

**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  
The 2014-2015 Fishing Season

December 2015 Revision

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## Executive Summary

This annual report on the Puget Sound Chinook Comprehensive Harvest Management Plan summarizes information about salmon fisheries occurring between May 1, 2014 and April 30, 2015, and Chinook spawning escapement in 2014.

Commercial Chinook catch in Puget Sound pre-terminal fisheries was similar to the pre-season projection for the Strait of Juan de Fuca troll fishery, and substantially lower than projected in the Strait of Juan de Fuca and the San Juan Islands net fisheries, largely due to limited fishing opportunity for Fraser sockeye salmon. Commercial catches in all terminal areas were all below expectations due to poor returns.

Marine and freshwater landed recreational Chinook catch in the 2013-2014 season was estimated at 61,866, i.e., higher than the pre-season projection of 55,546. Creel survey-based estimates of catch in 2014-2015 mark-selective recreational fisheries in Areas 5, 9-10, and 11 are included in this report. Total encounter estimates for the 2014-15 marine area selective fisheries are presented and compared to pre-season projections for these areas.

Escapement in 2014 was lower than projected for nearly every stock in the Puget Sound. Escapement for Skagit River spring Chinook was slightly higher than projected levels.

Coded-wire tag sampling rates for 2013 commercial fisheries exceeded 20% in some areas although some extreme terminal areas were below the target 20%. Sampling rates for marine recreational fisheries achieved the 10% objectives.

## 1 Introduction

The 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 2014-2015 management year (May 1, 2014 through April 30, 2015)
- Projected and actual commercial landed catch in Puget Sound, and descriptions of fisheries, for the 2014-2015 management year
- Projected and actual landed catch for 2014 Puget Sound recreational fisheries where creel surveys were conducted, and for all 2013 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 2014, with details on estimation methods and surveys.

- Summaries of biological sampling of spawning escapement, and estimates of contributions of hatchery- and natural-origin spawners where available
- Coded-wire tag sampling rates for commercial and recreational fisheries in 2013.

## **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 1-1. Table 1-2 identifies the rates that were used as the ceilings for each Management Unit (MU) in 2014, and the projected exploitation rates and escapements for each unit, from the final pre-season FRAM model run (2814).

Pre-season fishery planning for 2014-2015 fisheries projected that natural spawning escapement would fall below the Low Abundance Thresholds for the Nooksack early, Dungeness, and Stillaguamish MUs, so CERC's were implemented for those units. Escapement projections for other MUs exceeded their LAT's.

Table 1-1. 2014 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	52%	50% Reduction of SUS ER		700
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 1-2. Management guidelines implemented and projected exploitation rates and escapements for Puget Sound Chinook from 2014 – 2015 pre-season planning (FRAM 2814).

Management Unit	ERC or CERC implemented	Projected ER <sup>1</sup>	Projected Escapement <sup>1</sup>	UMT	LAT
Nooksack	7% SUS	6.35% SUS	260	4,000	2,000
Skagit summer fall	50%	42.6%	15,070	14,500	4,800
Skagit spring	38%	32.8%	1,243	2,000	576
Stillaguamish	15% SUS	7.4%	823	900	700
Snohomish	21%	20.3%	4,427	4,600	2,800
L. Washington (Cedar)	20% SUS	20.0% SUS	654	1,680	200
Green	15% PT SUS	9.7% PTSUS	2,746	5,800	1,800
White	20%	19.3%	1,516	1,000	200
Puyallup	50%	49.5%	1,683	500 South Prairie	500
Nisqually	52%	52.0%	3,542		700
Skokomish	50%	49.8%	1,544	3650 aggregate 1650 natural	1300 aggregate 800 natural
Mid Hood Canal	15% PT SUS	10.7% PT SUS	469	750	400
Dungeness	6% SUS	2.8% SUS	287	925	500
Elwha	10% SUS	2.4% SUS	5,518	2,900	1,000
Western SJDF	10% SUS	7.4% SUS	2,448	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 2014–15 List of Agreed Fisheries (Appendix A), describes all salmon fisheries for all areas of Puget Sound and ocean fisheries off the Washington coast. The final pre-season projections of catch under this regime were made in FRAM run number 2814.

Commercial, ceremonial, subsistence, and test fishery catch is accounted for on fish tickets, i.e., receipts from transactions between fishers and buyers. 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 2-8 and Table 2-9.

Non-treaty troll, treaty troll, and recreational catches in Washington coastal fisheries north of Cape Falcon were less than their expected quotas (Table 2-1). Comparisons of projected and actual Puget Sound catch are provided 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 2014–15 fisheries,

including in-season management actions that deviated from the pre-season plan, and explanations for differences in projected and actual catch.

Table 2-1. Projected and actual Chinook catch in Washington ocean and Puget Sound fisheries in 2014.

Fishery	Projected	Actual
Washington ocean non-treaty troll	56,900	39,723
Washington ocean recreational	59,100	45,199
Washington ocean treaty troll	62,500	61,531
Puget Sound pre-terminal net & troll total		
Strait of Juan de Fuca troll	4,950	4,030
Strait of Juan de Fuca net	1,647	1,064
San Juan Islands net *	7,967	8,782
Nooksack-Samish terminal net	22,698	12,637
Skagit terminal net	4,540	2,300
Stillaguamish-Snohomish net	3,572	1,750
South Puget Sound terminal net	31,040	13,324
Hood Canal terminal net	40,763	21,297
Strait Tributaries terminal net	4	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 Islands caught 1,064 and 6,722 Chinook, respectively, primarily during the fisheries directed at Fraser River sockeye. Sockeye test fishing in Area 5 caught 236 Chinook.

Non-treaty fisheries targeting Fraser sockeye in Areas 7 and 7A landed 149 Chinook. Because purse seines are required to release all Chinook, release mortality estimates are calculated using available data from on-water by-catch monitoring. Post-season analysis estimated 1,885 Chinook mortalities in this sockeye fishery, and 25 in the chum fishery, for a total of 1,911.

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 4,030 Chinook.

## 2.2 Nooksack/Samish Terminal Area

Treaty Spring Chinook Ceremonial and Subsistence Fishery

The Lummi Nation conducted fishing with tangle-net gear on 20 days from April 10 to June 16, 2014. Total landed catch was 251 hatchery origin Chinook with an additional 26 natural-origin Chinook released. The encounter rate of NORs was lower than the pre-season projection of 31 fish.

In 2014, the Nooksack Tribe conducted limited traditional fisheries in the Upper mainstem Nooksack River on May 14, and May 20<sup>th</sup>. The May 14<sup>th</sup> ceremonial fishery was to catch a spring chinook for the first salmon ceremony. The May 20<sup>th</sup> to 21<sup>st</sup> fishery was a subsistence fishery for permitted fishers, open for a total of 13 hours from 8:00 PM May 20<sup>th</sup> to 9:00 AM May 21<sup>st</sup>. Thirty-three chinook were caught in this fishery, in addition to the single chinook caught May 14<sup>th</sup> for a total of 34 chinook caught. That was two more than anticipated in preseason planning. All 34 chinook were sampled. Twenty eight of the 34 chinook either had clipped adipose fins, or coded wire tags (or both), indicating they were hatchery origin. The remaining six are estimated to be natural origin chinook, although otolith results may reduce this number. The preseason planning estimate was that four natural origin chinook would be caught in the fishery targeting 32 chinook.

Table 2-2. Expected and actual Chinook catches in the Nooksack/Samish terminal area, 2014.			
Area	Management Period	Projected	Actual
7B, 7C, 7D Treaty net	Chinook, coho, chum	10,481	7,415
7B, 7C Non-treaty net	Chinook, coho, chum	11,189	4,177
Nooksack Treaty net	Early Chinook, May-Jun	282	285
	Fall Chinook, Aug-Sep	745	760

#### 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 6 (management weeks 32 – 36), with a catch of 5,976 Chinook. The coho fishery operated as planned from September 8 through October 26, with an incidental harvest of 1,439 Chinook. No Chinook were harvested incidentally during the chum fishery, which took place from October 27 to December 11. The total fall Chinook catch of 7,415 for Areas 7B, 7C and 7D was lower than the preseason projection of 10,481.

The non-treaty fishery in Area 7B and 7C landed 4,177 Chinook from July through September, lower than the pre-season projection of 11,189. No Chinook were landed after September, compared to the projection of 35.

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 760, exceeding the projected 745; 310 were caught during the Chinook period, 449 during the coho fishery, and one during the chum period.

### 2.3 Skagit Bay/Skagit River Terminal Areas

**Spring Chinook Fisheries:** Treaty commercial fisheries in the Skagit terminal area directed at hatchery spring Chinook were conducted in 2014 as scheduled preseason. 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 89 wild spring Chinook and 698 hatchery spring Chinook were caught in these fisheries, compared to 167 wild and 716 hatchery spring Chinook expected pre-season (FRAM Chin 2814). An additional 2 hatchery spring Chinook were harvested for ceremonial purposes.

**Summer/Fall Chinook Fisheries:** No treaty commercial fisheries directed at summer/fall Chinook were scheduled in the Skagit terminal area for 2014. However, as anticipated, incidental catch of summer/fall Chinook occurred in the sockeye and coho fisheries. The sockeye and coho fisheries were adjusted from the preseason schedule (Table 2-3) due to in-season management needs and intertribal sharing agreements. Total summer/fall Chinook mortality in these fisheries was 498 fish, compared to the pre-season expectation of 1,178. An additional 471 summer/fall Chinook were harvested for ceremonial purposes, which was less than the pre-season modeled value of 1,945.

**Terminal Area Test Fisheries:** A suite of Skagit terminal area test fisheries targeting Chinook, sockeye, coho, and chum were conducted by the Skagit tribes in 2014. Some weeks of these fisheries were adjusted or cancelled (Table 2-3) in response to weather or flow concerns. A total of 38 wild spring Chinook, 29 hatchery spring Chinook, and 475 summer/fall Chinook were caught in these fisheries. The pre-season expectation of mortalities in the test fisheries was 30 wild spring Chinook, 56 hatchery spring Chinook, and 420 summer/fall Chinook (FRAM Chin2814).

**Summary:** Overall, a total of 127 wild spring Chinook, 729 hatchery spring Chinook, and 1,442 summer/fall Chinook were killed in treaty commercial, C&S, and test fisheries. The preseason expectation based on FRAM Chin2814 was 207 wild springs, 792 hatchery springs, and 3,543 summer/falls. The preliminary (incomplete) post-season estimate of the terminal run size for wild springs (1,726) was higher than the FRAM forecast (1,467). The preliminary (incomplete) post-season estimate (11,648) of summer/fall terminal run size was less than the FRAM forecast (18,648). A preliminary hatchery spring run size estimate is not yet available. There were no non-treaty commercial net fisheries in this area.

Table 2-3. Skagit terminal area projected and actual Chinook catches for treaty fisheries in 2014. Weekly projections were made by plugging the FRAM Chin2814 run sizes into the Skagit weekly harvest rate model, so totals may differ slightly from FRAM.

Fishery	Preseason Projected			Post-season Observed/Estimated			Difference	
	Schedule	Encounters	Mortality	Schedule	Encounters	Mortality	Encounters	Mortality
<b>Test:</b>								
Chinook	1 site, wks 19-35	176	176	No week 25	166	166	-10	-10
Sockeye	2 sites: A3 wks 23-30, Blakes wks 24-29	95	95	Same	70	70	-25	-25
Coho	3 sites: Blakes wks 34-45, A3 wks 35-44, Spudhouse wks 35-44	235	235	Blakes no week 45, A3, Spudhouse, same	306	306	71	71
Chum	3 sites, wks 44-45	0	0	Blakes, Bay same, Jetty only wk 44	0	0	0	0
<b>Area 8/78C Hatchery Spring Chinook Swinomish and Sauk-Suiattle Tribes:</b>								
Week 19	2 days	100	100	Same	10	10	-90	-90
Week 20	2 days	110	110	Same	110	110	0	0
Week 21	2 days	91	91	Same	46	46	-45	-45
<b>Area 78C/78D Hatchery Spring Chinook Upper Skagit Tribe:</b>								
Week 20	1 day	182	182	Same	268	268	86	86
Week 21	1 day	186	186	Same	200	200	14	14
Week 22	1 day	213	213	Same	155	155	-58	-58
<b>Area 8/78C/78D Chinook C&amp;S Swinomish, Sauk-Suiattle, Upper Skagit Tribes:</b>								
Sum/Fall-Spring Chin.	As needed	1,975	1,975	As needed	471	471	-1,504	-1,504
<b>Areas 8/78C Sockeye Swinomish and Sauk-Suiattle Tribes:</b>								
Week 25	3 days	29	29	Same	8	8	-21	-21
Week 26	4 days	85	85	Same	19	19	-66	-66
Week 27	5 days	68	68	Same	23	23	-45	-45
Week 28	5 days	149	149	Same	14	14	-135	-135
<b>Area 78D/78O Sockeye Swinomish Tribe:</b>								
Week 29	1 day	113	113	0.5 day	1	1	-112	-112
Week 30	0 days	0	0	1 day	3	3	3	3
<b>Areas 78C/78D/78O Sockeye Upper Skagit Tribe:</b>								
Week 27	0.667 day	12	12	None	0	0	-12	-12
Week 28	0.667 day	36	36	1.333	13	13	-23	-23
Week 29	0.5 day	56	56	0.5 day	22	22	-34	-34
<b>Areas 8/78C Coho Swinomish and Sauk-Suiattle Tribes:</b>								
Week 38	1 day	89	89	Same	37	37	-52	-52
Week 39	3 days	70	70	Same	25	25	-45	-45
Week 40	4 days	19	19	Same	15	15	-4	-4
Week 41	2 days	5	5	Same	2	2	-3	-3
Week 42	0 days	0	0	2 days	0	0	0	0
<b>Areas 78C/78D Coho Upper Skagit Tribe:</b>								



Week 40	1.167 days	137	137	1.083 days	204	204	67	67
Week 41	1.167 days	84	84	1.167 days	55	55	-29	-29
Week 42	1.417 days	156	156	1.333 days	57	57	-99	-99
Week 43	1.167 days	71	71	None	0	0	-71	-71
<b>Areas 8/78C Chum Swinomish and Sauk-Suiattle Tribes:</b>								
Week 46	1 Day	0	0	None	0	0	0	0
<b>Total Skagit Terminal Area:</b>		<b>4,542</b>	<b>4,542</b>		<b>2,300</b>	<b>2,300</b>	<b>-2,242</b>	<b>-2,242</b>

## 2.4 Stillaguamish/Snohomish Terminal Area

The tribal net fishery in Area 8A caught no Chinook during the coho fishery, however 17 Chinook were taken for Ceremonial and Subsistence purposes during June and July (Table 2-4), prior to the coho fishery. Tribal Chinook catch in Area 8D occurred from May through mid-September, with most of the catch occurring during mid-June to mid-July. Total 8D catch was 1,729, including 67 used for ceremonial or subsistence purposes (Table 2-4). Chinook catch was substantially lower than projected because the hatchery return was below the forecast.

Non-treaty Chinook catch in Area 8A was zero Chinook during the coho fishery.

The Stillaguamish Tribes harvested four Chinook for ceremonial and subsistence purposes from the Stillaguamish River (Table 2-4).

Table 2-4. Projected (FRAM 2814) and actual Chinook net fishery harvest in the Stillaguamish - Snohomish terminal area in 2014.

Area		Projected	Actual
8A Commercial	Trty	221	0
	Trty C&S	Up to 100	17
	Ntrty	1	0
8A Test		4	0
8D Commercial	Trty	3,308	1,662
	Trty C&S		67
	Ntrty	0	0
Stillaguamish R. Net	Treaty	38	4

## 2.5 South Puget Sound Terminal Areas

Table 2-5. Projected and actual Chinook catch in 2014 South Puget Sound net fisheries.

Area	Management Period	Projected	Actual
Area 9/10/11	Coho (test)	44	13
	Chum (test)	35	12
	A9 (T) subsist H&L	681	33
	Treaty coho/chum	22	0
	NT chum	175	12
Area 10E	Treaty Chinook	4,087	2,467
Area 10A	Chinook (test)	177	0
	Chinook C&S	0	122
	coho/chum	215	11
Duwamish River	coho	580	345
L Washington/Ship Canal	Sockeye/coho/C&S	736	155
	Test/Research		2
Lake Sammamish	Chinook	2,355	0
Puyallup River	Spring C&S	353	374
	Fall C&S	74	81
	Chinook/Coho	2,375	2,040
Areas 13D-K	Chinook/Coho/Chum	5,129	2,389
Area 13 & 13A	Chinook/Coho/Chum	1,653	320
Areas 13C/Chambers	Chinook	4,109	363
Nisqually River	Chinook/coho	8,234	4,596

### Marine Areas 9, 10 & 11

Test fisheries in Area 10 for coho and at Apple Cove Point (Area 9) for chum, incidentally caught a total of 25 Chinook (Table 2-5).

The non-treaty chum-directed fishery in Area 10 and 11 incidentally harvested 2 Chinook, with a total estimated mortality of 12. The treaty chum fishery harvested zero Chinook. Fisheries directed at Chinook and coho in Area 10E harvested 2,466 Chinook (Table 2-5), with two Chinook harvested during the chum fishery.

### 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 Muckleshoot tribe conducted C&S fisheries in the Lake Ship Canal targeting sockeye, with total by-catch of 35 Chinook. The Muckleshoot Tribe and Suquamish Tribe did not conduct any C&S fisheries on Chinook. Incidental Chinook catch during the coho fishery in Lake Union, and the upper and lower Ship Canal harvested 120 Chinook, which was well less than expected. There were no Chinook or coho directed fisheries in Lake Sammamish nor any coho directed fisheries in North Lake Washington.

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

The Chinook test fishery in Area 10A did not occur in 2014. There were no Chinook-directed fisheries in 10A or the Duwamish River. The Muckleshoot Tribe conducted a C&S fishery on Chinook which caught 122 fish. In 10A, there were 11 Chinook harvested in early September by Muckleshoot Tribe incidentally during the coho directed fishery. In the Duwamish River, 345 Chinook were caught incidentally during the coho directed fishery, which was well below the projected number.

### **Puyallup River and White Rivers**

Ceremonial and subsistence fisheries for White River spring Chinook caught 245 fish in management weeks 20 – 32 and an additional 116 during management weeks 20 – 27 in the White River. The pre-season projected catch was 353. The Muckleshoot Tribe had an additional C&S fishery in the White River starting in week 36 which caught 13 Chinook, of which 10 were ad-clipped indicating they were not spring run Chinook.

Ceremonial and subsistence catch of fall Chinook in the Puyallup River was 81 fish (Table 2-5). Fall Chinook catch was 2,040 combined during the half-day Chinook period and the subsequent coho fishery.

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

The Chinook fishery in Carr Inlet (13A) caught 320 Chinook (Table 2-5), in August and early September (weeks 32 – 37). Pre-season projected catch was 1,653.

The Chinook fishery at Chambers Bay (13C) occurred in weeks 34 – 36, and caught 363 fish (Table 2-5). The preseason catch projection was 4,109.

Chinook directed fisheries in 13D and Budd Inlet (13F) occurred from late-July through September (weeks 30 – 40); total catch was 1,696. Chinook caught incidentally during the coho fishery in (Week 37-42) 13D totaled 693. The total preseason catch projection for both areas was 5,129.

### **Nisqually River**

The treaty commercial fishery in the Nisqually River caught 4,582 Chinook plus 14 additional fish for Ceremonial and Subsistence purposes, with a pre-season projected commercial catch of 8,234 (Table 2-5). The Chinook-directed gillnet fishery was conducted July 28 through August 27; catch was 2,705. The gill net pre and post season harvest rates were 0.19295 and 0.19583, respectively. Chinook fisheries using tangle net and beach seine gear, both requiring release of unmarked Chinook, were open from September 3 to September 16. Retained catch in the tangle net fishery was 1,734 marked and 70 unmarked Chinook with a 140 unmarked released. Tangle net pre and post season encounter rates were 0.0778 and 0.14, respectively. The tangle net and beach seine fishery was closed three weeks early over conservation concerns. The beach seine fishery was open the same time as the tangle net but did not perform to preseason expectations with a total encounter of zero and a preseason expectation of 271. Seventy three Chinook were taken during the coho period in weeks 42-44. The overall Chinook run to the Nisqually River was 40% of forecasted.

## **2.6 Hood Canal**

Treaty Chinook directed fishing in 12C occurred as planned from July 15 thru August 31 (weeks 30 – 36). Catch was 4,359, with 82 of those landed during the first three weeks of the coho fishery which began the second week of September. Catch was 50% lower than pre-season expectations due to the lower than predicted run size.

Chinook harvest in the Hoodsport Hatchery Zone (12H) was 7,626 and occurred as planned from July 13 through September 20. Catch fell substantially short of the expected 22,316 due to poor hatchery returns and a lower than predicted run size.

Chinook harvest in the Skokomish River occurred as planned from July 14 through August 22 landing 3,680 fish. Chinook harvest also occurred in Purdy Creek (tributary of Skokomish River that feeds the George Adams Hatchery) to access Chinook returning to George Adams Hatchery each Saturday from July 5 through September 6 landing 5,548 fish. The Purdy Creek Chinook fishery was successful by substantially reducing the chronic over-escapement to the hatchery, which in some years exceeded 20,000 fish beyond broodstock goals.

For 2014, the tribal net fishery was completely re-structured by time and area in order to focus harvest on early returning hatchery Chinook and allow passage of fish to spawning grounds. This re-structuring included a three (3) week tribal fishing closure of the entire river during the peak Chinook return timing and reducing the coho fishery to only two (2) days, in order to minimize by-catch of Chinook to increase passage to spawning grounds. Overall, Chinook harvest in the Skokomish River (not including Purdy Creek) was lower than expected pre-season projections supporting the re-structuring of the tribal net fishery. Also, the Skokomish Tribe commercial fishery sampling supported the assumption that by moving the tribal Chinook fishery to the July opening resulted in a reduction of tribal catch by 61% and a 94-100% harvest on hatchery origin fish.

In Port Gamble (Area 9A) 84 Chinook were harvested, primarily in mid August (week 34) during coho fisheries.

There were 3 Chinook landed in non-treaty fisheries in Hood Canal in 2014, with a total estimated mortality of 28.

