

**2010-11 Winter Mark-Selective Recreational Chinook Fisheries  
In Marine Areas 7, 8-1, 8-2, 9, 10, 11, and 12**

**Post-season Report**

**REVISED DRAFT**

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## INTRODUCTION

In recent years, abundant runs of hatchery Chinook salmon (*Oncorhynchus tshawytscha*) have been mixed with depressed runs of wild Chinook salmon in the marine environments of the Puget Sound and Strait of Juan de Fuca. Providing recreational anglers with opportunities to harvest abundant hatchery stocks while simultaneously protecting weaker, wild stocks has proven to be a significant conservation and management challenge. The combination of large-scale hatchery marking (i.e., fin clipping) programs and mark-selective harvest regulations makes it possible for anglers to pursue and harvest hatchery Chinook salmon while minimally impacting wild salmon populations. In such “mark-selective fisheries” (MSFs), anglers are generally allowed to retain adipose-fin clipped (“marked”) hatchery fish and are required to release unharmed any unclipped (“unmarked”, predominantly wild) salmon encountered<sup>1</sup>.

Since the Washington Department of Fish and Wildlife (WDFW) implemented the first marine mark-selective Chinook fishery in Marine Catch Areas 5 and 6 (Strait of Juan de Fuca) in 2003 based on state-tribal agreements (Thiesfeld and Hagen-Breaux 2005a, WDFW 2008a), mark-selective Chinook salmon fishing regulations have been implemented on a pilot basis in multiple Puget Sound Marine Catch Areas during both the summer and winter seasons. As of the close of the summer 2011 fishing season, pilot *summer* selective Chinook seasons have occurred in Areas 5 and 6 for nine years (2003-2011; Thiesfeld and Hagen-Breaux 2005a, Thiesfeld and Hagen-Breaux 2005b, WDFW 2008a, WDFW 2009a, WDFW 2010g, WDFW 2011a) and in Areas 9, 10, 11, and 13 for five years (2007-2011; WDFW 2007a and 2007b, WDFW 2009b and 2009c, WDFW 2010e and 2010f, WDFW 2011a). Draft reports for summer 2011 mark-selective fisheries are in preparation. Additionally, pilot *winter* selective Chinook fisheries have occurred in Areas 8-1 and 8-2 for six complete seasons (2005-06, 2006-07, 2007-08, 2009, 2009-10, and 2010-11; WDFW 2008b, WDFW 2009d, WDFW 2010b, WDFW 2011b), Areas 9 and 10 for four winter seasons (2008, 2008-09, 2009-10, and 2010-11; WDFW 2010c, WDFW 2010d, WDFW 2011b), Area 7 for four winter seasons (2008, 2009, 2009-10, 2010-11; WDFW 2009e, WDFW 2010a, WDFW 2011b), and in Areas 11 and 12 for two winter seasons (February 1 - April 30, 2010 and February 1 - April 30, 2011; WDFW 2011b).

During the 2010-11 winter season (i.e., October 2010 through April 2011 period), WDFW implemented seven pilot mark-selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11 and 12. The 2010-11 winter Chinook MSF seasons in each of the areas were as follows:

- Area 7 from December 1, 2010 through April 30, 2011;
- Areas 8-1 and 8-2 from November 1, 2010 through April 30, 2011;
- Area 9 from November 1-30, 2010 and January 16 – April 15, 2011;
- Area 10 from October 1, 2010 through January 31, 2011; and
- Areas 11 and 12 from February 1 through April 30, 2011.

Consistent with the 2004 (and 2010 update) Puget Sound Chinook Harvest Management Plan (Puget Sound Indian Tribes and WDFW 2004 and 2010), a key goal of implementing each of these mark-

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<sup>1</sup>The regulations specific to winter mark-selective fisheries in Puget Sound Marine Catch Areas allowed for the retention of up to two legal-sized ( $\geq 22$  inches [56 cm]) marked Chinook salmon per day and required the immediate release of all unmarked or sublegal Chinook. Additionally, anglers were: *i*) required to use single-point, barbless hooks while fishing for salmon, *ii*) held to a combined (all salmon species) two-fish daily limit, and *iii*) held to a handling rule that prevented them from bringing unmarked and/or sublegal Chinook aboard their vessels.

selective Chinook fisheries has been to provide meaningful opportunity to the recreational angling public while minimally impacting ESA-listed Puget Sound Chinook salmon.

### Comprehensive Sampling and Monitoring Program

Given the pilot nature of the mark-selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12, WDFW's Puget Sound Sampling Unit (PSSU) was tasked with implementing a comprehensive sampling and monitoring program to collect the data needed to evaluate each pilot mark-selective Chinook fishery and its impact on unmarked salmon. As per state-tribal agreement (e.g., WDFW and NWIFC 2011), we developed area-specific sampling plans consisting of several comprehensive and complementary sampling components, including dockside creel sampling, test fishing, on-water or aerial effort surveys, and angler-completed voluntary trip reports (VTRs). We tailored area-specific sampling plans so that we could reliably estimate the following critical parameters needed for evaluating mark-selective fisheries: *i*) the mark rate of the targeted Chinook population, *ii*) the total number of Chinook salmon harvested (by size [legal or sublegal] and mark-status [marked or unmarked] group), *iii*) the total number of Chinook salmon released (by size and mark-status group), *iv*) the coded-wire tag- (CWT) and/or DNA-based stock composition of marked and unmarked Chinook mortalities<sup>2</sup>, and *v*) the total mortality of marked and unmarked double index tag (DIT) CWT stocks. In addition, we acquired and analyzed relevant data characterizing other aspects of the pilot fisheries, including descriptors of fishing effort, fishing success (catch [landed Chinook] per unit effort), the length and age composition of encountered Chinook, and the overall intensity of our sampling efforts.

### Reporting Efficiencies

In July 2010, technical staffs from the WDFW Puget Sound Sampling Unit, Northwest Indian Fisheries Commission (NWIFC), and Puget Sound Treaty Tribes met to discuss potential reporting efficiencies in WDFW's mark-selective Chinook fishery post-season reports. NWIFC and tribal representatives had initiated the idea for such a meeting, considering that we at WDFW had been submitting a separate post-season report for each area and season (since 2003) to the co-managers, resulting in redundancies between individual reports, particularly in the Methods section. Also, over the years we kept adding sections to the selective fishery annual reports, in response to individual tribal co-manager requests, and sustained those additions in each future report, resulting in ever-lengthening post-season reports. From both the WDFW and tribal technical perspectives, we needed to prioritize the most essential reporting elements and achieve efficiencies to streamline the selective fishery reporting work load.

Thus, at the July 2010 meeting the WDFW and tribal staffs worked on prioritizing the most essential elements (i.e., tables, figures, and appendices) needed in WDFW's annual post-season selective fishery reports in an effort to define reporting efficiencies. Based on these decisions (details available in a WDFW memo dated August 16, 2010 summarizing the July 2010 meeting), we began implementing reporting efficiencies starting with the 2009-10 winter mark-selective Chinook fisheries post-season report and continuing thereafter.

At the July 2010 meeting we also agreed that a key efficiency in the annual reporting process would be for WDFW staff to produce a centralized Methods Report. The Methods Report would be a stand-alone document that includes the details of each area's Chinook MSF study design (for both winter and

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<sup>2</sup> Though the necessary tissue samples have been collected, DNA-based estimates of stock composition are presently unavailable for Puget Sound/Strait of Juan de Fuca mark-selective fisheries. In the present report, methods for producing CWT-based (unexpanded) estimates of the stock composition of marked Chinook harvest are provided.

summer fisheries), sampling procedures, data analysis methods, and all equations used to generate estimates and variances. Thus, we refer the reader to our Methods Report (WDFW 2012) for detailed descriptions of the diverse study designs and protocols used to monitor and evaluate the selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12 during winter 2010-11.

In the following pages, we report the results generated through our monitoring activities during the 2010-11 winter Areas 7, 8-1, 8-2, 9, 10, 11, and 12 mark-selective Chinook fisheries. We report results based on our more efficient reporting format agreed-to between state and tribal technical representatives, in which we focus on presenting data tables and figures rather than interpretive text (unless text is needed to specify noteworthy in-season adjustments or other circumstances unique to the particular season). We present 2010-11 winter Chinook MSF results in separate chapters (1 through 6) by area, and within each chapter the data are presented in a series of tables and figures generally according to the following sequence: *i*) estimates of fishery characteristics obtained from the dockside creel survey data, including catch and effort total estimates, Chinook length-frequency data, and CWT recovery results; *ii*) results from our recreational test fishery (where applicable); *iii*) results from our VTR collection efforts; *iv*) total mortality estimates of marked and unmarked DIT CWT stocks by hatchery and brood year; *v*) total fishery Chinook encounters and impacts—estimated based on creel survey and test fishery or VTR data—which we compare with pre-season expectations (i.e., based on Fishery Regulation Assessment Model [FRAM] predictions); *vi*) sample rate information based on dockside sampling of harvested Chinook; and *vii*) historical Chinook encounters estimates for each area's winter mark-selective Chinook fishery.

## RESULTS

### 1) Marine Area 7 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 7 for the fourth winter season from December 1, 2010 through April 30, 2011. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 7 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, and aerial effort surveys, and collecting voluntary trip reports (VTRs) from the angling public. **Table 7-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012).

In this section we present results from our monitoring activities during the Area 7 winter selective Chinook fishery from December 1, 2010 through April 30, 2011. In addition to the major components of the results described previously (page 3), we present aerial survey and dockside data used to estimate the sample fraction in Area 7 (see WDFW 2012, *Aerial-Access Design*). Total salmon harvest and release estimates presented in this chapter include only Chinook salmon because no other salmon were reported as retained or released during the Area 7 winter fishery.

**Table 7-1.** Sampling/estimation details on target parameters associated with the overall Area 7 mark-selective fishery monitoring program.

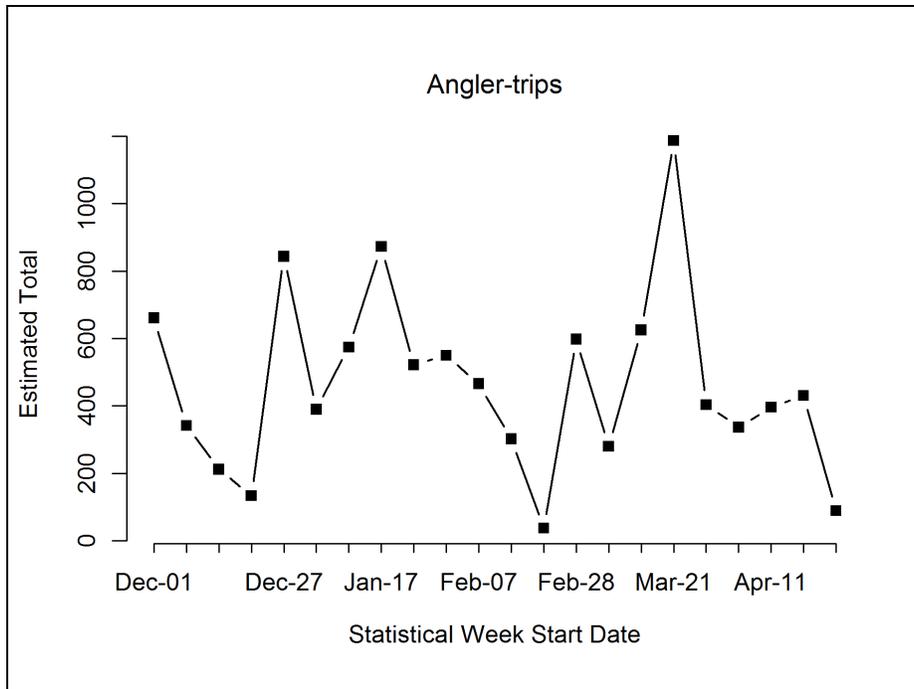
Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week. The eight-day weekday estimates for each two-week period were then split evenly between individual weeks in the two-week block to enable weekly estimates (see WDFW 2012).
Aerial Surveys	Fraction of Area 7 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see <b>Table 7-12</b> ; $n=22$ surveys conducted out of $N=151$ days available in the season). To compute the season-wide sample fraction the aerial survey data were lumped across the season, due to low sample sizes for individual surveys.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	We used the test fishery data only to estimate the size/mark status proportions (LM=47.1%, LU=34.5%, SM=9.2%, SU=9.2%) needed to produce the total encounters estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data ( <b>Table 7-6</b> ) were not used for impact estimation steps due to the assumed higher data quality and sufficient sample size of test fishery data. See comment in row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<sup>1</sup>The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

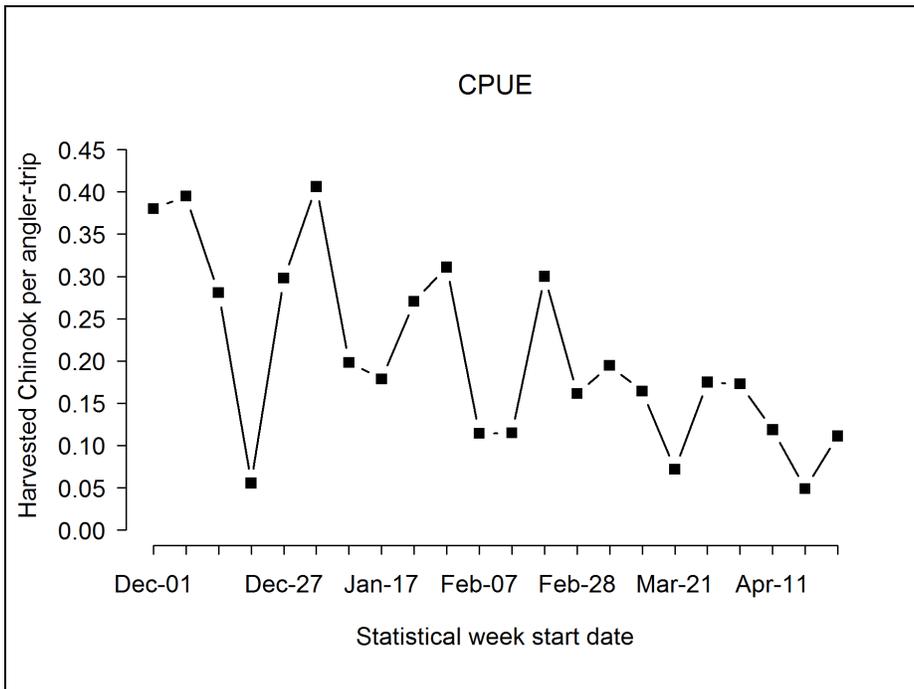
<sup>2</sup>Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 7-2.** Estimates of total fishing effort and total salmon catch (harvest and releases) during the December 1, 2010-April 30, 2011 Area 7 selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked. The lower 95% confidence interval for the estimated AD released Chinook is the actual number reported in the dockside creel.

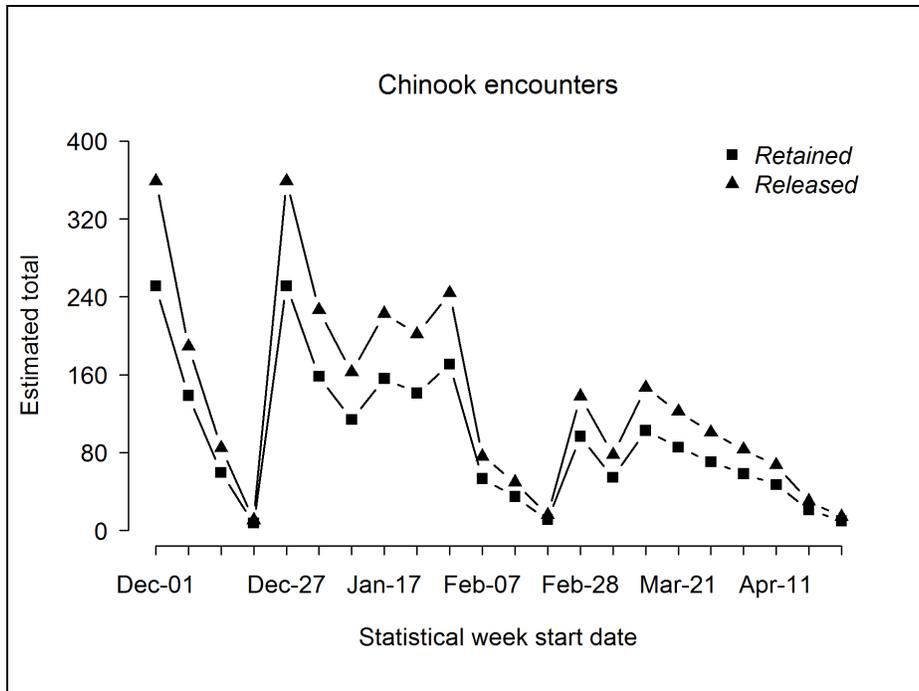
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Dec	49	Dec-01	05-Dec	296	661	251	0	92	266	610
	50	06-Dec	12-Dec	205	342	135	4	50	139	328
	51	13-Dec	19-Dec	110	212	59	0	22	63	143
	52	20-Dec	26-Dec	69	134	7	0	3	7	17
	53/1	27-Dec	02-Jan	408	843	251	0	92	266	610
Jan	2	03-Jan	09-Jan	201	390	158	0	58	168	384
	3	10-Jan	16-Jan	297	574	114	0	42	121	277
	4	17-Jan	23-Jan	420	873	156	0	57	165	379
	5	24-Jan	30-Jan	271	522	141	0	52	150	342
Feb	6	31-Jan	06-Feb	290	550	171	0	63	181	415
	7	07-Feb	13-Feb	250	465	53	0	20	56	129
	8	14-Feb	20-Feb	178	302	35	0	13	37	85
	9	21-Feb	27-Feb	19	37	11	0	4	12	27
Mar	10	28-Feb	06-Mar	286	598	97	0	36	103	236
	11	07-Mar	13-Mar	168	280	54	0	20	57	131
	12	14-Mar	20-Mar	347	625	103	0	38	109	250
	13	21-Mar	27-Mar	535	1,187	85	0	31	90	206
	14	28-Mar	03-Apr	215	404	71	0	26	75	172
Apr	15	04-Apr	10-Apr	182	337	58	0	21	62	141
	16	11-Apr	17-Apr	208	396	47	0	17	50	114
	17	18-Apr	24-Apr	209	431	21	0	8	22	51
	18	25-Apr	30-Apr	50	89	10	0	4	11	24
<b>Private Fleet Subtotal</b>				<b>5,214</b>	<b>10,252</b>	<b>2,088</b>	<b>4</b>	<b>768</b>	<b>2,211</b>	<b>5,071</b>
<b>Resurrection Derby, Dec 3-4, 2010</b>				47	125	120	0	44	127	291
<b>Roche Harbor Derby, Feb 4-5, 2011</b>				100	337	68	0	25	72	165
<b>Anacortes Salmon Derby, Mar 26-27, 2011</b>				500	1100	101	0	37	107	245
<b>Private Fleet + Derby Total</b>				<b>5,861</b>	<b>11,814</b>	<b>2,378</b>	<b>4</b>	<b>875</b>	<b>2,519</b>	<b>5,776</b>
<b>Variance:</b>				318,940	1,338,397	48,986	7	341,681	209,527	723,981
<b>Standard Error:</b>				565	1,157	221	3	585	458	851
<b>CV (%):</b>				9.6%	9.8%	9.3%	66.1%	66.8%	18.2%	14.7%
<b>95% CI:</b>				4,754-6,968	9,546-14,082	1,943-2,811	2-9	120-2,020	1,620-3,415	4,105-7,441



**Figure 7-1.** Temporal patterns in fishing effort during the Area 7 mark-selective Chinook fishery from December 1, 2010 through April 30, 2011.



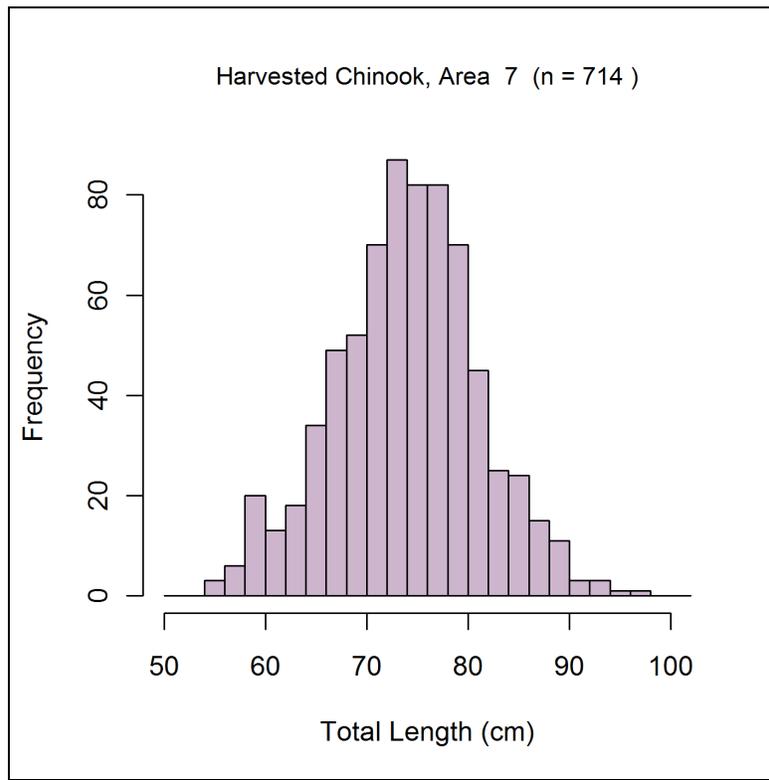
**Figure 7-2.** Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 7 mark-selective Chinook fishery from December 1, 2010 through April 30, 2011.



**Figure 7-3.** Temporal patterns in Chinook encounters (retained and released) during the Area 7 mark-selective Chinook fishery from December 1, 2010 through April 30, 2011.

**Table 7-3.** Summary of total length samples collected from retained Chinook during dockside angler interviews and derby sampling, Area 7 mark-selective Chinook fishery, December 1, 2010 - April 30, 2011.

Mark Type	Number Sampled		Total
	Legal-size	Sublegal-size	
Marked	711	3	714
Unmarked	2	0	2
<b>Total</b>	<b>713</b>	<b>3</b>	<b>716</b>



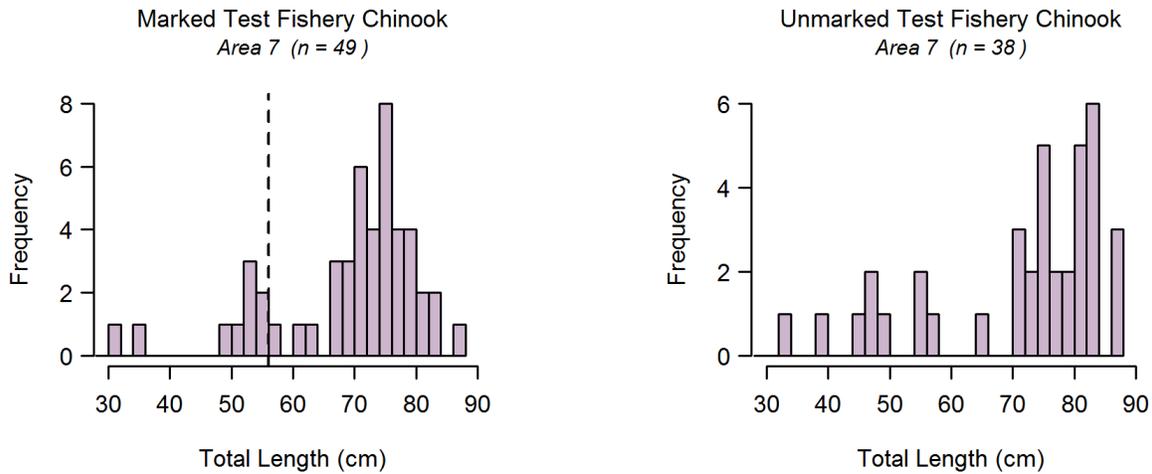
**Figure 7-4.** Length-frequency distribution for marked Chinook harvested and then sampled in dockside angler interviews, during the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery.

**Table 7-4.** Summary of coded-wire tags recovered from Chinook salmon harvested during the Area 7 December 1, 2010-April 30, 2011 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	Number CWTs Recovered	Number DITs
British Columbia	Fraser River – Thompson River (4.7%)	R-HARRISON R	H-CHEHALIS R	3 (3.5%)	3
		R-CHILLIWACK R	H-CHILLIWACK R	1 (1.2%)	0
	Georgia Strait (5.9%)	R-COWICHAN R	H-COWICHAN R	5 (5.9%)	0
Washington	Northern Washington (14.1%)	FRIDAY CR 03.0017	SAMISH HATCHERY	1 (1.2%)	1
		NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	5 (5.9%)	5
		EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	6 (7.1%)	0
	Hood Canal (15.3%)	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	8 (9.4%)	8
		FINCH CR 16.0222	HOODSPORT HATCHERY	5 (5.9%)	0
	Northern Puget Sound (24.7%)	WALLACE R 07.0940	WALLACE R HATCHERY	9 (10.6%)	5
		TULALIP CR 07.0001	BERNIE GOBIN HATCH	3 (3.5%)	0
		WALLACE R 07.0940		2 (2.4%)	0
	Skagit River (22.4%)	WHITEHORSE SPRINGS	WHITEHORSE POND	7 (8.2%)	0
		BAKER R 03.0435		2 (2.4%)	0
		CASCADE R 03.1411	MARBLEMOUNT HATCHERY	17 (20%)	3
	Mid Puget Sound (8.2%)	GREEN R 09.0001	ICY CR HATCHERY	1 (1.2%)	0
		BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	2 (2.4%)	2
		GROVERS CR HATCHERY	GROVERS CR HATCHERY	4 (4.7%)	4
	Southern Puget Sound (3.5%)	CLEAR CR 11.0013C	CLEAR CREEK HATCHERY	1 (1.2%)	1
KALAMA CR 11.0017		KALAMA CR HATCHERY	2 (2.4%)	0	
Columbia River	Central Columbia River (Bonneville Dam to McNary Dam) (1.2%)	KLICKITAT HATCHERY (YKFP)	KLICKITAT HATCHERY (YKFP)	1 (1.2%)	0
<b>Total</b>				<b>85</b>	<b>32</b>

**Table 7-5.** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Variances associated with total size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	# Days	# Hours	AD	UM	AD	UM	
49	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
51	12	28.5	3	1	0	0	4
52	4	14.5	4	0	0	0	4
53	6	14.9	2	2	1	0	5
2	4	10.8	1	0	0	1	2
3	9	14.3	1	1	0	0	2
4	6	13.5	1	1	1	0	3
5	8	17.75	4	2	1	0	7
6	15	29.9	1	2	1	0	4
7	8	21.0	2	2	0	2	6
8	4	15.4	1	2	1	0	4
9	0	0.0	0	0	0	0	0
10	8	20.4	4	3	0	0	7
11	7	13.2	1	1	0	0	2
12	7	18.5	0	2	0	0	2
13	9	27.0	4	4	1	3	12
14	8	21.5	0	2	0	0	2
15	10	25.0	1	0	0	1	2
16	7	22.0	2	0	1	0	3
17	7	24.5	7	2	1	1	11
18	12	21.8	2	3	0	0	5
<b>Total</b>	<b>129</b>	<b>316.5</b>	<b>41</b>	<b>30</b>	<b>8</b>	<b>8</b>	<b>87</b>
<b>Size/mark-status composition:</b> 0.471 (0.003) 0.345 (0.003) 0.092 (0.001) 0.092 (0.001) <b>Legal size mark rate:</b> 0.577 (0.003) <b>Overall mark rate:</b> 0.563 (0.003)							



**Figure 7-5.** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Note that the vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

**Table 7-6.** Total Chinook encountered (retained and released) by anglers reporting their catch on voluntary trip reports (VTRs) in the Area 7 December 1, 2010 – April 30, 2011 mark-selective Chinook fishery compared to test fishing encounter data, with estimates of legal-size, sublegal-size, and overall mark rates. AD = marked (i.e., adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data source	Effort and Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
<b>Test Fishery</b>	<b>129 Days, 258 Angler Trips</b>	41	30	8	8	87	0.56	0.58
Test fishery size/mark-status comp:		0.471	0.345	0.092	0.092			
Variance:		(0.00290)	(0.00263)	(0.00097)	(0.00097)			
<b>Private Boat VTR</b>	<b>159 1-trip VTR's, 293 Angler Trips</b>	104	52	4	1	161	0.67	0.67
VTR size/mark-status comp:		0.646	0.323	0.025	0.006			
Variance:		(0.00143)	(0.00137)	(0.00015)	(0.00004)			
<b>Grand Total</b>		<b>145</b>	<b>82</b>	<b>12</b>	<b>9</b>	<b>248</b>	<b>0.633</b>	<b>0.639</b>
Combined size/mark-status comp:		0.585	0.331	0.048	0.036			
Variance:		(0.00098)	(0.00090)	(0.00019)	(0.00014)			

We compared the size and mark-status proportions of the Area 7 test fishery versus VTR data sources using homogeneity tests. We first considered using a Pearson's chi-squared test to compare the two data sources in four size/mark status categories (2x4 contingency table), but due to low expected frequencies (<5) in two of the categories (sublegal-marked and sublegal-unmarked), we could not use this test. Thus, we applied Fisher's Exact Test to compare the test fishery versus VTR mark rates for legal-sized only as well as the combined size groups (i.e., 2x2 tables). Results showed that legal-size mark rates were not significantly different (test fishery: 58% vs. VTR: 67%;  $\chi^2 = 1.7$ ,  $df = 1$ ,  $p = 0.233$ )

between groups. Likewise, overall mark rates (test fishery: 56% vs. VTR: 67%) were not significantly different between the two data sources ( $\chi^2 = 2.8$ ,  $df = 1$ ,  $p = 0.100$ ). Despite finding no significant difference between groups, we decided to use the test fishery data only (i.e., assuming higher data quality and sufficient sample size) to estimate the Chinook size/mark status proportions needed for estimating total Chinook encounters and associated mortalities in the Area 7 MSF.

