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# **2009 Volunteer Salmon Watcher Program**

**Lake Washington Watershed,  
Puget Sound WRIA 8 Streams,  
and Vashon Island**

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April 2010



**King County**

Department of Natural Resources and Parks  
Water and Land Resources Division

**Science Section**

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and Vashon Island

King County Water and Land Resources Division, in cooperation with:  
Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Forum  
Bellevue Stream Team  
Cities of Bothell, Kirkland, Redmond, Renton, Seattle, and Woodinville  
Snohomish County Surface Water Management  
Vashon-Maury Island Land Trust  
With support from King Conservation District

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**King County**

Department of  
Natural Resources and Parks

**Water and Land Resources Division**

201 South Jackson Street, Suite 600  
Seattle, WA 98104



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## Summary

The purpose of the Salmon Watcher Program is to document the distribution of spawning adult salmon throughout the basin via an active public outreach and education program and subsequently consolidate all the information into a single resource (this report). These data can be used by policy makers and the public to improve how aquatic resources are managed, to protect salmon and trout species, and to enhance their habitat.

For the 2009 program, 113 volunteers surveyed 100 sites on 42 streams throughout the Lake Washington Watershed, other WRIA 8 streams in Central Puget Sound, and Vashon Island streams from August 30, 2009, to January 31, 2010. Because volunteers collect the data in this program, the agencies are able to obtain more information from far more locations than would otherwise be possible. However, data in this report should be used with the following factors in mind:

- (1) All volunteers have been trained, but volunteer expertise in locating and identifying fish species varies from very high to very low;
- (2) Coverage of streams by volunteers was by no means complete;
- (3) Volunteers view stream sites for relatively brief periods of time during the spawning season;
- (4) Determination of survey sites is based on volunteer availability and site accessibility (and many survey locations change from year to year, even on the same creek);
- (5) Adult fish can be difficult to see and therefore may have passed through reaches undetected; and
- (6) Volunteer data indicate only where minimum fish distributions extend to, but do not indicate reaches where fish are definitively absent (in other words, the data may confirm fish presence but does not confirm absence).

Volunteers observed the following species: sockeye, kokanee, coho, and chinook salmon, as well as trout. The following results were compiled from volunteer observations: (1) Sockeye were seen in the greatest numbers (1,189 enumerated); (2) Coho were seen in 6 Lake Washington Watershed basins including WRIA 8 Puget Sound streams; (3) Chinook and sockeye were observed in 6 Lake Washington basins; (4) Kokanee were observed in 2 Lake Washington basins; (5) No chum were reported anywhere; and (6) No fish were observed in the one Vashon stream that was viewed.

This report is published on the Internet and can be found using the hyperlinks on this web page: <http://www.kingcounty.gov/environment/animalsAndPlants/salmon-and-trout/salmon-watchers/reports.aspx>.

Maps included in this report have been published on the Internet and can be found using the hyperlinks on this web page: <http://www.kingcounty.gov/environment/animalsAndPlants/salmon-and-trout/salmon-watchers/maps.aspx>.

The home page for the Salmon Watcher Program web site is here: <http://www.kingcounty.gov/environment/animalsandplants/salmon-and-trout/salmon-watchers.aspx>.

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## Acknowledgements

Many thanks to all the dedicated volunteers for spending many hours in what is often cold and wet weather to collect the information for this report—some for the tenth year in a row, and sometimes without ever seeing a single fish. Without the volunteers there would be no data, no maps, and no report. They help make a positive difference here in the Northwest, not only by reporting fish species, but by acting as the eyes and ears of the streams, reporting stream blockages as well as illegal and other suspect activities. They are the stewards of resources that make the Pacific Northwest so special. A *huge* Thank You to all our great volunteers!

We also want to acknowledge the various individuals from the cooperating jurisdictions. Every year these folks meet and plan the program, organize and stage the training sessions, and invest lots of time attending to the questions of the volunteers. Thanks (in no particular order) to Laurie Devereaux, Debra Crawford, Peter Holte, Janet Geer, Gary Fink, Betsy Adams, Micah Bonkowski, Kollin Higgins, Miles Mayhew, Hans Berge, Kit Paulsen, Beth Miller, Wendy Collins, Suzi Wong-Swint, and Karren Gratt.

Jennifer Vanderhoof is the program's technical lead and also writes these annual reports.

Finally, we would like to thank those who partially sponsored our funding: Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Forum through a King Conservation District grant.

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## Introduction

The Salmon Watcher Program is a volunteer program that originated in 1996 and whose purpose is to record observations of adult fall-spawning salmonids. Volunteers are recruited and trained to identify and watch for spawning salmon throughout Water Resource Inventory Area 8 (WRIA 8), which includes the Lake Washington Watershed and some streams leading to Puget Sound (Figure 1). Volunteers also watch on Vashon Island. Regional agencies who participated in the Salmon Watcher Program along with King County during the 2009 season include the Bellevue Stream Team, the cities of Bothell, Kirkland, Issaquah, Redmond, Renton, Seattle, and Woodinville, Snohomish County Surface Water Management, and the Vashon-Maury Island Land Trust.

The Salmon Watcher Program was initiated to expand on current efforts undertaken by resource agencies to document the distribution of spawning salmon in WRIA 8, including the Lake Washington Watershed. Basins that comprise the Lake Washington Watershed include Bear Creek, Cedar River, East Lake Washington, West Lake Sammamish, East Lake Sammamish, West Lake Sammamish, Issaquah Creek, and North Lake Washington (divided into the North Lake Washington tributaries and the Sammamish River tributaries). Other streams in WRIA 8 that were watched included Pipers Creek and Boeing Creek, both of which drain to Puget Sound. Vashon Island streams were observed as part of the Salmon Watcher Program for the ninth year in a row.

Salmon Watcher volunteers annually collect information on the presence of fall-spawning salmonids, including chinook, coho, sockeye, kokanee (resident form of sockeye), and chum salmon, as well as trout species. Data of this type become more important in the region as salmonids, such as Puget Sound chinook, are listed under the Endangered Species Act.

Because volunteers do this work, gathering this volume of data is accomplished with reduced agency resources, and the watersheds' residents can become involved and educated at the same time. Further, interactions with agency personnel foster positive relationships between the public and government agencies. With current budget and time constraints of agency personnel, much of the data collected in this effort would not be collected otherwise.

In addition to summaries of fish observed during the fall season, this 2009 report contains information and some statistics about the volunteers. It should be noted that this report summarizes data collected only by Salmon Watcher volunteers, and it is therefore in no way intended to be an exhaustive report of fish distribution in WRIA 8 or on Vashon. Other fish surveys are conducted annually by county, state, city, and federal agencies and non-profit organizations. For example, surveys have been conducted by volunteers or County staff to look specifically for kokanee and chinook; the results of these surveys are reported separately and are not included here.

### **Figure 1. Basins surveyed for the 2009 Salmon Watcher Program**

(see <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/1-basins-surveyed-map.pdf>).

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## Methods

Volunteers were recruited during late summer and early fall of 2009 to observe fish in streams through-out the Lake Washington Watershed<sup>1</sup>, other WRIA 8 streams, and streams on Vashon Island. The 116 volunteers who surveyed in the project area, plus 1 individual who observed outside the project area, are listed in Table 1 (totals: 117 individuals, pairs, or groups totaling 138 people).

**Table 1. Volunteer observers for the 2009 Salmon Watcher Program.**

---

Ann Aagaard	Birgit Hansen	Kelly Rau
Eric Adman	Christine Henderson	Grace Reamer
Russ Atkins	An Huynh	David L. Reitz
Kathleen Auld	Nels Johnson	Tom Remy
Frank Backus	Monika and Christina Kaetz	Larry Reymann
Danielle Bannier	Laurel Kaminski	Marian Rice
Ed and Sheila Barnes	Pam Kelly	David Richardson
Cathleen Barry	Cheri Kirchmeier	Steve & Chase Rodgers
Judith Barry	Bob Klee	Kathleen Ryan
John and Morgan Beaumier	Tatsu Komada	Ronald Ryan
Katrina Beyer	Janusz Komorowski	Ed Schein
Marilyn & Tom Blue	Tommy & Caroline Kraft	Laura and Jim Shellooe
Kevin Boze	Yvonne Kuperberg	Patty & Dave Shelton
Janet Broadus	John Laible	John & Peggy Sherman
Arlene & Jarred Bruce	Kim Lancaster	Henry Shirinyan
John Ching	Belinda & Moe Ledoux	Sue Short
Dick and Jane Christie	Debra Lehrberger	Kris Sigloh
Michael Scott Clark	Lynne Lew	Pamela Silimperi
Martha Clatterbaugh	Mark & Jodi Linstead	Gary Smith
Bridget & Margaret Cook	Mary Loarie	Lauren Soliday
Justin Crittenden	Andy Loch	Dan Spuckler
Nancy Daar	Ginny Lodwig	Randy & Sandra Spurlock
Maki & Tony Dalzell	Richard Lofgren	Nancy Stafford
James & Edna Dam	Don Mackey	Kirk Stauffer
Alyse & Dennis DeKraker	Ken Mackey	John, Johnny, Becky Stephenson
Ken Dorsch	Ron Marshall	Mike Stults
Amelia Dumovic	Tiffany McGill	Dee Dee Tilley
Debbie Ellenwood	Jim McRoberts	Kay Tokuda
Willie Elliot	C. Blaise Mitsutama	Gary Tribble
Gary & Bob Emerson	Jane Neubauer	Terry Trimmingham
Carol Fielder (Woodridge Elementary)	Dawn Olmsted	Mary Vincent
Dorothy Fischer	Yoshiko Otonari	Diana Wadley
Gail Fligstein	Tammy Parise	Leslie Walker
Adrienne Fox	Betty Peltzer	Leslie Waters
Charlie & Carolyn Francis	Connie Peterman	Todd Wentworth
Heather Frankovic	Gary Pilawski	Maggie & Brian Windus
Hon Cheung Fung	Perrilee & Dana Miller Pizzini	Gary Wright
Maria Gerrald	Tiffany Quarles	John Zanatta
Laurie Gogic	Katherine Quinn-Dumovic	Margaret Ziviski
Rhoda Green		