Table 2-6. Pre-season projected and observed catch of Chinook in Hood Canal terminal area net fisheries in 2014.

Area	Target Species	Projected	Actual
(12, 12B-12D, 9A) (T)	Chin, coho, chum	8,564	4,443
(12-12C, 9A) (NT)	chum, coho	60	28
12A Net (T)	Coho	131	0
12H Net (T)	Chinook, chum	22,316	7,626
Skokomish River and Purdy Creek (82G/J) (T)	Chin, coho, chum	9,602	9,228
	Total	40,673	21,297

## 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. Chinook retention in the Dungeness Bay (6D) coho fishery was restricted, although one Chinook was retained on the opening day by a fisher unaware of the restriction. This was a single, isolated incident and was promptly addressed by Tribal Managers. Four Chinook were harvested for ceremonial purposes in the Elwha River (Table 2-7).

Table 2-7. Projected and actual catches of Chinook in Strait of Juan de Fuca terminal net fisheries in 2013.		
Terminal Area	Projected	Actual
Area 6D & Dungeness River Treaty	0	1 <sup>a</sup>
Area 6D Non-Treaty	0	0
Elwha River Treaty (C&S)	4	4
Hoko River Treaty	0	0

<sup>a</sup> One Chinook was harvested in area 6D. This was an isolated incident by a single fisheremen uninformed of the closure of Chinook retention in 6D which has been addressed by respective Tribal Fishery Managers.

## 2.8 Non-Treaty Commercial Monitoring and Total Mortality

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. Summaries of observer data for 2014 are presented in Table 2-8. 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 below in Table 2-9.

Table 2-8. Commercial fishery observation data for 2014 Puget Sound non-treaty salmon net fisheries.								
Area	Gear type	# sets observed	Chinook	Coho	Sockeye	Pink	Chum	Steelhead
10	PS	26	0	22	0	0	1,431	0
11	PS	60	1	54	0	0	5,743	0
7	PS	55	102	313	5,922	4	1,431	0
7A	PS	172	487	99	5,528	29	649	2
12	PS	17	0	13	0	0	897	0
12B	PS	22	0	118	0	0	4,115	0
10	GN	21	2	6	0	0	1,010	0
12	GN	7	0	1	0	0	258	0
12B	GN	6	0	2	0	0	639	0
7	GN	2	0	0	0	0	6	0

Table 2-9. Total pre-season projected and post-season estimated Chinook mortality (landed + released) in Puget Sound non-treaty commercial salmon fisheries in 2014.

Area	Total Mortality	
	Projected	Actual
6D	0	N/A (0 landed)
7/7A	3,145	1,911
8	0	N/A (no openings)
8A	2	0
10/11	175	12
12/12B	53	28
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 2014-2015 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 2013-2014 management year are also included here.

#### 3.1 2013-2014 Recreational Catch

Total Recreational Chinook harvest in 2013-2014, estimated from preliminary Catch Record Card (CRC) data and creel estimates where available, was 61,333, compared to a preseason projection of 62,746. The CRC estimates are preliminary and subject to revision. Projected and actual catches for individual fisheries are shown in Table 3-1. 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 3-1. Projected (FRAM 1213) and actual (preliminary creel & preliminary CRC) landed Chinook catches in Puget Sound recreational fisheries during the 2013-2014 season.

Area/Fishery	Projected	Actual
Area 5-6		
Area 5 Summer MSF	4,896	8,564
Area 6 Summer MSF	1,538	4,002
Area 6 Winter MSF	1,736	2,201
Other	904	290*
Strait Tributaries	0	0
Area 7		
Non MSF	2,826	6,287
MSF (December-April)	3,744	3,456
Nooksack/Samish FW	5,967	6,376
Area 8-1 & 8-2		
MSF	2,652	482
Skagit River		
Spring MSF	381	277
Area 8D SAF	251	159
Stillaguamish River	0	0
Snohomish River		
Skykomish MSF	873	604
Area 9		
Summer MSF	4,940	4,724
Winter MSF	1,377	2,083
Area 10		
Summer MSF	2,687	3,534
Winter MSF	2,214	357
Area 11		
Summer MSF	6,187	3,146
Winter Non-Selective	719	137
Winter MSF	403	119
Area 10E SAF	83	17**
Lake Sammamish	272	306
Area 10A SAF	0	0
Green River	0	0
Puyallup River		
Carbon R MSF	426	343
Puyallup R MSF	1,945	2,360
Area 13		
Summer MSF	1,604	1,448
Winter Non-Selective	219	24*
Chambers Cr	59	15
Nisqually	3,793	4,297
Deschutes	130	0
Area 12		
Summer MSF	841	609
Winter MSF	813	52*
Skokomish River	8,265	5,064
* Estimates through 3/31/2014		
**10E catch included in estimate for Area 10 MSF for the period when both were open concurrently.		

### **3.2 2014-2015 Recreational Catch**

Projected Chinook catches for 2014-2015 recreational fisheries are listed in Table 3-2. The recreational fishing regime included mark selective fisheries (MSF) for portions of the year in Marine Areas 5 through 13 and in a number of rivers. WDFW conducted intensive sampling and monitoring of MSFs in Marine Area 5, 9, 10 and 11, which provided the estimates in Table 3-2. Brief summaries of Chinook catch and encounters resulting from these sampling programs are included below. The analysis of 2014 summer fisheries is still in draft, but will be available, with similar previous years' analyses on the WDFW website:

<http://wdfw.wa.gov/publications/search.php?Cat=Fishing / Shellfishing>.

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 freshwater fisheries, catch estimates are made using CRC data, unless creel studies were conducted and harvest estimates are available. For marine fisheries, species-specific catch estimates are made using CRC estimates of total catch, combined with species composition data obtained from the baseline sampling program. These estimates will be included in the 2015 annual report.



Table 3-2. Projected (FRAM 2814) and actual (preliminary, where available) Chinook catches in Puget Sound recreational fisheries during the 2014-2015 season.

Area/Fishery	Projected	Actual
Area 5-6		
Area 5 Summer MSF	6,296	5,134
Area 5 Winter MSF	503	
Area 6 Summer MSF	4,283	
Area 6 Winter MSF	1,547	
Other	162	
Strait Tributaries	0	
Area 7		
Non MSF	3,687	
MSF (December-April)	4,403	
Nooksack/Samish FW	6,554	
Area 8-1 & 8-2		
MSF	1,204	
Skagit River		
Spring MSF	369	
Area 8D SAF	163	
Stillaguamish River	0	
Snohomish River		
Skyokomish MSF	705	
Area 9		
Summer MSF	3,218	2,875
Winter MSF	1,333	
Area 10		
Summer MSF	1,112	1,071
Winter MSF	300	
Area 11		
Summer MSF	3,828	2,943
Winter MSF	510	
Area 10E SAF	91	
Lake Sammamish	186	
Area 10A SAF	0	
Green River	0	
Puyallup River		
Carbon R MSF	323	
Puyallup R MSF	752	
Area 13		
Summer MSF	1,169	
Winter MSF	96	
Chambers Cr	71	
Nisqually	2,726	
Deschutes	77	
Area 12		
Summer MSF	927	
Winter MSF	1,002	
Skokomish River	10,845	

Table 3-2. Projected (FRAM 2814) and actual (preliminary, where available) landed Chinook catches in Puget Sound recreational fisheries during the 2014-2015 season.

Area/Fishery	Projected	Actual
Area 5-6		
Area 5 Summer MSF	6,296	5,134
Area 5 Winter MSF	503	
Area 6 Summer MSF	4,283	
Area 6 Winter MSF	1,547	
Other	162	
Strait Tributaries	0	
Area 7		
Non MSF	3,687	
MSF (December-April)	4,403	
Nooksack/Samish FW	6,554	
Area 8-1 & 8-2		
MSF	1,204	
Skagit River		
Spring MSF	369	
Area 8D SAF	163	
Stillaguamish River	0	
Snohomish River		
Skykomish MSF	705	
Area 9		
Summer MSF	3,218	2,875
Winter MSF	1,333	
Area 10		
Summer MSF	1,112	1,071
Winter MSF	300	
Area 11		
Summer MSF	3,828	2,943
Winter MSF	91	
Area 10E SAF	186	
Lake Sammamish	0	
Area 10A SAF	0	
Green River		
Puyallup River		
Carbon R MSF	323	
Puyallup R MSF	752	
Area 13	1,169	
Summer MSF	96	
Winter MSF	71	
Chambers Cr	2,726	
Nisqually MSF	77	
Deschutes		
Area 12	927	
Summer MSF	1,002	
Winter MSF	10,845	
Skokomish River MSF		

### 3.2.1 Marine Area 5 Summer MSF

2014 was the 12<sup>th</sup> year of summer mark-selective Chinook fishing in Marine Area 5. The 2013 fishery was opened for a set season, from July 1 through August 15.

WDFW conducted comprehensive fishery monitoring activities during the Area 5 MSF. Sampling activities included dockside creel sampling and intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. 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 (2015).

For Area 5, WDFW estimates that 5,134 Chinook were landed (5,085 marked and 49 unmarked; Table 3-3). Total encounters were higher than projected pre-season unmarked fish and lower than projected pre-season for marked fish.

Table 3-3. Comparison of modeled (FRAM 2814) and estimated total Chinook encounters for the 2014 Area 5 summer Chinook MSF.					
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	8,300	5,742	2,558	57
	AD	15,020	7,171	7,849	6,239
	Total	23,320	12,913	10,407	6,296
	% Marked	64	56	75	99
Estimated (Creel) Encounters	UM	10,413	3,046	7,367	49
	AD	9,492	5,383	4,108	5,085
	Total	19,905	8,429	11,475	5,134
	% Marked	48	64	36	99

### 3.2.2 Marine Areas 9 & 10 Summer MSF

In 2014, recreational MSFs occurred for the eighth consecutive summer in Marine Areas 9 and 10. These fisheries were scheduled to be open from July 16 through August 15, however, due to higher than expected catch rates, the Area 10 fishery was closed on August 8. As in previous years, WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Areas 9 and 10 during the 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 (2015).

Total harvest in Areas 9 and 10 was estimated at 2,875 and 1,071 Chinook, respectively, compared to preseason projections of 3,218 and 1,112. As mentioned above, the Area 10 fishery was closed early, as estimated catch had reached the pre-season quota.

Table 3-4. Comparison of modeled (FRAM 2814) and estimated Chinook encounters for the 2014 Areas 9 and 10 summer Chinook MSFs.						
	Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
Area 9	FRAM Encounters	UM	1,324	715	609	14
		AD	6,850	3,682	3,168	3,204
		Total	8,174	4,397	3,777	3,218
		% Marked	84	84	84	100
	Estimated (Creel) Encounters	UM	973	674	299	6
		AD	4,042	3,293	748	2,869
		Total	5,015	3,967	1,048	2,875
		% Marked	81	83	71	100
Area 10	FRAM Encounters	UM	1,179	636	543	38
		AD	2,887	1,234	1,653	1,074
		Total	4,066	1,870	2,196	1,112
		% Marked	71	66	75	97
	Estimated (Creel) Encounters	UM	652	326	326	8
		AD	2,851	1,222	1,629	1,063
		Total	3,503	1,548	1,955	1,071
		% Marked	81	79	83	99

### 3.2.3 Marine Area 11 Summer MSF

In 2014, a summer recreational MSF was implemented in Area 11 for the eighth consecutive year, 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 2,943 Chinook were landed during the fishery, compared to the pre-season projection of 3,827 (Table 3-5). Unmarked legal and sublegal encounters were above projection.

Table 3-5. Comparison of modeled (FRAM 2814) and estimated Chinook encounters for the 2014 Area 11 summer Chinook MSF.					
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	1,928	1,111	817	33
	AD	7,046	4,361	2,685	3,794
	Total	8,974	5,472	3,502	3,827
	% Marked	79	80	77	99
Estimated (Creel) Encounters	UM	2,466	1,605	861	20
	AD	5,500	3,347	2,153	2,923
	Total	7,966	4,952	3,014	2,943
	% Marked	69	68	71	99

## **4 Spawning escapement**

This section compares natural Chinook escapement estimates for 2014 with pre-season escapement projections, and management thresholds.

In general, FRAM projects natural escapement of unmarked Chinook. 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 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.

Spring Chinook escapements were above predictions for the Skagit population. Escapement to the Dungeness was lower than projected and below the LAT.

For summer/fall populations, escapement was lower than projected for all management units with both North Fork and South Fork Stillaguamish as well as Mid-Hood Canal escapements below their respective LATs.

Table 4-1. Preseason projections and estimates of Puget Sound Chinook natural spawning escapement in 2014.

Management Unit		NOR	HOR	Total	Projected (FRAM 2814)
Nooksack	NF			N/A	176 <sup>1</sup>
	SF			N/A	85 <sup>1</sup>
Skagit spring	Suiattle			460	300 <sup>1</sup>
	Cascade			225	308 <sup>1</sup>
	Sauk			923	635 <sup>1</sup>
	Total spring			1,608	1,243 <sup>1</sup>
Skagit summer/fall	Sauk summer			364	649 <sup>1</sup>
	Upper Skagit summer			8,308	11,606 <sup>1</sup>
	Lower Skagit fall			1,808	2,556 <sup>1</sup>
	Total summer/fall			10,480	15,070 <sup>2</sup>
Stillaguamish	NF	141	276	417	682 <sup>1</sup>
	SF	12	3	15	141 <sup>1</sup>
	Total	153	279	576 <sup>3</sup>	823 <sup>1</sup>
Snohomish	Skykomish	1,654	1,409	3,063	2,790 <sup>1</sup>
	Snoqualmie	698	141	838	1,637 <sup>1</sup>
	Total	2,352	1,550	3,901	4,427 <sup>1</sup>
Lake Washington	Cedar	306	262	568	654
	Sammamish	35	447	482	N/A: Sammamish not in FRAM
Green		756 <sup>8</sup>	1,974 <sup>9</sup>	2,730	2,746
Puyallup		518	926	1,444	1,683
White		245	637	882	1,516 <sup>4</sup>
Nisqually		485	471	956 <sup>5</sup>	3,542
Skokomish		208	641	849	1,544
Mid Hood Canal	Dosewallips	3	8	11	
	Duckabush	4	9	13	
	Hamma Hamma	33	84	117	
	Total	40	101	141	469
Dungeness		47	157	204 <sup>6</sup>	287
Elwha				4,360 <sup>7</sup>	5,518
Hoko		1,470	64	1,534	2,448

1. Natural-origin only.

2. Skagit Su/Fa projection total includes NOR and HOR escapement to the spawning grounds

3. Included additional 57 NOR and 87 HOR collected for broodstock, which are part of the FRAM Projection.

4. Includes NORs and vent-clipped acclimation pond fish trucked and released upstream of Mud Mountain

5. Change-in-ratio (CIR) estimate will be revised with actual sport-catch data when available.

6. Includes 96 fish removed from the river for use as broodstock.

7. Includes 2,513 fish natural spawning fish and 1,847 fish as broodstock. Estimate does not include jacks.

8. This figure does not include 32 NORs that were brought into the Soos Creek Hatchery from the mainstem Green.

9. This figure includes the redds resulting from the outplanting of 541 HORs from the Soos Hatchery pond to the mainstem Green

## **4.1 Nooksack River Early Chinook**

Nooksack River 2014 Chinook escapement estimates are not available at this time, pending additional data and genetic laboratory analysis. In the absence of this data, we are providing a descriptive summary of surveys and carcasses for the 2014 season. We intend to provide an update on escapements when the data are available at a future date.

The co-managers surveyed the North Fork and Middle Fork sub-basins for North/Middle Fork early-timed chinook. A total of 563 carcasses were enumerated in Kendall Creek or Kendall Slough. An additional 154 more Chinook carcasses were enumerated in the remainder of the North Fork sub-basin. In the Middle Fork sub-basin, 235 carcasses were enumerated. Additionally, 1,973 adult Chinook and 15 jacks recruited to Kendall Hatchery.

Co-manager surveys in the South Fork Nooksack River, recovered a total of 45 carcasses. A total of 92 redds were enumerated through September 30<sup>th</sup>, however until more data is analyzed an escapement estimate is not available at this time.

## **4.2 Skagit River**

### **Background**

Six recognized Chinook populations spawn in the tributaries and mainstems of the Skagit River watershed. The Sauk River, Suiattle River, Baker River, and the Cascade River are the major tributaries to the Skagit River, but there are also numerous smaller, anadromous fish bearing tributaries flowing both into the major tributaries, and also into the Skagit River directly. Five hydroelectric projects are in the basin; two on the Baker River at river miles (RM) 1.6 and 9.3, and three on the Skagit River at RM 96.6, 100.9, and 105.1.

Escapements were calculated using various methodologies dependent on population and based on either redd counts or predicted by linear regression. Chinook carcasses were sampled for fork length, sex, scales and presence or absence of a hatchery mark. We also electronically sampled Chinook carcasses for coded wire tags (CWT) and collected CWT present snouts. Estimates of spawner abundance by natural and hatchery origin were not available at the time of this report.

Surveys were performed on foot or by pontoon or jet boat. Calculation of escapements for Skagit summer and Skagit fall Chinook, Sauk River spring (one 0.9 mile mainstem index), and Sauk River summer Chinook have relied heavily on aerial redd surveys of extensive mainstem sections.

Additional personnel from the Skagit Fisheries Enhancement Group (SFEG), Skagit River System Cooperative (SRSC, the management body for the Sauk-Suiattle and Swinomish Indian tribes), the Upper Skagit Indian Tribe (USIT), Seattle City Light, and Puget Sound Energy, also performed work necessary to complete the escapement estimates and predictions for the Skagit River Basin Chinook salmon runs.

### **Methods and Results**

#### **Suiattle River Spring Chinook**

Suiattle River spring Chinook spawn in the clear, large water tributaries draining into the turbid mainstem of the Suiattle River. Historically, limited spawning activity has been documented in the glacially influenced, highly turbidity mainstem with the exception of

spawning in the clear water lens formed at tributary junctions. The only recorded exception to date was in 2011, when an unusual combination of environmental variables reduced turbidity in the mainstem and resulted in conditions apparently suitable for observing mainstem and off channel Suiattle River spring Chinook spawning. Redds found at the junction of a tributary and the mainstem within the tributary's clear water lens were included in the tributary count.

Surveys were conducted from 4 August 2014 through 30 September 2014. Tributary indexes were surveyed for new redds every seven to fourteen days depending on access and spawning densities to ensure all redds were enumerated. The indexes included all known spawning habitat for each tributary. Tributary spawning surveys were conducted on foot. Encountered Chinook carcasses were sampled for scales, measured for fork length, and checked for presence of coded wire tags. Redds were marked with survey flagging to prevent double counting during subsequent surveys. The total redd count was multiplied by 2.5 fish per redd to estimate escapement.

The logjam that had been a passage barrier on Buck Creek in previous years (approximately river mile 1.2) remained in 2014 and appeared even larger than observed in 2013. The pool habitat behind the jam had nearly completely backfilled with cobble and smaller substrate forcing the creek to leak through small "sieve-like" spaces at the base of the jam to continue down to the Suiattle River.

A total of 41 Suiattle spring Chinook carcasses were located in 2014 and 36 were able to be sampled. One sampled carcass had a coded wire tag and was not adipose clipped. All other sampled carcasses were unmarked wild spring Chinook. The season total redd count was 184 redds (Table 4-2).

Table 4-2. Suiattle River spring Chinook 2014 spawning ground survey redd counts.

Stream	WRIA	Survey method	Reach (RM)	Location**	Redds
Big Creek	3.0723	Foot	0.0-0.6	7.8	7
Tenas Creek	3.0761	Foot	0.0-0.5	9.6	7
Straight Creek	3.0797	Foot	0.0-0.1	15.1	0
Buck Creek	3.0813	Foot	0.0-1.7	18.1	33
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	73
Sulfur Creek	3.0973	Foot	0.0-0.9	26.3	53
Milk Creek	3.1022	Foot	0.0-0.1	28.6	7
Total redds					184

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

The preliminary 2014 Suiattle River Spring Chinook escapement estimate was 460 fish (rounded). All data and estimates of escapement are preliminary at the time of reporting and remain subject to further review and agreement by the Skagit comanagers before finalization.

### Upper Cascade River Spring Chinook

Cascade River spring Chinook spawn in the mainstem and accessible tributaries of the Cascade River from river mile 8.1 (just upstream of a high gradient canyon) up to, and



including, the forks at RM 18.6. Spawning has also been documented in the North and South Fork Cascade Rivers, from the mouth of each fork upstream variable distances (less than one river mile) dependent upon annual variations in available spawning habitat.

Cascade spring Chinook surveys occurred from 12 August 2014 through 29 September 2014. The surveys included all known spawning habitat. Mainstem surveys were conducted by foot or pontoon boat depending on the stream features of the index. Indexes with numerous log jams, side channels, or crossings that could not be waded were floated. The survey protocol was to survey each index every ten to fourteen days. All new redds were marked with survey flagging to ensure they were only counted once. The total redd count was multiplied by 2.5 fish per redd to estimate escapement. All recoverable carcasses were sampled for scales, measured for fork length, and electronically checked for coded wire tags.

Eight upper Cascade spring Chinook carcasses were located in 2014. Of the located carcasses, four were able to be sampled. All sampled carcasses were unmarked and untagged fish.

We identified and marked 90 redds in 2014 (Table 4-3). The 2014 upper Cascade River spring Chinook spawning escapement estimate was 225 fish. All data and estimates of escapement are preliminary at the time of reporting and remain subject to further review and agreement by the Skagit comanagers before finalization.

Table 4-3. 2014 Cascade River spring Chinook redd counts.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>*1</sup>
Cascade River	3.1411	Foot	8.1-9.0	8.1
Marble Creek	3.1451	Foot	0.0-0.3	8.6
Cascade River	3.1411	Foot/Raft	9.0-12.4	9.0
Cascade River	3.1411	Foot	12.4-15.8	12.4
Cascade River	3.1411	Foot	15.8-18.6	15.8
Kindy Creek	3.1528	Foot	0.0-0.5	16.2
North Fork Cascade River	3.1605	Foot	0.0-0.1	18.6
South Fork Cascade River	3.1411	Foot	0.0-0.5	18.6
Total redds:				90

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

### Upper Sauk River Spring Chinook

Upper Sauk River spring Chinook spawn in the mainstem Sauk River and in the North and South Fork Sauk Rivers. Mainstem spawning has been documented between RM 31.0 to the forks at RM 31.9. A high gradient section of the Sauk River beginning 0.9 river miles downstream of the White Chuck River acts as an assumed barrier to Sauk summer Chinook and the beginning and lowest point of spawning of upper Sauk River spring Chinook. Spawning in the North Fork Sauk occurs from the mouth to an impassable falls 1.6 RM upstream. Spawning in the South Fork Sauk has been documented from the forks upstream to approximately river mile 5.0, upstream of the area known as Monte Cristo Lake.