**Table 7-7.** Summary of season-wide fishery impact estimates for the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

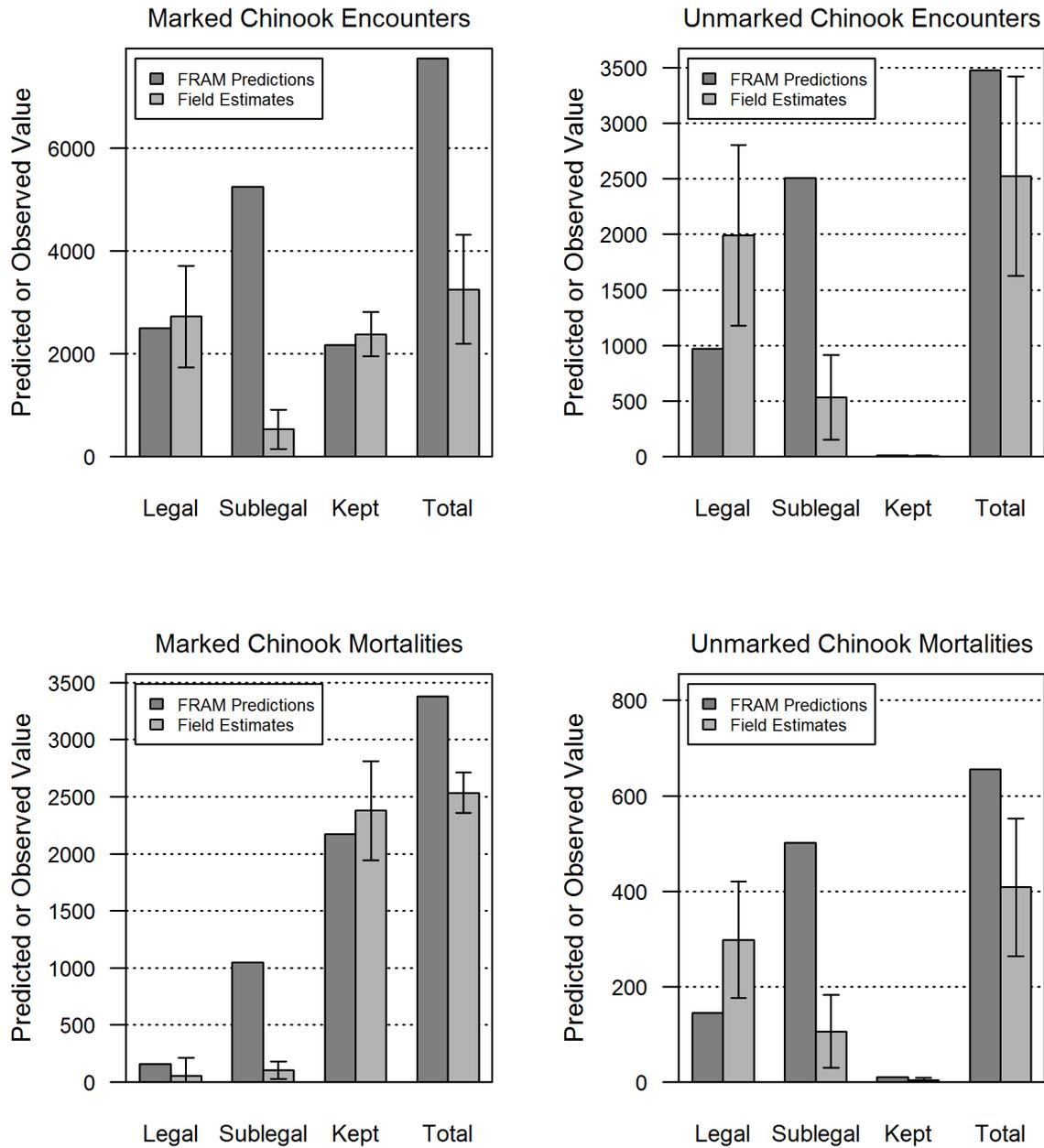
<b>Total Encounters</b> <b>(E): 5,776</b> <b>V(E): 724,462</b>										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	2,722	2,368	354	0.15	53	2,421	55,450	235	1960 - 2883	10
Legal unmarked	1,992	4	1,988	0.15	298	302	3,875	62	180 - 424	21
Sublegal marked	531	10	521	0.20	104	114	1,548	39	37 - 191	34
Sublegal unmarked	531	0	531	0.20	106	106	1,513	39	30 - 182	37
All groups combined	<b>5,776</b>	<b>2,382</b>	<b>3,394</b>		<b>562</b>	<b>2,944</b>	<b>62,385</b>	<b>250</b>	<b>2454 - 3433</b>	<b>8</b>

**Table 7-8.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters for the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	3,476	971	2,505	10
	Mark.	7,742	2,497	5,245	2,172
	Total	11,218	3,468	7,750	2,182
	% Marked	69	72	68	100
Estimated (Creel) Encounters	Unmark.	2,523	1,992	531	4
	Mark.	3,253	2,722	531	2,378
	Total	5,776	4,714	1,062	2,382
	% Marked	56	58	50	100

**Table 7-9.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook mortalities for the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	656	3,378	4,034	408	2,536	2,944
Released Legal	145	157	302	298	53	351
Released Sublegal	501	1,049	1,550	106	104	210
Landed Only	10	2,172	2,182	4	2,378	2,382



**Figure 7-6.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters (*upper panel*) and mortalities (*lower panel*) for the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 7-10.** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 7 December 1, 2010 - April 30, 2011 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Clear Creek Hatchery	2007	1	3.3	7.8	3.3	0.3	0.1	0.3
George Adams Hatchery	2007	8	26.7	62.2	26.9	2.7	0.6	2.3
Grovers Creek Hatchery	2007	4	10.0	23.3	13.4	4.3	8.0	3.6
Chilliwack River Hatchery	2008	3	10.0	23.3	10.0	1.0	0.2	0.8
Kendall Creek Hatchery	2007	3	10.0	23.3	10.1	1.0	0.2	0.8
	2008	2	6.7	15.6	6.9	0.7	0.2	0.6
Marblemount Hatchery	2007	2	6.7	15.6	6.7	0.7	0.2	0.6
	2008	1	3.3	7.8	3.3	0.3	0.1	0.3
Samish Hatchery	2007	1	3.3	7.8	3.4	0.3	0.1	0.3
Soos Creek Hatchery	2007	2	6.7	15.6	6.7	0.7	0.2	0.6
Wallace River Hatchery	2007	4	13.3	31.1	13.3	1.3	0.3	1.1
	2008	1	3.3	7.8	3.3	0.3	0.1	0.3
<b>TOTAL</b>		<b>32</b>	<b>103.3</b>	<b>241.1</b>	<b>107.4</b>	<b>13.7</b>	<b>10.2</b>	<b>11.5</b>

**Table 7-11.** Monthly sample rates (Total retained Chinook sampled <sup>1/</sup> / Estimated retained Chinook) in the winter 2010-11 Area 7 mark-selective Chinook fishery, December 1, 2010 - April 30, 2011.

Time period			Estimated Retained Chinook				Number of Chinook sampled				Sample Rate
Month	Stat. Weeks	Dates	Marked	Un-marked	Unk.	Total	Marked	Un-marked	Unk.	Total	
December	49-53/1	Dec 1 - Jan 2	824	4	0	828	264	1	0	265	32.0%
January	2-5	Jan 3 - Jan 30	569	0	0	569	118	0	0	118	20.7%
February	6-9	Jan 31 - Feb 27	337	0	0	337	123	0	0	123	36.5%
March	10-13	Feb 28 - Mar 27	440	0	0	440	162	0	0	162	36.8%
April	14-18	Mar 28 - Apr 30	207	0	0	207	47	0	0	47	22.7%
<b>Season Total</b>			<b>2,377</b>	<b>4</b>	<b>0</b>	<b>2,381</b>	<b>714</b>	<b>1</b>	<b>0</b>	<b>715</b>	<b>30.0%</b>

<sup>1/</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2010-11 Area 7 selective Chinook fishery (i.e., the four sample-frame sites included in the creel estimates, derby samples, and the fish sampled as part of baseline sampling in Area 7).

**Table 7-12.** Summary of aerial survey and dockside data used to estimate the fraction of Area 7 effort captured in the four-site sample frame during the December 1, 2010 – April 30, 2011 Area 7 mark-selective Chinook fishery. See Methods Report (WDFW 2012) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, $f_{ij}$
		Start Time	End Time	Total Boats, $m_{ij}$	Total Boats, $\Sigma y_{ijk}$	Fishing Boats	Active Boats, $X_{ij}$	
01-Dec	Weekday	11:45	12:55	84	179	34	16	0.190
03-Dec	Weekday	11:35	12:50	62	89	33	23	0.371
04-Dec	Weekend	10:52	11:58	87	106	44	36	0.414
11-Dec	Weekend	10:20	11:28	77	111	26	18	0.234
18-Dec	Weekend	10:31	11:23	25	63	20	8	0.320
30-Dec	Weekend	11:10	12:20	70	140	22	11	0.157
08-Jan	Weekend	10:42	11:45	62	100	42	26	0.419
19-Jan	Weekday	10:48	11:48	49	72	34	23	0.469
22-Jan	Weekend	11:00	12:13	111	125	53	47	0.423
09-Feb	Weekday	9:20	10:23	22	43	31	16	0.727
12-Feb	Weekend	10:50	12:00	15	20	15	11	0.733
13-Feb	Weekend	10:55	12:20	57	68	38	32	0.561
19-Feb	Weekend	10:40	11:15	24	216	9	1	0.042
19-Mar	Weekend	10:32	11:45	118	143	62	51	0.432
25-Mar	Weekday	11:22	12:25	37	74	24	12	0.324
27-Mar	Weekend	10:37	11:45	203	280	91	66	0.325
02-Apr	Weekend	10:40	11:40	38	80	36	17	0.447
05-Apr	Weekday	10:48	11:53	25	39	11	7	0.280
09-Apr	Weekend	10:36	11:45	81	136	52	31	0.383
16-Apr	Weekend	10:45	12:03	27	29	29	27	1.000
20-Apr	Weekday	10:32	11:40	33	51	14	9	0.273
23-Apr	Weekend	10:41	11:56	130	207	75	47	0.362
Mean				65.3	107.9	36.1	24.3	0.40
Standard Deviation				45.3	66.5	20.6	16.6	0.21
CV(%)				69.3%	61.7%	57.1%	68.4%	51.9%

**Table 7-13.** Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 7 winter mark-selective Chinook fishery.

Area	Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
7	Feb 1 - 29, 2008	4,862	1,301	2	24	0	200	1,042	244	155	2,967
7	Feb 1 - April 15, 2009	8,167	1,406	9	14	0	210	708	139	17	2,501
7	December 1, 2009 - April 30, 2010	9,589	1,400	0	18	0	209	673	150	74	2,524
7	December 1, 2010 - April 30, 2011	11,814	2,368	4	10	0	354	1,988	521	531	5,776

## 2) Marine Areas 8-1 & 8-2 Winter Mark-selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a winter mark-selective Chinook fishery (MSF) in Marine Areas 8-1 and 8-2 for the sixth time from November 1, 2010 through April 30, 2011. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Areas 8-1 and 8-2 during the November-April season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and distributing/collecting voluntary trip reports (VTR's) from the angling public. **Table 8182-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012).

**Table 8182-1.** Sampling/estimation details on target parameters associated with the overall Areas 8-1 and 8-2 mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into "weekday" (Mon.-Thurs.) and "weekend" (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week. The eight-day weekday estimates for each two-week period were then split evenly between individual weeks in the two-week block to enable weekly estimates (see WDFW 2012).
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., "size measures" or "weights" of sampled sites) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats and anglers.	Month	A total of 2 boat surveys per month ( $n=12$ ) were conducted during the six-month fishery. The site size measures calculated from 2010-11 data were compared with the average size measures from previous seasons and did not vary significantly from the past average size measures per site.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season (6 months)	We combined the Areas 8-1 and 8-2 VTR data to estimate total Chinook encounters by size/mark group (LM=35.1%, LU=5.4%, SM=35.1%, SU=24.3%) and associated impacts (see <b>Table 8182-6</b> ).
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (6 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire Tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (6 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

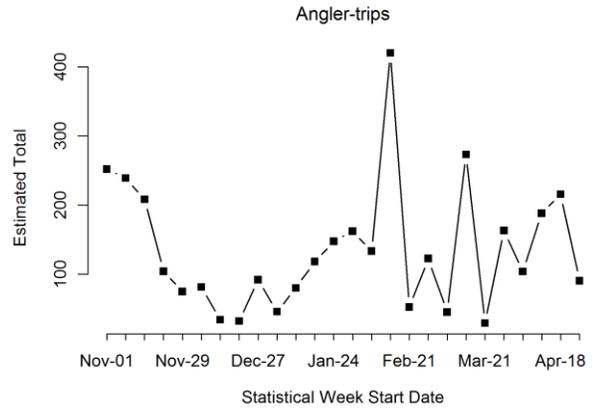
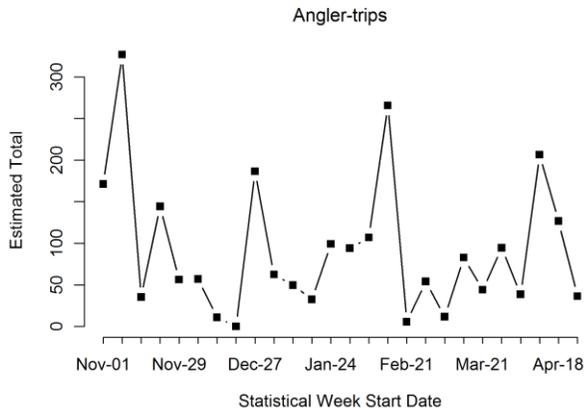
<sup>1</sup> The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

**Table 8182-2.** Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2010-April 30, 2011 Area 8-1 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked.

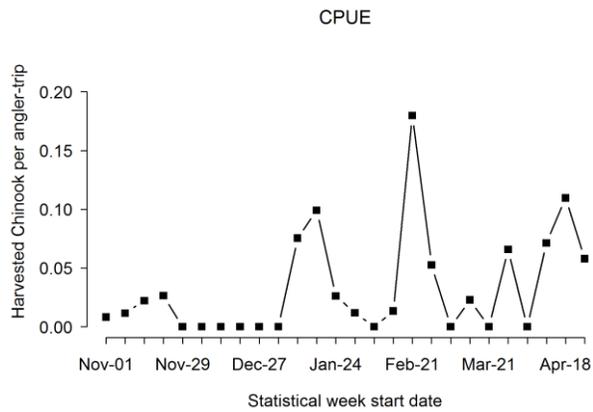
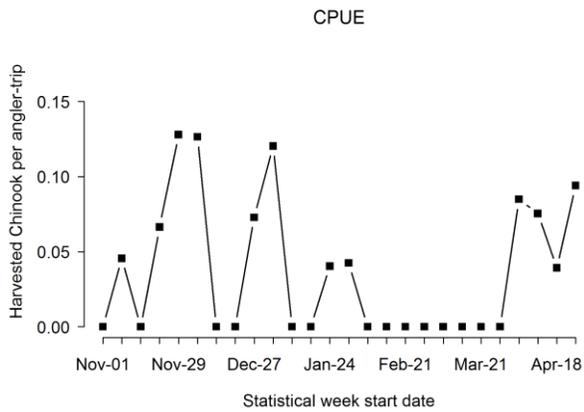
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
<b>Nov</b>	45	Nov-01	07-Nov	83	171	0	0	0	0	0
	46	Nov-08	14-Nov	170	327	15	0	16	13	44
	47	Nov-15	21-Nov	15	35	0	0	0	0	0
	48	Nov-22	28-Nov	75	144	10	0	11	8	29
	49	Nov-29	05-Dec	31	56	7	0	8	6	22
<b>Dec</b>	50	Dec-06	12-Dec	26	57	7	0	8	6	22
	51	Dec-13	19-Dec	5	11	0	0	0	0	0
	52	Dec-20	26-Dec	0	0	0	0	0	0	0
	53/1	Dec-27	Jan-02	82	186	14	0	15	12	41
<b>Jan</b>	2	Jan-03	09-Jan	34	62	8	0	8	7	22
	3	Jan-10	16-Jan	30	50	0	0	0	0	0
	4	Jan-17	23-Jan	18	33	0	0	0	0	0
	5	Jan-24	30-Jan	52	99	4	0	4	4	12
	6	Jan-31	06-Feb	51	94	4	0	4	4	12
<b>Feb</b>	7	Feb-07	13-Feb	62	107	0	0	0	0	0
	8	Feb-14	20-Feb	187	266	0	0	0	0	0
	9	Feb-21	27-Feb	3	6	0	0	0	0	0
	10	Feb-28	06-Mar	28	54	0	0	0	0	0
<b>Mar</b>	11	Mar-07	13-Mar	6	12	0	0	0	0	0
	12	Mar-14	20-Mar	36	83	0	0	0	0	0
	13	Mar-21	27-Mar	26	44	0	0	0	0	0
	14	Mar-28	03-Apr	47	94	0	0	0	0	0
<b>Apr</b>	15	Apr-04	10-Apr	20	38	3	0	4	3	10
	16	Apr-11	17-Apr	98	206	16	0	17	14	47
	17	Apr-18	24-Apr	57	127	5	0	5	4	15
	18	Apr-25	30-Apr	21	36	3	0	4	3	10
<b>Area 8-1 Season Total:</b>				<b>1,263</b>	<b>2,398</b>	<b>95</b>	<b>0</b>	<b>104</b>	<b>84</b>	<b>283</b>
<b>Variance:</b>				26,771	87,124	617	0	3,940	1,082	9,977
<b>Standard Error:</b>				164	295	25	0	63	33	100
<b>CV (%):</b>				13%	12%	26%	-	60%	39%	35%
<b>95% CI:</b>				942-1,583	1,820-2,977	46-144	-	53-228	20-149	88-480

**Table 8182-3.** Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2010-April 30, 2011 Area 8-2 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked.

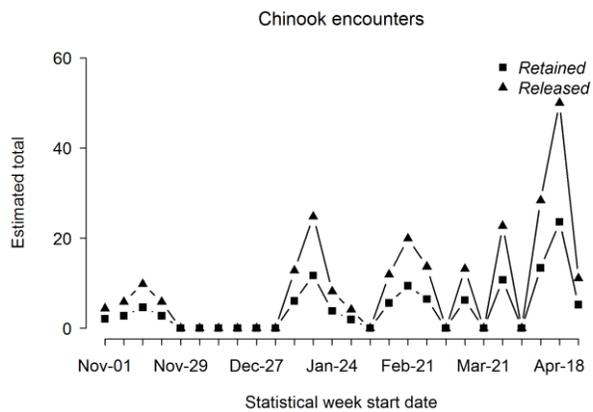
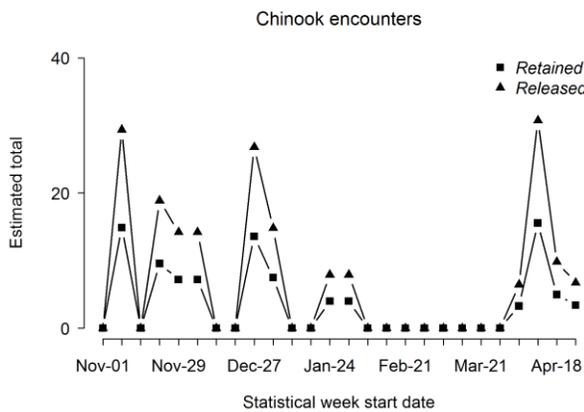
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	45	Nov-01	07-Nov	120	252	2	0	2	2	6
	46	Nov-08	14-Nov	115	239	3	0	3	3	9
	47	Nov-15	21-Nov	84	208	5	0	6	4	14
	48	Nov-22	28-Nov	60	104	3	0	3	3	9
	49	Nov-29	05-Dec	43	75	0	0	0	0	0
Dec	50	Dec-06	12-Dec	40	81	0	0	0	0	0
	51	Dec-13	19-Dec	17	34	0	0	0	0	0
	52	Dec-20	26-Dec	14	32	0	0	0	0	0
	53/1	Dec-27	Jan-02	48	92	0	0	0	0	0
Jan	2	Jan-03	09-Jan	23	46	0	0	0	0	0
	3	Jan-10	16-Jan	42	80	6	0	7	6	19
	4	Jan-17	23-Jan	61	118	12	0	14	11	36
	5	Jan-24	30-Jan	78	147	4	0	5	4	12
	6	Jan-31	06-Feb	84	162	2	0	2	2	6
Feb	7	Feb-07	13-Feb	80	133	0	0	0	0	0
	8	Feb-14	20-Feb	186	420	6	0	7	5	17
	9	Feb-21	27-Feb	28	52	9	0	11	9	29
	10	Feb-28	06-Mar	71	122	6	0	8	6	20
Mar	11	Mar-07	13-Mar	38	45	0	0	0	0	0
	12	Mar-14	20-Mar	113	273	6	0	7	6	19
	13	Mar-21	27-Mar	18	29	0	0	0	0	0
	14	Mar-28	03-Apr	81	163	11	0	13	10	33
Apr	15	Apr-04	10-Apr	52	104	0	0	0	0	0
	16	Apr-11	17-Apr	95	188	13	0	16	12	42
	17	Apr-18	24-Apr	109	216	24	0	28	22	74
	18	Apr-25	30-Apr	45	90	5	0	6	5	16
<b>Area 8-2 Season Total:</b>				<b>1,747</b>	<b>3,505</b>	<b>116</b>	<b>0</b>	<b>139</b>	<b>108</b>	<b>363</b>
<b>Variance:</b>				35,535	169,967	353	0	4,434	1,433	10,329
<b>Standard Error:</b>				189	412	19	0	67	38	102
<b>CV (%):</b>				11%	12%	16%	-	48%	35%	28%
<b>95% CI:</b>				1,377-2,116	2,697-4,313	79-153	-	8-269	34-182	163-562



**Figure 8182-1.** Temporal patterns in fishing effort during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2010- April 30, 2011.



**Figure 8182-2.** Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2010- April 30, 2011.



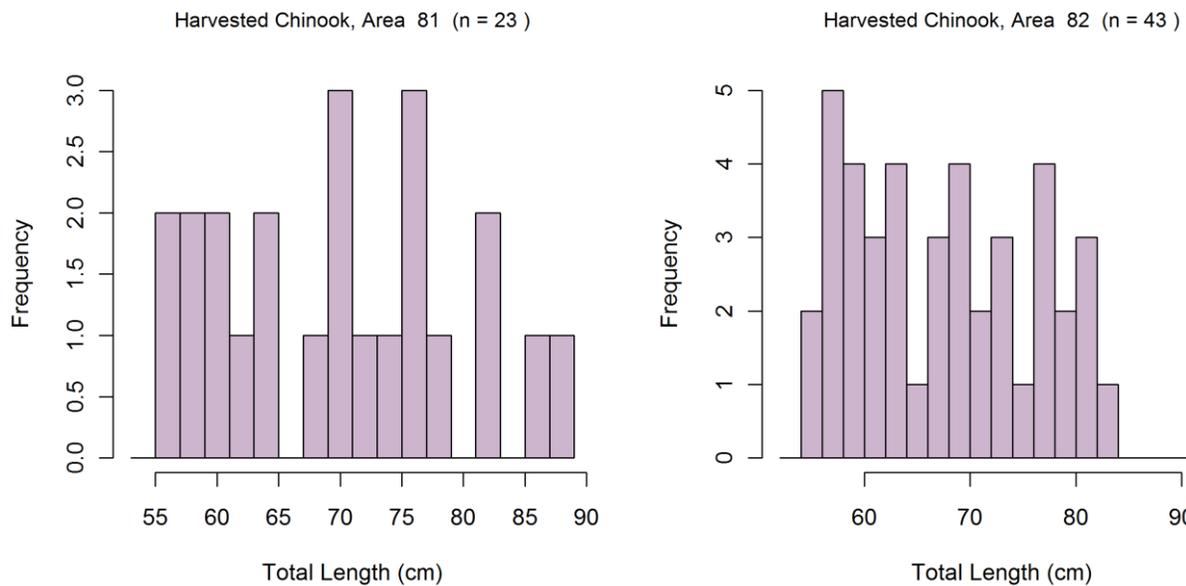
**Figure 8182-3.** Temporal patterns in Chinook encounters (retained and released) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2010- April 30, 2011.