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<sup>1</sup> In this document, the Lake Washington Watershed means all waters draining through the Ballard Locks, and the subbasins of the Lake Washington Watershed are referred to as basins (e.g., Issaquah Creek Basin).

## Volunteer Training

Agency staff held a total of 4 classroom training sessions in 2009. Approximately 144 people attended a training sessions, and of those, about 50 were returning volunteers from prior seasons. Returning volunteers are not required to attend a training every year; they are encouraged to attend a session every other year. For the 2009 season, veteran volunteers were strongly encouraged to attend a session as a refresher, and a large number obliged.

During training sessions, all volunteers were taught to identify adult spawning salmon species with a slide presentation, which was placed on King County's web site so volunteers could review it any time. During the training sessions, volunteers signed up for one or more sites to survey. They were given salmon identification materials, including color adult salmon identification cards and spawner timing charts. Volunteers were taught how to fill out and return data forms.

Some survey locations were prioritized by staff from each cooperating jurisdiction based on the need for information. However, sites were typically surveyed based on volunteer choice and availability. Volunteers were assigned to stream locations near their homes or customary walking places whenever possible. Volunteers were instructed to stay on public property (bridges, parks, etc.) unless they gained permission from the landowners to enter private property or the survey location was on their own property. Figure 2 shows all the sites watched by volunteers during the 2009 fall spawning season.

### Figure 2. Sites surveyed by Salmon Watcher volunteers in 2009

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/2-sites-surveyed-map.pdf>.

## Data Collection

Surveys were conducted between August 30, 2009 to January 31, 2010, though most surveys began in September and were concluded in December (Table 2). Volunteers were asked to watch at their survey sites for at least 15 minutes, twice per week, and record any adult salmonids they observed. Actual survey frequency and duration varied greatly among volunteers.

**Table 2. Number of surveys per month during 2009 Salmon Watcher season.**

Month	Number of Surveys
August	1
September	377
October	952
November	772
December	186
January	18

Volunteers counted all live and dead adult salmonids they observed. If a volunteer surveyed the same site more than one time on the same day, the highest fish count was used; however, occasionally more than one volunteer surveyed the same site on a single day and their individual observations were used. Volunteers were asked to report only once those dead fish observed on more than one occasion and to note subsequent observations of the same fish in their comments. Juvenile fish were noted if present. Unidentified fish were counted and described when possible.

Volunteers were asked if they could tell whether the fish they saw had an adipose fin. Volunteers were asked to note how many citizens they came into contact with during their streamside duties. They were also asked if they noticed anything at their site that needed to be reported and whether they reported it. All

data were recorded onto field data forms (Appendix A), which were mailed to Salmon Watcher staff on a monthly basis.

Volunteers were asked to fill out a “First Fish ID” form. This form had several multiple-choice questions about various key characteristics for identifying fish. Volunteers were asked to fill one of these forms out the first time they saw a new species and to turn the forms in with their data. The purpose of this form is twofold: (1) to aid volunteers in identification by highlighting key characteristics, and (2) to aid Salmon Watcher staff in quality control.

## **Quality Assurance/Quality Control**

Several means were used to assure that the data collected from volunteers were as accurate and consistent as possible during all phases of the program. Volunteers were provided with training by fish experts: data included in this report were collected either by returning volunteers or new volunteers who attended one of the training sessions for the 2009 season. Volunteers were provided laminated fish identification cards and a packet of training materials that included fish identification information. Duplicate as well as additional fish identification materials were placed on the Internet. Contact persons were made available to volunteers to answer questions and verify species identification when necessary; volunteers were encouraged to call upon these individuals if they were unsure of species identification.

Staff receiving the data sheets screened them for anything requiring immediate attention such as an unusual fish sighting or potential water quality problems. If an unusual fish sighting were noticed on a data form, agency staff contacted the volunteer to further inquire about what characteristics were used to identify the fish. The First Fish ID forms were intended to provide another means by which fish identifications could be checked and verified.

Data were input into a SQL server database housed at King County. The database has been designed to catch anomalies in data entry, such as dates not in the season. The database also poses questions when it detects that a count of a certain species has never been as high at that site in that month in previous years. These and other checks were built into the database software to increase accuracy of input data. Following data entry, the figures were verified at least once by agency staff to ensure accuracy, as well as catch anything that might need addressing. The data reviewers are familiar with the basins and the fish runs typical for the basins.

Because of the limitations of usage of these data (Limitations of Volunteer Data, page 23) and despite quality control measures, the data are intended to be used only to make preliminary evaluations of the distribution of spawning salmonids in the Lake Washington Watershed and Vashon streams.

## Results and Discussion

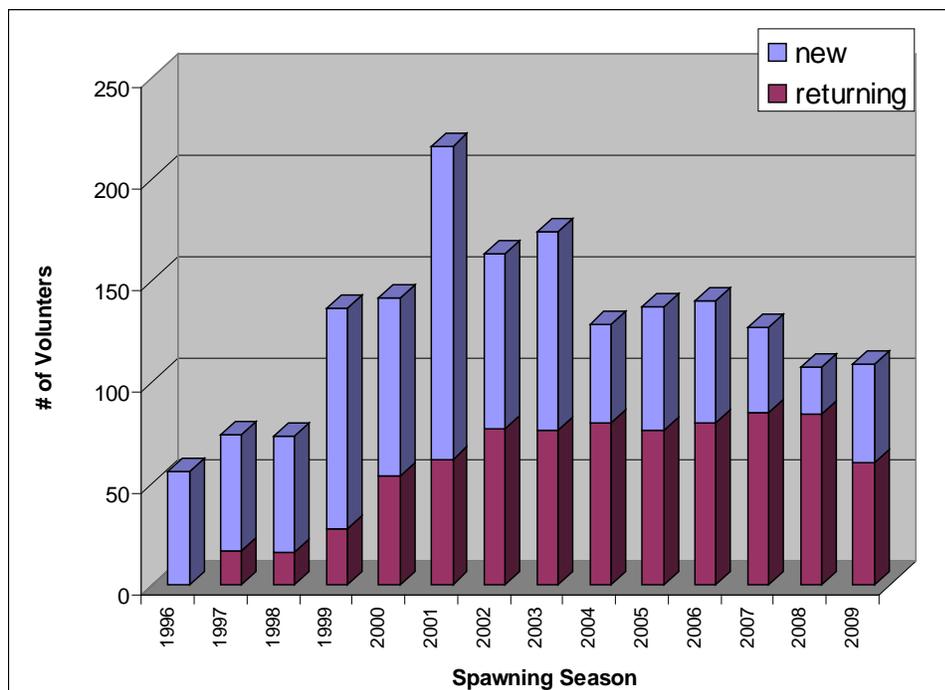
In 2009, a total of 103 sites on 44 streams were surveyed by 117 volunteers (Table 3).

**Table 3. Numbers of streams, sites, and volunteers involved in the 2009 spawning season.**

Area	# streams	# sites	# volunteers
Lake Washington Watershed	38	95	108
Other WRIA 8 Streams	3	3	3
Vashon Island	1	2	2
Other (outside program area)	2	3	4
Total	44	103	117

In 2009, 60 out of 108 volunteers (56 percent) watching in the official program area were returnees (Figure 3). The number of returning volunteers had remained consistent for about 7 years, until 2008. But in 2009 the number of returning volunteers dropped. Approximately 41 people signed up to watch sites but were unable to follow through, and of those 41, 20 were previous volunteers. Many of those 20 reported that they were over-committed and hope to return to the program in 2010. Of the 84 returnees, 2 pairs of volunteers have surveyed every year since the program began. Additionally, the 4 volunteers at sites outside the funded program areas were returnees.

