

**Washington Department of Fish and Wildlife  
Puget Sound Treaty Indian Tribes**

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# **Puget Sound Chinook Comprehensive Harvest Management Plan**

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Annual Report Covering  
The 2012-2013 Fishing Season

Revised 8-13-13

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## Executive Summary

This annual report on the Puget Sound Chinook Comprehensive Harvest Management Plan summarizes results of salmon fisheries occurring between May 1, 2012 and April 30, 2013. This includes comparisons of pre-season projections with actual catch in all commercial and some recreational fisheries. 2011 Recreational catch estimates are presented for those areas where data were not available in time for the 2011-2012 report. Chinook spawning escapement estimates for 2012 are reported for all Puget Sound populations, with details on escapement surveys and estimation methods. Comparisons are also made between pre-season projections of escapement, and actual results.

Commercial Chinook catch in Puget Sound pre-terminal fisheries was lower than projected in the Strait of Juan de Fuca and the San Juan Islands, largely due to limited fishing opportunity for Fraser sockeye salmon. Commercial catches in the Nooksack, Stillaguamish/Snohomish, and South Puget Sound terminareas were all below expectation. Catches in the Hood Canal and Skagit areas were above expectation.

Marine and freshwater landed recreational Chinook catch in the 2011-2012 season was estimated, from a combination of creel and preliminary Catch Record Card data, to be 44,800, below the pre-season projection of 54,100. Creel survey-based estimates of catch in 2012-2013 mark-selective recreational fisheries in Areas 5, 9-10, and 11 are included in this report. Total encounter estimates for the 2012-13 marine area selective fisheries are presented and compared to pre-season projections for these areas.

Spring Chinook escapement was above predictions for the White, Nooksack and Skagit, and slightly below for the Dungeness. White River and Skagit escapement exceeded their Upper Management Thresholds. Dungeness was above its LAT but below its UMT, and Nooksack was below its LAT.

For summer/fall populations, escapement was higher than predicted for most management units. Only the Puyallup, Skokomish, and Hoko were below projection. The Nooksack unit and the South Fork Stillaguamish population were below their LAT's. The Mid Hood Canal total escapement was slightly above LAT, natural spawning escapement was slightly below LAT after accounting for 22 fish collected for broodstock. All other populations were above their LATs.

Coded-wire tag sampling of 2011 commercial fisheries achieved sampling rate above 20% in most areas. Area 12H (19%) and the Skokomish River (15%) were the only areas with significant catch and rates less than 20%. Sampling rates for marine recreational fisheries ranged from 11% to 33%, with all areas sampled at rates above the goal of 10%.



# 1 Introduction

The Co-managers' Puget Sound Chinook Harvest Management Plan mandates annual reporting of the performance of Chinook harvest management relative to the standards and guidelines of the plan (PSIT and WDFW 2010). This report fulfills that requirement by assessing the performance and effectiveness of fishery management actions adopted for the most recent management year. Included in this report are:

- Management objectives for the 2012-2013 management year (May 1, 2012 through April 30, 2013)
- Projected and actual commercial landed catch in Puget Sound, and descriptions of fisheries, for the 2012-2013 management year
- Projected and actual landed catch for 2012 Puget Sound recreational fisheries where creel surveys were conducted, and for all 2011 Puget Sound recreational fisheries
- Estimates of total encounters for mark-selective fisheries, and non-landed mortality for commercial fisheries with Chinook non-retention, where data are available
- Projected and actual spawning escapement for all Puget Sound Chinook populations in 2012, with details on estimation methods and factors affecting the quality of estimates
- Summaries of biological sampling of spawning escapement, and estimates of contributions of hatchery- and natural-origin spawners where available
- 2011 Coded-wire tag sampling rates for commercial and recreational fisheries

## 1.1 Management Objectives

General management objectives for Puget Sound Chinook populations, including Exploitation Rate Ceilings (ERCs), Critical Exploitation Rate Ceilings (CERC's), Upper Management Thresholds (UMTs), and Low Abundance Thresholds (LATs) are shown in Table 1. Table 2 identifies the rates that were used as the ceiling for each Management Unit (MU) in 2012, and the projected exploitation rates and escapements for each unit, from the final pre-season FRAM model run (1512).

Pre-season fishery planning for 2012-2013 fisheries projected that natural spawning escapement would fall below the critical abundance thresholds for the Nooksack early, Stillaguamish, Snohomish and Mid-Hood Canal MUs, and for the Sauk population within the Skagit MU, so CERC's were implemented for those units. Model escapement projections for other MUs exceeded their LAT's.

Table 1. 2012 Puget Sound Chinook Harvest Management Objectives.				
Management Unit	ER Ceiling	Critical ER Ceiling	Upper Management Threshold	Low Abundance Threshold
Nooksack		7.0% SUS (9% allowed 1 of 5 years)	4,000	
North Fork			2,000	1,000
South Fork			2,000	1,000
Skagit summer / fall	50%	15% SUS	14,500	4,800
Upper Skagit summer				2,200
Sauk summer				400
Lower Skagit fall				900
Skagit spring	38%	18% SUS	2,000	576
Upper Sauk				130
Cascade				170
Suiattle				170
Stillaguamish	25%	15% SUS	900	700
North Fork summer			600	500
South Fork & MS fall			300	200
Snohomish	21%	15% SUS	4,600	2,800
Skykomish			3,600	1,745
Snoqualmie			1,000	521
Lake Washington	20% SUS	10% PTSUS		
Cedar River			1,680	200
Green	15% PTSUS	12% PTSUS	5,800	1,800
White River spring	20%	15% SUS	1,000	200
Puyallup fall	50%	12% PTSUS		500
South Prairie Creek			500	
Nisqually	65%			
Skokomish	50%	12% PTSUS	3,650 aggregate; 1,650 natural	1,300 aggregate; 800 natural
Mid-Hood Canal	15% PTSUS	12% PTSUS	750	400
Dungeness	10% SUS	6% SUS	925	500
Elwha	10% SUS	6% SUS	2,900	1,000
Western SJDF	10% SUS	6% SUS	850	500

Table 2. Management guidelines implemented and projected exploitation rates and escapements for Puget Sound Chinook from 2012-2013 pre-season planning (FRAM 1512).					
Management Unit	ERC or CERC implemented	Projected ER <sup>1</sup>	Projected Escapement <sup>1</sup>	UMT	LAT
Nooksack	7% SUS	7.0% SUS	309	4,000	2,000
Skagit summer fall	15% SUS	14.3% SUS	8,398	14,500	4,800
Skagit spring	38%	33.1%	942	2,000	576
Stillaguamish	15% SUS	13.5%	338	900	700
Snohomish	15% SUS	9.1%	2,301	4,600	2,800
L. Washington (Cedar)	20% SUS	17.8% SUS	994	1,680	200
Green	15% PT SUS	14.6% PTSUS	1,911	5,800	1,800
White	20%	19.2%	2,141	1,000	200
Puyallup	50%	48.5%	2,206	500 South Prairie	500
Nisqually	56%	55.3%	1,072		
Skokomish	50%	47.9%	1,889	3650 aggregate 1650 natural	1300 aggregate 800 natural
Mid Hood Canal	12% PT SUS	12.0% PTSUS	196	750	400
Dungeness	10% SUS	3.4% SUS	656	925	500
Elwha	10% SUS	3.4% SUS	1,887	2,900	1,000
Western SJDF	10% SUS	2.8% SUS	2,118	850	500

## 2 Commercial Harvest

This chapter provides post-season estimates of Chinook catch for Puget Sound commercial fisheries, and also includes catch from tribal ceremonial and subsistence (C&S) fisheries, and test or research fisheries. Catch is projected pre-season through modeling of the fishery regime, which is developed and agreed upon in the Pacific Fisheries Management Council (PFMC) and North of Cape Falcon (NOF) forums, using the Fishery Regulation Assessment Model (FRAM). The regime agreed to for the 2012-13 fishing season is described in detail in the Co-managers List of Agreed-to Fisheries, which describes all salmon fisheries for all areas of Puget Sound and ocean fisheries off the Washington coast (see Appendix). The final pre-season projections of catch under this regime were made in FRAM run number 1512.

Actual catch is accounted by summarizing fish tickets, which are the sales receipts used for recording commercial, C&S, and research fishery landings. Fish ticket data are stored in a database maintained jointly by WDFW and the Puget Sound Tribes. In some fisheries, particularly non-treaty purse seine fisheries, estimates of non-landed mortality are also available, for comparison to pre-season expectations. WDFW conducts on-the-water observations of by-catch in commercial fisheries, concentrating on areas and gears where Chinook retention is not allowed. Summary results of that monitoring are included below in Table 10 and Table 11.

Non-treaty troll and treaty troll catches in Washington coastal fisheries north of Cape Falcon were near their quotas (Table 3), while recreational catch was well below its quota. Comparisons of projected and actual Puget Sound catch are provided here for two pre-terminal areas (Strait of Juan de Fuca and San Juan Islands), and six regional terminal fisheries (Nooksack/Samish, Skagit, Stillaguamish/Snohomish, South Puget Sound, Hood Canal, and Strait of Juan de Fuca). General information is presented for the 2012-13 fisheries, including in-season management actions that deviated from the pre-season plan, and explanations for differences in projected and actual catch.

Table 3. Summary of projected and actual Chinook catch in Washington ocean and Puget Sound fisheries in 2012.

Fishery	Projected	Actual
Washington ocean non-treaty troll	47,500	45,299
Washington ocean recreational	51,500	35,433
Washington ocean treaty troll	55,000	56,183
Puget Sound pre-terminal net & troll total		
Strait of Juan de Fuca troll	9,300	2,901
Strait of Juan de Fuca net	700	1,487
San Juan Islands net *	6,219	527
Nooksack-Samish terminal net	30,838	25,118
Skagit terminal net	1,835	2,675
Stillaguamish-Snohomish net	4,167	399
South Puget Sound terminal net	35,137	27,289
Hood Canal terminal net	21,218	59,426
Strait Tributaries terminal net	5	5

\* includes non-retention mortality in NT purse seine fishery

## **2.1 Strait of Juan de Fuca and San Juan Islands**

Treaty net fisheries in the Strait of Juan de Fuca, and the San Juan Island caught 1,487 and 310 Chinook, respectively, primarily during the fisheries directed at Fraser River sockeye. Sockeye test fishing in Area 5 caught 29 Chinook. Set net fisheries in Area 4B and 5 in July and August caught 30 Chinook.

Non-treaty fisheries targeting Fraser sockeye and pink in Areas 7 and 7A landed 16 Chinook, all by gillnet. Because purse seines are required to release all Chinook, release mortality estimates are calculated using available data from on-the-water bycatch monitoring. Post-season analysis estimated 72 Chinook mortalities in this sockeye fishery, and 23 in the chum fishery, for a total of 95.

The Treaty troll fishery in the Strait of Juan de Fuca, exclusive of catch in Area 4B when it was managed under PFMC quotas, caught 1,487 Chinook.

## **2.2 Nooksack/Samish Terminal Area**

Treaty Spring Chinook Ceremonial and Subsistence Fishery

The C&S fishery operated by the Nooksack tribe operated from May 10 – 26, and caught 33 spring Chinook; 8 were of natural origin. The Lummi Nation fishery operated from April 10 to July 14, and caught 85 Chinook, of which 12 were natural origin, based on otoliths analysis. Combined total catch of early Chinook was 118, of which 20 were of natural origin.

Chinook caught in the C&S fishery were sampled to determine length, age, and external mark status. More certain identification of the stock composition of catch is contingent on reading otoliths and /or genetic analysis.

Fall Chinook, coho, and chum fisheries

The tribal fall Chinook fishery in Bellingham Bay (Area 7B), Samish Bay (7C), and Lummi Bay (7D) operated as planned from August 1 through September 7 (management weeks 32 – 36), with a catch of 12,350 Chinook. The coho fishery operated as planned from September 9 through October 20, with an incidental harvest of 3,413 Chinook. One Chinook was harvested incidentally during the chum fishery, which took place from October 21 to December 12. The total fall Chinook catch of 15,764 for Areas 7B, 7C and 7D was moderately higher than the preseason projection of 12,935.

The non-treaty fishery in 7B/7C landed 9,018 Chinook from July through September, lower than the pre-season projection of 16,826. Seven Chinook were landed after September, compared to the projection of 80.

Fisheries for fall Chinook, coho, and chum in the Nooksack River occurred as planned in weeks 32 – 37, 38-43, and 44-51, respectively. The total Chinook catch was 211, falling short of the projected 830.; 32 were caught during the Chinook period, 176 during the coho fishery, and 3 during the chum period.

Table 4. Expected and actual Chinook catches in the Nooksack/Samish terminal area, 2012.			
Area	Timestep	Projected	Actual
7B, 7C, 7D Treaty net	Jul-Sep	12,751	15,764
	Oct-Dec	184	
7B, 7C Non-treaty net	Jul-Sep	16,836	9,018
	Oct-Dec	80	7
Nooksack Treaty net	Early Chinook, May-Jun	174	115
	Fall Chinook, Jul-Sep	813	211

### 2.3 Skagit Bay/Skagit River Terminal Areas

#### Skagit Terminal Area Treaty Fisheries

Treaty commercial fisheries in the Skagit terminal area directed at spring Chinook were conducted in 2012. Fisheries were adjusted from the preseason schedule as noted in Table 5 due to in-season management needs. The 24 hour opening originally scheduled in week 20 for the Swinomish and Sauk-Suiattle Tribes was moved to week 21, and the week 21 Upper Skagit fishery was delayed due to high water and the week 22 Upper Skagit fishery closed early because of higher than expected Chinook catch. Incidental catch of spring Chinook also occurred during week 27 of the directed sockeye fishery, as Skagit River sub-area 78D-4 was still in the spring management period at that time. A total of 214 wild spring Chinook and 551 hatchery spring Chinook were caught in these fisheries, compared to 103 wild and 363 hatchery spring Chinook expected pre-season (FRAM Chin1512). An additional 12 hatchery springs were harvested for ceremonial purposes as modeled preseason.

No treaty commercial fisheries directed at summer/fall Chinook were scheduled in the Skagit terminal area for 2012. However, as anticipated, incidental catch of summer/fall Chinook occurred in the sockeye and Coho fisheries. These fisheries were adjusted from the preseason schedule as noted in Table 5 due to in-season management needs. Total summer/fall Chinook catch in these fisheries was 930 fish, compared to the pre-season expectation of 612 (FRAM Chin1512). An additional 85 summer/fall Chinook were harvested for ceremonial purposes, which was less than the pre-season modeled value of 220.

A suite of Skagit terminal area test fisheries targeting Chinook, sockeye, coho, and chum was conducted by the Skagit tribes in 2013. Some weeks of these fisheries were adjusted or cancelled due to weather or flow concerns as noted in Table 5. A total of 37 wild spring Chinook, 38 hatchery spring Chinook, and 808 summer/fall Chinook were harvested in these fisheries. The pre-season expectation of test catch was 32 wild spring Chinook, 69 hatchery spring Chinook, and 419 summer/fall Chinook (FRAM Chin1512).

Overall, a total of 251 wild spring Chinook, 601 hatchery spring Chinook, and 1,823 summer/fall Chinook were caught in treaty commercial, C&S, and test fisheries. The preseason expectation based on FRAM Chin1512 was 135 wild springs, 444 hatchery

springs, and 1,251 summer/falls. The preliminary post-season estimates of the terminal run size for wild springs (3,287), hatchery springs (3,107), and summer/falls (15,818) were considerably higher than the forecasts (1,112 wild springs, 2,478 hatchery springs, and 9,856 summer/falls). We feel that the underestimates of Chinook salmon run sizes (and concomitant pre-season expected catch numbers) may explain the higher than expected realized catches. It should also be noted that an error was found in the summer/fall forecast after the preseason modeling was complete, which resulted in an artificially low estimate of run size and projected catch.



Table 5. Projected and actual landed catch and total mortality in terminal-area fisheries in Skagit Bay/Saratoga Passage (Area 8) and the Skagit River (Area 78C/78D) during 2012.

Fishery	Preseason Projected--unFRAMIZED values			Post-season Observed/Estimated			Difference	
	Schedule	Encounters	Mortality	Schedule	Encounters	Mortality	Encounters	Mortality
<b>Test:</b>								
Chinook	1 site, w ks 19-35	165	165	Wks 19-24, 27-35	211	211	46	46
Sockeye	2 sites: A3 w ks 23-30, Blakes w ks 24-29	144	144	Blakes no w k 27	101	101	-43	-43
Coho	3 sites, w ks 34-45	213	213	Blakes same, Spudhouse no w k 42/44, A3 no w k 42	571	571	358	358
Chum	3 sites, w ks 44-45	0	0	Blakes/Bay same, Jetty only w k 44	0	0	0	0
<b>Area 8/78C Hatchery Spring Chinook Sw inomish and Sauk-Suiattle Tribes:</b>								
Week 19	1 day	37	37	Same	51	51	14	14
Week 20	1 day	55	55	None	0	0	-55	-55
Week 21	1 day	36	36	2 days	48	48	12	12
<b>Area 78C/78D Hatchery Spring Chinook Upper Skagit Tribe:</b>								
Week 20	1 day	134	134	Same	158	158	24	24
Week 21	1 day	116	116	None	0	0	-116	-116
Week 22	1 day	86	86	1.19 days	503	503	417	417
<b>Area 8/78C/78D Chinook C&amp;S Sw inomish, Sauk-Suiattle, Upper Skagit Tribes:</b>								
Sum/Fall-Spring Chin.	As needed	232	232	As needed	97	97	-135	-135
<b>Areas 8/78C Sockeye Sw inomish and Sauk-Suiattle Tribes:</b>								
Week 25	7 days / 2 days	67	67	Same	9	9	-58	-58
Week 26	7 days / 5 days	180	180	Same	28	28	-152	-152
Week 27	7 days / 5 days	57	57	Same	35	35	-22	-22
Week 28	7 days / 5 days	90	90	Same	5	5	-85	-85
<b>Area 78D Sockeye Sw inomish Tribe</b>								
Week 29	1 day	36	36	None	0	0	-36	-36
<b>Areas 78C/78D Sockeye Upper Skagit Tribe:</b>								
Week 27	1.167 days	7	7	Same	26	26	19	19
Week 28	1 day	33	33	0.42 days	21	21	-12	-12
<b>Areas 8/78C Coho Sw inomish and Sauk-Suiattle Tribes:</b>								
Week 38	1 day	22	22	1.167 days	131	131	109	109
Week 39	2 days	30	30	Same	74	74	44	44
Week 40	2.5 days	5	5	Same	22	22	17	17
Week 41	1 day	1	1	2.5 days	21	21	20	20
Week 42	None	0	0	3.5 days	18	18	18	18
<b>Areas 78C/78D Coho Upper Skagit Tribe:</b>								
Week 41	1 day	30	30	None	0	0	-30	-30
Week 42	1.167 days	44	44	3.167 days	545	545	501	501
Week 43	1.167 days	16	16	None	0	0	-16	-16
<b>Areas 8/78C Chum Sw inomish and Sauk-Suiattle Tribes:</b>								
Week 46	1 day	0	0	None	0	0	0	0
<b>Total Skagit Terminal Area:</b>		<b>1,835</b>	<b>1,835</b>		<b>2,675</b>	<b>2,675</b>	<b>840</b>	<b>840</b>

## 2.4 Stillaguamish/Snohomish Terminal Area

In Area 8A treaty fisheries 11 Chinook were caught, 5 in July and 6 during the Coho fishery (weeks 37, 42). The total catch was much lower than the preseason projected level (139, Table 6). No Chinook were caught during the non-treaty Coho fisheries (preseason projection was 7)

During the hatchery Chinook directed fishery in Area 8D, 376 Chinook were caught, significantly lower than the pre-season projection of 4,060. The lower catch is attributable to the poor recruitment of Tulalip Hatchery Chinook from BY 2008 (poor returns as 3 years old in 2011 and as 4 years old in 2012) and possibly BY 2009.

Treaty C&S Chinook fisheries in the Stillaguamish River (78G) harvested 5 Chinook in July (week 29), well below the preseason projection of 30. An additional 7 Chinook were harvested in treaty Coho fisheries in September and October (wks 37-40). Total treaty Chinook harvest in 78G was 12 Chinook, below the preseason projection of 46.

Table 6. Projected (FRAM 1512) and actual Chinook net harvest in the Stillaguamish - Snohomish terminal area non-treaty commercial and treaty fisheries in 2012.			
Area		Projected	Actual
8A Commercial	Trty	139	11
	Ntrty	7	0
8A Test		2	0
8D Commercial	Trty	3980	376
	Ntrty	0	0
Stillaguamish R. Net	Treaty	46	12

## 2.5 South Puget Sound Terminal Areas

Table 7 compares projected and actual catches for 2012 South Puget Sound treaty and non-treaty commercial fisheries. Descriptions of the treaty and non-treaty commercial fisheries by terminal area are in the following sections.

Table 7. Projected and actual Chinook catches in 2012 South Puget Sound net fisheries.			
Area	Management Period	Projected	Actual
Area 9/10/11	Coho (test)	55	0
	Chum (test)	45	27
	A9 T subsist H&L	<500	15
	Treaty coho	24	10
	NT chum	5	4
	Treaty Chum	10	0
Area 10E	Treaty Chinook	3,843	1,174
Area 10A	Chinook (test)	177	0
	MIT C&S		98
	coho/chum	14	15
Duwamish River	Chinook/coho	616	333
Lake Washington/Ship Canal	Sockeye/coho	700	1,033
Lake Sammamish	Chinook	2,088	2,844
Puyallup River	Spring C&S	387	330
	Fall C&S	82	67
	Chinook/Coho	2,848	1,614
Areas 13D-K	Chinook/Coho/Chum	5,120	4,025
Area 13 & 13A	Chinook/Coho/Chum	2,286	495
Areas 13C/Chambers	Chinook	5,540	3,831
Nisqually River	Chinook/coho + tangle net	11,297	11,441

### 2.5.1 Marine Areas 9, 10 & 11

Test fisheries in Area 10 for coho, and for chum at Apple Cove Point, involved incidental catch of 27 Chinook.

The Non-treaty chum-directed fishery in Area 10 and 11 incidentally harvested 4 Chinook, with a total estimated mortality of 196. The treaty chum fishery harvested no Chinook.

The fisheries directed at Chinook and coho in Area 10E harvested 1,174 Chinook.

### 2.5.2 Lake Washington

There were no Chinook-directed fisheries in Lake Washington, the Ship Canal, or North Lake Washington. Sockeye returns to Lake Washington were insufficient to allow any directed fisheries. The Suquamish and Muckleshoot tribes conducted C&S fisheries in the Lake Ship Canal targeting sockeye, with total bycatch of 98 Chinook. Incidental Chinook catch during the coho fishery in Lake Union, and the upper and lower Ship Canal

harvested 935 Chinook, which was more than expected. Catch in Lake Sammamish was 2,844, which was well below the projected number. There were no coho-directed fisheries in North Lake Washington or Lake Sammamish.

### **2.5.3 Elliott Bay/Duwamish River**

The Chinook test fishery in Area 10A did not occur. There were no Chinook-directed fisheries in 10A or the Duwamish River. In 10A there were 98 Chinook harvested by Muckleshoot for C&S purposes, and 15 additional Chinook were caught incidentally during the coho/chum fishery. In the Duwamish River; 333 chinook were caught incidentally during the coho fishery which was well below the projected number.

### **2.5.4 Puyallup/White rivers**

Ceremonial and subsistence fisheries for White River spring Chinook in management weeks 20 – 27 caught 330 fish – 147 in the Puyallup River and 183 in the White River. The pre-season projected catch was 387.

Ceremonial and subsistence catch of fall Chinook in the Puyallup River was 67 fish. The fall Chinook catch was 1,614 during the half-day opening during the Chinook period and the subsequent coho fishery.

### **2.5.5 Marine area 13 & sub areas (Deep South Sound)**

The Chinook fishery in Carr Inlet (13A) caught 495 Chinook, in August and early September (weeks 32 – 39). Pre-season projected catch was 2,286.

The Chinook fishery at Chambers Bay (13C) occurred in weeks 34 – 40, caught 3,411 fish. The preseason catch projection was 5,540. The observed catch was lower mainly because the terminal abundance of Garrison Springs Hatchery Chinook was lower than expected.

The Chinook fisheries in Case Inlet (13D) and Budd Inlet (13F) occurred from late-July through September (weeks 31 – 41); total catch was 3,831.

### **2.5.6 Nisqually River**

The tribal commercial fishery in the Nisqually River caught 11,421 and 20 Ceremonial and Subsistence for a total of 11,441. The Chinook-directed gillnet fishery was conducted July 27 through August 28; catch was 7,776. A coho beach seine fishery, which required release of unmarked Chinook, which was open from August 29 to October 2. Retained catch was 362 marked Chinook; A tangle net fishery, requiring released of unmarked Chinook, was open from September 9 through October 2; retained catch was 2,897 marked Chinook and 51 unmarked. Approximately 8% of the total Chinook catch was taken during the coho period in weeks 40 – 47.

The pre-season management objective was for the terminal harvest rate to not exceed 27% on unmarked Chinook. Based on a preliminary accounting of unmarked terminal run size (3,323) the extreme terminal harvest rate on unmarked Chinook was 28%. Based on the preliminary accounting of marked terminal run size (30,441) the extreme terminal harvest rate on marked Chinook was 35%.

## 2.6 Hood Canal

Treaty Chinook directed fishing in 12C occurred as planned from July 15 thru August 31 (weeks 30 – 36). Catch was 11,887, with only 20 of those landed during the first two weeks of the coho fishery at the end of September.

Chinook harvest in the Hoodsport Hatchery Zone (12H) was 29,137 and occurred as planned from July 17 through September 20.

Chinook harvest in the Skokomish River occurred as planned from August 1 through September 15 (during the Chinook period). Total Chinook harvest was 18,037, with 903 of those taken during the coho period.

Terminal area Chinook catch exceeded the pre-season projections, due to hatchery returns greatly exceeding the forecasted level. Terminal harvest rates aligned with in-season estimates.