**Table 8182-4.** Summary of length samples collected during dockside angler interviews from retained Chinook salmon, Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
8-1	Marked	21	2	23
	Unmarked	1	0	1
	<b>Total</b>	<b>22</b>	<b>2</b>	<b>24</b>

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
8-2	Marked	41	2	43
	Unmarked	0	0	0
	<b>Total</b>	<b>41</b>	<b>2</b>	<b>43</b>



**Figure 8182-4.** Length-frequency distributions of retained marked Chinook sampled at dockside during the Areas 8-1 (left panel) and 8-2 (right panel) November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

**Table 8182-5.** Summary of coded-wire tags recovered from Chinook salmon harvested during the Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
Hood Canal (10%)	FINCH CR 16.0222	HOODSPORT HATCHERY	1 (10%)	0
Northern Puget Sound (70%)	TULALIP CR 07.0001	BERNIE GOBIN HATCH	1 (10%)	0
	WALLACE R 07.0940	WALLACE R HATCHERY	3 (30%)	1
	WHITEHORSE SPRINGS	WHITEHORSE POND	3 (30%)	0
Mid Puget Sound (20%)	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	1 (10%)	1
	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	1 (10%)	0
<b>Grand Total</b>			<b>10</b>	<b>2</b>

**Table 8182-6.** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the November 1, 2010- April 30, 2011 mark-selective Chinook fishery in Areas 8-1 and 8-2, with estimates of legal-size and overall (legal and sublegal) mark rates.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Overall Mark Rate	Legal-size Mark Rate
		AD	UM	AD	UM			
Private Boat VTRs Area 8-1	13 1-trip VTRs, 24 Angler Trips	3	0	4	6	13	0.54	1.00
Area 8-1 size/mark-status comp:		0.231	0.000	0.308	0.462			
Variance		(0.0148)	(0.0000)	(0.0178)	(0.0207)			
Private Boat VTRs Area 8-2	24 1-trip VTRs, 64 Angler Trips	10	2	9	3	24	0.79	0.83
Area 8-2 VTR size/mark-status comp:		0.417	0.083	0.375	0.125			
Variance		(0.0106)	(0.0033)	(0.0102)	(0.0048)			
<b>Combined Areas VTR Data</b>	<b>37 1-Trip VTR's, 88 Angler Trips</b>	<b>13</b>	<b>2</b>	<b>13</b>	<b>9</b>	<b>37</b>	<b>0.70</b>	<b>0.87</b>
<b>Combined size/mark-status comp:</b>		<b>0.351</b>	<b>0.054</b>	<b>0.351</b>	<b>0.243</b>			
Variance		(0.0063)	(0.0014)	(0.0063)	(0.0051)			

We used Fisher’s Exact test to compare the size/mark status proportions of the Area 8-1 versus Area 8-2 VTR data, to evaluate homogeneity of the data for pooling purposes. The results indicated no significant difference ( $\chi^2 = 5.9477$ ,  $df = 3$ ,  $P = 0.1420$ ) between the two samples. Thus, we combined the Area 8-1 and 8-2 VTR data to estimate the size/mark status proportions needed to produce estimates of Chinook encounters and mortalities.

**Table 8182-7.** Summary of season-wide fishery impact estimates for the Areas 8-1(upper panel) and 8-2 (lower panel) mark-selective Chinook fishery, November 1, 2010- April 30, 2011. Values may not add up perfectly due to rounding error.

<b>Area 8-1 Total</b> <b>Encounters (E): 283</b> <b>V(E): 9,923</b>										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	99	87	13	0.15	2	88	593	24	41 - 136	28
Legal unmarked	15	0	15	0.15	2	2	3	2	1-6	74
Sublegal marked	99	9	91	0.20	18	27	107	10	7-47	39
Sublegal unmarked	69	0	69	0.20	14	14	38	6	2-26	45
<b>All groups combined</b>	<b>283</b>	<b>95</b>	<b>188</b>		<b>36</b>	<b>131</b>	<b>740</b>	<b>27</b>	<b>78 - 185</b>	<b>21</b>

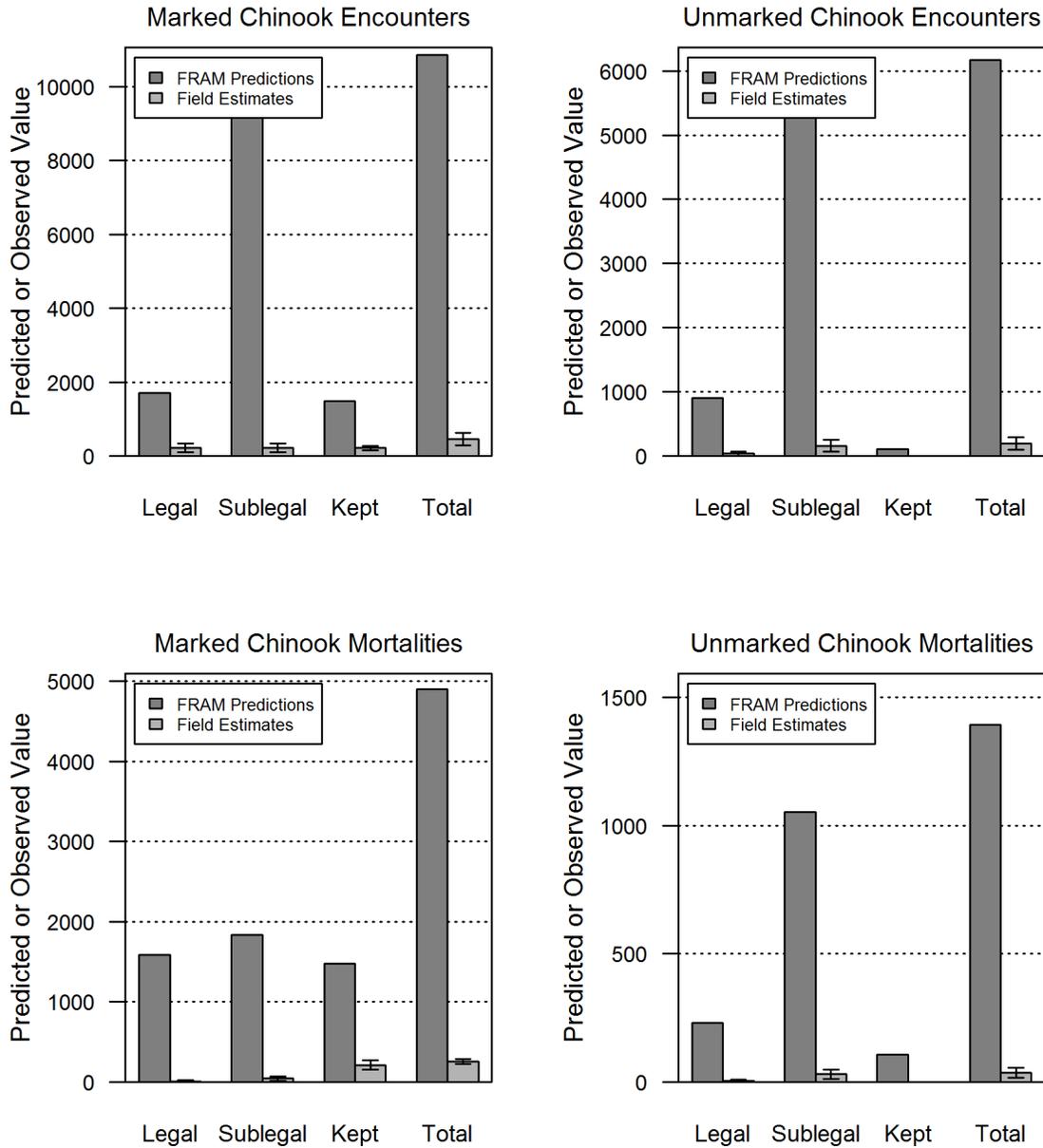
<b>Area 8-2 Total</b> <b>Encounters (E): 363</b> <b>V(E): 10,329</b>										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	127	111	17	0.15	2	113	389	20	75 - 152	17
Legal unmarked	20	0	20	0.15	3	3	5	2	1-7	73
Sublegal marked	127	5	122	0.20	24	30	97	10	11-49	33
Sublegal unmarked	88	0	88	0.20	18	18	49	7	4-31	40
<b>All groups combined</b>	<b>363</b>	<b>116</b>	<b>246</b>		<b>47</b>	<b>164</b>	<b>539</b>	<b>23</b>	<b>118 - 209</b>	<b>14</b>

**Table 8182-8.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters for the combined Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

<b>Data Source</b>	<b>Group</b>	<b>Total Encounters</b>	<b>Legal</b>	<b>Sublegal</b>	<b>Landed Only</b>
FRAM Encounters	Unmark.	6,170	900	5,270	108
	Mark.	10,870	1,700	9,170	1,479
	Total	17,040	2,600	14,440	1,587
	% Mark.	64	65	64	93
Estimated (Creel) Encounters	Unmark.	192	35	157	0
	Mark.	454	227	227	211
	Total	646	262	384	211
	% Mark.	70	87	59	100

**Table 8182-9.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook mortalities for the combined Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

<b>Mortality Category</b>	<b>FRAM Chinook Mortalities</b>			<b>Estimated Chinook Mortalities</b>		
	<b>Unmark.</b>	<b>Mark.</b>	<b>Total</b>	<b>Unmark.</b>	<b>Mark.</b>	<b>Total</b>
Total (Landed + Released)	1,394	4,899	6,293	37	258	295
Released Legal	232	1,586	1,818	5	4	10
Released Sublegal	1,054	1,834	2,888	31	43	74
Landed Only	108	1,479	1,587	0	211	211



**Figure 8182-5.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters and mortalities for the Areas 8-1 and 8-2 (combined) November 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 8182-10.** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
SOOS CREEK HATCHERY	2007	1	2.7	4.7	2.7	0.3	0.0	0.2
WALLACE R HATCHERY	2008	1	2.7	4.7	2.7	0.3	0.0	0.2
<b>TOTAL</b>		<b>2</b>	<b>5.4</b>	<b>9.3</b>	<b>5.4</b>	<b>0.5</b>	<b>0.1</b>	<b>0.4</b>

**Table 8182-11.** Monthly sample rates (Total retained Chinook sampled <sup>1/</sup> / Estimated retained Chinook) in the Areas 8-1 and 8-2 November 1, 2010- April 30, 2011 mark-selective Chinook fishery.

Area	Time period			Estimated Retained Chinook			Number of Chinook Sampled			Sample Rate
	Month	Stat. Weeks	Dates	Marked	Unmarked	Total	Marked	Unmarked	Total	
8-1	November	44-48	Nov 1 - Nov 28	32	0	32	7	1	8	25.0%
	December	49-53/1	Nov 29 - Jan 2	21	0	21	3	0	3	14.3%
	January	2-6	Jan 3 - Feb-6	16	0	16	1	0	1	6.3%
	February	7-10	Feb 7 - Mar 6	0	0	0	0	0	0	--
	March	11-14	Mar 7 - Apr 3	0	0	0	3	0	3	--
	April	15-18	Apr 4 - Apr 30	27	0	27	9	0	9	33.3%
	<b>Season Total</b>				<b>96</b>	<b>0</b>	<b>96</b>	<b>23</b>	<b>1</b>	<b>24</b>

Area	Time period			Estimated Retained Chinook			Number of Chinook Sampled			Sample Rate
	Month	Stat. Weeks	Dates	Marked	Unmarked	Total	Marked	Unmarked	Total	
8-2	November	44-48	Nov 1 - Nov 28	13	0	13	9	0	9	69.2%
	December	49-53/1	Nov 29 - Jan 2	0	0	0	0	0	0	--
	January	2-6	Jan 3 - Feb-6	24	0	24	8	0	8	33.3%
	February	7-10	Feb 7 - Mar 6	21	0	21	5	0	5	23.8%
	March	11-14	Mar 7 - Apr 3	17	0	17	8	0	8	47.1%
	April	15-18	Apr 4 - Apr 30	42	0	42	13	0	13	31.0%
	<b>Season Total</b>				<b>117</b>	<b>0</b>	<b>117</b>	<b>43</b>	<b>0</b>	<b>43</b>

<sup>1/</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2010-11 Areas 8-1 and 8-2 selective Chinook fishery (i.e., the sample-frame sites included in the creel estimates and the fish sampled as part of baseline sampling in the Area).

**Table 8182-12.** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) for the Area 8-1 November 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Values may not add exactly due to rounding error.

<b>Area 8-1 MSF Salmon Catch Estimates (other than Chinook), 2010-11</b>									
<b>Month</b>	<b>Stat Week</b>	<b>Start Date</b>	<b>End Date</b>	<b>Est. Retained Chum</b>	<b>Est. Released Salmon</b>				
					<b>Coho AD</b>	<b>Coho UM</b>	<b>Coho UNK</b>	<b>Chum</b>	<b>Unk. Salmon</b>
<b>Nov</b>	45	Nov-01	07-Nov	0	0	0	0	0	0
	46	Nov-08	14-Nov	0	0	0	0	0	0
	47	Nov-15	21-Nov	0	0	0	0	0	0
	48	Nov-22	28-Nov	0	0	0	0	0	0
	49	Nov-29	05-Dec	0	0	0	0	0	0
<b>Dec</b>	50	Dec-06	12-Dec	0	0	0	0	0	0
	51	Dec-13	19-Dec	0	0	0	0	0	0
	52	Dec-20	26-Dec	0	0	0	0	0	0
	53/1	Dec-27	Jan-02	0	0	0	0	0	0
<b>Jan</b>	2	Jan-03	09-Jan	0	0	0	0	0	0
	3	Jan-10	16-Jan	0	0	0	3	0	0
	4	Jan-17	23-Jan	0	0	0	0	0	0
	5	Jan-24	30-Jan	0	0	0	0	0	0
	6	Jan-31	06-Feb	0	0	0	0	0	0
<b>Feb</b>	7	Feb-07	13-Feb	0	0	0	0	0	0
	8	Feb-14	20-Feb	0	0	0	0	0	0
	9	Feb-21	27-Feb	0	0	0	0	0	0
	10	Feb-28	06-Mar	0	0	0	0	0	0
<b>Mar</b>	11	Mar-07	13-Mar	0	0	0	0	0	0
	12	Mar-14	20-Mar	0	0	0	0	0	0
	13	Mar-21	27-Mar	0	0	0	0	0	0
	14	Mar-28	03-Apr	0	0	0	0	0	0
<b>Apr</b>	15	Apr-04	10-Apr	0	0	0	0	0	0
	16	Apr-11	17-Apr	0	0	0	0	0	0
	17	Apr-18	24-Apr	0	0	0	0	0	0
	18	Apr-25	30-Apr	0	0	0	0	0	0
<b>Area 8-1 Season Total:</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>Variance:</b>				0	0	0	4	0	0
<b>Standard Error:</b>				0	0	0	2	0	0
<b>CV (%):</b>				-	-	-	73%	-	-
<b>95% CI:</b>				-	-	-	1-7	-	-

**Table 8182-13.** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) for the Area 8-2 November 1, 2010 - April 30, 2011 mark-selective Chinook fishery. Values may not add exactly due to rounding error.

<b>Area 8-2 MSF Salmon Catch Estimates (other than Chinook), 2010-11</b>									
<b>Month</b>	<b>Stat Week</b>	<b>Start Date</b>	<b>End Date</b>	<b>Est. Retained Chum</b>	<b>Est. Released Salmon</b>				
					<b>Coho AD</b>	<b>Coho UM</b>	<b>Coho UNK</b>	<b>Chum</b>	<b>Unk Salmon</b>
<b>Nov</b>	45	Nov-01	07-Nov	0	2	0	0	0	31
	46	Nov-08	14-Nov	0	0	0	9	0	39
	47	Nov-15	21-Nov	0	0	0	2	0	0
	48	Nov-22	28-Nov	0	0	0	0	0	0
	49	Nov-29	05-Dec	0	0	0	0	0	0
<b>Dec</b>	50	Dec-06	12-Dec	0	0	0	0	0	0
	51	Dec-13	19-Dec	0	0	0	0	0	2
	52	Dec-20	26-Dec	0	0	0	0	0	0
	53/1	Dec-27	02-Jan	0	0	2	0	0	0
<b>Jan</b>	2	Jan-03	09-Jan	0	0	0	0	0	0
	3	Jan-10	16-Jan	0	0	0	0	0	0
	4	Jan-17	23-Jan	0	0	0	0	0	0
	5	Jan-24	30-Jan	0	0	0	0	0	0
	6	Jan-31	06-Feb	0	0	0	0	0	0
<b>Feb</b>	7	Feb-07	13-Feb	0	3	0	0	0	0
	8	Feb-14	20-Feb	0	3	0	0	0	6
	9	Feb-21	27-Feb	0	0	0	0	0	0
	10	Feb-28	06-Mar	0	0	0	0	0	0
<b>Mar</b>	11	Mar-07	13-Mar	0	0	0	0	0	0
	12	Mar-14	20-Mar	0	0	0	4	0	15
	13	Mar-21	27-Mar	0	0	0	0	0	0
	14	Mar-28	03-Apr	0	0	0	0	0	0
<b>Apr</b>	15	Apr-04	10-Apr	0	0	0	0	0	0
	16	Apr-11	17-Apr	0	0	0	0	0	0
	17	Apr-18	24-Apr	0	0	0	0	0	0
	18	Apr-25	30-Apr	0	0	0	0	0	0
<b>Area 8-2 Season Total:</b>				<b>0</b>	<b>7</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>92</b>
<b>Variance:</b>				0	24	2	87	0	881
<b>Standard Error:</b>				0	5	1	9	0	30
<b>CV (%):</b>				-	66%	65%	59%	-	32%
<b>95% CI:</b>				-	2-17	1-5	4-34	-	34-151

**Table 8182-14.** Summary of the total number of anglers intercepted in Area 8-1 (left panel) and 8-2 (right panel) during on-the-water surveys conducted from November 1, 2010 - April 30, 2011. Grayed cells represent sites included in the dockside sample frame.

<b>Area 8-1</b>			<b>Area 8-2</b>		
<b>Site Name</b>	<b>Total Anglers</b>	<b>Season Total (unadjusted) Size Measure</b>	<b>Site Name</b>	<b>Total Anglers</b>	<b>Season Total (unadjusted) Size Measure</b>
Camano Island State Park	81	0.409	Bayside Marina	5	0.035
Cornet Bay Ramp	6	0.030	Camano State Park	23	0.161
Coupeville Ramp	11	0.056	Dagmars Landing	8	0.056
Everett Ramp (Norton)	17	0.086	Edmonds Sling	2	0.014
Holmes Harbor Ramp (Freeland Ramp)	2	0.010	Everett (Norton) Ramp	55	0.385
Maple Grove Ramp	32	0.162	Everett Marina	37	0.259
Misc. Private Launch	9	0.045	Langley Ramp	2	0.014
Oak Harbor Public	32	0.162	Misc. Private Launch	2	0.014
Utsalady Ramp	8	0.040	Mukilteo Public Ramp	5	0.035
<b>Total Anglers</b>	<b>198</b>	<b>1.000</b>	Tulalip Ramp	4	0.028
			<b>Total Anglers</b>	<b>143</b>	<b>1.000</b>

**Table 8182-15.** Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Areas 8-1 and 8-2 winter mark-selective Chinook fisheries.

Area	Season Dates	Year	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
				LM	LU	SM	SU	LM	LU	SM	SU	
81	October 1, 2005 - April 30, 2006	2005-06	3,976	303	0	39	0	45	188	763	575	1,914
81	October 1, 2006 - April 30, 2007	2006-07	3,454	278	8	37	4	42	118	1,437	857	2,781
81	November 1, 2007 - April 30, 2008	2007-08	3,288	638	5	36	0	95	304	1,345	577	3,000
81	January 1, 2009 - April 30, 2009	2008-09	2,518	396	12	7	0	59	45	1,443	909	2,870
81	November 1, 2009 - April 30, 2010	2009-2010	3,192	273	0	11	0	41	45	595	269	1,234
81	November 1, 2010 - April 30, 2011	2010-2011	2,398	87	0	9	0	13	15	91	69	283
82	October 1, 2005 - April 30, 2006	2005-06	8,521	735	40	35	0	106	618	1,706	876	4,116
82	October 1, 2006 - April 30, 2007	2006-07	7,848	766	18	95	3	113	183	10,486	5,407	17,071
82	November 1, 2007 - April 30, 2008	2007-08	5,678	795	15	74	3	114	181	942	303	2,428
82	January 1, 2009 - April 30, 2009	2008-09	5,946	495	15	14	0	74	18	1,557	468	2,641
82	November 1, 2009 - April 30, 2010	2009-2010	6,732	814	4	10	0	122	164	1300	487	2,902
82	November 1, 2010 - April 30, 2011	2010-2011	3,505	111	0	5	0	17	20	122	88	363

### 3) Marine Area 9 Winter Mark-selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 9 for the fourth winter season from November 1-30, 2010 and January 16– April 15, 2011. WDFW’s Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 9 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, aerial effort surveys, and we distributed and collected voluntary trip reports (VTRs) from the angling public. **Table 9-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012).

In this section we present results from our monitoring activities during the Area 9 winter selective Chinook fishery from November 1-30, 2010 and January 16-April 30, 2011. In addition to the major components of the results described previously (page 3), we present the aerial survey and dockside data used to estimate the sample fraction in Area 9 (see WDFW 2012, *Aerial-Access Design*).

**Table 9-1.** Sampling/estimation details on target parameters associated with the overall Area 9 winter mark-selective fishery monitoring program.

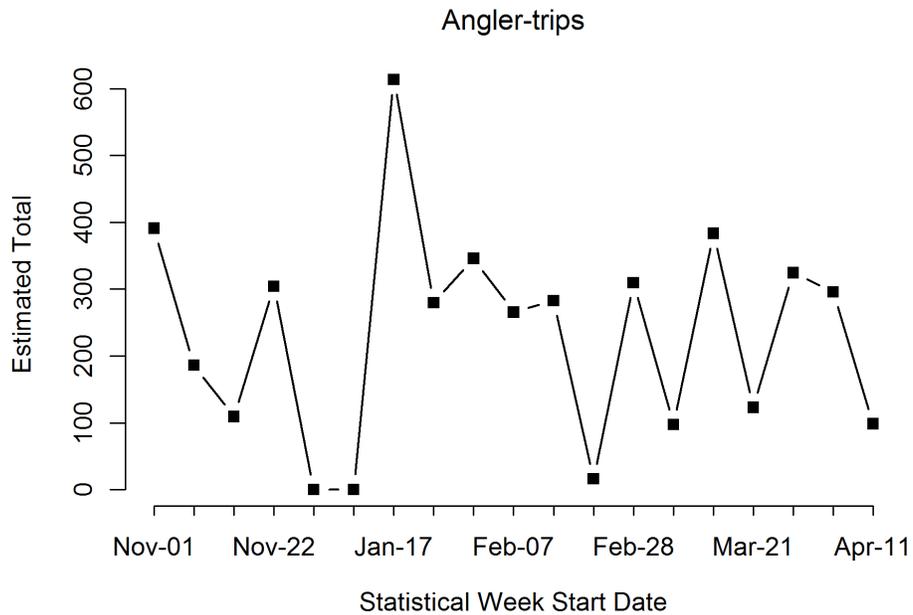
Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week. The eight-day weekday estimates for each two-week period were then split evenly between individual weeks in the two-week block to enable weekly estimates (see WDFW 2012).
Aerial Surveys	Fraction of Area 9 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Month	The sample fraction was calculated for individual aerial survey dates (see <b>Table 9-12</b> ; $n=15$ surveys conducted out of $N=150$ days available in the season). Aerial survey data were combined to calculate the overall sample fraction for the season, as shown in <b>Table 9-12</b> .
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Season-total test fishery data were used to estimate total Chinook encounters by size/mark group (LM=30.4%, LU=7.2%, SM=36.2%, SU=26.1%).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data were not used to estimate the size/mark status proportions needed to produce the Chinook encounters estimates. See Test Fishing row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<sup>1</sup> The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

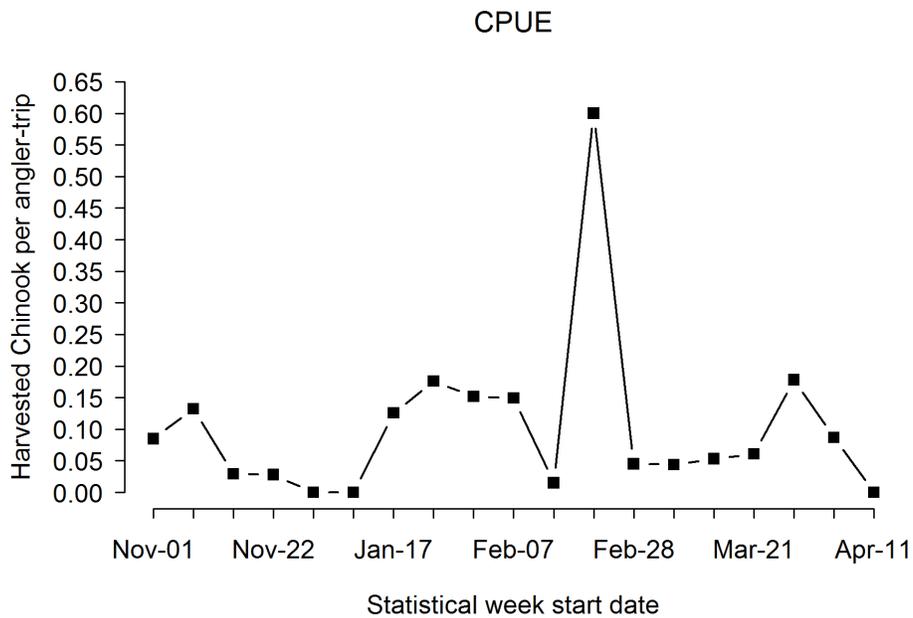
<sup>2</sup> Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 9-2.** Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked.