WDFW and staff from the Upper Skagit Indian Tribe surveyed the upper Sauk River spring Chinook spawning areas from 11 August 2014 through 8 October 2014. 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 by helicopter every two

weeks because it was too treacherous to raft or walk. Recovered carcasses were sampled for scales, fork length, and presence of coded wire tags. Redds located during foot or pontoon boat surveys were counted and marked with survey flagging.

A total of 95 Sauk spring Chinook carcasses were located in 2014 and 26 of the carcasses were able to be recovered and sampled. Of the sampled carcasses 25 were wild unmarked and untagged fish, and one was adipose clipped and coded wire tagged.

There were 365 redds located upstream of the White Chuck River by ground based surveys and four redds observed downstream of the White Chuck River in the section surveyed by helicopter (Table 4-4). Normally redds were estimated for the aerial section using area under the curve, but in 2014 the number of redds observed during the first flight was used, because during the second flight the river was too turbid to see the substrate (and therefore redds) while during the third and fourth flights, zero redds were observed. With the last two surveys documenting zero redds, the second flight would had to have had more than four redds visible for the area under the curve method to estimate more than four redds in the section. Because Chinook redd life averages 21 days in the Skagit basin, we assumed it was more likely there were no more than four redds in the section in 2014 and less likely more redds had been built after the initial flight by which all redd-lives had expired by the third flight.

Table 4-4. Upper Sauk River spring Chinook redd counts from 2014 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>1</sup>	Redds
Sauk River	3.0673	Flight	31.0-31.9	31.0	4
Sauk River	3.0673	Foot/Float	31.9-34.5	31.9	116
Sauk River	3.0673	Foot/Float	34.5-37.8	34.5	183
Falls Creek	3.1182	Foot	0.0-0.2	34.9	2
Sauk River	3.0673	Foot/Float	37.8-39.7	37.8	10
South Fork Sauk River	3.1204	Foot	0.0-3.5	0.0	20
South Fork Sauk River	3.1204	Foot	4.4-5.0	4.4	0
North Fork Sauk River	3.0673	Foot	39.7-40.1	39.7	12
North Fork Sauk River	3.0673	Foot	40.1-41.3	40.1	22
Total redds (rounded):					369

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

Total redds from ground based counts and the flown section were summed and multiplied by 2.5 fish per redd to estimate escapement. The 2014 upper Sauk River spring Chinook escapement estimate was 923 fish. All data and estimates of escapement are preliminary at the time of reporting and remain subject to further review and agreement by the Skagit comanagers before finalization.

### Skagit Summer Chinook

Skagit River summer Chinook spawn in the mainstem of the Skagit River from the mouth of the Sauk River at RM 67.2 to the Seattle City Light Gorge Powerhouse at RM 94.3. Documented spawning has also occurred in several tributary streams. Tributaries were surveyed by foot or pontoon boat at an interval of every seven to fourteen days to ensure all redds were enumerated before redd life expired. The mainstem of the Skagit River was surveyed by helicopter and all visible redds were counted. Tributary surveys covered

most of the known spawning area with the exception of some limited spawning known to occur above the tributary index areas in years of high abundance, and in some other tributaries which have infrequent spawning activity. Time constraints due to limited personnel resources prevented us from surveying all known spawning habitat.

Recovered carcasses were sampled for scales, measured for fork length, and checked for presence of tags and marks. Not all carcasses encountered could be sampled; carcasses were often observed in deep pools or were so badly decomposed they disintegrated upon disturbance. All redds located during tributary surveys were counted and marked with survey flagging.

Skagit summer Chinook tributary spawning surveys occurred regularly from 8 September 2014 through 21 October 2014 (Table 4-5). A total of 231 Skagit summer Chinook carcasses were found in 2014 and 193 carcasses were recovered and sampled. A total of 175 carcasses were unmarked and untagged wild Chinook and 17 carcasses were hatchery origin with coded wire tag, adipose clipped, or both. One sampled fish was of unknown origin due to missing tissue from the head and back area; the fish could not be electronically or visually sampled but was scale sampled.

Table 4-5. Skagit summer Chinook redd counts from 2014 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>1</sup>	Redds
Illabot Creek	3.1346	Foot	0.0-2.6	71.6	26
Cascade River	3.1411	Foot/Float	0.0-4.2	78.1	83
Diobsud Creek	3.1750	Foot	0.0-1.3	80.7	29
Bacon Creek	3.1774	Foot	0.0-4.2	82.9	39
Falls Creek <sup>2</sup>	3.1780	Foot	0.0-0.4	4.0	0
Goodell Creek	3.1867	Foot	0.0-1.3	92.9	11
<b>Total redds:</b>					<b>188</b>

<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.

We observed 188 summer Chinook redds in the tributaries (Table 4-5) and using area under the curve estimated 3,135 redds were built in the mainstem Skagit River above the Sauk River. The tributary redd count and estimated mainstem redds were summed and multiplied by 2.5 fish per redd to estimate escapement. The 2014 expected escapement of Skagit summer Chinook was 8,308 fish. All data and estimates of escapement are preliminary at the time of reporting and remain subject to further review and agreement by the Skagit comanagers before finalization.

### Lower Sauk River Summer Chinook

Lower Sauk River summer Chinook spawn from the mouth of the Sauk River to approximately RM 31.0 (0.9 RM downstream of the White Chuck River). The only documented tributary spawning has occurred in Dan Creek (WRIA 3.1079) but due to frequent low flows during spawning, summer Chinook use of Dan Creek has been intermittent. Any carcasses located in Dan Creek were sampled for scales, measured for fork length, and checked for presence of tags and marks. The lower Sauk River is too wide, braided, and spawning too sparsely distributed to be effectively surveyed by foot or pontoon boat, so mainstem Sauk River summer Chinook spawning was surveyed by helicopter.

Four Sauk summer Chinook carcasses were located in 2014 and 3 of the carcasses were sampled. Two of the carcasses were unmarked and untagged wild origin fish and one carcass was an adipose clipped and coded wire tagged hatchery origin fish.

Dan Creek had impassable low stream flow during the initial survey attempt on 25 September, but maintained passable flows throughout the remainder of the spawning season and was surveyed regularly through 28 October 2014.

Table 4-6. Lower Sauk River summer Chinook redd counts from 2014.

Stream	WRIA	Survey method	Reach (RM)	Location <sup>1</sup>	Redds
Sauk River	3.0673	Flight	0.0-13.2	0.0	23
Sauk River	3.0673	Flight	13.2-21.1	13.2	104
Dan Creek	3.1079	Foot	0.0-0.8	16.8	3
Sauk River	3.0673	Flight	21.1-31.0	21.1	18
<b>Total redds (rounded):</b>					<b>149</b>

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

Four flights were conducted on the Lower Sauk River summer Chinook mainstem reaches (Table 4-6). The total number of redds in the mainstem were estimated using the area under the curve method and added to the redd count from Dan Creek. The summed estimated number of redds were multiplied by 2.5 fish per redd to estimate escapement. The 2014 escapement estimate of lower Sauk River summer Chinook was 364 fish (rounded). All data and estimates of escapement are preliminary at the time of reporting and remain subject to further review and agreement by the Skagit comanagers before finalization.

#### Lower Skagit River Fall Chinook

Skagit fall Chinook spawn in the mainstem Skagit River from the vicinity of RM 24.5 to the mouth of the Sauk River (RM 67.2). They have also been documented spawning in a variable number of large and small tributary streams depending on flow conditions. Tributary surveys were conducted by foot every seven to fourteen days. Encountered carcasses were sampled for scales, measured for fork length, and checked for coded wire tags. Tributary redds were counted and marked with flagging to prevent repeated counting. Redds counted in the tributaries and estimated redds from the AUC calculation were summed, and multiplied by 2.5 fish per redd to estimate escapement.

As with 2013, we were unable to conduct any aerial surveys of the mainstem Skagit River fall Chinook spawning zone in 2014 due to poor weather and/or poor water visibility. River conditions in the mainstem Skagit can be extremely poor in the fall period of the year and 2014 was worse than usual. The preliminary 2014 Skagit fall Chinook escapement estimate was 1,785 fish and is dependent on co-manager review and agreement which had not yet occurred at publication.

We surveyed the index sections of known fall Chinook spawning areas from 11 September 2014 through 14 November 2014 (Table 4-7). In general weather and stream flow conditions in the Skagit River tributaries were mostly favorable for conducting surveys. A total of 9 Skagit fall Chinook carcasses were observed in 2014 and eight were able to be sampled. All sampled carcasses were unmarked wild fall Chinook. The season total redd count was 45 redds (Table 4-7).

Table 4-7. Lower Skagit River fall Chinook redd counts from 2014 spawning ground surveys.

Stream	WRIA	Survey method	Reach (RM)	Redds
Skagit River	3.0176	Flight	24.5-56.5	No flights conducted
Skagit River	3.0176	Flight	56.5-67.2	No flights conducted
Hansen Creek	3.0265	Foot	3.0-4.3	0

Day Creek	3.0299	Foot	0.0-2.2	8
Jones Creek	3.0332	Foot	0.0-1.3	0
Grandy Creek	3.0337	Foot	0.0-1.1	2
Alder Creek	3.0359	Foot	0.0-1.6	0
O'Toole Creek	3.0365	Foot	0.0-0.2	0
Pressentin Creek	3.0385	Foot	0.0-0.4	4
Finney Creek	3.0392	Foot	0.0-6.0	29
Jackman Creek	3.0626	Foot	0.0-0.7	0
EF Nookachamps	3.0230	Foot	3.5-5.1	2
Total redds:				45

Redd counts were provided from Grandy Creek and part of Finney Creek by the Upper Skagit Tribe. The Skagit Fisheries Enhancement group surveyed Hansen Creek and Alder Creek.

### 4.3 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 River. 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, and Deer, Grant, French, and Squire Creeks. The natural-origin fall stock spawns primarily in the mainstem and South Fork Stillaguamish River, in Pilchuck, Jim, and Canyon Creeks and in the North Fork Stillaguamish River. Escapement is currently estimated for North Fork and South Fork Stillaguamish Rivers 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 during each 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. Escapement was estimated using expansion of cumulative redd counts (2.5 fish per redd) from raft and foot surveys. Survey conditions for counting Chinook in the North Fork Stillaguamish were generally good throughout the spawning period, except below the mouth of Boulder River (RM 24.3) which added significant turbidity for most of the season. The first redds were detected August 25. Most redds were made by late-October with the final few constructed in early November. Flows in the North Fork were generally lower than normal for much of September through mid-October. Rain events in late-October and November caused elevated stream levels and temporarily hampered some surveys with decreased visibility.

A large mudslide that occurred on March 22, 2014 on the North Fork of the Stillaguamish River temporarily dammed the river at Oso, destroyed a neighborhood, and killed 43 people. The slide did not pose a barrier to upstream migration of adult Chinook but it did add a large amount of sediment and turbidity to the river during the 2014 smolt outmigration and affected spawning habitat and visibility downstream.

A total of 166 Chinook redds were counted on the North Fork of the Stillaguamish in 2014. The escapement estimate was 417 fish (141 NOR, 276 HOR). An additional 144 fish were taken for hatchery brood stock and were not included in the escapement estimate (57 NOR, 87 HOR). Total NOR North Fork Stillaguamish escapement (natural spawning + broodstock collection) was 176 Chinook. Table 4-8 lists redd counts and escapement estimates by surveyed reach. Table 4-10 lists HOR:NOR breakout.

Table 4-8. North Fork Stillaguamish summer Chinook redd counts in 2014.

<b>Stream</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	5	13
North Fork	5.0135	Foot/Float	14.3-30.0	115	288
North Fork	5.0135	Foot/Float	30.0-34.4	28	70
Grant Creek	5.0156	Foot	0.0-0.4	0	0
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	4	10
French Creek	5.0246	Foot	0.0-3.0	3	8
Squire Creek	5.026	Foot	0.0-4.0	11	28
Brown Creek	5.0265	Foot	0.0-1.0	0	0
<b>Total Redds</b>				<b>166</b>	
<b>Escapement Estimate</b>					<b>417</b>

#### **South Fork Stillaguamish Chinook**

South-Fork Stillaguamish Chinook escapement in 2014 was estimated using expansion of cumulative redd counts (2.5 fish per redd) 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), and Canyon, Jim, Siberia, and Pilchuck Creeks. River mile 34.7 to 55.1 include Granite Falls and Robe Canyon and are neither surveyable nor good Chinook spawning habitat.

Survey conditions were good while flows in the South Fork remained low. Rain generated flow pulses in late October and November reduced visibility during surveys. The mainstem aerial index reach, from the juvenile trap (RM 6.0) to the forks (RM 17.8) was flown three times, September 9, 12, and October 15.

A total of 6 Chinook redds were found in the South Fork Stillaguamish River in 2014. The escapement estimate was 15 adult fish. Redd counts by surveyed reach and escapement estimates are listed in Table 4-9. Table 4-10 in the carcass sampling section lists HOR:NOR breakdown.



Table 4-9. Stillaguamish fall (South Fork) Chinook redd counts in 2014.

<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	0	0
South Fork	5.0001	Foot/Float	17.8-34.7	6	15
South Fork (upper)	5.0001	Foot	34.7-65.0	0	0
Pilchuck Creek	5.0062	Foot/Float	0.0-6.2	0	0
Jim Creek	5.0322	Foot/Float	0.0-4.1	0	0
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>6</b>	
<b>Escapement Estimate</b>					<b>15</b>

### **Carcass sampling and escapement composition**

WDFW and Stillaguamish Tribe Natural Resources staff conducted spawning ground survey work and carcass sampling in the 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, 72 complete carcasses (status of both adipose fin and CWT was determined) were sampled in the Stillaguamish River, 72 in the North Fork reaches and zero in the South Fork reaches. An additional 10 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 19.9% for North Fork reaches, and 0.0% 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 4-10.

In 2014, too few carcasses were recovered in North Fork survey reaches below Deer Creek and in the Tributary reaches to produce valid HOR/NOR estimates. To account for this, sample results from the North Fork reaches above Deer Creek were applied to these under represented reaches to approximate HOR/NOR breakouts. In the South Fork, no carcasses were recovered and HOR/NOR breakouts there were based on averages of the previous two years.

Table 4-10. Stillaguamish Chinook carcass sampling and escapement composition in 2014.

	Escapement	No. Hatchery	No. Natural	% Hatchery	% Natural	No. Sample	% sampled
North Fork Stillaguamish							
NF Confluence to Deer Creek <sup>1</sup>	13	9	4	66.2%	33.8%	1	23.1%
NF above Deer Creek	358	237	121	66.2%	33.8%	71	22.1%
NF Tributaries	46	30	16	66.2%	33.8%	0	2.1%
<b>NF Totals</b>	<b>417</b>	<b>276</b>	<b>141</b>	<b>66.2%</b>	<b>33.8%</b>	<b>72</b>	<b>17.3%</b>
South Fork Stillaguamish <sup>2</sup>	15	3	12	20.0%	80.0%	0	0.0%
<b>Stillaguamish Totals</b>	<b>432</b>	<b>279</b>	<b>153</b>	<b>64.6%</b>	<b>35.4%</b>	<b>72</b>	<b>19.2%</b>

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, and Ashton creeks, and Boulder River

All "SF" reaches: Mainstem RM 0-17.8, South Fork Stillaguamish RM 17.8-70.0 and, Pilchuck, Jim, Siberia, and Canyon (RM 0.0-0.3) creeks.

<sup>1</sup>Due to low sample size, rates from the NF above Deer Cr. Reach were used for HOR/NOR breakout in this reach.

<sup>2</sup>Due to low sample size, the average of rates from the previous two years were used for HOR/NOR breakouts.

#### 4.4 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 River (between RM 49.6 and RM 51.1 and above Sunset Falls) and the North Fork Skykomish River (occasionally above Bear Falls at RM 13.1). The Snoqualmie stock spawns in the Snoqualmie River and its tributaries, including the Tolt and Raging Rivers, and Tokul Creek.

Escapement estimates of naturally spawning 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, float, and jet sled surveys, as well as aerial surveys conducted 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 yielding 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 moderate for most of the spawning season. Survey intervals were kept to seven to ten days except for when rain-fed flow pulses in late-October and November caused minor survey delays. Four aerial surveys were flown on the Mainstem Snohomish, Skykomish and North and South Fork Skykomish Rivers between September 21 and November 14.

A total of 1,087 Chinook redds were found in the Skykomish River and its tributaries in 2014. The spawning escapement estimate (including Sunset Falls trap counts) was 3,063 adult fish (1,654 NOR, 1,409 HOR). An additional 4,085 adult fish recruited to Wallace Hatchery and were not included in this escapement estimate (120 NOR and 3,965 HOR). Total NOR Skykomish escapement (natural spawning + broodstock collection) was 1,770 Chinook. Redd counts and escapement estimates by surveyed reach are listed in Table 4-11. Table 4-13 summarizes HOR:NOR results.

Table 4-11. Skykomish summer/fall Chinook redd counts and escapement, 2014.

Stream Reach	WRIA	Method	Reach (RM)	Redds	Escapement
Snoh-Sky (Mainstems)	7.0012	Float/Flight	20.5-51.5	434	1,085
NF Skykomish	7.0982	Foot/Flight	0.0-13.5	142	153
SF Sky (Sunset Falls)	7.0012	Trap/Haul	51.5-up	-	344
Pilchuck River	7.0125	Foot/Float	2.0-26.5	27	68
Woods Creek	7.0826	Foot/Float	0.0-3.5	2	5
Elwell Creek	7.0865	Foot	0.0-1.0	0	0
Sultan River	7.0881	Foot/Float	0.0-9.7	146	365
Wallace River (lower)	7.094	Foot/Float	0.0-4.4	164	410
Wallace River (upper)	7.094	Foot/Float	4.4-7.3	126	315
Olney Creek	7.0946	Foot	0.0-0.6	3*	8
Proctor Creek	7.097	Foot	0.0-0.4	0	0
Bridal Veil Creek	7.1248	Foot	0.0-0.4	43*	108
<b>Total Escapement</b>				<b>1,087</b>	<b>3,063</b>

\*In Olney and Bridal Veil Creeks, carcass counts were greater than redd-based escapement estimates, therefore carcass counts were used as minimum escapements in these creeks.

### 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 late October elevated stream flows and turbidity and caused temporary interruptions in survey coverage.

In 2014, the escapement of 838 Chinook in the Snoqualmie Basin was based on a total count of 335 redds. Table 4-12 lists redd counts and escapement estimates by survey reach for Snoqualmie fall Chinook. Table 4-13 shows the HOR:NOR breakdown by reach.

Table 4-12. Snoqualmie fall Chinook redd counts and escapement by reach, 2014.

<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	39	96
Snoqualmie River (Upper)	7.0219	Float	32.9-39.6	132	330
Cherry Creek	7.0240	Foot	1.8-3.5	2	5
Tolt River (Lower)	7.0291	Foot/Float	0.0-6.0	52	130
Tolt River (Upper)	7.0291	Foot/Float	6.0-8.9	5	13
SF Tolt River	7.0302	Foot	0.0-2.3	8	20
Raging River	7.0384	Foot	0.0-4.6	39	98
Raging River (Upper)	7.0384	Foot	4.6-13.2	35.5	89
Tokul Creek (Lower)	7.044	Foot	0.0-0.3	18	45
Tokul Creek (Upper)	7.044	Foot	0.3-0.6	0	0
<b>Total Redds</b>				<b>335</b>	
<b>Escapement Estimate</b>					<b>838</b>

#### **Sampling and HOR:NOR summary**

Field staff sampled 215 complete Chinook carcasses (status of CWT, otolith mark, and adipose fin mark are known) within the Snohomish basin. Additionally, adipose fin and CWT status was determined for 69 live Chinook passed at Sunset Falls. In total, the Chinook carcass sampling rate on the spawning grounds and at Sunset Falls was 9.3% (Table 4-21). 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 4-13.

Table 4-13. Snohomish Chinook carcass sampling and escapement composition in 2014.

Stratum	Escapement	No. Hatchery	No. Natural	% Hatchery	% Natural	Number Sampled	Percent Sampled
Skykomish	1,098	366	732	33.3%	66.7%	99	9.0%
Bridal Veil	463	163	300	35.3%	64.7%	34	7.3%
SF Sky (Sunset Falls)*	344	115	229	33.3%	66.7%	69	20.1%
Pilchuck River	68	14	54	20.4%	79.6%	2	2.9%
Sultan River	365	122	243	33.3%	66.7%	27	7.4%
Wallace River	725	629	96	86.8%	13.2%	53	7.3%
<b>Skykomish Population</b>	<b>3,063</b>	<b>1,409</b>	<b>1,654</b>	<b>46.0%</b>	<b>54.0%</b>	<b>284</b>	<b>9.3%</b>
Snoqualmie	793	118	675	14.9%	85.1%	87	11.0%
Tokul	45	23	23	50.0%	50.0%	34	73.9%
<b>Snoqualmie Population</b>	<b>838</b>	<b>141</b>	<b>698</b>	<b>16.8%</b>	<b>83.3%</b>	<b>121</b>	<b>14.4%</b>
<b>Snohomish Total</b>	<b>3,901</b>	<b>1,550</b>	<b>2,352</b>	<b>39.7%</b>	<b>60.3%</b>	<b>405</b>	<b>10.4%</b>

\*Sunset Falls sample: A sub-sample of Chinook passed upstream were sampled for cwt wire and adipose mark

**Key for Grouped Stratum and Populations:**

**Skykomish Population:**

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)

**Snoqualmie Population:**

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)

## 4.5 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 of the mainstem river, where every Chinook redd 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 to the Cedar Falls powerhouse (RM 34.5), 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 to a redd.