In Port Gamble (Area 9A) 326 Chinook were harvested, primarily in late-August (weeks 35 and 36). Catch exceeded the pre-season projection of 52.

Chinook catch in other areas of Hood Canal were very low, as expected: 5 were landed in Area 12/12B, 31 Quilcene Bay (12A), and one in Area 12D, all of these during coho fisheries.

There were 2 Chinook landed in non-treaty fisheries in Hood Canal in 2012, with a total estimated mortality of 55.

Area	Target Species	Catch	
		Projected	Actual
Hood Canal Marine Net (12, 12B-12D,9A) (T)	Chinook, Coho, Chum	4,236	12,219
Hood Canal Marine Net (12-12c,9A) (NT)	Chum, Coho	5	2
12A Net (T)	coho	78	31
12H Net (T)	Chinook, Chum	10,306	29,137
Skokomish River (82G/J) (T)	Chinook, Coho, Chum	6,593	18,037
	Total	21,218	59,426

## 2.7 Strait of Juan de Fuca

Due to the continued depressed status of Chinook populations, terminal fisheries in the Dungeness River and Elwha River were closed or provided very limited fishing opportunity. No Chinook were caught in the Dungeness Bay (6D) coho fishery. Five Chinook were harvested for ceremonial purposes in the Elwha River (Table 9).

Terminal Area	Projected	Actual
Area 6D & Dungeness River Treaty	1	0
Area 6D Non-Treaty	0	0
Elwha River Treaty (C&S)	4	5
Hoko River Treaty	0	0

## 2.8 Non-Treaty Commercial Monitoring Data and Total Mortality Estimates

Because non-treaty vessels are required to release non-target species in many fisheries, WDFW conducts on-water monitoring to provide data on encounters of non-target species. In 2012, an effort was made to sample gillnets more intensively than in the many recent years. Summaries of observer data for 2012 are presented in Table 10. Expanded estimates of total mortality, where available, were presented above in the summaries for individual fisheries, and are summarized and compared to pre-season expectations in below in Table 11.

Table 10. Summary of commercial fishery observation data for 2012 Puget sound non-treaty salmon net fisheries.

Area	Gear type	# sets observed	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
10	PS	5	0	2	0	0	195	0
11	PS	8	0	1	0	0	662	0
7	PS	25	34	138	3,870	28	568	1
7A	PS	40	45	61	2,562	14	407	1
8A	PS	30	0	677	0	0	3	0
10	GN	51	2	41	0	0	4,120	0
12	GN	33	3	20	0	0	1,995	1
12B	GN	13	0	4	0	0	1224	0
12C	GN	6	0	1	0	0	117	0
7	GN	11	3	0	204	2	7	0
7A	GN	6	0	7	0	0	152	1
12A	BS	13	0	323	0	0	47	0

Table 11. Total pre-season projected and post-season estimated Chinook mortality (landed + released) in Puget Sound non-treaty commercial salmon fisheries in 2012.

Area	Total Mortality (released + landed)	
	Projected	Actual
6D	0	N/A (0 landed)
7/7A	1,460	111
8	0	N/A (no openings)
8A	2	0
10/11	170	196
12/12B	40	55
9A/12A	0	N/A (0 landed)

## **3 Recreational Harvest**

This chapter summarizes expected recreational catch in Puget Sound marine waters and freshwater tributaries for the 2012-2013 management year, and presents catch estimates available from creel studies for that period. Due to the cycle of recovery and analysis of Catch Record Cards (CRCs) used by recreational anglers, complete catch estimates for all areas are not yet available. Since complete catch estimates were not available for all areas in the annual report covering the previous management cycle, projected and actual recreational catches for the 2011-2012 management year are also included here.

### **3.1 2011-2012 Recreational Catch**

Total Recreational Chinook harvest in 2011-2012, estimated from a combination of preliminary Catch Record Card (CRC) data and creel estimates where available, was 44,763, compared to a preseason projection of around 54,130. Note that CRC estimates are still in draft format, and subject to future revision. Projected and actual catches are presented for individual fisheries in Table 12. Updated estimates of total mortality in mark-selective fisheries, for those fisheries where estimates are available, are presented in final reports available at <http://wdfw.wa.gov/publications/search.php?Cat=Fishing / Shellfishing>.



Table 12. Projected (FRAM 1811) and actual (preliminary creel & preliminary CRC) landed Chinook catches in Puget Sound recreational fisheries during the 2011-2012 season, through March 31, 2012.

Area/Fishery	Projected	Actual
Area 5-6		
MSF (July-August)	5,966	7,992
Other	1,597	1,423
Strait Tributaries	0	0
Area 7	5,412	
Non MSF		4977
MSF (January-April)		918
Nooksack/Samish FW	5,496	7,523
Area 8-1 & 8-2		
MSF	2,045	520
Skagit River		
Spring MSF	455	202
Area 8D SAF	411	183
Stillaguamish River	0	
Snohomish River		
Skyokomish MSF	452	382
Area 9		
Summer MSF	4,928	2,372
Winter MSF	1,212	348
Area 10		
Area 10 Summer MSF	2,456	2,616
Area 10 Winter MSF	1,926	9
Area 11		
Area 11 Summer MSF	8,479	2,577
Area 11 other	342	208
Area 10E SAF	1,175	131*
Lake Sammamish	231	181
Area 10A SAF	0	0
Green River	0	0
Puyallup River		
Carbon R MSF	1,076	411
Puyallup R MSF	1,101	1,731
Area 13		
Area 13 Summer MSF	1,395	1,001
Area 13 other	200	121
Chambers Cr	54	62
Nisqually	2,079	2,179
Deschutes	214	
Area 12	1,020	1,031
Skokomish River	4,408	5,665
*10E catch included in estimate for Area 10 MSF for the period when both were open concurrently.		

## **3.2 2012-2013 Recreational Catch**

### **3.2.1 Expected catch**

Projected Chinook catches in 2012-2013 recreational fisheries are listed in Table 13. Total projected catch was 55,684. The recreational fishing regime included mark selective fisheries (MSF) for portions of the year in marine areas 5, 6, 7, 8-1, 8-2, 9, 10, 11, 12 and 13, and in the Skagit, Skykomish, Skokomish, Puyallup, Carbon and Nisqually rivers. For those fisheries where creel survey estimates of harvest are available, those estimates are listed as actual catches in Table 13. Intensive sampling efforts were applied to marine area selective fisheries throughout the year, and to several freshwater selective fisheries, so estimates of landed catch and total encounters are available for the several of those fisheries. Brief summaries of results of those sampling programs are included below. In-depth analyses of sampling and statistical methods are available in a series of reports produced by WDFW. The latest final reports are available online at: <http://wdfw.wa.gov/publications/search.php?Cat=Fishing/Shellfishing>. Many of the results presented here are from the draft report for the 2012 summer fisheries (WDFW 2013), which will be available online in the future.

For fisheries without intensive sampling and/or creel data available, catch will be estimated using CRC data and data from baseline dockside sampling of marine fisheries. Baseline sampling provides data on catch per unit effort (CPUE), species composition, as well as CWT and biological sampling data. For most freshwater fisheries, catch estimates are made using CRC data, although creel data are available for several fisheries. For marine fisheries, catch estimates are made using CRC estimates of total catch, combined with species composition data obtained from the baseline sampling program. Because of the timing of the annual reporting cycle for the CRC program, these estimates will not be available until 2014.

Table 13. Projected (FRAM 1811) and actual (preliminary, where available) landed Chinook catches in Puget Sound recreational fisheries during the 2012-2013 season.

Area/Fishery	Projected	Actual
Area 5-6		
MSF (July-August)	5,966	4,627*
Other	1,597	
Strait Tributaries	0	
Area 7	5,412	
Non MSF		
MSF (January-April)		
Nooksack/Samish FW	5,496	
Area 8-1 & 8-2		
MSF	2,045	
Skagit River		
Spring MSF	455	234
Area 8D SAF	411	
Stillaguamish River	0	
Snohomish River		
Skyokomish MSF	452	763
Area 9		
Summer MSF	4,928	2,363
Winter MSF	1,212	
Area 10		
Area 10 Summer MSF	2,456	2,662
Area 10 Winter MSF	1,926	
Area 11		
Area 11 Summer MSF	8,479	2,657
Area 11 other	342	
Area 10E SAF	1,175	
Lake Sammamish	231	
Area 10A SAF	0	
Green River	0	
Puyallup River		
Carbon R MSF	1,076	
Puyallup R MSF	1,101	
Area 13		
Area 13 Summer MSF	1,395	
Area 13 other	200	
Chambers Cr	54	
Nisqually MSF	2,079	2,116
Deschutes	214	
Area 12	1,020	
Skokomish River MSF	4,408	5,306
* Area 5 only		

### 3.2.2 Marine Areas 5 & 6 Summer MSF

2012 was the 10<sup>th</sup> year of summer mark-selective Chinook fishing in marine areas 5 & 6. The 2012 fishery was opened for a set season, July 1 through August 15.

WDFW conducted comprehensive fishery monitoring activities during the Areas 5 and 6 mark-selective fisheries. Sampling activities included dockside creel sampling (intensive in Area 5 and baseline in Area 6) and intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. In both Areas 5 and 6, an enhanced Voluntary Trip Report (VTR) program was used to obtain estimates of Chinook encounter rates by size class (legal or sub-legal) and mark status (ad-marked or unmarked), similar to the approach used successfully during summer 2009. Detailed descriptions of the sampling program and results are available in WDFW (2012).

For Area 5, a total of 5,696 Chinook were estimated to have been landed (5,679 marked and 17 unmarked (Table 14)). Total encounters were higher than projected pre-season for unmarked fish, and lower for marked fish.

Due to the alternate sample design for area 6, comparisons will not be possible until Catch Record Card data can be combined with sampling data to generate total harvest and encounter estimates.

Table 14. Comparison of modeled (i.e., using FRAM, model run 1512) and estimated total Chinook encounters for the Area 5, July 1-Aug. 15, 2012 mark-selective Chinook fishery.					
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	5,081	3,486	1,595	35
	AD	11,428	5,453	5,975	4,744
	Total	16,509	8,939	7,570	4,779
	% Marked	69	61	79	99
Estimated (Creel) Encounters	UM	9,399	4,626	4,774	17
	AD	9,596	6,250	3,346	5,679
	Total	18,996	10,876	8,120	5,696
	% Marked	51	58	41	100

### 3.2.3 Marine Areas 9 & 10 Summer MSF

In 2012, a recreational mark-selective fishery occurred for the sixth consecutive summer in marine areas 9 and 10. The 2012 fishery was scheduled to be open from July 16-August 31. The season was closed beginning on August 20 due to estimated in-season encounters exceeding the preseason projection. As in the previous years, WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Areas 9 and 10 during their summer seasons in order to collect the data needed to provide in-season catch estimates and to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Detailed descriptions of the sampling program and results are available in WDFW (2012).

Total harvest in Areas 9 and 10 was estimated to 7,087 and 3,098 Chinook, respectively (5,059 total ( Table 15)). As mentioned above, the fishery was closed early due to estimated encounters exceeding the pre-season projections.

Table 15. Comparison of modeled (i.e., using FRAM, model run 1512) and estimated total Chinook encounters for the Areas 9 and 10 July 16-August 19, 2012 mark-selective Chinook fisheries.						
	Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
Area 9	FRAM Encounters	UM	2,765	1,050	1,715	21
		AD	13,635	5,100	8,535	4,437
		Total	16,400	6,150	10,250	4,458
		% Marked	83	83	83	100
	Estimated (Creel) Encounters	UM	7,087	2,363	4,724	14
		AD	13,280	8,011	5,269	7,073
		Total	20,366	10,374	9,992	7,087
		% Marked	65	77	53	100
Area 10	FRAM Encounters	UM	3,066	1,171	1,895	82
		AD	8,677	2,792	5,885	2,429
		Total	11,743	3,963	7,780	2,511
		% Marked	74	71	76	97
	Estimated (Creel) Encounters	UM	2,362	394	1,968	34
		AD	9,850	3,419	6,431	3,064
		Total	12,212	3,813	8,399	3,098
		% Marked	81	90	77	99

### 3.2.4 Area 11 Summer MSF

A summertime recreational mark-selective fishery was implemented for the sixth year in Area 11 in 2012, running from June 1 through September 30. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 11 to collect the data needed to provide in-season catch estimates and to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. An estimated total of 5,038 Chinook were landed during the fishery, compared to the pre-season projection of 7,667 (Table 16). Unmarked legal encounters were above projection, while unmarked sublegal and total encounters were below projection.

Table 16. Comparison of modeled (i.e., using FRAM, model run 1512) and estimated total Chinook encounters for the Area 11 summer 2012 mark-selective Chinook fishery, June 1-September 30, 2012.					
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	5,182	1,362	3,820	41
	AD	24,280	8,765	15,515	7,626
	Total	29,462	10,127	19,335	7,667
	% Marked	82	87	80	100
Estimated (Creel) Encounters	UM	3,893	2,722	1,171	72
	AD	8,347	5,625	2,722	4,966
	Total	12,240	8,347	3,893	5,038
	% Marked	68	67	70	99

## 4 Spawning escapement

This section presents natural Chinook escapement estimates for 2012, and compares them to projections from FRAM 1512, and management thresholds.

In general, pre-season FRAM projections are made for natural escapement (the number of Chinook spawning naturally). For some MUs where hatchery-origin adults contribute to natural spawning, the FRAM projections of escapement include natural-origin recruits (NOR) and hatchery-origin recruits (HOR) that spawn naturally. This includes projections for the Skagit, Cedar, Green, Puyallup, Skokomish, Mid-Hood Canal, Dungeness, and Elwha. For the White MU, the projection includes fish of natural origin and fish originating from the upstream acclimation pond program. Natural-origin adults that are used for hatchery broodstock may be included in the projections of natural escapement.

FRAM projects natural-origin escapement for the Nooksack, Skagit Spring, Stillaguamish and Snohomish populations, so hatchery-origin fish must be subtracted from total escapement, and the number of natural-origin fish used for broodstock added, to obtain an estimate comparable to the FRAM projections. The comparisons in Table 17 represent the best currently available data for comparing predicted and actual escapements.

Spring Chinook escapement was above predictions for the White, Nooksack and Skagit, and slightly below for the Dungeness. White River and Skagit escapement exceeded their Upper Management Thresholds. Dungeness was above its LAT but below its UMT, and Nooksack was below its LAT.

For summer/fall populations, escapement was higher than predicted for most management units. Only the Puyallup, Skokomish, and Hoko were below projection. The Nooksack unit and the South Fork Stillaguamish population were below their LAT's. The Mid Hood Canal total escapement was slightly above LAT, natural spawning escapement was slightly below LAT after accounting for 22 fish collected for broodstock. All other populations were above their LATs.

Details for each escapement estimate, including information on biological sampling of carcasses on the spawning grounds, and hatchery/natural-origin composition estimates, are presented in the following sections.

Table 17. Pre-season projections and post-season estimates of 2012 Puget Sound Chinook natural spawning escapement.

Management Unit		NOR	HOR	Total	Projected (FRAM 1512)
Nooksack	NF	281	477	758	236 <sup>1</sup>
	SF			485 <sup>2</sup>	73 <sup>1</sup>
Skagit spring	Suiattle			460	197
	Cascade			488	276
	Sauk			1,826	468
	Total spring			2,774	941
Skagit summer/fall	Sauk summer			715	288
	Upper Skagit summer			9,808	5,796
	Lower Skagit fall			3,295	1,168
	Total summer/fall			13,818	7,252
Stillaguamish	NF	714	631 <sup>5</sup>	1,345 <sup>4</sup>	296 <sup>1</sup>
	SF	172	17	189	43 <sup>1</sup>
	Total	886	648	1,534	339
Snohomish	Skykomish	2,462	1,282	3,744 <sup>3</sup>	1,453 <sup>1</sup>
	Snohomish	891	488	1,379	848 <sup>1</sup>
	Total	3,353	1,770	5,123	2,301 <sup>1</sup>
Lake Washington	Cedar	910	173	1,083	994
	Sammamish	165	1,869	2,034	
Green		1,628	1,462	3,090	1,911
Puyallup		353	419	772	2,206
White		2,226 <sup>5</sup>	1,553	3,779	2,141
Nisqually		828	2,849	3,677	1,072 <sup>1</sup>
Skokomish		199	1,334	1,533	1,889
Mid Hood Canal	Dosewallips			7	
	Duckabush			6	
	Hamma Hamma	20	383	403 <sup>6</sup>	
	Total			416	196
Dungeness		250	364	614 <sup>7</sup>	656
Elwha		120	2,066	2,186 <sup>8</sup>	1,887
Hoko		212	451	663 <sup>9</sup>	2,118

1. Natural-origin only.

2. NOR/HOR breakouts not yet available

3. Additional 68 adults collected at Sunset Falls for use as broodstock at Wallace River.

4. Additional 109 NOR and 70 HOR were collected for broodstock. The NOR's were part of the FRAM projection.

5. White River NOR includes vent-clipped acclimation pond fish trucked and released upstream of Mud Mountain. An additional 45 NOR's, which were part of the FRAM projection, were taken to the hatchery for use as broodstock.

6. Includes 22 fish collected for broodstock.

7. Includes 106 collected for broodstock

8. Includes 1,028 spawning naturally and 1,158 collected for use as broodstock. H/W composition estimates based on recent average pending otolith analysis.

9. Includes 262 adults collected for broodstock



## **4.1 Escapement surveys and estimation methods**

### **4.2 North Puget Sound**

#### **4.2.1 Nooksack River Early Chinook**

North and Middle forks early Chinook

The Nooksack River North and Middle Forks originate from Mount Baker glaciers and are typically turbid with moderate flows during summer due to glacial melt. Along with the increased in-channel instability and frequently shifting braided patterns in the North and Middle Forks, the Co-Managers have needed to modify escapement methodologies to fit the changing location patterns of spawning Spring Chinook. This is why over the last seven years fish managers have modified the North and Middle Fork escapement methodologies at least three times. We strive to develop a methodology that accurately reflects the dynamic nature of the Nooksack watershed.

Because of the unpredictability of redd viewing conditions during Spring Chinook spawning seasons, typically July to September, it was necessary to develop an alternative escapement methodology than using redds counts. The escapement estimate of the number of volitional (natural and hatchery-origin) spawners in the North Fork and Middle Forks has been derived by expanding the total number of carcasses from the two watersheds by a 3.48 expansion factor. This factor is a five-year average of the ratio of cumulative redd counts to total carcass counts, in years when good visibility allowed accurate surveys.

However, beginning in 2005, an alternative method was developed in the Middle Fork by the Co-managers. From 2005 through 2008 because of lower water flows and higher river bank exposure, we believed that the spawning surveys on the Middle Fork accounted for the majority of redds in that section of the river. In order to avoid over-inflating the Chinook estimate, it was decided to calculate the Middle Fork estimates by using fish per redd (using a standard 2.5 fish per redd expansion factor) and to apply the 3.48 expansion factor to estimate the North Fork carcass counts only. The resulting combined number of the previous methods is the NF/MF Nooksack escapement estimate.

In 2009 higher than normal water flows and associated scouring events in the Middle Fork Nooksack limited redd observations during the early Chinook spawning season. As a result the Co-managers decided to adjust the Middle fork escapement methodology to account for less than optimum viewing conditions. The following methodology was agreed to for the 2009 through 2012 early Chinook returns only in the Middle Fork.

An expansion factor was calculated in a method similar to the North Fork. (See explanation above). In the four previous years; 2005- 2008, the escapement based on redd counts (# redds x 2.5) was divided by the number of carcasses observed to equal an expansion factor (Table 18). The average of those four years was used to calculate the 2009 through 2012 Middle Fork escapement.

There was another significant change in methodology introduced in 2010 for the NF/MF Nooksack River escapement estimate. The carcasses observed in Kendall Creek were not expanded but enumerated as actual counts.



In 2012 pond mortalities dropped considerably from the previous year due to the closure of Kendall Creek to trout sport fishing.

Table 19. North Fork Nooksack escapement estimates and spawner composition, 2005-2012.								
<b>Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Total North Fork carcasses includes; sampled, un-sampled and non-sampled carcasses observed	505	289	337	282	498	272	130	<b>115</b>
North Fork carcasses multiplied by 3.48 expansion factor	1757	1006	1173	981	1733	947	452	<b>400</b>
<b>Kendall Creek carcasses (NON expanded)</b>						<b>707</b>	<b>199</b>	<b>179</b>
Middle Fork Estimate based on 2.5 fish per redd	290	178	265	285	na	na	na	na
Middle Fork Estimate based on 2005-2008 averaged carcass to redd ratio (1.91)	na	na	na	na	170	378	214	<b>179</b>
<b>Combined North/Middle Fork Escapement Estimate</b>	<b>2047</b>	<b>1184</b>	<b>1438</b>	<b>1266</b>	<b>1903</b>	<b>2032</b>	<b>865</b>	<b>758</b>
North Fork estimated NOR (from otolith reads)	11.4%	27.3%	26.8%	27.3%	14.1%	9.7%	7.3%	<b>38.7%</b>
Middle Fork estimated NOR (from otolith reads)	3.5%	20.2%	7.4%	13.6%	13.4%	11.3%	24.5%	<b>31.9%</b>
<b>Number of NOR Fish (Escape/NOR%=)</b>	<b>210</b>	<b>311</b>	<b>334</b>	<b>307</b>	<b>269</b>	<b>205</b>	<b>99</b>	<b>281</b>

Year	2005	2006	2007	2008	2009	2010	2011	2012
<b>Total Number Carcasses observed</b>	220	123	150	85	89	198	112	94
Number redds surveyed in 6 miles of Middle Fork	116	71	106	114	na	na	na	na
Fish/Redd (2.5) X redds surveyed	290	178	265	285	na	na	na	na
Carcasses x MF expansion (1.91)	na	na	na	na	170	378	214	179
<b>Total Middle Fork Estimate</b>	<b>290</b>	<b>178</b>	<b>265</b>	<b>285</b>	<b>170</b>	<b>378</b>	<b>214</b>	<b>179</b>

#### South Fork Nooksack

While no escapement estimate is available for the South Fork early Chinook population for 2012, there are preliminary results that can be described. The combined total count in the South Fork and its tributaries through Sept. 30 was 194 Chinook redds. Expanded by 2.5 fish per redd, the total (hatchery and wild fish of all stocks ) escapement estimate is 485 fish. Based on 137 carcasses sampled for otoliths, 109 of those fish were of natural origin, and 28 were hatchery origin. DNA analysis of the NORs will allow differentiation of South Fork origin Chinook from other stocks, but the results here only represent otolith analysis.

#### 4.2.2 Skagit River

Escapement estimates for the six populations of Skagit River Chinook were calculated using estimated fish per redd expansions. Redds were counted using one of two methods. In tributaries to the Skagit River, the Cascade River, and tributaries and upper reaches of the Sauk River, redds were marked and counted by foot or float surveys. Total visible redds in the mainstem Skagit River and in the Sauk River below the mouth of the White Chuck River were counted by helicopter survey and the number of unique redds was estimated using the area under the curve method (AUC). We attempted to survey the mainstems by helicopter at approximately 14 day intervals. The first flight for a population generally occurred just after spawning began so the actual date of the first redd was not known. Likewise, the final flight may have occurred before spawning was fully completed. Because redds were generally observed during the first flight and may have been built after the last flight beginning and end dates of mainstem spawning aerial surveyed populations were estimated using historical data and field observations.

#### Suiattle spring Chinook

Suiattle River spring Chinook spawn in the clear water tributaries of the glacially turbid Suiattle River. Spawning generally does not occur throughout the mainstem but has regularly been documented at the interfaces of the clear water tributaries with the mainstem. In 2011 an unusual combination of environmental variables had reduced

mainstem turbidity and resulted in conditions suitable for mainstem and off channel Suiattle River spring Chinook spawning. Environmental conditions were more normal in 2012 and no mainstem spawning was observed.

The Suiattle River spring Chinook escapement estimation method has been used since 1994. Spawning ground indexes were surveyed on foot every 7 to 10 days. Redds were marked with dated PVC flagging tape and counted and recorded. The cumulative redd count from all surveyed tributaries (which is the entire known spawning area) was expanded by 2.5 fish per redd to calculate the escapement estimate.

The indexes surveyed in 2012 represented the total known spawning distribution of the population. The indexes included most clear water tributaries in the basin with enough flow to allow Chinook access. Redds constructed in the interface between a tributary and the mainstem were included in the total for the tributary.

Tributaries were surveyed for spring Chinook redds between August 6 and September 19, 2012. The survey interval goal was generally maintained throughout the survey period.

A total of 184 redds were identified by surveyors and the 2012 Suiattle River spring Chinook escapement estimate was 460 fish (rounded). The final escapement number was still dependent on co-manager review and agreement at publication.

Table 21. Suiattle River spring Chinook redd counts from 2012 spawning ground surveys. Redds found at the interface of the Suiattle River and a tributary were included in the count for the tributary.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>	Redds
Big Creek	3.0723	Foot	0.0-0.6	7.8	3
Tenas Creek	3.0761	Foot	0.0-0.5	9.6	11
Straight Creek	3.0797	Foot	0.0-0.1	15.1	3
Buck Creek	3.0813	Foot	0.0-1.7	18.1	16
Circle Creek	3.0892	Foot	0.0-0.2	18.4	0
Lime Creek	3.0897	Foot	0.0-0.5	20.8	4
Downey Creek	3.0919	Foot	0.0-2.1	24.4	91
Sulphur Creek	3.0973	Foot	0.0-0.9	26.3	44
Milk Creek	3.1022	Foot	0.0-0.1	28.6	12
Total redds:					184

<sup>\*1</sup>Location refers to river mile location of tributary mouth on mainstem, or lower river mile terminus of a mainstem index.

#### Upper Cascade spring Chinook

Upper Cascade spring Chinook surveys cover the entire known spawning distribution of the population. Surveyed areas were the mainstem Cascade River from river mile (RM) 8.1 to 18.6, the lower reaches of the North and South Fork Cascade Rivers, and indexes in Marble Creek and Kindy Creek. Marble and Kindy Creeks were the only tributary

creeks in the upper Cascade spring Chinook spawning zone with suitable habitat for Chinook spawning.

