2015 Summer Mark-Selective Recreational Chinook Fisheries In Marine Areas 5, 6, 9, 11, 12 and 13

Post-season Report

DRAFT

January 28, 2016

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INTRODUCTION

In the marine environments of the Strait of Juan de Fuca and Puget Sound, abundant runs of hatchery Chinook salmon (*Oncorhynchus tshawytscha*) have been mixed with depressed runs of wild Chinook salmon. 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[1].

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 in multiple Puget Sound Marine Catch Areas during both the summer and winter seasons. As of the close of the summer 2015 fishing season, *summer* Chinook MSFs have occurred in Areas 5 and 6 for thirteen consecutive seasons, in Areas 9, 11, and 13 for nine consecutive seasons and in Area 12 for four consecutive seasons. Additionally, *winter* Chinook MSFs have occurred in Areas 8-1 and 8-2 for ten consecutive seasons, in Areas 7, and 9 for eight consecutive seasons, in Areas 11 and 12 for six consecutive seasons, in Area 6 for three seasons and in Area 5 for its first season[2].

During the 2015 summer season (May through September), WDFW implemented six mark-selective Chinook fisheries in Areas 5, 6, 9, 11, 12 and 13. The Chinook MSF seasons in each area were scheduled as follows:

- Areas 5 and 6 from July 1 through August 15, 2015;
- Areas 9 from July 16 through August 15, 2015;
- Area 11 from June 1 through September 30, 2015;
- Area 12 from July 1 through September 30, 2015; and
- Area 13 from May 1 through September 30, 2015.

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

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[1]The regulations specific to summer mark-selective fisheries in Puget Sound Marine Catch Areas allowed for the retention of up to two legal-sized (≥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.

[2] For information regarding effort, harvest and impacts estimates related to these fisheries, see the references listed at the end of this report, or visit: http://wdfw.wa.gov/publications/search.php?Cat=Fishing / Shellfishing&SubCat=Selective Fishing.

Comprehensive Sampling and Monitoring Program

WDFW's Puget Sound Sampling Unit (PSSU) was tasked with implementing a comprehensive sampling and monitoring program in Areas 5, 6, 9, 11, 12 and 13 to collect the data needed to evaluate each Chinook MSF and its impact on unmarked salmon. Through state-tribal agreement (WDFW and NWIFC 2015), 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 MSFs:

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[3]
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 fisheries, including descriptors of fishing effort, fishing success (catch [landed Chinook] per unit effort), the length 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 Chinook MSF post-season reports. NWIFC and tribal representatives had initiated the idea for such a meeting, considering that 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.

WDFW and tribal staffs worked to prioritize the most essential elements (tables, figures and appendices) needed in WDFW's annual post-season MSF 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 winter 2009-10 Chinook MSF post-season report and continuing thereafter.

[3] 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.

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 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 2012a) for detailed descriptions of the diverse study designs and protocols used to monitor and evaluate the Chinook MSFs in Areas 5, 6, 9, 11, 12 and 13 during summer 2015.

In the following pages, we report the results generated through our monitoring activities during the summer 2015 Chinook MSFs. 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 needed to specify noteworthy in-season adjustments or other circumstances unique to the particular season). We present summer 2015 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; i*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 (based on Fishery Regulation Assessment Model [FRAM] predictions); *v*) sample rate information based on dockside sampling of harvested Chinook; *vi*) total mortality estimates of marked and unmarked DIT CWT stocks by hatchery and brood year; and *vii*) historical Chinook encounters estimates for each area's summer mark-selective Chinook fishery.

RESULTS

1) Marine Area 5 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a thirteenth consecutive summer Chinook MSF in Marine Area 5 from July 1 through August 15, 2015. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 5 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 and intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. During the summer 2015 mark-selective Chinook fishery in Area 5 we maintained our enhanced VTR program in an effort to improve the return rate of voluntary trip reports, which provide estimates of Chinook encounter rates by size class (legal or sublegal) and mark status (ad-marked or unmarked). An additional WDFW technician was hired to work exclusively on distributing and collecting VTRs from the angling public in Area 5. This technician, along with the dockside samplers, also educated anglers about the VTR program and salmon species identification in a focused effort to increase the sample size of VTR-based encounter data. **Table 1.1** 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 2012a). In this section we present results from our monitoring activities during the Area 5 summer Chinook MSF.

Table 1.1 Sampling/estimation details on target parameters associated with the overall Area 5 summer 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[1]	Catch rates (CPUE); length, age, and CWT composition of harvest[1]; 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.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site "size measures") versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	2 weekend boat surveys and 1 weekday survey were conducted during the 2015 Area 5 summer Chinook MSF. As in-season observations suggested that sites and effort patterns did not change substantially in 2015 compared to past years, we incorporated data from these surveys into recent average site weights to compute catch and effort estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	We used VTR data to estimate the size/mark-status proportions (LM = 14%, LU = 21%, SM = 41%, SU = 24%; **Table 1.5**) needed to produce encounter and mortality estimates.
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.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 1.2 Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2015 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (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	
July	27	1-Jul	6-Jul	701	1,716	619	11	1,949	2,081	4,659
	28	7-Jul	13-Jul	1,376	3,388	811	0	2,556	2,743	6,110
	29	14-Jul	20-Jul	1,236	3,048	430	5	1355	1,449	3,238
	30	21-Jul	27-Jul	1,393	3,381	694	5	2185	2340	5,224
	31	28-Jul	3-Aug	1,551	3,233	1154	5	3637	3898	8,694
August	32	4-Aug	10-Aug	1,284	3,040	615	5	1936	2073	4,629
	33	11-Aug	15-Aug	1,439	3,506	428	22	1347	1424	3,220
Season Total:				**8,980**	**21,313**	**4,750**	**52**	**14,964**	**16,008**	**35,774**
Variance:				717,905	4,058,037	532,742	313	11,235,495	6,312,640	51,061,154
SE:				847	2014	730	18	3,352	2,512	7,146
CV (%):				9	9	15	34	22	16	20
95% CI:				7,319 - 10,641	17,364 - 25,261	3,320 - 6,181	18 - 87	8,394 - 21,534	11,083 - 20,932	21,769 - 49,780

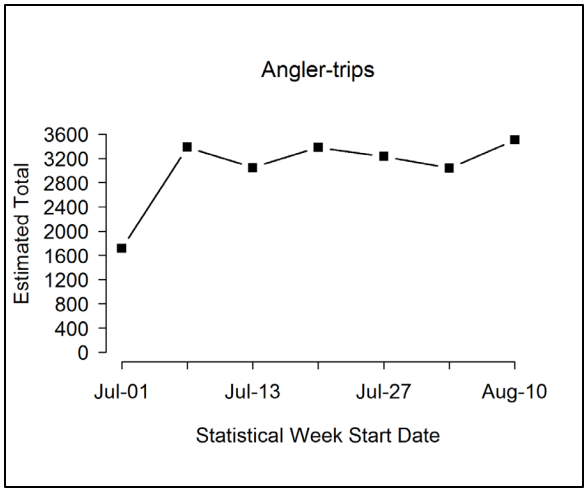

Figure 1.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 5.

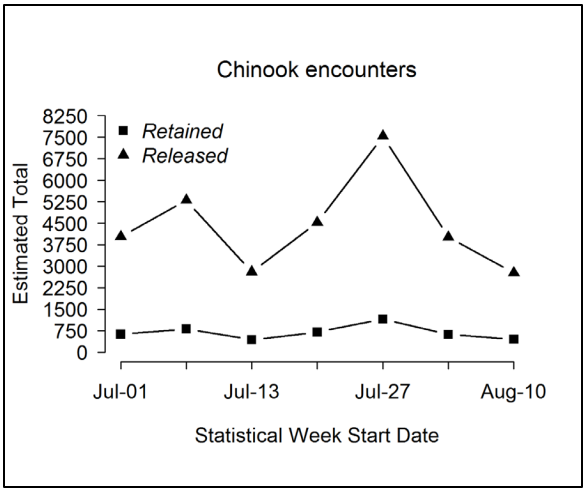

Figure 1.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 5.

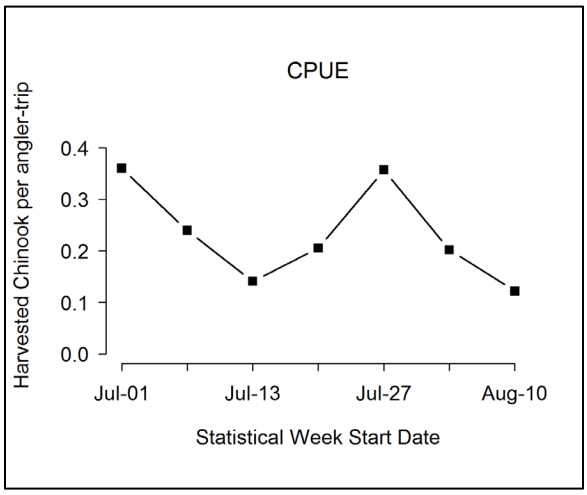

Figure 1.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 5.

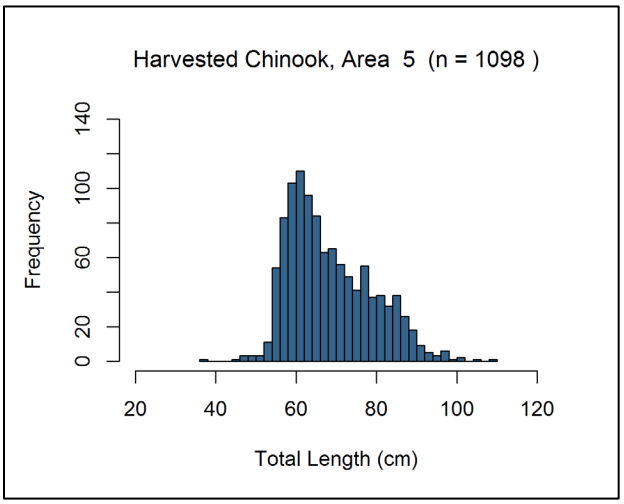

Figure 1.4 Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 5.

Table 1.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 5.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1,025	73	1,098
Unmarked	6	3	9
Total	**1,031**	**76**	**1,107**

Table 1.4 Summary of coded-wire tags recovered from Chinook salmon harvested during the 2015 summer Chinook MSF in Marine Area 5. 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
B.C.	Fraser R – Thompson River (9.5%)	R-Shuswap R Low	H-Shuswap River, Middle,	2 (2.1%)	0
	Fraser R – Thompson River (9.5%)	R-Chilliwack R	H-Chilliwack River H	3 (3.2%)	1
	Fraser R – Thompson River (9.5%)	R-Harrison R	H-Chehalis River H	2 (2.1%)	0
	Fraser Rr – Thompson River (9.5%)	R-Shuswap R Middle	H-Shuswap River, Middle,	2 (2.1%)	0
	Georgia Strait (2.1%)	R-Puntledge R	H-Puntledge River H	2 (2.1%)	0
WA	N Washington (4.2%)	East Sound Bay (San)	Glenwood Springs	4 (4.2%)	0
	N Washington Coast (7.4%)	Sol Duc R 20.0096	Lonesome Cr Hatchery	1 (1.1%)	0
	N Washington Coast (7.4%)	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	6 (6.3%)	0
	Strait of Juan De Fuca (9.5%)	Hoko R 19.0148	Hoko Falls Hatchery	7 (7.4%)	0
	Strait of Juan De Fuca (9.5%)	Elwha R 18.0272	Elwha Hatchery	2 (2.1%)	0
	Hood Canal (4.2%)	Finch Cr 16.0222	Hoodsport Hatchery	2 (2.1%)	0
	Hood Canal (4.2%)	Purdy Cr 16.0005	George Adams Hatchry	2 (2.1%)	2
	N Puget Sound (4.2%)	Wallace R 07.0940	Wallace R Hatchery	3 (3.2%)	3
	N Puget Sound (4.2%)	Whitehorse Springs	Whitehorse Pond	1 (1.1%)	0
	Skagit River (2.1%)	County Line Cr3.2363	Marblemount Hatchery	2 (2.1%)	0
	Mid Puget Sound (8.4%)	Grovers Cr Hatchery	Grovers Cr Hatchery	3 (3.2%)	3
	Mid Puget Sound (8.4%)	Grovers Cr 15.0299	Grovers Cr Hatchery	2 (2.1%)	2
	Mid Puget Sound (8.4%)	Big Soos Cr 09.0072	Soos Creek Hatchery	2 (2.1%)	1
	Mid Puget Sound (8.4%)	White R 10.0031	White River Hatchery	1 (1.1%)	0
	S Puget Sound (5.3%)	Minter Cr 15.0048	Minter Cr Hatchery	1 (1.1%)	0
	S Puget Sound (5.3%)	Minter Cr 15.0048	Hupp Springs Rearing	1 (1.1%)	0
	S Puget Sound (5.3%)	Clear Cr 11.0013C	Clear Creek Hatchery	2 (2.1%)	2
	S Puget Sound (5.3%)	Kalama Cr 11.0017	Kalama Cr Hatchery	1 (1.1%)	0
	Willapa Bay (1.1%)	Naselle R 24.0543	Naselle Hatchery	1 (1.1%)	0
Col Riv	Upper Columbia R (5.3%)	Col R @ Rm 369.9	Ringold Springs Hatchery	1 (1.1%)	0
	Upper Columbia R (5.3%)	Wenatchee R 45.0030	Dryden Pond	1 (1.1%)	0
	Upper Columbia R (5.3%)	Chelan R 47.0052	Chelan Falls Hatchery	2 (2.1%)	0
	Upper Columbia R (5.3%)	Columbia Near Wells	Wells Hatchery	1 (1.1%)	0
	Central Columbia River (7.4%)	Ltl White Salmon@Nfh	Ltl White Salmon Nfh	2 (2.1%)	0
	Central Columbia River (7.4%)	Klickitat Hatchery	Klickitat Hatchery	1 (1.1%)	0
	Central Columbia River (7.4%)	Spring Cr 29.0159	Spring Cr Nfh	4 (4.2%)	4
	Lower Columbia River (12.6%)	Big Cr (Lwr Col R)	Big Cr Hatchery	5 (5.3%)	5
	Lower Columbia River (12.6%)	Santiam R & N Fk-1	Marion Forks Hatch	1 (1.1%)	0
	Lower Columbia River (12.6%)	Cowlitz R 26.0002	Cowlitz Salmon Hatch	3 (3.2%)	0
	Lower Columbia River (12.6%)	Willamette R M Fk-1	Willamette Hatchery	1 (1.1%)	0
	Lower Columbia River (12.6%)	Santiam R S Fk	Willamette Hatchery	1 (1.1%)	0
	Lower Columbia River (12.6%)	Fallert Cr 27.0017	Fallert Cr Hatchery	1 (1.1%)	0
	Snake River (7.4%)	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	2 (2.1%)	0
	Snake River (7.4%)	Snake R@Pitt. Lndg	Lyons Ferry Hatchery	1 (1.1%)	0
	Snake River (7.4%)	Luke'S Gulch A F	Npt Hatchery	1 (1.1%)	0
	Snake River (7.4%)	Magrudor Corridor	Npt Hatchery	2 (2.1%)	0
	Snake River (7.4%)	Snake L.Mon-Ltl Goos	Lyons Ferry Hatchery	1 (1.1%)	0
OR	Southern Oregon Coast (1.1%)	Elk R	Elk R Hatchery	1 (1.1%)	0
CA	Central California Coast (7.4%)	San Pablo Bay Net Pens	Feather R Hatchery	4 (4.2%)	0
	Central California Coast (7.4%)	Half Moon Bay Johnson Pr	Feather R Hatchery	2 (2.1%)	0
	Central California Coast (7.4%)	Fort Baker Barge Release	Feather R Hatchery	1 (1.1%)	0
	San Joaquin River (1.1%)	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	1 (1.1%)	0
			Total	**95**	**23**