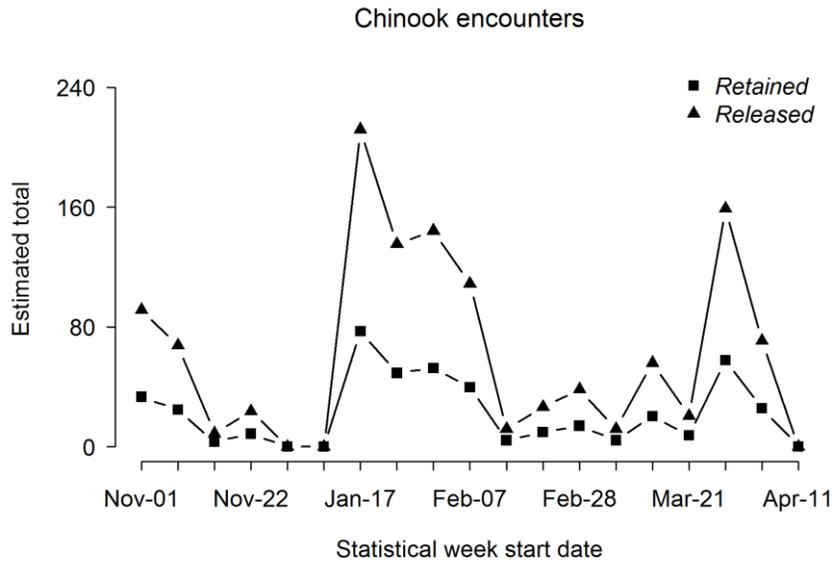
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
<b>Nov.</b>	45	Nov-01	Nov-07	210	391	33	0	50	41	124
	46	Nov-08	Nov-14	124	186	25	0	37	31	92
	47	Nov-15	Nov-21	55	109	3	0	5	4	12
	48	Nov-22	Nov-28	158	304	9	0	13	11	32
	49	Nov-29	Nov-30	0	0	0	0	0	0	0
<b>November Total:</b>				<b>547</b>	<b>990</b>	<b>70</b>	<b>0</b>	<b>104</b>	<b>87</b>	<b>261</b>
<b>Jan. - Apr.</b>	3	Jan-16	Jan-16	0	0	0	0	0	0	0
	4	Jan-17	Jan-23	315	614	77	0	116	96	289
	5	Jan-24	Jan-30	149	279	49	0	74	62	185
	6	Jan-31	Feb-06	208	346	52	0	79	66	197
	7	Feb-07	Feb-13	156	266	40	0	59	50	149
	8	Feb-14	Feb-20	120	283	4	0	6	5	16
	9	Feb-21	Feb-27	13	16	10	0	14	12	36
	10	Feb-28	Mar-06	177	309	14	0	21	17	52
	11	Mar-07	Mar-13	55	97	4	0	6	5	16
	12	Mar-14	Mar-20	175	383	20	0	30	25	76
	13	Mar-21	Mar-27	69	123	7	0	11	9	28
	14	Mar-28	Apr-03	180	324	58	0	87	72	217
	15	Apr-04	Apr-10	161	296	26	0	39	32	96
16	Apr-11	Apr-15	58	99	0	0	0	0	0	
<b>Jan.-April Total:</b>				<b>1,833</b>	<b>3,435</b>	<b>362</b>	<b>0</b>	<b>543</b>	<b>452</b>	<b>1,357</b>
<b>Season Total:</b>				<b>2,380</b>	<b>4,425</b>	<b>432</b>	<b>0</b>	<b>647</b>	<b>539</b>	<b>1,618</b>
<b>Variance:</b>				51,974	204,572	3,456	0	32,265	11,562	92,367
<b>Standard Error:</b>				228	452	59	0	180	108	304
<b>CV (%):</b>				10%	10%	14%	-	28%	20%	19%
<b>95% CI:</b>				1,933-2,827	3,539-5,312	316-547	-	295-999	328-750	1,022-2,213



**Figure 9-1.** Temporal patterns in fishing effort in the Area 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16-April 15, 2011.



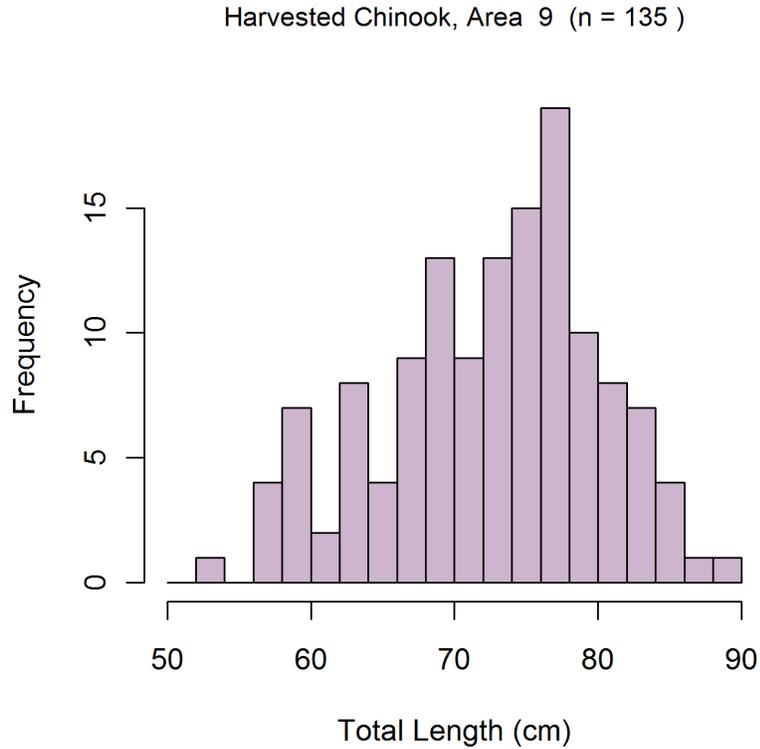
**Figure 9-2.** Temporal patterns in CPUE (landed Chinook per angler trip) in the Areas 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16-April 15, 2011.



**Figure 9- 3.** Temporal patterns in Chinook encounters (retained and released) in the Area 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16-April 15, 2011.

**Table 9-3.** Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16 - April 15, 2011.

Mark Type	Number Sampled November		Total
	Legal-size	Sublegal-size	
Marked	27	0	27
Unmarked	0	0	0
<b>Nov. Total</b>	<b>27</b>	<b>0</b>	<b>27</b>
Mark Type	Number Sampled January - April		Total
	Legal-size	Sublegal-size	
Marked	107	1	108
Unmarked	0	0	0
<b>Jan - Apr Total</b>	<b>107</b>	<b>1</b>	<b>108</b>
<b>Season Total</b>	<b>134</b>	<b>1</b>	<b>135</b>



**Figure 9-4.** Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16-April 15, 2011.

**Table 9-4.** Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2010-11 Area 9 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
Hood Canal (14.3%)	FINCH CR	HOODSPORT HATCHERY	1 (14.3%)	0
Northern Puget Sound (71.4%)	TULALIP CR	BERNIE GOBIN HATCH	1 (14.3%)	0
	WALLACE R	WALLACE R HATCHERY	2 (28.6%)	1
	WHITEHORSE SPRINGS	WHITEHORSE POND	2 (28.6%)	0
Mid Puget Sound (14.3%)	GROVERS CR HATCHERY	GROVERS CR HATCHERY	1 (14.3%)	1
<b>Grand Total</b>			<b>7</b>	<b>2</b>

**Table 9-5.** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective Chinook fishery. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

	Stat Week	Fishing Effort		Legal		Sublegal		Total	
		Days	Hours Fished	AD	UM	AD	UM		
<b>Nov. 2010</b>	<b>45</b>	8	23.6	4	0	0	2	6	
	<b>46</b>	5	20.6	4	1	10	5	20	
	<b>47</b>	5	14.2	4	0	1	8	13	
	<b>48</b>	0	0.0	0	0	0	0	0	
	<b>49</b>	2	10.5	0	0	5	1	6	
	<b>Total</b>	<b>20</b>	<b>68.8</b>	<b>12</b>	<b>1</b>	<b>16</b>	<b>16</b>	<b>45</b>	
	<b>Size/mark-status comp:</b> 0.267 (0.0044) 0.022 (0.0005) 0.356 (0.0052) 0.356 (0.0052) <b>Legal size mark rate:</b> 0.92 (0.0059) <b>Overall mark rate:</b> 0.62 (0.0053)								
<b>Jan.-Apr. 2011</b>	<b>4</b>	7	20.2	7	0	0	0	7	
	<b>5</b>	6	15.1	6	1	0	1	8	
	<b>6</b>	11	23.0	6	3	4	0	13	
	<b>7</b>	10	18.9	2	0	9	4	15	
	<b>8</b>	6	15.0	0	0	3	0	3	
	<b>9</b>	1	5.0	0	0	3	1	4	
	<b>10</b>	4	13.5	2	1	6	8	17	
	<b>11</b>	11	17.6	0	0	4	4	8	
	<b>12</b>	4	11.2	1	1	1	0	3	
	<b>13</b>	6	16.6	1	1	1	0	3	
	<b>14</b>	7	15.0	1	0	2	1	4	
	<b>15</b>	4	15.0	1	2	0	0	3	
	<b>16</b>	3	11.0	3	0	1	1	5	
	<b>Total</b>	<b>80</b>	<b>197.0</b>	<b>30</b>	<b>9</b>	<b>34</b>	<b>20</b>	<b>93</b>	
<b>Size/mark-status comp:</b> 0.323 (0.0024) 0.097 (0.0010) 0.366 (0.0025) 0.215 (0.0018) <b>Legal size mark rate:</b> 0.77 (0.0047) <b>Overall mark rate:</b> 0.69 (0.0023)									
<b>Season Total</b>	<b>Grand Totals</b>	<b>100</b>	<b>265.8</b>	<b>42</b>	<b>10</b>	<b>50</b>	<b>36</b>	<b>138</b>	
	<b>Size/mark-status comp <sup>1/</sup>:</b> 0.304 (0.0015) 0.072 (0.0005) 0.362 (0.0017) 0.261 (0.0014) <b>Legal size mark rate:</b> 0.81 (0.0030) <b>Overall mark rate:</b> 0.67 (0.0016)								

<sup>1/</sup> Note: The test fishery season-total size/mark status proportions were used to estimate total Chinook encounters and associated impacts in the 2010-11 Area 9 winter mark-selective fishery (also see **Table 9-1** and WDFW 2012).

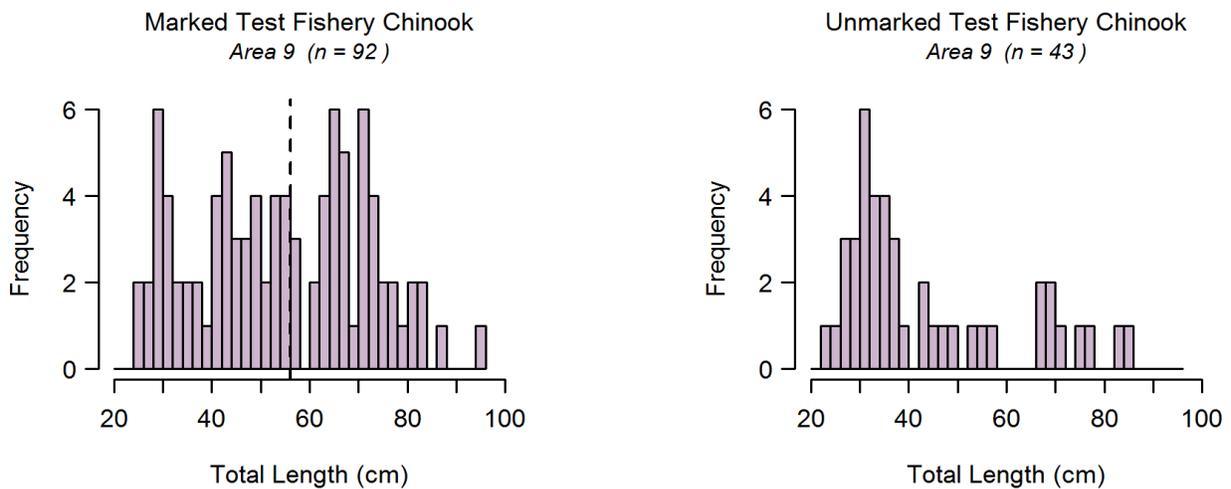
**Table 9-6.** Total Chinook encountered (retained and released) by private-boat anglers reporting their catch on voluntary trip reports (VTRs) compared to test fishery results, with estimates of legal, sublegal, and overall mark rates, during the winter 2010-11 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Total	Total Mark Rate	Legal Mark Rate
		AD	UM	AD	UM			
<b>November 1-30, 2010</b>								
<b>Charter Boat VTR</b>	11 1-trip VTRs, 27 Angler Trips	6	3	0	2	11	0.55	0.67
<b>Private Boat VTR</b>	41 1-trip VTRs, 60 Angler Trips	5	0	31	10	46	0.78	1.00
<b>Test Fishery</b>	20 trips, 40 Angler Trips	12	1	16	16	45	0.62	0.92
<b>Nov. Sub-total</b>	<b>127 Angler Trips</b>	<b>23</b>	<b>4</b>	<b>47</b>	<b>28</b>	<b>102</b>	<b>0.69</b>	<b>0.85</b>
Nov. size/mark-status comp: 0.225 0.039 0.461 0.275 Variance: (0.0017) (0.0004) (0.0025) (0.0020)								
<b>January 16 - April 15, 2011</b>								
<b>Charter Boat VTR</b>	0 1-trip VTRs, 0 Angler Trips	0	0	0	0	0	-	-
<b>Private Boat VTR</b>	38 1-trip VTRs, 73 Angler Trips	12	6	9	13	40	0.53	0.67
<b>Test Fishery</b>	80 trips, 160 Angler Trips	30	9	34	20	93	0.69	0.77
<b>Jan.-Apr. Sub-total</b>	<b>233 Angler Trips</b>	<b>42</b>	<b>15</b>	<b>43</b>	<b>33</b>	<b>133</b>	<b>0.64</b>	<b>0.74</b>
Jan-April size/mark-status comp: 0.316 0.113 0.323 0.248 Variance: (0.0016) (0.0008) (0.0017) (0.0014)								
<b>Pooled Data <sup>1/</sup></b>	<b>360 Angler Trips</b>	<b>65</b>	<b>19</b>	<b>90</b>	<b>61</b>	<b>235</b>	<b>0.66</b>	<b>0.77</b>
Season Total size/mark-status comp <sup>1/</sup> : 0.277 0.081 0.383 0.260 Variance: (0.0009) (0.0003) (0.0010) (0.0008)								

<sup>1/</sup> Note: We did not use the pooled data sources (test fishery + VTRs) for encounters and impact estimation; rather, we used season-total test fishing data only for the impact estimation steps (see **Tables 9-1, 9-5** and WDFW 2012).

We used Pearson’s chi-squared test to compare size/mark status proportions in the test fishery between two separate time periods during the Area 9 winter MSF season (Nov. 1-30 vs. Jan 16-Apr 15). Results showed no significant difference ( $\chi^2 = 4.94$ ,  $df = 3$ ,  $P = 0.1762$ ) between the two time periods. Further, we used Fisher’s Exact test to compare overall (legal and sublegal) test fishery mark rates between the two time periods, yielding similar results of no significant difference ( $P = 0.4481$ ;  $df = 1$ ). Thus, we decided to lump the test fishery data across the season to estimate the size/mark status proportions for further estimation steps (**Table 9-5**).

Secondly, we used Fisher’s Exact test to compare the size/mark status proportions of the test fishery data to the VTR (charter and private boat VTRs combined) data within each time period. Results showed no significant difference between the two data sources ( $\chi^2 = 5.05$ ,  $df = 3$ ,  $P = 0.1709$ ) during the November 2010 time period and no difference ( $\chi^2 = 3.82$ ,  $df = 3$ ,  $P = 0.2815$ ) during the January-April 2011 period. Nevertheless, we elected to use only the pooled season-total test fishery data to estimate the size/mark status proportions needed to produce the Area 9 Chinook encounters estimates.



**Figure 9-5.** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the winter 2010-11 Area 9 (November 1-30, 2010 and January 16-April 15, 2011) mark-selective Chinook fishery. Note that the vertical dashed line in the upper panel corresponds to the legal size limit (22 in or 56 cm).

**Table 9-7.** Summary of season-wide fishery impact estimates for the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

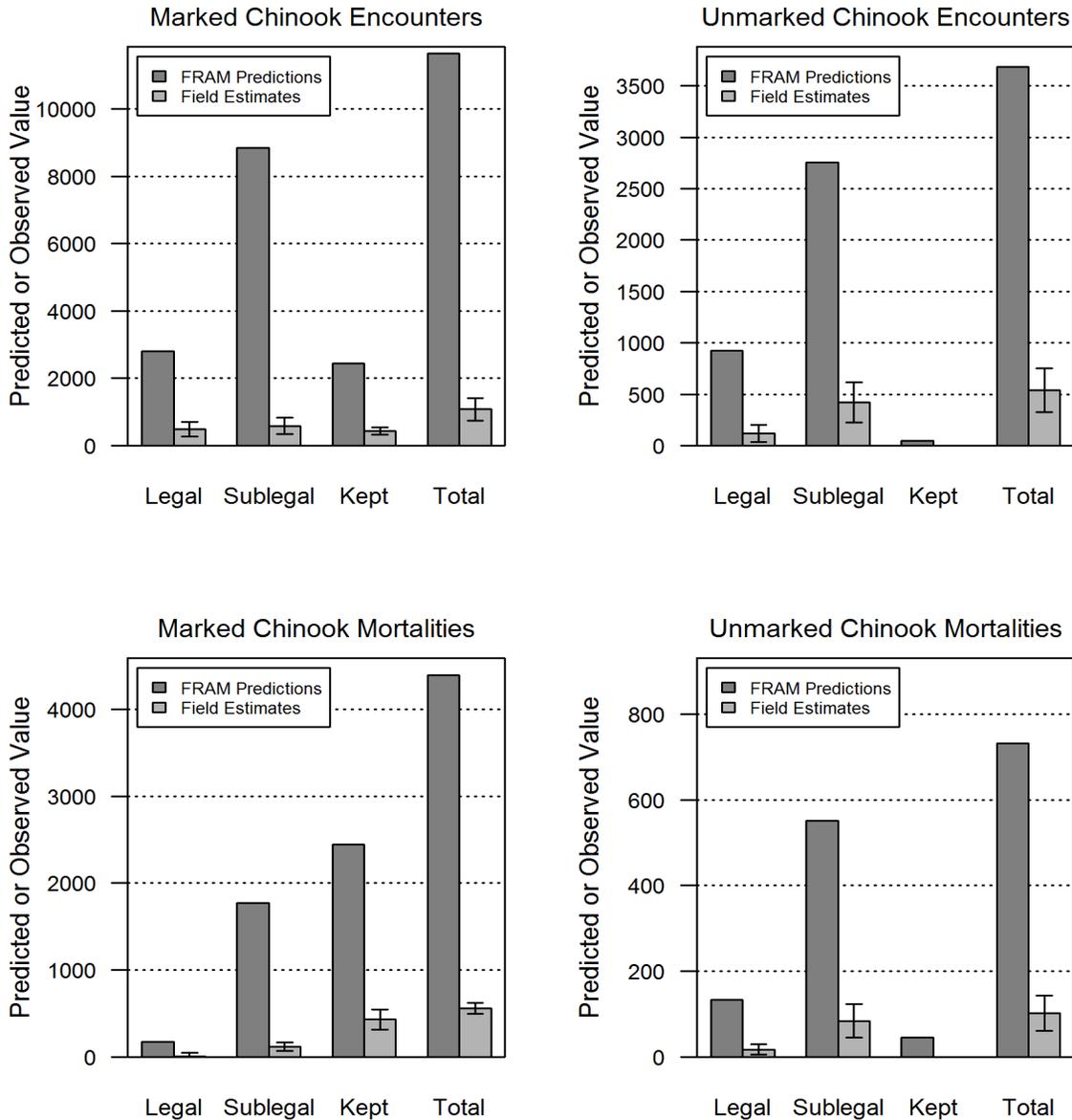
<b>Total Encounters (E): 1,618</b> <b>V(E): 92,367</b>										
<b>Size/mark group</b>	<b>Encounters</b>	<b>No. Retained</b>	<b>No. Rel'd</b>	<b>Rel. Mort. Rate</b>	<b>Rel. Mort.</b>	<b>Total Mortality</b>	<b>Var</b>	<b>SE</b>	<b>95% CI</b>	<b>CV (%)</b>
Legal marked	492	428	64	0.15	10	438	3,772	61	318 - 558	14
Legal unmarked	117	0	117	0.15	18	18	39	6	5 - 30	35
Sublegal marked	586	3	583	0.20	117	120	666	26	69 - 170	22
Sublegal unmarked	422	0	422	0.20	84	84	394	20	46 - 123	24
<b>All groups combined</b>	<b>1,618</b>	<b>432</b>	<b>1,186</b>		<b>228</b>	<b>660</b>	<b>4,870</b>	<b>70</b>	<b>523 - 796</b>	<b>11</b>

**Table 9-8** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters for the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective Chinook fishery.

<b>Data Source</b>	<b>Group</b>	<b>Total Encounters</b>	<b>Legal</b>	<b>Sublegal</b>	<b>Landed Only</b>
FRAM Encounters	Unmark.	3,682	927	2,755	46
	Mark.	11,658	2,808	8,850	2,443
	Total	15,340	3,735	11,605	2,489
	% Mark.	76	75	76	98
Estimated (Creel) Encounters	Unmark.	539	117	422	0
	Mark.	1,078	492	586	432
	Total	1,618	610	1,008	432
	% Mark.	67	81	58	100

**Table 9-9.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook mortalities for the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	731	4,390	5,121	102	558	660
Released Legal	134	177	311	18	10	27
Released Sublegal	551	1,770	2,321	84	117	201
Landed Only	46	2,443	2,489	0	432	432



**Figure 9-6.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters (upper panel) and mortalities (lower panel) for the 2010-11 Area 9 winter mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 9-10.** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 9 mark-selective Chinook fishery from November 1-30, 2010 and January 16-April 15, 2011. AD = marked (i.e., adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Grovers Creek Hatchery	2008	1	3.2	7.0	3.6	0.4	0.1	0.3
Wallace R. Hatchery	2007	1	3.2	7.0	3.2	0.3	0.1	0.3
<b>Total</b>		<b>2</b>	<b>6.4</b>	<b>14.0</b>	<b>6.8</b>	<b>0.7</b>	<b>0.2</b>	<b>0.6</b>

**Table 9-11.** Monthly sample rates (Total retained Chinook sampled <sup>1/</sup> / Estimated retained Chinook) in the winter Area 9 mark-selective Chinook fishery during November 1-30, 2010 and January 16-April 15, 2011.

Time period			Estimated Retained Chinook			Number of Chinook Sampled			Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmarked	Total	Marked	Unmarked	Total	
November	45-49	Nov 1 - Nov 30	70	0	70	27	0	27	38.6%
January	3-5	Jan 16 - Jan 30	126	0	126	29	0	29	23.0%
February	6-9	Jan 31 - Feb 27	106	0	106	32	0	32	30.2%
March	10-14	Feb 28 - Mar 28	46	0	46	12	0	12	26.1%
April	14-16	Mar 29 - Apr 15	84	0	84	35	0	35	41.7%
<b>Season Total</b>			<b>432</b>	<b>0</b>	<b>432</b>	<b>135</b>	<b>0</b>	<b>135</b>	<b>31.3%</b>

<sup>1/</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2010-11 Area 9 selective Chinook fishery (i.e., the sample-frame sites included in the creel estimates and the fish sampled as part of baseline sampling in the Area).

**Table 9-12.** Summary of aerial survey and dockside data used to estimate the fraction of Area 9 effort captured in the four-site sample frame during the winter 2010-11 (November 1-30, 2010 and January 16-April 15, 2011) Area 9 mark-selective Chinook fishery. See Methods Report (WDFW 2012) for computational details and notation.

			Aerial Survey Details			Dockside Sampling Details			
Time Period	Survey Date	Stratum	Start Time	End Time	Total Boats, $m_{ij}$	Total Boats, $\Sigma y_{ijk}$	Fishing Boats	Active Boats, $X_{ij}$	Sample Fraction, $f_{ij}$
<b>November</b>	9-Nov	Weekday	9:30	11:00	2	2	1	1	0.500
	13-Nov	Weekend	9:56	10:25	21	24	8	7	0.333
	20-Nov	Weekend	10:38	11:10	29	38	21	16	0.552
	21-Nov	Weekend	10:19	10:48	29	54	13	7	0.241
<b>November Stratum Summary Statistics</b>			Mean		20	29	11	8	0.407
			St. Dev.		13	22	8	6	0.144
			CV(%)		62.9%	74.7%	78.3%	79.8%	35.5%
<b>January - April</b>	19-Jan	Weekday	10:27	10:43	42	50	26	22	0.524
	22-Jan	Weekend	10:32	10:57	66	75	41	36	0.545
	9-Feb	Weekday	9:00	9:16	15	30	14	7	0.467
	13-Feb	Weekend	10:25	10:51	20	23	14	12	0.600
	19-Feb	Weekend	10:40	11:15	39	78	18	9	0.231
	19-Mar	Weekend	10:12	10:30	44	78	48	27	0.614
	25-Mar	Weekday	11:04	11:19	3	8	5	2	0.667
	27-Mar	Weekend	10:16	10:33	12	20	10	6	0.500
	2-Apr	Weekend	10:15	11:40	34	34	20	20	0.588
	5-Apr	Weekday	10:27	10:47	3	3	1	1	0.333
9-Apr	Weekday	10:13	10:32	85	111	34	26	0.306	
<b>January - April Stratum Summary Statistics</b>			Mean		33	46	21	15	0.489
			St. Dev.		26	35	15	12	0.141
			CV(%)		78.8%	75.0%	70.8%	75.6%	28.9%
<b>Season Total Stratum Summary Statistics</b>			<b>Totals</b>		<b>444</b>	<b>628</b>	<b>274</b>	<b>199</b>	
			Mean		30	42	18	13	0.467
			St. Dev.		24	36	14	9	0.179
			CV(%)		82.7%	85.2%	77.5%	71.0%	38.3%

**Table 9-13.** Fishery-total estimates of retained and released salmon (*other than Chinook*) in the Area 9 mark-selective Chinook fishery from November 1-30, 2010 and January 16-April 15, 2011. Values may not add exactly due to rounding error.

Stat Week	Est. Retained Salmon				Est. Released Salmon				
	Coho				Coho				Unk. Salmon
	Mark	Unmark	Total	Chum	Mark	Unmark	Unk.	Total	
45	0	0	0	12	0	4	27	31	152
46	0	0	0	0	0	10	0	10	55
47	0	0	0	0	0	0	0	0	19
48	0	0	0	0	0	10	10	21	21
49	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	7	0	3	10	7
5	0	0	0	0	4	0	0	4	4
6	0	0	0	0	0	7	0	7	0
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0
15	0	0	0	0	3	0	0	3	3
16	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>14</b>	<b>31</b>	<b>41</b>	<b>86</b>	<b>261</b>
<b>Grand Total Summary Statistics:</b>									
Variance	0	0	0	52	5	139	160	303	4,272
SE	0	0	0	7	2	12	13	17	65
CV	-	-	-	62.1%	15.3%	38.0%	31.2%	20.3%	25.0%
95% CI	-	-	-	6-26	10-18	8-54	16-65	52-120	133-389

**Table 9-14.** Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 9 winter mark-selective Chinook fishery.

Area	Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
9	January 16 -April 15, 2008	6,887	1,333	3	72	0	195	304	1,288	375	3,570
9	Nov 1 - 30,2008 and January 16 - April 15, 2009	7,064	871	14	14	0	130	158	3,520	2,837	7,545
9	Nov 1 - 30,2009 and January 16 - April 15, 2010	6,823	1,450	18	106	10	217	353	2,166	615	4,934
9	Nov 1 - 30, 2010 and January 16 - April 15, 2011	4,425	428	0	3	0	64	117	583	422	1,618

#### **4) Marine Area 10 Winter Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 10 for the fourth winter season from October 1, 2010 through January 31, 2011. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 10 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, on-water effort surveys, and we distributed and collected voluntary trip reports (VTRs) from the angling public.