The Cascade spring Chinook escapement estimate methodology was implemented in 1992. Indexes were surveyed preferably by foot, but cataracts were used in safely floatable sections when flows were too high for walking (650 cfs or greater). Redds were marked with dated PVC flagging and counted. The cumulative redd count was expanded by 2.5 fish per redd to calculate escapement.

We maintained the survey interval of 10 to 14 days in 2012. On August 24 we began surveys and surveyed all indexes. The only indexes without preexisting redds on the first survey were the two forks and Marble Creek. Our final upper Cascade spring Chinook spawning survey was October 8, 2012. We located a season total of 195 upper Cascade spring Chinook redds in 2012 (Table 22). The escapement estimate was 488 fish. The final escapement number was still dependent on co-manager review and agreement at publication.

Table 22. Upper Cascade River spring Chinook index total redd counts from 2012 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>	Redds
Cascade River	3.1411	Foot	8.1-9.0	8.1	15
Marble Creek	3.1451	Foot	0.0-0.3	8.6	0
Cascade River	3.1411	Foot/Raft	9.0-12.4	9	63
Cascade River	3.1411	Foot	12.4-15.8	12.4	71
Cascade River	3.1411	Foot	15.8-18.6	15.8	44
Kindy Creek	3.1528	Foot	0.0-0.5	16.2	1
North Fork Cascade River	3.1605	Foot	0.0-0.1	18.6	0
South Fork Cascade River	3.1411	Foot	18.6-19.3	18.6	1
Total redds:					195

<sup>\*1</sup>Location refers to river mile location of tributary mouth on mainstem, or lower river mile terminus of a mainstem index.

#### Upper Sauk spring Chinook

Spawning ground surveys for upper Sauk River spring Chinook encompassed the known spawning distribution of the population. Mainstem Sauk River indexes were between RM 31.0 (which is 0.9 miles below the mouth of the White Chuck River) and RM 39.7, at the confluence of the North Fork Sauk and South Fork Sauk Rivers. The North Fork Sauk River was surveyed from the mouth upstream to an impassable falls 1.6 RM upstream, and the South Fork Sauk River was surveyed from the mouth to approximately RM 3.5 which is an assumed Chinook barrier most water years.

Surveys were performed on foot or by cataract except for the 0.9 mile index below the White Chuck River. The section below the White Chuck (RM 31.0 to RM 31.9) is too dangerous to walk or float and is surveyed by helicopter. Redds in sections surveyed from the ground were marked with dated PVC flagging and recorded. All visible redds in the aerial survey sections were counted and recorded. Redd days were calculated from the aerial surveyed section using the area under the curve (AUC) method. Estimated redds

were calculated by dividing redd days by redd life. The redd life value used was 21 days (Schuller, 1974). Actual and estimated redds were summed and expanded by 2.5 fish per redd to estimate escapement. The Sauk River spring Chinook escapement estimate methodology has remained unchanged since 1994.

Low flows throughout the 2012 season enabled complete survey coverage of all upper Sauk spring Chinook indexes. We surveyed the upper Sauk River spring Chinook spawning areas from August 22 through October 09, 2012. Surveys were conducted by foot or pontoon boat on indexes above the White Chuck River every 10 to 14 days. The index below the White Chuck River was surveyed approximately every two weeks by helicopter. Most redds were constructed between the first and second week of September, a week earlier than observed in 2011. We located a total of 718 redds during ground surveys and estimated 12 Sauk spring Chinook redds from flight surveys (Table 23). The 2012 Sauk River spring Chinook escapement estimate was 1,826 fish. The final escapement number was dependent on co-manager review and agreement which had not yet occurred at publication.

Table 23. Upper Sauk River spring Chinook index total and estimated redd counts from 2012 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>	Redds
Sauk River	3.0673	Flight	31.0-31.9	31	12
Sauk River	3.0673	Foot/Float	31.9-34.5	31.9	142
Sauk River	3.0673	Foot/Float	34.5-37.8	34.5	397
Falls Creek	3.1182	Foot	0.0-0.2	34.9	0
Sauk River	3.0673	Foot/Float	37.8-39.7	37.8	22
South Fork Sauk River	3.1204	Foot	0.0-3.5	39.7	103
North Fork Sauk River	3.0673	Foot	39.7-40.1	39.7	16
North Fork Sauk River	3.0673	Foot	40.1-41.3	40.1	38
Total redds (rounded):					730

<sup>\*1</sup>Location refers to river mile location of tributary mouth on mainstem, or lower river mile terminus of a mainstem index.

#### Skagit Spring aggregate escapement

The 2012 observed spawning escapement of wild Skagit spring Chinook was 2,774, much higher than the FRAM predicted escapement of 941. Total wild spring Chinook escapement was above the Upper Management Threshold of 2,000, and escapement for all three populations was above their LATs as well.

#### Upper Skagit summer Chinook

Skagit summer Chinook escapement estimation methodologies have remained unchanged since at least 1974. The escapement estimate is composed of a ground based survey redd count of tributaries and an aerial based mainstem surveys with the number of redds estimated using the AUC method. The survey protocol stipulates surveying nearly the entire known spawning distribution of the population which includes the mainstem Skagit River from the mouth of the Sauk River (RM 67.2) to the Seattle City

Light powerhouse at Newhalem (RM 94.3), and several tributaries. Tributaries surveyed were the lower Cascade River (RM 0.0 to 3.4) and also included indexes in Illabot Creek, Diobsud Creek, Bacon Creek, Falls Creek (tributary of Bacon Creek) and Goodell Creek. All redds located in tributaries were marked with dated PVC tape and recorded. Infrequent spawning in some tributaries not normally surveyed has been documented historically, but limited staffing prevented us from monitoring those areas. The survey interval for tributaries was every 10 to 14 days and the interval for flights was approximately once every two weeks. Cumulative redds from all tributary counts were added to the AUC redd estimate and multiplied by 2.5 fish per redd to calculate the escapement estimate. The AUC method used an assumed redd life of 21 days to calculate total redds (Schuller, 1974). Beginning and end points for the curve were estimated using field observations of redd construction and historical data

Tributary surveys began September 11 and concluded November 16, 2012. Weather conditions were favorable for surveys throughout the spawning period and we maintained our tributary interval protocol and surveyed every 10 to 14 days. Flows dropped throughout the spawning period but and appeared to hamper passage beginning the second half of September. Late September low flows appeared to discourage fish from moving to the upper section of Goodell Creek, the two upper sections of Bacon Creek, and the upper section of Diobsud Creek. Despite low tributary flows, mainstem flows were stabilized by Seattle City Light project operations and no barriers were documented. We surveyed the mainstem Skagit River by helicopter four times beginning September 12 and concluding October 24. Weather conditions were favorable for all the flights.

We estimated 3,923 Skagit summer Chinook redds were constructed in 2012 (Table 24). We located 183 redds in tributary indexes and estimated 3,740 mainstem redds from flight surveys. The 2012 Skagit River summer Chinook escapement estimate was 9,808 fish. Redds constructed in the tributaries prior to September 1 were not included in the total estimate. Carcass recoveries have shown the majority of these fish were hatchery strays from the Marblemount hatchery spring Chinook program, so they were enumerated separately. The final escapement number was dependent on co-manager review and agreement which had not yet occurred at publication.

Table 24. Skagit summer Chinook redd counts from 2012 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>	Redds
Skagit River	3.0176	Flight	67.2-78.1	67.2	1,661
Illabot Creek	3.1346	Foot	0.0-2.6	71.6	56
Skagit River	3.0176	Flight	78.1-89.5	78.1	1,825
Cascade River	3.1411	Foot/Float	0.0-4.2	78.1	72
Diobsud Creek	3.175	Foot	0.0-1.3	80.7	13
Bacon Creek	3.1774	Foot	0.0-4.2	82.9	42
Falls Creek <sup>*2</sup>	3.178	Foot	0.0-0.4	0.4	0
Skagit River	3.0176	Flight	89.5-94.3	89.5	254
Goodell Creek	3.1867	Foot	0.0-1.3	92.9	0
Total redds (rounded):					3,923

<sup>\*1</sup>Location refers to river mile location of tributary mouth on mainstem, or lower river mile terminus of a mainstem index.

<sup>\*2</sup>Falls Creek WRIA 03.1780 is a tributary of Bacon Creek. The mouth is located at river mile 4.0 of Bacon Creek on the right bank.



### Lower Sauk summer Chinook

Sauk River summer Chinook escapement was estimated by summing calculated mainstem redds with redds counted in one tributary, and expanding the sum by fish per redd. The methodology has remained unchanged since at least 1974. The mainstem was surveyed by helicopter at approximately two week intervals from the mouth of the Sauk River to RM 31.0. The reach from RM 31.0 to 31.9 (mouth of the White Chuck) was high gradient with limited spawning habitat and was assumed to separate the spring and summer Chinook stock distributions. Redd days were calculated by the AUC and divided by the assumed redd life of 21 days to calculate total redds (Schuller, 1974). Beginning and end points for the curve were estimated using field observations of redd construction and historical data. Any redds counted in the tributary were added to the AUC redds and the sum was multiplied by 2.5 fish per redd to calculate escapement. The area surveyed represented the total known spawning distribution of the population. Dan Creek was the only tributary surveyed.

We surveyed the Sauk River four times by helicopter between September 12 and October 24, 2012 (the Skagit summers were surveyed during the same flights). Flow and visibility conditions were good during all flights. Dan Creek was observed too low for passage up until October 10. After that observation a strong storm returned flows to passable levels. We surveyed Dan Creek again on October 18 and located 7 redds and observed several live Chinook.

The 2012 Sauk summer Chinook escapement estimate was 715 fish. An estimated 279 redds were constructed in the Sauk River summer Chinook zone and 7 redds were counted in the tributary index (Table 25).

Table 25. Sauk summer Chinook redd counts from 2012 spawning ground surveys. Dan Creek flows were too low for Chinook passage until after October 10, 2012.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>	Redds
Sauk River	3.0673	Flight	0.0-13.2	0	73
Sauk River	3.0673	Flight	13.2-21.1	13.2	176
Dan Creek	3.1079	Foot	0.0-0.8	16.8	7
Sauk River	3.0673	Flight	21.1-31.0	21.1	30
Total redds (rounded):					286

<sup>\*1</sup>Location refers to river mile location of tributary mouth on mainstem, or lower river mile terminus of a mainstem index.

### Lower Skagit fall Chinook

The Skagit River fall Chinook escapement was estimated using redd counts from main stem Skagit River aerial surveys and cumulative counts from 10 tributaries. The main stem was flown by helicopter at approximately two week intervals from Highway 9 at Sedro Woolley to the Sauk River Mouth. Redd days were estimated from the aerial counts using the AUC method. Beginning and end points for the curve were estimated using field observations of redd construction and historical data. Estimated redd days were then divided by an assumed redd life of 21 days to calculate total redds (Schuller 1974). The

tributary cumulative redd count was added to the AUC derived redds and multiplied by 2.5 fish per redd to calculate escapement

Tributary surveys in 2012 began September 17 and concluded November 11, 2012 (Table 26). Protocol was to survey each index once every 7 to 10 days and for the exception of a few high water episodes, moderate flow conditions presented favorable surveying conditions throughout the fall Chinook spawning period allowing a full set of surveys to be attained. The main exception to this occurred between October 29 and November 6 when numerous freshets turned the creeks high and dirty (too high to survey) and all previous redds were flattened by the high flows. Tributaries surveyed included; Jackman Creek, Finney Creek, Pressentin Creek, O'Toole Creek (supplemental index), Grandy Creek, Day Creek, Alder Creek, Jones Creek, and Hansen Creek. WDFW did not survey all the indexes. The Upper Skagit Indian Tribe (USIT) surveyed the upper index of Finney Creek, and Grandy Creek. The Skagit Fisheries Enhancement Group (SFEG) also participated in fall Chinook surveys; they surveyed Hansen Creek, Jones Creek, and Alder Creek. All tributaries were surveyed by foot, and all new redds were marked with dated PVC flagging and recorded. The areas surveyed represented nearly the entire known spawning distribution of the lower Skagit fall Chinook population. Some limited spawning may have occurred in tributaries not sampled.

The main stem was surveyed by helicopter three times in 2012 from RM 24.5 (Highway 9 Bridge) to the mouth of the Sauk River (RM 67.2) beginning September 25 and ending on October 24. As in past years, the Baker and Sauk Rivers both added color and reduced visibility Skagit River during aerial surveys

From the flight data there were 1,145 redds estimated in the main stem section from the Highway 9 Bridge to the Sauk River and we documented 173 redds in the tributary indexes. The preliminary 2012 Skagit fall Chinook escapement estimate was 3,295 fish. The final escapement number is dependent on co-manager review and agreement which had not yet occurred at publication.

Table 26. Lower Skagit River fall Chinook redd counts from 2012 spawning ground surveys. Redd counts were provided from Grandy Creek, and part of Finney Creek by the Upper Skagit Tribe. The Skagit Fisheries Enhancement group surveyed Jones Creek, Hansen Creek, and Alder Creek.

Stream	WRIA	Survey method	Reach (RM)	Redds
Skagit River	3.0176	Flight	24.5-56.5	609
Skagit River	3.0176	Flight	56.5-67.2	536
Hansen Creek	3.0265	Foot	3.0-4.3	7
Day Creek	3.0299	Foot	0.0-2.2	14
Jones Creek	3.0332	Foot	0.0-1.3	0
Grandy Creek	3.0337	Foot	0.0-1.1	1
Alder Creek	3.0359	Foot	0.0-1.6	0
O'Toole Creek	3.0365	Foot	0.0-0.2	9
Pressentin Creek	3.0385	Foot	0.0-0.4	8
Finney Creek	3.0392	Foot	0.0-6.0	126
Jackman Creek	3.0626	Foot	0.0-0.7	8
East Fork Nookachamps	3.0230	Foot	3.5-5.1	0
Total redds (rounded):				1318

#### Skagit summer/fall aggregate escapement

The total Skagit summer/fall Chinook escapement was 13,818, well above the pre-season forecast of 7,252, and slightly below the UMT of 14,500. Escapements for all three populations were above their low abundance thresholds.

#### Skagit Hatchery Spring Chinook Stray Rate Study

A study began in 2006 to determine the number of hatchery spring Chinook spawning in natural spawning areas prior to the onset of native summer Chinook spawning. The study was conducted by Washington Department of Fish and Wildlife and the Skagit River System Cooperative (SRSC), the management body for the Swinomish and Sauk-Suiattle tribes of Indians. Prior to 2005, no attempt had been made to enumerate the number of strays that did not enter the hatchery.

Weekly redd surveys were conducted by foot or pontoon boat in the Lower Cascade River (RM 0.0 – 3.4) and Boulder Creek, a tributary to the Cascade River where hatchery strays were known to spawn. Encountered carcasses were sampled for coded wire tags to ascertain origin. Tributaries to the upper Skagit River, Bacon Creek, Illabot Creek and Diobsud Creek were also surveyed by foot to determine whether strays were spawning in those streams. On an August 30 survey, hatchery spring chinook were encountered spawning in Jordan Creek and Clark Creek; these two creeks are not regular indexes normally used for escapement purposes. Carcass recoveries revealed redds built before September 1 in the all the sites surveyed could be reasonably expected to have been constructed by hatchery spring Chinook strays.

Surveys began August 1, 2012 and concluded August 30, 2012. Note that the areas surveyed do not overlap with the areas surveyed for natural-origin spring Chinook described above. A cumulative total of 326 redds were observed in the Cascade River and its tributaries and an additional 35 redds were counted in the upper Skagit tributary indexes prior to September 1. Using an expansion of 2.5 fish per redd, an estimated 903 stray Marblemount Hatchery spring Chinook spawned in natural spawning areas. These fish are not included in the natural escapement estimates reported above for the three Skagit spring Chinook populations.

Table 27. Redd counts from 2012 hatchery spring Chinook spawning surveys. The origin of the strays was the WDFW Marblemount Hatchery.

Stream	RM	8/1	8/9	8/14	8/16	8/17	8/20	8/27	8/30	Total
Cascade River	0.0-0.9	4	25			59		33	50	171
Cascade River	0.9-3.4	19	40			32		25	14	130
Jordan Creek	0.0-0.3								5	5
Clark Creek	0.0-0.2								8	8
Boulder Creek	0.0-0.4	3	5			1		1	2	12
Goodell Creek	0.0-0.7				0			0		0
Bacon Creek	0.0-1.5				4			1	5	10
Bacon Creek	1.5-3.5				0			0	0	0
Bacon Creek	3.5-4.2				1			2	1	4
Falls Creek	0.0-0.2				0			0	0	0
Diobsud Creek	0.0-1.4		2				3		3	8
Illabot Creek	0.0-2.0		5	4					4	13
Total										361

#### 4.2.3 Stillaguamish River

The Stillaguamish River basin has two populations of Chinook distinguished by genetic characteristics, summers and falls. These two populations overlap in spawn timing and distribution with both populations spawning in both forks of the Stillaguamish. The summer stock is a composite of natural and hatchery-origin supplemental production with the majority of spawning occurring in the North Fork Stillaguamish and its major tributaries, including Boulder River, Deer, Grant, French, and Squire creeks. The natural-origin fall stock spawns primarily in the mainstem and South Fork Stillaguamish, in Pilchuck, Jim and Canyon creeks and in the North Fork Stillaguamish. Escapement is currently estimated for South Fork and North Fork Stillaguamish rather than summer and fall populations of Chinook.

Escapement estimates for the two Stillaguamish Chinook populations were calculated by multiplying the cumulative redd count by 2.5. Since 2008 Chinook redds found in the North and South Forks have been individually counted during periodic foot or raft surveys using the marked redd census method. Previous to 2008, redd counts in the North and South Forks were estimated using area under the curve methodology based on aerial surveys of North and South fork mainstem reaches as well as ground-based surveys of tributary streams. Aerial surveys continue to provide redd count data for the Lower Mainstem and upper South Fork. Since 2008 the Stillaguamish Tribe Department of

Natural Resources has provided ground coverage of the North Fork Stillaguamish River from its mouth to river mile (RM) 30.0. WDFW staff surveyed the remaining known Chinook spawning areas in the Stillaguamish basin.

Surveys were conducted from mid-August to mid-November to encompass the spawn timing of both stocks. All known spawning habitat was surveyed either by foot or raft on a seven to fourteen day cycle or by helicopter every fourteen to twenty-one days. All ground-counted redds were flagged, enumerated and recorded with a GPS waypoint. Helicopter surveys counted total visible redds each successive flight and total redds were estimated using area-under-the-curve methods. Carcasses encountered were sampled for scales, DNA, CWT, and adipose fin mark status.

#### North Fork Stillaguamish Chinook

North fork Stillaguamish Chinook spawning surveys covered the entire known distribution. Surveyed areas were the North Fork from RM 0.0 to 34.4 and North Fork tributaries including Squire, Segelson, French, Brooks, and Grant creeks, and Boulder River.

Survey conditions for counting Chinook in the North Fork Stillaguamish were generally good throughout the spawning period. The first redds were detected August 27. Most redds were made by the end of September with the final few constructed in early November. Flows in the North Fork were low until mid-October. Rain events in mid-October and November caused occasional elevated stream levels and temporarily hampered some of the later surveys with decreased visibility.

A total of 537 North Fork Stillaguamish Chinook redds were counted in 2012. The escapement estimate was 1345 fish (714 NOR, 631 HOR). An additional 179 fish were taken for hatchery brood stock and were not included in the escapement estimate (109 NOR, 70 HOR). Total NOR North Fork Stillaguamish escapement (natural spawning + broodstock collection) was 823 Chinook. Table 28 lists redd counts and escapement estimates by surveyed reach. Table 30 in the carcass sampling section lists HOR:NOR breakdown.

Table 28. North Fork Stillaguamish Summer Chinook redd counts and escapement by survey reach in 2012.

<b>Stream Reach</b>	<b>WRIA</b>	<b>Method</b>	<b>Reach (RM)</b>	<b>Redds</b>	<b>Escapement</b>
North Fork	5.0135	Foot/Float	0.0-14.3	109	273
North Fork	5.0135	Foot/Float	14.3-30.0	342	855
North Fork	5.0135	Foot/Float	30.0-34.4	27	68
Grant Creek	5.0156	Foot	0.0-0.4	3	8
Deer Creek	5.0173	Foot	0.0-6.0	NA	NA
Brooks Creek	5.0215	Foot	0.0-0.1	0	0
Boulder River	5.0229	Foot	0.0-2.9	36	90
French Creek	5.0246	Foot	0.0-3.0	0	0
Squire Creek	5.026	Foot	0.0-4.0	19	48
Ashton Creek	5.0262	Foot	0.0-1.2	1	3
<b>Total Redds</b>				<b>537</b>	
<b>Escapement Estimate</b>					<b>1345</b>

## South Fork Stillaguamish Chinook

South-Fork Stillaguamish Chinook escapement in 2012 was estimated using expansion of redd counts from aerial, foot, and raft surveys. Areas surveyed were the Mainstem between the mouth and the confluence of the North and South Forks (river miles 0.0 to 17.8), the South Fork from the confluence to Granite Falls (river miles 17.8 to 34.7), and from Red Bridge to Coal Creek (river miles 55.1 to 62.5), Canyon, Jim, Siberia, and Pilchuck Creeks.

Survey conditions were good while flow in the South Fork remained low, until October 10 when rain came. Flow and turbidity conditions mid- October reduce survey frequency. The South Fork was unsurveyable after October 10 because of high turbidity. South Fork redd counts are likely biased low due to lack of survey coverage in late October. The Mainstem aerial index reach, from the juvenile trap (RM 6.0) to the forks (RM 17.8) was flown three times, September 12, 25, and October 10.

A total of 75 Chinook redds were found in the South Fork Stillaguamish River in 2012. The escapement estimate was 189 adult fish. Redd counts by surveyed reach and escapement estimates are listed in Table 29. Table 30 in the carcass sampling section lists HOR:NOR breakdown.

Table 29. Stillaguamish fall (South Fork) Chinook redd counts and escapement by survey reach in 2012.

<b>Stream Reach</b>	<b>WRIA</b>	<b>Method</b>	<b>Reach (RM)</b>	<b>Redds</b>	<b>Escapement</b>
Mainstem	5.0001	Flight	6.0-17.8	27	68
South Fork	5.0001	Foot/Float	18.2-30.6	36	90
South Fork (upper)	5.0001	Foot	30.6-65.0	9	23
Pilchuck Creek	5.0062	Foot/Float	0.0-6.2	5	13
Jim Creek	5.0322	Foot/Float	0.0-4.1	3	8
Siberia Creek	5.0324	Foot	0.0-0.4	0	0
Canyon Creek	5.0359	Foot	0.0-0.5	0	0
<b>Total Redds</b>				<b>75</b>	
<b>Escapement Estimate</b>					<b>189</b>

## Carcass sampling and HOR:NOR summary

WDFW and Stillaguamish Tribe Natural Resources staff conducted spawning ground survey work and carcass sampling in North and South Forks of the Stillaguamish River and their tributaries. Tribal staff focused their Chinook carcass recovery efforts in the North Fork between the mouth and Swede Heaven Bridge (RM 0.0 to 30.0) and WDFW staff focused on the remaining spawning grounds. In total, 331 complete carcasses (status of both adipose fin and cwt was determined) were sampled in the Stillaguamish River, 320 in the North Fork reaches and 11 in the South Fork reaches. An additional 47 sampled carcasses were categorized as “unknown” because either the adipose status or the cwt status was undetermined. The sampling rates of Chinook carcasses, not including those with unknown mark dispositions, were 23.8% for North Fork reaches, and 5.8% for South Fork reaches. These rates were calculated by dividing the number of carcasses sampled by the escapement estimate for each population.

Escapement of Chinook by origin (hatchery or natural) was determined by applying ratios of hatchery marked carcasses and unmarked carcasses to the escapement estimate by reach groupings. Grouping reaches into subsets of the populations allows the calculation of hatchery origin recruits (HOR) and natural origin recruits (NOR) for escapement reaches where sample sizes were small or no carcasses were sampled. Results of these calculations are listed in Table 30.

Table 30. Stillaguamish Chinook HOR:NOR summary and carcass sample rates by stratum, 2012.

North Fork Stillaguamish	Escapement	No.	No.	%	%	No.	percent
		Hatchery	Natural	Hatchery	Natural	Sample	sampled
NF Confluence to Deer Creek	273	71	202	26.1%	73.9%	23	8.4%
NF above Deer Creek	924	462	462	50.0%	50.0%	282	30.5%
NF Tributaries	149	99	50	66.7%	33.3%	15	10.1%
NF Totals	1346	632	714	47.0%	53.0%	320	23.8%
South Fork Stillaguamish							
All "SF" reaches	189	17	172	9.1%	90.9%	11	5.8%
Stillaguamish Totals							
	1535	649	886	42.3%	57.7%	331	21.6%

Key for Grouped Stratum and Populations:

NF Confluence to Deer Creek: North Fork Stillaguamish from RM0.0 to RM14.3

NF above Deer Creek - Deer Cr.: North Fork Stillaguamish from RM14.3 to RM34.4

NF Tributaries: Grant, Brooks, French Segelson, Squire, Ashton Creeks, and Boulder River

All "SF" reaches: Mainstem RM 0-17.7, South Fork Stillaguamish RM 17.7-70.0 and, Pilchuck, Jim, Siberia, and Canyon Creeks

#### 4.2.4 Snohomish River

There are two populations of Chinook in the Snohomish River basin - Skykomish summer/fall Chinook and Snoqualmie fall Chinook. The Skykomish stock spawns in the mainstem of the Skykomish River and its tributaries, including the Wallace and Sultan Rivers, Bridal Veil Creek, the South Fork Skykomish (between RM 49.6 and RM 51.1 and above Sunset Falls) and the North Fork Skykomish (occasionally above Bear Falls at RM 13.1). The Snoqualmie stock spawns in the Snoqualmie River and its tributaries, including the Tolt River, Raging River, and Tokul Creek.