**Figure 3. Total number of new and returning volunteers for each year of the Salmon Watcher Program<sup>2</sup>.**



<sup>2</sup> Note that volunteers in 2001 were from a larger geographic area. For further discussion, please see “Volunteer Activity” on page 23.

## Basin Summary

For the 2009 spawning season, chinook were reported in the greatest numbers in Issaquah Creek Basin (Table 4). Sockeye were reported in the largest numbers in the Cedar River Basin; however, their numbers continue to decline from observations in past years (see “Species Summary,” below). The most kokanee were observed in Lewis Creek, in the West Lake Sammamish Basin. Coho were seen in the most number of basins.

**Table 4. Species enumerated within surveyed basins during the 2009 Salmon Watcher season.**

Basin	Chinook	Coho	Kokanee	Sockeye	Trout	Unid. <sup>1</sup>	Basin Total
Big Bear Creek	132	19	-	205	4	54	414
Cedar River	1	16	-	635	-	68	720
East Lake Washington	38	6	-	7	2	19	72
West Lake Sammamish	-	-	41	-	-	-	41
Issaquah Creek	351	560	3	27	-	41	982
North Lake Washington Tribs.	10	-	-	57	-	34	101
Samm. River Tribs.	25	11	11	269	-	38	354
Vashon Island	-	-	-	-	-	-	-
Middle Puget Sound - WRIA 8	-	3	-	-	-	4	7
Other <sup>2</sup>	-	13	-	-	-	12	25
Species Total	557	628	55	1200	6	270	2716

<sup>1</sup> Unidentified species.

<sup>2</sup> Outside program area.

Detailed results for each basin in the program are presented below in basin groupings. Data include stream name and state stream numbers as assigned in the “stream catalog” by Williams et al. (1975), corresponding stream sites (with Site ID and river mile), dates of surveys, number of surveys, number of surveyors, and number of each species observed. The unique Site ID numbers that correspond with each survey site are used to distinguish the sites. A site, with its unique ID number, will always have the same data associated with it, regardless of refined river mile (RM) designations. River mile designations are generally derived from the stream catalog combined with measurements made using King County’s Geographic Information System. Additionally, a designated site may vary a few feet from year to year: (1) if a volunteer watches on the upstream side of a bridge versus the downstream side, (2) if a new volunteer happens to watch a few yards from where a previous watcher observed, (3) if a volunteer moves a few feet to observe in an area of better spawning habitat or visibility, or (4) if restoration and/or overgrown vegetation improves or obstructs the view.

Maps are presented for each basin in the program area and depict observations of sockeye, coho, chinook, kokanee, and chum identified during the survey. The streams surveyed in the Lake Washington Watershed were grouped into the following basins: Big Bear Creek, Cedar River, East Lake Washington, West Lake Sammamish, Issaquah Creek, and North Lake Washington (split into North Lake Washington tributaries and Sammamish River tributaries). Salmonids were observed in all basins surveyed in 2009. Trout and unidentified species were not mapped.

## Big Bear Creek Basin

Volunteers surveyed 18 sites in 6 streams in the Big Bear Creek Basin in 2009 (Figure 2). From 1 to 8 sites were watched per stream, and the total number of surveys ranged from 1 to 74 per site (Table 6). Most sites was monitored by 1 volunteer.

**Table 5. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers<sup>3</sup>, and years the sites were watched for each stream surveyed in the Big Bear Creek Basin for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Big Bear Creek	080105	453	0.9	9/20 - 11/3	14	1	2001-2007, 2009
		65	2.7	9/14 - 12/7	74	5	1997- 2000, 2002-2009
		290	3.2	10/3 - 10/22	5	1	1997, 2000, 2002-2004, 2006, 2009
		101	4.9	9/23 - 9/30	4	1	1997-2009
		89	6	8/30 - 10/31	18	1	1998-2009
		647	7.2	9/27 - 12/17	22	1	2009
		136	7.4	9/14 - 11/12	13	1	1998-2009
		503	7.85	9/21 - 12/6	26	1	2002, 2004-2007, 2009
Trib. to Bear	-	90	0.2	10/3 - 11/29	18	1	1998-2009
Cold Creek		621	1.3	11/8 - 11/8	1	1	2009
Cottage Lake Cr.	080122	102	0.6	9/30 - 12/6	10	1	1997, 1998, 2001-2006, 2008, 2009
		646	1.97	9/18 - 10/31	24	1	2009
		50	2.2	9/14 - 12/19	55	3	1997, 1999-2009
		644	2.4	9/20 - 12/31	25	1	2009
		395	2.7	9/21 - 11/15	34	3	2002, 2003, 2008, 2009
		638	3.2	9/30 - 10/6	3	1	2008, 2009
Trib 0127 to Cottage Lake	80127	168	0.14	10/4 - 10/31	6	1	1999, 2000, 2002, 2004, 2007, 2009
Daniel's Creek	80122	165	1.2	10/4 - 11/20	6	1	1999, 2000, 2009

Salmonids were found in 2 of the 6 streams observed in Big Bear Creek Basin (Table 7): Bear Creek and Cottage Lake Creek. Chinook, coho, and sockeye were all seen in Bear Creek and its primary tributary, Cottage Lake Creek. In addition to sockeye and chinook, one coho was reported at site 395 (NE 159<sup>th</sup> St.) in Cottage Lake Creek; prior to this observation, no coho had been seen by Salmon Watcher volunteers this far upstream but downstream of the lake. The same volunteer reported a chinook at site 638 (NE 161<sup>st</sup> Pl.); this marks the first report of a chinook by volunteers that far upstream in Cottage Lake Creek but downstream of the lake. Note that upstream of Cottage Lake in Tributary 080127, one chinook and one coho were reported in 2002. No other salmonids have been reported upstream of the lake by volunteers.

<sup>3</sup> "Volunteer," when used in this context, is defined as an individual, pair, or group of people who observed a stream site for adult spawning salmonids at a given time on a given date.

**Table 6. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the Big Bear Creek Basin for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Sockeye	Unid.
<b>Big Bear Creek</b>	453	0.9	-	-	2 (9/20 - 10/6)	8 (9/20 - 10/3)
	65	2.7	4 (9/25 - 10/2)	1 (10/7)	40 (9/24 - 11/2)	12 (9/24 - 11/2)
	290	3.2	-	-	-	-
	101	4.9	-	-	2 (9/30)	-
	89	6	-	-	-	-
	647*	7.2	2 (10/1)	-	18 (10/8 - 11/2)	12 (10/1 - 11/30)
	136	7.4	-	-	-	-
	503	7.85	-	3 (10/27 - 10/30)	-	-
<b>Trib. to Bear</b>	90	0.2	-	-	-	-
<b>Cold Creek</b>	621	1.3	-	-	-	-
<b>Cottage Lake Cr.</b>	102	0.6	-	12 (10/19 - 12/6)	3 (11/15)	11 (9/30 - 11/24)
	646	1.97	39 (10/1 - 10/9)	-	50 (10/1 - 10/19)	-
	50	2.2	30 (9/28 - 10/17)	2 (11/3 - 11/16)	2 (10/2 - 10/31)	8 (10/1 - 10/16)
	644	2.4	7 (10/3 - 10/15)	-	7 (10/3 - 10/15)	2 (10/8 - 10/8)
	395	2.7	49 (10/1 - 10/23)	1 (10/4)	81 (10/4 - 11/3)	1 (10/2)
	638	3.2	1 (10/6)	-	-	-
<b>Trib 0127 to Cottage Lake</b>	168	0.14	-	-	-	-
<b>Daniel's Creek</b>	165	1.2	-	-	-	-

\*Trout also observed at this location.

The observations of sockeye, coho, and chinook in the Big Bear Creek Basin determined from volunteer surveys are shown in Figure 4.

**Figure 4. Observations of salmonids in the Big Bear Creek Basin**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/4-salmonid-observations-big-bear-cr.pdf>.

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## Cedar River Basin

Volunteers surveyed 15 sites in 4 streams in the Cedar River Basin in 2009 (Figure 2). From 1 to 7 sites were watched per stream, and the total number of surveys ranged from 6 to 58 per site (Table 7). Most sites were monitored by 1 volunteer.