In 2014, a total of 227 Chinook redds were observed in the mainstem Cedar River during the spawning season (including the surveyed area upstream from Landsburg Dam, 204 below Landsburg Dam and 23 above). Chinook redds in tributaries have not traditionally been counted and are not part of the 1,680 UMT for Cedar Chinook. In 2014, 5 additional Chinook redds were observed in Taylor Creek, a small tributary to the Cedar River, and are not included in the mainstem escapement estimate. Expansion by 2.5 fish per redd resulted in the estimated mainstem escapement of 568 Chinook. A total of 342 adult Cedar River Chinook were

sampled for adipose fin clips in 2014. This sample indicated that 54% of the Cedar River Chinook were NORs (unclipped) and 46% were hatchery origin (clipped) fish.

#### **4.6 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 downstream of Issaquah Salmon Hatchery. Chinook natural escapement to the Sammamish River/ North Lake Washington tributaries in 2014 was estimated at 482 fish.

##### **Big Bear/Cottage Lake Creeks**

Escapement estimation to Big Bear Creek and Cottage Lake Creek involves weekly surveys of all known Chinook spawning areas to enumerate live 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 during the 2014 spawning season. The escapement estimate was 104 fish. Of these, 32 fish were counted in the Bear Creek mainstem, and 72 fish were counted in the Upper and Lower Cottage Creek Indexes. A total of 49 Chinook were sampled for adipose fin clips in 2014. This sample indicated that 12% of all Chinook in the Bear/Cottage system were NORs (unclipped) and 88% 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 2014 spawning season and total escapement was estimated at 378. This estimate includes 333 fish in the mainstem below the hatchery and 45 fish from the East Fork. A total of 173 adult Chinook from the Issaquah Creek system were sampled for adipose fin clips in 2014. This sample indicated that 6% of all Chinook in the Issaquah Creek system were NORs (unclipped) and 94% were hatchery origin fish.

Chinook escapement to Issaquah Hatchery in 2014 was 1,872; 560 of which were intentionally released upstream to spawn in upper Issaquah Creek. No Chinook returned to the University of Washington hatchery program in 2014; the first year of zero return since the program was discontinued.

#### **4.7 Green River**

Beginning in 2009, Muckleshoot (MIT) and WDFW Biologists agreed to attempt weekly counts of new Chinook redds in all reaches of the Green River and Newaukum Creek where adequate survey conditions existed, during Chinook spawning ground surveys. Since so few redds were being dug, it appeared possible to count all redds in all reaches. This estimation methodology uses season total redd counts, without adjustment, in four of the six sections of the mainstem

Green River. At the conclusion of the spawning season, the observed number of redds in these sections of the river are known with zero variance, although there may be observational error in these estimates and/or spawning outside the surveyed sections. However, such factors operate in all sampling programs and are rarely included in any variance estimates.

New Chinook redds were counted weekly over three days in the mainstem river between River Mile (RM) 33.8 to 48.5 (Lower River, Middle River, and Lower Gorge) and 56.2 to 61.0 (Headworks). The Lower River (RM 26.8 to 33.8) was surveyed every two weeks. Using two, one-man pontoon boats or two, two-man boats, crews worked in tandem to count redds left and right of the center of the river. Foot surveys of Chinook naturally spawning in Newaukum Creek were conducted weekly by WDFW crews from the creek mouth to river mile 3.9. Redds in the Metzler Side Channel (MSC) were counted opportunistically when adequate water filled the side channel, in a similar manner. Only those redds that could reasonably be presumed to be Chinook redds were counted, based on the presence of a female observed digging or guarding the redd, or when redd size and substrate size were unambiguous.

A rigorous surveying schedule began the week of September 7 and continued through the week of November 2. Surveys were suspended during the week of October 26 when high flows were prohibitive. A redd count from Metzler Side Channel was conducted on October 8 and 21. These redds were added to the weekly count for the Middle River. The weekly number of redds counted in each section, was summed, without adjustment, to produce the season total redd count by section.

On October 9, 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. Pending amenable weather conditions, flights were timed to coincide with the historical peak of natural Chinook spawning activity which typically occurs the first or second week in October. Flight scheduling was limited by availability of the helicopter as well as weather and river conditions.

Escapement was calculated for the sections of the river not surveyed by boat: "Gorge", RM 48.5 to 56.2, and "Hwy 167 to Transfer Shack", RM 25.4 to 26.7. The season total redd count from the section just below the Gorge (Lower Gorge section: RM 44.3 to 48.5) was divided by the number of redds in the Lower Gorge section counted on the flight, resulting in the "Ground to Air Ratio" (G/A). The G/A was then multiplied by the number of redds observed in the Gorge on the day of the flight. Similarly, for the Hwy 167 to Transfer Shack section, the season total redd count was calculated using RM 29.7 to 30.0 for a ground to air ratio.

Season total redd counts from boat and 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.

Post season analysis of the season totals indicate that spawning activity peaked during the weeks of September 28 or October 5 (depending on section) in the mainstem and the week of September 28 in Newaukum Creek (Table 4-14 and Table 4-15). By the end of surveys the week of October 12, 95.9% of the total season redds observed during boat and foot spawning ground surveys were complete (820 of 855).

Table 4-14. Chinook redd counts from foot and boat surveys of the Green River in 2014.

Section	Week									Total
	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	2-Nov	
Headworks	-	-	53	72	43	68	-	-	-	236
Lower Gorge	-	0	5	13	40	37	10	-	-	105
Middle River	1	8	41	97	81	60	10	-	0	298
Lower River	-	-	5	-	30	-	12	-	-	47
Newaukum Creek	-	0	26	60	44	36	3	-	-	169
Total	1	8	130	242	238	201	35	-	0	855

Table 4-15. Aerial survey counts of Chinook redds in the Green River, 2014.

Section	Week									Total
	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Pct	19-Oct	26-Oct	2-Nov	
Headworks	-	-	-	-	112	-	-	-	-	112
Gorge	-	-	-	-	103	-	-	-	-	100
Lower Gorge	-	-	-	-	47	-	-	-	-	55
Middle River	-	-	-	-	153	-	-	-	-	149
Lower River	-	-	-	-	52	-	-	-	-	52
Hwy 167- Transfer Shack	-	-	-	-	2	-	-	-	-	2
Total	-	-	-	-	469	-	-	-	-	469

<sup>1</sup> Aerial counts can include redds still visible from prior weeks and thus exceed boat counts for the same week.

The season total redd count from the Lower River was 47 including two from Highway 167-Transfer Shack, 298 redds in the Middle River including seven from MSC, 105 from the Lower Gorge, and 236 from the Headworks. The G/A ratio for the Lower Gorge was 2.23 (105/47) resulting in a calculation of 230 redds for the "Gorge". A total of 923 redds were counted or calculated 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" was 71 and for the section "Whitney Hill Bridge" to mouth" was 98, totaling 169 redds in Newaukum Creek.

Applying the constant 2.5 fish/redd (1.5 males:1.0 female), an estimate of 2,730 naturally spawning Chinook was generated for the Green River Basin.

During the season, 514 adults that returned to the Soos Creek hatchery were tagged by the Muckleshoot Indian Tribe, hauled upstream in the mainstem, and released. 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 2014 Chinook spawning season remained moderate until approximately the final week of surveys when flows increased, but spawning activity was virtually complete by that time (Table 4-16).



Table 4-16. Average weekly discharge (cfs) at two locations on the Green River (Palmer USGS Gage 12106700, Auburn USGS Gage 12113000, and Newaukum USGS Gage 12108500) in 2014. Weekly discharges are averages for a 7-day period beginning with the day listed.

USGS Gauge	Week								
	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	2-Nov
Palmer	230	263	434	461	443	523	926	1,558	986
Auburn	365	384	569	612	602	750	1,235	2,133	1,455
Newaukum Cr.	17	16	23	19	16	30	50	84	43

### Carcass sampling

Naturally spawning Chinook carcasses (clipped and unclipped) were sampled opportunistically during spawning ground surveys in the mainstem and Newaukum Creek. Biological data were collected from these carcasses, and a "Percent Egg Retention" variable was determined. The "Percent Egg Retention" variable was determined by inspection of the gonads of all female carcasses. The proportion of eggs estimated to have been retained was noted for carcasses where eggs remained in the body cavity and a photograph was taken. A carcass noted as having 25% egg retention was estimated to have expelled 75% of her total eggs. Additionally, tagged fish from re-released hatchery returns were noted for all sampled carcasses.

A total of 604 carcasses were sampled for standard biological data by Green River crews in 2014 (Table 4-17); 459 (2 DIT (CWT+unclipped) + 14 CWT&AD + 443 AD) or 76.0% were of hatchery origin as indicated by the presence of an adipose fin and/or presence of a CWT tag (Table 4-18).

Table 4-17. Summary of Chinook biological sampling in the Green River, 2014.

Section	Biological Samples	Egg Retention Photos	MIT Tags <sup>1</sup>	CWT <sup>2</sup>	DIT <sup>3</sup>
Lower Gorge	51	25	3	0	0
Middle River	113	62	16	4	0
Lower River	24	9	0	2	1
Metzler Side Channel	12	1	0	0	0
<b>SubTotal: River</b>	<b>356</b>	<b>152</b>	<b>19</b>	<b>6</b>	<b>1</b>
Newaukum: 400th to Whitney Hill Br	132	29	30	0	0
Newaukum: Whitney Hill Br to Mouth	116	40	27	10	1
<b>SubTotal: Newaukum</b>	<b>248</b>	<b>69</b>	<b>57</b>	<b>10</b>	<b>1</b>
<b>Grand Total:</b>	<b>604</b>	<b>221</b>	<b>76</b>	<b>16</b>	<b>2</b>

<sup>1</sup>"MIT tags"; the number of sampled fish with MIT tags, or those identified as having lost the MIT tag.

<sup>2</sup>CWT = Coded wire tag present (indicated by electronic detection);

<sup>3</sup>DIT = Double Index Tag; Adipose fin present, coded wire tag present.

Table 4-18. Coded wire tag sampling and origin of natural Chinook spawners in the Green River, 2014.

	Sampled					Adipose present		Adipose Clip	
	Number <sup>2</sup>	NOS	HOS	CWT	No CWT	DIT	no CWT	CWT	no CWT
Green River	356	109	246	3	350	1	108	5	241
Newaukum Creek	248	33	213	10	238	1	32	9	204
Green River Basin Total	604	158	459	16	588	2	140	14	445

<sup>2</sup>Includes 3 carcasses (1 Green River + 2 Newaukum Creek) for which adipose fin presence was unknown.

#### 4.8 White River

The escapement estimate for White River Spring Chinook is derived from trap counts at the Army Corps of Engineers' Buckley Diversion Dam fish trap and hatchery returns to the White River Hatchery (WRH). The WRH and Buckley Trap are on opposite sides of a diversion dam on the White River. Off-site propagation of White River Spring Chinook also occurs at the Minter Creek/Hupp Springs Hatchery, and returns to that facility are recorded separately. Under ideal conditions, the Buckley Trap allows sampling and enumeration of all fish transported to the upper White River watershed. During odd years when pink salmon return and during years of relatively high coho returns (all years since 2003), sampling at the Buckley trap is limited, particularly during the latter part of the Chinook run. As a consequence, the proportions of hatchery and natural-origin spring and fall Chinook transported above the dam are uncertain. Records of trap and haul operations conducted in the absence of state or tribal fisheries managers are a subject of ongoing concern. In 2014, complete sampling occurred through September 17<sup>th</sup>, but 266 Chinook (including jacks) of unknown origin were transported upstream after this date.

The total number of fish sampled at the White River Hatchery and the Buckley Trap prior to the termination of sampling was 2,263 adults. Of these, 734 were natural-origin (NOR) and acclimation pond (AP) recruits. NORs made up 17% and APs made up 43% of the sampled Chinook. The ratio of adipose clipped to non-clipped fish among sampled fish was applied to unsampled fish passed upstream after September 17<sup>th</sup>. Eighteen adult NORs were taken to the White River Hatchery for use as broodstock.

Table 4-19. Estimated Number of NOR and Acclimation Pond Chinook hauled upstream of Buckley fish trap in 2014.

Origin	Adults	Jacks	Totals
Wild (NOR)	245	90	335
Acclimation Pond	637	183	820
<b>Totals</b>	<b>882</b>	<b>273</b>	<b>1,155</b>

There are two hatchery programs for White River spring Chinook: the Minter Creek/Hupp Springs program and the White River Hatchery. The Minter Creek/Hupp Springs program was initiated in the mid-1970's in response to steep declines in population abundance. The spring Chinook program was subsequently expanded following completion of the Muckleshoot Tribe's White River Hatchery in 1989. In 2014, escapement to the Minter Creek/Hupp Springs hatchery was 382 (i.e., 361 adults and 21 jack). None of these fish were taken to the White River Hatchery. Escapement to the White River Hatchery in 2014 was 983 (782 adults and

191 jacks). These fish were either collected at the Buckley fish trap on the south side of the diversion dam, or volunteered to the WRH trap on the north side of the diversion dam.

#### **4.9 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 2014. Extreme low flows may have resulted in fish spawning lower in the system compared to recent years. The cumulative redd count of 163 in South Prairie Creek, expanded by 2.5, yielded an escapement estimate of 408 spawners. In Wilkeson Creek, the cumulative redd count of 2, expanded by 2.5, yielded an escapement estimate of 5 spawners. The South Prairie Creek (SPC) sub-basin total spawning escapement estimate for 2014 is 408. Based on mark-sampling of carcasses observed, about 44% of these fish were unmarked, so the escapement was made up of 180 NORs and 228 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 was an accurate redd count 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 spawn timing curve with a high degree of confidence.

Survey conditions were not suitable on the Carbon River during the 2014 spawning period. Consistent with the last ten years, the 2014/1999 SPC escapement ratio ( $335 / 1422 = 0.2356$ ) was applied to the 1999 Carbon River escapement (250) to estimate the 2014 value. This method estimated 59 Chinook spawning in the Carbon during 2014 ( $250 * 0.2356 = 59$ ). Based on mark sampling ratios observed in South Prairie Creek, the escapement was made up of 26 NORs and 33 HORs.

##### Mainstem Puyallup River Tributaries

Aggregate escapement to Puyallup River tributaries in 2014 was estimated at 304 (Table 4-20). Based on mark sampling in these tributaries, excluding Clark's Creek, 20 of these fish are NORs and 284 HORs.

Redd-based escapement estimates were calculated for most of the Puyallup River tributaries. Clarks Creek escapement was 218 fish.

Table 4-20. Chinook escapement estimates for Puyallup River tributaries, 2014.

	Escapement
Fennel Creek (WRIA 10.0406)	10
Canyon Falls Creek (10.0410)	3
Kapowsin Creek (10.0600)	25
Clear Creek (10.0022)	48
Clarks Creek (10.0027)	218
Tributary total	304

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, so the origin of natural spawners cannot be estimated.

#### Mainstem Puyallup River

Chinook spawning escapement to the mainstem Puyallup River was estimated to be 440. This escapement comprised 220 NOR and 220 HOR Chinook, based on mark sampling ratios observed in mainstem tributaries.

As with the Carbon River, surveys of Puyallup River were not possible in 2014. WDFW and PTF staff believe that mainstem spawning escapement is closely related to the tributaries (Fennel, Canyon Falls, Kapowsin, and Clarks creeks). Therefore, the 2014/1999 Puyallup tributary ratio ( $255/113 = 2.2566$ ) was applied to the estimated 1999 Puyallup mainstem escapement (195) to estimate 2014 escapement of 440 Chinook ( $195 * 2.2566 = 440$ ).

The 2014 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 2014 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. We assume the proportion of hatchery origin fish spawning in Clark’s Creek is higher than in the mainstem and other tributaries.

#### Lower White River

The fall component of Chinook spawning in the lower White River and its tributaries, downstream of the Buckley trap, are included in the 2014 Puyallup River basin fall Chinook escapement estimate. Spawning ground surveys indicate that, in some years, a sizeable number of Chinook spawn 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 2014 was estimated to be 228 fish. This escapement is made up of 70 NORs and 158 HORs based on mark sampling ratios observed during spawning ground surveys.

#### Total Puyallup Escapement

The estimated total number of naturally spawning fall Chinook in the Puyallup basin in 2014 was 1,444. Based on carcass sampling, we estimated that 518 were NORs, and 926 were HORs. The estimate of NORs assumes the proportions of hatchery and natural origin spawners is the same in Puyallup River tributaries (except Clark's Creek), the Puyallup River mainstem, South Prairie Creek, and the Carbon River.

### **4.10 Nisqually River**

Escapement to the Nisqually River in 2014 was estimated using a change in ratio methodology (Seber, 1982). This method uses (1) the proportion of marked fish entering the river (as estimated by sampling tribal gillnet catch), (2) the total removals below the weir (in all fisheries and hatchery returns) and proportion of those removals marked, and (3) 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 Nisqually River was estimated to be 968 Chinook salmon (482 HOR, 486 NOR). Twelve Chinook salmon trapped at the weir were removed from the river, leaving a total return of 956 fish (471 HORs and 485 NORs) to the river.

## 4.11 Hood Canal

Natural Chinook escapement to the Skokomish River and Mid-Hood Canal rivers in 2014 were 849 and 141, respectively (Table 4-21).

Table 4-21. Summary of Chinook escapement to Hood Canal streams during 2014.

Marine Area	Stream	Spawner escapement	Comments
--	Skokomish R.	539	Redd counts + AUC in Hunter Cr. INDEX
	N.F. Skokomish R.	270	Redd counts + redds in McTaggart
	S.F. Skokomish R.	40	Redd counts + redds in Vance
	Total	849	
12A	Little Quilcene R.	0	No chinook observed
	Big Quilcene R.	0	No chinook observed
	Total	0	
12B	Dosewallips R.	11	Redd counts + Rockybrook live/dead
	Duckabush R.	13	AUC
	Hamma Hamma R. a/	117	Hamma AUC + John Creek AUC
	Total	141	
12C	Dewatto R.	0	AUC
	Lilliwaup Cr.	1	AUC
	Total	1	
12D	Tahuya R.	20	AUC
	Union R.	33	Observed during summer chum trapping
	Total	53	
<b>Hood Canal total</b>		<b>1,044</b>	

a/ Hamma natural escapement = 78, broodstock = 0, John Ck = 39

### 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 the Dosewallips and Duckabush rivers have also been regularly surveyed since 1998, but few adults have been observed. Current escapement estimates are derived from combinations of live Chinook adult counts and Chinook redd expansions, depending on flow conditions and fish distributions.

In the Hamma Hamma River, most of the Chinook spawning area is currently being surveyed. A cooperative supplementation program was initiated in 1995 to rebuild Chinook abundance.

Prior to 1998, escapement had been estimated from counts of cumulative new redds and/or from live Chinook using the area-under-the curve (AUC) method. However, since returns increased as the result of supplementation, the AUC method has been employed as the primary method of escapement estimation.

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).

The WDFW conducted spawner surveys 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 141 adults: 11, 13, and 117 Chinook in Dosewallips, Duckabush, and Hamma Hamma rivers, respectively. During 2014, 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 accurate.

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. No Chinook redds were observed and the escapement estimate based on AUC with 4 live fish observations in the Dosewallips River during 2014. The Duckabush River was surveyed from RM 0 to RM 2.6, RM 4.8 to RM 6. Although no Chinook redds were identified, a minimum of 4 individual live adults were observed in successive surveys and the escapement estimate is 13 Chinook in the Duckabush River during 2014. 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 estimated total escapement to the Hamma Hamma is 117 which is the sum of the AUC estimate of natural spawners in the mainstem (78), 39 in John Creek, and no Chinook collected for broodstock). The FRAM pre-season escapement projection was 469 for the Mid-Hood Canal (FRAM 2814) while actual escapement was 117 Chinook. A late September freshet was responsible for the high number of Chinook in Johns Creek for this time of year. 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 15.7 (where Little Falls blocks further access). Natural escapement estimates are based on counts of Chinook redds in the 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). Since 2008, surveys have been conducted from RM 0 to RM 5.5 in the South Fork, and included in the total escapement estimate. In addition, escapement estimates are made for Vance Creek and Hunter Creek.

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 2014, however, Chinook had limited access the South Fork Skokomish throughout the season.

The total estimated spawner escapement to the Skokomish River is 849. This total includes 450 in the mainstem Skokomish, 89 Chinook in Hunter Creek, 270 Chinook in the North Fork, and 40 Chinook in the lower (RM 0 to RM 5.5) South Fork Skokomish. The pre-season escapement prediction was 1,544 (FRAM 2814).

### **Mark Sampling**

Mass marking has been implemented for releases from George Adams Hatchery, Hoodspout Hatchery, and Endicott Ponds. Double index tag groups have been released from George Adams Hatchery since 1998. The proportion of all Hood Canal hatchery Chinook 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 from Chinook returning to George Adams Hatchery since 1988.

There has been more intensive sampling of Chinook on the spawning grounds since 1998. During 2014, 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.

Of the 90 Chinook sampled in Hood Canal rivers during 2014, 65 Chinook were adipose-clipped and, of these, two Chinook had CWTs. Four unmarked Chinook were coded-wire tagged. We sampled 5.3% of Chinook spawner escapement in the Skokomish River, 7.12% of the Mid-Hood Canal Chinook spawner escapement (in the Hamma Hamma, Duckabush, and Dosewallips rivers), and had an overall sampling rate of 8.6% in all Hood Canal rivers combined (Table 4-22).

Jacks are not included in Chinook spawner escapement estimates in Hood Canal, but few jacks were sampled during 2014.

The proportion of hatchery fish in the spawning escapement is estimated based on age composition in the escapement, carcass sampling rate, and the proportion of hatchery production releases that were marked and/or tagged from BY 2009 (age 5), BY 2010 (age 4), and BY 2011 (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, 34 of 45 (75.6%) Chinook sampled were adipose-marked (Table 4-22). A preliminary estimate is that spawning escapement in the Skokomish River was comprised of about 76% hatchery-origin Chinook and 24% natural-origin Chinook, with little ability to detect variation in composition in the three principal reaches due to low run size.