**Table 10-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012). In the following section we present results from our monitoring activities during the Area 10 winter selective Chinook fishery from October 1, 2010 through January 31, 2011.

**Table 10-1.** Sampling/estimation details on target parameters associated with the overall Area 10 mark-selective fishery monitoring program.

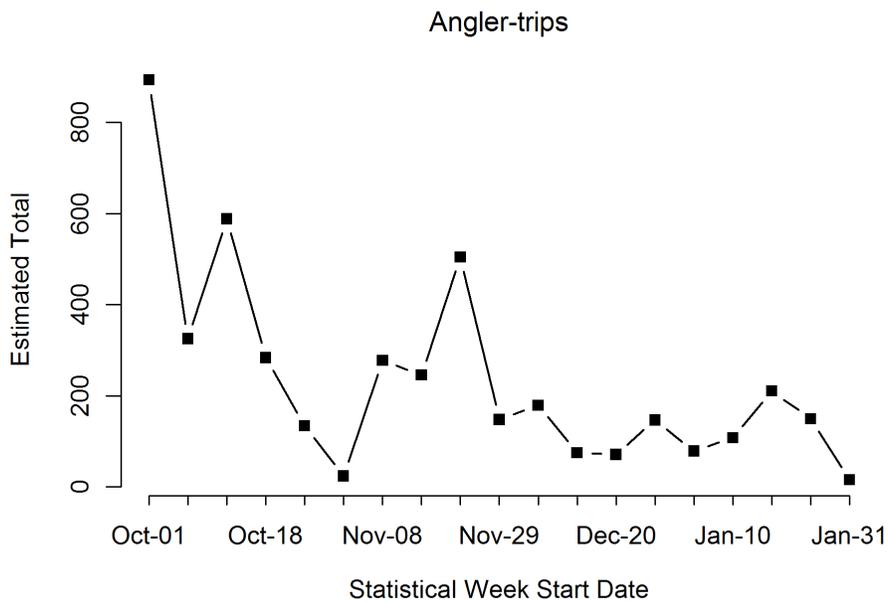
Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release.	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week. The eight-day weekday estimates for each two-week period were split evenly between individual weeks in the two-week block to enable weekly estimates (see WDFW 2012).
On-the-water Surveys (Boat Surveys)	Proportion of total angler effort accessing fishery via sample-frame sites (i.e., site “size measures”) versus out-of-frame sites. Size measures were used to select sites for dockside creel surveys using a probability proportional to size (PPS) site selection process, and to produce total-fishery creel estimates (see WDFW 2012).	Data on spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 2 boat surveys per month ( $n=8$ ) were conducted during the four-month fishery.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Season-total test fishery data were used to estimate total Chinook encounters by size/mark group and associated impacts; LM=9.6%, LU=3.0%, SM=46.1%, SU=41.3% (see <b>Table 10-5</b> ).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data were not used to estimate the size/mark status proportions needed to produce the Chinook encounters estimates. See Test Fishing row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<sup>1</sup> The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

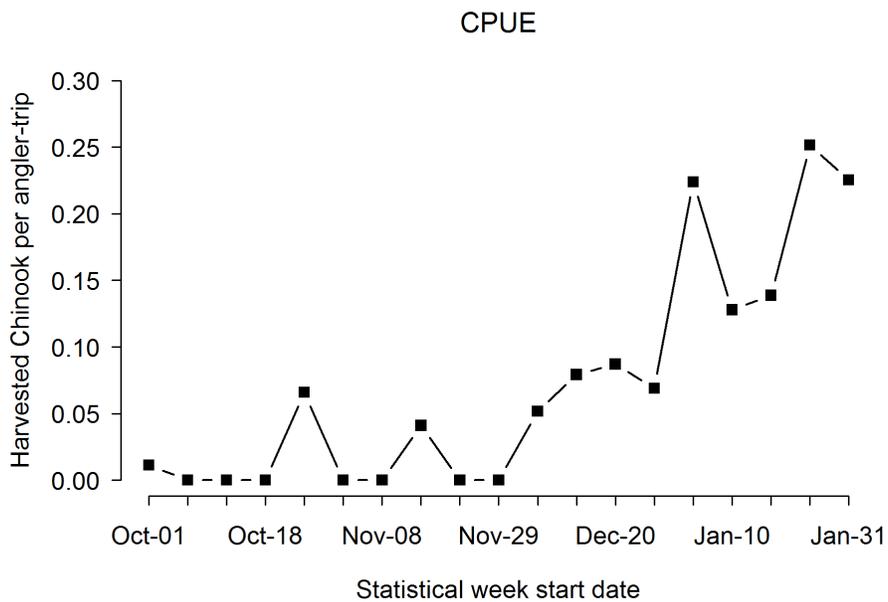
<sup>2</sup> Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

**Table 10-2.** Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2010-11 (October 1, 2010 – January 31, 2011) Area 10 mark-selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status.

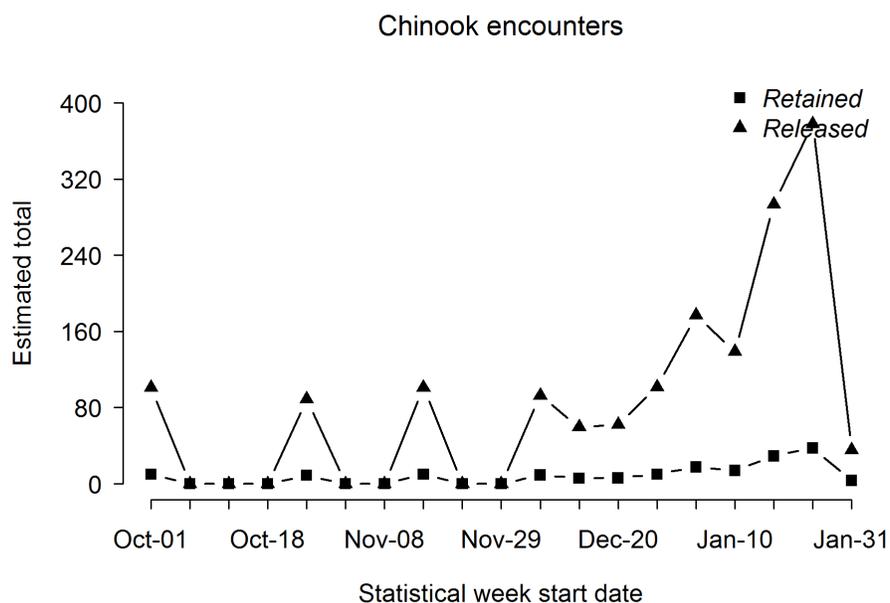
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Oct	40	Oct-01	Oct-03	462	894	10	0	52	49	111
	41	Oct-04	Oct-10	184	325	0	0	0	0	0
	42	Oct-11	Oct-17	295	589	0	0	0	0	0
	43	Oct-18	Oct-24	143	284	0	0	0	0	0
	44	Oct-25	Oct-31	72	134	9	0	46	43	98
Nov	45	Nov-01	Nov-07	15	24	0	0	0	0	0
	46	Nov-08	Nov-14	136	278	0	0	0	0	0
	47	Nov-15	Nov-21	132	246	10	0	52	49	111
	48	Nov-22	Nov-28	255	505	0	0	0	0	0
	49	Nov-29	Dec-05	80	148	0	0	0	0	0
Dec	50	Dec-06	Dec-12	109	179	9	0	48	45	102
	51	Dec-13	Dec-19	37	75	6	0	31	29	66
	52	Dec-20	Dec-26	30	71	6	0	32	30	68
	53/1	Dec-27	Jan-02	67	147	10	0	52	49	112
Jan	2	Jan-03	Jan-09	32	79	18	0	91	86	195
	3	Jan-10	Jan-16	64	108	14	0	71	68	153
	4	Jan-17	Jan-23	122	211	29	0	151	143	323
	5	Jan-24	Jan-30	77	150	38	0	194	184	415
	6	Jan-31	Jan-31	8	16	4	0	18	17	39
<b>Season Total:</b>				<b>2,320</b>	<b>4,461</b>	<b>162</b>	<b>0</b>	<b>836</b>	<b>793</b>	<b>1,792</b>
Variance:				48,972	208,555	1018	0	58,623	44722	243,146
Standard Error:				221	457	32	0	242	211	493
CV (%):				9.5%	10.2%	19.6%	-	29.0%	26.7%	27.5%
95% CI:				1,886-2,754	3,566-5,357	100-225	-	361-1,311	379-1,208	825-2,758



**Figure 10-1.** Temporal patterns in fishing effort during the Area 10 mark-selective Chinook fishery from October 1, 2010 – January 31, 2011.



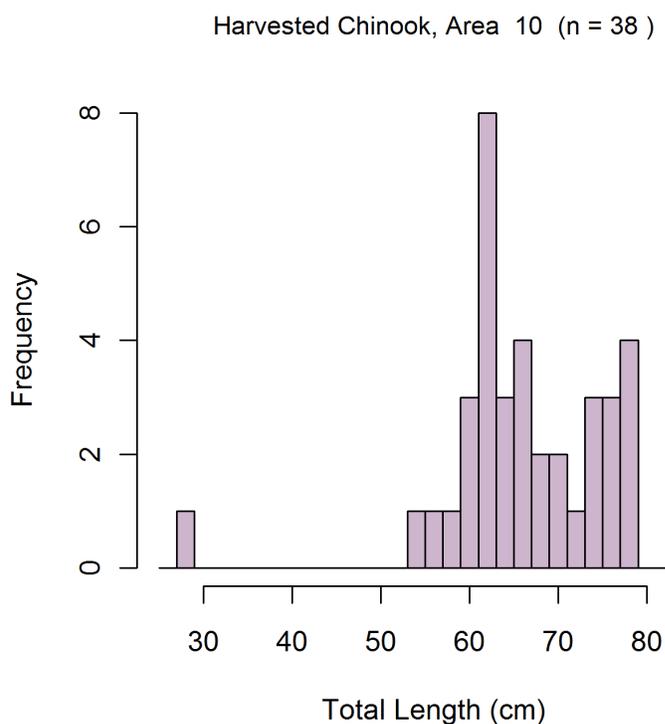
**Figure 10-2.** Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 10 mark-selective Chinook fishery from October 1, 2010 – January 31, 2011.



**Figure 10-3.** Temporal patterns in Chinook encounters (retained and released) during the Area 10 mark-selective Chinook fishery from October 1, 2010 – January 31, 2011.

**Table 10-3.** Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 10 mark-selective Chinook fishery from October 1, 2010 – January 31, 2011.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	35	3	38
Unmarked	0	0	0
<b>Total</b>	<b>35</b>	<b>3</b>	<b>38</b>



**Figure 10-4.** Length-frequency distribution for marked Chinook harvested and sampled dockside during the Area 10 mark-selective Chinook fishery from October 1, 2010 – January 31, 2011.

**Table 10-4.** Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2010-11 Area 10 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
British Columbia	Fraser River – Thompson River (7.1%)	Chilliwack River	Chilliwack R. Hatchery	1 (7.1%)	1
Washington	Hood Canal (57.1%)	Finch Creek	Hoodsport Hatchery	4 (28.6%)	0
		Purdy Creek	George Adams Hatchery	4 (28.6%)	4
	Northern Puget Sound (7.1%)	Wallace River	Wallace R. Hatchery	1 (7.1%)	0
	Skagit River (7.1%)	Cascade River	Marblemount Hatchery	1 (7.1%)	0
	Mid Puget Sound (7.1%)	Green River	n/a	1 (7.1%)	0
	Southern Puget Sound (14.3%)	Lakewood Hatchery	Lakewood Hatchery	2 (14.3%)	0
<b>Total</b>				<b>14</b>	<b>5</b>

**Table 10-5.** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery. Variances associated with season-total size/mark status proportions and mark rates are provided in parentheses. AD=adipose fin-clipped (marked); UM=adipose fin intact (unmarked).

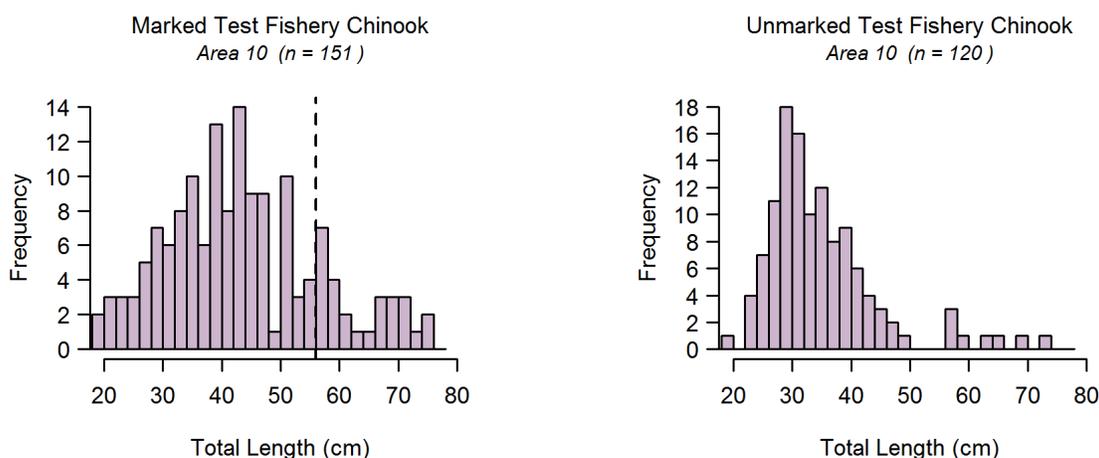
Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hours Fished	AD	UM	AD	UM	
40	2	6.4	0	0	1	3	4
41	4	19.4	0	0	2	3	5
42	5	23.3	0	0	8	5	13
43	3	12.9	0	0	2	4	6
44	4	21.6	0	0	8	8	16
45	4	23.0	0	0	5	10	15
46	4	23.5	0	0	2	1	3
47	5	19.5	0	0	6	3	9
48	2	8.0	0	0	1	2	3
49	6	25.7	1	0	4	13	18
50	4	17.3	2	2	16	9	29
51	5	20.8	6	0	20	19	45
52	3	16.5	3	2	12	8	25
53/1	4	16.0	7	3	14	7	31
2	4	14.3	1	0	10	8	19
3	3	14.6	4	1	11	8	24
4	1	4.9	0	0	2	1	3
5	2	4.7	2	0	1	0	3
<b>Total</b>	<b>65</b>	<b>292.4</b>	<b>26</b>	<b>8</b>	<b>125</b>	<b>112</b>	<b>271</b>
<b>Size/mark-status composition: 0.096 (0.0003) 0.030 (0.0001) 0.461 (0.0009) 0.413 (0.0009)</b> <b>Legal size mark rate: 0.76 (0.0055)</b> <b>Overall mark rate: 0.56 (0.0009)</b>							

**Table 10-6.** Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the Area 10 mark-selective Chinook fishery (October 1, 2009 through January 31, 2010), with estimates of legal-size, sublegal-size, and overall mark rates.

Data source	Effort & Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
<b>Charter Boat VTR</b>	4 1-trip VTRs, 13 Angler Trips	11	0	5	22	38	42.1%	100.0%
<b>Private Boat VTR</b>	21 1-trip VTRs, 33 Angler Trips	14	5	26	30	75	53.3%	73.7%
<b>Pooled VTR Data <sup>1/</sup></b>	46 Angler Trips	<b>25</b>	<b>5</b>	<b>31</b>	<b>52</b>	<b>113</b>	<b>49.6%</b>	<b>83.3%</b>
Size/mark-status comp <sup>1/</sup> : 0.221      0.044      0.274      0.460 Variance: (0.0015)    (0.0004)    (0.0018)    (0.0022)								

<sup>1/</sup> Note: We did not use the VTR data for encounters and impact estimation; rather, we used season-total test fishing data only for the impact estimation steps (see **Tables 10-1, 10-5** and WDFW 2012).

We used Pearson's chi-squared test to compare the size/mark status proportions of the test fishery data versus the VTR data from private boats and charter vessels combined. The  $\chi^2$  statistic was significant at the .05 probability level ( $\chi^2 = 17.21$ ,  $df = 3$ ,  $P = 0.001$ ), indicating a difference between the two samples. We also applied Fisher's Exact test to compare overall (legal and sublegal) mark rates between the test fishery and VTR data sources, which showed no significant difference between them ( $\chi^2 = 1.22$ ,  $df = 1$ ,  $P = 0.312$ ), and similarly a comparison of legal-size only mark rates showed no significant difference ( $\chi^2 = 0.46$ ,  $df = 1$ ,  $P = 0.548$ ). Nevertheless, ultimately we elected to use only the test fishery data to estimate the size/mark status proportions needed to produce the Chinook encounters estimates in the Area 10 winter mark-selective fishery.



**Figure 10- 5.** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery. The dashed vertical line in the marked Chinook plot corresponds to the legal size limit (22 in or 56 cm).

**Table 10-7.** Summary of season-wide fishery impact estimates for the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

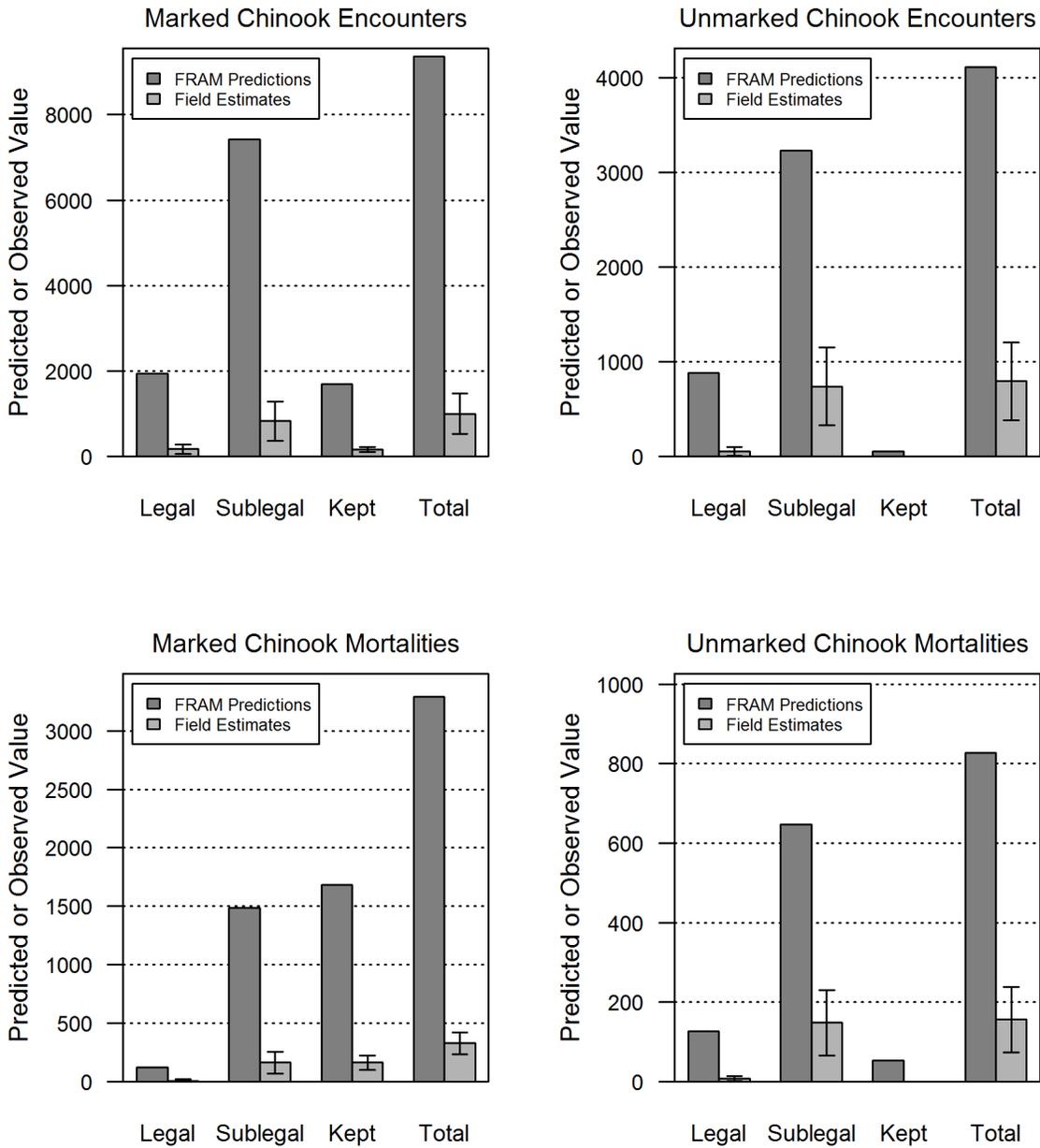
<b>Total Encounters (E): 1,792</b> <b>V(E): 243,146</b>										
<b>Size/mark group</b>	<b>Encounters</b>	<b>No. Retained</b>	<b>No. Rel'd</b>	<b>Rel. Mort. Rate</b>	<b>Rel. Mort.</b>	<b>Total Mortality</b>	<b>Var</b>	<b>SE</b>	<b>95% CI</b>	<b>CV (%)</b>
Legal marked	172	150	22	0.15	3	153	1,006	32	91 - 215	21
Legal unmarked	53	0	53	0.15	8	8	12	3	115-2012	43
Sublegal marked	826	13	814	0.20	163	176	2,237	47	83 - 268	27
Sublegal unmarked	740	0	740	0.20	148	148	1,768	42	66 - 231	28
<b>All groups combined</b>	<b>1,792</b>	<b>162</b>	<b>1,629</b>		<b>322</b>	<b>484</b>	<b>5,022</b>	<b>71</b>	<b>346 - 623</b>	<b>15</b>

**Table 10-8.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters for the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery.

<b>Data Source</b>	<b>Group</b>	<b>Total Encounters</b>	<b>Legal</b>	<b>Sublegal</b>	<b>Landed Only</b>
FRAM Encounters	Unmark.	4,114	879	3,235	53
	Mark.	9,357	1,937	7,420	1,685
	Total	13,471	2,816	10,655	1,738
	% Mark.	70	69	70	97
Estimated (Creel) Encounters	Unmark.	793	53	740	0
	Mark.	998	172	826	162
	Total	1,792	225	1,567	162
	% Mark.	56	77	53	100

**Table 10-9.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook mortalities for the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery.

<b>Mortality Category</b>	<b>FRAM Chinook Mortalities</b>			<b>Estimated Chinook Mortalities</b>		
	<b>Unmark.</b>	<b>Mark.</b>	<b>Total</b>	<b>Unmark.</b>	<b>Mark.</b>	<b>Total</b>
Total (Landed + Released)	827	3,291	4,118	156	328	484
Released Legal	127	122	249	8	3	11
Released Sublegal	647	1,484	2,131	148	163	311
Landed Only	53	1,685	1,738	0	162	162



**Figure 10-6.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters and mortalities for the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 10-10.** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 10 October 1, 2010 - January 31, 2011 mark-selective Chinook fishery.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
George Adams Hatchery	2007	4	17.2	56.5	17.3	1.7	0.6	1.5
Chilliwack River Hatchery	2009	1	4.3	14.1	2.2	0.2	0.04	0.2
<b>TOTAL</b>		<b>5</b>	<b>21.5</b>	<b>70.6</b>	<b>19.5</b>	<b>2.0</b>	<b>0.6</b>	<b>1.7</b>

**Table 10-11.** Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 10 mark-selective Chinook fishery from October 1, 2010 through January 31, 2011.

Time period			Estimated Retained Chinook			Number Retained Chinook Sampled <sup>1/</sup>			Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmark	Total	Marked	Unmark	Total	
<b>October</b>	40-44	Oct 1 - Oct 31	19	0	19	5	0	5	26.3%
<b>November</b>	45-48	Nov 1 - Nov 28	10	0	10	3	0	3	30.0%
<b>December</b>	49-53/1	Nov 29 - Jan 2	31	0	31	10	0	10	32.3%
<b>January</b>	2-5	Jan 3 - Jan 31	103	0	103	20	0	20	19.4%
<b>Season Total</b>			<b>163</b>	<b>0</b>	<b>163</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>23.3%</b>

<sup>1/</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the four-month winter Area 10 fishery (i.e., the two selected sites per sampling day for creel [Murthy] estimates, plus the fish sampled as part of baseline [non-Murthy] sampling in the Area).

**Table 10-12.** Fishery-total estimates of retained and released salmon (*other than Chinook*) for the Area 10 mark-selective Chinook fishery from October 1, 2010 through January 31, 2011. Values may not add exactly due to rounding error.

Stat Week	Est. Retained				Est. Released						
	Coho			Chum	Coho				Chum	Cutthroat Trout	Unk. Salmon
Mark	Unmark	Total	Mark		Unmark	Unk.	Total				
40	9	59	69	6	49	27	103	178	0	0	205
41	6	10	15	0	101	23	62	186	27	0	184
42	6	20	26	0	29	20	46	96	21	0	105
43	0	0	0	0	17	17	0	33	0	0	45
44	0	0	0	0	17	17	0	33	0	0	30
45	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	6	0	0	6	0	0	27
47	0	0	0	0	5	7	11	23	0	0	9
48	0	4	4	7	0	0	0	0	0	0	69
49	0	0	0	0	0	0	0	0	0	7	47
50	0	0	0	0	0	0	0	0	0	0	63
51	0	0	0	0	0	0	6	6	0	0	3
52	0	0	0	0	0	0	0	0	0	0	93
53/1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	12
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>20</b>	<b>93</b>	<b>114</b>	<b>13</b>	<b>223</b>	<b>110</b>	<b>229</b>	<b>561</b>	<b>48</b>	<b>7</b>	<b>892</b>
<b>Grand Total Summary Statistics:</b>											
Variance	155	168	323	54	6,008	2,402	3,337	11,746	1,003	43	14,089
SE	12	13	18	7	78	49	58	108	32	7	119
CV	61.1%	13.9%	15.8%	58.2%	34.8%	44.6%	25.3%	19.3%	65.8%	89.9%	13.3%
95% CI	5-45	68-119	78-149	3-27	71-375	14-206	116-342	349-774	1-7	2-20	659-1,124

**Table 10-13.** Summary of the total number of anglers intercepted in Area 10 during on-the-water surveys from October 1, 2010 through January 31, 2011. Grayed cells represent sites included in the dockside sample frame.