**Table 7. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the Cedar River Basin for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Cedar River  (Cavanaugh Pond)	080299	595	0	9/16 - 12/6	16	1	2006, 2009
		198	0.1	9/20 - 12/6	13	1	2009
		199	1	9/20 - 12/6	21	1	1999, 2006, 2009
		201	1.3	10/10 - 12/18	6	1	2001, 2005, 2007, 2008, 2009
		206	4.3	9/16 - 11/27	17	1	1999, 2001, 2002, 2009
		609	4.8	9/18 - 10/25	8	1	2009
		139	6.4	10/10 - 1/17/10	14	1	1997-2009
<b>C.R. Side Channel</b>	-	557	0.15	9/20 - 12/7	22	2	2003, 2005-2009
<b>Kennydale Creek</b>	-	590	0.1	9/18 - 12/12	15	1	2005, 2007, 2008, 2009
<b>Rock Creek</b>	080338	410	0.2	10/25 - 11/30	35	1	2001-2009
		154	0.4	10/25 - 11/28	10	1	1999-2009
<b>Taylor Creek*</b>	080320	588	0.37	9/20 - 12/7	58	3	2004-2009
		596	0.5	10/25 - 11/30	35	1	2004-2009
		71	1.8	10/25 - 11/28	10	1	1998-2009
		126	2.4	10/25 - 11/28	10	1	1998, 2001-2009

\*Taylor Creek is a tributary to the Cedar River, not to be confused with the Taylor Creek that is a tributary to Lake Washington in the City of Seattle.

Sockeye were observed at all but one site watched, and they were seen at the most upstream location watched in the Cedar River: at river mile 6.4, Cavanaugh Pond (Table 8). Only one chinook salmon was reported in the Cedar River basin in 2009; it was seen just up from the mouth of the Cedar River. No adult salmon were reported in Kennydale Creek or Rock Creek.

**Table 8. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the Cedar River Basin for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Sockeye	Unidentified
Cedar River	595	0	-	-	13 (9/30 - 11/7)	32 (10/15 - 12/6)
	198	0.1	1 (11/12)	-	15 (10/10 - 11/3)	-
	199	1	-	2 (10/13)	533 (9/30 - 11/27)	7 (10/10 - 12/6)
	201	1.3	-	-	6 (10/10)	27 (10/10 - 11/28)
	206	4.3	-	14 (10/15 - 11/13)	-	-
	609	4.8	-	-	4 (9/27 - 10/21)	-
(Cavanaugh Pond)	139	6.4	-	-	42 (10/27 - 11/29)	-
<b>C.R. Side Channel</b>	557	0.15	-	-	2 (10/15 - 10/30)	-
<b>Kennydale Creek</b>	590	0.1	-	-	-	-
<b>Rock Creek</b>	410	0.2	-	-	-	-
	154	0.4	-	-	-	-
<b>Taylor Creek</b>	588	0.37	-	-	3 (10/28 - 11/11)	2 (10/27)
	596	0.5	-	-	17 (10/25 - 11/16)	-
	71	1.8	-	-	-	-
	126	2.4	-	-	-	-

The observations of sockeye, chinook, and coho in the Cedar River Basin determined from volunteer surveys are shown in Figure 5.

**Figure 5. Observations of salmonids in the Cedar River Basin**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/5-salmonid-observations-cedar-river.pdf>.

## East Lake Washington Basin

Volunteers surveyed 22 sites in 10 streams and 1 beach site in the East Lake Washington Basin in 2009 (Figure 2). From 1 to 6 sites were watched per stream, and the total number of surveys ranged from 3 to 86 per site (Table 9). Each site was monitored by 1 to 5 volunteers.

**Table 9. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the East Lake Washington Basin for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Coal Creek	080268	442	2.1	9/20 - 12/28	38	2	2001-2009
Trib. to Coal Cr.	080273	212	0.1	10/2 - 12/21	30	1	1999, 2002-2004, 2006, 2009
East Creek	-	514	0.2	9/17 - 12/10	43	2	2003, 2005-2009
Honey Creek	080285	295	0.1	11/9 - 11/26	3	1	1997, 2009
Kelsey Creek	080259	13	2	9/11 - 12/28	86	5	1997-2009
		124	2.4	9/12 - 12/8	20	1	1997-2009
		120	3	10/14 - 10/28	3	1	1997-2009
		216	4.5	9/14 - 11/28	39	3	1999, 2001, 2002, 2004, 2007-2009
		586	4.9	9/18 - 10/25	11	1	2004-2009
		45	5	9/12 - 11/30	40	2	1997-2000, 2003, 2006-2009
Lake Wa. Beach	080028	130	32.4	9/13 - 11/27	15	1	1998, 2007-2009
May Creek	080282	208	0.2	9/17 - 11/28	19	1	2001- 2009
		432	0.5	9/17 - 11/28	19	1	2000, 2004-2009
Mercer Slough	080259	445	1.6	9/15 - 12/28	72	5	2001, 2003-2009
Richards Creek	080261	75	0.4	9/12 - 12/8	20	1	1998-2000, 2007- 2009
		27	0.7	9/12 - 12/8	20	1	1997-2009
		80	1.6	9/17 - 12/10	13	1	1998, 2002-2009
Sunset Creek	-	446	0.1	9/17 - 12/10	12	1	2009
West Trib. Kelsey Cr.	080264	116	0.25	9/10 - 11/28	55	4	1998, 1999, 2001-2009
		325	0.7	9/17 - 11/29	24	1	1997, 2001-2007, 2009
		506	0.9	9/26 - 11/28	12	1	2002-2009
		73	1.1	9/11 - 12/7	14	1	1998, 2000, 2004-2009

Salmonids were found in 6 of the 10 streams surveyed in 2009 (Table 10). One chinook was seen in Kelsey Creek, and chinook were also seen in Mercer Slough and West Trib. Kelsey Creek, all of which are part of the same Kelsey Creek system. Coho were reported in Coal Creek and one of its tributaries. No sockeye were seen in this basin. No fish were observed in East, Honey, Richards or Sunset creeks or the one Lake Washington beach that was observed.

**Table 10. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the East Lake Washington Basin for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Sockeye	Unid.
Coal Creek	442	2.1	-	3 (11/10 - 11/10)	-	1 (11/11)
Trib. to Coal Cr.	212	0.1	-	3 (11/10)	-	-
East Creek	514	0.2	-	-	-	-
Honey Creek	295	0.1	-	-	-	-
Kelsey Creek	13	2	1 (10/14)	-	1 (10/2)	6 (10/2 - 12/22)
	124	2.4	-	-	-	1 (11/1)
	120	3	-	-	-	-
	216	4.5	-	-	-	1 (10/18)
	586	4.9	-	-	-	-
	45	5	-	-	-	-
Lake Wa. Beach	130	32.4	-	-	-	-
May Creek	208	0.2	-	-	3 (10/28)	-
	432	0.5	-	-	-	-
Mercer Slough	445	1.6	3 (9/30 - 11/3)	-	-	1 (11/3)
Richards Creek	75	0.4	-	-	-	-
	27	0.7	-	-	-	-
	80	1.6	-	-	-	-
Sunset Creek	446	0.1	-	-	-	-
West Trib. Kelsey Cr.	116*	0.25	33 (9/10 - 10/24)	-	3 (9/21 - 9/30)	7 (10/1 - 10/21)
	325	0.7	1 (9/20)	-	-	-
	506	0.9	-	-	-	2 (10/3 - 10/4)
	73	1.1	-	-	-	-

\*Trout also observed at this location.

The observations of sockeye, chinook, and coho in the East Lake Washington Basin determined from volunteer surveys are shown in Figure 6.

**Figure 6. Observations of salmonids in the East Lake Washington and West Lake Sammamish Basins**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/6-salmonid-observations-e-lake-washington.pdf>.

## West Lake Sammamish Basin

Volunteers surveyed 4 sites on 2 streams in the West Lake Sammamish Basin in 2009 (Table 11). From 26 to 49 surveys were conducted per site. Each site was monitored by 1 or 2 volunteers.

**Table 11. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the West Lake Sammamish Basin for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Lewis Creek	080162	327	0.05	10/2 - 12/30	26	1	1997, 2001-2009
		598	0.37	10/24 - 1/31/10	29	1	2004, 2005-2009
		283	0.5	10/2 - 1/30/10	33	2	1999, 2001-2009
Vasa Creek	080156	641	0.4	9/11 - 12/31	49	1	2009

Kokanee were observed at all three sites in Lewis Creek (Table 12). No fish were observed in Vasa Creek. Observations of kokanee in the West Lake Sammamish Basin determined from volunteer surveys are shown above in Figure 6, "Observations of Salmonids in the East Lake Washington and West Lake Sammamish Basins."

**Table 12. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the West Lake Sammamish Basin for the 2009 spawning season.**

Stream	Site ID	RM	Kokanee	Unidentified
Lewis Creek	327	0.05	31 (11/18 - 12/30)	-
	598	0.37	9 (11/27 - 12/4)	-
	283	0.5	1 (1/9/10)	-
Vasa Creek	641	0.4	-	-

## Issaquah Creek Basin

Volunteers surveyed 5 sites in 4 streams in Issaquah Creek Basin in 2009 (Figure 2). The total number of surveys ranged from 12 to 30 per site (Table 13). Each site was monitored by 1 or 2 volunteers.