Hatchery releases into the Hamma Hamma River are 100% CWT and otolith marked. All Chinook carcasses were sampled for otoliths during 2014. In the Hamma Hamma River, 10 of 14 (71%) Chinook sampled had a CWT. Preliminary estimates are that spawning escapement comprised 71% hatchery-origin Chinook and 29% natural-origin Chinook in the Hamma



Hamma River. No Chinook carcasses were sampled in the Duckabush or Dosewallips rivers in 2014. Preliminary estimates based on CWT recoveries indicated that spawning escapement for Mid-Hood Canal Chinook was comprised of 71% natural-origin and 29% hatchery-origin Chinook.

Table 4-22. Chinook carcass sampling in Hood Canal rivers, 2014.

Mgmt Unit	River	Spawner escapement	Chinook sampled		Tagged 1/			Untagged 1/			Unk. tagged 2/			Totals		Rate	HOR	NOR
			Number	%	AD	NM	Unk	AD	NM	Unk	AD	NM	Unk	recovered	AD-clips observed			
Skokomish	Mainstem Skokomish R.	539	43	8.0%	1	0	0	31	7	4	0	0	0	1	32	0.74	407	132
	N.F. Skokomish R.	270	1	0.4%	0	0	0	0	0	0	1	0	0	0	1	1.00	204	66
	S.F. Skokomish R.	40	1	2.5%	0	0	0	1	0	0	0	0	0	0	1	1.00	30	10
	<b>Skokomish River total</b>	<b>849</b>	<b>45</b>	<b>5.3%</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>32</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>34</b>	<b>0.76</b>	<b>641</b>	<b>208</b>
12A	Big Quilcene R.	0	0	0.0%	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0
	Little Quilcene R.	0	0	0%	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0
12B	Hamma Hamma R. 3/	117	14	12.0%	0	10	0	0	4	0	0	0	0	10	0	0.71	84	33
	Duckabush R.	13	0	0.0%	0	0	0	0	0	0	0	0	0	0	0	0.00	9	4
	Dosewallips R.	11	0	0.0%	0	0	0	0	0	0	0	0	0	0	0	0.00	8	3
	<b>Mid-Hood Canal total</b>	<b>141</b>	<b>14</b>	<b>9.9%</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0.71</b>	<b>101</b>	<b>40</b>
12C	Dewatto R.	0	0	0.0%	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0
	Lilliwaup R.	1	0	0.0%	0	0	0	0	0	0	0	0	0	0	0	0.00	0	1
12D	Tahuya R.	20	2	10.0%	0	0	0	2	0	0	0	0	0	0	2	1.00	20	0
	Union R. 2/	33	33	100.0%	1	0	0	28	5	0	0	0	0	1	29	0.88	29	4
	<b>Hood Canal total</b>	<b>1,044</b>	<b>94</b>	<b>9.0%</b>	<b>2</b>	<b>10</b>	<b>0</b>	<b>62</b>	<b>16</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>65</b>	<b>0.76</b>	<b>791</b>	<b>253</b>

1/ AD = adipose fin-clipped; NM = no mark; Unk = unknown  
 2/ Visual +Electronic detection only live fish at the trap  
 3/ Supplementation Origin Fish calculated from otolith recoveries

natural escapement = 253  
 hatchery escapement = 791

## 4.12 Dungeness

Since 1986, surveys by foot 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 2014, 39 redds (98 adults) were counted in the Dungeness and 4 redds (10 adults) were counted in the Gray Wolf (Table 4-23) for a total escapement of 108 spawners. There were an additional 96 adults removed from the river and used for broodstock. The total estimated return to the river was 204, and was lower than the FRAM projected escapement of 287. 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 94 carcasses sampled for scales and checked for CWTs. The majority of the adults sampled for scales and CWTs were collected from the lower river for broodstock. Based on the CWT results and scale samples analyzed, the preliminary HOR/NOR composition for RY2014 was 80.8% HOR and 19.2% NOR (Table 4-24) in the natural spawning population of 108. The numbers in Table 4-23 are preliminary and subject to change until otolith analysis from unmarked and untagged Chinook have been verified.

Table 4-23 The distribution of Chinook redds in the Dungeness Rivers system, 2010–2014.

	SURVEY REACHES (miles)		Total	2010	2011	2012	2013	2014
	Lower RM	Upper RM	Miles					
<b>DUNGENESS RIVER</b>								
Mouth to Woodcock Bridge	0.5	3.3	2.8	17	18	68	2	18
Woodcock Bridge to Hwy 101	3.3	6.4	3.1	17	46	40	13	1
Hwy 101 to Taylor Cut-Off - May	6.4	9.2	2.8	37	63	44	6	5
Taylor Cut-Off - May to Canyon Ck.	9.2	10.8	1.6	38	34	26	5	6
Canyon Creek to Clink Bridge	10.8	13.8	3.0	14	30	14	5	4
Clink Bridge to Forks Campground	13.8	15.8	2.0	8	12	3	0	4
Forks Campground to East Crossing	15.8	17.5	1.7	5	3	1	0	1
East Crossing to Gold Creek	17.5	18.7	1.2	0	1	0	0	0
<b>GRAY WOLF RIVER</b>								
Mouth to RM 1.0 Bridge	0.0	1.0	1.0	0	6	2	0	0
RM 1.0 Bridge to Above 2 Mile Camp	1.0	2.5	1.5	2	1	5	0	3
Above 2 Mile Camp to Cliff Camp	2.5	4.0	1.5	0	0	0	0	0
Cliff Camp to Slab Camp	4.0	5.1	1.1	0	0	0	0	1
Slab Camp and upstream 1 mile	5.1	6.1	1.0	0	0	0	0	0
Grand total				138	214	203	31	43

Table 4-24 Chinook coded wire tag recoveries from the Dungeness River in 2014.

No. recovered carcasses	Tag number/ Mark/Tag status	Brood year	No. released	Size at release	Release site	Estimated number in spawning population of 108	Percent HOR in escapement of 108	Percent NOR in escapement of 108	Estimated number in terminal run 204	Percent of terminal run
1	211022	2012	48,898	58-62/lb	Upper Dungeness	No estimate	No estimate	No estimate	No estimate	No estimate
1	211066	2012	154,847		Skookum Creek-stray	No estimate	No estimate	No estimate	No estimate	No estimate
7	210968	2011	56,080	55.5/lb	Greywolf Accl. pond	8	7.5%		15	7.3%
8	210969	2011	54,104	42.5/lb	Dungeness Hatchery	9	8.5%		17	8.4%
16	210970	2011	53,786	53/lb & 58/lb	Upper Dungeness	18	17.0%		34	16.7%
5	210971	2011	51,984	7.4/lb	Hurd Creek	6	5.3%		11	5.2%
22	210894	2010	48,817	52/lb	Greywolf Accl. pond	25	23.4%		47	22.3%
4	210895	2010	39,931	8.5/lb	Hurd Creek	5	4.3%		9	4.2%
8	210986	2010	27,387	54/lb	Dungeness Hatchery	9	8.5%		17	8.4%
1	210893	2009	43,242	9-9.5/lb.	Hurd Creek	1	1.1%		2	1.0%
3	210563	2009	49,594	52 / lb.	Greywolf Accl. pond	3	3.2%		6	3.1%
1	210773	2009	50,400	59 / lb.	Dungeness Hatchery	1	1.1%		2	1.0%
1	635270	2009	101,892		Elwha Hatchery-stray	1	1.1%		2	1.0%
0	210846	2008	48,975	78 / lb.	Greywolf Accl. pond	0	0.0%		0	0.0%
0	210847	2008	49,750	44 / lb.	Greywolf Accl. pond	0	0.0%		0	0.0%
0	210848	2008	49,600	6.2 / lb.	Dungeness Hatchery	0	0.0%		0	0.0%
0	210849	2008	49,600	9.9 / lb.	Dungeness Hatchery	0	0.0%		0	0.0%
TBD b/	No CWT+ No Mark HOR	2011							0 b/	
6 b/	No CWT+ No Mark NOR	2011						6.4%	14 b/	6.7%
TBD b/	No CWT+ No Mark HOR	2010							0 b/	
8 b/	No CWT+ No Mark NOR	2010						8.5%	19 b/	9.3%
TBD b/	No CWT+ No Mark HOR	2009							0 b/	
4 b/	No CWT+ No Mark NOR	2009						4.3%	10 b/	4.7%
<b>Totals 94 a/</b>						<b>108</b>	<b>80.8%</b>	<b>19.2%</b>	<b>204</b>	

a/ Excluded 2 year olds (n=2) in spawning escapement.

b/ Final HOR-NOR determination for No CWT+ No Marked Chinook depends on otolith analyses

The age of the HOR Chinook for RY2014 consisted of 77 (47.8%) age 3, 74 (46.0%) age 4, 10 (6.2%) age 5, and no age 6 for a total of 161. The age of the NOR Chinook consisted of 14 (32.6%) age 3, 19 (44.2%) age 4, 10 (23.5%) age 5, and no age 6 (Table 4-25) for a total of 43. The combined by the following age groups: 91 (age 3), 92 (age 4), 20 (age 5), and zero (age 6). Two CWT age 2 Chinook carcasses were observed during the season. Age 2 Chinook were not used for escapement expansion estimates.

Table 4-25. The age and origin of Chinook returns to the Dungeness River in 2014.

Age	Number HORs	Percent HORs	Number NORs	Percentage NORs	Total HOR+NORs	Percent
3	77	47.8%	14	32.6%	91	44.6%
4	74	46.0%	19	44.2%	93	45.6%
5	10	6.2%	10	23.5%	20	9.8%
6	0	0.0%	0	0.0%	0	0.0%
Total	161		43		204	100.0%

#### **4.13 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. In August 2014, the Glines Canyon Dam was removed. Before dam removal, Chinook surveys were conducted by raft and foot surveys. On September 17<sup>th</sup> 2014, 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 4-26 and Table 4-27. Three Elwha tributaries (Hughes Creek, Little River, and Indian Creek) as well as the area immediately upstream of the Glines Powerhouse, were also included with these surveys. A total of 812 and 534 Chinook redds were observed upstream and downstream of the lower Elwha dam site, respectively, in the mainstem Elwha River, 12 redds in Hughes Creek, one redd in Little River, and 26 in Indian Creek for a total of 1,308. A single redd was counted immediately upstream of the Glines Powerhouse site.

Table 4-26. The distribution of Chinook spawning in the Elwha River in 2014.

Elwha River – Section surveyed	RM sections	No. of Redds	Males	Females	Unknown	Carcasses	Jacks
Upstream of Glines Powerhouse	13.3+	1					0
Glines Powerhouse to Top of Altaire Canyon	13.3-12.9	241	NS	NS	257	57	0
Altaire Canyon to Altaire Bridge	12.9-12.5	29	NS	NS	23	19	0
Altaire Bridge to Griff Creek (Right Channel)	12.5-12.0	32	NS	NS	19	9	0
Griff Creek Rabbit Hole (Right Channel)	12.0-11.3	59	NS	NS	48	24	0
Altaire Split to Rngr Stn (Left Channel)	12.5-12.0	31	18	22	10	12	0
Rngr Stn Rabbit Hole (Left Channel)	12.0-11.3	23	9	12	5	25	0
Rabbit Hole to Fisherman's Corner	11.3-10.7	69	43	29	14	56	0
Fisherman's Corner to Park Boundary	10.7-9.7	55	25	7	58	49	0
Park Boundary to McDonald Bridge Gauge	9.7-8.5	82	36	22	148	49	0
McDonald Bridge Gauge to A-Frame	8.5-8.2	17	2	1	24	17	0
A-Frame to Highway 101 Bridge	8.2-7.7	35	3	2	73	12	0
Highway 101 Bridge to Gooseneck	7.7-6.3	57	NS	NS	62	26	0
Gooseneck to Elwha Dam	6.3-4.9	42	NS	NS	61	40	0
Hughes Creek	0.45-0.0	12	3	5	0	3	0
Little River (RM 0.0-1.2)	1.2-0.0	1	NS	NS	0	0	0
Indian Creek (RM 0.0-1.2)	1.2-0.0	26	NS	NS	89	0	0
Totals upstream of Elwha Dam Site		812	139	100	891	398	0

Table 4-27. Number of Chinook and redds observed in the Elwha River RM 0.0 to 4.9 in 2014.

Elwha River – Section surveyed	RM sections	No. of Redds	Males	Females	Unknown	Carcasses	Jacks
Dam outflow to Hwy 112 Bridge	4.9-4.4	50	NS	NS	10	NS	0
Hwy 112 Bridge to Elwha weir	4.4-3.7	125	NS	NS	65	NS	0
Elwha weir to New Bridge	3.7-3.2	25	NS	NS	33	NS	0
New Bridge to Sisson's Riffle	3.2-2.8	14	NS	NS	36	NS	0
Sisson's Riffle-Spruce Hole	2.8-2.3	83	NS	NS	87	NS	0
Spruce Hole to Right Side Channel by LEK Hatchery	2.3-0.9	154	NS	NS	0	NS	0
Hunt Channel	2.3-0.9	47	NS	NS	14	NS	0
Elwha Bluff to mouth	0.7-0.2	36	0	0	15	NS	0
Total downstream of lower dam		534	NS	NS	260	NS	0
Grand Total (upstream + downstream of Elwha Dam)	15.75	1,346	139	100	1,151	408	0

In addition to spawning ground surveys, adult Chinook were collected by various methods for broodstock purposes in the lower river. WDFW staff collected by gaff, gill net, seine, and trap methods a total of 1,847 Chinook from the river for use as brood stock for the hatchery program (Table 4-28). The terminal run size to the river was 4,360 Chinook, approximately 1,100 less than the FRAM prediction of 5,518.

Table 4-28. Chinook broodstock collection and total escapement to the Elwha River in 2014.

Method of capture	No. of males	No. of females	No. of jacks	Non-viable females	Total w/o jacks
Number of Chinook gaffed and spawned onsite	77	140	0	150	367
Number of Chinook netted in river and taken to hatchery	552	438	1	0	990
Number of Chinook transported from LEK Hatchery to WDFW Elwha Channel	213	103	2	0	316
Number of Chinook return to WDFW Channel Trap (Volunteers)	114	60	0	0	174
Totals	956	741	3	150	1,847
Estimated number of natural spawners in the river					2,513
Estimated total returns					4,360

### SONAR Enumeration Method

SONAR technology is being used in the Elwha River as a method to improve enumeration of Chinook passage during the entire run from June through September. This technology generates an improved Chinook escapement estimate due to the difficulty of observing redds and fish in turbid water conditions caused by the removal of the two dams. The lower Elwha dam was removed in the spring of 2012 and the upper dam (Glines Canyon) was removed in 2014. Denton et. al. (2014) used a DIDSON (**D**ual-frequency **I**dentification **SON**ar) LR (long range) multi-beam sonar system on one portion of the mainstem Elwha River and an ARIS 1800 (Adaptive Resolution Imaging Sonar) unit on the other channel (the Elwha River mainstem is branched in that portion of the river valley) to enumerate Chinook salmon in the Elwha River from June 4th, 2014 through September 10th, 2014. Denton et al (2014) estimated a total Chinook return to the Elwha River of 4,360 (4,050-4,685; 95% CI) using SONAR (described in next section). To estimate the number of natural spawners in the river, the total number of broodstock used at the Elwha Rearing channel was subtracted from the estimated total return:  $4,360 - 1,847 = 2,513$  natural spawners.

### CWT and Otolith Mark Recoveries

The following information for Elwha River Chinook carcass sampling in 2014 is taken from the summary report by Weinheimer et. al. 2015.

We surveyed the mainstem Elwha and tributaries from the former Glines Dam Powerhouse site at river km 21.4 to the confluence of the river with the Strait of Juan de Fuca. Surveys were conducted by foot and inflatable raft. The Elwha River was broken

up into 6 sections. Each reach was scheduled to be surveyed every 7 to 10 days. Based on redd survey numbers from previous spawning seasons, we felt this sampling structure would allow us to sample most of the available carcasses in each reach throughout the season.

#### Evaluating hatchery mark rates

The primary hatchery marking strategy for brood years of Elwha Chinook salmon expected to return in 2014 was a thermal otolith mark. Avoidance of the adipose clip was intended to reduce vulnerability to mark selective fisheries. Most hatchery Chinook salmon are released into the Elwha River as sub-yearlings, but there is also a smaller yearling release group. The yearling, but not sub-yearling release, receives a CWT mark in addition to the thermal otolith mark.

In some years, equipment malfunctions limited the capacity to induce thermal otolith marks. Inducing the thermal otolith mark requires sequentially altering the water temperature during embryonic development in a prescribed protocol over the course of approximately 1-3 weeks, and specialized chillers are required to accomplish this task. Any hatchery juveniles that were not otolith marked due to chiller malfunctions were selectively placed into the yearling program receiving the CWT mark (Table 4-29, brood year 2012). For brood year 2010, although all hatchery chinook salmon were otolith marked, chiller malfunctions limited the number of cold water incubations for some fish, resulting in a mark that was less distinctive than desired.

Chinook salmon carcasses were sampled weekly at the WDFW Elwha Rearing Channel (hereafter WDFW Hatchery) throughout the spawning season. Chinook salmon broodstock spawned at the WDFW hatchery originated from a variety of sources. The primary collection method was by gill net from the Elwha River. Chinook salmon broodstock also included volunteers to the WDFW hatchery trap and volunteers to the LEKT hatchery trap that were subsequently transported to the WDFW adult holding pond. WDFW used PIT tags, inserted upon capture and transfer to the adult holding pond, to identify the original collection method of Chinook salmon spawned at the hatchery. Some broodstock were collected from the river and spawned on site rather than at the hatchery but these were not sampled in our study.

Table 4-29. Releases of hatchery Chinook in the Elwha River Basin, brood years 2009-2012.

Brood Year	Type	OT	OT + CWT	CWT	AD + CWT + OT	Total
2009	Sub-yearling	3,039,730	0	0	0	3,039,730
	Yearling	0	200,824	0	0	200,824
2010	Sub-yearling	1,236,562	0	0	0	1,236,562
	Yearling	0	212,900	0	0	212,900
2011	Sub-yearling	1,524,769	0	0	0	1,524,769
	Yearling	0	196,575	0	0	196,575
2012	Sub-yearling	907,387	0	0	251,892	1,159,279
	Yearling	0	0	201,074	0	201,074

We sampled a total of 802 carcasses throughout the sampling season (Table 4-30). A total of 302 samples (37.7%) originated from the Elwha River and tributaries. Nearly a third of all



carcasses were sampled above the former Elwha dam site. The highest number of samples collected in one week occurred during week of Sept 15-19 (Table 4-31). The number of carcasses found dropped significantly after the high water on September 24. Length and sex data were recorded for each carcass except for one from Reach 1. Otolith samples were taken from 783 (97.6%) carcasses, scale samples from 779 (97.1%) and DNA fin clips from 556 (69.3%). No carcasses were recovered from Little River in 2014. The last week of the season the technician was tasked with assisting on spawning ground surveys in other nearby streams due to the lack of visibility in the Elwha.

Table 4-30. Total number of Chinook carcasses sampled by survey reach in the Elwha River Watershed 2014.

Reach	Number of Carcasses Sampled	Percent of Total
Reach 1 - Elwha Dam Site to river mouth	36	4.50%
Reach 2 - Gooseneck to former Elwha Dam Site	41	5.10%
Reach 3 - Highway 101 Bridge to Gooseneck	27	3.40%
Reach 4 - Fishermans Corner to Highway 101 Bridge	54	6.70%
Reach 5 - Altaire Bridge to Fishermans Corner plus Hughes (left channel)	40	5.00%
Reach 6 - Glines Powerhouse to Rabbit Hole (right channel)	85	10.60%
Indian Creek	19	2.40%
Little River	0	0.00%
WDFW Hatchery	500	62.30%
<b>Total</b>	<b>802</b>	<b>100%</b>

Table 4-31. Number of Chinook carcasses sampled by week for individual reaches during the 2014 season. Zero indicates a survey was completed but no carcasses were sampled. A dash indicates no survey was conducted that week. No surveys were conducted during the week October 27-31 due to lack of visibility.

Week	Reach						Indian Creek	Little River	Hatchery
	1	2	3	4	5	6			
Aug 25-29	0	-	-	-	-	26	-	-	9
Sept 1-5	0	0	0	-	2	-	-	-	34
Sept 8-12	7	-	-	15	6	15	19	-	92
Sept 15-19	0	25	17	-	25	36	-	-	110
Sept 22-26	-	11	8	30	-	-	-	-	105
Sept 29 - Oct 3	13	5	-	6	5	7	-	-	80
Oct 6-10	16	0	2	3	2	1	-	-	70
Oct 13-17	0	0	0	-	0	-	-	-	-
Oct 20-24	-	-	0	0	-	-	-	-	-

Totals	36	41	27	54	40	85	19	0	500
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*Adult Collection Method Data*

Over three quarters (76%) of the samples we found outside of the hatchery were recovered during the month of September. Due to a lack of fish voluntarily entering the hatchery, most of the fish sampled at Elwha hatchery were net-collected fish (Table 4-32). We sampled close to a third of all the net and LEKT fish that came to the hatchery in 2014 and just over 50% of all volunteer fish. Carcasses that were found during surveys that had been gaffed for hatchery broodstock were not sampled this season.

Table 4-32. Adult Collection Method Summary for Elwha Chinook Carcass Sampling 2014.

Sample Location	Collection Method	Number of Carcasses Sampled	Percent of Total Carcasses Sampled
Mainstem and Tributaries	Natural Spawners (NS)	302	37.7%
	Gaffed (G)	0	0.0%
	Gill Net (N)	305	38.0%
WDFW Hatchery	Lower Elwha Klallam (LEKT)	104	13.0%
	Volunteers (V)	91	11.3%

*Hatchery mark rates*

We collected 783 otolith samples over the course of the season. Seven hundred and fourteen (91.2%) of the samples had an otolith mark present. Of the remaining 69 samples, 32 had no otolith mark but did have a CWT present and one fish was ad marked but did not carry an otolith mark or CWT. Thus, 36 fish (4.6%) had no internal (Otolith or CWT) or external hatchery marks. Overall, the hatchery mark rate >95% and we observed relatively little differences in the mark rates of the different survey reaches and hatchery broodstock sources (Table 4-33). Only a single reach had mark rate <90% (Table 4-33).

Table 4-33. Hatchery mark rates of Chinook salmon sampled from the Elwha River in 2014 based on thermal otolith, adipose, and CWT marks.