Site Name	Total Anglers (less 'Tengu' Armeni Ramp anglers) <sup>1/</sup>	Season Total (unadjusted) Size Measure	Total Anglers (with 'Tengu' Armeni Ramp anglers) <sup>1/</sup>	Season Total (unadjusted) Size Measure
Armeni Ramp	40	0.131	116	0.278
Brownsville Ramp	4	0.013	4	0.010
Brownsville Marina	4	0.013	4	0.010
Day Island Marina	1	0.003	1	0.002
Eagle Harbor Ramp	6	0.020	6	0.014
Edmonds Marina Dry Storage	25	0.082	30	0.072
Edmonds Sling	14	0.046	14	0.034
Edmonds Marina	24	0.079	24	0.058
Elliot Bay Marina	7	0.023	11	0.026
Everett Ramp (Norton)	6	0.020	8	0.019
Gig Harbor Ramp	2	0.007	2	0.005
Harbor Island	0	0.000	9	0.022
Jacobesen's Dry Stack	2	0.007	2	0.005
Kingston Public	31	0.102	33	0.079
Kingston Wet	6	0.020	6	0.014
Manchester	17	0.056	21	0.050
Point Defiance Marina	3	0.010	3	0.007
Port Orchard Ramp	5	0.016	5	0.012
Poulsbo Marina	4	0.013	4	0.010
Private Buoy/moorage	16	0.052	16	0.038
Redondo ramp	2	0.007	2	0.005
Seacrest Boat House	0	0.000	5	0.012
Shilshole Ramp	76	0.249	81	0.194
Shilshole Marina	10	0.033	10	0.024
<b>Total Anglers</b>	<b>305</b>	<b>1.000</b>	<b>417</b>	<b>1.000</b>

<sup>1/</sup> See WDFW 2012 for detailed methods descriptions on calculating Area 10 site size measures during the Tengu Derby period (Tengu Derby occurs on Sundays only, extending from the last Sunday in October through last Sunday in December).

**Table 10-14.** Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 10 winter mark-selective Chinook fishery.

Area	Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
10	December 1, 2007 - January 31, 2008	2,544	539	21	96	0	80	163	1,860	361	3,120
10	December 1, 2008 - January 31, 2009	2,029	247	0	4	0	37	36	1,010	462	1,796
10	October 1, 2009 - January 31, 2010	5,560	354	2	42	0	53	83	2,531	898	3,962
10	October 1, 2010 - January 31, 2011	4,461	150	0	13	0	22	53	814	740	1,792

## 5) Marine Area 11 Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 11 for the second time during the winter season from February 1 through April 30, 2011. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 11 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and collecting and distributing voluntary trip reports (VTRs) from the angling public. **Table 11-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012). In this section we present results from our monitoring activities during the Area 11 winter selective Chinook fishery from February 1 through April 30, 2011.

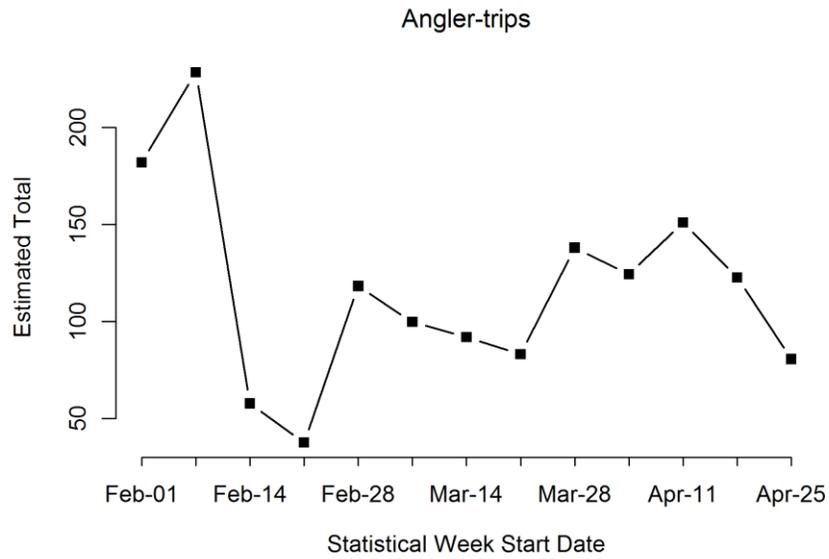
**Table 11-1.** Sampling/estimation details on target parameters associated with the overall Area 11 mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum, we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum, we sampled $n=2$ days out of $N=3$ available weekend days per week. The eight-day weekday estimates for each two-week period were split evenly between individual weeks in the two-week block to enable weekly estimates (see WDFW 2012).
On-the-water Surveys (Boat Surveys)	Proportion of total angler effort accessing fishery via sample-frame sites (i.e., site “size measures”) versus out-of-frame sites. Size measures were used to select sites for dockside creel surveys using a probability proportional to size (PPS) site selection process, and to produce total-fishery creel estimates (see WDFW 2012).	Data on spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 2 boat surveys per month ( $n=6$ ) were conducted during the three-month fishery.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season (4 months)	VTR data were used to estimate total Area 11 Chinook encounters by size/mark group (LM=12.0%, LU=12.0%, SM=44.0%, SU=32.0%) and associated impacts (see <b>Table 11-5</b> ).
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (4 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (4 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

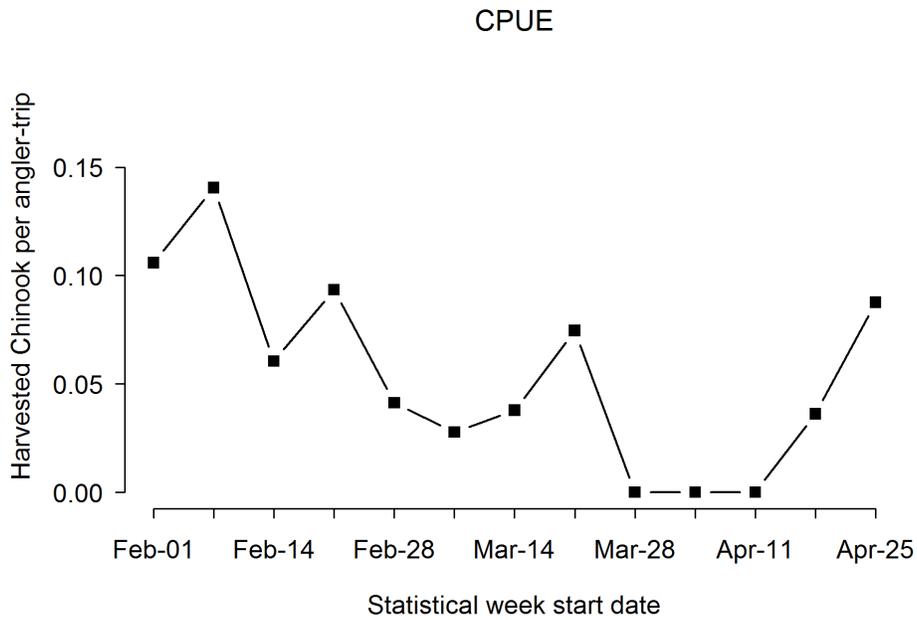
<sup>1</sup> The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

**Table 11-2.** Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the February 1, 2011 – April 30, 2011 Area 11 mark-selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status.

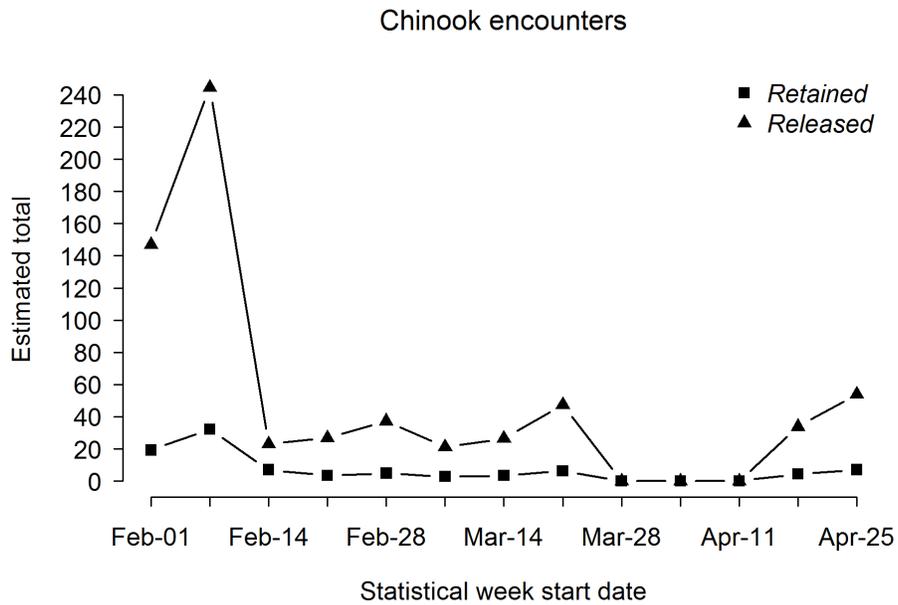
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Feb	6	Feb-01	Feb-06	98	182	19	0	74	73	166
	7	Feb-07	Feb-13	127	228	32	0	123	122	277
	8	Feb-14	Feb-20	51	58	3	3	13	10	30
	9	Feb-21	Feb-27	21	38	4	0	13	13	30
Mar	10	Feb-28	Mar-06	67	118	5	0	19	19	42
	11	Mar-07	Mar-13	52	100	3	0	11	10	24
	12	Mar-14	Mar-20	66	92	3	0	13	13	30
	13	Mar-21	Mar-27	58	83	6	0	24	24	53
	14	Mar-28	Apr-03	72	138	0	0	0	0	0
Apr	15	Apr-04	Apr-10	72	124	0	0	0	0	0
	16	Apr-11	Apr-17	78	151	0	0	0	0	0
	17	Apr-18	Apr-24	69	123	4	0	17	17	38
	18	Apr-25	Apr-30	50	81	7	0	27	27	61
<b>Season Total:</b>				<b>880</b>	<b>1,515</b>	<b>87</b>	<b>3</b>	<b>334</b>	<b>327</b>	<b>752</b>
<b>Variance:</b>				15,112	43,850	892	7	55,636	32,511	240,899
<b>Standard Error:</b>				123	209	30	3	236	180	491
<b>CV (%):</b>				14.0%	13.8%	34.2%	73.2%	70.7%	55.1%	65.3%
<b>95% CI:</b>				639-1,121	1,105-1,926	29-146	-2-8	-129-796	-26-681	-210-1,714



**Figure 11- 1.** Temporal patterns in fishing effort during the Area 11 winter mark-selective Chinook fishery from February 1 – April 30, 2011.



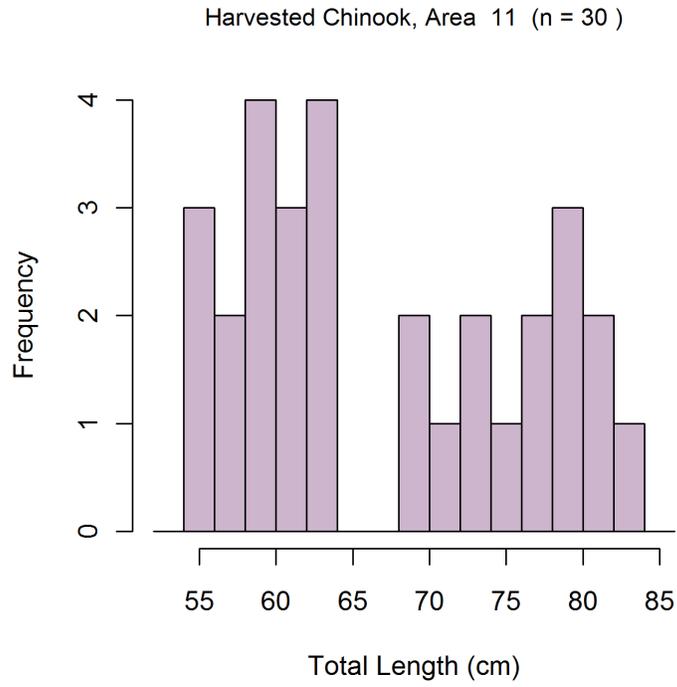
**Figure 11-2.** Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 11 mark-selective Chinook fishery from February 1 – April 30, 2011.



**Figure 11-3.** Temporal patterns in Chinook encounters (retained and released) during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

**Table 11-3.** Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
11	Marked	27	3	30
	Unmarked	1	0	1
<b>Total</b>		<b>28</b>	<b>3</b>	<b>31</b>



**Figure 11- 4.** Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2011.

**Table 11-4.** Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2010-11 Area 11 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
Hood Canal (50%)	Finch Creek	Hoodsport Hatchery	1 (50%)	0
Mid Puget Sound (50%)	Big Soos Creek	Soos Creek Hatchery	1 (50%)	1
<b>Grand Total</b>			<b>2</b>	<b>1</b>

**Table 11-5.** Total Chinook encountered (retained and released) by private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the February 1 – April 30, 2011 Area 11 mark-selective Chinook fishery, with estimates of legal-size, sublegal-size, and overall mark rates.

Data Source	Effort and Sample Size	Legal		Sublegal		Total	Total Mark Rate	Legal Mark Rate
<b>Private Boat VTR</b>	18 1-trip VTRs, 31 Angler Trips	3	3	11	8	25	56.0%	50.0%
Size/mark-status comp:		0.120	0.120	0.440	0.320			
Variance:		(0.0050)	(0.0050)	(0.0180)	(0.0132)			

**Table 11-6.** Summary of season-wide fishery impact estimates for the Area 11 February 1 – April 30, 2011 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

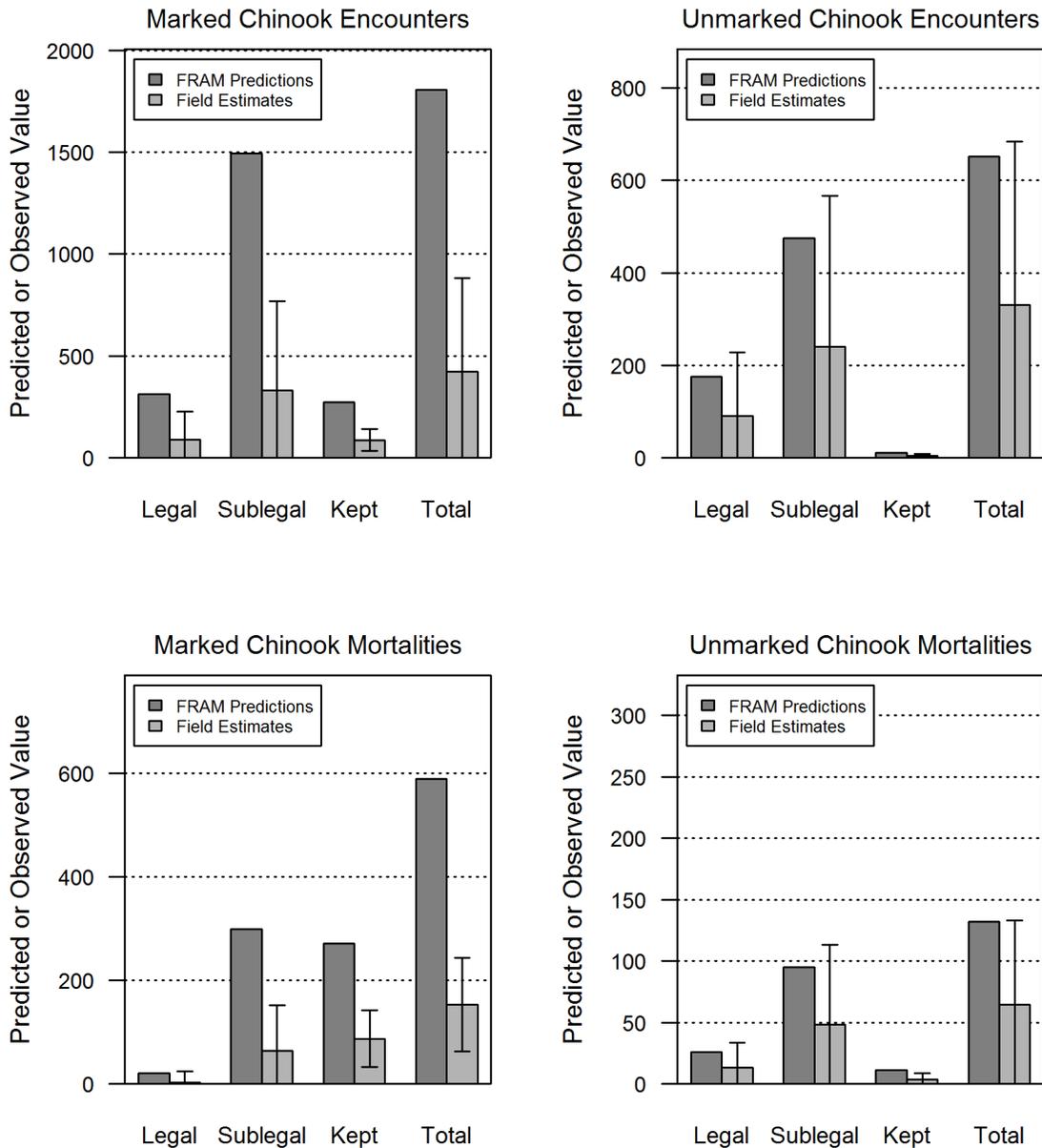
<b>Total Encounters (E): 752 V(E): 240,899</b>										
<b>Size/mark group</b>	<b>Encounters</b>	<b>No. Retained</b>	<b>No. Rel'd</b>	<b>Rel. Mort. Rate</b>	<b>Rel. Mort.</b>	<b>Total Mortality</b>	<b>Var</b>	<b>SE</b>	<b>95% CI</b>	<b>CV (%)</b>
Legal marked	90	78	12	0.15	2	80	870	29	22 - 138	37
Legal unmarked	90	3	87	0.15	13	16	117	11	5 - 38	66
Sublegal marked	331	9	322	0.20	64	73	2,030	45	15-161	62
Sublegal unmarked	241	0	241	0.20	48	48	1,104	33	17-113	69
<b>All groups combined</b>	<b>752</b>	<b>91</b>	<b>661</b>		<b>127</b>	<b>218</b>	<b>4,121</b>	<b>64</b>	<b>92 - 344</b>	<b>29</b>

**Table 11-7.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters for the Area 11 February 1 – April 30, 2011 mark-selective Chinook fishery.

<b>Data Source</b>	<b>Group</b>	<b>Total Encounters</b>	<b>Legal</b>	<b>Sublegal</b>	<b>Landed Only</b>
FRAM Encounters	Unmark.	651	176	475	11
	Mark.	1,806	311	1,495	271
	Total	2,457	487	1,970	282
	% Mark.	74	64	76	96
Estimated (Creel) Encounters	Unmark.	331	90	241	3
	Mark.	421	90	331	87
	Total	752	180	571	91
	% Mark.	56	50	58	96

**Table 11-8.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook mortalities for the Area 11 February 1 – April 30, 2011 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	132	590	722	65	153	218
Released Legal	26	20	46	13	2	15
Released Sublegal	95	299	394	48	64	113
Landed Only	11	271	282	3	87	91



**Figure 11-5.** Comparison of modeled (i.e., using FRAM, model run 1010) and estimated total Chinook encounters and mortalities for the Area 11 February 1 – April 30, 2011 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 11-9.** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 11 February 1 – April 30, 2011 mark-selective Chinook fishery.

Hatchery	Brood Year	DIT's Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(est.)
Soos Creek Hatchery	2008	1	2.9	5.4	3.0	0.3	0.1	0.2
<b>TOTAL</b>		<b>1</b>	<b>2.9</b>	<b>5.4</b>	<b>3.0</b>	<b>0.3</b>	<b>0.1</b>	<b>0.2</b>

**Table 11-10.** Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 11 mark-selective Chinook fishery from February 1 – April 30, 2011.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmarked	Total	Marked	Unmarked	Total	
February	6-9	Feb 1 - Feb 28	58	3	61	16	1	17	27.9%
March	10-13	Mar 1 - Mar 28	17	0	17	8	0	8	47.1%
April	14-18	Mar 29 - Apr 30	11	0	11	6	0	6	54.5%
<b>Season Total</b>			<b>86</b>	<b>3</b>	<b>89</b>	<b>30</b>	<b>1</b>	<b>31</b>	<b>34.8%</b>

**Table 11-11.** Summary of the total number of anglers intercepted in Area 11 during on-the-water surveys conducted from February 1 – April 30, 2011. Grayed cells represent sites included in the dockside sample frame.

Site Name	Total Anglers	Season Total (unadjusted) Size Measure
Breakwater Marina	6	0.033
Day Island Marina	4	0.022
Des Moines Marina	10	0.055
Foss Harbor Marina	12	0.066
Gig Harbor Marina	5	0.027
Gig Harbor Ramp	10	0.055
Harbor Marina	2	0.011
Manchester Ramp	5	0.027
Narrows Marina	7	0.038
Olalla Ramp	2	0.011
Point Defiance Boathouse	38	0.208
Point Defiance Ramp	72	0.393
Port Orchard Ramp	2	0.011
Private	5	0.027
Tyee Marina	3	0.016
<b>Total Anglers</b>	<b>183</b>	<b>1.000</b>

**Table 11-12.** Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 11 winter mark-selective Chinook fishery.

Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
February 1 - April 30, 2010	3,096	315	3	11	0	47	80	114	10	580
February 1 - April 30, 2011	1,515	78	3	9	0	12	87	322	241	752

## 6) Marine Area 12 Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 12 for the second time during the winter season from February 1 through April 30, 2011. Data collection methods used to monitor the Area 12 mark-selective Chinook fishery included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (i.e., CPUE), mark rates (based on VTRs), and landed-catch composition (age, length, and CWT). Additionally, we described relative catch and effort patterns over the three-month (February 1 – April 30, 2011) season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

WDFW dockside samplers conducted “Baseline Sampling” at selected Area 12 access sites during the 2011 Area 12 winter mark-selective Chinook fishery. Complete details of the Baseline Sampling methods are presented in a separate Methods Report (WDFW 2012). Briefly, Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Area 12 baseline sample frame included 13 different access sites (**Table 12-1**), each of which was visited on an average of 16 days during the three-month season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Area 12 fishery at the selected access site. The interview and catch-sampling procedures employed in Area 12 were identical to those used in other mark-selective fisheries. Thus, Area 12 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and coho salmon only), and 3) landed Chinook size (fork and total length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and coho salmon for CWTs using wand detectors and acquired snouts when tags were present; resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

In contrast to the intensive survey design (i.e., the “Murthy” design) employed in other areas, Area 12 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook impacts. It should be noted, however, that Area 12 baseline sampling observations will ultimately (one to two years from the close of the fishery) be combined with Catch Record Card (CRC) data to estimate catch and effort at the fishery-total level, by month. Thus, while these descriptors of MSF impacts are not presented in the present document, they will be available at a future time.

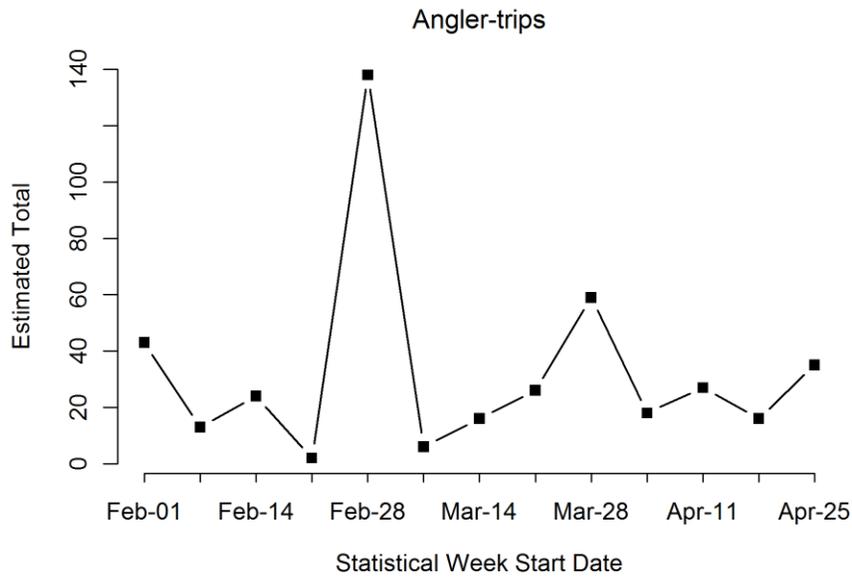
In this section we report results from monitoring the Area 12 winter mark-selective Chinook fishery based on our efficient, streamlined reporting format agreed-to between state and tribal technical representatives (in July 2010), which is focused on presenting data tables and figures rather than interpretive text. Results are presented in a series of tables and figures according to the following sequence: *i*) the intensity (i.e., spatial and temporal coverage) of sampling efforts is described; and *ii*) observed data on fishery characteristics obtained from the dockside baseline sampling efforts are reviewed, including catch and effort observations, Chinook length-frequency data, and CWT recovery results.

**Table 12-1.** List of sites sampled, with the number of sampling events (site-days) during the Area 12 winter mark-selective Chinook fishery, February 1 through April 30, 2011.

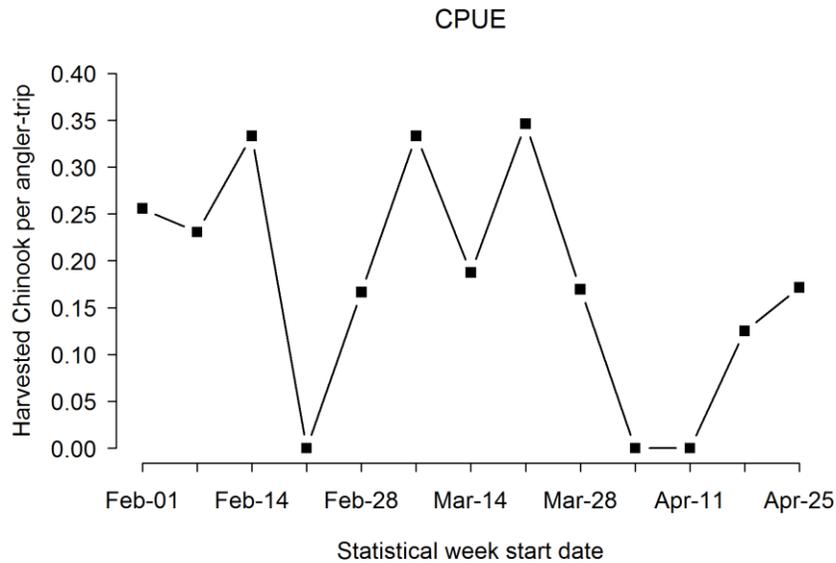
Location	Number of Site-Days Sampled per Month			Total Site-Days	% of Total
	Feb	Mar	Apr		
Lilliwaup Beach Launch	2			2	1.3%
Mats Mats Bay Ramp	1			1	0.7%
Menard's Landing (near Tahuya)			1	1	0.7%
Misery Point Ramp	15	26	23	64	42.1%
Pleasant Harbor Boat Ramp (WDFW)	8	5	7	20	13.2%
Quilcene Bay Ramp	4	1	1	6	3.9%
Salisbury County Park Ramp	12	7	9	28	18.4%
Saltwater Park Ramp	6	7	3	16	10.5%
Seabeck Marina		1		1	0.7%
Tahuya Ramp			2	2	1.3%
Termination Point Ramp	3			3	2.0%
Triton Cove State Park	3	2	2	7	4.6%
Yelwicks Ramp	1			1	0.7%
<b>Grand Total</b>	<b>55</b>	<b>49</b>	<b>48</b>	<b>152</b>	<b>100.0%</b>

**Table 12-2.** Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the Area 12 February 1-April 30, 2011 mark-selective Chinook fishery. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates. AD = marked (i.e., adipose-clipped), UM = unmarked, UK = unknown mark status.