**Table 13. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the Issaquah Creek Basin for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Carey Creek	080218	635	1.7	10/3 - 12/19	28	2	2007- 2009
E. Fork Issaquah Creek	080183	637	0.4	9/12 - 12/26	30	2	2007-2009
Issaquah Creek	080178	60	3.4	9/12 - 11/29	23	1	1997, 1998, 2005-2007, 2009
		642	6.8	9/13 - 12/14	14	1	2009
Trib. to Issaquah Cr.		643	0	9/16 - 10/30	12	1	2009

In 2009, sockeye were reported in Carey Creek for the first time by volunteers (Table 14); they were seen as far upstream as SE 196<sup>th</sup> St. Chinook and coho were reported in Issaquah Creek, and the coho were seen well upstream of the hatchery. Chinook and coho were also reported in East Fork Issaquah Creek. A new creek was watched in 2009, a tributary to Issaquah Creek, and 2 unidentified adult salmonids were reported near its confluence with Issaquah Creek (near river mile 9).

**Table 14. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the Issaquah Creek Basin for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Sockeye	Unid.
Carey Creek	635	1.7	-	2 (11/21 - 11/23)	8 (10/29 - 11/29)	-
E. Fork Issaquah Creek	637	0.4	17 (10/4 - 10/27)	5 (10/1 - 10/6)	8 (11/15 - 11/29)	-
Issaquah Creek	60	3.4	66 (10/4 - 11/15)	164 (10/4 - 11/29)	-	-
	642	6.8	-	9 (11/4 - 12/1)	-	4 (11/3 - 11/20)
Trib. to Issaquah Cr.	643	0	-	-	-	2 (10/17)

The distributions of chinook, coho, and sockeye in the Issaquah Creek Basin determined from volunteer observations are shown in Figure 7.

### Figure 7. Observations of salmonids in the Issaquah Creek Basin

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/7-salmonid-observations-issaquah-creek.pdf>.

## North Lake Washington Tributaries

The North Lake Washington Tributaries are those streams flowing into the north end of Lake Washington (e.g., McAleer, and Thornton creeks, the Sammamish River). Volunteers surveyed 14 sites in 7 streams in 2009 (Figure 2). From 1 to 3 sites were watched per stream, and the total number of surveys ranged from 8 to 25 per site (Table 15). Each site was monitored by 1 or 2 volunteers.

**Table 15. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the North Lake Washington Tributaries for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Juanita Creek	080230	68	0.2	9/18 - 12/4	18	2	1998, 2000, 2001, 2003, 2009
		411	0.7	9/30 - 12/1	10	1	2000, 2004-2009
		196	1.4	9/23 - 11/27	25	1	2000-2002, 2008, 2009
Peters Creek	080104	47	0	9/26 - 12/2	24	1	1998, 2003, 2009
		452	0.5	9/19 - 12/13	23	1	2002- 2009
Sammamish River	080057	269	3.3	9/21 - 10/30	8	1	2009
		42	11.5	10/4 - 11/15	11	1	1998, 2002, 2003, 2009
		271	12.5	9/28 - 11/20	13	1	1997, 1999, 2001-2004, 2007, 2009
Trib to Samm. R.		275	0.4	9/21 - 12/9	14	1	2009
S. Fk. Thornton Cr.	080033	527	1.15	9/27 - 12/10	20	1	2002-2009
Thornton Creek	080030	183	0.1	9/9 - 12/7	25	2	1997, 2000-2009
		24	1.3	10/1 - 11/27	14	1	2009
		528	2.8	9/13 - 12/8	24	1	2002-2009
Woodin Creek	-	228	0.3	9/26 - 12/6	9	1	1999, 2002, 2003, 2006-2009

Salmonids were found in 2 of the 7 streams surveyed in the North Lake Washington Tributaries (Table 16). Chinook were observed in Peters Creek. Sockeye were observed in the Sammamish River. No coho were reported by volunteers. No salmonids were seen in Juanita Creek, Thornton Creek, South Fork Thornton Creek, Woodin Creek, or a tributary to the Sammamish River.

**Table 16. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the North Lake Washington Tributaries for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Sockeye	Unid.
Juanita Creek	68	0.2	-	-	-	-
	411	0.7	-	-	-	-
	196	1.4	-	-	-	-
Peters Creek	47	0	10 (9/27 - 10/2)	-	-	-
	452	0.5	-	-	-	-
Sammamish River	269	3.3	-	-	-	-
	42	11.5	-	-	-	6 (10/4 - 10/18)
	271	12.5	-	-	57 (9/30)	28 (10/14 - 10/22)
Trib to Sammamish River	275	0.4	-	-	-	-
South Fk. Thornton Creek	527	1.15	-	-	-	-
Thornton Creek	183	0.1	-	-	-	-
	24	1.3	-	-	-	-
	528	2.8	-	-	-	-
Woodin Creek	228	0.3	-	-	-	-

The distribution of sockeye in the North Lake Washington Tributaries determined from volunteer observations is shown in Figure 8.

**Figure 8. Observations of salmonids in the North Lake Washington Tributaries**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/8-salmonid-observations-n-lake-washington.pdf>.

## Sammamish River Tributaries

The Sammamish River Tributaries are those streams flowing into the Sammamish River from waters originating in Snohomish County (Little Bear, North, and Swamp creeks; Big Bear Creek is discussed separately above). Volunteers surveyed 17 sites on 3 Sammamish River tributaries in 2009 (Figure 2). From 1 to 11 sites were watched per stream, and the total number of surveys ranged from 5 to 54 per site (Table 17). Each site was monitored by from 1 to 4 volunteers.

**Table 17. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the Sammamish River Tributaries for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Little Bear Creek	080080	114	0	9/16 - 12/8	54	4	1999, 2001, 2002, 2005-2009
		67	0.2	9/13 - 11/15	19	2	1997-1999, 2001-2009
		175	0.3	9/26 - 12/6	13	2	1997, 2000, 2002, 2006-2009
		176	1.3	9/18 - 12/5	40	3	1997, 2000-2007, 2009
		14	1.9	9/23 - 10/12	13	1	1999, 2000, 2002-2004, 2006-2009
North Creek	080070	438	0.01	9/18 - 10/6	10	1	2000, 2003, 2004, 2006, 2008, 2009
		112	0.9	10/2 - 11/8	5	1	1998-2009
		57	0.95	9/18 - 12/12	41	2	1998, 2001, 2004-2009
		408	1.05	10/2 - 11/8	5	1	2000-2009
		483	1.4	9/20 - 12/2	14	2	2002, 2007-2009
		113	1.5	9/18 - 12/8	39	3	1998, 2000, 2001, 2003, 2006-2009
		255	1.8	9/18 - 12/8	15	1	1999-2004, 2006, 2007, 2009
		425	2.6	9/1 - 12/3	41	3	2006, 2008, 2009
		254	2.8	9/18 - 11/29	29	2	2004, 2007, 2009
		253	3	9/21 - 12/10	28	1	1997, 1999, 2000, 2001, 2006-2009
Swamp Creek	080059	321	1.7	10/1 - 12/19	26	1	1997, 2001, 2007-2009

\*In 2004, site 408 was remapped; however, the river mile designations were not corrected. As a result, sites 57 and 408 have been numerically reversed since then. These numbers have now been corrected.

Salmonids were found in all 3 of the streams surveyed (Table 18). Chinook and sockeye were observed in North Creek, and a single kokanee was reported (which was more likely a residual sockeye; see the Kokanee section, page 28). Chinook, coho, kokanee, and sockeye were reported in Little Bear Creek. However, professional surveyors found residual sockeye but no kokanee in Little Bear Creek, so it is very likely the kokanee reported by volunteers in Little Bear Creek were actually residual sockeye (for more information, see the section on Kokanee below as well as the 2008 Salmon Watcher report). The only fish reported in Swamp Creek were two fish not identified to species.

**Table 18. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in the Sammamish River Tributaries for the 2009 spawning season.**

Stream	Site ID	RM	Chinook	Coho	Kokanee	Sockeye	Unid.
Little Bear Creek	114	0	8 (9/28 - 10/2)	10 (9/29 - 10/12)	4 (10/12 - 10/19)	129 (9/28 - 10/22)	1 (9/26)
	67	0.2	1 (10/6)	1 (10/19)	-	18 (10/8 - 10/30)	5 (10/4 - 10/19)
	175	0.3	2 (10/8)	-	6 (10/11)	21 (10/8 - 10/19)	18 (10/8 - 11/1)
	176	1.3	-	-	-	11 (9/20 - 10/15)	1 (10/7)
	14	1.9	1 (10/7)	-	-	4 (10/9 - 10/11)	-
North Creek	438	0.01	1 (10/5)	-	-	-	1 (9/22)
	112	0.9	-	-	-	-	-
	57	0.95	-	-	-	9 (10/18 - 10/22)	2 (10/18 - 10/25)
	408	1.05	-	-	-	-	-
	483	1.4	1 (9/20)	-	-	2 (10/15)	2 (11/2)
	113	1.5	2 (9/24 - 9/30)	-	-	2 (9/30 - 10/9)	-
	255	1.8	-	-	-	-	-
	425	2.6	1 (10/23)	-	1 (10/19)	37 (10/7 - 10/18)	1 (9/1)
	254	2.8	6 (9/20 - 10/2)	-	-	33 (9/20 - 10/9)	4 (9/20 - 10/9)
	253	3	-	-	-	-	-
548	3.9	2 (10/2)	-	-	3 (9/30 - 10/2)	1 (10/9)	
Swamp Creek	321	1.7	-	-	-	-	2 (10/5)

The distributions of chinook, coho, sockeye, and kokanee in the Sammamish River Tributaries determined from volunteer observations are shown in Figure 9.