	Location	Otolith Mark		All Hatchery Marks	
		N	Percent Marked	N	Percent Marked
Hatchery	Net	304	90.50%	304	97.40%
	LEKT	104	81.70%	104	92.30%
	Volunteer	91	91.20%	91	97.80%
Carcass Survey	Reach 1	20	95.00%	20	100.00%
	Reach 2	41	92.70%	41	92.70%
	Reach 3	27	88.90%	27	88.90%
	Reach 4	54	98.10%	54	98.10%
	Reach 5	40	92.50%	40	92.50%
	Reach 6	85	98.80%	85	98.80%
	Indian Creek	17	94.10%	17	94.10%
	Total	783	91.20%	783	96.20%

#### *CWT Data*

We collected CWTs from 62 fish in the Elwha River watershed during fall 2014. All but two of the CWT samples were collected at the WDFW Hatchery. The two snouts from the river were recovered between the former Elwha Dam site and the river mouth. The majority of the CWTs originated from releases into the Elwha River, but some were derived from releases into the neighboring Morse Creek (N = 3) or Dungeness (N= 2) watersheds (Table 4-34). All of the Elwha released CWTs were from the yearling program, as was expected based on the recent CWT marking strategy.

Table 4-34. Chinook Coded Wire Tag (CWT) data for snouts recovered during spawn year 2014.

	Sampling Location	# of Snouts	Brood Year	Release Location
River	Elwha Dam to Mouth	1	2009	Elwha River
		1	2010	Elwha River
Hatchery	Net	11	2009	Elwha River
		17	2010	Elwha River
		1	2010	Morse Creek
		1	2011	Elwha River
		1	2011	Morse Creek
		1	2011	Gray Wolf River
		1	2012	Elwha River
		LEKT	8	2009
	7		2010	Elwha River
	1		2010	Morse Creek
	1		2010	Hurd Creek
	2		2012	Elwha River
	Volunteer	6	2010	Elwha River
		1	2011	Elwha River
		1	2012	Elwha River
Total		62		

#### Scale Data

Of the 779 scale samples collected, 738 (94.7%) were successfully aged in the laboratory. Age 4 was the dominate age class in each sampling reach and all collection sources at the hatchery, as over 50% of the entire collection was composed of age-4 Chinook salmon (Table 4-35). In some reaches, the number of age-3 samples outnumbered age-5, whereas in other reaches, age-5 fish were in greater abundance (Table 4-35). The highest percentage of age-5 Chinook salmon were collected from the two reaches immediately surrounding the former Elwha Dam site, reaches 1 and 2 (Table 4-35). We did not find any age 2 Chinook carcasses in the mainstem or tributary surveys, but a small percent (<5%) were collected at the hatchery. Forty-three fish (5.5%) were identified as fish that migrated to the ocean as age 2 (Stream type Chinook, Table 4-36). All of these stream-type Chinook were hatchery origin. No scale samples were collected from Indian Creek or Little River.

Scale samples from six of the 36 unmarked fish displayed signs of accelerated growth indicative of hatchery rearing. Experienced scale readers from the WDFW lab are certain that these fish, age of which were age-4, are hatchery origin. These fish either originated from out of basin or a portion of the fish released from brood year 2010 did not receive otolith and or CWT.

Table 4-35. Chinook carcass age data from scale samples by reach for the Elwha River 2014.

Sample Location	Collection Method	Number of Samples	Total age			
			2	3	4	5
WDFW Hatchery	Net	293	0.30%	20.10%	58.40%	21.20%
	LEKT	95	2.10%	28.40%	54.70%	14.70%
	Volunteer	82	2.40%	35.40%	56.10%	6.10%
Reach 1	Carcass Sample	34	0.00%	8.80%	55.90%	35.30%
Reach 2		40	0.00%	17.50%	50.00%	32.50%
Reach 3		26	0.00%	30.80%	57.70%	11.50%
Reach 4		50	0.00%	24.00%	58.00%	18.00%
Reach 5		39	0.00%	20.50%	69.20%	10.30%
Reach 6		79	0.00%	21.50%	51.90%	26.60%
Indian Creek		0	-	-	-	-
Little Creek	0	-	-	-	-	
All Samples		738	0.70%	23.00%	56.90%	19.40%

Table 4-36. Age at return of hatchery and unmarked subyearling and yearling releases.

Origin	Age at Outmigration	N	Total Age			
			2	3	4	5
Unmarked <sup>1</sup>	Subyearling	27	0	4	22	1
Unmarked <sup>1</sup>	Yearling	0	NA	NA	NA	NA
WDFW Hatchery	Subyearling	668	5	165	378	120
WDFW Hatchery	Yearling	43	0	1	20	22

<sup>1</sup> Excludes N = 6 unmarked fish with scales showing accelerated growth indicative of hatchery rearing

#### 4.14 Hoko

WDFW and Makah Fisheries Management staff conducted foot surveys to count live and dead Chinook and Chinook 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 surveys from RM 2.8 to 10.1 during the 2014 return year (Table 4-37). Makah Fisheries Management (MFM) surveyed the mainstem Hoko upstream of RM 10.2 to RM 21.7, Hoko tributaries, and the Sekiu River (Table 4-38). Survey conditions were poor after October 15<sup>th</sup> survey due to high water. No live or dead Chinook or redds were observed by WDFW during the last survey on November 13, 2014.

Table 4-37. Hoko River Chinook escapement surveys by WDFW in 2014.

Date	Reach	Live	Dead	Total	New Redds	Visible Redds	Cumulative Redds
10/9/14	2.8 - 3.4	NS	NS	NS	NS	NS	NS
10/9/14	3.4 - 4.4	1	0	1	2	2	2
10/9/14	4.4 - 5.6	0	0	0	7	7	7
10/9/14	5.6 - 7.5	8	0	8	13	13	13
10/9/14	7.5 - 8.4	48	0	48	10	10	10
10/9/14	9.8 - 10.1	28	0	28	18	18	18
10/15/14	2.8 - 3.4						
10/15/14	3.4 - 4.4	1	0	1	1	2	3
10/15/14	4.4 - 5.6	21	0	21	14	17	21
Rained out used rds/mi	5.6 - 7.5				17		30
10/15/14	7.5 - 8.4	39	0	39	5	10	15
10/15/14	9.8 - 10.1	45	6	51	20	29	38
10/20/14 through	2.8 - 3.4						
11/3/14	3.4 - 4.4	NS	NS	NS	NS	NS	NS
High flows	4.4 - 5.6	NS	NS	NS	NS	NS	NS
No surveys	5.6 - 7.5	NS	NS	NS	NS	NS	NS
11/3/14	7.5 - 8.4	NS	NS	NS	NS	NS	NS
11/3/14	9.8 - 10.1	NS	NS	NS	NS	NS	NS
11/13/14	2.8 - 3.4	0	0	0	0	0	0
11/13/14	3.4 - 4.4	0	0	0	0	0	0
11/13/14	4.4 - 5.6	0	0	0	0	0	0
11/13/14	5.6 - 7.5	0	0	0	0	0	0
11/13/14	7.5 - 8.4	0	0	0	0	0	0
11/13/14	9.8 - 10.1	0	0	0	0	0	0

Table 4-38. Summary of Hoko and Sekiu Chinook surveys by Makah Fisheries Management in 2014.

Stream	WRIA#	Date	Lower RM	Upper RM	New Redds	Visible Redds	Total live count	Total dead count	Total Count
Bear Cr.	190196	10/20/14	0.00	0.66	2	2	0	0	2
Browns	190170	10/14/14	0.00	0.59	13	13	63	1	63
Browns	190170	10/14/14	0.59	1.00	2	2	12	0	12
Browns	190170	10/31/14	0.54	0.97	14	14	46	0	46
Browns	190170	10/20/14	0.59	0.97	1	1	8	0	8
Browns	190170	10/19/14	0.00	0.59	12	8	104	3	107
Browns	190170	10/30/14	0.00	0.59	2	12	44	20	44
Browns	190170	11/10/14	0.00	1.00	0	0	0	3	0
Ellis	190192	10/27/14			1	1	3	0	3
Hoko	190148	10/6/14	9.00	10.00	0	0	60	0	60
Hoko	190148	10/8/14	8.50	6.00	0	0	0	0	0
Hoko	190148	10/17/14	9.00	10.00	0	0	8	4	8
Hoko	190148	10/14/14	10.00	9.00	0	0	2	0	2
Hoko	190148	10/16/14	20.40	21.70	1	1	1	0	1
Hoko	190148	10/30/14	18.30	20.40	0	1	2	1	2
Hoko	190148	11/3/14	13.00	15.50	0	0	0	0	0
Hoko	190148	11/11/14	13.00	15.50	0	0	0	0	0
Little Hoko	190149	10/15/14	0.00	1.00	3	3	1	0	4
Little Hoko	190149	11/3/14	0.00	1.00	0	0	0	0	0
Sekiu	190205	11/12/14	1.30	3.30	3	1	6		9
Sekiu	190205	11/12/14	3.30		0	0	2		2
Sekiu	190203	9/30/14	5.03	5.47	0	0		1	1
Sekiu	190203	9/30/14	1.30	3.39	0	0	0	0	0
Sekiu	190203	9/30/14	3.39	5.03	0	0	0	0	0
Sekiu	190203	11/12/14	8.47	9.66	0	0	0	0	0
Sekiu	190203	11/12/14	8.13	8.47	0	0	0	0	0
Sekiu	190203	11/12/14	6.89	8.13	0	0	0	0	0
Sekiu	190203	11/12/14	6.65	6.89	0	0	0	0	0
Sekiu	190203	11/12/14	6.46	6.65	0	0	0	0	0
Sekiu	190203	11/12/14	6.16	6.46	0	0	0	0	0
Sekiu	190203	11/12/14	5.47	6.16	0	0	0	0	0
Sekiu	190203	11/12/14	1.30	3.90	0	0	1	0	1

Redd counts are multiplied by 2.5 adults/redd to estimate natural escapement. Live and dead counts were used to estimate number of spawners in areas of dense spawning, such as Browns Creek. Fish originally collected by Hoko Falls Hatchery staff for broodstock but not spawned and eventually returned to the river were counted as in-river spawners. These fish were assumed not to have been counted during the river surveys due to the release date when river conditions were poor for counting redds or fish.

The estimated total number of natural spawners in the rivers was 1,534 (Table 4-39). This total consisted of 10 in the Sekiu River, 329 in the Hoko River tributaries, and 1,195 in the mainstem Hoko River. The total number of natural spawners in the mainstem Hoko River included 878 fish that were collected by Hoko Falls Hatchery staff for broodstock but eventually returned to the river to spawn naturally. The total number of hatchery broodstock collected

and spawned by Hoko Falls Hatchery staff was 226 bringing the total number of Chinook returns at 1,760 for RY2014 (Table 4-39).

Table 4-39. Estimated total Chinook returns to the Hoko River and Sekiu River in 2014.

Source	Method	Total adult estimate
Sekiu. NF, SF	Live, dead, redds	10
Hoko River tributaries	Live, dead, redds	329
Hoko River	Redds+ expansion	317
Hoko Falls Hatchery	Broodstock collected and returned to the river to spawn naturally	878
<b>Hoko/Sekiu</b>	<b>Total natural spawners</b>	<b>1,534</b>
Hoko Falls Hatchery	Broodstock spawned	226
<b>Total return</b>	<b>Natural river spawners + broodstock spawned</b>	<b>1,760</b>

Of the 1,534 natural in-river spawners, 64 were of hatchery origin (HOS) and 1470 were natural origin (NOS). The number of hatchery origin and natural origin Chinook spawned for the broodstock program were 165 and 61, respectively. The total number and percentage by age of the Chinook in-river spawners and broodstock collected, including jacks were 152 age 2 (8.6%), 1,053 age 3 (59.8%), 472 age 4 (26.8%), 83 age 5 (5.0%), and no age 6 or age 7. The in-river spawners plus broodstock collected consisted of 229 (13.0%) hatchery origin and 1,531 (87.0%) natural origin (Table 4-40).

Table 4-40. Age and origin of broodstock and natural Chinook spawners in the Hoko River in 2014.

Age	In-River Spawners By Origin			Hatchery Broodstock By Origin			Total Spawners By Origin		
	HOS	NOS	Total	HOS	NOS	Total	HOS	NOS	Total
2	64	74	138	11	3	14	75	76	152
3	0	919	919	86	48	134	86	967	1,053
4	0	404	404	59	9	68	59	413	472
5	0	74	74	9	1	10	9	74	83
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>64</b>	<b>1,470</b>	<b>1,534</b>	<b>165</b>	<b>61</b>	<b>226</b>	<b>229</b>	<b>1,531</b>	<b>1,760</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. Sampling rates in 2013 are summarized below, and were based on catches reported by local biologists, and sample sizes queried from the RMIS database. Sampling rates of commercial fisheries in areas with significant Chinook catch generally exceeded the objective, with the exception of some extreme terminal areas. Catch from Areas 13D-F is generally not sampled since hatchery production returning to the area is not CWT'd. Marine area recreational fisheries were sampled at rates between 22% and 49% for the year (Table 5-2). Note that these data were updated just prior to completion of this report, and will be validated and corrected as needed prior to submission to update the RMIS (Regional Mark Information System) database.

Table 5-1. Chinook coded-wire tag sampling rates for commercial fisheries in 2013 (calendar year).

Catch Area/River	Catch	# Sampled	Sample Rate
7-7A	3,919	716	18%
7B-7C-7D-Nooksack River	23,588	5,312	23%
Skagit River/Bay	2,784	1,714	62%
8A	164	19	12%
8D	1,855	1,086	59%
Stillaguamish River	10	0	0%
10	20	19	95%
10E	8,833	3,860	44%
10F	213	142	67%
10A	182	177	97%
Duwamish River	311	42	14%
Puyallup/White rivers	1,780	791	44%
Nisqually River	10,695	4,591	43%
13A	698	171	24%
13C	5,121	3,339	65%
13D-F	4,781	2	0%
9	103	0	0%
9A-12-12A-12B	185	25	14%
12C	8,315	1,615	19%
12H	28,302	4,269	15%
Skokomish River	8,912	1,905	21%
Strait of JDF 4B-5-6C	764	302	40%

Table 5-2. Chinook coded-wire tag sampling rates for marine recreational fisheries in 2013.

Catch Area	Catch	# Sampled	Sample Rate
Marine Sport Area 5	9,478	3,270	34.5%
Marine Sport Area 6	4,860	2,401	49.4%
Marine Sport Area 7	8,265	2,236	27.0%
Marine Sport Area 8.1	108	45	41.6%
Marine Sport Area 8.2	415	140	33.7%
Marine Sport Area 9	6,305	1,677	26.6%
Marine Sport Area 10	4,189	1,264	30.2%
Marine Sport Area 11	3,502	970	27.7%
Marine Sport Area 13	1,254	284	22.6%
Marine Sport Area 12	853	209	24.5%

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## Appendix 1. 2014-2015 List of Agreed Fisheries

### Part I. Treaty/Non-Treaty OCEAN Fisheries (FRAM #2814 (Chinook) & #1416 (Coho))

Treaty Troll Quota	62,500 Chinook; 57,500 Coho
Non-treaty TAC	116,000 Chinook (non-mark selective equivalent of 111,500); 220,000 Coho.
NT Troll TAC	56,900 Chinook; Mark Selective Fishery impacts associated with a landed catch of 35,200 Coho
Recreational TAC	59,100 Chinook (includes non-selective quota of 50,100 and mark selective fishery impacts associated with a landed catch of 9,000 Chinook) and Mark Selective Fishery impacts associated with a landed catch of 184,800 Coho.

#### 1.1 Treaty Troll: Areas 2, 3, 4 & 48

5/1-6/30	Chinook directed fishery with sub quota of 31,250 Chinook. May 1 through June 30 or attainment of 31,250 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 for limiting stocks into the later all-salmon season.] If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season.
	All salmon species with sub quota of 31,250 Chinook plus any portion of uncaught Chinook rolled over from the May 1st through the time period on an impact neutral basis or quota of 57,500 Coho whichever comes first. Chum release 8/1-9/15.

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

5/1- thru earliest 6/30 or pre-season Chinook quota of	All salmon except Coho with 37,900 Chinook quota; no more than of 12,200 of which may be caught in the area between the U.S./Canada border and the Queets River; Open May 1-June 30, sub-7 days per week. An in-season conference call will occur when it
37,900 (no more than 12,200 of which may be caught in the area between the U.S./Canada	is projected that 28,425 Chinook have been landed overall or than 9,150 have been landed in the area between the U.S./Canada border and the Queets River to consider modifying the open period and adding landing and possession limits. Mandatory between Yelloweye Rockfish Conservation Area, Columbia and Cape Flattery Control Zones closed. Trip limits, gear restrictions, and

border and the  
Queets River)

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 in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW with area fished, total chinook and halibut catch

	<p>aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW with area fished, total chinook and halibut catch aboard, and destination. 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.</p>
<p>7/1 thru earliest of 9/16 or pre-season Chinook sub-quota of 19,000 (no more than 8,750 of which may be taken in the area between the U.S./Canada border and the Queets River) or Mark Selective Fishery quota of 35,200 Coho (no than 5,040 which may be taken in the area between the U.S./Canada border and the Queets River).</p>	<p>Open July 1-8, then Friday through Tuesday July 11 through August 19 with a landing and possession limit of 60 Chinook and 40 marked Coho per vessel per open period north of the Queets River or 60 Chinook and 60 marked Coho per vessel per open period south of the Queets River. Open Friday through Tuesday August 22 through September 16 with a landing and possession limit of 20 Chinook and 50 marked Coho per vessel per open period north of the Queets River or 20 Chinook and 50 marked Coho per vessel per open period south of the Queets River. All salmon, except no Chum retention north of Cape Aiava, 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, and beginning August 9, Grays Harbor Control Zone closed. Trip limits, gear restrictions, and guidelines may be implemented or more 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 in possession of salmon north of the Queets River may not cross the Queets River line without first notifying WDFW with area fished, total chinook, coho, and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW with area fished, total chinook, coho, and halibut catch aboard, and destination. 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.</p>

### 1.3 Non-Treaty Recreational

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

5/31-6/13 (9,000 Coastwide Mark Fishery)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook Selective minimum size limit 24 inches. In-season management may be
Chinook guideline)	used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/14-9/30 (92,400Mark)	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;
Selective Fishery sub quota)	Chinook minimum size limit 24 inches and Coho minimum size Coho 16"; Chinook guideline: 13,100; 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	
8/1-8/29	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. Barbless hooks only.
8/30-9/1	Open 7 days/week; 2 fish per day, only one of which may be a hatchery Chinook. Release all salmon other than hatchery Chinook and Coho. Chinook minimum size 24 inches and Coho minimum size 16 inches. Retained Chinook and Coho must have a healed adipose fin clip. In addition, Chinook with a left ventral fin clip may be retained. Barbless hooks only.
9/2-9/30	Open 7 days/week; 3 fish per day, 3 adults Coho minimum size 16 inches; retained Coho must have a healed adipose fin clip. Release all salmon other than hatchery Coho. Barbless hooks only.
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. Barbless hooks only.
1/1/2015-3/31/2015	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 wild Chinook. Barbless hooks only.

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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. Barbless hooks only.



Area 2: Queets River to Leadbetter Point

5/31-6/13 (9,000 Coastwide Mark Fishery	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook Selective minimum size limit 24 inches. In-season management may be
Chinook guideline)	used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/14-9/30 (68,380 Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day, only one of which may be a Mark Chinook; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and Coho minimum size 16 inches; Chinook guideline: 27,600. 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

5/31-7/31	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 5/31-8/10	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 7/1-8/15	Closed for salmon through 8/15.
East of Buoy 13 line 8/16-9/15	2 fish limit, 2 adults, only 1 may be a Chinook. 12" min size limit. Release wild Coho. Open to salmon angling only in the area described as Humptulips – North Bay (the area conforms to the commercial SMCRA 2C).
East of Buoy 13 line 9/16-11/30	3 fish limit, 3 adults, 12" min size limit. Release Chinook. Open to salmon angling only in the area described as East Grays Harbor (the area conforms to the commercial SMCRA 20).

Westport Boat Basin and Ocean Shores Boat Basin

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8/16-1/31 6 fish limit, 4 adults; 12" min size limit. Release Chinook.

Areas 3-4: U.S./Canada border to Queets River

5/16-5/17, 5/23-5/24, 5/31-6/13 (9,000 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 Aiava to Queets River

6/14-9/21 (4,800 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: 2,400. 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 9/27-10/12	(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 Aiava and east to Sekiu River

6/14-9/21 (19,220 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: 7,000; 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; Closed to salmon angling May 31-Sept. 21 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

	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
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Part II. PUGET SOUND including STRAIT of JUAN de FUCA and SAN JUAN ISLANDS fisheries (All fisheries modeled in FRAM #2814 (Chinook) & #1416 (Coho))

2.1 Strait of Juan de Fuca Pre-terminal Areas

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

NOTE: Area 48: 5/1-10/31 see Ocean Troll. For 11/1-12/31 & 1/1-4/15 see below.

5/1-6/15	Closed
6/16 - 9/30	The catch estimates for this fishery modeled in FRAM are statistically-derived predictions, and are the best available pre-season estimates of catch in this fishery. In order to have the actual catch reflect run strength, however, these estimates will not be treated as a ceiling when the managers make in-season fishery management decisions. Open for salmon, Chum release; Freshwater Bay closed, south of Angeles Pt/Observatory Pt. line; Pt. Angeles Harbor closed west of line from tip of Ediz Hook to ITT Rayonier Dock; Hoko Bay closed inside the area bounded by a line from Kydaka Point to Shipwreck Point; Area 6 closed east of a line true north from Green Point; 1,000 foot closure around stream mouths.
10/1-10/31	Closed
11/1-4/15	In Areas 48, 5, 6, 6C the treaty troll fishery will be open from November 1, 2014 through April 15, 2015, or when the catch reaches the harvest ceiling 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. The catch estimates for this fishery modeled in FRAM are statistically-derived predictions, and are the best available pre-season estimates of catch in this fishery. In order to have the actual catch reflect run strength, however, these estimates will not be treated as a ceiling when the managers make in-season fishery management decisions. The winter troll catch ceiling is 8,500 Chinook.
4/16-4/30	Closed

Areas 48, 5, & 6C Treaty Net (Ntrty net closed)

Note: The catch estimates for this fishery modeled in FRAM are statistically-derived predictions, and are the best available pre-season estimates of catch in this fishery. In order to have the actual catch reflect run strength, however, these estimates will not be treated as a ceiling when the managers make in-season fishery management decisions.