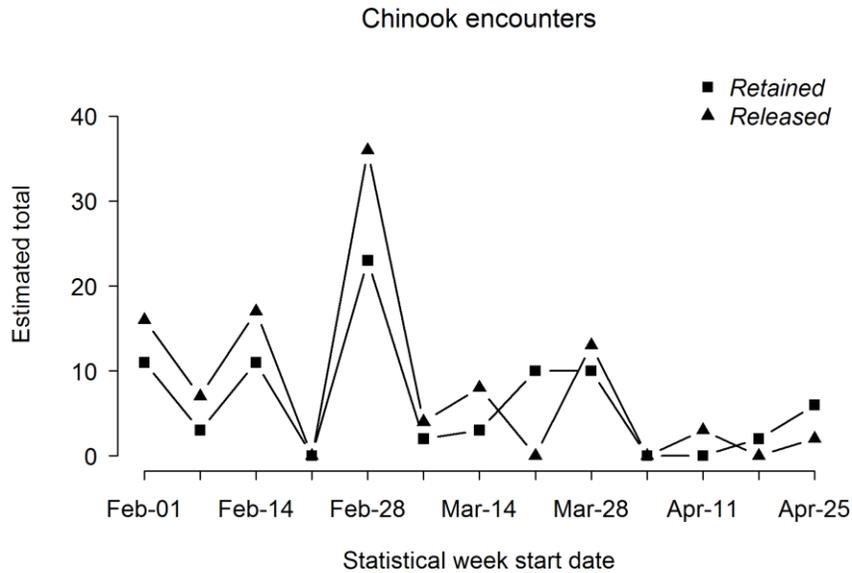
Month	Stat Week	Start Date	End Date	Effort		Retained Chinook		Other Species Kept		Released Chinook			Other Species Released				
				Boats	Anglers	AD	UM	AD Coho	UM Coho	AD	UM	UK	Ad Coho	UM Coho	UK Coho	Cutthroat Trout	Unknown Salmon
Feb	6	01-Feb	06-Feb	23	43	11	0	0	0	9	7	13	0	0	0	0	0
	7	07-Feb	13-Feb	9	13	3	0	0	0	7	0	0	0	0	0	0	0
	8	14-Feb	20-Feb	12	24	8	3	0	0	13	4	3	0	0	0	0	0
	9	21-Feb	27-Feb	1	2	0	0	0	0	0	0	1	0	0	0	0	0
Mar	10	28-Feb	06-Mar	69	138	23	0	0	0	25	11	15	0	0	0	0	0
	11	07-Mar	13-Mar	5	6	2	0	0	0	2	2	0	0	0	0	0	0
	12	14-Mar	20-Mar	10	16	3	0	0	0	8	0	5	0	0	0	0	0
	13	21-Mar	27-Mar	13	26	9	1	0	0	0	0	2	0	0	0	0	0
Apr	14	28-Mar	03-Apr	28	59	10	0	0	0	9	4	2	0	0	0	0	0
	15	04-Apr	10-Apr	11	18	0	0	0	0	0	0	2	0	0	0	0	0
	16	11-Apr	17-Apr	18	27	0	0	0	0	2	1	1	0	0	0	0	0
	17	18-Apr	24-Apr	8	16	2	0	0	0	0	0	1	0	0	0	0	0
	18	25-Apr	30-Apr	17	35	6	0	0	0	2	0	3	0	0	0	0	0
<b>Season Total:</b>				<b>224</b>	<b>423</b>	<b>77</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>77</b>	<b>29</b>	<b>48</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



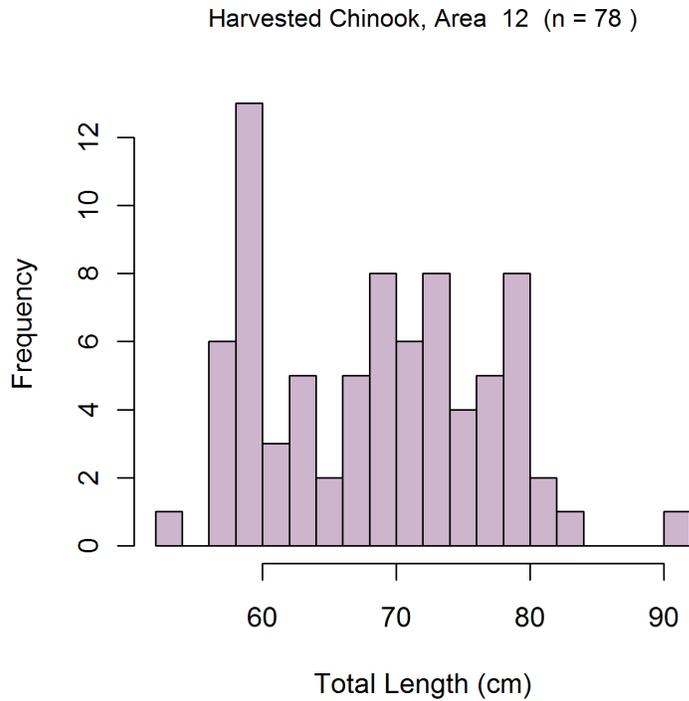
**Figure 12- 1.** Temporal patterns in fishing effort by week during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2011. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.



**Figure 12- 2.** Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2011. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.



**Figure 12-3.** Temporal patterns in Chinook encounters (retained and released) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2011. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.



**Figure 12-4.** Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2011.

**Table 12-3.** Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 12 mark-selective Chinook fishery from February 1 – April 30, 2011.

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
12	Marked	77	1	78
	Unmarked	1	0	1
<b>Total</b>		<b>78</b>	<b>1</b>	<b>79</b>

**Table 12-4.** Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2010-11 Area 12 mark-selective Chinook fishery. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	Number DITs
Hood Canal (93.8%)	Finch Creek	Hoodsport Hatchery	12 (75%)	0
	John Creek	RFEG 6 Hood Canal	1 (6.2%)	0
	Purdy Creek	George Adams Hatchery	2 (12.5%)	2
Southern Puget Sound (6.2%)	Clear Creek	Clear Creek Hatchery	1 (6.2%)	1
<b>TOTAL</b>			<b>16</b>	<b>3</b>

**Table 12-5.** Total Chinook encountered (retained and released) by private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the Area 12 mark-selective Chinook fishery (February 1 – April 30, 2011), with estimates of legal-size, sublegal-size, and overall mark rates.

Data Source	Effort & Sample Size	Legal		Sublegal		Total	Total Mark Rate	Legal Mark Rate
<b>Private Boat VTR</b>	8 1-trip VTRs, 12 Angler Trips	6	2	9	6	23	65.2%	75.0%
VTR size/mark-status comp:		0.261	0.087	0.391	0.261			
Variance:		(0.0117)	(0.0039)	(0.0175)	(0.0117)			

## ACKNOWLEDGEMENTS

This review of the 2010-11 winter mark-selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12 is the result of the dedicated efforts of several individuals. First, we thank the WDFW Puget Sound Sampling Unit (PSSU) field supervisors and their staff, who successfully implemented comprehensive sampling programs during the winter 2010-11 mark-selective Chinook fisheries. The PSSU field staff have conducted the dockside creel surveys, test fishery sampling, on-the-water effort surveys, aerial surveys, voluntary trip report program, angler education, as well as compiled, error-checked, and delivered high-quality monitoring data to enable mark-selective fishery evaluations. In particular, from Central Sound, we thank Slim Simpson (Central Sound Sampling Supervisor), Jeff McKee, Kathy Young-Berg, Sue Kraemer, Pete Sergeeff, Toby Black, Courtney Adkins, Jim Pykonen, Mike Petronelli, and April Bosley. From the Strait of Juan de Fuca/Peninsula area, we thank Larry Bennett (Peninsula Sampling Supervisor), Connie Warren, Jessica Slipper, and Ken Wall. From North Sound, we thank Steve Axtell (North Sampling Supervisor), Al Esparza, Marcus Thompson, Dean Toba, Patrick Morrison, Lynn Stricker, Mary Mureau, Jim Repoz, Angela Foster, Alan (Skeeter) Lowe, Nathan Layman, and Area 7 test fishers Phil Colwell and Chad Paul. From South Sound as well as Hood Canal and the Kitsap Peninsula, we thank Dan O'Brien (South Sound Supervisor), Justin Terry, John Moore, Scott Walker, Cara Crowley, Mary Raymond, and Dave Parrao. Additionally, we thank WDFW pilots Marty Kimbrel, Jim Hodgson, and Kevin Nelsen and samplers Mark Baltzell, Chris Moran, Ellie Heikilla, Brant Boelts, Lee Dyer, and Brianna Murphy for their time in surveying Areas 7 and 9 from the sky.

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## **APPENDICES**

**Appendix A-1.** Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-1 mark-selective Chinook fishery from November 1, 2010 through April 30, 2011.

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
11/01/2010	45	0.312	Camano Island State Park Public Ramp	02/01/2011	6	0.352	Camano Island State Park Public Ramp
11/01/2010	45	0.208	Maple Grove Ramp; Camano Is	02/04/2011	6	0.352	Camano Island State Park Public Ramp
11/05/2010	45	0.312	Camano Island State Park Public Ramp	02/04/2011	6	0.088	Norton Street (Everett) Ramp
11/05/2010	45	0.111	Norton Street (Everett) Ramp	02/05/2011	6	0.352	Camano Island State Park Public Ramp
11/06/2010	45	0.263	Oak Harbor Marina & Public Ramp	02/05/2011	6	0.176	Oak Harbor Marina & Public Ramp
11/06/2010	45	0.312	Camano Island State Park Public Ramp	02/09/2011	7	0.352	Camano Island State Park Public Ramp
11/09/2010	46	0.312	Camano Island State Park Public Ramp	02/09/2011	7	0.230	Maple Grove Ramp; Camano Is
11/09/2010	46	0.111	Norton Street (Everett) Ramp	02/12/2011	7	0.176	Oak Harbor Marina & Public Ramp
11/13/2010	46	0.312	Camano Island State Park Public Ramp	02/12/2011	7	0.352	Camano Island State Park Public Ramp
11/13/2010	46	0.208	Maple Grove Ramp; Camano Is	02/13/2011	7	0.352	Camano Island State Park Public Ramp
11/14/2010	46	0.312	Camano Island State Park Public Ramp	02/13/2011	7	0.088	Utsalady Ramp; Camano Is
11/14/2010	46	0.263	Oak Harbor Marina & Public Ramp	02/14/2011	8	0.415	Camano Island State Park Public Ramp
11/18/2010	47	0.312	Camano Island State Park Public Ramp	02/14/2011	8	0.151	Oak Harbor Marina & Public Ramp
11/18/2010	47	0.208	Maple Grove Ramp; Camano Is	02/18/2011	8	0.415	Camano Island State Park Public Ramp
11/20/2010	47	0.111	Norton Street (Everett) Ramp	02/18/2011	8	0.182	Maple Grove Ramp; Camano Is
11/20/2010	47	0.312	Camano Island State Park Public Ramp	02/19/2011	8	0.415	Camano Island State Park Public Ramp
11/21/2010	47	0.312	Camano Island State Park Public Ramp	02/19/2011	8	0.151	Oak Harbor Marina & Public Ramp
11/21/2010	47	0.263	Oak Harbor Marina & Public Ramp	02/24/2011	9	0.182	Maple Grove Ramp; Camano Is
11/22/2010	48	0.312	Camano Island State Park Public Ramp	02/24/2011	9	0.415	Camano Island State Park Public Ramp
11/22/2010	48	0.024	Utsalady Ramp; Camano Is	02/26/2011	9	0.151	Oak Harbor Marina & Public Ramp
11/27/2010	48	0.312	Camano Island State Park Public Ramp	02/26/2011	9	0.415	Camano Island State Park Public Ramp
11/27/2010	48	0.111	Norton Street (Everett) Ramp	02/27/2011	9	0.415	Camano Island State Park Public Ramp
11/28/2010	48	0.312	Camano Island State Park Public Ramp	02/27/2011	9	0.182	Maple Grove Ramp; Camano Is
11/28/2010	48	0.263	Oak Harbor Marina & Public Ramp	03/02/2011	10	0.424	Camano Island State Park Public Ramp
12/01/2010	49	0.152	Camano Island State Park Public Ramp	03/02/2011	10	0.163	Norton Street (Everett) Ramp
12/01/2010	49	0.245	Norton Street (Everett) Ramp	03/04/2011	10	0.424	Camano Island State Park Public Ramp

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
12/03/2010	49	0.272	Oak Harbor Marina & Public Ramp	03/04/2011	10	0.037	Coupeville Public Ramp
12/03/2010	49	0.152	Camano Island State Park Public Ramp	03/06/2011	10	0.424	Camano Island State Park Public Ramp
12/04/2010	49	0.152	Camano Island State Park Public Ramp	03/06/2011	10	0.272	Maple Grove Ramp; Camano Is
12/04/2010	49	0.183	Maple Grove Ramp; Camano Is	03/07/2011	11	0.272	Maple Grove Ramp; Camano Is
12/08/2010	50	0.152	Camano Island State Park Public Ramp	03/07/2011	11	0.424	Camano Island State Park Public Ramp
12/08/2010	50	0.245	Norton Street (Everett) Ramp	03/12/2011	11	0.424	Camano Island State Park Public Ramp
12/11/2010	50	0.152	Camano Island State Park Public Ramp	03/12/2011	11	0.272	Maple Grove Ramp; Camano Is
12/11/2010	50	0.183	Maple Grove Ramp; Camano Is	03/13/2011	11	0.424	Camano Island State Park Public Ramp
12/12/2010	50	0.272	Oak Harbor Marina & Public Ramp	03/13/2011	11	0.092	Oak Harbor Marina & Public Ramp
12/12/2010	50	0.152	Camano Island State Park Public Ramp	03/16/2011	12	0.424	Camano Island State Park Public Ramp
12/14/2010	51	0.152	Camano Island State Park Public Ramp	03/16/2011	12	0.092	Oak Harbor Marina & Public Ramp
12/14/2010	51	0.272	Oak Harbor Marina & Public Ramp	03/18/2011	12	0.424	Camano Island State Park Public Ramp
12/17/2010	51	0.152	Camano Island State Park Public Ramp	03/18/2011	12	0.272	Maple Grove Ramp; Camano Is
12/17/2010	51	0.245	Norton Street (Everett) Ramp	03/19/2011	12	0.424	Camano Island State Park Public Ramp
12/18/2010	51	0.152	Camano Island State Park Public Ramp	03/19/2011	12	0.09	Oak Harbor Marina & Public Ramp
12/18/2010	51	0.183	Maple Grove Ramp; Camano Is	03/21/2011	13	0.424	Camano Island State Park Public Ramp
12/20/2010	52	0.272	Oak Harbor Marina & Public Ramp	03/21/2011	13	0.272	Maple Grove Ramp; Camano Is
12/20/2010	52	0.152	Camano Island State Park Public Ramp	03/25/2011	13	0.424	Camano Island State Park Public Ramp
12/26/2010	52	0.152	Camano Island State Park Public Ramp	03/25/2011	13	0.272	Maple Grove Ramp; Camano Is
12/26/2010	52	0.245	Norton Street (Everett) Ramp	03/27/2011	13	0.163	Norton Street (Everett) Ramp
12/30/2010	53	0.152	Camano Island State Park Public Ramp	03/27/2011	13	0.424	Camano Island State Park Public Ramp
12/30/2010	53	0.183	Maple Grove Ramp; Camano Is	03/29/2011	14	0.453	Camano Island State Park Public Ramp
12/31/2010	53	0.152	Camano Island State Park Public Ramp	03/29/2011	14	0.227	Maple Grove Ramp; Camano Is
12/31/2010	53	0.045	Utsalady Ramp; Camano Is	04/02/2011	14	0.453	Camano Island State Park Public Ramp
01/02/2011	1	0.152	Camano Island State Park Public Ramp	04/02/2011	14	0.227	Maple Grove Ramp; Camano Is
01/02/2011	1	0.272	Oak Harbor Marina & Public Ramp	04/03/2011	14	0.453	Camano Island State Park Public Ramp
01/06/2011	2	0.183	Maple Grove Ramp; Camano Is	04/03/2011	14	0.077	Oak Harbor Marina & Public Ramp
01/06/2011	2	0.152	Camano Island State Park Public Ramp	04/05/2011	15	0.453	Camano Island State Park Public Ramp

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
01/07/2011	2	0.152	Camano Island State Park Public Ramp	04/05/2011	15	0.077	Oak Harbor Marina & Public Ramp
01/07/2011	2	0.272	Oak Harbor Marina & Public Ramp	04/08/2011	15	0.202	Norton Street (Everett) Ramp
01/08/2011	2	0.152	Camano Island State Park Public Ramp	04/08/2011	15	0.453	Camano Island State Park Public Ramp
01/08/2011	2	0.245	Norton Street (Everett) Ramp	04/09/2011	15	0.202	Norton Street (Everett) Ramp
01/13/2011	3	0.3765	Camano Island State Park Public Ramp	04/09/2011	15	0.453	Camano Island State Park Public Ramp
01/13/2011	3	0.1917	Maple Grove Ramp; Camano Is	04/12/2011	16	0.453	Camano Island State Park Public Ramp
01/15/2011	3	0.3765	Camano Island State Park Public Ramp	04/12/2011	16	0.227	Maple Grove Ramp; Camano Is
01/15/2011	3	0.1467	Oak Harbor Marina & Public Ramp	04/16/2011	16	0.453	Camano Island State Park Public Ramp
01/16/2011	3	0.1917	Maple Grove Ramp; Camano Is	04/16/2011	16	0.227	Maple Grove Ramp; Camano Is
01/16/2011	3	0.3765	Camano Island State Park Public Ramp	04/17/2011	16	0.453	Camano Island State Park Public Ramp
01/19/2011	4	0.3765	Camano Island State Park Public Ramp	04/17/2011	16	0.202	Norton Street (Everett) Ramp
01/19/2011	4	0.0733	Utsalady Ramp; Camano Is	04/20/2011	17	0.227	Maple Grove Ramp; Camano Is
01/22/2011	4	0.3765	Camano Island State Park Public Ramp	04/20/2011	17	0.453	Camano Island State Park Public Ramp
01/22/2011	4	0.1917	Maple Grove Ramp; Camano Is	04/23/2011	17	0.453	Camano Island State Park Public Ramp
01/23/2011	4	0.3765	Camano Island State Park Public Ramp	04/23/2011	17	0.202	Norton Street (Everett) Ramp
01/23/2011	4	0.0548	Coupeville Public Ramp	04/24/2011	17	0.453	Camano Island State Park Public Ramp
01/25/2011	5	0.3765	Camano Island State Park Public Ramp	04/24/2011	17	0.202	Norton Street (Everett) Ramp
01/25/2011	5	0.1917	Maple Grove Ramp; Camano Is	04/28/2011	18	0.453	Camano Island State Park Public Ramp
01/29/2011	5	0.1917	Maple Grove Ramp; Camano Is	04/28/2011	18	0.227	Maple Grove Ramp; Camano Is
01/29/2011	5	0.3765	Camano Island State Park Public Ramp	04/29/2011	18	0.453	Camano Island State Park Public Ramp
01/30/2011	5	0.1467	Oak Harbor Marina & Public Ramp	04/29/2011	18	0.077	Oak Harbor Marina & Public Ramp
01/30/2011	5	0.3765	Camano Island State Park Public Ramp	04/30/2011	18	0.202	Norton Street (Everett) Ramp
02/01/2011	6	0.176	Oak Harbor Marina & Public Ramp	04/30/2011	18	0.453	Camano Island State Park Public Ramp

**Appendix A-2.** Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-2 mark-selective Chinook fishery from November 1, 2010 through April 30, 2012.

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
11/01/2010	45	0.574	Norton Street (Everett) Ramp	02/01/2011	6	0.194	Camano Island State Park Public Ramp
11/01/2010	45	0.302	Camano Island State Park Public Ramp	02/04/2011	6	0.047	Dagmar's Landing; Forklift Launch
11/05/2010	45	0.085	Dagmar's Landing; Forklift Launch	02/04/2011	6	0.713	Norton Street (Everett) Ramp
11/05/2010	45	0.574	Norton Street (Everett) Ramp	02/05/2011	6	0.194	Camano Island State Park Public Ramp
11/06/2010	45	0.302	Camano Island State Park Public Ramp	02/05/2011	6	0.713	Norton Street (Everett) Ramp
11/06/2010	45	0.574	Norton Street (Everett) Ramp	02/09/2011	7	0.713	Norton Street (Everett) Ramp
11/09/2010	46	0.574	Norton Street (Everett) Ramp	02/09/2011	7	0.025	Bayside Marine
11/09/2010	46	0.021	Bayside Marine	02/12/2011	7	0.713	Norton Street (Everett) Ramp
11/13/2010	46	0.085	Dagmar's Landing; Forklift Launch	02/12/2011	7	0.194	Camano Island State Park Public Ramp
11/13/2010	46	0.574	Norton Street (Everett) Ramp	02/13/2011	7	0.194	Camano Island State Park Public Ramp
11/14/2010	46	0.574	Norton Street (Everett) Ramp	02/13/2011	7	0.713	Norton Street (Everett) Ramp
11/14/2010	46	0.302	Camano Island State Park Public Ramp	02/14/2011	8	0.162	Camano Island State Park Public Ramp
11/18/2010	47	0.302	Camano Island State Park Public Ramp	02/14/2011	8	0.602	Norton Street (Everett) Ramp
11/18/2010	47	0.574	Norton Street (Everett) Ramp	02/18/2011	8	0.059	Dagmar's Landing; Forklift Launch
11/20/2010	47	0.574	Norton Street (Everett) Ramp	02/18/2011	8	0.602	Norton Street (Everett) Ramp
11/20/2010	47	0.021	Bayside Marine	02/19/2011	8	0.162	Camano Island State Park Public Ramp
11/21/2010	47	0.302	Camano Island State Park Public Ramp	02/19/2011	8	0.602	Norton Street (Everett) Ramp
11/21/2010	47	0.574	Norton Street (Everett) Ramp	02/24/2011	9	0.602	Norton Street (Everett) Ramp
11/22/2010	48	0.302	Camano Island State Park Public Ramp	02/24/2011	9	0.059	Dagmar's Landing; Forklift Launch
11/22/2010	48	0.574	Norton Street (Everett) Ramp	02/26/2011	9	0.602	Norton Street (Everett) Ramp
11/27/2010	48	0.085	Dagmar's Landing; Forklift Launch	02/26/2011	9	0.059	Dagmar's Landing; Forklift Launch
11/27/2010	48	0.574	Norton Street (Everett) Ramp	02/27/2011	9	0.029	Mukiteo State Park Public Ramp
11/28/2010	48	0.302	Camano Island State Park Public Ramp	02/27/2011	9	0.602	Norton Street (Everett) Ramp
11/28/2010	48	0.574	Norton Street (Everett) Ramp	03/02/2011	10	0.061	Dagmar's Landing; Forklift Launch
12/01/2010	49	0.156	Camano Island State Park Public Ramp	03/02/2011	10	0.612	Norton Street (Everett) Ramp
12/01/2010	49	0.588	Norton Street (Everett) Ramp	03/04/2011	10	0.235	Camano Island State Park Public Ramp
12/03/2010	49	0.588	Norton Street (Everett)	03/04/2011	10	0.612	Norton Street (Everett)

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
			Ramp				Ramp
12/03/2010	49	0.117	Dagmar's Landing; Forklift Launch	03/06/2011	10	0.612	Norton Street (Everett) Ramp
12/04/2010	49	0.156	Camano Island State Park Public Ramp	03/06/2011	10	0.046	Bayside Marine
12/04/2010	49	0.588	Norton Street (Everett) Ramp	03/07/2011	11	0.612	Norton Street (Everett) Ramp
12/08/2010	50	0.156	Camano Island State Park Public Ramp	03/07/2011	11	0.061	Dagmar's Landing; Forklift Launch
12/08/2010	50	0.588	Norton Street (Everett) Ramp	03/12/2011	11	0.029	Mukiteo State Park Public Ramp
12/11/2010	50	0.156	Camano Island State Park Public Ramp	03/12/2011	11	0.612	Norton Street (Everett) Ramp
12/11/2010	50	0.588	Norton Street (Everett) Ramp	03/13/2011	11	0.235	Camano Island State Park Public Ramp
12/12/2010	50	0.117	Dagmar's Landing; Forklift Launch	03/13/2011	11	0.612	Norton Street (Everett) Ramp
12/12/2010	50	0.588	Norton Street (Everett) Ramp	03/16/2011	12	0.221	Camano Island State Park Public Ramp
12/14/2010	51	0.588	Norton Street (Everett) Ramp	03/16/2011	12	0.589	Norton Street (Everett) Ramp
12/14/2010	51	0.156	Camano Island State Park Public Ramp	03/18/2011	12	0.221	Camano Island State Park Public Ramp
12/17/2010	51	0.588	Norton Street (Everett) Ramp	03/18/2011	12	0.589	Norton Street (Everett) Ramp
12/17/2010	51	0.117	Dagmar's Landing; Forklift Launch	03/19/2011	12	0.221	Camano Island State Park Public Ramp
12/18/2010	51	0.156	Camano Island State Park Public Ramp	03/19/2011	12	0.589	Norton Street (Everett) Ramp
12/18/2010	51	0.588	Norton Street (Everett) Ramp	03/21/2011	13	0.08	Dagmar's Landing; Forklift Launch
12/20/2010	52	0.156	Camano Island State Park Public Ramp	03/21/2011	13	0.589	Norton Street (Everett) Ramp
12/20/2010	52	0.588	Norton Street (Everett) Ramp	03/25/2011	13	0.221	Camano Island State Park Public Ramp
12/26/2010	52	0.117	Dagmar's Landing; Forklift Launch	03/25/2011	13	0.589	Norton Street (Everett) Ramp
12/26/2010	52	0.588	Norton Street (Everett) Ramp	03/27/2011	13	0.019	Tulalip Marina & Ramp
12/30/2010	53	0.156	Camano Island State Park Public Ramp	03/27/2011	13	0.589	Norton Street (Everett) Ramp
12/30/2010	53	0.588	Norton Street (Everett) Ramp	03/29/2011	14	0.221	Camano Island State Park Public Ramp
12/31/2010	53	0.588	Norton Street (Everett) Ramp	03/29/2011	14	0.589	Norton Street (Everett) Ramp
12/31/2010	53	0.117	Dagmar's Landing; Forklift Launch	04/02/2011	14	0.221	Camano Island State Park Public Ramp
01/02/2011	1	0.156	Camano Island State Park Public Ramp	04/02/2011	14	0.589	Norton Street (Everett) Ramp
01/02/2011	1	0.588	Norton Street (Everett) Ramp	04/03/2011	14	0.221	Camano Island State Park Public Ramp
01/06/2011	2	0.156	Camano Island State Park Public Ramp	04/03/2011	14	0.589	Norton Street (Everett) Ramp
01/06/2011	2	0.588	Norton Street (Everett) Ramp	04/05/2011	15	0.221	Camano Island State Park Public Ramp
01/07/2011	2	0.117	Dagmar's Landing; Forklift	04/05/2011	15	0.589	Norton Street (Everett)

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
			Launch				Ramp
01/07/2011	2	0.588	Norton Street (Everett) Ramp	04/08/2011	15	0.589	Norton Street (Everett) Ramp
01/08/2011	2	0.588	Norton Street (Everett) Ramp	04/08/2011	15	0.221	Camano Island State Park Public Ramp
01/08/2011	2	0.06	Bayside Marine	04/09/2011	15	0.589	Norton Street (Everett) Ramp
01/13/2011	3	0.1939	Camano Island State Park Public Ramp	04/09/2011	15	0.027	Mukiteo State Park Public Ramp
01/13/2011	3	0.7134	Norton Street (Everett) Ramp	04/12/2011	16	0.221	Camano Island State Park Public Ramp
01/15/2011	3	0.0468	Dagmar's Landing; Forklift Launch	04/12/2011	16	0.589	Norton Street (Everett) Ramp
01/15/2011	3	0.7134	Norton Street (Everett) Ramp	04/16/2011	16	0.221	Camano Island State Park Public Ramp
01/16/2011	3	0.1939	Camano Island State Park Public Ramp	04/16/2011	16	0.589	Norton Street (Everett) Ramp
01/16/2011	3	0.7134	Norton Street (Everett) Ramp	04/17/2011	16	0.08	Dagmar's Landing; Forklift Launch
01/19/2011	4	0.1939	Camano Island State Park Public Ramp	04/17/2011	16	0.589	Norton Street (Everett) Ramp
01/19/2011	4	0.7134	Norton Street (Everett) Ramp	04/20/2011	17	0.589	Norton Street (Everett) Ramp
01/22/2011	4	0.0468	Dagmar's Landing; Forklift Launch	04/20/2011	17	0.027	Mukiteo State Park Public Ramp
01/22/2011	4	0.7134	Norton Street (Everett) Ramp	04/23/2011	17	0.221	Camano Island State Park Public Ramp
01/23/2011	4	0.7134	Norton Street (Everett) Ramp	04/23/2011	17	0.589	Norton Street (Everett) Ramp
01/23/2011	4	0.1939	Camano Island State Park Public Ramp	04/24/2011	17	0.221	Camano Island State Park Public Ramp
01/25/2011	5	0.1939	Camano Island State Park Public Ramp	04/24/2011	17	0.589	Norton Street (Everett) Ramp
01/25/2011	5	0.7134	Norton Street (Everett) Ramp	04/28/2011	18	0.221	Camano Island State Park Public Ramp
01/29/2011	5	0.1939	Camano Island State Park Public Ramp	04/28/2011	18	0.589	Norton Street (Everett) Ramp
01/29/2011	5	0.7134	Norton Street (Everett) Ramp	04/29/2011	18	0.589	Norton Street (Everett) Ramp
01/30/2011	5	0.7134	Norton Street (Everett) Ramp	04/29/2011	18	0.047	Bayside Marine
01/30/2011	5	0.0253	Bayside Marine	04/30/2011	18	0.589	Norton Street (Everett) Ramp
02/01/2011	6	0.713	Norton Street (Everett) Ramp	04/30/2011	18	0.221	Camano Island State Park Public Ramp

**Appendix A-3.** Size measures by sample date, for sites sampled during dockside creel surveys in the Area 10 mark-selective Chinook fishery from October 1, 2010 through January 31, 2011.