Table 1.5 Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2015 summer Chinook MSF in Marine Area 5, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (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		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	**71 1-trip VTRs, 162 Angler Trips**	**53**	**79**	**152**	**88**	**372**	**0.55**	**0.40**
Test fishery size/mark-status composition:		0.14	0.21	0.41	0.24			
Variance:		(0.0003)	(0.0004)	(0.0006)	(0.0005)			

As no test fishery was conducted in the Area 5 summer mark-selective fishery, we focused our efforts on increasing the return rate of VTRs and thus, the sample size of fish encountered by recreational fishers. This year we received 71 VTRs, accounting for 162 angler trips during the 1.5 month fishery. We used these data to estimate the size/mark-status proportions needed to produce Chinook encounter and mortality estimates for the Area 5 summer Chinook MSF.

Table 1.6 Summary of season-wide fishery impact estimates for the 2015 summer Chinook MSF in Marine Area 5. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	5,097	4,434	663	99	4,534	508,404	713	3,136 - 5,931	16
Legal UM	7,597	35	7,562	1134	1169	64,489	254	672 - 1,667	22
Sublegal AD	14,617	316	14,302	2860	3,176	376,756	614	1,973 - 4,379	19
Sublegal UM	8,463	17	8,445	1,689	1,707	138,328	372	978 - 2,435	22
Total	**35,774**	**4,802**	**30,972**	**5,783**	**10,586**	**1,087,977**	**1043**	**8,541 - 12,630**	**10**

Table 1.7 Comparison of modeled (FRAM model run 2115) and estimated total Chinook encounters for the 2015 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	9,436	6,001	3,435	60
	AD	14,937	7,362	7,575	6,405
	Total	24,373	13,363	11,010	6,465
	% Marked	61	55	69	99
Estimated (Creel) Encounters	UM	16,060	7,597	8,463	52
	AD	19,714	5,097	14,617	4,750
	Total	35,774	12,694	23,080	4,802
	% Marked	55	40	63	99

Table 1.8 Comparison of modeled (FRAM model run 2115) and estimated total Chinook mortalities for the 2015 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	1,641	8,384	10,025	2,876	7,710	10,586
Released Legal	894	464	1,358	1,134	99	1,234
Released Sublegal	687	1,515	2,202	1,689	2860	4,549
Landed Only	60	6,405	6,465	52	4,750	4,802

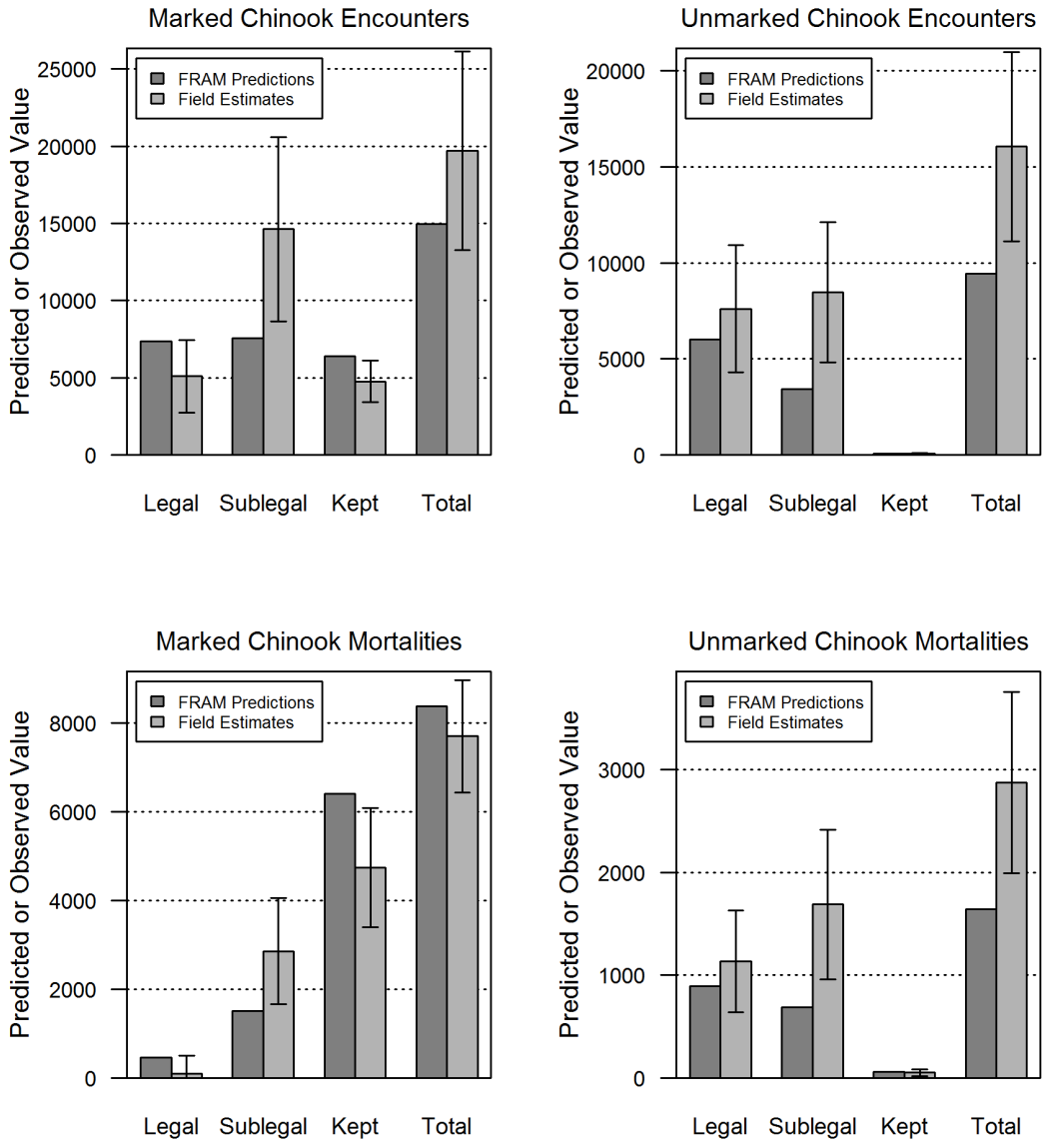

Figure 1.5 Comparison of modeled (using FRAM, model run 2115) and estimated total Chinook encounters and mortalities for the 2015 summer Chinook MSF in Marine Area 5. Error bars represent approximate 95% confidence intervals for field estimates.

Table 1.9 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 2015 summer Chinook MSF in Marine Area 5. AD = marked (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.)
Big Cr Hatchery	2011	1	4.3	14.48	1.5	0.1	0.016	0.13
Big Cr Hatchery	2012	4	17.4	57.93	19.1	1.9	0.705	1.68
Clear Creek Hatchery	2011	1	4.3	14.48	4.4	0.4	0.146	0.38
Clear Creek Hatchery	2012	1	4.3	14.48	4.5	0.5	0.157	0.4
George Adams Hatchry	2012	2	8.7	28.96	8.8	0.9	0.295	0.77
Grovers Cr Hatchery	2011	3	13	43.45	12.9	1.3	0.428	1.13
Grovers Cr Hatchery	2012	1	4.3	14.48	4.3	0.4	0.143	0.38
Grovers Cr Hatchery	2013	1	0	0	4.3	4.3	14.482	3.81
H-Chilliwack River H	2011	1	4.3	14.48	2.2	0.2	0.037	0.19
Soos Creek Hatchery	2012	1	4.3	14.48	4.6	0.5	0.165	0.41
Spring Cr Nfh	2012	4	17.4	57.93	18.9	1.9	0.688	1.66
Wallace R Hatchery	2012	3	13	43.45	13	1.3	0.436	1.14
Total		**23**	**95.4**	**318.6**	**98.6**	**13.8**	**17.698**	**12.07**

Table 1.10 Monthly sample rates (Total retained Chinook sampled[1] / Estimated retained Chinook) for the 2015 summer Chinook MSF in Marine Area 5. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
July	27 - 31	01 Jul - 02 Aug	3,708	26	3,733	837	5	842	22.6%
August	32 - 33	03 Aug - 15 Aug	1,042	27	1,069	261	4	265	24.8%
Season Total			**4,750**	**52**	**4,802**	**1,098**	**9**	**1,107**	**23.1%**

[1/] Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the 2015 summer Chinook MSF in Marine Area 5 (creel estimates and fish sampled as part of baseline sampling).

Table 1.11 Fishery-total estimates of retained and released salmon (*other than Chinook*) for the 2015 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Start Date	End Date	Retained Salmon				Released Salmon					
			Coho AD	Coho UM	Pink	Sockeye	Coho AD	Coho UM	Coho UK	Pink	Steelhead	Unk Salmon
27	1-Jul	6-Jul	112	3	948	0	84	167	59	518	3	665
28	7-Jul	13-Jul	353	5	3715	23	53	417	110	1904	5	649
29	14-Jul	20-Jul	698	15	3143	0	22	887	81	1277	0	237
30	21-Jul	27-Jul	428	5	4137	0	5	473	40	1645	0	1053
31	28-Jul	3-Aug	1150	25	1897	0	27	1163	0	230	0	1628
32	4-Aug	10-Aug	1643	7	2450	0	70	1559	0	234	0	912
33	11-Aug	15-Aug	3203	50	2606	0	43	4649	39	1205	0	1958
Season Total:			**7,588**	**109**	**18,897**	**23**	**303**	**9,314**	**329**	**7,014**	**8**	**7,102**
Variance:			1,200,634	1,160	3,063,479	207	11,026	1,708,469	10,424	657,441	54	1,355,021
Standard Error:			1096	34	1750	14	105	1,307	102	811	7	1164
CV (%):			14	31	9	61	35	14	31	12	93	16
95% CI:			5,440 - 9,735	42 - 176	15,467 - 22,328	0 - 52	97 - 509	6,752 - 11,876	129 - 529	5,424 - 8,603	0 - 22	4,820 - 9,383

Table 1.12 Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2015 summer Chinook MSF in Marine Area 5. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
Coho Resort	0	0.000	16	0.033
Curley's/Straitside	**5**	0.054	**27**	0.055
Neah Bay Marina	0	0.000	2	0.004
Olson's East	**28**	0.301	**169**	0.343
Olson's Ramp & Docks	**0**	0.000	**89**	0.181
Olson's West	**31**	0.333	**8**	0.016
Olsons's South	2	0.022	20	0.041
Silver King	0	0.000	20	0.041
Van Riper's North	**11**	0.118	**53**	0.108
Van Riper's South	**16**	0.172	**88**	0.179
Total Anglers	**93**	**1**	**492**	**1**

Two weekend boat surveys were conducted during the 2015 Area 5 summer mark-selective Chinook fishery. Results from these surveys indicated that sites and effort patterns did not change substantially in 2015 compared to past years. Data from these surveys were included with the average of the previous years' site weights to determine site selections and to compute catch and effort estimates. Sites in the summer 2015 sample frame remained the same and included: Olson's East Docks, Olson's West Docks, Olson's Ramp & Docks, Van Riper's North, Van Riper's South and Curley's Resort.