Escapement estimates of naturally spawning Summer/Fall Chinook salmon returning to the Snohomish watershed are calculated from cumulative redd counts made from physical surveys of their spawning grounds, and from counts of adult fish passed at Sunset Falls. Survey methods included ground based walking and float surveys, and aerial surveys done from a helicopter. Ground counted redds were monitored using marked-redd-census methodology. Ground surveys were done at a frequency of seven to ten days so as to not miss new redds. Redds in ground-surveyed reaches were, enumerated, marked with a GPS waypoint and flagged to prevent re-counting on subsequent surveys. Aerial surveys were conducted on the Snohomish, Skykomish and North Fork Skykomish Rivers at target intervals of two weeks. Aerial surveys provided total visible redd counts per survey flight and were plotted against survey date for the area-under-curve (AUC) method to give total redd days. Total redd days were then divided by the assumed standard 21-day redd life to yield the estimated cumulative redds from aerial surveyed reaches. The cumulative redd count was then expanded by 2.5 (fish per redd) to estimate escapement. Additionally a count of Chinook passed above the trap at Sunset Falls on the South Fork

of the Skykomish was made. Carcasses encountered were sampled for scales, DNA, CWT, adipose fin mark status, and otoliths.

#### Skykomish summer/fall Chinook

Spawning ground surveys were conducted throughout the known spawning distribution of Skykomish summer/fall Chinook. Survey reaches were the mainstem Snohomish and Skykomish rivers, Pilchuck, Sultan, and Wallace rivers, Woods, Elwell, Bridal Veil, Olney, and Proctor creeks, and in the North and South forks of the Skykomish River.

Survey conditions were good while stream flows were low from September through mid-October. Survey intervals were kept to seven to ten days except for when rain-fed flow pulses in mid-October caused minor survey delays. Three aerial surveys were flown on the Mainstem Snohomish, Skykomish and North and South Fork Skykomish Rivers between September 19 and October 18.

A total of 1,358 Chinook redds were found in the Skykomish River and its tributaries in 2012. The spawning escapement estimate (including Sunset Falls trap counts) was 3,744 adult fish (2462 NOR, 1282 HOR). An additional 6417 fish recruited into Wallace Hatchery and were not included in this escapement estimate (84 NOR, 6333 HOR). Total NOR Skykomish escapement (natural spawning + broodstock collection) was 2,446 Chinook. Redd counts and escapement estimates by surveyed reach are listed in Table 31. Table 33 summarizes HOR:NOR results.

Table 31. Skykomish summer/fall Chinook redd counts and escapement, 2012

Stream Reach	WRIA	Method	Reach (RM)	Redds	Escapement
Snoh-Sky (Mainstems)	7.0012	Float/Flight	20.5-51.5	486	1,215
NF Skykomish	7.0982	Foot/Flight	0.0-13.5	163	408
SF Sky (Sunset Falls)	7.0012	Trap/Haul	51.5-up	-	346
Pilchuck River	7.0125	Foot/Float	2.0-26.5	70	175
Woods Creek	7.0826	Foot/Float	0.0-3.5	0	0
Elwell Creek	7.0865	Foot	0.0-1.0	3	8
Sultan River	7.0881	Foot/Float	0.0-9.7	390	975
Wallace River (lower)	7.094	Foot/Float	0.0-4.4	137	343
Wallace River (upper)	7.094	Foot/Float	4.4-7.3	65	163
Olney Creek	7.0946	Foot	0.0-0.6	5	13
Proctor Creek	7.097	Foot	0.0-0.4	5	13
Bridal Veil Creek	7.1248	Foot	0.0-0.4	34	85
<b>Total Redds</b>				<b>1,358</b>	
<b>Escapement Estimate</b>					<b>3,744</b>

#### Snoqualmie summer/fall Chinook

The escapement estimate for Snoqualmie summer/fall Chinook was made using cumulative redd counts from boat foot, and aerial surveys of known spawning habitat. Surveyed reaches were the Snoqualmie River and its tributaries, including the Tolt and



Raging rivers and Cherry and Tokul creeks. Chinook redds were observed from the end of August to mid-November.

Survey conditions were good for most of the spawning season. Rainstorms in October elevated stream flows and turbidity and caused interruptions in survey coverage.

In 2012 the escapement of 1,379 Chinook in the Snoqualmie Basin was based on a total count of 551 redds. Table 32 lists redd counts and escapement estimates by survey reach for Snoqualmie fall Chinook. Table 33 shows HOR:NOR breakdown by reach.

Table 32. Snoqualmie Fall Chinook redd counts and escapement by reach in 2012.

<b>Stream Reach</b>	<b>WRIA</b>	<b>Method</b>	<b>Reach (RM)</b>	<b>Redds</b>	<b>Escapement</b>
Snoqualmie River (Lower)	7.0219	Float	20.5-24.9	116	290
Snoqualmie River (Upper)	7.0219	Float	32.9-39.6	247	618
Tolt River (Lower)	7.0291	Foot/Float	0.0-6.0	82	205
Tolt River (Upper)	7.0291	Foot/Float	6.0-8.9	19	48
SF Tolt River	7.0302	Foot	0.0-2.3	18	45
Raging River	7.0384	Foot	0.0-4.6	38	95
Tokul Creek (Lower)	7.044	Foot	0.0-0.3	31	78
Tokul Creek (Upper)	7.044	Foot	0.3-0.6	0	0
<b>Total Redds</b>				<b>551</b>	
<b>Escapement Estimate</b>					<b>1,379</b>

#### Sampling and HOR:NOR summary

Field staff sampled 711 complete Chinook carcasses (status of CWT, otolith mark, and adipose fin mark are known) within the Snohomish basin. Additionally, adipose fin status was determined for 346 live Chinook passed at Sunset Falls. In total, the Chinook carcass sampling rate on the spawning grounds and at Sunset Falls was 20.6% (Table 33). This was calculated by dividing the number of carcasses and live fish sampled by the escapement estimate.

Escapement of Chinook by origin (hatchery or natural) was determined by applying ratios of hatchery marked carcasses and unmarked carcasses to the escapement estimate by reach groupings. Grouping reaches into subsets of the populations allows the calculation of hatchery origin recruits (HOR) and natural origin recruits (NOR) for escapement reaches where sample sizes were small or no carcasses were sampled. Results of these calculations are listed in Table 33.

Table 33. Snohomish Chinook HOR:NOR and spawning ground sampling rates grouped by stratum, 2012.

Stratum	Escape ment	No. Hatchery	No. Natural	% Hatchery	% Natural	Number Sampled	Percent Sampled
Skykomish	1,249	414	835	33.2%	66.8%	220	17.6%
Bridal Veil	493	176	317	35.7%	64.3%	140	28.4%
SF Sky (Sunset Falls)*	346	25	321	7.2%	92.8%	346	100.0%
Pilchuck River	175	22	153	12.5%	87.5%	8	4.6%
Sultan River	975	244	731	25.0%	75.0%	64	6.6%
Wallace River	507	402	105	79.3%	20.7%	92	18.1%
<b>Skykomish Pop.:</b>	<b>3,745</b>	<b>1,283</b>	<b>2,462</b>	<b>34.3%</b>	<b>65.7%</b>	<b>870</b>	<b>23.2%</b>
Snoqualmie	1301	434	867	33.3%	66.7%	141	10.6%
Tokul	78	54	24	69.6%	30.4%	46	59.0%
<b>Snoqualmie Pop.:</b>	<b>1,379</b>	<b>488</b>	<b>891</b>	<b>35.4%</b>	<b>64.6%</b>	<b>187</b>	<b>13.6%</b>
<b>Snohomish Total.:</b>	<b>5,124</b>	<b>1,771</b>	<b>3,353</b>	<b>34.6%</b>	<b>65.4%</b>	<b>1,057</b>	<b>20.6%</b>

\*Sunset Falls sample: 100% of live fish sampled for adipose fin mark status only

**Key for Grouped Stratum and Populations:**

<p><b>Skykomish Population:</b>                      Bridal Veil: Bridal Veil Creek, NF Skykomish River, SF Sky (Sunset Falls)                      Sultan: Sultan River                      Skykomish: Snoh-Sky (Mainstems), Elwell Creek, Olney Creek, Woods Creek, Proctor Creek                      Pilchuck: Pilchuck River                      Wallace: Wallace River (Upper and Lower)</p>
<p><b>Snoqualmie Population</b>                      Snoqualmie: Snoqualmie River (Lower and Upper), Raging River, Tolt River (Lower and Upper), SF Tolt River, Cherry Creek.                      Tokul: Tokul Creek (Lower), Tokul Creek (Upper)</p>

## **4.3 South Puget Sound**

### **4.3.1 Lake Washington**

#### Cedar River

Prior to 1999, live counts and Area Under the Curve (AUC) methods were used to estimate Chinook spawning abundance in the Cedar River. Since 1999 Chinook redds have been enumerated and mapped in the Cedar River via floating surveys, and escapement estimated by expanding the redd count by 2.5. Cedar River redd surveys are considered to be a complete census, where every Chinook redd in the Cedar system is counted. Redd surveys are conducted between RM 4.2 and RM 21.8 (Landsburg Dam) 2-3 times per week for the duration of the Chinook spawning period. The portion of the river upstream from the Landsburg Dam, and the lower 4.2 miles of the Cedar mainstem are each surveyed once per week. Due to the overlap with sockeye spawning timing, Chinook redds are only included in the count if a female Chinook is present and actively attending a redd.

In 2012 a total of 433 Chinook redds were observed in the Cedar River mainstem during the spawning season (including the surveyed area upstream from Landsburg Dam and including all small tributaries). Of the 433 Chinook redds, 418 were observed in the Cedar River mainstem (387 below Landsburg Dam and 31 above), 13 were observed in Taylor Creek, and 2 were observed in Rock Creek, both small tributaries to the Cedar River. Expansion by 2.5 fish per redd resulted in the estimated escapement of 1,083 Chinook. A total of 590 adult Cedar River Chinook were sampled for adipose fin clips in 2012. This sample indicated that 84% of the Cedar River Chinook were wild (unclipped) and 16% were hatchery origin (clipped) fish.

#### Sammamish River/North Lake Washington Tributaries

The Sammamish Chinook population is composed of naturally spawning Chinook in the Big Bear/Cottage Lake Creek watershed and in the Issaquah Creek watershed. Chinook escapement to the Sammamish River/ North Lake Washington Tributaries in 2012 was estimated at 2,034 fish.

#### Big Bear/Cottage Lake Creeks

Escapement to Big Bear Creek and Cottage Lake Creek involves weekly surveys of all known Chinook spawning areas to enumerate live and dead Chinook. Total spawning escapement is estimated using the AUC method, where live fish counts and a 10-day stream life estimate are used to calculate escapement.

The Bear Creek/Cottage Creek index area was surveyed weekly, and the Cottage Creek index area (a subset of the Bear/Cottage Index area) was surveyed twice each week during the 2012 spawning season. The escapement estimate was 591 fish. Of these, 239 were counted in the Bear Creek mainstem, 60 in the Upper Cottage Creek Index, and 292 in the Lower Cottage Creek Index. A total of 194 Chinook were sampled for adipose fin clips in 2012. This sample indicated that 15% of all Chinook in the Bear/Cottage system were wild (unclipped) and 85% were hatchery origin fish.

#### Issaquah Creek System

Issaquah Creek is surveyed weekly from the Issaquah Hatchery (located at river mile 3.0), downstream to its confluence with Lake Sammamish to count Chinook carcasses. All Chinook carcasses are assumed to have spawned, and the cumulative carcass count is used as the escapement estimate for this reach of Issaquah Creek. East Fork Issaquah Creek is also surveyed weekly from its confluence with the Issaquah Creek mainstem, upstream to the High Point Trail crossing at approximately RM 3.0. Similar to the Issaquah Creek mainstem, the cumulative carcass count is used as the escapement estimate for the East Fork.

The Issaquah Creek system was surveyed weekly during the 2012 spawning season, and total escapement was estimated at 1,443 fish (1,426 fish from the mainstem and 17 fish from the East Fork). A total of 304 adult Chinook from the Issaquah Creek system were sampled for adipose fin clips in 2012. This sample indicated that 5% of all Chinook in the Issaquah Creek system were wild (unclipped) and 95% were hatchery origin fish.

Chinook escapement to Issaquah Hatchery in 2012 was 4,492; 1,096 of these were released upstream to spawn in upper Issaquah Creek. Chinook passed above the hatchery are not included in the Issaquah Creek natural escapement estimate. Chinook escapement to the University of Washington hatchery was 651 fish.

#### **4.3.2 Green River**

Since 2009, Muckleshoot (MIT) and WDFW Biologists have agreed to attempt weekly<sup>1</sup> counts of new Chinook redds in all surveyable reaches of the Green River and Newaukum Creek during spawning season, reasoning that so few redds were being dug, it was possible to count all redds in all reaches. This estimation methodology uses season total redd counts, without adjustment, for the mainstem river; between River Mile (RM) 25.4 to 48.5 and 59.2 to 61.0. At the conclusion of the spawning season, the observed number of redds in the surveyed portion of the river is known and the variance is zero. There may be observational error in the surveyed area and/or spawning outside the surveyed area. However these factors operate in all sampling programs and are therefore, not included in any variance estimates.

For the purpose of surveying, the mainstem Green River was divided into 6 sections consisting of a varying number of reaches. Using 2 one-man pontoon boats (Headworks, Lower Canyon, & Lower<sup>2</sup> River sections) or 2 two-man boats (Middle River section), crews worked in tandem to count redds left and right of the center of the river. Completed redds were marked with surveyor's tape, changing the color of the tape each week. Redd counts were recorded at the end of each reach. Redds in the Metzler side channel (MSC) were counted opportunistically (when adequate water filled the side channel) in a similar manner. In 2012, new Chinook redds were counted weekly over three days in 4 of the 6 sections.

A rigorous surveying schedule began during Statistical Week (SW) 38 (September 16-22) and ended in SW 43 (October 21-26) due to high water. Redd counts from Metzler side channel (MSC) were conducted on October 9<sup>th</sup> (SW 41) and 19<sup>th</sup> (SW 42). These counts were added to the weekly count for the Middle River. The number of redds counted on each reach, each week was summed, without adjustment, to produce the season total

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<sup>1</sup> Surveys are conducted weekly, given favorable river conditions.

<sup>2</sup> Two reaches of the Lower Section; Main Street to Lower Carbody Hole (RM 31.8–33.3) and Lower Carbody Hole to Soos Ramp (RM 33.3–33.8) are surveyed on foot due to a logjam.

redd count by reach. Reach totals were summed to section totals, and section totals to river totals.

Surveys of Chinook naturally spawning in Newaukum Creek were conducted weekly by WDFW crews. Completed redds were counted and marked with surveyors tape each week in two reaches Newaukum Creek; from the creek mouth to river mile 4.3.

On October 1<sup>st</sup> (SW 40) and 15<sup>th</sup> (SW 42), a count of visible redds in each reach was made by helicopter in all 6 sections; encompassing the entire “spawnable area” of the mainstem river between RM 25.4 and approximately RM 60.4. Flights<sup>3</sup> were timed to coincide with the historical peak of natural Chinook spawning activity which typically occurs the first or second week in October, and occurred during Statistical Week 41 in 2012.

Escapement was calculated for the sections of the river not surveyed by boat: “Canyon”; RM 48.2 to 57.6 and “Hwy 167 to Transfer Shack”; RM 25.4 to 26.7. The season total redd count from the section just below the Canyon; Lower Canyon section: RM 44.3 to 48.2, was divided by the number of redds in the Lower Canyon section counted on the flight, resulting in the “Ground to Air Ratio” (G/A). The G/A was then applied to the number of redds observed in the Canyon on the day of the flight. A similar calculation was made for the section Hwy 167 to Transfer Shack, using the Footbridge to Lucky Hole reach (RM 30.0 to 30.6) to calculate the G/A ratio.

Season total redd counts from boat/foot surveys of the mainstem Green River and Newaukum Creek and calculated values from the aerial sections of the Green River, were multiplied by 2.5 fish per redd to estimate total Chinook spawning naturally in the Green River Basin. This multiplier is intended to account for the number of males and females and is derived from the sex ratio of 1.5 males for every female. This multiplier is based on surveys of the Skagit River more than 40 years ago and may be a source of error associated with the census count method.

Redd count surveys were conducted between Statistical Weeks 38 and 43. Post season analysis of the season totals confirms spawning activity peaked around SW 41 (Table 34). By the end of SW 42, 89% of the redds observed during spawning ground surveys were complete (Table 35).

Table 34. 2012 Green River: Number of Chinook Redds by Stat Week and Section.

<b>Stat Week</b>	38	39	40	41	42	43	<b>Total</b>
Headworks		18	39	35	30	13	135
Lower Gorge		6	25	28	41	30	130
Middle River	2	73	166	207	148	70	666
Lower River	3		43				46
Newaukum		8	28	67	40	6	149
<b>Total</b>	5	105	301	337	259	119	1,126

<sup>3</sup> Flight scheduling is limited by availability of the helicopter and weather/river conditions.

Table 35. 2012 Green River: Cumulative % of Chinook Redds by Statistical Week and Section.

<b>Stat Week</b>	38	39	40	41	42	43
Headworks		1.60%	5.10%	8.20%	10.80%	12.00%
Lower Gorge		0.50%	2.80%	5.20%	8.90%	11.50%
Middle River	0.20%	6.50%	21.20%	39.60%	52.80%	59.00%
Lower River	0.30%		3.80%	3.80%	3.80%	3.80%
Newaukum		0.70%	3.20%	9.10%	12.70%	13.20%
	0.40%	9.30%	36.10%	66.00%	89.00%	99.60%

The season total redds from the Lower River is 666 redds from the Middle River (including 24 from MSC), 130 from the Lower Canyon, and 135 from the Headworks. The G/A ratio for the Lower River reach “footbridge to Lucky hole” was 1.0 (2/2) resulting in a calculated 8 redds from Highway 167 to the “transfer shack”. Similarly, the G/A ration for the Lower Canyon was 1.86 (130/70) resulting in a calculated 102 redds for the “Canyon”. A total of 1,087 redds were counted in the mainstem Green River, including MSC.

In Newaukum Creek the season total redds for the section “400<sup>th</sup> to Whitney Hill Bridge” is 33 and for the section “Whitney Hill Bridge” to mouth” is 116, totaling 149 redds in Newaukum Creek.

During the season, 1,626 adults that returned to the Soos Creek hatchery were tagged, hauled upstream, and released in the mainstem. Although survival and spawning success of these fish is unknown, any redds created by these fish would have been counted during surveys, meaning that they are included in the natural spawning escapement estimate.

River flows during the 2012 Chinook spawning season (Table 36) were closer to the historic norm, than those of recent years. This did not appear to impede spawning activity as demonstrated by comparing spawning activity to discharge.

Table 36. 2012 Green River Discharge (ft<sup>3</sup>/sec) at Palmer by Statistical Week.

	<b>Stat Week</b>					
	38	39	40	41	42	43
Discharge	206	379	371	363	449	470

Applying the constant 2.5 fish/redd (1.5 males:1.0 female), an estimated 3,090 naturally spawning Chinook is generated for the Green River Basin.

#### Carcass sampling

During the course of 2012 WDFW and MIT crews collected biological data in compliance with the supplemental document; “WDFW field data & scale sampling”. Naturally spawning Chinook carcasses (clipped and unclipped) were sampled opportunistically during spawning ground surveys. DNA tissue samples (typically 3 small tissue samples

taken with a standard punch from the opercula) were collected from all sampled carcasses deemed to be in fair to excellent condition.

Additionally, MIT tags from re-released hatchery returns were noted for all sampled carcasses. In most cases fish were marked with disc tags inserted just below the dorsal fin. On at least one day, fish were tagged with T-bar tags through the dorsal fin. Such tags may not persist through the spawning process. As a result, the snout of all fish were inspected for signs of tissue damage associated with impoundment at the hatchery

A total of 643 fish were sampled for a variety of studies. Of those 502 were used to determine NOR/HOR ratios of the total escapement. A tally by mark/tag status is presented in Table 37. Using these values, the proportion of NORs was 57% and 21% for the Green River and Newaukum Creek respectively (Table 38).

Table 37. 2012 Green River Basin Naturally Spawning Chinook Biological Sample Totals

Section	Biological Samples	DNA Sampled	MIT Tags*	CWT	DIT (CWT&NM)
Headworks	67	55	8	1	1
Icy Crk to Christy Crk	69	63	10	7	
Christy Crk to Neely Br	303	280	131	3	1
Neely Br to Soos Crk	2	2	0	0	
Soos Crk to County Take Out	11	10	0	0	
Metzler Side Channel	6	6	0	1	
<i>SubTotal: River</i>	458	416	149	12	2
Newaukum: 400th to Whitney Hill Br	178	118	34	16	
Newaukum: Whitney Hill Br to Mouth	8	6	33	0	8
<i>SubTotal: Newaukum</i>	186	124	67	16	8
<b>Grand Total:</b>	644	540	216	28	10

Table 38. 2012 Green River Basin Naturally Spawning Chinook CWT Summary

Chinook Spawning Naturally	Sampled			NM		AD		NOS	HOS
	Number	CWT	no CWT	DIT	no CWT	CWT	no CWT		
Green River	458	12	446	2	215	10	231	243	215
Newaukum Creek	186	16	170	8	33	8	137	153	33
Green River Basin	644	28	616	10	248	28	368	396	248

\* "MIT tags"; the number of sampled fish with MIT tags, or those otherwise identified as hatchery re-release. Includes 91 subsampled fish not included in Biological Samples.

### 4.3.3 White River

Escapement estimates for White River spring Chinook comprise trap counts at the Army Corps of Engineers Buckley Diversion Dam fish trap (Buckley trap) and hatchery returns to the Minter Creek/Hupp Springs and White River hatcheries.

The Buckley Diversion Dam is a migration barrier to anadromous fish and contains a fish trapping facility where fish are trapped and trucked upstream of Mud Mountain dam. The Buckley trap enables enumeration of fish transported to the upper watershed. However, precise counts are dependent upon accurate species identification and record keeping. Records of trap and haul operations conducted in the absence of state or tribal fisheries managers are a subject of ongoing concern. The total number of natural-origin adult recruits (NOR) and acclimation pond (AP) Chinook trapped at Buckley was 2,271. Of these 2,226 were hauled upstream of the dam (Table 39) and 45 NORs were taken to the White River hatchery for use as broodstock.

Table 39. Numbers of Chinook hauled upstream of Buckley fish trap in 2012.

Origin	Adults	Jacks	Totals
Wild (NOR)	1,121	29	1,150
Acclimation Pond	1,105	186	1,291
<b>Totals</b>	<b>2,226</b>	<b>215</b>	<b>2,441</b>

There are two hatchery programs for White River spring Chinook. The Minter Creek/Hupp Springs program was initiated in the mid-1970's in response to steep declines in population abundance. This program was expanded following completion of the Muckleshoot Tribe's White River hatchery in 1989. In 2012 escapement to the Minter Creek/Hupp Springs hatchery was 275 adults and 50 jacks, for a total of 325. None of these fish were taken to the White River Hatchery.

Escapement to the White River hatchery in 2012 was 1,656. These fish were either collected at the Buckley fish trap on the south side of the diversion dam, or volunteered to the hatchery trap on the north side of the diversion dam. Of the total, 1,553 were adults and 103 were jacks.

### 4.3.4 Puyallup River

The Puyallup Tribal Fisheries (PTF) and WDFW staff used a redd count-based methodology to estimate Chinook escapement in the Puyallup River basin during even years. The escapement estimate includes fall-timed Chinook spawning in the lower White River downstream of the Buckley diversion dam trap. These fish have been enumerated by PTF biologists through spawning ground surveys since 2002, but were not accounted for in escapement estimates prior to 2009.

South Prairie Creek



Survey coverage of the South Prairie system was very good in 2012. Extreme low flows may have resulted in fish spawning lower in the system compared to recent years. The cumulative redd count of 90 in South Prairie Creek, expanded by 2.5, yielded an escapement estimate of 225 spawners. Extreme low flows at the mouth of Wilkeson Creek resulted in a zero redd count for the season. The South Prairie Creek (SPC) sub-basin total spawning escapement estimate for 2012 is 225. Based on mark-sampling of carcasses observed, about 51 percent of these fish were unmarked, so the escapement was made up of 129 NORs and 136 HORs.

#### Carbon River

Because conditions in the Carbon River seldom allow accurate Chinook escapement surveys, estimates are based on the relationship between SPC and Carbon River escapement in 1999, when there accurate redd count data for the Carbon River. Carbon River reaches with complete data tracked the SPC spawn timing remarkably well. Therefore, reaches with incomplete data were expanded using the SPC spawning timing curve with a high degree of confidence.

Suitable survey conditions never occurred on the Carbon River during the 2012 spawning period. Consistent with the last ten years, the 2012/1999 SPC escapement ratio ( $225 / 1422 = 0.1582$ ) was applied to the 1999 Carbon River escapement (250) to estimate the 2012 value. This method estimated 40 Chinook spawning in the Carbon during 2012 ( $250 * 0.1582 = 40$ ) Based on mark sampling ratios observed in South Prairie Creek, the escapement was made up of 20 NORs and 20 HORs. .

#### Mainstem Puyallup River Tributaries

Aggregate escapement to Puyallup River tributaries in 2012 was estimated at 155. Based on mark sampling in these tributaries, excluding Clark’s Creek, 52 of these fish are NORs and 103HORs.

Redd-based escapement estimates were calculated for most of the Puyallup River tributaries. No redds or fish were observed in Canyon Falls Creek in 2012. Clarks Creek escapement was 60 fish.

Puyallup River tributaries:	Escapement estimate:
Fennel Creek (WRIA 10.0406)	18
Canyon Falls Creek (10.0410)	0
Kapowsin Creek (10.0600)	13
Clear Creek (10.0022)	95
Clarks Creek (10.0027)	60
Tributary total	186

Mark sampling data collected in Clark’s Creek are not used for the tributary mark rate estimate because, many of the Chinook produced and released from Clark’s Creek hatchery are not marked and the identification of origin of natural spawners cannot be made.