**Figure 9. Observations of salmonids in the Sammamish River Tributaries.**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/9-salmonid-observations-sammamish-river.pdf>.

## Vashon Island

Volunteers surveyed 2 sites on Shinglemill Creek on Vashon Island in 2009 (Figure 2). The total number of surveys ranged from 6 to 10 per site (Table 19).

**Table 19. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed on Vashon Island for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Shinglemill Creek	150159	146	0	10/20 - 12/25	10	1	1998, 2001-2009
		148	0.5	10/18 - 12/25	6	1	1998, 2001-2003, 2005, 2006, 2008, 2009

No fish were observed in Shinglemill Creek.

## Puget Sound Streams

Streams draining to Puget Sound that were surveyed during the 2009 Salmon Watcher season are both inside and outside WRIA 8 (Table 20). Those streams within WRIA 8 include Boeing Creek, Pipers Creek, and Venema Creek. Longfellow Creek, watched annually, is part of WRIA 9<sup>4</sup>. A total of 5 sites in 4 streams draining to Puget Sound were watched in 2009. All sites were monitored by 1 or 2 volunteers.

**Table 20. Stream number, site ID, site location (listed in river miles, RM), survey dates, total number of surveys, number of volunteers, and years the sites were watched for each stream surveyed in the Central Puget Sound for the 2009 spawning season.**

Stream	Stream #	Site ID	RM	Survey Dates	# Surveys	# Vols.	Years Watched
Boeing Creek*	080017	436	0.1	10/9 - 11/4	6	1	2000-2009
Longfellow Creek	090360	177	0.6	10/11 - 11/22	14	2	1999-2007, 2009
		179	0.8	10/24 - 12/5	6	1	1998-2009
Pipers Creek*	080023	98	0.4	10/2 - 12/8	19	1	1998-2002, 2007-2009
Venema Creek*	-	383	0.02	10/2 - 12/12	18	1	2000, 2001, 2004-2009

\*Streams within WRIA 8.

Adult salmon were seen in Boeing, Pipers, and Longfellow creeks (Table 21) (this discussion does not include Vashon streams; for discussion of Vashon Island streams, see section above). Coho were observed at the only site watched in Boeing Creek. The only fish observed in Pipers and Longfellow creeks were not identified to species. No chum were reported in any streams draining to Puget Sound in 2009. No fish were seen in Venema Creek, a tributary to Pipers Creek. The observations of coho in the Central Puget Sound streams determined from volunteer surveys is shown in Figure 10.

**Table 21. Site ID, RM, and fish counts (live and dead) with dates seen at each stream surveyed in Central Puget Sound for the 2009 spawning season.**

Stream	Site ID	RM	Chum	Coho	Unidentified
Boeing Creek*	436	0.1	-	3 (10/22 - 11/4)	-
Longfellow Creek	177	0.6	-	-	4 (11/15)
	179	0.8	-	-	8 (11/14 - 11/15)
Pipers Creek*	98	0.4	-	-	4 (12/2 - 12/8)
Venema Creek*	383	0.02	-	-	-

\*Streams within WRIA 8.

**Figure 10. Observations of salmonids in Puget Sound basins.**

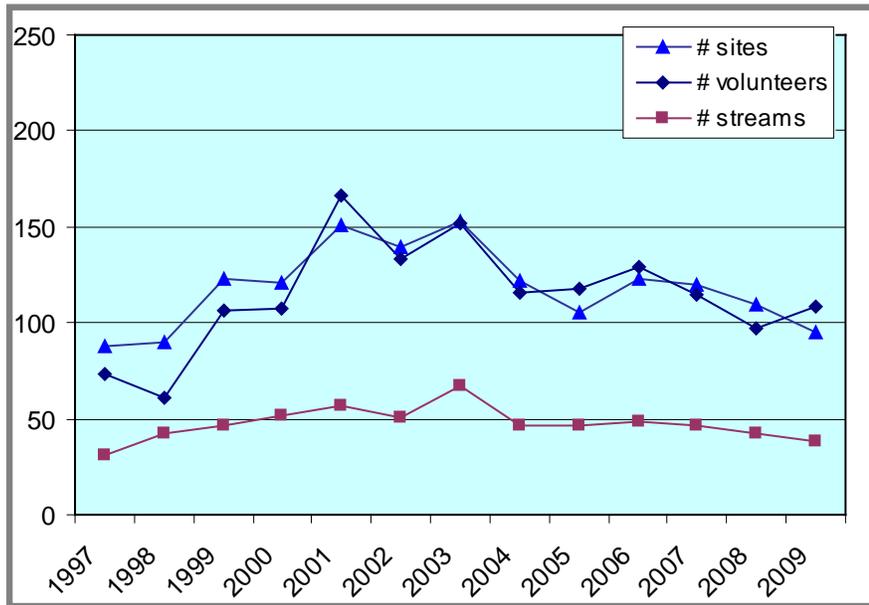
See: <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/10-salmonid-observationsn-puget-sound-tribs.pdf>.

<sup>4</sup> Fauntleroy Creek, a WRIA 9 stream that drains to Puget Sound, is also watched by volunteers; however, survey methods are different from those of this program. See Appendix B for a summary of salmonid observations at Fauntleroy Creek in 2009.

## Volunteer Activity

The trend in the number of volunteers participating in the Salmon Watcher Program has varied over the 14 years of the program (Figure 11; data for 1996 not cataloged). Many volunteers watch more than one site, and many sites have more than one volunteer watching at it. The last 6 years have been relatively consistent in terms of numbers of volunteers, sites, and streams in the program. However, the trend since 2006 has been decreased volunteer participation, mostly with new recruits. In 2009, the trend in new recruits versus veteran returnees reversed, and we were able to recruit the highest number of new volunteers since 2006, but our number of returning veterans dropped by about 20 people.

**Figure 11. Number of volunteers (defined as an individual, pair, or group) watching in the Lake Washington Watershed from 1997<sup>5</sup>-2009.**



## Contact with Citizens

Volunteers were asked to keep track of how many citizens they came into contact with during their time by the streams. Salmon Watcher volunteers spoke with at least 415 citizens during the 2009 spawning season. Table 23 details the numbers of citizens who interacted with volunteers.

**Table 22. Number of citizen contacts made by all Salmon Watcher volunteers in each of the surveyed basins.**

Basin	Number of Citizen Contacts
Big Bear Creek	90
Cedar River	62
E. Lake Wash.	83
W. Lake Samm.	6
Issaquah Creek	17
N. Lake Wash.	44
Samm. River Tribs.	92
Vashon Island	5
Puget Sound	16

<sup>5</sup> See previous Salmon Watcher annual reports for details on yearly participation.

## Time Spent by Volunteers

Salmon Watcher volunteers are asked to record the start and end times of each site visit. Those times are used to calculate the amount of time volunteers spend watching stream-side. Occasionally, some volunteers do not fill in that part of the data sheet. Additionally, some volunteers watched twice a day, and only one time period is included in these calculations. Time underestimates notwithstanding, Table 24 illustrates the approximate amount of time spent by volunteers in each basin. More than 741 hours were volunteered during the 2009 Salmon Watcher season.

**Table 23. Number of hours spent by Salmon Watcher volunteers in each of the surveyed basins.**

Big Bear Creek	Cedar River	E. Lake Wash.	W. Lake Samm.	Issaquah Creek	N. Lake Wash.	Samm. River Tribs.	Vashon	Puget Sound
149.12	94.8	187.9	43.2	35.03	77.45	123.28	6.08	22.94

## Limitations of Volunteer Data

Individuals, citizen groups, non-profit organizations, and government agencies all use data from the Salmon Watcher Program for various reasons (for an extensive list of reasons, please see the report from the 2000 Salmon Watcher season, Vanderhoof 2001). However, several qualifications must be kept in mind when reviewing the data in this report and especially when using the data for any purpose other than describing fish presence. The level of expertise of the volunteers varies widely: some volunteers have past experience identifying fish through professional or school training, recreational fishing, or personal interest. Other volunteers learned to identify salmon for the first time from the Salmon Watcher training session. For additional discussion on the limitations of volunteer data, please see previous reports (e.g., King County 2004).