Table 1.13 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 5 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jul 5 - Aug 3, 2003	19,398	2,251	53	225	0	336	3,435	1,656	5,174	13,131
Jul 1 - Aug 10, 2004	25,174	2,706	0	194	0	404	4,017	1,167	2,462	10,950
Jul 1 - Aug 10, 2005	30,115	1,520	23	100	26	227	1,418	1,210	1,459	5,984
Jul 1 - Aug 14, 18-21, 2006	23,177	3,105	10	196	7	464	3,125	1,010	2,212	10,129
Jul 1 - Aug 9, 2007	18,830	2,969	23	280	94	444	2,509	1,371	1,118	8,808
Jul 1 - Aug 10, 2008	13,004	2,773	0	45	0	414	1,869	65	330	5,496
Jul 1 - Aug 6, 2009	23,662	4,843	78	1,115	362	724	6,210	9,823	14,309	37,463
Jul 1 - Aug 15, 2010	16,806	5,461	14	242	0	816	4,961	3,163	4,140	18,796
Jul 1 - Aug 15, 2011	24,848	4,259	70	276	22	636	9,275	1,593	5,319	21,450
Jul 1 - Aug 15, 2012	21,074	5,437	9	242	9	812	4,617	3,105	4,765	18,996
Jul 1 - Aug 15, 2013	25,725	7,473	77	933	81	1,117	7,188	8,173	8,702	33,743
Jul 1 - Aug 15, 2014	23,310	4,684	41	401	8	700	3,005	3,707	7,359	19,905
Jul 1 - Aug 15, 2015	21,313	4,434	35	316	17	663	7,562	14,302	8,445	35,774

2) Marine Area 6 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a thirteenth consecutive summer Chinook MSF in Marine Area 6 from July 1 through August 15, 2015. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. We maintained our enhanced VTR program in an effort to improve the return rate of voluntary trip reports, which provide estimates of Chinook encounter rates by size class (legal or sublegal) and mark status (ad-marked or unmarked). An additional WDFW technician was hired to work exclusively on distributing and collecting VTRs from the angling public in Area 6. This technician, along with the dockside samplers, also educated anglers about the VTR program and salmon species identification in a focused effort to increase the sample size of VTR-based encounter data.

Unlike the other survey designs, Baseline Sampling does not provide a means for generating in-season or immediate post-season estimates of fishery total catch and effort. These estimates will be available approximately one year after the close of the fishery through the WDFW Catch Record Card (CRC) program. Once available, CRC-based catch estimates will be used to generate estimates of total Chinook encounters and mortalities by size and mark-status using the methods provided in WDFW & NWIFC (2013). Thus, while these descriptors of MSF impacts are not presented in the present document, they will be available at a future time.

Table 2.1 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 2012a). In this section we present results from our monitoring activities during the Area 6 summer Chinook MSF, including relative catch and effort patterns over the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

Table 2.1 Sampling/estimation details on target parameters associated with the overall Area 6 summer mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest[1]; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the 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	When CRC-based retained Chinook estimates become available VTR data will be used in the estimation of total Chinook encounters by size/mark group (LM = 43%, LU = 15%, SM = 23%, SU = 19%; **Table 2.5**), along with associated impacts, using the methods described in WDFW & NWIFC (2013).
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	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 2.2 Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2015 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark status.

Month	Stat Week	Effort		Retained Fish							Released Fish							
		Boats	Anglers	Chinook		Coho		Pink	Sockeye	Steelhead	Chinook			Coho			Pink	Unknown Salmon
				AD	UM	AD	UM				AD	UM	UK	AD	UM	UK		
July	27	251	512	544	5	1	0	46	0	1	128	249	212	1	4	6	61	34
	28	248	533	102	0	0	0	429	0	0	50	100	45	0	6	0	569	0
	29	243	513	64	0	0	0	878	2	0	51	96	128	0	16	5	1384	22
	30	154	329	41	0	1	0	420	0	0	58	57	62	0	19	0	670	2
	31	218	457	121	1	3	0	747	0	0	108	98	142	3	36	3	672	297
August	32	232	491	63	2	16	2	789	0	0	40	111	79	3	18	2	708	34
	33	148	300	22	0	13	1	562	0	0	9	39	15	3	23	4	427	1
Season Total:		**1,494**	**3,135**	**957**	**8**	**34**	**3**	**3871**	**2**	**1**	**444**	**750**	**683**	**10**	**122**	**20**	**4491**	**390**

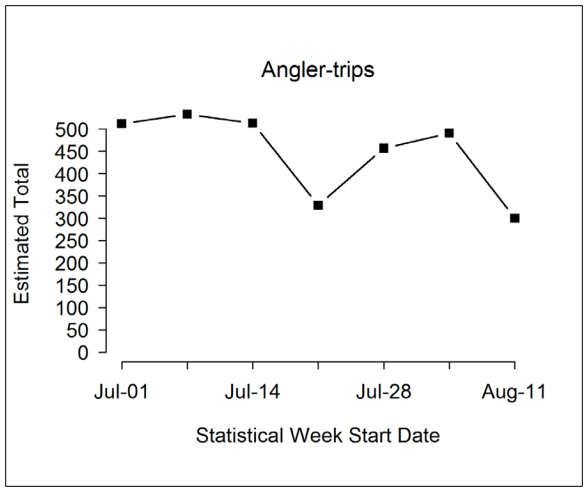

Figure 2.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

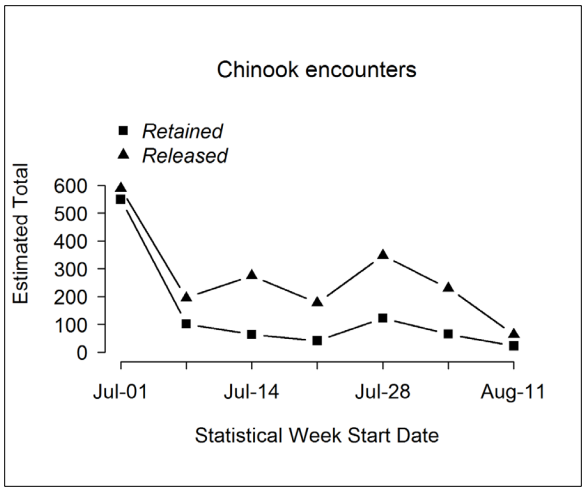

Figure 2.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

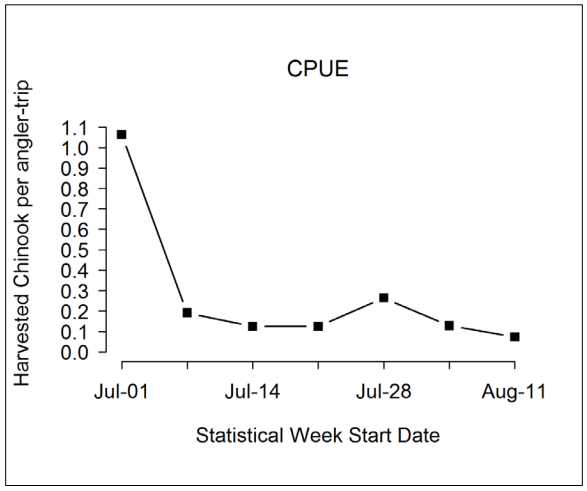

Figure 2.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

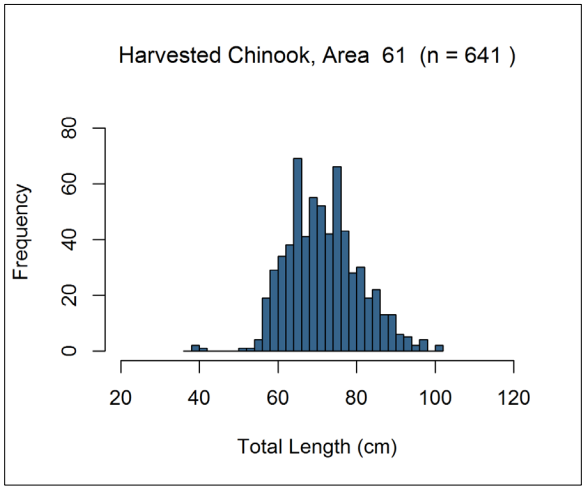

Figure 2.4 Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 6.

Table 2.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 6.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	633	8	641
Unmarked	5	1	6
Total	**638**	**9**	**647**

Table 2.4 Summary of coded-wire tags recovered from Chinook salmon harvested during the 2015 summer Chinook MSF in Marine Area 6. 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
BC	Fraser R – Thompson River (5.9%)	R-Shuswap R Low	H-Shuswap River, Middle	2 (3.9%)	0
	Fraser R – Thompson River (5.9%)	R-Chilliwack R	H-Chilliwack River H	1 (2%)	0
	W Vancouver Island (2%)	R-Robertson Cr	H-Robertson Creek H	1 (2%)	0
	Georgia Strait (2%)	R-Cowichan R	H-Cowichan River H	1 (2%)	0
WA	N Washington (17.6%)	Friday Cr 03.0017	Samish Hatchery	4 (7.8%)	4
	N Washington (17.6%)	East Sound Bay (San)	Glenwood Springs	4 (7.8%)	0
	N Washington (17.6%)	Kendall Cr 01.0406	Kendall Cr Hatchery	1 (2%)	0
	Strait Of Juan De Fuca (5.9%)	Elwha R 18.0272	Elwha Hatchery	3 (5.9%)	0
	Hood Canal (11.8%)	Finch Cr 16.0222	Hoodsport Hatchery	3 (5.9%)	0
	Hood Canal (11.8%)	Purdy Cr 16.0005	George Adams Hatchry	3 (5.9%)	3
	N Puget Sound (7.8%)	May Cr 07.0943	Wallace R Hatchery	2 (3.9%)	2
	N Puget Sound (7.8%)	Whitehorse Springs	Whitehorse Pond	1 (2%)	0
	N Puget Sound (7.8%)	Wallace R 07.0940	Wallace R Hatchery	1 (2%)	1
	Mid Puget Sound (29.4%)	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	2 (3.9%)	0
	Mid Puget Sound (29.4%)	Grovers Cr 15.0299	Grovers Cr Hatchery	4 (7.8%)	4
	Mid Puget Sound (29.4%)	Big Soos Cr 09.0072	Soos Creek Hatchery	3 (5.9%)	0
	Mid Puget Sound (29.4%)	Grovers Cr Hatchery	Grovers Cr Hatchery	5 (9.8%)	5
	Mid Puget Sound (29.4%)	Voight Cr 10.0414	Voights Cr Hatchery	1 (2%)	0
	S Puget Sound (3.9%)	Minter Cr 15.0048	Minter Cr Hatchery	2 (3.9%)	0
Col Riv	Central Columbia River (3.9%)	Spring Cr 29.0159	Spring Cr Nfh	2 (3.9%)	2
	Lower Columbia River (5.9%)	Big Cr (Lwr Col R)	Big Cr Hatchery	1 (2%)	1
	Lower Columbia River (5.9%)	Tanner Cr (Bnville)	Bonneville Hatchery	1 (2%)	0
	Lower Columbia River (5.9%)	Cowlitz R 26.0002	Cowlitz Salmon Hatch	1 (2%)	0
	Snake River (3.9%)	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	2 (3.9%)	0
			Total:	**51**	**22**

Table 2.5 Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2015 summer Chinook MSF in Marine Area 6, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (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		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	127 1-trip VTRs, 280 Angler Trips	218	74	118	96	506	0.66	0.75
VTR size/mark-status composition:		0.43	0.15	0.23	0.19			
Variance:		(0.0005)	(0.0002)	(0.0004)	(0.0003)			

Table 2.6 List of sites sampled with the number of sampling events (site-days) during the 2015 summer Chinook MSF in Marine Area 6.

Location	Site-Days Sampled per Month		Total Site-Days	% of Total
	July (1-31)	August (1-15)		
Freshwater Bay Ramp	3	2	5	9.43%
Ediz Hook Port Angeles Public Ramp	21	12	33	62.26%
Port Angeles West Ramp	8	7	15	28.30%
Grand Total	**32**	**21**	**53**	**100%**

3) Marine Area 9 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a ninth consecutive summer Chinook MSF in Marine Area 9 from July 16 through July 26, 2015. 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 intensive dockside creel sampling, on-the-water effort surveys, test fishing and collection of voluntary trip reports (VTRs) from the angling public. **Table 3.1** 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 2012a). In this section we present results from our monitoring activities during the Area 9 summer Chinook MSF.