### Mainstem Puyallup River

Chinook spawning escapement into the mainstem Puyallup River is estimated to be 155 fish. This escapement was made up of 52 NOR and 104 HOR Chinook, based on mark sampling ratios observed in Puyallup River mainstem tributaries.

As with the Carbon River, surveys of Puyallup River were not possible in 2012. WDFW and PTF staff believe that Puyallup River mainstem spawning escapement trend is closely related to the tributaries (Fennel, Canyon Falls, Kapowsin, and Clarks creeks). Therefore, the 2012/1999 Puyallup tributary ratio ( $90/113 = 0.7965$ ) was applied to the estimated 1999 Puyallup mainstem escapement (195) to estimate 2012 escapement of 155 Chinook ( $195 * 0.7965 = 155$ ).

The 2012 Chinook natural spawning escapement into Clark's Creek was not included in the tributary to Puyallup River mainstem ratio. For brood years contributing to the 2012 return, many of the Chinook released from Clark's Creek hatchery were not marked, so the origin of natural spawners could not be determined. Since 1999 is used as the base year, the 1999 natural spawning escapement estimate for Clark's Creek is used instead. It cannot be assumed that the composition of Clark's Creek Chinook spawning escapement is the same as in the Puyallup River mainstem due to the proximity to Clark's Creek hatchery.

### Lower White River

The fall component of Chinook spawning in the lower White River and its tributaries, downstream of the Buckley diversion dam fish trap, are included in the 2012 Puyallup River basin fall Chinook escapement estimate. Spawning ground survey efforts by co-managers indicate that, in some years, a sizeable population of Chinook spawns in these areas.

Spring and fall Chinook spawn in the White River. The fall component in the lower White River and tributaries was identified by mark sampling during spawning ground surveys and the genetic analysis conducted by Ford et al. (2004). Carcass sampling during spawning ground surveys provides a ratio of hatchery-origin fall Chinook (i.e. fish with a clipped adipose fin), to unmarked fish. Based on previous genetic analysis of samples collected in Boise Creek (Ford et al 2004), 60% of the unmarked fish are assumed to be fall Chinook.

Fall Chinook spawning escapement into the lower mainstem White River and its tributaries in 2012 was estimated to be 168 fish. This escapement is made up of 108 NORs and 59 HORs based on mark sampling ratios observed during spawning ground surveys.

### Total Puyallup Escapement

The total 2012 estimated Puyallup River naturally spawning fall Chinook escapement is 772 fish. It is estimated that 353 were NORs, and 419 were HORs, based on mark-sampling of carcasses observed. The estimate of NORs assumes the proportion of hatchery verses natural origin spawners is the same between Puyallup River tributaries (except Clark's Creek) and the Puyallup River mainstem and SPC and the Carbon River.

#### **4.3.5 Nisqually River**

Escapement to the Nisqually in 2012 was estimated using a change in ratio methodology. This method uses the proportion of marked fish entering the river (as estimated by sampling gillnet catch, the total removals below the weir (in all fisheries and hatchery returns) and proportion of those removals marked, and the proportion of marked fish returning to the weir to estimate the total return to the river and escapement above the weir.

Total return to the weir was estimated to be 2,967 Chinook (2,320 HOR, 647 NOR). 121 HOR's trapped at the weir were removed from the river, leaving a total estimated upstream escapement of 2,846. Escapement downstream of the weir was calculated using the assumptions that downstream escapement was 28% of the return to the weir, and that HOR/NOR ratios were the same as the return to the weir. This resulted in an estimate of 831 fish spawning downstream of the weir (650 HOR, 181 NOR).

Total natural spawning escapement was estimated to be 3,677 (2,849 HOR, 828 NOR).

#### **4.4 Hood Canal**

A summary of Chinook spawner escapement estimates for tributaries to Hood Canal during 2012 is provided in Table 40.

##### Mid-Hood Canal

The Mid-Hood Canal population is comprised of Chinook produced in the Dosewallips, Duckabush, and Hamma Hamma watersheds.

In the Dosewallips and Duckabush rivers, the lower reaches surveyed are spawning and transit areas. Upper reaches of each river have been regularly surveyed in the Dosewallips and Duckabush since 1998, but few adults have been observed. Current escapement estimates are derived from a combination of counts of live Chinook adults and Chinook redds.

In the Hamma Hamma River, most of the Chinook spawning area is currently being surveyed. Since 1998, escapement was estimated from counts of cumulative new redds and/or from live Chinook using the area-under-the curve (AUC) method. A cooperative supplementation program was initiated in 1995 to rebuild Chinook abundance.

Table 40. Summary of Chinook escapement to Hood Canal streams during 2012.

Marine Area	Stream	Spawner escapement	Comments
--	Skokomish R.	897	Redd counts + AUC in Hunter Cr. INDEX
	N.F. Skokomish R.	538	Redd counts+ 1 redd in McTaggart
	S.F. Skokomish R.	98	Redd counts
	<b>Total</b>	<b>1,533</b>	
12A	Little Quilcene R.	0	No chinook observed
	Big Quilcene R.	1	One unclipped unmarked female, dead
	<b>Total</b>	<b>1</b>	
12B	Dosewallips R.	7	Redd counts + Rockybrook live/ dead observations
	Duckabush R.	6	AUC based on live fish observed
	Hamma Hamma R. a/	403	AUC adjusted for broodstock + John Creek AUC
	<b>Total</b>	<b>416</b>	
12C	Dewatto R.	7	AUC
	Lilliwaup Cr.	2	Count
	<b>Total</b>	<b>9</b>	
12D	Tahuya R.	11	AUC
	Union R.	18	Trap
	<b>Total</b>	<b>29</b>	
<b>Hood Canal total</b>		<b>1,988</b>	

a/ Hamma natural escapement = 373, broodstock = 22, John Ck = 8

Summer chum salmon and pink salmon (in odd years) spawn at the same time as Chinook in the lower reaches of these three streams. Consequently, it can be difficult to distinguish Chinook redds from summer chum or pink redds unless Chinook are actively spawning and observed on redds. Pink salmon spawn predominately downstream of RM 6.7 on the Dosewallips, downstream of RM 2.6 on the Duckabush and throughout the reaches surveyed on the Hamma Hamma. Summer chum salmon spawn predominately downstream of RM 3.6 on the Dosewallips, downstream of RM 2.6 on the Duckabush and throughout the reaches surveyed on the Hamma Hamma. It has been possible to count Chinook redds in the upper Dosewallips and Duckabush River reaches (especially in years without pink salmon).

During 2012, spawner surveys were conducted by WDFW on the Dosewallips, Duckabush, and Hamma Hamma rivers every 7 to 10 days from late August or early September through October. The escapement estimate to all three systems combined was 416 adults: 7, 6, and 403 Chinook in Dosewallips, Duckabush, and Hamma Hamma rivers, respectively. During 2012, it is possible that some Chinook redds were not identifiable on the Dosewallips and Duckabush rivers in areas with summer chum spawning. However, based on the number of Chinook redds and adults observed during surveys, few Chinook were present and the escapement estimates for Dosewallips and Duckabush rivers are considered good.

The Dosewallips River was surveyed from RM 0 to RM 2.3, RM 3.6 to RM 6.7, and RM 7 to RM 11; Rockybrook Creek, a tributary, was surveyed from RM 0 to RM 0.3. Three Chinook redds were observed and the escapement estimate is 7 Chinook in the Dosewallips River during 2012. The Duckabush River was surveyed from RM 0 to RM 2.6, RM 4.8 to RM 6, and snorkel surveyed from RM 2.6 to 4.2; Hatchery Creek, a tributary, was surveyed from RM 0 to RM 0.1. Although no Chinook redds were identified, a minimum of 6 individual live adults were observed and the escapement estimate is 6 Chinook in the Duckabush River during 2012. The Hamma Hamma River was surveyed from RM 0.3 to RM 1.8; John Creek, a tributary, was also accessible to Chinook and was surveyed from RM 0 to RM 1.6. The AUC escapement estimate is 395 Chinook in the Hamma Hamma (which includes 22 Chinook collected for broodstock) and 8 Chinook spawned in John Creek. Total escapement to the Hamma Hamma River system is estimated as 403 Chinook during 2012.

The FRAM preseason escapement projection was 196 Chinook in Mid-Hood Canal (FRAM 1512,) while actual escapement was 416 Chinook. The escapements to the Dosewallips River and Duckabush River were low as anticipated.

#### Skokomish River

Chinook spawning takes place in the mainstem Skokomish River up to the confluence with the South and North Forks at RM 9, in the South Fork (primarily up to RM 5.5), and in the North Fork from RM 9 to 17 (where Cushman Dam blocks further access). Natural escapement estimates are based on counts of Chinook redds in all principal spawning habitat in the mainstem Skokomish (RM 2.2 to 9.0), North Fork (R.M. 9.0 to 15.6), and South Fork (R.M. 0 to 2.2). In addition, escapement estimates are made for Vance Creek and Hunter Creek. Since 2008, surveys have been conducted from RM 0 to RM 5.5 in the South Fork, and are included in the total escapement estimate.

Live and dead adults, along with visible redds, were counted in Skokomish River index areas during foot and raft surveys (e.g., see Smith and Castle 1994). Surveys are conducted every seven to ten days from late August through October. A cumulative new redd count for each section of the river was tabulated at the end of the season and multiplied by 2.5 fish per redd to estimate total Chinook escapement. In addition, foot surveys are made in Hunter and Vance creeks. Escapements to these tributaries are estimated based on redd counts and/or live Chinook observed.

In recent years, low flows at the mouth of the South Fork have prevented Chinook from accessing the lower South Fork early in the season. In 2012, however, Chinook were able to access the South Fork Skokomish throughout the season.

During 2012, total estimated spawner escapement is 1,533 Chinook in the Skokomish River system. Spawner escapement is comprised of 897 Chinook in the mainstem Skokomish (including 98 Chinook in Hunter Creek), 538 Chinook in the North Fork Skokomish, and 98 Chinook in the lower (RM 0 to RM 5.5) South Fork Skokomish.

The 2012 FRAM preseason escapement prediction was 1,889 Chinook (FRAM 1512).

#### Hood Canal Chinook Mark Sampling

Mass marking has been implemented for Hood Canal hatchery Chinook, including releases from George Adams Hatchery, Hoodsport Hatchery, and Endicott Ponds. The proportion of all Hood Canal hatchery Chinook released that was either tagged and/or

marked has incrementally increased since brood year 2003. In addition, all of the Chinook released from the Hamma Hamma supplementation program were tagged and/or marked.

Coded-wire tag (CWT) data and age and sex composition data have been routinely collected for Chinook returning to George Adams Hatchery since 1988 and Double Index tag groups of Chinook have been released since 1998.

More intensive sampling of Chinook on the natural spawning grounds has been done since 1998. During 2012, the Skokomish, Dosewallips, Duckabush, and Hamma Hamma rivers were targeted for enhanced mark and CWT sampling and WDFW also sampled Chinook carcasses for marks and CWTs on the Dewatto and Lilliwaup rivers during 2012.

Of the 219 Chinook sampled in Hood Canal rivers during 2012, 135 Chinook were adipose-marked and, of these, 7 Chinook had CWTs. Forty-eight unmarked Chinook sampled in 2012 had CWTs. We sampled 10.4% of Chinook spawner escapement in the Skokomish River, 13.2% of the Mid-Hood Canal Chinook spawner escapement (in the Hamma Hamma, Duckabush, and Dosewallips rivers), and had an overall sampling rate of 11% in all Hood Canal rivers combined (Table 36).

Jacks are not included in Chinook spawner escapement estimates in Hood Canal, but few jacks were sampled during 2012.

The proportion of hatchery fish in the spawning escapement are estimated based on age composition in the escapement, sampling rate of the spawning escapement, and the proportion of hatchery production releases that was marked and/or tagged from BY 2007 (age 5), BY 2008 (age 4), and BY 2009 (age 3). Preliminary estimates of hatchery fish in the spawning escapement are also made based only on the total number of tags and marks recovered corrected for clip error rates for the returning brood years.

In the Skokomish River system during 2012, 132 of 159 (80%) Chinook sampled were adipose-marked (Table 37). A preliminary estimate is that spawning escapement in the Skokomish River was comprised of about 87% hatchery-origin Chinook and 13% natural-origin Chinook.

In Mid- Hood Canal, releases from the Hamma Hamma River supplementation program are 100% otolith marked and all Chinook carcasses were sampled for otoliths during 2012. In 2012, 23 of 24 (95%) Chinook sampled in the Hamma Hamma River were otolith-marked. Preliminary estimates are that spawning escapement was comprised of 95% supplementation (hatchery)-origin Chinook and 5% natural-origin Chinook in the Hamma Hamma River. During 2012, 0 Chinook were sampled in the Duckabush and 0 unmarked/untagged Chinook was sampled in the Dosewallips. Preliminary estimates are that spawning escapement for Mid-Hood Canal Chinook is comprised of 5% natural-origin and 95% hatchery-origin Chinook.

Table 41. Spawner escapement and carcass sampling results for Hood Canal streams, 2012.

Mgmt Unit	River	Spawner escapement	Chinook sampled Number	%	Tagged 1/			Untagged 1/			Unk. tagged 2/			Totals	
					AD	NM	Unk	AD	NM	Unk	AD	NM	Unk	CWTs recovered	AD-clips observed
Skokomish	Mainstem Skokomish R.	897	133	14.8%	6	5	0	105	13	0	4	0	0	11	115
	N.F. Skokomish R.	538	20	3.7%	0	0	0	9	4	2	3	1	1	0	12
	S.F. Skokomish R.	98	6	6.1%	0	0	0	5	0	1	0	0	0	0	5
	<b>Skokomish River total</b>	<b>1,533</b>	<b>159</b>	<b>10.4%</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>119</b>	<b>17</b>	<b>3</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>11</b>	<b>132</b>
12A	Big Quilcene R.	1	1	0%	0	0	0	0	1	0	0	0	0	0	0
	Little Quilcene R.	0	0	0%	0	0	0	0	0	0	0	0	0	0	0
12B	Hamma Hamma R.	403	55	13.6%	0	43	0	0	7	0	0	5	0	43	0
	Duckabush R.	6	0	0.0%	0	0	0	0	0	0	0	0	0	0	0
	Dosewallips R.	7	0	0.0%	0	0	0	0	0	0	0	0	0	0	0
	<b>Mid-Hood Canal total</b>	<b>416</b>	<b>55</b>	<b>13.2%</b>	<b>0</b>	<b>43</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>43</b>	<b>0</b>
12C	Dewatto R.	7	3	42.9%	0	0	0	1	2	0	0	0	0	0	1
	Lilliwaup R.	2	0	0.0%	0	0	0	0	0	0	0	0	0	0	0
12D	Tahuya R.	11	2	18.2%	1	0	0	1	0	0	0	0	0	1	2
	Union R.	18	0	0.0%	0	0	0	0	0	0	0	0	0	0	0
	<b>Hood Canal total</b>	<b>1,987</b>	<b>219</b>	<b>11.0%</b>	<b>7</b>	<b>48</b>	<b>0</b>	<b>121</b>	<b>26</b>	<b>3</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>55</b>	<b>135</b>

#### 4.5 Strait of Juan de Fuca

##### Dungeness

Since 1986, surveys have been conducted throughout the spawning season from RM 0.0 to 18.8 in the mainstem Dungeness, and from RM 0 to 5.1 in the Gray Wolf mainstem, to generate a cumulative redd count for the season. The total redd count is multiplied by 2.5 to estimate the total number of adults. In 2012, 196 redds (490 adults) were counted in the Dungeness and 7 redds (18 adults) were counted in the Gray Wolf for a total of 203 redds (508 adults). There were an additional 106 adults removed from the river and used for broodstock. The total estimated return to the river was 614 which was slightly below the FRAM projected escapement of 656. The decreases in escapement of Dungeness spring Chinook relative to recent years and relative to forecast are partially due to the termination of the captive brood program after the 2002 brood, and resulting decrease in numbers of hatchery juveniles released. Because the forecasts for Strait of Juan de Fuca Chinook are based solely on average recent returns, they did not account for this reduction in production.

There were 132 carcasses sampled for scales and checked for CWTs. The majority of the adults sampled for scales and CWTs were collected for broodstock. Based on the CWT results and scale samples analyzed, the preliminary HOR/NOR composition for RY2012 was 58.3% HOR and 41.7% NOR (Table 2). The numbers in Table 2 are preliminary and subject to change until otolith analysis from unmarked and untagged Chinook have been verified.

Table 42. Estimated HORs and NORs for Dungeness Chinook in the Dungeness Basin based on CWT returns. Results subject to change based on otolith analysis of unmarked/untagged samples.										
No. recovered carcasses	Tag number/Mark/Tag status	Brood year	No. released	Size at release	Percent of carcasses sampled	Estimated number in spawning population of 508	Percent HOR escapement	Percent NOR escapement	Estimated number in TRS population of 614	Percent of total population (TRS)
14	210563	2009	50,200	52 / lb.	10.60%	54	10.5%		67	10.9%
7	210773	2009	50,400	59 / lb.	5.30%	27	5.5%		34	5.5%
27	210846	2008	48,975	78 / lb.	20.50%	104	20.4%		124	20.2%
12	210847	2008	49,750	44 / lb.	9.10%	46	9.1%		56	9.2%
7	210848	2008	49,600	6.2 / lb.	5.30%	27	5.3%		34	5.5%
5	210849	2008	49,600	9.9 / lb.	3.80%	19	3.7%		24	4.0%
1	210774	2007	49,600	68 / lb.	0.80%	4	0.8%		5	0.8%
4	210775	2007	49,300	34 / lb.	3.00%	15	3.0%		19	3.2%
0	210776	2007	25,700	6.4 / lb.	0.00%	0	0.0%		0	0.0%
0	634669	2007	10,264	7.6 lb.	0.00%	0	0.0%		0	0.0%
0	210716	2006	51,000	70 / lb.	0.00%	0	0.0%		0	0.0%
0	210718	2006	58,400	6.9 / lb.	0.00%	0	0.0%		0	0.0%
0	210719	2006	55,536	7.7 / lb.	0.00%	0	0.0%		0	0.0%
0	No CWT+ No Mark HOR	2009			0.00%	0	0.0%		0	0.0%
12	No CWT+ No Mark NOR	2009				46		9.1%	56	9.2%
0	No CWT+ No Mark HOR	2008			0.00%	0			0	0.0%
39	No CWT+ No Mark NOR	2008				150		29.6%	174	28.4%
0	No CWT+ No Mark HOR	2007			0.00%	0			0	0.0%
4	No CWT+ No Mark NOR	2007				15		3.0%	19	3.2%
<b>Totals 132</b>						<b>508</b>	<b>58.3%</b>	<b>41.7%</b>	<b>614</b>	

The age of the HOR Chinook for RY2012 consisted of 27.7% age 3, 65.6% age 4, 6.7% age 5, and no age 6. The age of the NOR Chinook consisted of 22.5% age 3, 69.7% age 4, 7.8% age 5, and no age 6 (Table 2). We recovered a total of 77 CWT Chinook during the season by the following age groups: 21 (age 3), 51 (age 4), and 5 (age 5). No age 2 Chinook carcasses were observed during the season.



Table 43. The estimated number and percentages of Chinook HORs and NORs by age group in the Dungeness River during RY2012.						
Total age	Total number of HORs	Percentage of HORs	Total number of NORs	Percentage of NORs	Total number of HOR+NORs	Percentage of HOR+NORs
3	101	27.70%	56	22.50%	157	25.60%
4	238	65.60%	175	69.70%	414	67.30%
5	24	6.70%	19	7.80%	43	7.10%
6	0	0.00%	0	0.00%	0	0.00%
Totals	363	100.00%	250	100.00%	614	100.00%

#### Elwha River

The Elwha Dam removal project began in September 2011 and was completed by March 2012. The natural river flow was restored through the former Lake Aldwell. Prior to September 2012, Chinook spawning in the Elwha River was limited to the 4.8 miles below the dam with most natural spawning concentrated between RM 2.8 and 4.4. Before dam removal, Chinook surveys were conducted by raft and foot surveys. Beginning in September 2012, National Park Service, Lower Elwha Klallam Tribe, and National Marine Fisheries Service staff conducted foot surveys between the Glines Powerhouse and the old lower dam site in several sections listed in Table 44. Two major Elwha tributaries, Little River and Indian Creek, were also included with these surveys. A total of 119 Chinook redds were observed in the mainstem Elwha River, 40 in Little River, and 58 in Indian Creek for a total of 217.

Table 44. Number of Chinook redds and live and dead Chinook observed in the Elwha River from the Glines Powerhouse RM 13.4 to Spruce Hole at RM 2.3, Little River and Indian Creek in 2012.

<b>Elwha River – Section surveyed</b>	<b>No. of Redds</b>	<b>Males</b>	<b>Females</b>	<b>Unknown</b>	<b>Carcasses</b>	<b>Jacks</b>
Glines Powerhouse to Top of Altaire Canyon	6	0	0	23	1	1
Altaire Bridge to Griff Creek	0	2	3	3	1	1
Griff Creek to Rabbit Hole	8	0	0	0	1	0
Rabbit Hole to Fisherman's Corner	33	7	1	102	18	1
Fisherman's Corner to National Park Boundary	0	0	0	0	0	0
National Park Boundary to McDonald Bridge Gauge	0	0	0	0	0	0
McDonald Bridge Gauge to A-Frame	2	0	0	0	1	0
A-Frame to Highway 101 Bridge	NA	NA	NA	NA	NA	NA
Highway 101 Bridge to launch	10	0	0	6	0	0
Boat Launch (Aldwell) to Oxbow (Aldwell)	1	0	0	3	2	0
Oxbow Reach (Aldwell)	30	0	0	31	5	0
Oxbow Reach to Gooseneck	15	0	0	5	8	0
Lower River (weir) to Top of Hunt Channel (aka Spruce Hole)	14	0	0	0	2	0
Little River (RM 0.0-1.2)	40	28	16	0	18	8
Indian Creek (RM 0.0-1.2)	58	29	28	0	27	14
Totals upstream of Elwha Dam Site	203	66	48	173	82	25
Totals downstream of Elwha Dam Site	14	0	0	0	2	0
<b>Grand totals</b>	<b>217</b>	<b>66</b>	<b>48</b>	<b>173</b>	<b>84</b>	<b>25</b>

The total number of redds in the river and tributaries was estimated by expanding to the areas not surveyed. The expanded estimate for total redds was 411 (Table 45). This redd total is multiplied by 2.5 to estimate total adults. For RY2012, the estimated number of natural spawning Chinook in the Elwha River was 1028.

Table 45 . The number of redds observed, percent of the stream length surveyed, percent of stream area section surveyed, the percent visibility, and the estimated redds in the river sections not surveyed for the Elwha River in 2012.

Survey area	Total length (miles)	Unsurveyed length (miles)	Surveyed length (miles)	Percent surveyed	Observed redds	Percent complete	Visibility	Expanded redds
Mainstem Elwha River	15.7	6.9	8.8	56.1%	119	85%	90%	278
Indian Creek	1.5	0.2	1.3	86.7%	58	80%	100%	84
Little River	1.5	0	1.5	100.0%	40	80%	100%	50
<b>Total redds</b>					<b>217</b>			<b>411</b>
<b>Total adults (redds x 2.5 adults/redd)</b>					<b>543</b>			<b>1028</b>

In addition to spawning ground surveys in the area upstream of the former Elwha Dam site, adult Chinook were collected by various methods for broodstock purposes in the lower river. WDFW staff collected adults at the weir located near RM 4.1 and by gaff, net, seine, and trap methods. A total of 1158 Chinook were removed from the river and used as brood stock for the hatchery program (Table 46) The terminal run size to the river was 2,186 Chinook, higher than the FRAM prediction of 1,887.

Table 46. Total number of adult Chinook collected at the weir and in the river for broodstock purposes and total return to the Elwha River in RY 2012.

Method of capture	No. of males	No. of females	No. of jacks	Non-viable females	Total w/o jacks
Number of Chinook gaffed downstream of weir and spawned	107	68	0	59	234
Number of Chinook netted/gaffed in river downstream of weir and taken to hatchery	357	220	1	0	577
Number of Chinook transported from LEK Hatchery to WDFW Elwha Channel	139	32	5	0	171
Number of Chinook transported from Elwha River weir to WDFW Channel	47	17	1	0	64
Number of Chinook return to WDFW Channel	84	28	21	0	112
<b>Totals</b>	<b>734</b>	<b>365</b>	<b>28</b>	<b>59</b>	<b>1,158</b>
<b>Estimated number of natural spawners in the river</b>					<b>1,028</b>
<b>Estimated total returns</b>					<b>2,186</b>

WDFW field staff collected 114 otolith samples from Elwha Chinook in 2012. Otoliths were collected to help distinguish between hatchery and wild fish based on the presence or absence of otolith marks. Of the 114 samples, 95 had an otolith mark present (83.3%) and 19 (16.7%) had no otolith mark present. Of these, 1 was age 5, 32 were age 4, and 62 were age 3. WDFW field staff also collected 76 Chinook snouts that were detected with a CWT (Table 47).

Table 47. Number of CWT recoveries by tag number recovered in the Elwha River in 2012.

Number sampled with CWT	CWT number	Brood year	Release location	Percent of carcasses w / CWT sampled
1	635977	2010	Elwha R.	1.30%
5	635275	2009	Elwha R.	6.60%
9	635270	2009	Elwha R.	11.90%
41	634786	2008	Elwha R.	54.00%
15	631424	2008	Elwha R.	19.70%
1	210848	2008	Hurd Creek	1.30%
1	210847	2008	Greywolf R.	1.30%
1	185958	2008	Big Qualicum	1.30%
1	210774	2007	Greywolf R.	1.30%
1	633879	2006	Elwha R.	1.30%

## Hoko

WDFW and Makah Fisheries staff conduct foot surveys to count redds in the mainstem between river miles 2.8 to 21.7 and tributaries, which represents all Chinook spawning area in the Hoko basin. There are ten mainstem and 13 tributary reaches, which include the Little Hoko River, a tributary to the lower mainstem, and Browne's, Herman, North Fork Herman, Ellis, Bear, and Cub creeks, which are tributaries to the upper mainstem. WDFW conducted one peak survey in the mainstem Hoko River from RM 2.8 to RM 3.4 and five surveys from RM 3.4 to 10.2 during the 2012 return year. Makah Fisheries Management (MFM) surveyed the mainstem Hoko upstream of RM 10.2 and the Hoko tributaries. Survey conditions were poor after the November 12 survey due to high water. We believe the poor survey conditions did not impact escapement estimates in the lower river due to historical spawning timing and the low numbers of fish and redds observed prior to the high water.