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
10/01/2010	40	0.404	Shilshole Public Ramp	12/01/2010	49	0.219	Armeni Public Ramp
10/01/2010	40	0.148	Kingston Public Ramp	12/01/2010	49	0.404	Shilshole Public Ramp
10/02/2010	40	0.219	Armeni Public Ramp	12/03/2010	49	0.219	Armeni Public Ramp
10/02/2010	40	0.404	Shilshole Public Ramp	12/03/2010	49	0.137	Edmonds Boat Loft (Priv. fork lift)
10/06/2010	41	0.219	Armeni Public Ramp	12/04/2010	49	0.093	Manchester Public Ramp
10/06/2010	41	0.404	Shilshole Public Ramp	12/04/2010	49	0.404	Shilshole Public Ramp
10/08/2010	41	0.219	Armeni Public Ramp	12/08/2010	50	0.219	Armeni Public Ramp
10/08/2010	41	0.404	Shilshole Public Ramp	12/08/2010	50	0.404	Shilshole Public Ramp
10/09/2010	41	0.093	Manchester Public Ramp	12/11/2010	50	0.404	Shilshole Public Ramp
10/09/2010	41	0.404	Shilshole Public Ramp	12/11/2010	50	0.148	Kingston Public Ramp
10/13/2010	42	0.219	Armeni Public Ramp	12/12/2010	50	0.219	Armeni Public Ramp
10/13/2010	42	0.404	Shilshole Public Ramp	12/12/2010	50	0.404	Shilshole Public Ramp
10/16/2010	42	0.404	Shilshole Public Ramp	12/14/2010	51	0.219	Armeni Public Ramp
10/16/2010	42	0.148	Kingston Public Ramp	12/14/2010	51	0.404	Shilshole Public Ramp
10/17/2010	42	0.219	Armeni Public Ramp	12/17/2010	51	0.219	Armeni Public Ramp
10/17/2010	42	0.093	Manchester Public Ramp	12/17/2010	51	0.404	Shilshole Public Ramp
10/20/2010	43	0.219	Armeni Public Ramp	12/18/2010	51	0.404	Shilshole Public Ramp
10/20/2010	43	0.404	Shilshole Public Ramp	12/18/2010	51	0.148	Kingston Public Ramp
10/23/2010	43	0.404	Shilshole Public Ramp	12/20/2010	52	0.219	Armeni Public Ramp
10/23/2010	43	0.148	Kingston Public Ramp	12/20/2010	52	0.404	Shilshole Public Ramp
10/24/2010	43	0.219	Armeni Public Ramp	12/26/2010	52	0.404	Shilshole Public Ramp
10/24/2010	43	0.404	Shilshole Public Ramp	12/26/2010	52	0.137	Edmonds Boat Loft (Priv. fork lift)
10/28/2010	44	0.219	Armeni Public Ramp	12/30/2010	53	0.404	Shilshole Public Ramp
10/28/2010	44	0.404	Shilshole Public Ramp	12/30/2010	53	0.148	Kingston Public Ramp
10/29/2010	44	0.404	Shilshole Public Ramp	12/31/2010	53	0.219	Armeni Public Ramp
10/29/2010	44	0.148	Kingston Public Ramp	12/31/2010	53	0.404	Shilshole Public Ramp
10/30/2010	44	0.219	Armeni Public Ramp	01/02/2011	1	0.093	Manchester Public Ramp
10/30/2010	44	0.404	Shilshole Public Ramp	01/02/2011	1	0.404	Shilshole Public Ramp
11/01/2010	45	0.219	Armeni Public Ramp	01/06/2011	2	0.219	Armeni Public Ramp
11/01/2010	45	0.404	Shilshole Public Ramp	01/06/2011	2	0.404	Shilshole Public Ramp
11/05/2010	45	0.404	Shilshole Public Ramp	01/07/2011	2	0.219	Armeni Public Ramp
11/05/2010	45	0.137	Edmonds Boat Loft (Priv. fork lift)	01/07/2011	2	0.093	Manchester Public Ramp
11/06/2010	45	0.404	Shilshole Public Ramp	01/08/2011	2	0.404	Shilshole Public Ramp
11/06/2010	45	0.148	Kingston Public Ramp	01/08/2011	2	0.148	Kingston Public Ramp
11/09/2010	46	0.404	Shilshole Public Ramp	01/13/2011	3	0.219	Armeni Public Ramp
11/09/2010	46	0.137	Edmonds Boat Loft (Priv. fork lift)	01/13/2011	3	0.404	Shilshole Public Ramp
11/13/2010	46	0.219	Armeni Public Ramp	01/15/2011	3	0.219	Armeni Public Ramp
11/13/2010	46	0.404	Shilshole Public Ramp	01/15/2011	3	0.093	Manchester Public Ramp

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
11/14/2010	47	0.219	Armeni Public Ramp	01/16/2011	3	0.404	Shilshole Public Ramp
11/14/2010	47	0.148	Kingston Public Ramp	01/16/2011	3	0.148	Kingston Public Ramp
11/18/2010	47	0.404	Shilshole Public Ramp	01/19/2011	4	0.402	Shilshole Public Ramp
11/18/2010	47	0.137	Edmonds Boat Loft (Priv. fork lift)	01/19/2011	4	0.132	Edmonds Boat Loft (Priv. fork lift)
11/20/2010	47	0.093	Manchester Public Ramp	01/22/2011	4	0.212	Armeni Public Ramp
11/20/2010	47	0.404	Shilshole Public Ramp	01/22/2011	4	0.402	Shilshole Public Ramp
11/21/2010	48	0.219	Armeni Public Ramp	01/23/2011	4	0.212	Armeni Public Ramp
11/21/2010	48	0.148	Kingston Public Ramp	01/23/2011	4	0.164	Kingston Public Ramp
11/22/2010	48	0.404	Shilshole Public Ramp	01/25/2011	5	0.212	Armeni Public Ramp
11/22/2010	48	0.137	Edmonds Boat Loft (Priv. fork lift)	01/25/2011	5	0.164	Kingston Public Ramp
11/27/2010	48	0.093	Manchester Public Ramp	01/29/2011	5	0.212	Armeni Public Ramp
11/27/2010	48	0.404	Shilshole Public Ramp	01/29/2011	5	0.164	Kingston Public Ramp
11/28/2010	49	0.219	Armeni Public Ramp	01/30/2011	5	0.402	Shilshole Public Ramp
11/28/2010	49	0.148	Kingston Public Ramp	01/30/2011	5	0.132	Edmonds Boat Loft (Priv. fork lift)

**Appendix A-4.** Size measures by sample date, for sites sampled during dockside creel surveys in the Area 11 mark-selective Chinook fishery from February 1, 2010 through April 30, 2010.

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
02/01/2011	6	0.079	Gig Harbor Ramp	03/18/2011	12	0.647	Point Defiance Ramp
02/01/2011	6	0.635	Point Defiance Ramp	03/19/2011	12	0.282	Point Defiance Boathouse
02/04/2011	6	0.079	Gig Harbor Ramp	03/19/2011	12	0.647	Point Defiance Ramp
02/04/2011	6	0.635	Point Defiance Ramp	03/21/2011	13	0.071	Gig Harbor Ramp
02/05/2011	6	0.079	Gig Harbor Ramp	03/21/2011	13	0.647	Point Defiance Ramp
02/05/2011	6	0.635	Point Defiance Ramp	03/25/2011	13	0.282	Point Defiance Boathouse
02/09/2011	7	0.04	Armeni Ramp	03/25/2011	13	0.647	Point Defiance Ramp
02/09/2011	7	0.635	Point Defiance Ramp	03/27/2011	13	0.282	Point Defiance Boathouse
02/12/2011	7	0.222	Point Defiance Boathouse	03/27/2011	13	0.647	Point Defiance Ramp
02/12/2011	7	0.635	Point Defiance Ramp	03/29/2011	14	0.311	Point Defiance Boathouse
02/13/2011	7	0.04	Armeni Ramp	03/29/2011	14	0.611	Point Defiance Ramp
02/13/2011	7	0.635	Point Defiance Ramp	04/02/2011	14	0.311	Point Defiance Boathouse
02/14/2011	8	0.04	Armeni Ramp	04/02/2011	14	0.611	Point Defiance Ramp
02/14/2011	8	0.634	Point Defiance Ramp	04/03/2011	14	0.311	Point Defiance Boathouse
02/18/2011	8	0.222	Point Defiance Boathouse	04/03/2011	14	0.611	Point Defiance Ramp
02/18/2011	8	0.634	Point Defiance Ramp	04/05/2011	15	0.311	Point Defiance Boathouse
02/19/2011	8	0.634	Point Defiance Ramp	04/05/2011	15	0.611	Point Defiance Ramp
02/19/2011	8	0.024	Redondo Ramp	04/08/2011	15	0.311	Point Defiance Boathouse
02/24/2011	9	0.079	Gig Harbor Ramp	04/08/2011	15	0.611	Point Defiance Ramp
02/24/2011	9	0.634	Point Defiance Ramp	04/09/2011	15	0.311	Point Defiance Boathouse
02/26/2011	9	0.222	Point Defiance Boathouse	04/09/2011	15	0.611	Point Defiance Ramp
02/26/2011	9	0.634	Point Defiance Ramp	04/12/2011	16	0.069	Gig Harbor Ramp
02/27/2011	9	0.222	Point Defiance Boathouse	04/12/2011	16	0.627	Point Defiance Ramp
02/27/2011	9	0.634	Point Defiance Ramp	04/16/2011	16	0.304	Point Defiance Boathouse
03/02/2011	10	0.083	Gig Harbor Ramp	04/16/2011	16	0.627	Point Defiance Ramp

SAMPLE DATE	WEEK	SITE SIZE	LOCATION	SAMPLE DATE	WEEK	SITE SIZE	LOCATION
03/02/2011	10	0.625	Point Defiance Ramp	04/17/2011	16	0.069	Gig Harbor Ramp
03/04/2011	10	0.292	Point Defiance Boathouse	04/17/2011	16	0.627	Point Defiance Ramp
03/04/2011	10	0.625	Point Defiance Ramp	04/20/2011	17	0.304	Point Defiance Boathouse
03/06/2011	10	0.292	Point Defiance Boathouse	04/20/2011	17	0.627	Point Defiance Ramp
03/06/2011	10	0.625	Point Defiance Ramp	04/23/2011	17	0.304	Point Defiance Boathouse
03/07/2011	11	0.083	Gig Harbor Ramp	04/23/2011	17	0.627	Point Defiance Ramp
03/07/2011	11	0.625	Point Defiance Ramp	04/24/2011	17	0.069	Gig Harbor Ramp
03/12/2011	11	0.292	Point Defiance Boathouse	04/24/2011	17	0.627	Point Defiance Ramp
03/12/2011	11	0.625	Point Defiance Ramp	04/28/2011	18	0.102	Gig Harbor Ramp
03/13/2011	11	0.083	Gig Harbor Ramp	04/28/2011	18	0.602	Point Defiance Ramp
03/13/2011	11	0.625	Point Defiance Ramp	04/29/2011	18	0.102	Gig Harbor Ramp
03/16/2011	12	0.282	Point Defiance Boathouse	04/29/2011	18	0.602	Point Defiance Ramp
03/16/2011	12	0.647	Point Defiance Ramp	04/30/2011	18	0.297	Point Defiance Boathouse
03/18/2011	12	0.282	Point Defiance Boathouse	04/30/2011	18	0.602	Point Defiance Ramp

**Appendix B-1.** Coded Wire Tag (CWT) recoveries in the Area 7 winter mark-selective Chinook fishery, December 1, 2010 – April 30, 2011 (sorted by recovery date during sampling).

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
7	03-Dec-10	634844	2008	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634845	55	AD Fin Clp	62401
7	03-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	66	AD Fin Clp	62402
7	03-Dec-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		70	AD Fin Clp	62457
7	04-Dec-10	210777	2007	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		83	AD Fin Clp	62003
7	04-Dec-10	210840	2008	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		58	AD Fin Clp	62004
7	04-Dec-10	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		68	AD Fin Clp	62005
7	04-Dec-10	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		70	AD Fin Clp	62006
7	10-Dec-10	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		58	AD Fin Clp	62054
7	11-Dec-10	634272	2007	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	634273	67	AD Fin Clp	62419
7	17-Dec-10	210278	2007	BAKER R 03.0435		WDFW		72	AD Fin Clp	62055
7	17-Dec-10	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		62	AD Fin Clp	62470
7	19-Dec-10	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		62	AD Fin Clp	62057
7	31-Dec-10	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		61	AD Fin Clp	42670
7	31-Dec-10	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		69	AD Fin Clp	62058
7	02-Jan-11	210790	2007	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	634276		Unkn Marks	30610
7	02-Jan-11	634281	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634282	81	AD Fin Clp	62056
7	02-Jan-11	210790	2007	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	634276	75	AD Fin Clp	62458
7	03-Jan-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		71	AD Fin Clp	62205
7	06-Jan-11	633966	2006	WALLACE R 07.0940		WDFW		74	AD Fin Clp	62420
7	08-Jan-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	66	AD Fin Clp	62421
7	08-Jan-11	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		69	AD Fin Clp	62422
7	08-Jan-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		75	AD Fin Clp	62471
7	08-Jan-11	633966	2006	WALLACE R 07.0940		WDFW		86	AD Fin Clp	62472
7	08-Jan-11	210790	2007	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	634276	68	AD Fin Clp	62473
7	11-Jan-11	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL			Unkn Marks	30615
7	16-Jan-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		71	AD Fin Clp	62460
7	22-Jan-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	67	AD Fin Clp	62423
7	22-Jan-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		77	AD Fin Clp	62474
7	23-Jan-11	634286	2007	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	634285	72	AD Fin Clp	62475
7	23-Jan-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	73	AD Fin Clp	62476
7	25-Jan-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		76	AD Fin Clp	43409
7	31-Jan-11	180471	2008	R-Cowichan R	H-Cowichan River H	CDFO		57	AD Fin Clp	42671

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
7	01-Feb-11	186313	2008	R-Cowichan R	H-Cowichan River H	CDFO		54	AD Fin Clp	62424
7	04-Feb-11	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		64	AD Fin Clp	62151
7	04-Feb-11	634274	2007	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	634275	84	AD Fin Clp	62152
7	04-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		72	AD Fin Clp	62153
7	04-Feb-11	634797	2008	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	634798	66	AD Fin Clp	62154
7	04-Feb-11	180480	2008	R-Chilliwack R	H-Chilliwack River H	CDFO	180481,180482, 180000	67	AD Fin Clp	62155
7	04-Feb-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		72	AD Fin Clp	62156
7	05-Feb-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		77	AD Fin Clp	62157
7	05-Feb-11	634281	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634282	73	AD Fin Clp	62158
7	05-Feb-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		77	AD Fin Clp	62159
7	05-Feb-11	634274	2007	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	634275	78	AD Fin Clp	62387
7	05-Feb-11	634373	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW	634374	72	AD Fin Clp	62388
7	05-Feb-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	72	AD Fin Clp	62425
7	09-Feb-11	210790	2007	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	634276	78	AD Fin Clp	62426
7	10-Feb-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		80	AD Fin Clp	62477
7	13-Feb-11	180470	2008	R-Cowichan R	H-Cowichan River H	CDFO		57	AD Fin Clp	62463
7	06-Mar-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69	AD Fin Clp	62459
7	06-Mar-11	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		84	AD Fin Clp	62478
7	07-Mar-11	180482	2008	R-Chilliwack R	H-Chilliwack River H	CDFO	180481, 180480, 180000	63	AD Fin Clp	62427
7	16-Mar-11	210801	2007	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		75	AD Fin Clp	62428
7	19-Mar-11	634395	2008	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		53	AD Fin Clp	62429
7	19-Mar-11	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		62	AD Fin Clp	62479
7	20-Mar-11	210840	2008	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL			Unkn Marks	30609
7	20-Mar-11	210278	2007	BAKER R 03.0435		WDFW			Unkn Marks	30517
7	20-Mar-11	634395	2008	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW			Unkn Marks	30607
7	22-Mar-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		73	AD Fin Clp	62480
7	25-Mar-11	185001	2007	R-Harrison R	H-Chehalis River H	CDFO		83	AD Fin Clp	62481
7	25-Mar-11	210777	2007	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		70	AD Fin Clp	62482
7	26-Mar-11	210777	2007	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		73	AD Fin Clp	62206
7	26-Mar-11	634298	2007	GREEN R 09.0001	ICY CR HATCHERY	WDFW		64	AD Fin Clp	62207
7	26-Mar-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	83	AD Fin Clp	62208
7	26-Mar-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		83	AD Fin Clp	62209
7	26-Mar-11	634769	2008	CASCADE R 03.1411	MARBLEMOUNT	WDFW	635082	52	AD Fin Clp	62210

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
					HATCHERY					
7	26-Mar-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		76	AD Fin Clp	62212
7	26-Mar-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	67	AD Fin Clp	62213
7	26-Mar-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		74	AD Fin Clp	62214
7	26-Mar-11	180480	2008	R-Chilliwack R	H-Chilliwack River H	CDFO	1.80481E+17	65	AD Fin Clp	62215
7	26-Mar-11	634274	2007	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	634275	80	AD Fin Clp	62216
7	26-Mar-11	634268	2007	KLICKITAT HATCHERY (YKFP)	KLICKITAT HATCHERY (YKFP)	YAKA		72	AD Fin Clp	62217
7	26-Mar-11	635081	2008	EAST SOUND BAY (SAN)	GLENWOOD SPRINGS	WDFW		60	AD Fin Clp	62218
7	26-Mar-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		80	AD Fin Clp	62219
7	26-Mar-11	186226	2007	R-Cowichan R	H-Cowichan River H	CDFO		73	AD Fin Clp	62220
7	27-Mar-11	634797	2008	NOOKSACK R -NF 01.0120	KENDALL CR HATCHERY	WDFW	634798	72	AD Fin Clp	62221
7	27-Mar-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		77	AD Fin Clp	62222
7	29-Mar-11	210801	2007	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		78	Unkn Marks	43410
7	29-Mar-11	633869	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		74	AD Fin Clp	43411
7	09-Apr-11	634286	2007	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	634285	65	AD Fin Clp	42944
7	09-Apr-11	186137	2008	R-Cowichan R	H-Cowichan River H	CDFO		72	AD Fin Clp	62432
7	09-Apr-11	634281	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634282	73	AD Fin Clp	62484
7	15-Apr-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	77	AD Fin Clp	62461
7	16-Apr-11	210788	2007	CLEAR CR 11.0013C	CLEAR CREEK HATCHERY	NISQ	634277	72	AD Fin Clp	42945
7	16-Apr-11	634373	2007	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW	634374	78	AD Fin Clp	42946
7	30-Apr-11	634281	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634282	75	AD Fin Clp	42947

**Appendix B-2.** Coded-wire tag (CWT) recoveries in the winter Areas 8-1 and 8-2 mark-selective Chinook fisheries, November 1, 2010 – April 30, 2011.

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
81	24-Mar-11	210840	2008	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		70	AD Fin Clp	32813
82	14-Nov-10	634286	2007	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	634285	75	AD Fin Clp	66681
82	20-Nov-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		63	AD Fin Clp	66683
82	29-Jan-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		71	AD Fin Clp	66684
82	31-Jan-11	634284	2007	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		78	AD Fin Clp	66685
82	16-Apr-11	634782	2008	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		59	AD Fin Clp	66688
82	03-Apr-11	634844	2008	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634845	55	AD Fin Clp	50270
82	15-Jan-11	210840	2008	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		66	AD Fin Clp	58271
82	02-Nov-10	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		76	AD Fin Clp	66678

**Appendix B-3.** Coded-wire tag (CWT) recoveries in the winter Area 9 mark-selective Chinook fishery, November 1-30, 2010 and January 16 - April 15, 2011.

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
9	06-Nov-10	210787	2007	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		74	40020	AD Fin Clp
9	14-Nov-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		72	66682	AD Fin Clp
9	19-Jan-11	210822	2008	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	634796	55	58272	AD Fin Clp
9	05-Feb-11	210777	2007	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		77	66686	AD Fin Clp
9	20-Feb-11	634281	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	634282	65	60147	AD Fin Clp
9	07-Mar-11	210840	2008	WHITEHORSE SPRINGS	WHITEHORSE POND	STIL		56	66687	AD Fin Clp
9	19-Mar-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		68	58273	AD Fin Clp

**Appendix B-4.** Coded-wire tag (CWT) recoveries in the winter Area 10 mark-selective Chinook fishery, October 1, 2010 – January 31, 2011.

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
10	31-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	69	40019	AD Fin Clp
10	31-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	69	40019	AD Fin Clp
10	31-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	69	40019	AD Fin Clp
10	31-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	69	40019	AD Fin Clp
10	23-Jan-11	180896	2009	R-Chilliwack R	H-Chilliwack River H	CDFO	180898, 180895	25	54786	AD Fin Clp
10	29-Jan-11	634296	2007	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		69	54787	AD Fin Clp
10	21-Nov-10	634299	2007	LAKWOOD HATCHERY	LAKWOOD HATCHERY	WDFW		61	54955	AD Fin Clp
10	21-Nov-10	634299	2007	LAKWOOD HATCHERY	LAKWOOD HATCHERY	WDFW		61	54955	AD Fin Clp
10	19-Jan-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	70	56787	AD Fin Clp
10	30-Oct-10	633967	2006	GREEN R 09.0001		WDFW		75	58270	AD Fin Clp
10	31-Oct-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67	66510	AD Fin Clp
10	31-Oct-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67	66510	AD Fin Clp
10	31-Oct-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		63	66511	AD Fin Clp
10	31-Oct-10	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		63	66511	AD Fin Clp
10	11-Dec-10	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	65	67058	AD Fin Clp
10	26-Dec-10	634395	2008	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW		56	67059	AD Fin Clp

**Appendix B-5.** Coded-wire tag (CWT) recoveries in the winter Area 11 mark-selective Chinook fishery, February 1 – April 30, 2011.

Area	Recov. Date	Tag Code	BY	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recov. Mark
11	26-Feb-11	634864	2008	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	634865	58	56803	AD Fin Clp
11	13-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		76	62707	AD Fin Clp

**Appendix B-6.** Coded-wire tag (CWT) recoveries in the winter Area 12 mark-selective Chinook fishery, February 1 – April 30, 2011.

Area	Recov. Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Rel. Agency	DIT codes	FKL (cm)	Label	Mark
12	01-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		57	42227	AD Fin Clp
12	20-Feb-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		55	42228	AD Fin Clp
12	30-Apr-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		53	42229	AD Fin Clp
12	06-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		76	56802	AD Fin Clp
12	18-Feb-11	634271	2007	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634270	67	56976	AD Fin Clp
12	06-Mar-11	210788	2007	CLEAR CR 11.0013C	CLEAR CREEK HATCHERY	NISQ	634277	74	56977	AD Fin Clp
12	06-Mar-11	634867	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		57	56978	AD Fin Clp
12	07-Mar-11	634283	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		73	56979	AD Fin Clp
12	18-Mar-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		56	56980	AD Fin Clp
12	27-Mar-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		59	56981	AD Fin Clp
12	02-Apr-11	634384	2007	JOHN CR 16.0253	RFEG 6 HOOD CANAL	WDFW		70	56982	AD Fin Clp
12	05-Mar-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		54	60104	AD Fin Clp
12	06-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67	60145	AD Fin Clp
12	02-Feb-11	634297	2007	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		74	61577	AD Fin Clp
12	02-Feb-11	634873	2008	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	634872	54	61578	AD Fin Clp
12	29-Apr-11	634781	2008	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		58	63508	AD Fin Clp