Table 3.1 Sampling/estimation details on target parameters associated with the overall Area 9 summer 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[1]; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	One week	Within weeks, estimates were produced by day-type strata (weekday/weekend). Each week we sampled every Friday, Saturday and Sunday, and we randomly selected *n*=2 out of *N*=4 weekdays (Monday-Thursday) for sampling.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site "size measures") versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 4 boat surveys (1 weekday and 3 weekend) were conducted during the two week fishery.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook length, age, and DNA-based[2] stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Given sufficient sample size (n=42) of fish caught in the test fishery, we used the test fishery data only to estimate the size/mark-status proportions (LM = 45%, LU = 26%, SM = 26%, SU = 2%; **Table 3.5**) needed to produce encounter and mortality estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	The size/mark-status proportions of VTR data (LM = 65%, LU = 11%, SM = 20%, SU = 4%; **Table 3.6**) were not significantly different than those of the test fishery data. However, VTR data were not used in impact estimation due to the assumed higher data quality and sufficient sample sizes of the test fishery data.
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.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

[2] Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

Table 3.2 Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2015 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Month	Stat Week	Start Date	End Date	Estimated Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Jul	29	16-Jul	19-Jul	3,291	7,250	1343	9	1058	952	3,362
	30	20-Jul	26-Jul	3,266	6,868	969	11	763	682	2,424
Season Total:				**6,557**	**14,118**	**2,312**	**20**	**1,821**	**1,633**	**5,786**
Variance:				111,739	644,717	21,799	20	677,047	248,780	1,125,815
Standard Error:				334	803	148	5	823	499	1061
CV (%):				5	6	6	23	45	31	18
95% CI:				5,902 - 7,212	12,544 - 15,692	2,022 - 2,601	11 - 29	208 - 3,434	656 - 2,611	3,706 - 7,866

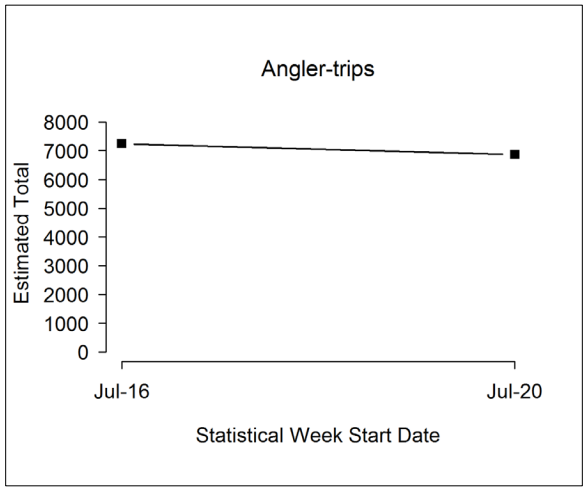

Figure 3.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 9.

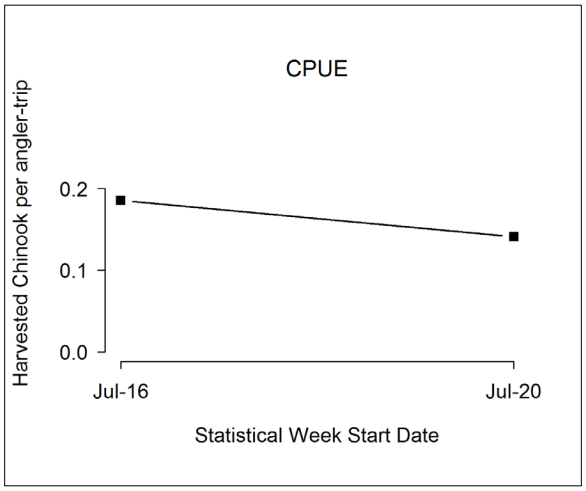

Figure 3.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 9.

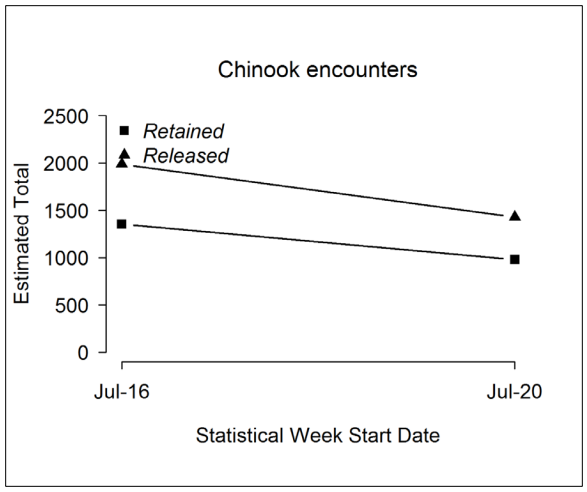

Figure 3.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 9.

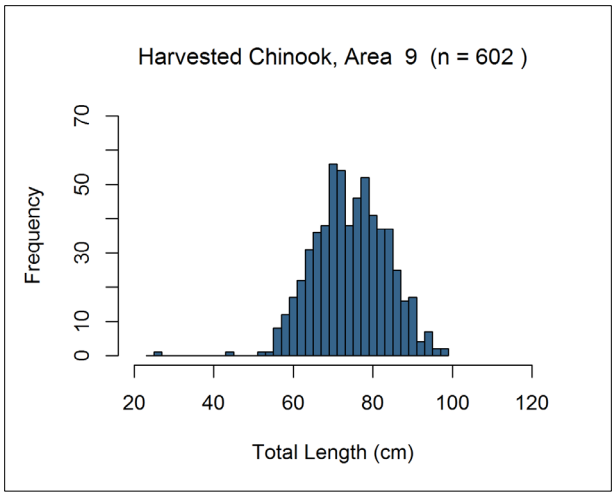

Figure 3.4 Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 9.

Table 3.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 9.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	593	9	602
Unmarked	4	2	6
Total	**597**	**11**	**608**

Table 3.4 Summary of coded-wire tags recovered from Chinook salmon harvested during the 2015 summer Chinook MSF in Marine Area 9. 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	CWTs Recovered	Number DITs
BC	Fraser R– Thompson River (7.7%)	R-Chilliwack R	H-Chilliwack River H	1 (7.7%)	1
	Georgia Strait (7.7%)	R-Cowichan R	H-Cowichan River H	1 (7.7%)	0
WA	Hood Canal (23.1%)	Purdy Cr 16.0005	George Adams Hatchry	1 (7.7%)	1
	Hood Canal (23.1%)	Finch Cr 16.0222	Hoodsport Hatchery	2 (15.4%)	0
	Skagit River (15.4%)	County Line Cr3.2363	Marblemount Hatchery	1 (7.7%)	0
	Skagit River (15.4%)	Cascade R 03.1411	Marblemount Hatchery	1 (7.7%)	1
	Mid Puget Sound (38.5%)	Palmer Hatchery	Keta Creek Complex	1 (7.7%)	0
	Mid Puget Sound (38.5%)	Grovers Cr Hatchery	Grovers Cr Hatchery	1 (7.7%)	1
	Mid Puget Sound (38.5%)	Voight Cr 10.0414	Voights Cr Hatchery	1 (7.7%)	0
	Mid Puget Sound (38.5%)	Big Soos Cr 09.0072	Soos Creek Hatchery	2 (15.4%)	0
	S Puget Sound (7.7%)	Clear Cr 11.0013C	Clear Creek Hatchery	1 (7.7%)	1
			Total:	**13**	**5**

Table 3.5 Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the 2015 summer Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. 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	
29	3	38.5	9	3	4	0	16
30	5	49.8	10	8	7	1	26
Total	**8**	**88.3**	**19**	**11**	**11**	**1**	**42**
Size/mark-status composition:			0.45	0.26	0.26	0.02	
Legal size mark rate:			0.63				
Overall mark rate:			0.71				

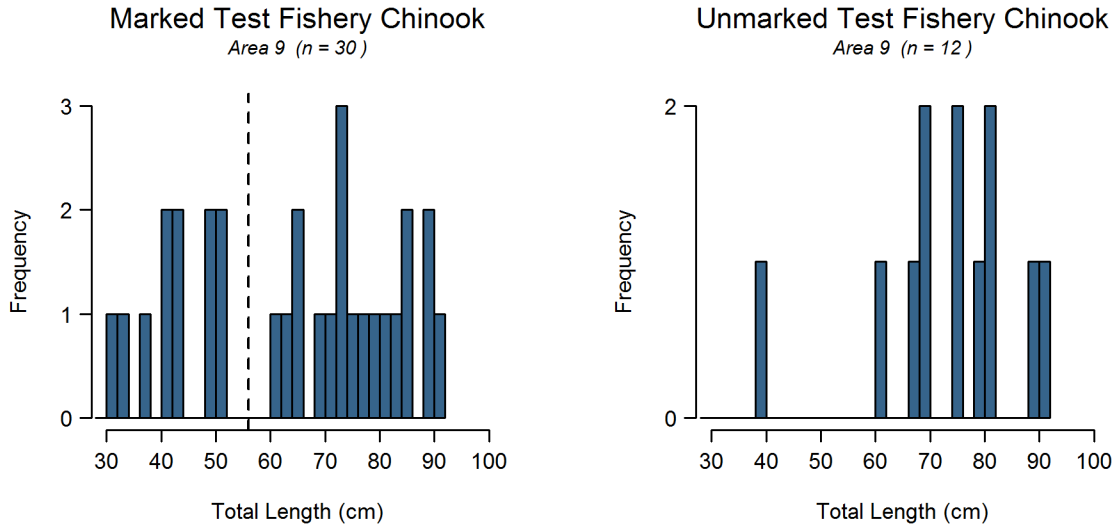

Figure 3.5 Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the 2015 summer Chinook MSF in Marine Area 9. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

Table 3.6 Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs), with estimates of legal-size and overall (legal and sublegal) mark rates during the 2015 summer Chinook MSF in Marine Area 9. AD = marked (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		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	24 1-trip VTRs, 51 Angler Trips	30	5	9	2	46	0.85	0.86
VTR size/mark-status composition:		0.65	0.11	0.20	0.04			
Variance:		(0.0050)	(0.0022)	(0.0035)	(0.0009)			

Size and mark-status proportions were not significantly different between private boat VTR and test fishery data (χ^2=5.08, df=3, p-value=0.166). However, based on sufficient sample size and assumed higher data quality, we used only test fishery data to estimate the size/mark-status proportions needed to produce Chinook encounter and mortality estimates for the Area 9 summer Chinook MSF.

Table 3.7 Summary of season-wide fishery impact estimates for the 2015 summer Chinook MSF in Marine Area 9. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	2,617	2,277	340	51	2,328	31,344	177	1,981 - 2,675	8
Legal UM	1,515	13	1,502	225	238	5,195	72	97 - 380	30
Sublegal AD	1,515	35	1,481	296	331	9,331	97	141 - 520	29
Sublegal UM	138	7	131	26	33	778	28	0 - 87	85
Total	**5,786**	**2,331**	**3,455**	**599**	**2,930**	**46,649**	**216**	**2,507 - 3,354**	**7**

Table 3.8 Comparison of modeled (FRAM model run 2115) and estimated total Chinook encounters for the 2015 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	1,070	529	541	11
	AD	5,199	2,842	2,357	2,472
	Total	6,269	3,371	2,898	2,483
	% Marked	83	84	81	100
Estimated (Creel) Encounters	UM	1653	1515	138	20
	AD	4,133	2,617	1515	2,312
	Total	5,786	4,133	1,653	2,331
	% Marked	71	63	92	99

Table 3.9 Comparison of modeled (FRAM model run 2115) and estimated total Chinook mortalities for the 2015 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	197	3,122	3,319	271	2,659	2,930
Released Legal	78	179	257	225	51	276
Released Sublegal	108	471	579	26	296	322
Landed Only	11	2,472	2,483	20	2,312	2,331

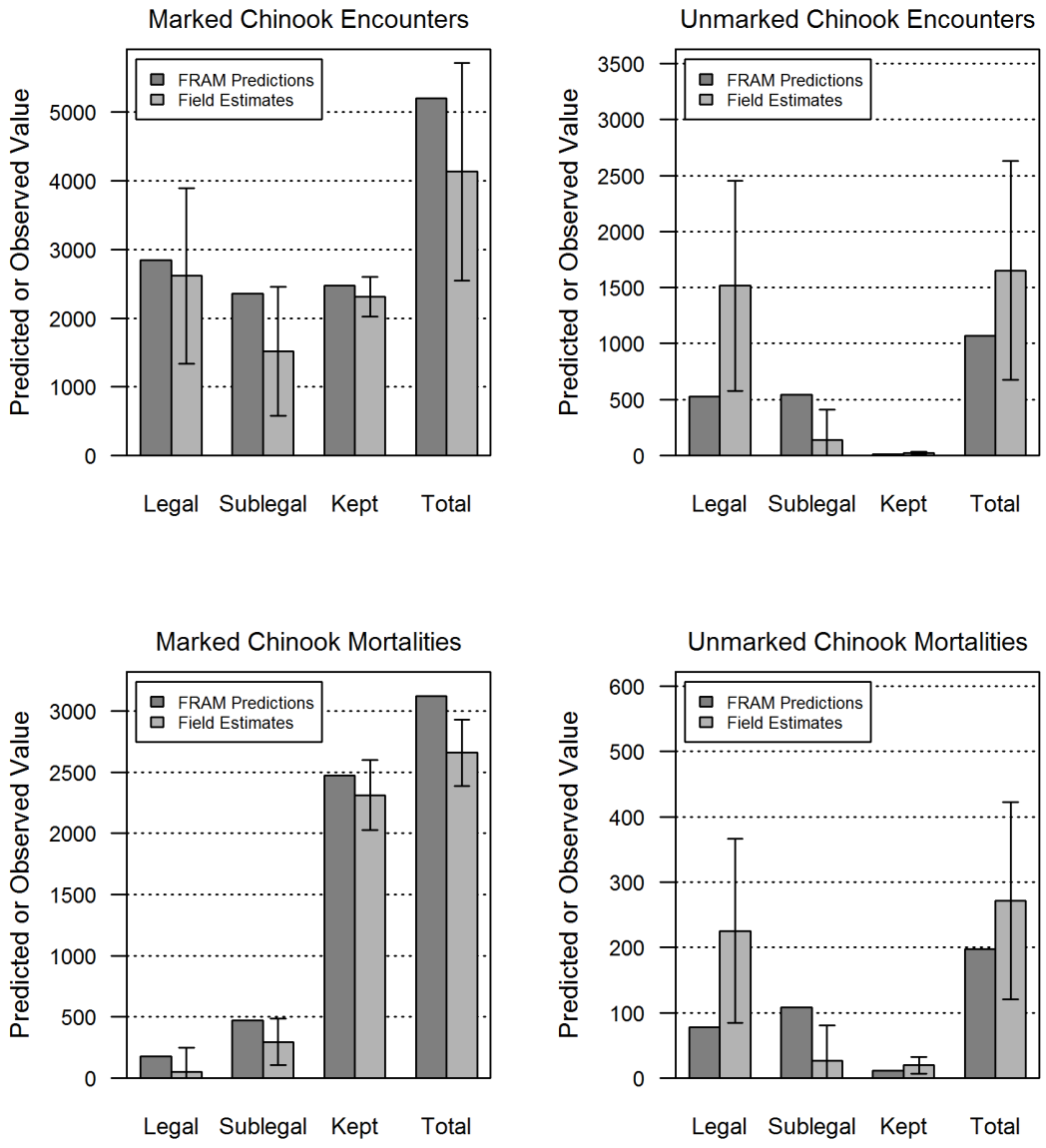

Figure 3.6 Comparison of modeled (using FRAM, model run 2115) and estimated total Chinook encounters and mortalities for the 2015 summer Chinook MSF in Marine Area 9. Error bars represent approximate 95% confidence intervals for field estimates.