Redd counts are multiplied by 2.5 adults/redd to estimate natural escapement. The lower mainstem Hoko River had an estimated 114 redds and the tributaries plus upper mainstem Hoko River had 40 redds. (Table 48) The escapement estimates for the upper mainstem Hoko River (RM 10.1 to 21.7) and all tributaries and lower mainstem Hoko River (RM 2.8 to 10.1), were 100 and 286, respectively.

The total number of natural spawners in the river was 401, which includes an additional 15 broodstock released live that were not spawned by hatchery staff. Makah Fisheries Management (MFM) staff collected 262 adult Chinook for broodstock and scale samples. Of the 262 brood stock collected, 141 were males and 121 were females. The 2012 Chinook terminal run size was estimated to be 663 adults, lower than the FRAM prediction of 2,118 (Table 2).

The total number and percentage by age of the Chinook in-river spawners were 62 (15.5%) age 4 and 339 (84.5%) age 5. For RY2012, the in-river spawners consisted of 273 (68.1%) HORs and 128 (31.9%) NORs. The age and origin of the total spawners including broodstock collected for RY2012 consisted of 40 (6.0%) age 2, 58 (8.8%) age 3, 151 (22.8%) age 4, 414 (62.42%) age 5, 1 (0.15%) age 6 and no age 7s. For RY2012, the total return consisted of 451 (68.1%) HORs and 212 (31.9%) NORs (Table 3).

Table 48. Summary of the observed and expanded redds in the mainstem Hoko River and its tributaries in RY 2012.

Stream	Lower end	Upper end	Total Length	Unsurveyed Length	Surveyed Length	% Surveyed	Observed redds	Expanded redds	Expanded redds/mile	% Complete
Mainstem Hoko 1/	2.00	10.10	8.10	0.80	7.30	90.1%	109	114	5	100.0%
Mainstem Hoko	10.10	11.00	0.90	0.00	0.90	100.0%	3	3		97.3%
Mainstem Hoko	11.00	13.00	2.00	0.00	2.00	100.0%	3	3		97.3%
Mainstem Hoko 2/	13.00	15.50	2.50	2.50	0.00	0.0%		4	4	97.3%
Mainstem Hoko	15.50	18.30	2.80	0.00	2.80	100.0%	4	4		100.0%
Mainstem Hoko	18.30	20.40	2.10	0.00	2.10	100.0%	2	2		100.0%
Mainstem Hoko	20.40	21.70	1.30	0.00	1.30	100.0%	0	0		100.0%
Brownes Cr.	0.00	0.97	0.97	0.00	0.97	100.0%	19	19		100.0%
Ellis Cr.	0.00	1.00	1.00	0.00	1.00	100.0%	0	0		97.3%
Herman Cr.	0.00	2.00	2.00	0.00	2.00	100.0%	0	0		67.7%
NF Herman Cr.	0.00	0.37	0.37	0.00	0.37	100.0%	1	1		97.3%
Johnson Cr.	0.00	0.35	0.35	0.00	0.35	100.0%	4	4		100.0%
<b>Total Redds</b>							<b>145</b>	<b>154</b>		
<b>Adults (redds * 2.5 adults/redd)</b>							<b>363</b>	<b>386</b>		
1/ Assumed some spawning downstream between RM 2.8 to RM 2.0. Used redds/mi. for RM 2.3-RM 3.4 observed during surveys										
2/ Used avg. redds/mi. from sections RM11-13 plus RM 15.5-18.3 based on surveys										

Table 49. Total number of HORs and NORs for in-river Chinook spawners, broodstock collected, and total spawners by age group for Hoko River during RY2012.

In-River Spawners									
Age	by Sex					by Origin			
	M	F	J	Totals	% of Totals	HOS	NOS		Dlb-chk
2	0	0		0	0%	0	0		0
3	0	0		0	0%	0	0		0
4	29	33		62	15%	42	20		62
5	121	218		339	85%	231	109		339
6	0	0		0	0%	0	0		0
7	0	0		0	0%	0	0		0
Unaged	0	0		0	0%	0	0		0
<b>Totals</b>	<b>150</b>	<b>251</b>	<b>0</b>	<b>401</b>	<b>100%</b>	<b>273</b>	<b>128</b>	<b>0</b>	<b>401</b>

Hatchery Broodstock Collected									
Age	by Sex					by Origin			
	M	F	J	Totals	% of Totals	HOS	NOS		Dlb-chk
2	40	0		40	15%	27	13		
3	57	1		58	22%	39	18		
4	34	56		89	34%	61	29		
5	12	63		74	28%	51	24		
6	0	1		1	0%	1	0		
7	0	0		0	0%	0	0		
Unaged	0	0		0	0%	0	0		
<b>Totals</b>	<b>141</b>	<b>121</b>		<b>262</b>	<b>100%</b>	<b>178</b>	<b>84</b>	<b>0</b>	<b>262</b>

Total Spawners									
Age	by Sex					by Origin			
	M	F	J	Totals	% of Totals	HOS	NOS		Totals
2	40	0		40	6%	27	13		40
3	57	1		58	9%	39	18		58
4	62	88		151	23%	103	48		151
5	133	281		414	62%	281	132		414
6	0	1		1	0%	1	0		1
7	0	0		0	0%	0	0		0
Unaged	0	0		0	0%	0	0		0
<b>Totals</b>	<b>292</b>	<b>371</b>	<b>0</b>	<b>663</b>	<b>100%</b>	<b>451</b>	<b>212</b>	<b>0</b>	<b>663</b>

## 5 Coded-wire Tag Sampling

Commercial and recreational catch is sampled to recover coded-wire tagged Chinook and coho. General objectives are to sample 20% of commercial catch in each area and week, and 10% of marine recreational catch in each area and month. Rates from 2011 are summarized below were based on catches as reported by local biologists, and samples sizes queried from the RMIS database. Sampling rates in commercial fisheries generally exceeded the objective (Table 50), with over 30,000 Chinook sampled for CWT, compared to total catch of around 108,000. All marine area recreational fisheries were sampled at rates between 10% and 33% for the year (Table 51). A total of 7,687 were sampled from an estimated 32,147 caught.

Table 50. Chinook coded-wire tag sampling rates for commercial fisheries in 2010 (calendar year).

	4B/5	Elwha R	7/7A	7B/C/D Nooksack R		
Catch	286	10	5672	24,392		
# Sampled	158	0	1156	8037		
Rate	55%	0%	20%	33%		
	8/Skagit R	8A	8D	Stillaguamish R		
Catch	4608	110	4165	44		
# Sampled	1930	34	1461	2		
Rate	42%	31%	35%	5%		
	10	10A	10E	10F	Duwamish R	Puyallup R
Catch	34	695	3163	632	4279	1600
# Sampled	5	474	582	424	1975	1057
Rate	15%	68%	18%	67%	46%	66%
	13A	13C	13D-F	Nisqually R		
Catch	2076	2116	6595	11541		
# Sampled	191	545	1,336	3,589		
Rate	9%	26%	20%	31%		
	9A	12C	12H	Skokomish R		
Catch	125	7405	16495	11749		
# Sampled	11	2086	3131	1818		
Rate	9%	28%	19%	15%		

Table 51. Chinook coded-wire tag sampling rates for marine recreational fisheries in 2011 (calendar year).			
Catch Area	Catch	# Sampled	Sample Rate
Marine Sport Area 5	6,669	1,981	29.7%
Marine Sport Area 6	4,392	1,418	32.3%
Marine Sport Area 7	6,348	1,362	21.5%
Marine Sport Area 8.1	201	31	15.4%
Marine Sport Area 8.2	425	118	27.8%
Marine Sport Area 9	4,835	805	16.6%
Marine Sport Area 10	3,683	929	25.2%
Marine Sport Area 11	3,254	764	23.5%
Marine Sport Area 13	1,165	150	12.9%
Marine Sport Area 12	1,175	129	11.0%

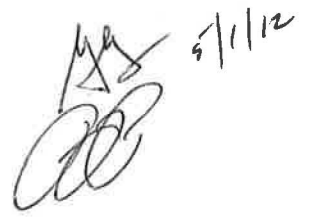


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## **Appendices**

### **Appendix 1. 2012-2013 Co-Managers' List of Agreed Fisheries (May 1, 2012 – April 30, 2013)**

 5/1/12

# **2012-13 Co-Managers'**

# **List of Agreed Fisheries**

**(May 1, 2012 – April 30, 2013)**

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(Bracketed and bolded language signifies areas where some unresolved issues remain. Additional Co-manager discussions will occur prior to the fisheries to resolve these remaining issues.)

**Part I. Treaty/Non-Treaty OCEAN Fisheries (FRAM #1512 (Chinook) & #1229 (Coho))**

Treaty Troll Quota	55,000 Chinook; 47,500 Coho
Non-treaty TAC	99,000 Chinook (non-mark selective equivalent of 95,000); 83,000 Coho.
NT Troll TAC	47,500 Chinook; Mark Selective Fishery impacts associated with a landed catch of 13,280 Coho
Recreational TAC	51,500 Chinook (includes non-selective quota of 43,500 and mark selective fishery impacts associated with a landed catch of 8,000 Chinook) and Mark Selective Fishery impacts associated with a landed catch of 69,720 Coho.

**1.1 Treaty Troll: Areas 2, 3, 4 & 4B**

5/1-6/30	Chinook directed fishery with sub quota of 27,500 Chinook. May 1 through June 30 or attainment of 27,500 Chinook sub quota, whichever comes first. All salmon except Coho. If the Chinook quota for the May-June fishery is not fully utilized, the excess fish may be transferred into the later all-salmon season on an impact-neutral basis with no more than 3,850 Chinook or 77% of any remaining Chinook from the May-June fishery. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season.
7/1-9/15	All salmon species with sub quota of 27,500 Chinook <u>or</u> quota of 47,500 Coho. Chum release 8/1-9/30. July 1 through September 15, or attainment of 27,500 Chinook or 47,500 Coho, whichever comes first.

**1.2 Non-Treaty Troll: U.S./Canada border to Cape Falcon**

5/1- thru earliest of 6/30 or pre-season Chinook sub-quota of 31,700	All salmon except Coho with 31,700 Chinook quota; Open May 1-June 30, 7 days per week. An in-season conference call will occur when it is projected that 24,975 Chinook have been landed to consider modifying the open period and adding landing and possession limits. Mandatory Yelloweye Rockfish Conservation Area, Columbia and Cape Flattery Control Zones closed. Trip limits, gear restrictions, and guidelines may be implemented or adjusted in-season. Vessels must land their fish within 24 hours of any closure of this fishery; under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing, or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing, or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi.
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7/1 thru earliest of 9/18 or pre-season Chinook sub-quota of 15,800 or Mark Selective Fishery quota of 13,280 Coho.	Open July 1-4, then Friday through Tuesday with a landing and possession limit of 40 Chinook and 35 marked Coho per vessel per open period. All salmon, except no Chum retention north of Cape Alava, Washington in August and September (all retained Coho must have a healed adipose fin clip). Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones closed. Grays Harbor Control Zone closed in August and September. Trip limits, gear restrictions, and guidelines may be implemented or adjusted in-season. Vessels must land their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing, or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing, or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi.
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### 1.3 Non-Treaty Recreational

#### Area 1: Leadbetter Point to Cape Falcon (Oregon)

6/9-6/22 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/23-9/30 (34,860 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day, only one of which may be a Chinook; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and Coho minimum size 16"; Chinook guideline: 11,100; closed in Columbia Control Zone. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.

#### Buoy 10

8/1-9/3	Open 7 days/week; 2 fish per day, only one of which may be a Chinook; Chinook minimum size 24 inches and Coho minimum size 16 inches; retained Coho must have a healed adipose fin clip. Release all salmon other than Chinook and hatchery Coho. Barbed hooks allowed.
9/4-9/30	Open 7 days/week; 2 fish per day. Release all salmon other than hatchery Coho. Coho minimum size 16 inches retained Coho must have a healed adipose fin clip. Barbed hooks allowed.
10/1-12/31	Open 7 days/week; 6 fish per day, 2 adults (minimum size 12 inches); retained Coho must have a healed adipose fin clip. Release all salmon other than Chinook and hatchery Coho.

	Barbed hooks allowed.
1/1/2013-3/31/2013	Open 7 days/week; 6 hatchery Chinook per day, 2 adults (minimum size 12 inches); retained Chinook must have a healed adipose fin clip; release sockeye, Chum, Coho and unmarked Chinook.
North Jetty	Open 7 days per week when Area 1 or Buoy 10 area is open. When Buoy 10 area and Area 1 are open concurrently, the daily limit and minimum size restrictions follow the most liberal regulations of those areas. Barbed hooks allowed.

**Area 2: Queets River to Leadbetter Point**

6/9-6/23 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/24-9/23 (25,800 Mark Selective Fishery Coho sub quota)	Open Sun-Thur; 2 fish per day, only one of which may be a Chinook; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and Coho minimum size 16 inches; Chinook guideline: 25,600. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.

**Area 2-1 (east of a line from Leadbetter Point to Cape Shoalwater): Willapa Bay**

6/18-7/31	Open concurrent with Area 2, when Area 2 is open for salmon. Area 2 rules apply.
8/1-1/31	6 fish limit, 3 adults, 12" min size limit. Release wild Chinook and Chum.

**Area 2-2 (east of line between tips of exposed jetties): Grays Harbor**

West of Buoy 13 line 6/9-9/23	Open concurrent with Area 2, when Area 2 is open for salmon. Area 2 rules apply.
East of Buoy 13 line, when open	All salmon required to be released may not be totally removed from the water, except anglers fishing from boats 30' or longer as listed on either their State or Coast Guard regulation are exempt. Single-point barbless hooks required.
East of Buoy 13 line 7/1-9/15	Closed for salmon through 9/15.
East of Buoy 13 line 9/16-10/7	3 fish limit, 3 adults, only 1 may be a Chinook and only 2 may be wild Coho. 12" min size limit. Release Chum.
East of Buoy 13 line 10/8-11/30	3 fish limit, 3 adults, only 2 may be wild Coho 12" min size limit. Release Chinook and Chum.

**Westport Boat Basin and Ocean Shores Boat Basin**

8/16-1/31	6 fish limit, 4 adults; 12" min size limit. Release wild Chinook.
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**Areas 3-4: U.S./Canada border to Queets River**

6/16-6/30 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. Closed waters: east of a true north-south line running through Sail Rock. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
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**Area 3: Cape Alava to Queets River**

7/1-9/23 (1,760 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches, Coho minimum size 16 inches; Chinook guideline: 2,050. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
La Push Late Season Area 9/29-10/14	(50 Coho sub quota; 50 Chinook sub quota, included above) Fishery restricted to the area north of 47°50'00" N latitude and south of 48°00'00" N latitude. Open 7 days/wk. Other regulations as described above.

**Area 4: U.S./Canada border to Cape Alava and east to Sekiu River**

7/1-9/23 (7,250 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day; retained Coho must have a healed adipose fin clip. Chum non-retention during August and September. Chinook minimum size limit 24 inches and Coho minimum size 16 inches; Chinook guideline: 4,700; Chinook non-retention east of Bonilla-Tatoosh line beginning August 1. Closed waters: east of a true north-south line running through Sail Rock in July; <b>Closed to salmon angling</b> July 1-Sept. 30 inside the area bounded by a line from Kydaka Point to Shipwreck Point. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
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**Area 4A: Makah Bay Treaty Evaluation Marine Set Net Fishery**

Chinook	Trty	Open 8/15 through 9/15 inside an area bounded by a line running from Strawberry Rock Point (48° 19' 07"N, 124° 40' 00"W) to the group of rocks (48° 19' 46"N, 124° 40' 35"W) which are located off Hobuck Beach and a line to the mouth of Hobuck Creek (48° 19' 54"N, 124° 39' 37"W), to be implemented per agreement by the Makah Tribe and WDFW.
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**Part II. PUGET SOUND including STRAIT of JUAN de FUCA and SAN JUAN ISLANDS fisheries (All fisheries modeled in FRAM #1512 (Chinook) & #1229 (Coho))**

**2.1 Strait of Juan de Fuca Pre-terminal Areas**

**Areas 5, 6, 6C Treaty Troll (Ntrty net closed)**

NOTE: Area 4B: 5/1-10/31 see Ocean Troll. For 11/1-12/31 & 1/1-4/15 see below.

5/1-6/16	Closed
6/17 - 9/30	Open for salmon, Chum release; Freshwater Bay, south of Angeles Pt./Observatory Pt. line closed; Pt. Angeles Hbr. W. of line from tip of Ediz Hook to ITT Rayonier Dock closed; Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point; 1,000 foot closure around stream mouths; Area 6 closed east of line true north from Green Point.
10/1-10/31	Closed
11/1-4/15	In Areas 4B, 5, 6, 6C the treaty troll fishery will be open from November 1, 2012 through April 15, 2013, or when catch reaches the harvest guideline of 8,500 Chinook, whichever comes first. 1,000-foot closures around stream mouths. Hoko Bay closed inside the area bounded by a line from Kydaka Point to Shipwreck Point, for the month of November.
4/16-4/30	Closed

**Areas 4B, 5, & 6C Treaty Net (Ntrty net closed)**

Chinook	Open for setnet gear only, 6/17 through 8/11; 7 days a week; Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point and Freshwater Bay, south of Angeles Pt./Observatory Pt. line closed. 1,000-ft. closure around stream mouths.
Sockeye	Start to be determined by Fraser River Panel. The Co-managers have identified the following management actions to control by-catch of Chinook. Estimated by-catches are best estimates and are not quotas or ceilings. The priority for this fishery is to harvest the full Treaty share of sockeye salmon, while managing the fishery so as to not greatly exceed the projected incidental harvest of Chinook salmon. All Chinook by-catch in this fishery will be promptly reported by each Tribe to the NWIFC TOCAS database and reported to the U.S. section of the Fraser Panel at least weekly, including take home and ceremonial and subsistence (C&S). If in-season the Chinook by-catch in this fishery exceeds 1,300, the Tribes will consider management actions to limit the Chinook by-catch, such as time or area restrictions, while continuing the priority objective of harvesting sockeye salmon. If in-season the fishery is projected to result in a total Chinook by-catch exceeding 3,300 Chinook, the Tribes

	will, effective with that scheduled fishery opening, prohibit any commercial sales of Chinook salmon, and any Chinook salmon landed must be delivered to the fishers' respective Tribe.
Coho	Open for gillnets starting at 6 days per week with in-season adjustments based on cumulative catch. Fishery will target Coho from the end of Fraser Panel control, through 10/6; 1,000 ft. closure around stream mouths. The gillnet catch number modeled will be used as management guideline and should not be greatly exceeded. Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point.
Chum	Open for gillnets, starting at 6 days per week (day may be added if effort is low), 10/7 through 11/10; 1,000-foot closure around stream mouths. Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point.

#### Area 5 Recreational

5/1-6/30	Closed
7/1-8/15	2 fish limit, (Chinook 22" min size); release unmarked Chinook, unmarked Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
8/16-9/14	2 fish limit; release Chinook, unmarked Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
9/15-9/30	2 fish limit; release Chinook and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
10/1-10/31	2 fish limit, 1 Chinook (Chinook 22" min size). South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
11/1-11/30	Closed
12/1-2/15	Closed
2/16-4/10	1 fish limit (Chinook 22" min size).
4/11-4/30	Closed

#### Area 6 Recreational

5/1-6/30	Closed
7/1-8/15	2 fish limit, (Chinook 22" min size); release unmarked Coho, Chum and Chinook, except W. of true N/S line through "2" buoy near tip of Ediz Hook retention of marked Chinook allowed. South of Angeles Pt./Observatory Pt. line – closed to angling. Pt. Angeles Hbr. W. of line from tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Dungeness Bay closed to salmon angling.
8/16-9/30	2 fish limit; release Chinook, unmarked Coho, and Chum. South of Angeles Pt./Observatory Point line - closed to angling. Pt. Angeles Hbr. W. of a line from the tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Dungeness Bay

	closed to salmon angling.
10/1-10/31	2 fish limit, 1 Chinook (Chinook 22" min size). South of Angeles Pt./Observatory Point line – closed to angling. Pt. Angeles Hbr. W. of a line from the tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Sequim Bay south of a line from the south end of Gibson Spit to the west end of Travis Spit - closed to salmon angling. Discovery Bay south of a line from the Gardiner Boat Ramp to Beckett Point - closed to salmon angling. (see: Dungeness Bay Recreational below.)
11/1 - 11/30	Closed
12/1 - 4/10	2 fish limit (Chinook 22" min size). Release unmarked Chinook. Dungeness Bay closed to salmon angling.
4/11 - 4/30	Closed

## 2.2 Strait of Juan de Fuca Terminal Areas

### Area 6D Dungeness Bay Net

Chinook	All	Closed
Coho	Trty	Open 9/21 through 10/28 with additional openings possible based on in-season catch composition data; 9/21 through 10/10, seven days per week, fishing 7 am to 7 pm only, nets must be attended by fisher, Chinook and Chum release; 10/11 through 10/28, seven days per week, 24 hours per day; 1,500 ft closure around mouth of Dungeness River.
	Ntrty	Open Wk 38 (wb 9/16) through Wk 42 (wb10/14) for skiff gillnet gear; 7AM – 7PM, 2 days first week starting 9/21 per SCSCI, 4 days T-F wk 39 (wb 9/23); 5 days M-F wks 40-42; Chinook and Chum NR, release by cutting ensnaring meshes; 1,500 ft. (1/4 nautical mile) closure around each river mouth. Additional openings possible in wk 43 (wb 10/21) based on in-season information.
Chum	All	Closed

### Dungeness River Treaty (Ntrty net closed)

Chinook	Trty	Closed
Coho	Trty	Commercial fishing up to 3 days/wk, to be determined in-season, for Coho only, may occur no earlier than 10/16 and will be restricted to areas below the Dungeness hatchery intake using species selective (non-gillnet) gear. Subsistence fishing using selective gear may open after 10/15.
Chum	Trty	Closed

**Elwha River Treaty (Ntrty net closed)**

Chinook	Trty	Closed except Ceremonial Harvest of 5 fish in July.
Coho	Trty	Closed
Chum	Trty	Closed

**Dungeness Bay Recreational**

5/1-9/30	Closed to salmon angling.	
10/1-10/31	2 fish limit, Coho only.	
11/1-4/30	Closed to salmon angling.	

**Dungeness River Recreational**

(mouth to hatchery intake pipe at RM 11.3)	10/16 - 12/31	4 fish limit, Coho only; 12" min size.
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**Elwha River Recreational**

Closed to all fishing.

**Hoko River Recreational**

(mouth to cement bridge (mile 7.0) on Hoko/Ozette Hwy.)	All year - Closed to salmon.
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All other STRAIT OF JUAN DE FUCA REGION freshwater recreational closed to salmon angling.

**2.3 San Juan Islands/Point Roberts Area****Areas 6, 7, & 7A Net**

Chinook	All	Closed
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Sockeye	Trty	Schedule to be determined. The Co-managers have identified the following management actions to track and control by-catch of Chinook. Estimated by-catches are best estimates and are not quotas. The priority for this fishery is to harvest the full treaty share of sockeye salmon, while managing the fishery so as to not greatly exceed the projected incidental harvest of Chinook salmon. All Chinook by-catch in this fishery will be promptly reported by each Tribe to the NWIFC TOCAS database and reported to the U.S. Section of the Fraser Panel at least weekly, including take home and ceremonial and subsistence (C&S). Prior to achieving a by-catch of 4,200 Chinook there will be no restrictions on the retention or sale of Chinook salmon. If, during the season, the Fraser Panel schedules a fishery that is projected to result in a total Chinook by-catch exceeding 4,200 fish, the Tribes will, effective with that scheduled fishery, prohibit any commercial sales of Chinook salmon, and any Chinook salmon landed must be delivered to the fisher's respective Tribe. July and August – C&S fishery. Further policy discussion may occur among the affected parties prior to the season.
	Ntrty	Schedule to be determined. The Co-managers have identified the following management actions to track and control by-catch. Modeled by-catches are best estimates and are not quotas. All vessel operators must complete best fishing practices certification prior to fishing. Purse seine brailing and use of recovery box required with Chinook, Coho, and Chum NR. Reef net unmarked Coho, Chum, and unmarked Chinook NR. Reef net fishers may retain marked Chinook, with a cap of 300 for all gears through 9/30. Estimates of by-catch will be shared at least weekly in the U.S. Section of the Fraser River Panel. Purse seine and gillnet fisheries will be managed to ensure that the non-treaty impact does not exceed 1,350 total Chinook (120% of pre-season estimate).
Coho	Trty	Closed
	Ntrty	Reef net: 7 days/wk beginning at end of Fraser Mgmt through Chum mgmt wk 45 (wb 11/4); Chinook NR after 9/30; unmarked-Coho release through 9/30, then Coho non-selective. Chum retention prohibited until after 9/30. All vessel operators must complete best fishing practices certification prior to fishing.
Chum	Trty	Starting 10/10 through 11/14; fishing pattern: Oct 10, 12, 13, 16. Dependent upon update of run status from CDFO. A conference call will be held on Oct 16 at 1:00 pm to determine fishing schedule for Oct. 18 and beyond.