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Chinook	Open for setnet gear only, 6/22 through 8/16; 7 days a week; Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point; Freshwater Bay closed, south of Angeles Pt./Observatory Pt. line; 1,000-ft. closure around stream
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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 TOGAS 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 10/11; 1,000 ft. closure around stream mouths. 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), 10/12 through 11/8; 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, plus 2 additional Sockeye (Chinook 22" min size); release wild Chinook, wild Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
8/16-9/18	2 fish limit; plus 2 additional Sockeye through Aug. 31, release Chinook, wild Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
9/19-9/25	2 fish limit; release Chinook and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
9/26–9/30	2 fish limit; release Chinook, Chum, and wild Coho. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
10/1-10/31	2 fish limit; release wild Chinook and wild coho (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	2 fish limit (Chinook 22" min size), release wild Chinook
4/11-4/30	Closed
Area 6 Recreational	
5/1-6/30	Closed
7/1-8/15	2 fish limit, plus 2 additional Sockeye (Chinook 22" min size); release Chinook, wild Coho, and Chum, except W. of true N/S line through "2" buoy near tip of Ediz Hook retention of wild 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; plus 2 additional sockeye through Aug. 31, release Chinook, wild 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 60 Dungeness Bay Net

Chinook	All	Closed
Coho	Trty	Open 9/21 through 11/1; Additional days beyond 11/1 may be considered; 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 11/1, seven days per week, 24 hours per day; 1,500 ft closure around mouth of Dungeness River .

	Ntrty	Open Wk 39 (wb 9/21) through Wk 43 (wb 10/19) for skiff gillnet gear; 7AM – 7PM, Week 39 Su, M, Th, F ; 5 days M-F wks 40-43; 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 44 (wb 10/26) based on in-season information.
Chum	All	Closed

#### Dungeness River (Treaty and Recreational)

Note: The following applies to all in-river fisheries (Tribal & WDFW): Co-managers will meet on, or prior to October 7, 2014 to review river flow and weather conditions for the week of October 8-15. In the absence of river flow and weather conditions meeting agreed-to criteria, Dungeness River fisheries remain closed prior to the dates listed below.

#### 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, is scheduled to open on 10/16 and will be restricted to areas below the Dungeness hatchery intake using species selective (hand-held) gear. Subsistence fishing using selective gear is scheduled to open on 10/16. Refer to the co-management agreement above for possible emergency openings.
Chum	Trty	Closed

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

Chinook	Trty	Closed except Ceremonial Harvest of 4 fish <i>in</i> 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
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 TOGAS 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. Reef net unmarked coho, unmarked Chinook, and chum NR. Reef net may retain marked Chinook through 9/30. 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 wild Coho, Chum, and wild 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 3,310 total Chinook (120% of pre-season estimate).
Coho	Trty	Reef net: 7 days/wk beginning at end of Fraser Panel management through 11/8; Chinook NR after 9/30; unmarked Coho NR through 9/30, then coho retention. Chum NR through 9/30.
	Ntrty	Reef net: 7 days/wk beginning at end of Fraser Mgmt through Chum mgmt wk 45 (wb 11/2); 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	The Treaty fishery will open October 10 and remain open for the duration of the chum fishery, dependent on run status updates from CDFO. See attached 2014 7/7A Chum Fishing Plan. Reef nets open from end of Fraser Panel management through end of chum management (11/8), 7 days/wk. Reef net release requirements listed in Coho fishery description, above.
	Ntrty	PS and GN open wk 41 (wb 10/5) through wk 46 (wb 11/9), first wk schedule; open 10/11, 10/12, 10/14. Dependent upon update of run status from CDFO. Co-managers will meet Wednesday 10/15 to discuss catch to date. Fishery will re-open based on conditions outlined in the attached 7/7A Chum Fishing Plan. PS: brailing required, Chinook and Coho NR; GN: Chinook and Coho NR, live box required and limited soak time restrictions in wks 41-42 (10/5-10/17). Reef nets open from end of Fraser Panel management through wk 46 (wb 11/9), 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). Bellingham Bay closed 4/1 – 4/30.

Area 7 Recreational

5/1-6/30	Closed
7/1-7/31	2 fish limit, plus 2 additional Sockeye, 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, plus 2 additional Sockeye through Aug. 31, 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; Sarnish Bay closed to salmon angling. Lummi Bay closure area: east of a line from Gooseberry Point to Sandy Point 9/2 – 10/15.
10/1-10/31	2 fish limit, release wild Chinook and wild Coho; 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 78, 7C, 7D; 7A On-Reservation) Net

Chinook	Trty	<p>Areas 78, &amp; 70: August 1 through September 5, open weekly 4 PM Sunday to 4 PM Friday; except opens 12:01 AM August 1. Fishing pattern 1,5,5,5,5,5.</p> <p>Area 7C: August 1 through September 19, open weekly 4 PM Sunday to 4 PM Friday; except opens at 12:01 AM August 1; fishing pattern 1,5,5,5,5,5,5.</p> <p>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, August 3 through September 17 Sunday 4 PM - Wednesday 4 PM, weekly; fishing pattern: 3,3,3,3,3,3. 6 Yz" mesh in 7C and off-reservation areas of 78, except when open for sockeye <i>in 7</i> and 7A.</p>
	Ntrty	<p>Areas 78 &amp; 7C: Wks 33 (wb 8/10) - 36 (wb 8/31); PS Coho NR through week 35. GN fishing pattern: 3, 4, 4, 5; PS fishing pattern: 1,1,1,1. See Hales Pass closure below beginning 9/1.</p>
Coho	Trty	<p>Area 7A on-reservation fishery: September 14 through October 8. Open weekly 4 PM Sunday – 4 PM Wednesday . Fishing pattern 3,3,3,3.</p>
		<p>Areas 78 and 70: September 7 through October 25, open Sunday 4 PM – Saturday 4 PM. Fishing Pattern:6,6,6,6,6,6.</p>
		<p>7C: On October 1, a Co-manager conference call will be held to determine the status of Samish Chinook escapement. If the escapement goal appears to be attainable, and through development of a co-manager agreed in-season update methodology it is determined that there is a harvestable surplus of Samish Coho, then a Coho fishery will open October 5 – October 22, Sunday 4 PM – Wednesday 4 PM, weekly; fishing pattern 3,3,3.</p>

	Ntrty	Area 78: Wks 37 (wb 9/7) - 43 (wb 10/19); 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 78 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 78 & 70: Oct. 26 – Dec.10; open weekly 4 PMSunday-4 PMWednesday; 3,3,3,3,3,3,3.
	Ntrty	Area 78: Wks 44 (wb 10/26)- 48 (wb 11/23); 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: On a weekly basis, Nooksack Tribe commercial fisheries on the Nooksack

River will open at 12:01 AM Sun, except that portion of the river between Marine Drive Bridge and the first turn in the river upstream of the Slater Road Bridge, which will open at 4:00 PM Sun. On a weekly basis the Nooksack Tribe's commercial Chinook and Coho fisheries will close 4:00 PM Sat and Chum fisheries will close 4:00 PM Wed,

	Chinook April	April to mid-June: limited ceremonial and subsistence fishery will be managed for a total mortality of 16 NOR Chinook. A traditional fishery will occur 500 feet upriver from the Highway 9 bridge in the lower North Fork and the Nugents Corner Boat Launch in the mainstem (the boat launch is located just down river from Nugent's Corner Bridge) (RM 30.8 and 36.8). A total of 32 Chinook are projected in this fishery with an anticipated 4 NORs among the 32. This fishery is by permit only. Another fishery will occur in the lower Nooksack River between the Slater Road bridge and the river mouth (between RM 0.0 and 3.5). The lower river fishery will be selective and is projected to encounter 31 NOR Chinook with an expected survival rate of 60% and an estimated mortality of 12 NOR Chinook.
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	8/1-9/6	<p>Open weekly 4 PM Sunday to 4 PM Saturday, except open 12:01 AM Friday August 1 to 4 PM Saturday August 2. Fishing pattern: 2,6,6,6,6,6 . The river is divided into five zones during this period. These zones open in subsequent weeks, proceeding upriver, to protect migrating spring</p> <p>Chinook. The area in Zone 4 upriver of the Nooksack Tribal Works building will remain closed from August 24 through September 6th to protect holding spring chinook</p> <p>Zone 1 is from Marine Drive Bridge to Slater Bridge. Zone 2 is from Slater Br. To Hannegan Br. In Lynden.</p> <p>Zone 3 is from Hannegan Br. to Nugents Corner Br.</p> <p><del>Zone 4 is from Nugents Corner Br. to the confluence of the north and south forks.</del></p>
		Zone 5 is upriver of the confluence of the north and south forks.
Coho	9n -10125	Open weekly 4 PM Sunday through 4 PM Saturday.
Chum	7 or 11/13-14	<p>Fishing Pattern: 6,6,6,6,6,6,6.</p> <p>Subsistence harvest only. The Lummi Nation and 11/6-Nooksack Tribe will determine in-season which two days to hold this subsistence fishery.</p>

Commercial. Open weekly 4 PM Sunday through 4

10/26-12/10

PM Wednesday . Fishing Pattern: 3,3,3,3,3,3,3,.

#### Bellingham Bay Terminal Area Recreational

5/1-8/15	Closed to salmon angling.
8/16-9/30	4 fish limit, 2 Chinook (Chinook 22" min size); Samish Bay closed to salmon angling.
10/1 -10/31	4 fish limit, 2 Chinook (Chinook 22" min size); Release wild Chinook, 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	9/1 – 12/31	2 fish limit, plus 2 additional Coho; 12" min size. Release wild Chinook thru 9/30.
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Reservation  
boundary to  
yellow marker at  
the FFA high  
school barn in  
Deming)

(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.
Nooksack River Recreational, South Fork		
(from mouth to Skookum Creek)	10/1 – 12/31	2 fish limit, plus 2 additional Coho; 12" min size. Release Chum.
Samish River Recreational		
(from mouth to 1-5 Bridge)	8/1-11/30	2 fish limit, 12" min size. Release wild Coho.
Dakota Creek Recreational		
(mouth to Giles Road Bridge)	10/1 – 12/31	2 fish limit, 12" min size. Release wild Chinook.
Whatcom Creek Recreational		
(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, Skagit River, and Baker River are pre-season projections. Schedules may be changed in-season as necessary to meet management objectives and harvestable shares.

Spring Chinook Area 8 –		<u>Swinomish Tribe fishing pattern:</u> Wk 19 (wb 5/4) thru wk 21 (wb 5/18);2,2,2; <u>Upper Skagit Tribe fishing pattern:</u> No scheduled fishery .
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Sockeye	Area 8 - Trty	Swinomish Tribe fishing gattern: Wk 25 (wb 6/15) thru wk 28 (wb 7/6);3,4,5,5;  <u>U;mer Skagit Tribe fishing 12attern: No scheduled fishery,</u>
	Ntrty	Closed
Sockeye Research Tagging Study	Area 8	Wk 24 (wb 6/8) thru wk 29 (wb 7/13); 1 beach seine, 8 hours/wk. Sockeye pit and/or acoustic tagged, all species released.
Coho	Trty	Terminal Treaty HR target 20% as a response to "Normal" abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.
	Area 8 - Trty	<u>Swinomish Tribe fishing 12attern: Wk 38 (wb 9/14) thru wk 41 (wb 10/5); 1,3,4,2.</u> <u>U1212er Skagit Tribe fishing gattern: No scheduled fishery.</u>
	Trty	1 boat at Jetty 1 day/wk 44 (wb 10/26) & 45 (wb 11/2) and 1 boat in Bay 1 day/wk 44 (wb 10/26) & 45 (wb 11/2).
	Chum Ar ea 8 - Trty	<u>Swinomish Tribe fishing 12attern: No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/9); 1. Fishery dependent on ISU and harvestable fish.</u> <u>U1212er Skagit Tribe fishing 12attern: No preseason harvestable.</u>
		Closed. May open pending co-manager agreement on ISU that indicates harvestable runsize.

Skagit River Treaty Net (Ntrty net closed)

Note: Fishers from the Sauk-Suiattle Tribe are invited to participate in the 2014 Swinomish salmon fishery in Skagit River Area 78C from the Mount Vernon bridge to the Spud House, subject to and in accordance with all provisions of fishing ordinances and regulations of the Swinomish Indian Tribal Community that apply to such fishery.

Chinook	Ceremonial and Subsistence – 1975 fish (30 spring and 1945 summer/fall) total Swinomish, Sauk-Suiattle, and Upper Skagit Tribes.	
Spring Chinook	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing 12attern: wk 19 (wb 5/4) thru wk 21 (wb 5/18);2,2,2;</u>

		<u>U1mer Skagit Tribe fishing Qattern</u> : wk 20 (wb 5/11) thru wk 22 (wb 5/25); 1,1,1.
	Area 780	<u>UQQer Skagit Tribe fishing Qattern</u> : wk 20 (wb 5/11) thru wk 22 (wb 5/25); 1,1,1.
Sockeye	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing Qattern</u> : wk 25 (wb 6/15) thru wk 28 (wb 7/6);3,4,5,5; <u>U1212er Skagit Tribe fishing 12attern</u> : wk 27 (wb 6/29) thru wk 29 (wb 7/13);0.667,0.667,0.5. Additional fishing dependent on ISU, per MOU.
	Area 780	<u>Swinomish Tribe fishing gattern (Area 780-4 and Baker River)</u> : Wk 29 (wb 7/13):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. Additional fishing dependent on ISU, per MOU.; <u>UQQer Skagit Tribe fishing Qattern</u> :Areas 780-2, 780-3, 780-4, and 780 (Baker River): wk 27 (wb 6/29) thru wk 29 (wb 7/13);0.667,0.667,0.5.
Coho	Terminal Treaty HR target 20% as a response to "Normal" abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.	
	Area 78C:	<u>Swinomish and Sauk-Suiattle Tribes fishing 12attern</u> : wk 38 (wb 9/14) thru wk 41 (wb 10/5);1,3,4,2; <u>U1212er Skagit Tribe fishing Qattern</u> : wks 40 (wb 9/28)
	Area 780	<u>U1212er Skagit Tribe fishing Qattern</u> : wks 40 (wb 9/28) thru wk 43 (wb 10/19);1.167,1.167,1.417,1.167.
Chum	Area 78C	<u>Swinomish and Sauk-Suiattle Tribes fishing 12attern</u> : No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/9);1. Fishery dependent on ISU and harvestable fish. <u>U1212er Skagit Tribe fishing Qattern</u> : No preseason harvestable.
	Area 780	<u>UQQer Skagit Tribe fishing 12attern</u> : No preseason harvestable.
River Test	Chinook	Area 78C - Blakes wk 19 (wb 5/4) thru wk 35 (wb 8/24);1 boat, 6 hours/wk .
	Sockeye	Area 78C – Blakes wk 24 (wb 6/8) thru wk 29 (wb 7/13); 1 boat, 12 hours/wk; Area 780-3 - Upper Skagit - wk 23 (wb 6/1) thru wk 30 (wb 7/20);1 boat, 4 hrs/wk.

Coho	Area 78C - Blakes Drift wk 34 (wb 8/17) thru wk 45 (wb 11/2), 12 hours/wk; Area 78C - Spudhouse Drift, Upper Skagit, wk 34 (wb 8/17) thru wk 44 (wb 10/26); 1 boat, 12 hours/wk; Area 780-3 wk 35 (wb 8/24) thru wk 44 (wb 10/26); 1 boat, 4 hours/wk.
Chum	Area 78C - Blakes Drift wk 44 (wb 10/26) and wk 45 (wb 11/2); 1 boat, 12 hours/wk.

Swinomish Channel Treaty Net (Ntrty net closed)

Coho No separate openings. Area opens during Area 8 openings.

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 wild Chinook.

Baker River/Lake Recreational

(mouth to Hwy 20 Bridge)	Closed.
From Hwy 20 Bridge upstream to Dam	Closed.
Baker Lake	7/10-9/7 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, hatchery Chinook only, 1T 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	4 fish limit, no more than 2 wild Coho, 12" min size, release Chum and Chinook.
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(From Memorial Hwy Bridge to Gilligan Creek)	6/14-6/29	2 fish limit, sockeye only (12" min size). Release Chinook.
	9/1 – 12/31	4 fish limit, no more than 2 wild Coho, 12" min size, release Chum and Chinook.
(From Gilligan Creek to Dalles Bridge at Concrete)	9/1 – 12/31	4 fish limit, no more than 2 wild coho, 12" min size, release Chum and Chinook.
Rockport Bridge to Marblemount Bridge  (From Dalles Bridge at Concrete to Cascade River)	6/1-7/15	4 hatchery Chinook, only 2 may be adults, 12" min size, open only from Highway 530 bridge at Rockport to Cascade River.
	9/1 – 12/31	4 fish limit, no more than 2 wild coho, 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

Note: Co-managers will meet during the week of 8/24-8/30 to discuss previous,

current and expected conditions in the Stillaguamish River (flow pattern, water quality, spawning habitat) and to review results from the smolt trap (out-migrant smolt

mortality and other relevant biological and environmental information). In-season adjustments to all fishery schedules and openings affecting the Stillaguamish stocks will also be discussed and agreed-to by co-managers.

### Area SA Net

Chinook	Trty	Closed (Ceremonial set-aside of up to 100 Chinook, July-September period).
	Ntrty	Closed
Coho	Trty	Tulalip Tribes: (8/31 – 9/13) 5 days per week (Evaluation Fishery); (9/14 – 10/18) 5 days per week. Update fishery through 10/4. Manage for Comprehensive Coho Management Plan breakpoints and rates.
	Test	Tulalip Tribes: (8/31- 10/18) 2 days per week.

	Ntrty	Wks 38 (wb 9/14) – 39 (wb 9/21): PS limited participation (2 boats per day): Chinook and Chum NR; fishing pattern: 1,1. GN wk 38 limited participation 2 boats only. 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, 10/11- 11/22: Dependent on Co-manager agreement on ISU indicating increased run size. Port Susan closed; Max 2,000 Chum. Commercial fishery depending on evaluation fishery, 10/19 – 11/22, manage for Stillaguamish and Snohomish harvest rates and minimum escapement goals.
	Test	10/19– 11/22; 1 day per week; 2 GN landings per week
	Ntrty	Closed. May open pending co-manager agreement on ISU that indicates harvestable run size.

**Area 80 Net**

Chinook	Trty	BS, RH, GN gear outside Tulalip Bay may be open during the following periods: 4/27 – 5/31 12:01 AM Sun – 11:59 PM Sat 6/1 – 8/23 12:01 PM Mon – 11:59 PM Thu 8/24 – 9/13 12:01 AM Mon – 11:59 PM Fri Setnets inside Tulalip Bay may be open during the following period: 4/27 – 9/13 12:01 AM Sun – 11:59 PM Sat
	Ntrty	Closed (see recreational SAF)
Coho	Trty	9/14 – 11/1; BS, RH, GN gear outside Tulalip Bay open Sun, Mon, Thu, Fri; open to target Tulalip hatchery Coho.
	Ntrty	Wks 39 (wb 9/21)- 44 (wb 10/26); PS Chinook NR; PS fishing pattern: 1,1,1,1,1,2,1; GN fish each night Sunday through Thursday night(S,5,5,5,5,5,5); also open daylight hours Tuesdays and Wednesdays (2,2,2,2,2,2,2). Closed east of the line from Mission Point to Hermosa Point.
Chum	Trty	11/2 – 12/13; open to target Tulalip hatchery Chum. Managed to allow for hatchery egg take needs based on Tulalip hatchery escapement updates and projections . All Area 80 fisheries will close concurrently as agreed to by Tulalip and WDFW to ensure egg take requirements are met.

		Wks 46 (wb 11/9) - 48 (wb 11/23); 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 80 fisheries will close concurrently
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Stillaguamish River Treaty Net (Ntrty net closed)

Chinook	C&S fishery; Wb 6/29 – wb 8/31; maximum catch of 30 Chinook; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Coho	Comm. Fishery; Wb 9/7 - wb 10/19; Up to 5 days per week; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Chum	C&S fishery; wb 10/26- wb 11/30; 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,	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 wild Chinook.

Tulalip Special Area Recreational Fishery

Same as Area 8-2 Recreational, except during the period 5/30-9/21:	5/30-9/1	Open 12:01 AM Friday – 11:59 AM Monday each week. Closed June 21. 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, 2 pole endorsement (Chinook 22" min. size).
	9/6-9/21	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, 2 pole endorsement (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, Release Chinook, Chum, and Pink, 12" min. size.
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Snoqualmie River Recreational

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

(From mouth to Wallace River)	6/1 - 7/31	4 fish limit, only 2 may be adults, hatchery Chinook only 12" min. size. Chinook fishery dependent on agreed ISU of Chinook abundance sufficient to meet the hatchery escapement goal.
(From mouth to Lewis St. Bridge in Monroe)	9/1 - 12/31	3 fish limit, 12" min size. Release Chinook, Chum and Pink.
From Lewis St Bridge in Monroe to River at forks.	9/1 – 12/31	3 fish limit, 12" min size. Release Chinook, Chum, and Pink.

Wallace River Recreational

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

(river and all sloughs downstream of Marine Drive	9/1 - 12/31	2 fish limit, Release Chinook, Chum and Pink, 12" min size.
(Marine Drive upstream to forks)	9/1 - 12/31	2 fish limit, Release Chinook, Chum and Pink, , 12" min size

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



## 2.7 Admiralty Inlet Area

### Area 9 Net

Note: The Tribes with chum stocks affected by Area 9 fisheries or with fishery jurisdiction in Area 9 commit to establish a chum technical workgroup to evaluate the available data, identify data gaps, and review and revise the Area 9 research plan.

The chum technical workgroup will be directed by an oversight committee of tribal policy representatives, with the ultimate goal of developing a management framework for chum salmon originating from the watersheds and hatchery programs of the Hood Canal, North Puget Sound, Mid-Puget Sound, and South Puget Sound production regions. A meeting will be held on May 21, 2014 to develop work plans and schedules for the policy and technical groups.