Table 3.10 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 2015 summer Chinook MSF in Marine Area 9. AD = marked (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	2011	1	3.8	10.54	3.8	0.4	0.106	0.33
George Adams Hatchry	2011	1	3.8	10.54	3.8	0.4	0.107	0.33
Grovers Cr Hatchery	2011	1	3.8	10.54	3.8	0.4	0.104	0.32
H-Chilliwack River H	2011	1	3.8	10.54	1.9	0.2	0.027	0.16
Marblemount Hatchery	2013	1	3.8	10.54	3.8	0.4	0.106	0.33
Total		**5**	**18.9**	**52.7**	**17.1**	**1.7**	**0.45**	**1.46**

Table 3.11 Monthly sample rates (Total retained Chinook sampled[1] / Estimated retained Chinook) in the 2015 summer Chinook MSF in Marine Area 9.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
July	29 - 30	16 Jul – 26 Jul	2,312	20	2,331	602	6	608	26.1%
Season Total			**2,312**	**20**	**2,331**	**602**	**6**	**608**	**26.1%**

[1/] Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the summer 2015 Area 9 Chinook MSF (creel estimates and the fish sampled as part of baseline sampling).

Table 3.12 Fishery-total estimates of retained and released salmon (*other than Chinook*) in the 2015 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status.

Week	Start Date	End Date	Retained Salmon				Released Salmon				
			Coho AD	Coho UM	Chum	Pink	Coho AD	Coho UM	Coho UK	Pink	Unk Salmon
29	16-Jul	20-Jul	26	29	0	1,193	8	15	86	338	444
30	21-Jul	26-Jul	111	79	3	2,128	81	71	35	473	644
Season Total:			**138**	**108**	**3**	**3321**	**89**	**85**	**121**	**811**	**1,088**
Variance:			990	452	2	95,436	443	414	315	14,305	36,452
Standard Error:			31	21	2	309	21	20	18	120	191
CV (%):			23	20	54	9	24	24	15	15	18
95% CI:			76 - 199	66 - 150	0 - 6	2,715 - 3,926	48 - 131	46 - 125	86 - 156	576 - 1,045	714 - 1,462

Table 3.13 Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2015 summer Chinook MSF in Marine Area 9. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
Armeni Public Ramp	0	0.000	1	0.001
Bayside Marina/Drystack	4	0.020	3	0.004
Bridge Haven - Private	0	0.000	2	0.002
Brownsville Marina/Dock/Ramp	0	0.000	1	0.001
Bush Point Ramp	0	0.000	6	0.007
Bush Point Ramp and Beach	0	0.000	2	0.002
Camano Island State Park Public Ramp	0	0.000	7	0.008
Coronet Bay Public Ramp	0	0.000	3	0.004
Coupeville Public Ramp	0	0.000	4	0.005
Dagmar's Landing, Forklift Launch	3	0.015	7	0.008
Driftwood Key Marina	10	0.051	14	0.017
Eagle Harbor Waterfront Park	0	0.000	3	0.004
Edmonds Boat Basin (Public Sling)	8	0.041	43	0.052
Edmonds Dry Storage (Boat Loft (Priv. fork lift))	**10**	**0.051**	**35**	**0.042**
Edmonds Marina	21	0.107	82	0.099
Eglon Public Ramp	2	0.010	10	0.012
Elliott Bay Marina	0	0.000	4	0.005
Everett Marina	4	0.020	50	0.060
Everett Ramp (formerly Norton Street Ramp (2010)	**33**	**0.168**	**168**	**0.203**
Fort Casey Public Ramp (Keystone)	**13**	**0.066**	**54**	**0.065**
Fort Flagler Ramps-Marrowstone Is	0	0.000	6	0.007
Fort Worden Ramp	5	0.026	23	0.028
Hadlock Public Ramp	2	0.010	14	0.017
Kingston Public Ramp	**11**	**0.056**	**40**	**0.048**
Lagoon PT Moorage	6	0.031	5	0.006
Marrowstone Beach	1	0.005	0	0.000
Mats Mats Bay Ramp	0	0.000	2	0.002
Mukilteo Lighthouse Park (State Park Public Ramp)	**4**	**0.020**	**38**	**0.046**
Mutiny Bay Public Ramp	2	0.010	2	0.002
Mutiny Bay Resort	2	0.010	0	0.000
Oak Bay Ramp	0	0.000	3	0.004
Point Hudson Marina	0	0.000	3	0.004
Port Gamble	0	0.000	2	0.002
Port Ludlow Marina/Beach Launch	1	0.005	5	0.006
Port Townsend Boat Haven (Docks)	3	0.015	23	0.028
Port Townsend Boat Haven Ramp	**18**	**0.092**	**68**	**0.082**
Possession Waterfront Beach Park	4	0.020	5	0.006
Private	12	0.061	28	0.034
Salmon Club Ramp	2	0.010	3	0.004
Salsbury County Park Ramp	1	0.005	21	0.025
Shilshole Marina	6	0.031	12	0.014
Shilshole Public Ramp	5	0.026	26	0.031
Utsalady Ramp, Camano Is	3	0.015	0	0.000
Total Anglers	**196**	**1**	**828**	**1**

Table 3.14 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 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jul 16 - Jul 31, 2007	18,160	5,094	13	146	20	711	1,111	1,286	317	8,697
Jul 16 - Aug 15, 2008	20,399	4,035	3	10	0	597	1,608	3,212	3,826	13,290
Jul 16 - Aug 31, 2009	42,219	3,090	20	139	0	462	1,272	8,256	2,905	16,143
Jul 16 - Aug 31, 2010	31,200	5,282	33	10	6	740	2,125	750	249	9,194
Jul 16 - Aug 31, 2011	37,862	2,285	19	78	6	339	1,142	2,150	1,070	7,090
Jul 16 - Aug 19, 2012	24,886	6,972	12	101	2	1,039	2,351	5,168	4,721	20,366
Jul 16 - Aug 4, 2013	20,501	4,667	18	39	0	697	1,174	1,750	397	8,742
Jul 16 - Aug 15, 2014	23,113	2,865	6	4	0	428	668	745	299	5,015
Jul 16 - Jul 26, 2015	14,118	2,277	13	35	7	340	1,502	1,481	131	5,786

4) Marine Area 11 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a ninth consecutive summer Chinook MSF in Marine Area 11 from June 1 through September 30, 2015. 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 and collection of voluntary trip reports (VTRs) from the angling public. **Table 4.1** 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 2012a). In this section we present results from our monitoring activities during the Area 11 summer Chinook MSF.

Table 4.1 Sampling/estimation details on target parameters associated with the overall Area 11 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[1]; 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.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site "size measures") versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 2 weekday and 8 weekend boat surveys were conducted during the four month fishery.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	We used VTR data to estimate the size/mark-status proportions (LM = 25%, LU = 12%, SM = 39%, SU = 24%; **Table 4.5**) needed to produce encounter and mortality estimates.
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.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 4.2 Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2015 summer Chinook MSF in Marine Area 11. Values may not add exactly due to rounding error. AD = marked (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	
Jun	23	1-Jun	7-Jun	877	1,579	43	0	78	68	189
	24	8-Jun	14-Jun	990	1,648	57	0	103	90	249
	25	15-Jun	21-Jun	391	633	27	0	49	43	119
	26	22-Jun	28-Jun	622	1,031	32	0	57	50	139
Jul	27	29-Jun	5-Jul	1,026	1,906	27	0	49	43	119
	28	6-Jul	12-Jul	1,015	1,762	57	0	104	90	251
	29	13-Jul	19-Jul	1,126	2,237	23	3	42	34	103
	30	20-Jul	26-Jul	1,139	2,271	61	7	112	90	270
	31	27-Jul	2-Aug	2,456	5,062	191	0	348	303	843
Aug	32	3-Aug	9-Aug	2,242	4,300	219	0	398	347	964
	33	10-Aug	16-Aug	1,980	3,980	149	0	271	236	655
	34	17-Aug	23-Aug	2,621	5,431	151	0	274	239	665
	35	24-Aug	30-Aug	1,087	2,033	176	0	321	280	778
Sept	36	31-Aug	6-Sep	1,429	2,675	207	3	376	324	910
	37	7-Sep	13-Sep	755	1,422	30	0	54	47	132
	38	14-Sep	20-Sep	703	1,315	30	0	55	48	134
	39	21-Sep	27-Sep	685	1279	6	0	10	9	25
	40	28-Sep	30-Sep	161	294	3	0	5	5	13
Season Total:				**21,306**	**40,858**	**1,488**	**14**	**2,707**	**2,347**	**6,556**
Variance:				1,128,238	4,683,800	57,208	50	375,647	121,021	1,349,166
SE:				1,062	2,164	239	7	613	348	1162
CV (%):				5	5	16	51	23	15	18
95% CI:				19,224 - 23,388	36,616 - 45,100	1,019 - 1,957	0 - 28	1,506 - 3,909	1,665 - 3,029	4,279 - 8,833

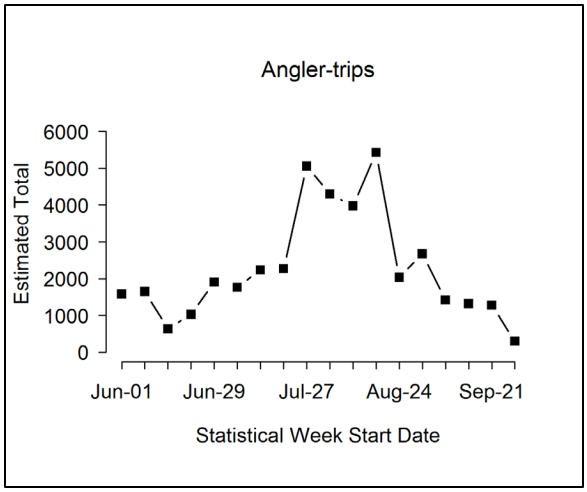

Figure 4.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 11.

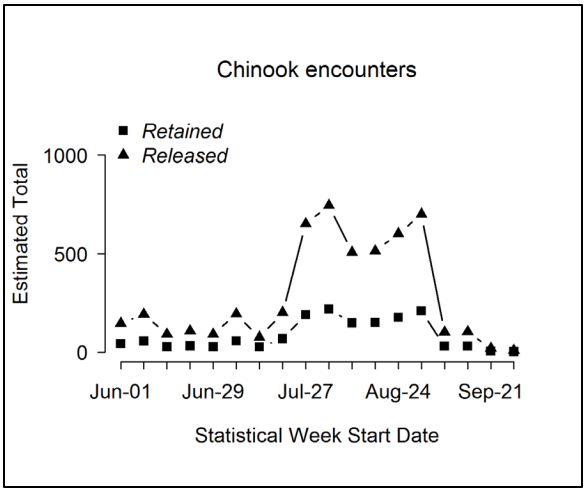

Figure 4.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 11.

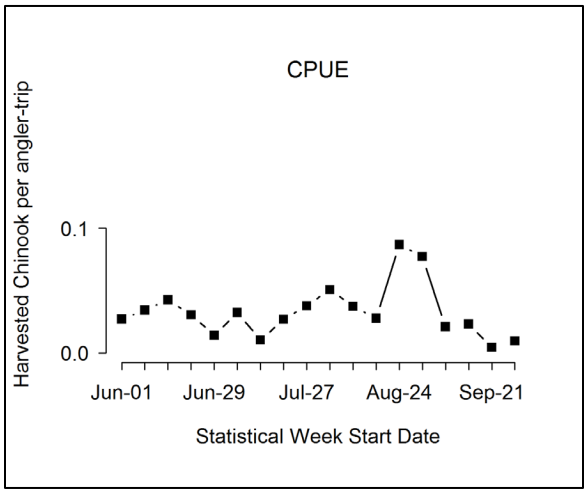

Figure 4.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 11.

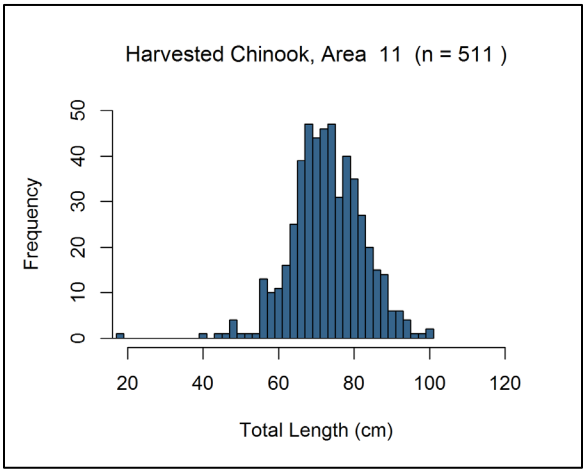

Figure 4.4 Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 11.