	Ntrty	PS and GN open wk 41 (wb 10/7) through wk 45 (wb 11/4), first wk schedule; open 10/11, 10/14, 10/15 and 10/17. Dependent upon update of run status from CDFO. Co-managers agree to discuss future openings on Tuesday 10/16. PS: brailing required, Chinook and Coho NR; GN: Chinook and Coho NR, live box required and limited soak time restrictions in wk 41 (10/7-10/13). Reef nets open from end of Fraser Panel management through wk 45 (wb 11/4), 7 days per week. Release requirements for reef nets stated for Coho management period apply. All vessel operators must complete best fishing practices certification prior to fishing.
Subsistence	Trty	12/1 – 4/30 subsistence troll fishery (Chinook 22” min size) by permit only. Bellingham Bay closed 4/1 – 4/30.

**Area 7 Recreational**

5/1-6/30	Closed
7/1-7/31	2 fish limit, 1 Chinook (Chinook 22” min size); Waters of Area 7 in Rosario Strait and the eastern portion of the Strait of Juan de Fuca southerly of a line running true south from the westernmost point on Fidalgo Head to Burrows Island, then westerly and southerly along the shore of Burrows Island to the Burrows Island Lighthouse, then westerly to Bird Rocks, then westerly from Bird Rocks to the southernmost point on Decatur Island, then southerly across Lopez Pass to Lopez Island and following the shore of Lopez Island southerly and westerly to Iceberg Point, then from Iceberg Point to Cattle Point, then south southwest to the Salmon Bank Buoy, and then true south from the Salmon Bank Buoy to the Area 7 boundary, closed to salmon angling. Bellingham and Samish Bay closed to salmon angling.
8/1-9/30	2 fish limit, 1 Chinook (Chinook 22” min size); release unmarked Coho and Chum; Waters of Area 7 in Rosario Strait and the eastern portion of the Strait of Juan de Fuca southerly of a line running true south from the westernmost point on Fidalgo Head to Burrows Island, then westerly and southerly along the shore of Burrows Island to the Burrows Island Lighthouse, then westerly to Bird Rocks, then westerly from Bird Rocks to the southernmost point on Decatur Island, then southerly across Lopez Pass to Lopez Island and following the shore of Lopez Island southerly and westerly to Iceberg Point, then from Iceberg Point to Cattle Point, then south southwest to the Salmon Bank Buoy, and then true south from the Salmon Bank Buoy to the Area 7 boundary, closed to salmon angling. Bellingham Bay closed to salmon angling 8/1-8/15; Samish Bay closed to salmon angling. Lummi Bay closure area: east of a line from Gooseberry Point to Sandy Point 9/4 – 9/30.
10/1-10/31	2 fish limit, 1 Chinook; Samish Bay closed to salmon angling 10/1-10/15.
11/1-11/30	Closed

12/1-4/30 | 2 fish limit, (Chinook 22" min size), release unmarked Chinook  
 Bellingham Bay closed to salmon angling 4/1 – 4/30.

## 2.4 Nooksack/Samish Terminal Region

### Bellingham Bay (Areas 7B, 7C, 7D; 7A On-Reservation) Net

Chinook	Trty	Areas 7B, & 7D: August 1 through September 7, open weekly 4 PM Sunday to 4 PM Friday; except opens 12:01 AM August 1. Fishing pattern 3,5,5,5,5,5. Area 7C: August 1 through September 14, open weekly 4 PM Sunday to 4 PM Friday; fishing pattern 5,5,5,5,5,5. Samish Bay is closed southeasterly of a line from Oyster Creek to the fisheries marker on Samish Island, except that hand pull gill nets may fish from 4 PM Sunday – 4 PM Wednesday south to a line from Oyster Creek to Fish Point on Samish Island; fishing pattern: 3,3,3,3,3,3,3. 6 ½" mesh in 7C and off-reservation areas of 7B except when open for sockeye in 7 and 7A.
	Ntrty	Areas 7B & 7C: Wks 33 (wb 8/12) - 36 (wb 9/2); PS Coho NR. GN fishing pattern: 3, 4, 4, 5; PS fishing pattern: 1,1,1,1. See Hales Pass closure below beginning 9/1.
Coho		Area 7A on reservation fishery: September 16 through October 10. Open weekly 4 PM Sunday – 4 PM Wednesday. Fishing pattern 3,3,3,3.
		Areas 7B and 7D: September 9 through October 20, open Sunday 4 PM – Saturday 4 PM. Fishing Pattern:6,6,6,6,6,6.
	Trty	7C: On October 6 conduct a Chinook clearance test. If Chinook have cleared, and there is a harvestable surplus of Coho, then open a Coho fishery Sunday 4PM – Wednesday 4PM (October 7 – October 24); fishing pattern 3,3,3.

	Ntrty	Area 7B: Wks 37 (wb 9/9) - 43 (wb 10/21); GN fishing pattern: 5,5,7,7,7,7,7 (24 hrs for all days); PS fishing pattern: 3,3,7,7,7,7,7. Hales Pass closed for all NT GN openings from Sept. 1 - 21, in the waters of Area 7B west of a line from Point Francis (48°41'42"N, 122°36'40"W), to the red and green buoy southeast of Point Francis (48°40'22"N, 122°35'30"W), then to the northernmost tip of Eliza Island (48°39'37"N, 122°35'45"W), then along the eastern shore of the island to a point intersecting a line drawn through Eliza Rock Light (48°38'35"N, 122°34'40"W) and Fish Point (48°34'35"N, 122°29'45"W) and then southeastward along that line to Fish Point. NT purse seine fisheries fishing in this area must release Coho Sept. 1-21.
Chum	Trty	Areas 7B & 7D: Oct. 21 – Dec.12; open weekly 4 PM Sunday – 4 PM Wednesday; 3,3,3,3,3,3,3.
	Ntrty	Area 7B: Wks 44 (wb 10/28)- 48 (wb11/25); PS/GN; 5,5,5,5,5. Whatcom Creek Zone (east of line from Post Point to flashing red light at west entrance of Squalicum Harbor) open 7 days per week.

**Nooksack River Treaty Net (Ntrty net closed)**

**[Note: Nooksack River Tribal commercial fishery openings will be 00:01 a.m. (Lummi openings at 4:00 p.m. and will close at 4:00 p.m, (concurrent with Lummi), on a weekly basis, with the exception of the off-reservation Coho fishery, which will open and close at the hours listed below.]**

Chinook	April 1 – June 15	April to mid-June limited ceremonial and subsistence fishery will be managed for <b>[a total catch of 159 Chinook, with]</b> an estimated impact of 17 NOR Chinook. The fishery will occur in the north fork between the railroad trestle just down river from the Highway 9 bridge and the Mosquito Lake Road Bridge (RM 36.6 to 40.8), the Nooksack River between Nugents Corner and the railroad trestle just down river from the Highway 9 Bridge (RM 30.8 and 36.6) and the Nooksack River between Slater Road Bridge and the river mouth (between RM 0.0 and 3.5). A Southern U.S. management objective is in effect for Early Nooksack Chinook during this third year of the 4 year Puget Sound Chinook Harvest Management Plan.
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	8/1-9/15	Open weekly 4 PM Sunday to 4 PM Saturday, except open 12:01 AM Wednesday August 1 to 4 PM Saturday August 4. Fishing pattern: 4,6,6,6,6,6. The river is divided into five zones during this period. These zones open in subsequent weeks, proceeding upriver, to protect migrating spring Chinook. Zone 1 is from Marine Drive Bridge to Slater Bridge. Zone 2 is from Slater Br. To Hannegan Br. In Lynden. Zone 3 is from Hannegan Br. to Nugents Corner Br. Zone 4 is from Nugents Corner Br. to the confluence of the north and south forks. Zone 5 is upriver of the confluence of the north and south forks.
Coho	9/16 – 10/20	Open weekly 4 PM Sunday through 4 PM Saturday. Fishing Pattern:6,6,6,6,6. The area extending from the confluence of the North and South Forks downstream to a marker behind the Nooksack Tribal Works Building will not be open during the early portion of the Coho management period, remaining closed prior to Sept. 11.
Chum	11/1-2	Subsistence harvest
	10/21-12/12	Commercial. Open weekly 4 PM Sunday through 4 PM Wednesday. Fishing Pattern: 3,3,3,3,3,3,3,3.

**Bellingham Bay Terminal Area Recreational**

5/1-8/15	Closed to salmon angling.
8/16-10/31	4 fish limit, 2 Chinook (Chinook 22" min size); Samish Bay closed to salmon angling thru 10/15.
11/1-3/31	Same as Area 7.
4/1-4/30	Closed to salmon angling.

**Nooksack River Recreational; mainstem and North Fork**

(from Lummi Indian Reservation boundary to yellow marker at the FFA high school barn in Deming)	9/1 – 12/31	2 fish limit, plus 2 additional Coho; 12" min size. Release unmarked Chinook thru 9/30.
(from yellow marker at the FFA high school barn in Deming to confluence of North and South forks)	10/1 – 12/31	2 fish limit, plus 2 additional Coho; 12" min size.

(from confluence of North and South forks to Maple Creek on North Fork)	10/1 – 11/30	2 fish limit, plus 2 additional Coho; 12” min size.
<b>Nooksack River Recreational, South Fork</b>		
(from mouth to Skookum Creek)	10/1 – 12/31	2 fish limit, plus 2 additional Coho; 12” min size. Release Chum.
<b>Samish River Recreational</b>		
(from mouth to I-5 Bridge)	8/1-11/30	2 fish limit, 12” min size. Release unmarked Coho.
<b>Dakota Creek Recreational</b>		
(mouth to Giles Road Bridge)	10/1 – 12/31	2 fish limit, 12” min size. Release unmarked Chinook.
<b>Whatcom Creek Recreational</b>		
(mouth to yellow markers below foot bridge below Dupont St. in Bellingham)	8/1 – 12/31	6 fish limit, 2 adults; 12” min size.

All other NOOKSACK/SAMISH TERMINAL REGION freshwater recreational: Closed to salmon angling.

## 2.5 Skagit Terminal Region

### Skagit Bay (Area 8) Net

Note: Fishing schedules for Skagit Bay and Skagit River are pre-season projections. Schedules may be changed in-season as necessary to meet management objectives.

Spring Chinook	Area 8 – Trty	<u>Swinomish Tribe fishing pattern:</u> wk 19 (wb 5/6) thru wk 21 (wb 5/20);1,1,1; <u>Upper Skagit Tribe fishing pattern:</u> wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
Sockeye	Area 8 – Trty	<u>Swinomish Tribe fishing pattern:</u> Wk 25 (wb 6/17) thru wk 28 (wb 7/8);7,7,7,7; <u>Upper Skagit Tribe fishing pattern:</u> Wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
	Ntrty	Closed
Coho	Trty	Terminal Treaty HR target 12.5% as a response to “Low” abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.

	Area 8 – Trty	<u>Swinomish Tribe fishing pattern:</u> Wks 38 (wb 9/16) thru wk 41 (wb 10/7);1,2,2.5,1; <u>Upper Skagit Tribe fishing pattern:</u> wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.
	Ntrty	Closed
Chum Test	Area 8	1 boat at Jetty 1 day/wk 44 (wb 10/28) & 45 (wb 11/4) and 1 boat in Bay 1 day/wk 44 (wb 10/28) & 45 (wb 11/4).
Chum	Area 8 – Trty	<u>Swinomish Tribe fishing pattern:</u> No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/11) 1. Fishery dependent on ISU and harvestable fish. <u>Upper Skagit Tribe fishing pattern:</u> No preseason harvestable.
	Ntrty	Closed. May open pending co-manager agreement on ISU that indicates harvestable runsize.

**Skagit River Treaty Net (Ntrty net closed)**

Chinook		Ceremonial and Subsistence – 232 (12 spring and 220 summer/fall) fish total Swinomish, Sauk-Suiattle, and Upper Skagit Tribes.
Spring Chinook	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing pattern:</u> wk 19 (wb 5/6) thru wk 21 (wb 5/20);1,1,1; <u>Upper Skagit Tribe fishing pattern:</u> wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
	Area 78D	<u>Upper Skagit Tribe fishing pattern:</u> wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
Sockeye	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing pattern:</u> wk 25 (wb 6/17) thru wk 28 (wb 7/8);2,5,5,5; <u>Upper Skagit Tribe fishing pattern:</u> wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
	Area 78D	<u>Swinomish Tribe fishing pattern:</u> Wk 29 (wb 7/15):1. Fishery will be managed so as not to exceed the Swinomish sockeye share based on preseason forecast until such time as an in-season update becomes available; <u>Upper Skagit Tribe fishing pattern:</u> wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
Coho		Terminal Treaty HR target 12.5% as a response to “Low” abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.
	Area 78C:	<u>Swinomish and Sauk-Suiattle Tribes fishing pattern:</u> wks 38 (wb 9/16) thru wk 41 (wb 10/7);1,2,2.5,1; <u>Upper Skagit Tribe fishing pattern:</u> wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.

	Area 78D	<u>Upper Skagit Tribe fishing pattern:</u> wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.
Chum	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing pattern:</u> No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/11);1. Fishery dependent on ISU and harvestable fish. <u>Upper Skagit Tribe fishing pattern:</u> No preseason harvestable.
	Area 78D	<u>Upper Skagit Tribe fishing pattern:</u> No preseason harvestable.
River Test	Chinook	Area 78C - Blakes wk 19 (wb 5/6) thru wk 35 (wb 8/26);1 boat, 6 hours/wk.
	Sockeye	Area 78C – Blakes wk 24 (wb 6/10) thru wk 29 (wb 7/15); 1 boat, 12 hours/wk; Area 78D-3 wk 23 (wb 6/3) thru wk 30 (wb 7/22);1 boat, 4 hrs/wk.
	Coho	Area 78C - Blakes Drift wk 34 (wb 8/19) thru wk 45 (wb 11/4), 12 hours/wk; Area 78C – Spudhouse Drift wk 34(wb 8/19) thru wk 44 (wb 10/28);1 boat, 12 hours/wk; Area 78D-3 wk 35 (wb 8/26) thru wk 44 (wb 10/28);1 boat, 4 hours/wk.
	Chum	Area 78C - Blakes Drift wk 44 (wb 10/28) and wk 45 (wb 11/4);1 boat, 12 hours/wk.

**Swinomish Channel Treaty Net (Ntrty net closed)**

Coho	No separate openings. Area opens during Area 8 openings.
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**Area 8-1 Recreational**

5/1-7/31	Closed
8/1-9/30	2 fish limit, release Chinook.
10/1- 10/31	2 fish limit, release Chinook.
11/1 – 4/30	2 fish limit (Chinook 22” min size). Release unmarked Chinook.

**Baker River/Lake Recreational**

(mouth to Hwy 20 Bridge)	Closed.
From Hwy 20 Bridge upstream to Dam	Closed.
Baker Lake	7/1-9/4   3 fish limit, sockeye only, 18” min. size.

**Cascade River Recreational**

(mouth to Rockport-Cascade Road Bridge)	6/1 – 7/15	4 fish limit, only 2 may be adults, marked Chinook only, 12” min. size. Co-managers will consult on harvest guidelines and fishery may close early.
	9/16 – 11/30	4 fish limit, Coho only, 12” min size.

**Skagit River Recreational**

(mouth to Memorial Hwy. Bridge (Hwy 536 at Mt. Vernon))	9/1 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Memorial Hwy Bridge to Gilligan Creek)	6/16-7/15	3 fish limit, sockeye only (12” min size).
	9/1 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Gilligan Creek to Dalles Bridge at Concrete)	9/16 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Dalles Bridge at Concrete to Cascade River)	6/1-7/15	4 marked Chinook, only 2 may be adults, 12” min size, open only from Highway 530 bridge at Rockport to Cascade River.
	9/16 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
	6/1- 8/31	Closed waters – between a line projected across the thread of the river 200’ above the east bank of the Baker River and a line projected across the thread of the river 200’ below the west bank of the Baker River.

**All other SKAGIT TERMINAL REGION freshwater recreational closed to salmon angling.**

**2.6 Stillaguamish/Snohomish Terminal Region**

**Area 8A Net**

Chinook	Trty	Closed (Ceremonial set-aside of up to 100 Chinook, July-September period).
	Ntrty	Closed

Coho	Trty	(9/9 – 10/20) 5 days per week. Update fishery through 10/6. Manage for Comprehensive Coho Management Plan breakpoints and rates. Stillaguamish Tribe – Open north of a line drawn from Kayak Point due west to Camano Island. Max catch of 500 Coho or 5 Chinook, whichever is reached first.
	Test	Wb 9/9 – wb 10/7: 1 day per week; 2 GN landings per week.
	Ntrty PS	Wks 38 (wb 9/16) – 39 (wb 9/23): PS limited participation (2 boats per day): Chinook and Chum NR; fishing pattern: 1,1. Closed south of a line from the Clinton ferry dock to the Mukilteo ferry dock.
	Ntrty GN	Wks 38 (wb 9/16) – 39 (wb 9/23): Wk 38 limited participation (2 boats only) Wk 39 (wb 9/23) GN fishing pattern: 1-2; GN fish night hours. Closed south of a line from the Clinton ferry dock to the Mukilteo ferry dock.
Chum	Trty	Evaluation Fishery, wb 10/14 -wb 10/28: Port Susan closed; Max 5,200 Chum. Dependant on evaluation fishery, wb 11/4 – wb 11/18, manage for Stillaguamish and Snohomish harvest rates and minimum escapement goals.
	Test	Wb 10/14 –wb 10/28 1 day per week; 2 GN landings per week.
	Ntrty	Closed. May open pending co-manager agreement on ISU indicating increased run size.
<b>Area 8D Net</b>		
Chinook	Trty	BS, RH, GN gear outside Tulalip Bay may be open during the following periods: 4/29 – 6/2      12:01 AM Sun – 11:59 PM Sat 6/3 – 8/25      12:01 PM Mon – 11:59 PM Thu 8/26 – 9/15      12:01 AM Mon – 11:59 PM Fri Setnets inside Tulalip Bay may be open during the following periods: 4/29 – 9/15      12:01 AM Sun – 11:59 PM Sat
	Ntrty	Closed (see recreational SAF)
Coho	Trty	Wb 9/16 –wb 10/28; BS, RH, GN gear outside Tulalip Bay open Sun, Mon, Thu, Fri; open to target Tulalip hatchery Coho.

	Ntrty	Wks 38 (wb 9/16)- 44 (wb 10/28); PS Chinook NR; PS fishing pattern: 1,1,1,1,1,2,1; GN fish each night Sunday through Thursday night(5,5,5,5,5,5); also open daylight hours Tuesdays and Wednesdays (2,2,2,2,2,2). Closed east of the line from Mission Point to Hermosa Point.
Chum	Trty	Wb 11/4 - wb 12/9; open to target Tulalip hatchery Chum. Managed to allow for hatchery egg take needs based on Tulalip hatchery escapement updates and projections. All Area 8D fisheries will close concurrently as agreed to by Tulalip and WDFW to ensure egg take requirements are met.
	Ntrty	Wks 45 (wb 11/4) - 47 (wb 11/18); PS fishing pattern: 2,1,1; GN fishing pattern:3,3,3 daylight hours. Closed east of the line from Mission Point to Hermosa Point. Managed to allow for hatchery egg take needs based on Tulalip hatchery escapement updates and projections. All Area 8D fisheries will close concurrently as agreed to by co-managers to ensure egg take requirements are met.

**Stillaguamish River Treaty Net (Ntrty net closed)**

Chinook	Wb 7/1 – wb 9/2. C&S fishery; maximum catch of 30 Chinook; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Coho	Open wb 9/9 - wb 10/21; Up to 5 days per week; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Chum	C&S fishery; wb 10/28- wb 12/2; Up to 3 days per week; max catch of 300 Chum; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).

**Snohomish River Treaty Net (Ntrty net closed)**

Chinook, Pink, Coho, Chum	Closed
Coho Test	Closed

**Area 8-2 Recreational**

5/1-7/31	Closed
8/1-9/30	2 fish limit, release Chinook.
10/1 – 10/31	2 fish limit, release Chinook.
11/1 – 4/30	2 fish limit (Chinook 22" min size). Release unmarked Chinook.

## Tulalip Special Area Recreational Fishery

Same as Area 8-2 Recreational, except during the period 6/4-9/26:	5/18-9/3	Open 12:01 AM Friday – 11:59 AM Monday each week. Closed June 9. Open within Tulalip Special Area boundaries only. Closed to all angling east of the line from Mission Point to Hermosa Point. 2 fish limit salmon (Chinook 22" min. size).
	9/8-9/23	Open Saturday and Sunday each week. Open within Tulalip Special Area boundaries only. Closed to all angling east of the line from Mission Point to Hermosa Point. 2 fish limit salmon (Chinook 22" min. size).

### Snohomish River Recreational

(mouth to confluence of Skykomish and Snoqualmie rivers, including all channels)	9/1 – 12/31	3 fish limit, 12" min. size. Release Pink and Chinook.
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### Snoqualmie River Recreational

(mouth to Snoqualmie Falls, including all channels)	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.
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### Skykomish River Recreational

(From mouth to Lewis St. Bridge in Monroe)	9/1 – 12/31	3 fish limit. 12" min size. Release Pink and Chinook.
(From mouth to Wallace River)	TBD	2 fish limit, 12" min size, marked Chinook only. Chinook fishery dependent on agreed ISU of Chinook abundance sufficient to meet the hatchery escapement goal.
From Lewis St Bridge in Monroe to Wallace River.	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.
(From Wallace River to the forks)	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.

### Wallace River Recreational

Mouth to 200' upstream of water intake of salmon hatchery	9/16 – 11/30	3 fish limit, 12" min size. Release Pink and Chinook.
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**Stillaguamish River Recreational**

(river and all sloughs downstream of Marine Drive	9/1 – 12/31	2 Coho only limit, 12” min size.
(Marine Drive upstream to forks)	9/1 - 12/31	2 Coho only limit, 12” min size

All other STILLAGUAMISH/SNOHOMISH TERMINAL REGION freshwater recreational closed to salmon angling.

**2.7 Admiralty Inlet Area**

**Area 9 Net**

Chinook	Trty	Ceremonial and Subsistence – Up to 500 Chinook as agreed upon by those Tribes with U&A in Area 9, (PS and Hook & Line, release all Chum 6/1 – 9/30).
Chum	Research	Wks 43 (wb 10/21) – 48 (wb 11/25) research fishery to develop stock composition/timing information (200 samples/site/wk). Research catch quota of 2,400 Chum. Sampling details described in 2012 A9 Chum research plan. Fishery to be implemented by NWIFC in conjunction with Tribes and WDFW staff.
Chum	Trty	No commercial fishery, unless prior agreement by all affected Tribes and WDFW.
	Ntrty	Closed

**Area 9 Recreational**

5/1-6/30	Closed
7/1-7/15	2 fish limit. Release Chinook.
7/16-8/31	2 fish limit (Chinook 22” min size). Release unmarked Chinook and Chum. Closed south and west of a line from Foulweather Bluff to Olele Point, except angling allowed from shore between Hood Canal Bridge and the northern boundary of Salsbury Point Park, daily limit 2 Coho only.
9/1-9/30	2 fish limit, release Chinook and Chum.
10/1-10/31	2 fish limit, release Chinook
11/1-11/30	2 fish limit, release unmarked Chinook (Chinook 22” min size).
12/1-1/15	Closed
1/16-4/15	2 fish limit, Chinook 22” min size, release unmarked Chinook.
4/16 – 4/30	Closed

**Edmonds Pier Recreational**

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Year-Round | 2 fish limit, 1 Chinook (22" min size), release Chum 8/1-9/30.

### 3.0 South Sound Region

#### 3.1 Area 10 Sub region

##### Area 10 Net

Chinook	Closed	
Sockeye	Trty	Fishery dependent upon ISU (Ballard lock counts)
	Ntrty	Closed
Coho	Test	Gillnet: Wks 37 (wb 9/9, not earlier than 9/8) - Wk 39 (wb 9/23); 3 boats, 3 sites; fishing pattern: 2,2,2.
	Trty	Fishery based on ISU beginning Wk 37(wb 9/9). Treaty allocation based on intertribal sharing agreement. Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Closed
Chum	Test	Purse Seine: Wks 41 (wb 10/7) - Wk 46 (wb 11/11); 1 site, fishing pattern: 1,1,1,1,1,1.
	Trty	Treaty allocation based on intertribal sharing agreement; Wks 41 (wb 10/7) – Wk 48 (wb 11/25) fishing pattern – ISU dependent; Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Wks 42 (wb 10/14) - 47 (wb 11/18); PS Chinook and Coho NR; PS fishing pattern: 1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,2. ISU Dependent. Area east of a line from Four Mile Rock south to Alki Point will be closed.

**Area 10A Treaty Net (Ntrty net closed): That portion of Elliott Bay east of the line from Pier 91 to the light at Duwamish Head.**

Chinook	Test	Wks 29 (wb 7/15) – Wk 31 (wb 7/29); 7/18 or 7/25, 8/1 (Wednesday); 5 fishing sites (one boat per site). 8 PM to 8 AM. The structure/correlation of this fishery is under review and may be modified or temporarily discontinued based on co-manager agreement.
	Trty	Closed
Coho	Trty	Gillnet: Wk 37 (wb 9/9)-Wk 44 (wb 10/28); fishing pattern: 5 days per week (Sun – Fri)
Chum	Trty	Gillnet Wk 45 (wb 11/4)-Wk 48 (wb 11/25); fishing pattern: up to 5 days per week (Sun – Fri).

**Duwamish/Green River (Area 80B) Treaty Net (Ntrty net closed)**

Chinook	Trty	Closed
Coho	Trty	Wk 37 (wb 9/9) – Wk 44 (wb 10/28) Closed until Chinook clear or Coho predominate. Clearance fishery on lower river (up to 16 <sup>th</sup> Avenue Bridge) begins 9/13; (6 sites); If Chinook clearance is met or Coho predominate, fishery will open Sept 16; starting Sept. 23, fishery will open up to Boeing St. Bridge. Starting Oct 1 fishery will open up to Hwy 99 Bridge fishing pattern: Sun – Fri (5 days per week).
Chum	Trty	Gillnet Wk 45 (wb 11/4)-Wk 48 (wb 11/25); fishing pattern: 5 days per week (Sun – Fri).