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 10/19) – 46 (wb 11/9) research fishery to develop stock composition/timing information. Research catch quota of 2,400 Chum. Details of research program will be based on previously agreed sampling design and a review of prior years' sampling results. Reference 2013 Area 9 Chum Salmon Research Fishery Plan.
Chum	Trty	[Wk 43 (wb 10/19) – Wk 46 (wb 11/9) Tribal gillnet only fishery. 2 days each wk, maximum of 6 fishing days. Fishery will be managed to not exceed 15,000 chum.]  [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 and Chum
7/16-8/15	2 fish limit, only 1 may be a hatchery Chinook (Chinook 22" min size). Release wild 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. Fishery will convert to Chinook non-retention upon attainment of Chinook impact guideline.

8/16-8/31	2 fish limit, Release 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 wild Chinook (Chinook 22" min size).
12/1-1/15	Closed
1/16-4/15	2 fish limit, Chinook 22" min size, release wild Chinook.
4/16-4/30	Closed
<b>Edmonds Pier Recreational</b>	
Year-Round	2 fish limit, 1 Chinook (22" min size), release Chum 8/1-9/30.

### 3.1 South Sound Region

### 3.2 Area 10 Sub region

#### Area 10 Net

	Chino	
	ok Closed	Fishery dependent upon ISU (Ballard lock counts)
	Ntrty	
	Test	Gillnet: Wks 37 (wb 9/7) - Wk 39 (wb 9/21); 3 boats, 3 sites; fishing pattern: 2,2,2.
		Fishery based on ISU beginning Wk 37 (wb 9/7). Treaty allocation based on intertribal sharing agreement. Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Closed
Chum	In order to allow fishing opportunity that allows both the treaty and non-treaty fleets to have the ability to catch their shares; better communication and cooperation is expected from both non-treaty and treaty co-managers to allow both parties the opportunity to access their shares.	
		Purse Seine: Wks 41 (wb 10/5) - Wk 46 (wb 11/9); 1 site, fishing pattern: 1,1,1,1,1,1.

	Trty	Treaty allocation based on intertribal sharing agreement; Wks 41 (wb 10/5) – Wk 48 (wb 11/23) fishing pattern – ISU dependent; Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Wks 42 (wb 10/12) - 48 (wb 11/23); PS Chinook and Coho NR; PS fishing pattern: 1,1,1,1,2,1,1; 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	Trty Test	Gillnet: Wk 29 (wb 7/13) – Wk 31 (wb 7/27); three consecutive weeks (Wednesday nights) 7/16, 7/23, and 7/30; 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 9/7)-Wk 44 (wb 10/26); fishing pattern: 5 days per week (Sun – Fri)
Chum	Trty	Gillnet: wk 45 (wb 11/2)-Wk 48 (wb 11/23); fishing pattern: up to 5 days per week (Sun – Fri).

Duwamish/Green River (Area 808) Treaty Net (Ntrty net closed)

Chinook	Trty	Closed
Coho	Trty	Wk 37 (wb 9/7) – Wk 44 (wb 10/26) Starting September 7 fishery will open up to 1 <sup>st</sup> Avenue Street Bridge, starting September 14 fishery will open up to 16 <sup>th</sup> Avenue Street Bridge, , starting September 21 fishery will open up to Boeing St. Bridge. Starting September 28 fishery will open up to Hwy 99 Bridge; fishing pattern: Sunday – Friday; 5 days per week.
Chum	Trty	Gillnet Wk 45 (wb 11/2)-Wk 48 (wb 11/23); fishing pattern: 5 days per week (Sun – Fri).

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

Chinook	Trty	Wk 30 (wb 7/20)-Wk 38 (wb 9/14); fishing pattern : 7 days/wk. Possible extension for Sinclair Inlet
Coho	Trty	On-Reservation only; Wk 38 (wb 9/14)-Wk 43 (wb 10/19); gillnet/beach seine; 7 days/wk.

	C	Wk 43 (wb 10/19)-Wk 50 (wb 12/7); schedule
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Lake Washington System (includes Lake, Lake Union, Ship Canal, & Lake Sammamish)

Areas 10F, 10G, 10C, 100 Treaty Net (Ntrty net closed)

Sockeye	Dependent upon ISU (lock counts).	
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 (9/14).
	Upper ship canal (above Ballard Locks):	Fishing pattern 5 days/wk (Sun – Fri) with a potential start date for fisheries beginning Wk 38 (9/14).
	North end Lake Washington (North of Hwy. 520 bridge):	Starting Wk 40 (wb 9/28): 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. 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.	
7/16-8/15	2 fish limit, only 1 may be a hatchery Chinook (Chinook 22" min size). Release wild Chinook and Chum. Fishery will convert to Chinook non-retention upon attainment of Chinook impact guideline.	
8/16-8/31	2 fish limit, Release Chinook and Chum.	
9/1-9/30	2 fish limit, release Chinook for the entire period and release Chum through 9/15.	
10/1-1/31	2 fish limit, release wild Chinook (Chinook 22" min size).	

2/1-4/30 j Closed

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

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

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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; 3 fish limit (Chinook 22" min size), release wild Chinook and release Chum 8/1-9/15, 2 pole endorsement.
10/1-4/30	Same regulations as Area 10.

**Green River Recreational**

(1st Ave South Bridge to Old Hwy.99/ Tukwila Intl.	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 1- 405)	9/1-12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook.
(1-405 to the S. 277'h 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>h</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 2014/2015 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:

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

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S. 27<sup>th</sup> Bridge to Tacoma Headworks Dam: Jan. 31

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**Soos Creek Recreational**

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Closed

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**Lake Washington Recreational**

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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 . If fishery occurs, other NT chinook impacts will be adjusted.
North of Hwy 520 Bridge	9/16 – 10/31	4 fish limit, Coho only; 12" min size

**Lake Sammamish Recreational**

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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 Wk 37 (wb 9/7) - Wk 41 (wb 10/5); ISU dependent; gillnets 7 days/wk, could close any time. Beach seine daylight hours only, 7 days/wk.
	Ntrty:	Closed
Chum	In order to allow fishing opportunity that allows both the treaty and non-treaty fleets to have the ability to catch their shares; better communication and cooperation is expected from both non-treaty and treaty co-managers to allow both parties the opportunity to access their shares.	
		Commercial fishery open Wk 42 (wb 10/12)-Wk 49 (wb 11/30); gillnets 7 nights/wk, could close at anytime. Beach seine daylight hours only, 7 days/wk.
		Wks 42 (wb 10/12) - 48 (wb 11/23); PS Chinook and Coho NR; PS fishing pattern: 1,1,1,1,2,1,1; 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 Wk 37 (wb 9/7) - Wk 42 (wb 10/12); 3 nights/wk
Chum	Commercial fishery open Wk 46 (wb 11/9) – Wk 53 (wb 12/28) 3 nights/wk.

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

	Spring Chinook	Ceremonial and Subsistence
	Summer - Fall	Commercial fishery 8/10, fishing pattern:
Coho	Commercial fishery Wk 36 (wb 8/31)-Wk 42 (wb 10/12) fishing pattern: 1,2,2,3,3,3,3.	
Chum	Test fishery Wk 43 (wb 10/19)-Wk 46 (wb 11/9) 1 day/wk, drift net only.	
Winter Chum	Commercial fishery Wk 46 (wb 11/9) – Wk 2 (wb 1/6) 1 to 3 days a week per annual River Chum/Steelhead management plan.	

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 wild 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 wild Chinook; Single-point barbless hooks only. Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling through 7/31.
10/1-12/31	2 fish limit, release wild Chinook (Chinook 22" min size).
1/1-1/31	Closed
2/1-4/30	2 fish limit (Chinook 22" min size), release wild Chinook. Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling 4/1-4/30.
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 11 <sup>th</sup> St. Bridge to Freeman Rd.	8/16 – 12/31	6 fish limit, 2 adults, 12" min size, release wild adult Chinook. Closed August 31, September 1, 7-9, 14-16, 21-24, 28-30, October 1, 5-8, 12-15.
Freeman Rd. to White River	8/11 – 12/31	6 fish limit, 2 adults, 12" min size, release wild adult Chinook. Closed August 31, September 1, 7-9, 14-16, 21-24, 28-30
White River to Carbon River	8/1 – 12/31	6 fish limit, 2 adults, 12" min size, release wild 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 wild 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)

	Closed
	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 - 9/20, 7 days/wk, opens in sections.
Coho	9/14 -10/25, 7 days/wk, in-season monitoring to meet hatchery escapement need.
Chum	10/26 - 12/6, 7 days/wk.

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

Chinook	7/27 – 10/11; Beach seines Sunday noon to Tuesday noon. Set nets Wednesday noon to Friday noon.
Coho	10/12 -11/1; Beach seines Sunday noon to Monday noon. Set nets Monday noon to Tuesday noon.
Chum	11/2 – 11/29; Beach seines Sunday noon to Tuesday noon. Set nets Wednesday noon to Friday noon.

#### Area 130 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.
Dana Pass (130-1)	7 days/wk
Pickering Pass (130-2)	7 days/wk

Peale Pass (130-3)	7 days/wk
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Southern Case (130-4)	7 days/wk
Chum	Open approximately 10/19; 2-3 days per week; managed weekly by updates (-10/12).
Area 13E Net	Closed to all fishing
Budd Inlet (Area 13F) Treaty Net (Ntrty net closed)	
Chinook	7/15-9/9 or earlier date dependent on in-season management needs; 7 days/wk 9/10-9/23 open dependent on in-season monitoring to meet hatchery escapement needs.
Coho	Closed
Chum	Open approximately 11/2, 2-3 days per week, managed by weekly in-season updates
Eld Inlet (Area 13G) Treaty Net (Ntrty net closed)	
Chinook	7/15-9/9; opening dependent upon in-season data, outer portion only.
Coho	Closed
Chum	Open approximately 11/2, 2-3 days per week, managed by weekly escapement updates
Totten Inlet (Area 13H) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9; schedule dependent on in-season data
Coho	Closed
Chum	Open approximately 10/5, 2-3 days per week; managed by weekly escapement updates
Little Skookum Inlet (Area 13I) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9; schedule dependent upon in-season data
Coho	Closed
Chum	Open approximately 11/30, 2-3 days per week; managed by weekly escapement updates
Hammersley Inlet (Area 13J) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9 or earlier date dependent on in-season management needs
Coho	Closed
Chum	Open approximately, 9/14 -12/25, 2-3 days/wk; managed by weekly escapement updates

Northern Case Inlet (Area 13K) Treaty Net (Ntrty net closed)	
Chinook	7/15-9/9
Coho	9/10-10/31 or earlier date dependent on in-season management needs
Chum	Open approximately 9/14-12/25; 2-3 days/wk; managed by weekly escapement updates
Nisqually River (Area 830) Treaty Net (Ntrty net closed)	
Chinook	<p>Gill Net 2 days/wk during the following weeks: Wk 31 (wb 7/27) through Wk 34 (wb 8/17). One day Wk 35 (wb 8/24).</p> <p>Beach Seine (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 during the following weeks: Wk 36 (wb 8/31) through wk 39 (wb 9/21). Release all unmarked Chinook.</p> <p>Tangle Net 3 daylight days a week Wk 36 (wb 8/31) and Wk 37 (wb 9/7). 2 daylight days a week Wk 38 (wb 9/14) and Wk 39 (wb 9/21). Release all unmarked Chinook.</p>
Coho	<p>Beach Seine (all freshwater immersion beaches from Luhr Beach to East Bank of Red Salmon Slough, McAllister Creek, Red Salmon Slough, and the Nisqually River) 3 daylight days a week Wk 40 (wb 9/28) and Wk 41 (wb 10/5). Release all unmarked Chinook.</p> <p>Tangle Net 2 daylight days a week Wk 40 (wb 9/28) and Wk 41 (wb 10/5). Release all unmarked Chinook.</p> <p>Gill Net 3 days/wk during the following weeks: Wk 42 (wb 10/12) through wk 47 (wb 11/16).</p>
Chum	<p>Proposed schedule: Gill Net 3-4 days/wk during the following weeks: Wk 48 (wb 11/23) through Wk 5 (wb 1/25/2015) per annual Nisqually River Chum/steelhead management plan.</p>
McAllister Creek (Area 83F) Treaty Net (Ntrty net closed)	
Chinook	Wk 27 (wb 6/29)-Wk 40 (wb 9/28); 3 days/wk
Coho	Wk 41 (wb 10/5)-Wk 48 (wb 11/23); 3-4 days/wk

Chum	Proposed schedule: Wk 49 (wb 11/30) - Wk 5 (wb 1/25/2015); 4 days/wk per annual Nisqually River Chum/steelhead management plan.
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Area 13 Recreational

5/1-6/30	2 fish limit (Chinook 22" min. size), Release wild Chinook, Minter Creek mouth closed. 2 pole endorsement
7/1-10/31	2 fish limit (Chinook 22" min. size), Release wild Chinook and wild Coho. Minter Creek mouth closed through 9/30; Lower Budd Inlet closure zone 7/16-10/31 . 2 pole endorsement
11/1-4/30	2 fish limit, (Chinook 22" min size). Release wild Chinook. Minter Creek mouth closure begins 4/16. 2 pole endorsement

Fox Island Pier Recreational

Year-Round 2 fish limit, 1 Chinook (22" min size)

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 Oly mpi a-	7/1 – 11/30	6 fish limit, 2 adults,
Mclane Creek Recreational		
(from a line 50' north of and parallel to the Mud Bay Rd. Bridge to a line 100' upstream of and parallel to the south bridge on Hwy.101)	Same as Area 13	Same as Area 13
Minter Creek Recreational		
(mouth to 50' downstream of hatchery rack)	11/1 – 12/31	4 fish limit, 12n min size, Chum only.
Nisqually River Recreational		
(mouth to the military tank crossing bridge, one mileupstream 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 wild Chinook. Closed: Aug. 11-13, 18-20, 25-27, Sept. 3-5, 8-10, 15-16, 22-23, 29-30.
	11/1-1/31	6 fish limit, 2 adults, 12" min. size; release wild Chinook.

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

#### 4.1 Hood Canal Region (AJI fisheries modeled in FRAM #2814 (Chinook) & #1416 (Coho))

Hood Canal Mainstem (Areas 12, 128, 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 128 and 12C).

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

Chinook	Trty	Areas 12, 128 and 120: Closed
		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.
		Area 12H: Open wb 7/13 through 9/20; hook and line gear continuous; beach seines daylight hours Tues and Thur each week; possible in-season modifications; Chum release.
	Ntrty	Closed
Coho	Trty	Area 12: Open 9/25 through 10/11 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.
		Area 128: Open 10/1 through 10/18 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.
		Area 12C: Open 10/1 through 10/18 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.
	Area 120 (west of Madrona Pt. - local name): Open for gillnets no earlier than 10/1. Weekly schedules identical to Area 12C.	
	Ntrty	Closed



Chum	<p>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 harvest of catch shares ("2012 Co-Management Agreement for Hood Canal Chum Salmon Fisheries"). In order to allow fishing opportunity that allows both the treaty and non-treaty fleets to have the ability to catch their shares, the Chum fishing schedules may be modified if pre-season harvestable abundance and catch shares are changed using the agreed ISU, based on Non-Treaty purse seine cumulative CPUE for October 15 through October 31. Better communication and cooperation is expected from both non-treaty and treaty co-managers to allow both parties the opportunity to access their shares.</p>	
	Trty	<p>Area 12: Open 10/12 through 11/20; 7 d/wk</p> <p>Area 128: Open 10/19 through 11/20; 7d/wk; except north of an East-West line from Zelatched Point to Seal Rock open through 11/27.</p> <hr/> <p>Area 12C: Open 10/19 through 11/27; 7d/wk.</p> <hr/> <p>Area 120: Closed.</p> <hr/> <p>Area 12H: Hook and line gear open from 10/12 through 11/29; beach seines open Tuesday and Thursday of each week. Then Monday and Wednesday for the week beginning 11/09; possible in-season adjustments to 3 days/wk. Starting 11/1, hatchery escapement control measures will go into effect.</p>
	Ntrty	<p>Area 12, 128. Fisheries scheduled wks 42 (wb 10/12) - 47 (wb 11/16): PS Chinook NR; PS fishing pattern: 1,1,1,1,2,1; GN fishing pattern: 2,2,2,2,2,2 daylight hours. Area closures: PS closed within 2 miles south of Hood Canal Bridge in Wk 44-45. Hazel/Misery point closure open to PS on Wk 44-45 and open to GN for the duration of the season.</p> <hr/> <p>Area 12C Fisheries scheduled wks 45 (wb 11/2) - 48 (wb 11/23): PS Chinook NR; PS fishing pattern: 1,2,1,1; GN fishing pattern: 2,2,2,2 daylight hours. Fishing is contingent upon the results from the agreed to ISU.</p> <hr/> <p>Area 12H: BS (Hoodsport Hatchery Zone) fishery in wks 45 – 48 pending discussions with the Co-Managers.</p> <hr/> <p>Area 120 Closed</p>
Port Gamble (Area 9A)		
Chinook	All	j Closed

Coho	Trty	Open wb 8/17 through wb 10/26; 7 days/wk; gillnet only. Ceremonial Harvest of 20 Chinook in August.
	Test	Open wb 8/4 through wb 9/29, gillnet only. 2 days per week.
	Ntrty	Open Wks 35 (wb 8/17) - 44 (wb 10/19) 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 11/2 through 11/29; 7 days/wk; gillnet only.
	Ntrty	Closed

Quilcene / Dabob (Area 12A)

Coho	Trty	Open 8/21 through 10/11; 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 8/17) - 39 (wb 9/21); Limited participation (4 permits/day); Chinook and Chum NR; fishing pattern 2,5,5,5,5,5; Fishery will be managed consistent with SCSCI, opening no sooner than 8/21. GN closed unless Treaty GN opening.
Chum	Trty	Open to set and drift gillnets wb 10/12 through 11/20, South of an E-W line through Pt. Whitney.
	Ntrty	Closed

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

Skokomish River (Area 82G) Treaty (Ntrty net closed) Purdy  
Creek (Area 82J) Treaty Net (Ntrty net closed)

The Skokomish Tribe may 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 and agreed to by the co-managers before implementation. The Skokomish Tribe will continue to sample all agreed to fisheries in order to provide weekly in-season updates (i.e. CWT, species, mark status and mark rates). The WDFW will provide weekly in-season updates for Chinook returns to the George Adams Hatchery rack. Note: Hook and line gear and beach seines release Chum through 10/15 above Hwy 106 Bridge.

Skokomish River – Mouth to HWY 106 Bridge (Area 82G) Treaty (Ntrty net closed)

Chinook	Open wb 7/13 – wb 7/27, 3 days/wk.
Coho	Open 10/1 – 10/11, 2 days/wk; wb 10/12 – wb 11/02, 7 days/wk.
Chum	Open 11/09 through wb 11/23, 7 days/wk.

Skokomish River – HWY 106 Bridge to HWY 101 Bridge (Area 82G) Treaty (Ntrty net closed)

	Open wb 8/3, 3 days/wk; 9pen wb 8/10 – wb 8/17, 4 days/wk.
	Open wb 9/14 – wb 10/05, 2 days/wk; wb 10/12 – wb 11/02, 7 days/wk.
	Open 11/09 through wb 11/23; 7 days/wk.

Purdy Creek (Area 82J) Treaty Net (Ntrty net closed) 250 feet from the confluence/mouth of Purdy Creek to the HWY 101 Bridge (fishing nets may not be attached to any abutment or railings on the HWY 101 Bridge).

Chinook	Gill Nets only: Open every Saturday beginning July 5 – September 6. In-season adjustments will occur to ensure weekly broodstock targets are achieved.
Chum	Gill Nets, Dip Nets and Hook & Line: Open beginning 11/15 as necessary to reach tribal share.

Misc. Hood Canal Rivers (Dosewallips, Duckabush, Hamma Hamma, Tahuya, Dewatto, Union)

All species Closed to commercial harvest.

Area 12 Recreational

5/1-6/30	Closed
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7/1-8/31

North of Ayock Pt. – Closed to salmon angling except see  
Quilcene/Dabob Bay Recreational below.

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9/1-10/15	North of Ayock Pt. (including Quilcene/Dabob Bay) – 4 fish limit, Coho only. Closed in Tarboo Bay N of Broad Spit starting 9/16.	
7/1-10/15	South of Ayock Pt. - 4 fish limit, 2 Chinook (Chinook 22" min size); release Chum and wild Chinook.	
10/16-12/31	4 fish limit, 2 Chinook (Chinook 22" min size). Release wild Chinook. Closed in Tarboo Bay N of Broad Spit.	
1/1-1/31	Closed	
2/1-4/30	2 fish limit (Chinook 22" min size), release wild Chinook	
Quilcene/Dabob Bay Recreational		
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	
Hoodsport Hatchery Zone Recreational		
Same as Area 12 except:		
7/1-12/31	4 fish limit, no minimum size, only 2 Chinook greater than 24"; Release wild Chinook and Chum 7/1-10/15.	
Dewatto River Recreational		
(mouth to Dewatto-Holly Rd. Bridge)	10/1 – 10/31	2 fish limit, 12" min size, Coho only.
Dosewallips River Recreational		
(mouth to Hwy. 101 Bridge)	11/1 – 12/15	2 fish limit, 12" min size, Chum only.
Duckabush River Recreational		
(mouth to Mason Co. PUD #1 overhead electrical distribution line)	11/1 – 12/15	2 fish limit, 12" min size, Chum only.
Quilcene River Recreational		
(from Rodgers St. to Hwy 101 Bridge)	8/16 – 10/31	4 fish, 12" min size, Coho only.

Skokomish River Recreational

(mouth to Hwy. 101 Bridge)	8/1 –9/1	2 fish limit, 12" min size, release wild Chinook and Chum. Closed upstream of Highway 106 bridge Monday through Thursday weekly, except open 7 days per week 8/25 - Labor Day (9/1).
	9/15 – 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.

Tahuya River Recreational

(mouth to marker 1 mile above N. Shore Rd. Bridge)	10/1 – 10/31	2 fish limit, 12" min size, Coho only.
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All other HOOD CANAL REGION freshwater trout and salmon fishing, regulations apply.