Table 4.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 11.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	497	14	511
Unmarked	3	1	4
Total	**500**	**15**	**515**

Table 4.4 Summary of coded-wire tags recovered from Chinook salmon harvested during the 2015 summer Chinook MSF in Marine Area 11. 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
BC	Fraser R – Thompson River (5.3%)	R-Chilliwack R	H-Chilliwack River H	1 (5.3%)	0
WA	Hood Canal (5.3%)	Purdy Cr 16.0005	George Adams Hatchry	1 (5.3%)	1
	Mid Puget Sound (31.6%)	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	1 (5.3%)	0
	Mid Puget Sound (31.6%)	Voight Cr 10.0414	Voights Cr Hatchery	4 (21.1%)	0
	Mid Puget Sound (31.6%)	Icy Cr 09.0125	Icy Cr Hatchery	1 (5.3%)	0
	Southern Puget Sound (52.6%)	Clear Cr 11.0013C	Clear Creek Hatchery	1 (5.3%)	1
	S Puget Sound (52.6%)	Chambers Cr 12.0007	Garrison Hatchery	1 (5.3%)	0
	S Puget Sound (52.6%)	Minter Cr 15.0048	Minter Cr Hatchery	5 (26.3%)	0
	S Puget Sound (52.6%)	Kalama Cr 11.0017	Kalama Cr Hatchery	2 (10.5%)	0
	S Puget Sound (52.6%)	Minter Cr 15.0048	Hupp Springs Rearing	1 (5.3%)	0
Col Riv	Central Columbia River (5.3%)	Spring Cr 29.0159	Spring Cr Nfh	1 (5.3%)	1
			Total	**19**	**3**

Table 4.5 Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2015 summer Chinook MSF in Marine Area 11, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (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		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	383 1-trip VTRs, 697 Angler Trips	136	62	207	131	536	0.64	0.69
VTR size/mark-status composition:		0.25	0.12	0.39	0.24			
Variance:		(0.0004)	(0.0002)	(0.0004)	(0.0003)			

Table 4.6 Summary of season-wide fishery impact estimates for the 2015 summer Chinook MSF in Marine Area 11. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	1,663	1,447	216	32	1,480	57,735	240	1,009 - 1,951	16
Legal UM	758	10	748	112	123	623	25	74 - 172	20
Sublegal AD	2,532	41	2,491	498	539	8,949	95	354 - 724	18
Sublegal UM	1602	3	1599	320	323	3,811	62	202 - 444	19
Total	**6,556**	**1,502**	**5,054**	**963**	**2,465**	**71,118**	**267**	**1,942 - 2,987**	**11**

Table 4.7 Comparison of modeled (FRAM model run 2115) and estimated total Chinook encounters for the 2015 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	1,117	614	503	18
	AD	5,496	3,547	1,949	3,086
	Total	6,613	4,161	2,452	3,104
	% Marked	83	85	79	99
Estimated (Creel) Encounters	UM	2,361	758	1602	14
	AD	4,195	1,663	2,532	1,488
	Total	6,556	2,422	4,134	1,502
	% Marked	64	69	61	99

Table 4.8 Comparison of modeled (FRAM model run 2115) and estimated total Chinook mortalities for the 2015 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	210	3,699	3,909	446	2,019	2,465
Released Legal	91	223	314	112	32	145
Released Sublegal	101	390	491	320	498	818
Landed Only	18	3,086	3,104	14	1,488	1,502

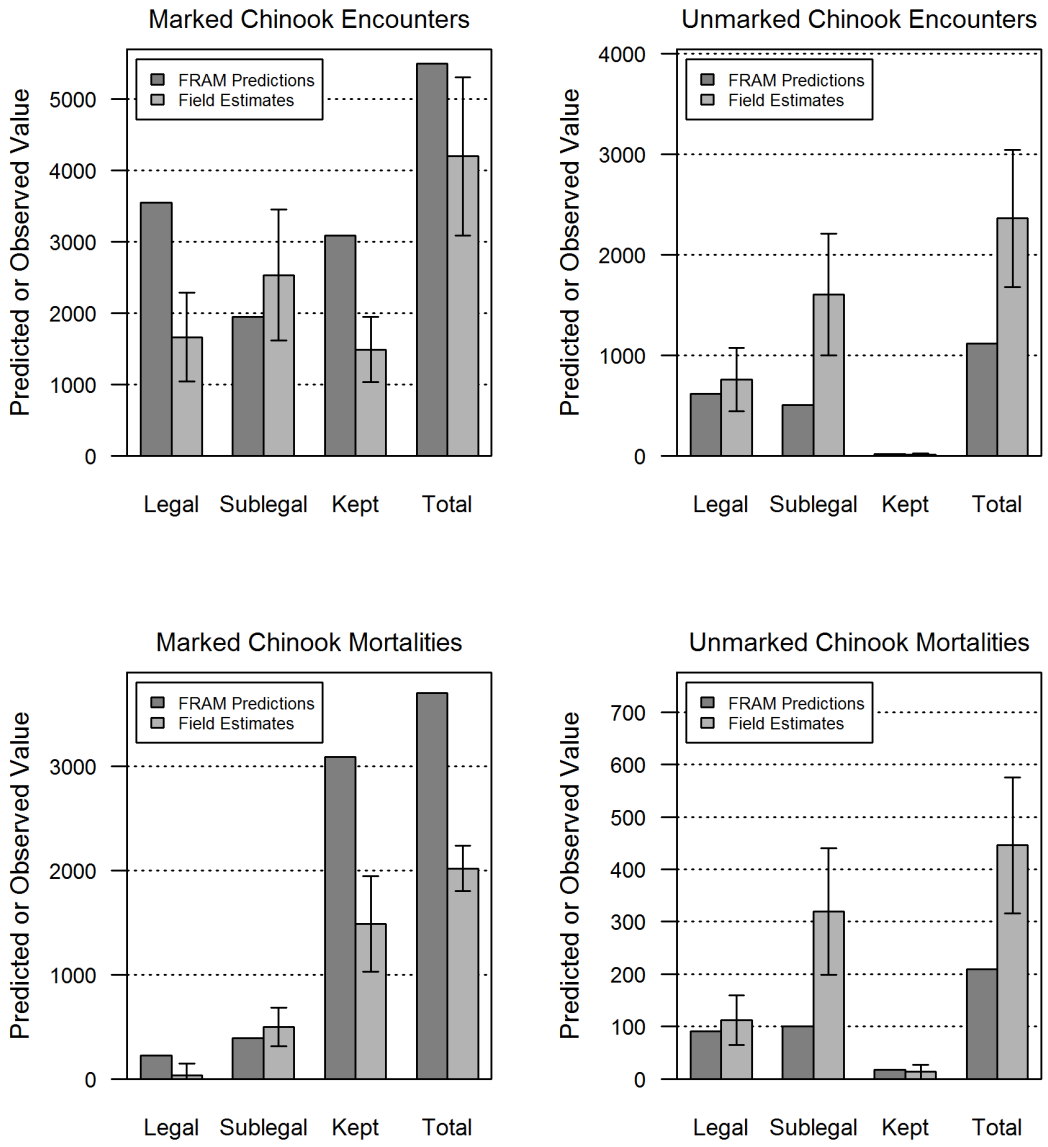

Figure 4.5 Comparison of modeled (FRAM model run 2115) and estimated total Chinook encounters and mortalities for the 2015 summer Chinook MSF in Marine Area 11. Error bars represent approximate 95% confidence intervals for field estimates.

Table 4.9 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 2015 summer Chinook MSF in Marine Area 11. AD = marked (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	2011	1	2.9	5.59	2.9	0.3	0.056	0.24
George Adams Hatchry	2012	1	2.9	5.59	2.9	0.3	0.057	0.24
Spring Cr Nfh	2012	1	2.9	5.59	3.1	0.3	0.064	0.25
Total		**3**	**8.7**	**16.77**	**9**	**0.9**	**0.177**	**0.73**

Table 4.10 Monthly sample rates (Total retained Chinook sampled[1] / Estimated retained Chinook) in the 2015 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
June	23 - 26	1 Jun - 28 Jun	158	0	158	41	0	41	26.00%
July	27 - 31	29 Jun - 2 Aug	360	11	370	107	3	110	29.70%
August	32 - 35	3 Aug - 30 Aug	695	0	695	331	1	332	47.80%
September	36 - 40	31 Aug - 30 Sep	275	3	279	32	0	32	11.50%
Season Total			**1,488**	**14**	**1,502**	**511**	**4**	**515**	**34.30%**

[1/] Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the summer 2015 Area 11 Chinook MSF (creel estimates and the fish sampled as part of baseline sampling).

Table 4.11 Fishery-total estimates of retained and released salmon (other than Chinook) for the 2015 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error.

Stat Week	Start Date	End Date	Retained Salmon			Released Salmon					
			Coho AD	Coho UM	Pink	Coho AD	Coho UM	Coho UK	Pink	Cutthroat Trout	Unknown Salmon
23	1-Jun	7-Jun	0	0	0	0	0	0	0	0	11
24	8-Jun	14-Jun	0	0	0	0	3	0	0	23	10
25	15-Jun	21-Jun	0	0	0	0	0	0	0	0	0
26	22-Jun	28-Jun	3	0	0	0	3	0	0	0	3
27	29-Jun	5-Jul	0	0	0	7	0	7	0	0	29
28	6-Jul	12-Jul	0	0	0	3	7	3	0	0	0
29	13-Jul	19-Jul	3	0	21	0	3	0	20	14	0
30	20-Jul	26-Jul	0	0	186	0	0	20	11	14	14
31	27-Jul	2-Aug	8	0	916	37	20	7	262	13	83
32	3-Aug	9-Aug	0	0	905	31	0	10	421	0	68
33	10-Aug	16-Aug	33	51	1983	4	10	34	710	8	83
34	17-Aug	23-Aug	88	79	3258	0	17	50	1064	96	70
35	24-Aug	30-Aug	121	61	721	0	15	18	1020	0	175
36	31-Aug	6-Sep	199	61	796	10	22	20	639	0	189
37	7-Sep	13-Sep	74	18	47	11	56	31	16	0	204
38	14-Sep	20-Sep	112	40	44	14	60	75	20	0	175
39	21-Sep	27-Sep	119	65	0	62	40	185	14	0	154
40	28-Sep	30-Sep	46	15	0	6	7	9	7	0	75
Season Total:			**805**	**389**	**8,876**	**186**	**263**	**468**	**4,204**	**169**	**1,345**
Variance:			34,166	5,689	1,344,820	1,824	10,372	3,961	1,182,455	5,656	30,814
Standard Error:			185	75	1160	43	102	63	1087	75	176
CV (%):			23	19	13	23	39	13	26	44	13
95% CI:			443 - 1,168	241 - 537	6,603 - 11,149	103 - 270	64 - 463	345 - 592	2,072 - 6,335	22 - 317	1,001 - 1,689

Table 4.12 Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2015 summer Chinook MSF in Marine Area 11. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
Armeni Public Ramp	**19**	**0.074**	**54**	**0.042**
Breakwater Marina (Warters)	0	0.000	17	0.013
Browns Point Ramp	2	0.008	19	0.015
Browns Point Shore	0	0.000	2	0.002
Brownsville Marina/Dock/Ramp	0	0.000	2	0.002
Chambers Bay Beach	1	0.004	0	0.000
Commencement Bay Marina Services	4	0.016	15	0.012
Day Island Marina	3	0.012	16	0.013
Des Moines Marina (Moorage)	25	0.097	123	0.097
Dockton Ramp, Vashon Is	5	0.019	24	0.019
Eagle Harbor Waterfront Park	6	0.023	0	0.000
Edmonds Dry Storage	1	0.004	0	0.000
Elliott Bay Marina	2	0.008	10	0.008
Fox Island Public Ramp	0	0.000	9	0.007
Fox Island Yacht Club	0	0.000	2	0.002
Gig Harbor Marina	**3**	**0.012**	**24**	**0.019**
Gig Harbor Ramp	22	0.086	87	0.068
Harstene Island Ramp	0	0.000	1	0.001
Home Public Ramp	0	0.000	4	0.003
Hylebos Boat Haven	0	0.000	7	0.005
Jensen Point	0	0.000	1	0.001
Luhr Beach Ramp	0	0.000	2	0.002
Manchester Public Ramp	1	0.004	31	0.024
Narrows Marina	2	0.008	16	0.013
Narrows Marina (Private)	3	0.012	6	0.005
Narrows Ramp	2	0.008	0	0.000
Narrows Ramp (Private)	0	0.000	2	0.002
Normandy Beach	0	0.000	2	0.002
Olalla Public Ramp	0	0.000	7	0.005
Point Defiance Boathouse	**40**	**0.156**	**95**	**0.075**
Point Defiance Public Ramp	**69**	**0.268**	**361**	**0.284**
Port Orchard Marina	0	0.000	1	0.001
Private	15	0.058	68	0.053
Redondo Ramp	**16**	**0.062**	**196**	**0.154**
Shilshole Marina	0	0.000	2	0.002
Shilshole Public Ramp	1	0.004	2	0.002
Solo Point	0	0.000	2	0.002
Steilacoom Public Ramp	2	0.008	1	0.001
Tacoma Outboard Association	8	0.031	23	0.018
Tyee Marina/Ramp	4	0.016	30	0.024
Wollochet Bay Public Ramp	1	0.004	9	0.007
Total Anglers	**257**	**1**	**1273**	**1**

Table 4.13 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 11 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jun 1 - Sept 30, 2007	78,958	10,192	74	354	21	1,511	3,015	8,033	2,357	25,558
Jun 1 - Sept 30, 2008	65,728	7,277	18	100	5	1,087	1,999	1,969	248	12,703
Jun 1 - Sept 30, 2009	80,157	3,149	20	117	17	470	1,269	3,820	3,302	12,164
Jun 1 - Sept 30, 2010	54,594	3,883	64	27	0	580	1,105	900	405	6,965
Jun 1 - Sept 30, 2011	69,919	2,559	9	77	12	382	2,120	1,932	1,579	8,670
Jun 1 - Sept 30, 2012	56,065	4,894	57	72	14	731	2,665	2,649	1,157	12,240
Jun 1 - Sept 30, 2013	64,509	3,056	35	55	0	457	1,289	1,214	669	6,774
Jun 1 - Sept 30, 2014	39,426	2,912	20	11	0	435	1,585	2,142	861	7,966
Jun 1 - Sept 30, 2015	40,858	1,447	10	41	3	216	748	2,491	1599	6,556

5) Marine Area 12 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a fourth consecutive summer Chinook MSF in Marine Area 12 from July 1 through September 30, 2015. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with efforts to distribute and collect voluntary trip reports (VTRs) from the angling public.