**Area 10E Treaty Net (Ntrty net closed; see below for recreational SAF)**

Chinook	Trty	Wks 29 (wb 7/15)-Wk 37 (wb 9/9); fishing pattern: 7days/wk. Possible extension for Sinclair Inlet
Coho	Trty	On-Reservation only; Wks 37 (wb 9/9)-Wk 42 (wb 10/14); gillnet/setnet/beach seine; 5-7 days/wk.
Chum	Trty	Wks 42 (wb 10/14)-Wk 49 (wb 12/2); schedule dependent upon ISU.

**Lake Washington System (includes Lake, Lake Union, Ship Canal, & Lake Sammamish)**

**Areas 10F, 10G, 10C, 10D Treaty Net (Ntrty net closed)**

Sockeye	Dependent upon ISU (lock counts). Potential fishery beginning Wk 28 (7/8).	
Chinook	Dependent on ISU and co-manager agreement.	
Coho	The Coho fisheries in the four following areas are dependent upon the ISU (if lock counts project run size <10,000 Coho entering the lake, then no Coho fishery):	
	Lower ship canal (below Ballard Locks)	Closed until Chinook clearance as seen in lock counts; anticipated pattern 5-7 days/wk dependent on in-season information, with a potential start date for fisheries beginning Wk 38 (9/16).
	Upper ship canal (above Ballard Locks):	Fishing pattern 5 days/wk (Sun – Fri) with a potential start date for fisheries beginning Wk 38 (9/16).
	North end Lake Washington (North of Hwy. 520 bridge):	Starting Wk 40 (wb 9/30): fishing pattern 5 days/wk (Sun – Fri).

## Lake Sammamish Treaty Net

Chinook and Coho	Fisheries will be based on ISU from the Ballard Lock counts.
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### Area 10 Recreational

5/1-5/31	Closed
6/1-6/30	Catch-and-release in waters N of Meadow Pt./Pt. Monroe line.
7/1-7/15	2 fish limit, release Chinook.
7/16-8/31	2 fish limit (Chinook 22" min size). Release unmarked Chinook and release Chum beginning 8/1.
9/1-9/30	2 fish limit, release Chinook and release Chum through 9/15.
10/1-1/31	2 fish limit, release unmarked Chinook (Chinook 22" min size).
2/1-4/30	Closed

Shilshole Bay (East of Meadow Point/West Point line) closed 7/1-8/31.

Outer Elliott Bay (E of West Pt./Alki Pt line to Pier 91/Duwamish Head line) Closed to salmon angling 7/1-8/31.

Inner Elliott Bay (E of Pier 91/Duwamish Head line) closed to salmon angling 7/1-8/31.

### Area 10 Piers Recreational

Seacrest Pier, Pier 86, Waterman Pier, Bremerton Boardwalk, Illahee State Park Pier	Year-Round	2 fish limit, 1 Chinook (22" min size), release Chum 8/1-9/15.
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### Elliott Bay Recreational SAF

5/1 – 6/30	Same as Area 10
7/1 – 8/31	Closed
9/1-4/30	Same as Area 10.

### Sinclair Inlet Recreational SAF

5/1-6/30	Same regulations as Area 10.
7/1-9/30	Open S of Manette Bridge, S of line drawn true W from Battle Point, and W of line drawn true S from Point White; 2 fish limit (Chinook 22" min size), release unmarked Chinook, release Chum 8/1-9/15.
10/1-4/30	Same regulations as Area 10.

**Green River Recreational**

(1st Ave South Bridge to Old Hwy.99/ Tukwila Intl. Blvd.)	9/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12” min size, release Chinook.
(Old highway 99/Tukwila Intl. Boulevard to I-405)	9/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12” min size, release Chinook.
(I-405 to the S. 277 <sup>th</sup> Bridge in Auburn)	10/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12” min size, release Chinook.
(S. 277 <sup>th</sup> Bridge to Auburn Black Diamond Rd Bridge)	10/16 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12” min size, release Chinook.
(from Auburn-Black Diamond Rd Bridge to mouth of Cristy Creek at Flaming Geyser Park])	9/16-10/31	Closed to all fishing.
(from Auburn-Black Diamond Rd Bridge to Tacoma Headworks Dam)	11/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12” min size, release Chinook Closed waters- within 150’ of the Palmer Ponds outlet rack and within 150’ of the mouth of Keta (Crisp) Creek.

The 2012/2013 WDFW sport pamphlet will reflect the following season end dates for trout and other game fish fall/winter season. These end dates are subject to change based on State-Tribal agreement:

Mouth to S. 277<sup>th</sup> Bridge in Auburn: Jan. 15

S. 277<sup>th</sup> Bridge to Tacoma Headworks Dam: Jan. 31

**Soos Creek Recreational**

Closed

**Lake Washington Recreational**

East of the Montlake Bridge	July-August	Dependent upon ISU (lock counts). Potential fishery, starting date to be determined. 2 fish limit, sockeye only, 12” min. size. Chinook retention dependent on ISU and co-manager agreement.
North of Hwy 520 Bridge	9/16 – 10/31	4 fish limit, Coho only; 12” min size

**Lake Sammamish Recreational**

8/16 – 11/30	4 fish limit, only 2 Chinook, 12” min size, release sockeye. Closed: waters within 100 yards of the mouth of Issaquah Creek are closed to salmon fishing.
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All other SOUTH SOUND AREA 10 REGION freshwater: Closed to salmon angling.

**3.2 Area 11 Sub region**

**Area 11 Net**

Chinook	All	Closed
Coho	Trty:	Commercial fishery open beginning Wks 37 (wb 9/9) - Wk 41 (wb 10/7); ISU dependent; gillnets 7 days/wk, could close any time. Beach seine daylight hours only, 7 days/wk.
	Ntrty:	Closed
Chum	Trty:	Commercial fishery open Wks 42 (wb 10/14)-Wk 49 (wb 12/2); gillnets 7 nights/wk, could close at anytime. Beach seine daylight hours only, 7 days/wk. Some unresolved issues remain. Additional Medicine Creek Treaty Tribal discussions will occur prior to the fisheries to resolve these remaining issues.
	Ntrty	Wks 42 (wb 10/14) - 47 (wb 11/18); PS Chinook and Coho NR; PS fishing pattern:1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,2. ISU dependent.

**Area 11A Net Treaty Net (Ntrty net closed)**

Chinook	Closed
Coho	Commercial fishery open Wks 37 (wb 9/9) - Wk 42 (wb 10/14); 3 nights/wk
Chum	Commercial fishery open Wks 46 (wb 11/11) – Wk 53 (wb 12/30) 3 nights/wk.

**Puyallup River (Area 81B) Treaty Net (Ntrty net closed)**

Chinook	Spring Chinook	Ceremonial and Subsistence 5/1 – 6/30
	Summer - Fall	Commercial fishery 8/26, fishing pattern: 12 hours.
Coho	Commercial fishery Wks 36 (wb 9/2)-Wk 42 (wb 10/14) fishing pattern: 1,2,2,3,3,3,3.	
Chum	Test fishery Wks 43 (wb 10/21)-Wk 46 (wb 11/11) 1 day/wk, drift net only.	

Winter Chum	Commercial fishery Wks 46 (wb 11/11) – Wk 2 (wb 1/6); In-season monitoring to meet hatchery escapement needs. Total fishing days yet to be determined in steelhead management plan.
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**White River Treaty Net**

Sp. Chinook	Ceremonial and subsistence fisheries.
Coho/Chum	Fishing pattern 7 days/wk.

**Area 11 Recreational**

5/1-5/31	Closed	
6/1-6/30	2 fish limit (Chinook 22" min. size), release unmarked Chinook; Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling.	
7/1-9/30	2 fish limit (Chinook 22" min. size), release unmarked Chinook; Single-point barbless hooks only. Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling through 7/31.	
10/1-10/31	2 fish limit, (Chinook 22" min size).	
11/1-12/31	2 fish limit, 1 Chinook (Chinook 22" min size).	
1/1-1/31	Closed	
2/1-4/30	2 fish limit (Chinook 22" min size), release unmarked Chinook.	
Dash Point Dock, Point Defiance Boathouse Dock, Les Davis Pier, Des Moines Pier and Redondo Pier	Year-Round	2 fish limit, 1 Chinook (22" min size).

**Puyallup River Recreational**

(from Freeman Road (82 <sup>nd</sup> Ave E) to Carbon River)	8/1 – 12/31	6 fish limit, 2 adults, 12" min size, release unmarked adult Chinook.
(from 11th St. Bridge to Freeman Road (82 <sup>nd</sup> Ave E))	8/16 – 12/31	Closed August 26 and September 2,3,9,10 and 11. 6 fish limit, 2 adults; 12" min size. Release unmarked adult Chinook.

**Carbon River Recreational**

(mouth to Voight Creek)	9/1 – 11/30	6 fish limit, 4 adults; no more than 2 adult Chinook may be retained; 12" min size, release Chum and
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		unmarked adult Chinook.
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All other SOUTH SOUND AREA 11 REGION freshwater recreational Closed to salmon angling

### 3.3 Area 13 Sub region

#### Fox Island/Ketron Island (Area 13)

Chinook	Treaty:	8/1-9/15, 7 days/wk
	Ntrty:	Closed
Coho	Treaty:	9/15-10/20, 7 days/wk
	Ntrty:	Closed
Chum	Treaty:	Closed unless opened by Medicine Creek Treaty Tribes' agreement
	Ntrty:	Closed

#### Area 13 Treaty Net (Ntrty net closed)

Chinook	Closed
Coho	Closed
Chum	Closed

#### Carr Inlet (Area 13A) Treaty Net <sup>1</sup>(Ntrty net closed) <sup>1</sup> Based on Medicine Creek Treaty Tribal proposal annual regulations. Individual Tribal regulations may deviate from this schedule.

Chinook	8/1 - 9/22, 7 days/wk, opens in sections.
Coho	9/16 -10/27, 7 days/wk, in-season monitoring to meet hatchery escapement need.
Chum	10/28 -12/8, 7 days/wk.

#### Chambers Bay (Area 13C) Treaty Net<sup>1</sup> (Ntrty net closed)

Chinook	Wb 7/29 - wb 10/13; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.
Coho	Wb 10/14 - wb 11/3; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.
Chum	11/4 – 12/1; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.

#### Area 13D Treaty Net (Ntrty net closed)

Chinook	7/15 - 9/9 or earlier date dependent on in-season management needs; 7 days/wk
Coho	9/10 -12/31 or earlier date dependent on in-season management needs.
<b>Dana Pass (13D-1)</b>	7 days/wk

<b>Pickering Pass (13D-2)</b>	7 days/wk
<b>Peale Pass (13D-3)</b>	7 days/wk
<b>Southern Case (13D-4)</b>	7 days/wk
Chum	Open approximately 10/21; 2-3 days per week; managed weekly by updates (~10/11).
<b>Area 13E Net</b>	Closed to all fishing
<b>Budd Inlet (Area 13F) Treaty Net (Ntrty net closed)</b>	
Chinook	7/15-9/9 or earlier date dependent on in-season management needs; 7 days/wk
Coho	Closed
Chum	Open approximately 11/4, 2-3 days per week, managed by weekly in-season updates
<b>Eld Inlet (Area 13G) Treaty Net (Ntrty net closed)</b>	
Chinook	7/15-9/9; opening dependent upon in-season data, outer portion only.
Coho	Closed
Chum	Open approximately 11/4, 2-3 days per week, managed by weekly escapement updates
<b>Totten Inlet (Area 13H) Treaty Net (Ntrty net closed)</b>	
Chinook	8/1-9/9; schedule dependent on in-season data
Coho	Closed
Chum	Open approximately 10/7, 2-3 days per week; managed by weekly escapement updates
<b>Little Skookum Inlet (Area 13I) Treaty Net (Ntrty net closed)</b>	
Chinook	8/1-9/9; schedule dependent upon in-season data
Coho	Closed
Chum	Open approximately 12/1, 2-3 days per week; managed by weekly escapement updates
<b>Hammersley Inlet (Area 13J) Treaty Net (Ntrty net closed)</b>	
Chinook	8/1-9/9 or earlier date dependent on in-season management needs
Coho	Closed
Chum	Open approximately, 9/16 – 12/25, 2-3 days/wk; managed by weekly escapement updates
<b>Northern Case Inlet (Area 13K) Treaty Net (Ntrty net closed)</b>	

Chinook	7/15-9/9
Coho	9/10-10/31 or earlier date dependent on in-season management needs
Chum	Open approximately 9/16-12/25; 2-3 days/wk; managed by weekly escapement updates

**Nisqually River (Area 83D) Treaty Net (Ntrty net closed)**

Chinook	GN 2 days/wk Wk 31 (wb 7/29) through Wk 35 (wb 8/26). Tangle Net (TN) 2 days/wk Wk 37 (wb 9/9) through wk 39 (wb 9/23). Release all unmarked Chinook. Beach Seine (BS) all freshwater immersion beaches from Luhr Beach to East Bank of Red Salmon Slough, McAllister Creek, Red Salmon Slough, and the Nisqually River 3 days/wk Wk 36 (wb 9/2) through wk 39 (wb 9/23). Release all unmarked Chinook. Gear Test by Nisqually Fisheries Staff Wk 31 (wb 7/29) through Wk 39 (wb 9/23). Total encounter not to exceed 50 Chinook. Release all fish encountered. Fishery schedule subject to change in season as per "Modification to 2012 PFMC List of Agreed Fisheries (LOAF)".
Coho	TN 2 days/wk Wk 40 (wb 9/30). Release all unmarked Chinook. BS all freshwater immersion beaches from Luhr Beach to East Bank of Red Salmon Slough, McAllister Creek, Red Salmon Slough, and the Nisqually River 3 days/wk Wk 40 (wb 9/30). GN 3 days/wk Wk 41 (wb 10/7) through wk 47 (wb 11/18).
Chum	Proposed schedule: GN 3-4 days/wk Wk 48 (wb 11/25) - Wk 5 (wb 1/27/2013) per annual Nisqually River Chum/steelhead management plan.

**McAllister Creek (Area 83F) Treaty Net (Ntrty net closed)**

Chinook	Wks 27 (wb 7/1)-Wk 40 (wb 9/30); 3 days/wk
Coho	Wks 41 (wb 10/7)-Wk 48 (wb 11/25); 3-4 days/wk
Chum	Proposed schedule: Wk 49 (wb 12/2) - Wk 5 (wb 1/27/2013); 4 days/wk per annual Nisqually River Chum/steelhead management plan.

**Area 13 Recreational**

5/1-6/30	2 fish limit (Chinook 22" min. size), Release unmarked Chinook, Minter Creek mouth closed.
7/1-9/30	2 fish limit (Chinook 22" min. size), Release unmarked Chinook and unmarked Coho. Minter Creek mouth closed through 9/30; Lower Budd Inlet closure zone 7/16-10/31.
10/1-10/31	2 fish limit, release unmarked Coho (Chinook 22" min size). Lower Budd Inlet closure zone 7/16-10/31.
11/1-12/31	2 fish limit, 1 Chinook (Chinook 22" min size).

1/1-4/30	1 fish limit, (Chinook 22" min size). Minter Creek mouth closure begins 4/16.
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**Fox Island Pier Recreational**

Year-Round	2 fish limit, 1 Chinook (22" min size); 7/1-10/31 release unmarked Coho.
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**Chambers Creek Estuary Recreational**

(downstream of markers 400' below Boise-Cascade Dam to Burlington Northern Railroad Bridge)	7/1 – 11/15	6 fish limit, 2 adults; 12" min size, release unmarked Coho.
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**Deschutes River Recreational**

Capitol Lake (from outlet to 400' below lowest Tumwater Falls (Deschutes River) fish ladder).	7/1 – 10/15	Closed
(from Old Hwy 99 Bridge on Capitol Blvd in Tumwater to Henderson Blvd Bridge)	7/1 – 10/15	6 fish limit, 2 adults, 12" min size, release Coho.
(upstream of Henderson Blvd Bridge)	7/1 – 10/15	6 fish limit, 2 adults, 12" min size, release Coho.

**Kennedy Creek Recreational**

(mouth to northbound Hwy. 101 Bridge)	10/1 – 11/30	6 fish limit, 2 adults, 12" min size, release unmarked Coho.
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**McAllister Creek Recreational**

(mouth to Olympia-Steilacoom Rd Bridge)	7/1 – 11/30	6 fish limit, 2 adults, 12" min size.
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**McLane Creek Recreational**

(from a line 50' north of and	Same as Area 13	Same as Area 13
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parallel to the Mud Bay Rd. Bridge to a line 100' upstream of and parallel to the south bridge on Hwy.101)		
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**Minter Creek Recreational**

(mouth to 50' downstream of hatchery rack)	11/1 – 12/31	4 fish limit, 12" min size, Chum only.
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**Nisqually River Recreational**

(mouth to the military tank crossing bridge, one mile upstream of the mouth of Muck Creek)	7/1 –10/31	6 fish limit, 3 adults, only 2 adults may be any combination of Coho, and Chum; 12" min. size; release unmarked Chinook.
	11/1-1/31	6 fish limit, 2 adults, 12" min. size; release unmarked Chinook.

All other SOUTH SOUND AREA 13 REGION freshwater recreational closed to salmon angling.

## 4.0 Hood Canal Region (All fisheries modeled in FRAM #1512 (Chinook) & #1229 (Coho))

### Hood Canal Mainstem (Areas 12, 12B, 12C, 12D)

Treaty: 1,000 feet closure around streams that are closed to net fishing. Beach seines and hook and line gear release Chum through 9/30 (through 10/10 if within 500' of western shore of Areas 12B and 12C).

Nontreaty: See WAC 220-47-307 for Nontreaty exclusion zones.

Chinook	Trty	<p>Areas 12, 12B and 12D: Closed</p> <p>Area 12C: Beach seines open wb 7/15-8/31; 5 days/wk; release Chum 8/1-8/31. Open wb 7/15 – 8/24 for gillnets 5 days/wk; restricted to 7" min mesh starting 8/1.</p> <p>Area 12H: Open wb 7/15 through 9/20; hook and line gear continuous; beach seines daylight hours Tues and Thur each week; possible in-season modifications; Chum release.</p>
	Ntrty	Closed
Coho	Trty	<p>Area 12: Open 9/25 through 10/13 for gillnets. Beach seines for Coho only (release all Chinook and Chum through 9/30) may start no earlier than 9/16. Both gear types open 7 days/wk.</p>
		<p>Area 12B: Open 10/1 through 10/20 for gillnets; 500 foot closure along western shore through 10/10; beach seines for Coho only (release all Chinook and Chum through 9/30) may start no earlier than 9/16. Both gear types open 7 days/wk.</p>
		<p>Area 12C: Open 10/1 through 10/20 for gillnets; with 500 foot beach closure from Ayock Pt. to approx. 2,000 feet south of Lilliwaup (at the large house, north of Octopus Hole) through 10/10; beach seines for Coho (release all Chum through 9/30) may start no earlier than 9/21. Both gear types may fish 7 days/wk when open.</p>
	Ntrty	Closed

Chum	The Co-Managers have reached agreement on a co-management process to assess and agree on in-season abundance estimation methods, and to define a process for addressing chronic over-harvest of catch shares (“2012 Co-Management Agreement for Hood Canal Chum Salmon Fisheries” (attached)). Products of this process may necessitate modification of Tribal or Non-Indian fishing schedules by agreement.	
	Trty	Area 12: Open 10/14 through 11/20; 7 d/wk
		Area 12B: Open 10/21 through 11/20; 7d/wk; except north of an East-West line from Zelatched Point to Seal Rock open through 11/27.
		Area 12C: Open 10/21 through 11/27; 7d/wk.
		Area 12D: Closed.
		Area 12H: Hook and line gear open from 10/16 through 11/29; beach seines open Tuesday and Thursday of each week. Then Monday and Wednesday for the week beginning 11/11; possible in-season adjustments to 3 days/wk. Starting 11/1, hatchery escapement control measures will go into effect.
	Ntrty	Area 12, 12B. Fisheries scheduled wks 42 (wb 10/14) - 47 (wb 11/18): PS Chinook NR; PS fishing pattern: 1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,1 daylight hours.
		Area 12C Fisheries scheduled wks 45 (wb 11/4) - 47 (wb 11/18): PS Chinook NR; PS fishing pattern: 2,1,1; GN fishing pattern: 2,2,2 daylight hours.
		Area 12H: BS (Hoodsport Hatchery Zone) fishery in wks 46 – 48 pending discussions with the Co-Managers.
		Area 12D Closed
<b>Port Gamble (Area 9A)</b>		
Chinook	All	Closed
Coho	Trty	Open wb 8/19 through wb 11/3; 7 days/wk; gillnet only.
	Ntrty	Open Wks 35 (wb 8/19) - 44 (wb 10/21) skiff GN limited to 100 fathoms length and 60 meshes in depth; 7 days/wk; Chinook NR; Chum NR through 9/30; release NR fish by cutting ensnaring meshes. The beach area of the Port Gamble Indian Reservation, between Pt. Julia and the boundary marker at the south end of the reservation - closed to all fishing.

Chum	Trty	Open 11/4 through 12/1; 7 days/wk; gillnet only.
	Ntrty	Closed

**Quilcene / Dabob (Area 12A)**

Coho	Trty	Open 8/21 through 10/13; Chum and Chinook release from hook and line and beach seine gear through 9/30; beach seines 5 days/wk, daylight hours. Hook and line fisheries for Coho only, open continuously. Gillnets closed until Summer Chum escapement exceeds 1500. Beach seine advance notification required prior to fishing.
	Ntrty	Beach seine open wks 34 (wb 8/19) – 39 (wb 9/23); Limited participation (4 permits/day); Chinook and Chum NR; fishing pattern 4,5,5,5,5,5; Fishery will be managed consistent with SCSCI. GN closed unless Treaty GN opening.
Chum	Trty	Open to set and drift gillnets wb 10/14 through 11/20, South of an E-W line through Pt. Whitney.
	Ntrty	Closed

**Skokomish River (Area 82G) Treaty (Ntrty net closed)**

The Skokomish Tribe will develop an evaluation fishery from the mouth of the Skokomish River to the HWY 106 Bridge, to assess Summer Chum incidence during the Tribal Chinook fishery. The study design will be reviewed by the co-managers before implementation. Impacts to Chinook will be absorbed in the Tribal Chinook fishery by adjustment of days fished above the HWY 106 Bridge.

Note: Hook and line gear and beach seines release Chum through 10/15.

Chinook	Open 8/01 through 9/15; no more than 4 days/wk; closed to gillnets below SR 106.
Coho	Open 9/16 through 9/29: 4 days/wk; 9/30-11/10: 7 days/wk. Closed to gillnets below SR 106 through 9/30.
Chum	Open 11/11 through 12/1; 7 days/wk.

**Big Quilcene River (Area 82F) Treaty (Ntrty net closed)**

Coho	Openings to be determined in-season, for Coho only, from 9/1 through 10/15. Closed below Rogers St. From Rogers St. to U.S. Hwy 101, hook and line gear only, release all other salmon. The hatchery area, from U.S. Hwy 101 to the Quilcene Hatchery rack, may be opened for short periods to take surplus Coho. Hand held gear only (dipnets, hand lines, etc.).
Chum	Closed



<b>Misc. Hood Canal Rivers (Dosewallips, Duckabush, Hamma Hamma, Tahuya, Dewatto, Union)</b>		
All species	Closed to commercial harvest.	
<b>Area 12 Recreational</b>		
5/1-6/30	Closed	
7/1-8/31	North of Ayock Pt. – Closed to salmon angling except see Quilcene/Dabob Bay Recreational below.	
9/1-10/15	North of Ayock Pt. (including Quilcene/Dabob Bay) – 4 fish limit, Coho only.	
7/1-10/15	South of Ayock Pt. - 4 fish limit, 2 Chinook (Chinook 22" min size); release Chum and unmarked Chinook.	
10/16-12/31	4 fish limit, 2 Chinook(Chinook 22" min size). Release unmarked Chinook	
1/1-1/31	Closed	
2/1-4/30	2 fish limit (Chinook 22" min size), release unmarked Chinook	
<b>Quilcene/Dabob Bay Recreational</b>		
5/1-8/15	Same as Area 12	
8/16-8/31	4 fish limit, Coho only.	
9/1-4/30	Same as Area 12	
<b>Hoodsport Hatchery Zone Recreational</b>		
Same as Area 12 except:		
7/1-12/31	4 fish limit, no minimum size, only 2 Chinook greater than 24"; Release unmarked Chinook and Chum release 7/1-10/15.	
<b>Dewatto River Recreational</b>		
(mouth to Dewatto-Holly Rd. Bridge)	10/1 – 10/31	2 fish limit, 12" min size, Coho only.
<b>Dosewallips River Recreational</b>		
(mouth to Hwy. 101 Bridge)	11/1 – 12/15	2 fish limit, 12" min size, Chum only.
<b>Duckabush River Recreational</b>		
(mouth to Mason Co. PUD #1 overhead electrical distribution line)	11/1 – 12/15	2 fish limit, 12" min size, Chum only.
<b>Quilcene River Recreational</b>		
(from Rodgers St.	8/16 –	4 fish, 12" min size, Coho only.

to Hwy 101 Bridge)	10/31	
<b>Skokomish River Recreational</b>		
(mouth to Hwy. 101 Bridge)	8/10 – 9/5	2 fish limit, 12” min size, release Chum and unmarked Chinook. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets. Closed upstream of Highway 106 bridge Monday through Thursday weekly, except Labor Day.
	9/16 – 9/30	2 fish limit, 12” min size, release Chum and Chinook. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets. Closed upstream of Highway 106 bridge.
	10/1 – 12/15	6 fish limit, 4 adults, 12” min size, release Chinook and release Chum through 10/15. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets.
<b>Tahuya River Recreational</b>		
(mouth to marker 1 mile above N. Shore Rd. Bridge)	10/1 – 10/31	2 fish limit, 12” min size, Coho only.

All other HOOD CANAL REGION freshwater recreational closed to salmon angling.