Every year volunteers from previous years return and new volunteers enter the program who must learn to identify the different species of salmonids they might encounter in their assigned streams. In 2009, 55 percent of Lake Washington Watershed volunteers were returnees (see the beginning of the Results and Discussion section above). The number of returning volunteers has remained somewhat consistent for the past 6 years, though with a drop in 2009; therefore, the level of accuracy has likely been relatively consistent during this time period.

Although training sessions are thorough, identification materials are provided, and technical experts are available for help with identification, some misidentifications will occur.

It is important to keep in mind that the absence of spawner sightings in a stream does not mean that spawning salmonids are not accessing that location. It does mean that fish were not seen by the volunteer at the site at the time of survey. Because of this important distinction and the other mentioned limitations of this type of survey, data in this report should be used only to indicate the presence of adult salmon at specific locations (species distribution). All other uses derived from the compilation of this data should be used cautiously and with the specific limitations of the data in mind. With very few exceptions, because most or all of these parameters are different for every stream surveyed from 1996 through 2009, comparisons of raw data likely would not yield valid information about changes in populations. Therefore, the best use for the fish data is in determining presence of fish and mapping fish distribution.

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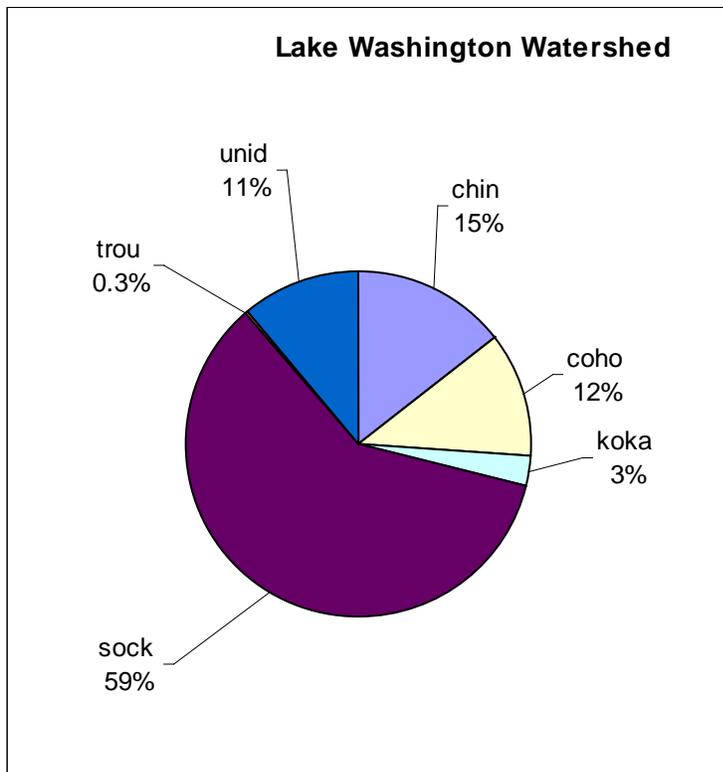
## Species Summary

Salmon Watcher Program volunteers recorded observations of all salmonid fish located during their stationary surveys, including chinook, coho, and sockeye salmon, kokanee, and trout (which may have been cutthroat or rainbow trout). The ratios of all fish observed (2019 total fish), including unidentified fish, is depicted in Figure 12 for the Lake Washington Watershed. Only 7 fish were counted in WRIA 8 streams that drain to Puget Sound: 3 coho and 4 unidentified species. No fish were counted on Vashon.

Of the 42 streams in the study area surveyed in 2009, sockeye were found in 13 streams. Coho were found in 11 streams and one beach site, chinook in 11 streams, kokanee were reported in 3 streams, and trout were reported in 2 streams. Sockeye was the most abundant species counted by volunteers in the Lake Washington Watershed, followed by chinook then coho. Chum were observed in no streams.

If a volunteer was unable to positively identify what species a fish was, the fish was tallied as “unidentified” (reporting a fish as unidentified was preferable to misidentifying a species). Of the 1,987 total adult fish observed in the Lake Washington Watershed, Vashon Island, and other WRIA 8 streams in 2009, 219 were tallied as unidentified (11 percent). For more information, see “Trout and Unidentified Species” below.

**Figure 12. Percentage of total fish observed in 2009 by volunteers in the Lake Washington Watershed.**



## Marked Fish and Juvenile Fish

On the data forms, one column asked the volunteers to note the “# of fish without adipose.” Hatcheries in the Lake Washington Watershed remove the adipose fins of chinook and coho before they are released into

the stream. Volunteers were instructed to focus on species identification first and foremost and only try to report on adipose fin clips when possible. Most volunteers did not fill in this column, or sometimes they noted they could not tell. Generally, water clarity must be excellent and the fish must be close and somewhat still in order to determine the presence of an adipose fin on a live fish.

No sockeye have their adipose fins clipped. However, volunteers reported 15 sockeye without adipose fins (Table 24). Because sockeye are too small to have their adipose fins clipped when they are released from hatcheries, their adipose fins remain intact. Therefore, if sockeye are reported with missing adipose fins, either the fish are sockeye with adipose fins that were difficult to see in the stream, or the fish were another species such as coho who were missing their adipose fins. The number of sockeye reported as being clipped in 2009 was very low (1.3 percent of all sockeye).

**Table 24. Number of adipose fin clips as reported by volunteer Salmon Watchers. Streams are listed in order of number of adipose-clipped fish reported.**

Stream	chinook	coho	sockeye*	unid.	total
Boeing Creek		1			1
Carey Creek		2	2		4
Cedar River			2		2
Cedar River Side Channel at Dorre Don			1		1
Cottage Lake Creek	1	2	1	3	7
East Fork Issaquah Creek	16	5			21
Issaquah Creek	66	61			127
Kelsey Creek	1			1	2
Longfellow Creek				4	4
North Creek	5		7		12
Taylor Creek (Rock Creek subbasin)			2		2
West Trib. Kelsey Creek	2			3	5
<b>Total</b>	91	71	15	11	188

\*See text for discussion about sockeye reported with adipose clips.

In some years, certain species of salmon are tagged for scientific research when they enter the Ballard Locks. Volunteers are asked to record when they see tagged fish, and they are asked to notify a staff member. In 2009, no fish were tagged, and no tagged fish were reported.

Volunteers made note of 135 fry and/or juvenile fish in a total of 21 streams in 9 basins.

## Chinook Salmon

Chinook were observed in 6 basins in the study area during the 2009 surveys (Figure 13). A total of 222 live fish and 67 carcasses were found in 11 streams throughout the Lake Washington Watershed. Streams in which chinook were reported include (in order of most to least fish seen): Cottage Lake Creek (126), Issaquah Creek (66), West Trib. Kelsey Creek (34), East Fork Issaquah Creek (17), North Creek (13), Little Bear Creek (12), Peters Creek (10), Big Bear Creek (6), Mercer Slough (3), Cedar River (1), and Kelsey Creek (1).

**Figure 13. Distribution of chinook salmon in the program area based on Salmon Watcher observations.**

See: <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/13-chinook-distribution-map.pdf>.

## Sockeye Salmon

Sockeye were by far the most numerous fish counted by volunteers. Sockeye were observed in 6 basins (Figure 14). A total of 1,141 live fish and 48 carcasses were observed in 13 streams (in order of most to least fish seen): Cedar River (613), Little Bear Creek (183), Cottage Lake Creek (143), North Creek (86), Big Bear Creek (62), Sammamish River (57), Taylor Creek (20), Carey Creek (8), East Fork Issaquah Creek (8), May Creek (3), West Trib. Kelsey Creek (3), Cedar River Side Channel at Dorre Don (2), and Kelsey Creek (1).

A very low number of sockeye were observed in 2007, 2008, and 2009 relative to prior years. The largest numbers of sockeye in the Lake Washington Watershed are typically in the Cedar River Basin and the Bear Creek Basin. Table 25 presents sockeye numbers observed by volunteers back through 1999. These numbers should be viewed with caution: they are only presented to provide a general comparison of what has been seen by volunteers in this program. The numbers are not useful for making statistically valid comparisons of returns or population trends, because too many variables are not controlled. Nonetheless, Cavanaugh Pond, along the Cedar River, is separated out in Table 25 because it has been watched consistently by the same volunteers since the Salmon Watcher Program began, and in 2007, 2008, and 2009 those volunteers recorded an unmistakably lower number of sockeye at that location.

**Table 25. Number of sockeye observed in Bear Creek and Cedar River basins from 1999 to 2009.**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bear Creek Basin fish	269	4,559	1,837	10,625	441	278	507	3,007	125	214	<b>204</b>
Bear Creek Basin hours	126.1	112.1	178.9	227.4	162.3	140.7	97.9	108.3	83.7	76.7	149.1
Bear Creek Basin fish/hour	2.1	40.7	10.3	46.7	2.7	2.0	5.2	27.8	1.5	2.8	1.4
Cedar River Basin fish	3,952	12,713	7,827	13,254	5,675	5,298	3,734	4,381	2,413	840	<b>591</b>
Cedar River Basin hours	139.2	257.0	270.2	266.4	208.4	310.7	300.9	295.1	188.4	176.4	94.8
Cedar River fish/hour	28.4	49.5	29.0	49.8	27.2	17.1	12.4	14.8	12.8	4.8	6.2
Cavanaugh Pond fish/hour	50.0	167.5	29.1	84.8	37.9	28.8	13.7	16.8	2.4	2.2	2.9

**Figure 14. Distribution of sockeye salmon in the program area based on Salmon Watcher observations**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/14-sockeye-distribution-map.pdf>.