Unlike the other survey designs, Baseline Sampling does not provide a means for generating in-season or immediate post-season estimates of fishery total catch and effort. These estimates will be available approximately one year after the close of the fishery through the WDFW Catch Record Card (CRC) program. Once available, CRC-based catch estimates will be used to generate estimates of total Chinook encounters and mortalities by size and mark-status using the methods provided in WDFW & NWIFC (2013). Thus, while these descriptors of MSF impacts are not presented in the present document, they will be available at a future time.

Table 5.1 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 2012a). In this section we present results from our monitoring activities during the Area 12 summer Chinook MSF, including relative catch and effort patterns over the course of the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

Table 5.1 Sampling/estimation details on target parameters associated with the overall Area 12 mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest[1]; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the 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	No VTRs were returned for the Area 12 summer Chinook MSF. When CRC-based retained Chinook estimates become available, estimates of total Chinook encounters by size/mark group, along with associated impacts, will likely be estimated using the M1 approach, as outlined in WDFW & NWIFC (2013).
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	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 5.2 Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2015 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark status.

Month	Stat Week	Effort		Retained Fish					Released Fish								
		Boats	Anglers	Chinook		Coho		Pink	Chinook			Coho			Pink	Chum	Cutthroat Trout
				AD	UM	AD	UM		AD	UM	UK	AD	UM	UK			
Jul	27	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	28	10	17	0	0	0	0	1	0	0	0	0	0	0	5	0	0
	29	24	26	0	0	0	0	12	0	0	0	0	0	0	0	0	0
	30	107	107	0	0	0	0	16	0	0	0	1	0	0	6	0	0
	31	51	54	0	0	0	0	6	0	0	0	0	0	2	13	0	0
Aug	32	25	38	1	0	0	1	1	0	0	0	0	0	0	4	0	0
	33	27	41	1	0	0	0	0	0	0	0	0	0	0	2	0	5
	34	33	35	0	0	0	0	0	0	3	1	0	0	0	0	0	0
	35	14	23	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sept	36	13	22	0	0	1	0	0	0	0	0	1	2	0	0	0	4
	37	2	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0
	38	8	8	1	0	0	0	0	0	0	0	0	0	0	0	1	0
	39	4	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	40	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Observed:		**325**	**391**	**3**	**0**	**3**	**1**	**37**	**0**	**5**	**1**	**2**	**4**	**2**	**30**	**1**	**11**

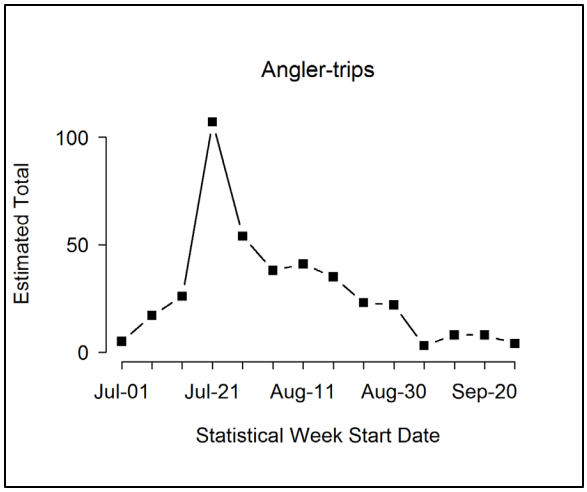

Figure 5.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

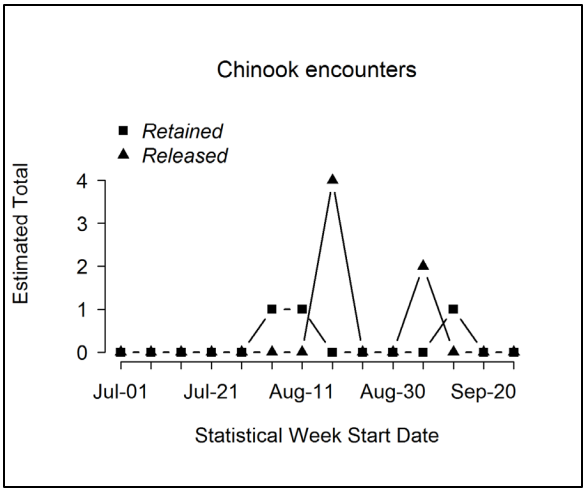

Figure 5.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

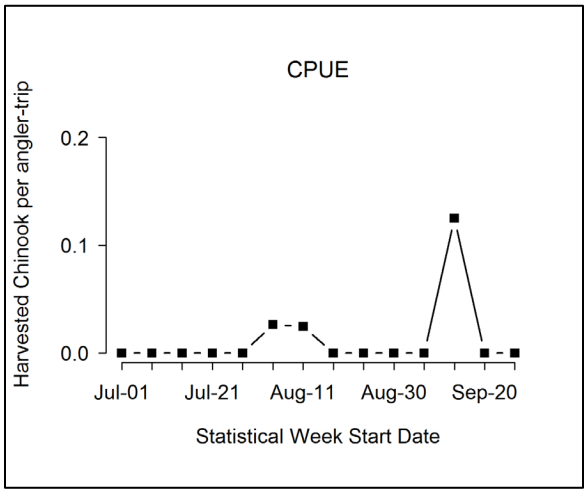

Figure 5.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

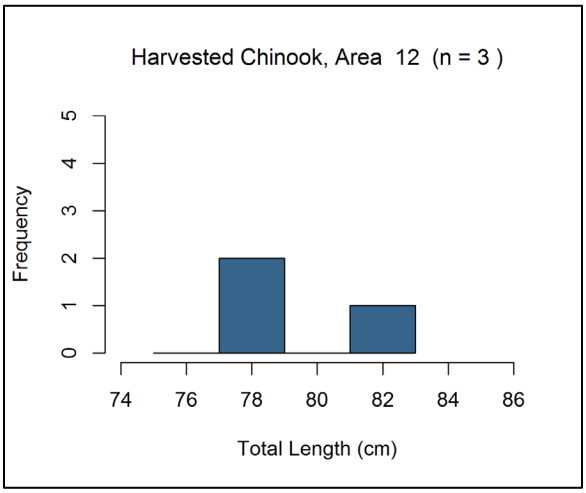

Figure 5.4 Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 12.

Table 5.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 12.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	3	0	3
Unmarked	0	0	0
Total	**3**	**0**	**3**

Table 5.4 List of sites sampled with the number of sampling events (site-days) during the 2015 summer Chinook MSF in Marine Area 12.

Location	Number of Site-Days Sampled per Month			Total Site-Days	% of Total
	Jul	Aug	Sept		
Big Beef Beach	0	0	2	2	3.57%
Hoodsport Shore	11	11	3	25	44.64%
Misery Point Ramp	3	4	4	11	19.64%
Pleasant Harbor Boat Ramp (WDFW)	1	0	0	1	1.79%
Quilcene Bay Ramp	1	4	1	6	10.71%
Skokomish Ramp	2	5	0	7	12.50%
Twanoh State Park	1	0	0	1	1.79%
Union Ramp	0	2	1	3	5.36%
Grand Total	**19**	**26**	**11**	**56**	**100%**

6) Marine Area 13 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a ninth consecutive summer Chinook MSF in Marine Area 13 from May 1 through September 30, 2015. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with efforts to distribute and collect voluntary trip reports (VTRs) from the angling public.

Unlike the other survey designs, Baseline Sampling does not provide a means for generating in-season or immediate post-season estimates of fishery total catch and effort. These estimates will be available approximately one year after the close of the fishery through the WDFW Catch Record Card (CRC) program. Once available, CRC-based catch estimates will be used to generate estimates of total Chinook encounters and mortalities by size and mark-status using the methods provided in WDFW & NWIFC (2013). Thus, while these descriptors of MSF impacts are not presented in the present document, they will be available at a future time.

Table 6.1 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 2012a). In this section we present results from our monitoring activities during the Area 13 summer Chinook MSF, including relative catch and effort patterns over the course of the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

Table 6.1 Sampling/estimation details on target parameters associated with the overall Area 13 mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest[1]; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the 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	When CRC-based retained Chinook estimates become available VTR data may be used in the estimation of total Chinook encounters by size/mark group (LM = 60%, LU = 16%, SM = 20%, SU = 4%; **Table 6.5**), along with associated impacts, using the methods described in WDFW & NWIFC (2013).
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	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

[1] The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 6.2 Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2015 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark status.

Month	Stat Week	Effort		Retained Fish					Released Fish							
		Boats	Anglers	Chinook		Coho		Pink	Chinook			Coho			Cutthroat	Unknown Salmon
				AD	UM	AD	UM		AD	UM	UK	AD	UM	UK		
May	18	2	3	0	0	0	0	0	0	0	0	0	0	0	1	0
	20	7	9	0	0	0	0	0	2	3	0	0	0	0	0	0
	21	3	3	0	0	0	0	0	0	1	0	0	0	0	0	0
	22	9	12	0	0	0	0	0	0	0	1	0	0	0	0	0
Jun	23	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0
	24	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0
	25	6	10	0	0	0	0	0	0	0	0	0	0	0	0	0
	26	25	45	1	0	0	0	0	1	1	0	0	0	0	0	0
Jul	27	14	22	0	0	0	0	0	0	0	0	0	0	0	0	0
	28	22	45	0	0	0	0	0	0	0	1	0	0	0	0	0
	29	10	22	0	0	0	0	0	0	0	0	0	0	1	0	0
	30	38	60	1	0	0	0	1	2	4	5	1	2	4	2	1
	31	21	35	2	0	0	0	0	2	0	2	0	0	0	6	2
Aug	32	101	161	13	0	0	0	6	5	3	4	0	1	0	7	1
	33	80	154	26	1	0	0	0	0	5	1	0	1	0	0	2
	34	155	262	38	0	1	0	3	4	14	5	0	0	0	0	1
	35	129	231	33	1	0	0	13	10	4	6	0	0	1	1	0
Sept	36	149	244	7	0	4	1	14	6	8	4	1	2	0	2	4
	37	81	137	2	0	3	0	17	0	3	0	0	0	0	10	1
	38	51	85	1	0	1	0	6	4	1	0	0	0	1	17	2
	39	40	55	0	0	5	0	0	3	2	0	0	1	3	2	0
	40	13	25	0	0	2	1	0	0	0	0	0	2	0	0	0
Total Observed:		**966**	**1634**	**124**	**2**	**16**	**2**	**60**	**39**	**49**	**29**	**2**	**9**	**10**	**48**	**14**

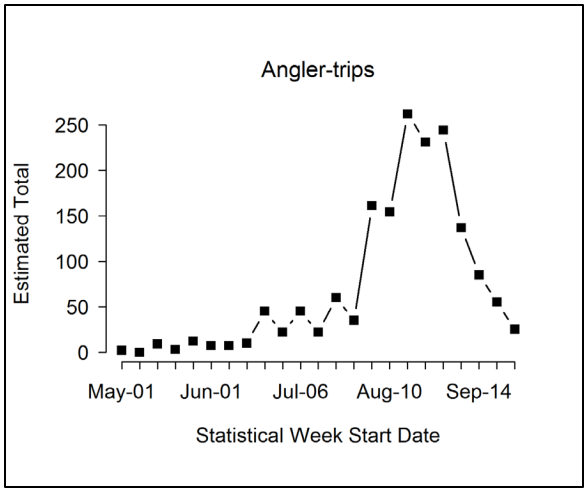

Figure 6.1 Temporal patterns in fishing effort during the 2015 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

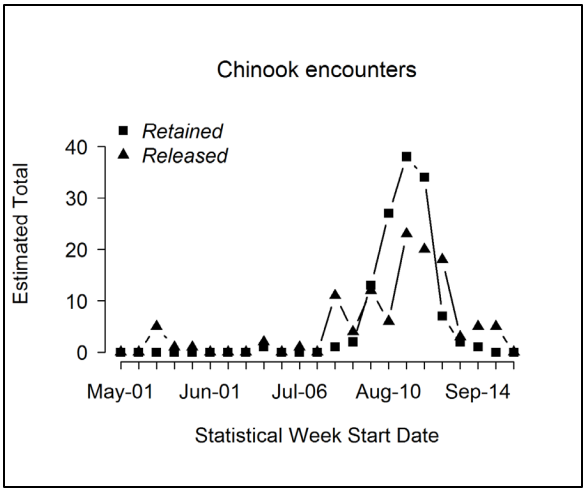

Figure 6.3 Temporal patterns in Chinook encounters (retained and released) during the 2015 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