## Coho Salmon

Coho were observed in 5 Lake Washington Watershed basins (Figure 15). A total of 227 live coho and 21 carcasses were reported in 9 streams in the Lake Washington Watershed, 1 stream that drains to Puget Sound, and in 1 stream outside the official watch area (in order of most to least fish seen): Issaquah Creek (173), Cedar River (16), Cottage Lake Creek (15), trib 070272 to Tuck Creek (out of area in Snoqualmie) (13), Little Bear Creek (11), East Fork Issaquah Creek (5), Big Bear Creek (4), Coal Creek (3), Trib to Coal Creek (3), Boeing Creek (Puget Sound) (3), and Carey Creek (2).

**Figure 15. Distribution of coho salmon in the program area based on Salmon Watcher observations.**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/15-coho-distribution-map.pdf>.

## Kokanee

Kokanee were observed in 2 basins (Figure 16). A total of 52 live fish were counted in 3 streams: Lewis Creek (41), Little Bear Creek (10), and North Creek (1). The fish reported as kokanee in Little Bear and North creeks may have been residual sockeye; for an explanation of residual sockeye, please see the 2008 Salmon Watcher report (King County 2009).

**Figure 16. Distribution of kokanee in the program area based on Salmon Watcher observations.**

See <http://your.kingcounty.gov/dnrp/library/water-and-land/salmon/salmonwatcher/2009/16-kokanee-distribution-map.pdf>.

## Chum

No chum were observed in any stream by volunteers in 2009.

## Trout and Unidentified Species

Six live trout were reported in only 2 creeks in the Lake Washington Watershed in 2009.

Fish of unidentified species were observed in 15 streams in 7 basins in the Lake Washington Watershed including WRIA 8 Puget Sound streams: 164 live fish and 59 carcasses were unidentifiable. The number of fish that went unidentified was approximately 11 percent of fish reported. Additionally, 6 live fish and 6 carcasses were reported in Longfellow Creek.

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**Appendix A**

**Data Collection Form used in 2009**



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**Appendix B**

**Fauntleroy Creek Salmon Watch 2009 Summary**

# 2009 SALMON WATCH REPORT

## FAUNTLEROY CREEK

**Dates and Location:** The 2009 salmon watch on Fauntleroy Creek began on **October 26**, the day after our annual drumming to call in the spawners, and closed **November 21** after several days without fish. The watch area in the lower creek encompassed the fish ladder and the reach above it, directly upstream of the culvert under Fauntleroy Way S.W. Our survey for carcasses extended to 45th Ave. S.W., where a barrier impedes upstream access.

**Count:** Watchers documented **18 coho spawners**. Most came on **November 8 and 9**, with one or two fish per day after that. The last came in on **November 12** and lingered in the fish ladder for another day. We saw no cutthroat trout.

**Volunteers:** Fourteen volunteers participated in the watch. They were a combination of veterans and new recruits. They used our standard recording form and methodology, both having proved themselves over several years.

**Live Condition:** All the fish were vigorous and, except for the last, they quickly moved upstream beyond the watch area. Many had more red coloring than usual; one was the most brilliant we have seen since our first formal watch in 1999. Their skin was clean and intact. We noted two with a pronounced hook to their noses.

**Carcass Condition:** Steev Ward, our volunteer fish biologist, visited the creek daily to try to find and check carcasses before predators took them away. He was able to locate and examine only three - two females and one male. One female was located near 45th and the other carcasses were on the bank close to the fish ladder. All had been chewed on. The pattern of chewing on the females suggested that predators had not gone for the belly first, which they would have had it been full of eggs. This observation suggests that the females had spawned.

Tissue samples were taken from the gill and kidney of each of the carcasses. Examination with light microscopy revealed no noticeable abnormalities.

Carcass examination and photos of live fish provided evidence that our spawners included hatchery-release fish (no adipose fin) and others that could have originated here as home hatch or Salmon in the Classroom release fish.

**Spawner Access:** Prior to the watch, logs and sand trapped by ferry-pier piling had forced the creek to flow parallel to the shoreline and under the pier before discharging into Fauntleroy Cove. The logjam was especially tight this year, so on the advice of Larry Fish, area habitat biologist with State Fish and Wildlife, we secured a five-year HPA from the state and a shoreline exemption from the city to relocate logs above the higher mean high waterline. Washington State Ferries was unable to fund removal, necessitating a volunteer work party, which occurred two days before the watch started. Although high tides deposited more logs in the channel, it appeared to stay open enough for spawner access throughout the watch. A volunteer spotted three or four fish circling near the mouth late in the watch and we again checked access. However, watchers never saw those fish in the spawning area.

**Redds:** Watchers recorded strong evidence of spawning in the upper fish ladder. We didn't have the expertise necessary to identify possible redds elsewhere in the reach. Given that the bulk of our spawners came in two batches, we could assume the possibility of spawning above the watch area. Those that came in individually were far less likely to find a mate.

**Visitors:** Watchers recorded a total of 68 visitors to the creek during the active days of the watch. They included several children who came after school while the light held and others who wandered down during the Veterans Day school holiday. In addition, we hosted 20 youngsters from the Mt. St. Vincent Intergenerational Preschool. While they didn't see live fish, we made sure they saw a carcass and had a good look around the habitat.

**Publicity:** We reached out for new volunteers through a watch preview posted on the *West Seattle Blog*, in conjunction with its excellent coverage of the drumming. We did no other publicity to recruit watchers, other than word of mouth. Seattle Public Utilities included the opportunity to watch here in its citywide training in October. The *West Seattle Herald* published a spawner article in its print and web editions. The *Blog* announced the first spawners within three hours of their coming in and returned for more coverage when the preschoolers visited.

**Identification Debate:** A fly-fishing expert (owner of a guide business) visited when the preschoolers were here and, after examining the male carcass they were viewing, pronounced it a blackmouth (a small chinook), not a coho. He noted the black tongue and gums, plus spots extending to the tail. Steev Ward had another look and held to his opinion that it was a coho, based on the pattern of spots and full articulation of the tail. After viewing a photo of the carcass on the Blog, a reader declared it a Chinook jack. We forwarded a photo of the carcass to Bill McMillan, salmon expert with the Wild Fish Conservancy, for his opinion (see addendum). He thought it a coho but one with both male and female characteristics, likely caused by chemicals in the water.

## FAUNTLEROY 2009 SALMON WATCH ADDENDUM

### Comments of Bill McMillan, Wild Fish Conservancy

Our primary means of telling chinook from coho in the field is the spotting on the tail, size of the spots (chinook particularly large), and the size differences (most creek coho 8 lbs or less and most adult chinook 10 lbs or more - although jack chinook remain problematic). The tail is not dependable if the carcass is really deteriorated, which is especially true of females from digging redds.

I was not able to blow the photo up on the website, but it appeared the spotting may be mostly, if not all, limited to the upper 1/3 to 1/4 of the tail. That is the typical tip-off to a coho. Coloration can vary, but most commonly the Puget Sound jack-sized chinook (smaller males of 2.5 lbs to 8 lbs, or 15"-26") are dusky bronze color with not much, if any, red coloration. Both the head and the entire fish shown have typical male coho coloring with a prominence of pink or red.

However, the head shape is not as classically hook-jawed as most male coho at spawning stage. Male coho typically have a very curled kipe to the lower jaw tip.

Regarding mouth coloration, it is common for male coho at spawning time to have very black coloration around the mouths, so that is not unusual. The one shot of the whole coho does have relatively large spots, but they still remain within the range for coho as well.

On the whole I would call it a coho, at least from what I can gather from the photos without blowing them up more to especially examine the tail spotting, but it is not a clear case. This fish does have some features of each.

Over the years we have found a few confusing specimens that could fall into the category of being hybrids - in this case chinook/coho. There was one especially prominent carcass we came on at Piper's Creek that we had to conclude was a chum/coho cross for its mixed features, and we have found coho males in apparent company with a chum female or two on the spawning grounds there. This particular fish appears to have no adipose that I can see, so a female coho potentially got fertilized by a chinook jack at a hatchery

operation where the hurry of the operations can cause a mistake, albeit rarely. So a hybrid is one possibility.

Another possibility is that it is purely a coho but the male sexual features are diluted with that of female characteristics. This is something that is increasingly happening with many chemical and pharmaceutical effluents in our waters - and not just in fish. I am inclined to lean in this direction rather than toward a hybrid, but both are possible.