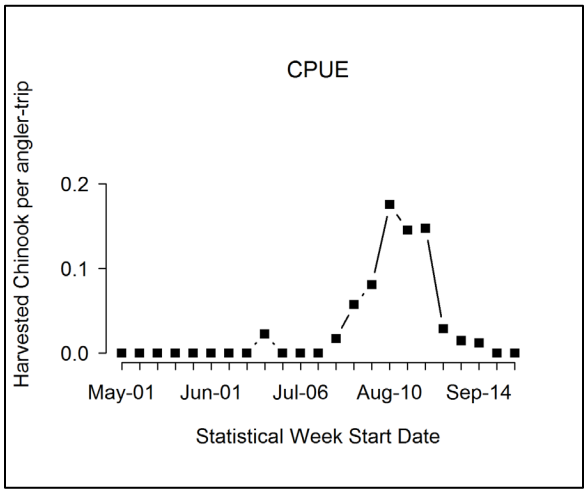

Figure 6.2 Temporal patterns in CPUE (landed Chinook per angler trip) during the 2015 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

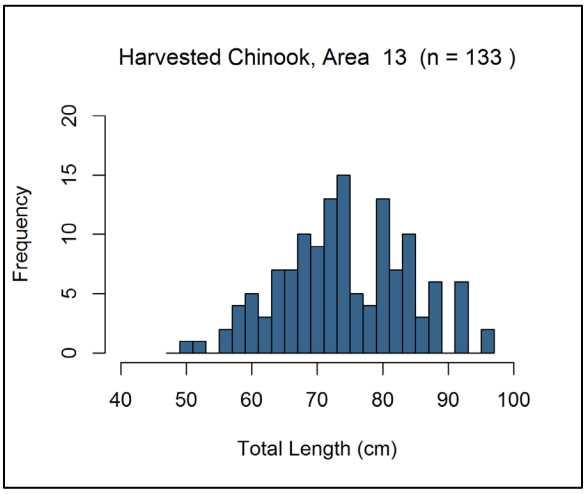

Figure 6.4 Length-frequency distributions of retained marked Chinook sampled in dockside angler interviews during the 2015 summer Chinook MSF in Marine Area 13.

Table 6.3 Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2015 summer Chinook MSF in Marine Area 13.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	131	2	133
Unmarked	2	0	2
Total	**133**	**2**	**135**

Table 6.4 Summary of coded-wire tags recovered from Chinook salmon harvested during the 2015 summer Chinook MSF in Marine Area 13. 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
WA	Hood Canal (50%)	Purdy Cr 16.0005	George Adams Hatchry	1 (50%)	0
	S Puget Sound (50%)	Clear Cr11.0013C	Clear Creek Hatchery	1 (50%)	1
			Total	**2**	**1**

Table 6.5 Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2015 summer Chinook MSF in Marine Area 13, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (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		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	16 1-trip VTRs, 28 Angler Trips	15	4	5	1	25	0.80	0.79
VTR size/mark-status composition:		0.60	0.16	0.20	0.04			
Variance:		(0.0100)	(0.0056)	(0.0067)	(0.0016)			

Table 6.6 List of sites sampled with the number of sampling events (site-days) during the 2015 summer Chinook MSF in Marine Area 13.

Location	Number of Site-Days Sampled per Month					Total Site-Days	% of Total
	May	Jun	Jul	Aug	Sept		
Boston Harbor Ramp/Marina	0	1	4	27	10	42	17.07%
Concrete Dock	0	0	0	1	1	2	0.81%
Day Island Marina	0	1	0	1	0	2	0.81%
Dupont Shore	0	0	0	1	4	5	2.03%
Fox Island Public Ramp	0	1	2	1	0	4	1.63%
Hartstene Is. Ramp	0	1	0	1	3	5	2.03%
Home Public Ramp	0	0	0	2	2	4	1.63%
Horsehead Bay Ramp	0	0	1	0	0	1	0.41%
Lemons Beach	0	0	0	0	4	4	1.63%
Longbranch Public Ramp	0	0	1	1	0	2	0.81%
Luhr Beach Ramp	2	5	6	12	8	33	13.41%
Narrows Marina	5	7	8	6	1	27	10.98%
Narrows Park	0	0	3	6	12	21	8.54%
Narrows Ramp	0	0	1	1	0	2	0.81%
Solo Point	0	2	6	12	14	34	13.82%
Solo Point Shore	0	0	0	3	2	5	2.03%
Steilacoom Public Ramp	0	0	0	1	1	2	0.81%
Swan Town/East Bay Marina/Ramp	0	0	0	4	7	11	4.47%
Wauna Ramp	0	0	0	1	1	2	0.81%
Wollochet Bay Public Ramp	0	0	1	2	3	6	2.44%
Zittels Marina	3	4	6	7	12	32	13.01%
Grand Total	**10**	**22**	**39**	**90**	**85**	**246**	**100%**

ACKNOWLEDGEMENTS

This review of the 2015 summer Chinook MSFs in Areas 5, 6, 9, 11, 12 and 13 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 summer 2015 Chinook MSFs. The PSSU field staff have conducted the dockside creel surveys, test fishery sampling, on-the-water effort 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, Courtney Adkins, April Bosley, Kendra Baird, Casey Green, Stephen Chandler, Joel Teitge, Daniel Bascom, Area 10 test fishers Joe Short and Ben Nelson, and Area 9 test fishers Pete Sergeeff and Toby Black. From the Strait of Juan de Fuca/Peninsula area, we thank Larry Bennett (Peninsula Sampling Supervisor), Connie Konopaski, Ryan Ollerman, Brad Stone, Jaron Sikes, Jamie Hamilton, Paul Wilson, Steve Grace, Brandon Kraynak, Tony Rodriguez, and Lorena McGovern. From North Sound, we thank Steve Axtell (North Sampling Supervisor), Marcus Thompson, Jim Repoz, Dean Toba, Mary Mureau, Lynn Stricker, Patrick Morrison, Nate Layman, Alexandra Gullikson and Heather McKinnon. 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, Bryan Blazer, Katrina Outland, Robert Green, Tom Matthews, Paul Lorenz, Karen Shields, John Rohr, Yale Johnson, Rodrigo Purpon, Lars Swartling and Maria Garcia-Rojas.

At the WDFW Headquarters in Olympia, we thank both Lance Campbell and John Sneva for their scale-reading expertise. We also thank Gil Lensegrav and the CWT Lab staff for their help and expertise in providing decoded CWT data. Erin Dilworth, Brant Boelts and Ellie Heikkila provided substantial help with quality control and flow of data, in addition to personnel logistics and support services for the summer 2015 Chinook MSF sampling projects. Mark Baltzell and Karen Kloempken supervised the sampling unit activities, provided timely in-season creel estimates, scheduled all boat surveys and worked with the WDFW Selective Fisheries Biologist, Jon Carey, to produce post-season analyses and reports. Also, Karen Kloempken managed the WDFW sampling databases and provided finalized post-season data. Are Strom completed "R" programming updates and database development to enable efficient analyses of selective fishery data and produce tables and figures for our post-season selective fishery reports.

Finally, we extend a special thanks to Robert Conrad of Northwest Indian Fisheries Commission (NWIFC) for his dedicated efforts and expertise in working with us to develop and refine mark-selective fishery estimation methods and reports. We also thank NWIFC biometrician Marianna Alexandersdottir for her helpful reviews and valuable guidance regarding sampling design and estimation methods, reporting efficiencies, and new opportunities to plan a collaborative online database that will better enable information sharing. Additionally, we thank tribal technical representatives, particularly Kit Rawson (Tulalip Tribe) and Bob Hayman (Skagit River System Cooperative), for their helpful contributions during our state-tribal collaborative efforts to develop the new, more efficient annual reporting format for selective fisheries.

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APPENDICES

Appendix A.1 Size measures by sample date, for sites sampled during dockside creel surveys in the 2015 summer Chinook MSF in Marine Area 5.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/1/2015	27	Olsons East Docks	0.1794	Van Riper's North	0.1193
7/3/2015	27	Olsons West Docks	0.0994	Olsons Ramp	0.3728
7/5/2015	27	Olsons West Docks	0.0994	Van Riper's South	0.1954
7/7/2015	28	Olsons East Docks	0.1794	Olsons Ramp	0.3008
7/10/2015	28	Olsons Ramp	0.3728	Van Riper's South	0.1954
7/11/2015	28	Olsons East Docks	0.17	Van Riper's North	0.0743
7/13/2015	29	Olsons Ramp	0.2256	Van Riper's South	0.2078
7/17/2015	29	Olsons Ramp	0.3728	Curleys Resort	0.0881
7/18/2015	29	Olsons Ramp	0.3728	Olsons East Docks	0.17
7/22/2015	30	Olsons Ramp	0.2256	Olsons East Docks	0.2197
7/24/2015	30	Van Riper's South	0.1954	Olsons East Docks	0.17
7/26/2015	30	Van Riper's South	0.1954	Olsons East Docks	0.17
7/27/2015	31	Olsons Ramp	0.2256	Olsons West Docks	0.1413
8/1/2015	31	Olsons West Docks	0.1002	Van Riper's South	0.1903
8/2/2015	31	Olsons West Docks	0.1002	Olsons East Docks	0.0945
8/6/2015	32	Olsons East Docks	0.1047	Van Riper's North	0.1724
8/7/2015	32	Olsons East Docks	0.0945	Olsons Ramp	0.4267
8/9/2015	32	Olsons Ramp	0.4267	Van Riper's South	0.1903
8/12/2015	33	Olsons Ramp	0.2408	Van Riper's South	0.1487
8/14/2015	33	Olsons Ramp	0.4267	Van Riper's North	0.1368
8/15/2015	33	Olsons Ramp	0.4267	Olsons East Docks	0.0945

Appendix A.2 Size measures by sample date, for sites sampled during dockside creel surveys in the 2015 summer Chinook MSF in Marine Area 9.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/16/2015	29	Everett Ramp	0.419	Port Townsend Boat Haven Ramp	0.1696
7/17/2015	29	Everett Ramp	0.419	Fort Casey Public Ramp (Keystone)	0.1347
7/18/2015	29	Everett Ramp	0.419	Port Townsend Boat Haven Ramp	0.1696
7/19/2015	29	Everett Ramp	0.419	Fort Casey Public Ramp (Keystone)	0.1347
7/21/2015	30	Everett Ramp	0.3708	Kingston Public Ramp	0.1236
7/22/2015	30	Everett Ramp	0.3708	Port Townsend Boat Haven Ramp	0.2022
7/24/2015	30	Everett Ramp	0.419	Fort Casey Public Ramp (Keystone)	0.1347
7/25/2015	30	Everett Ramp	0.419	Port Townsend Boat Haven Ramp	0.1696
7/26/2015	30	Everett Ramp	0.419	Fort Casey Public Ramp (Keystone)	0.1347

Appendix A.3 Size measures by sample date, for sites sampled during dockside creel surveys in the 2015 summer Chinook MSF in Marine Area 11.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
6/1/2015	23	Point Defiance Public Ramp	0.4299	Point Defiance Boathouse	0.2366
6/6/2015	23	Point Defiance Public Ramp	0.4901	Gig Harbor Ramp	0.1249
6/7/2015	23	Point Defiance Public Ramp	0.4901	Point Defiance Boathouse	0.1764
6/11/2015	24	Point Defiance Public Ramp	0.4299	Gig Harbor Ramp	0.198
6/12/2015	24	Point Defiance Public Ramp	0.4901	Point Defiance Boathouse	0.1764
6/13/2015	24	Point Defiance Public Ramp	0.4901	Point Defiance Boathouse	0.1764
6/17/2015	25	Point Defiance Public Ramp	0.4299	Gig Harbor Ramp	0.198
6/19/2015	25	Point Defiance Public Ramp	0.4901	Gig Harbor Ramp	0.1249
6/20/2015	25	Point Defiance Public Ramp	0.4901	Armeni Public Ramp	0.0856
6/23/2015	26	Point Defiance Public Ramp	0.4299	Point Defiance Boathouse	0.2366
6/27/2015	26	Point Defiance Public Ramp	0.4901	Point Defiance Boathouse	0.1764
6/28/2015	26	Point Defiance Public Ramp	0.4901	Gig Harbor Ramp	0.1249
7/1/2015	27	Point Defiance Public Ramp	0.5359	Gig Harbor Ramp	0.108
7/3/2015	27	Redondo Ramp	0.1359	Point Defiance Public Ramp	0.4818
7/5/2015	27	Point Defiance Public Ramp	0.4818	Gig Harbor Ramp	0.126
7/7/2015	28	Point Defiance Public Ramp	0.5359	Point Defiance Boathouse	0.1417
7/10/2015	28	Point Defiance Public Ramp	0.4818	Point Defiance Boathouse	0.1715
7/11/2015	28	Point Defiance Public Ramp	0.4818	Redondo Ramp	0.1359
7/13/2015	29	Point Defiance Public Ramp	0.5359	Redondo Ramp	0.1318
7/17/2015	29	Point Defiance Public Ramp	0.4818	Redondo Ramp	0.1359
7/18/2015	29	Point Defiance Public Ramp	0.4818	Point Defiance Boathouse	0.1715
7/22/2015	30	Point Defiance Public Ramp	0.5359	Redondo Ramp	0.1318
7/24/2015	30	Point Defiance Public Ramp	0.4818	Point Defiance Boathouse	0.1715
7/26/2015	30	Point Defiance Public Ramp	0.4818	Redondo Ramp	0.1359
7/27/2015	31	Point Defiance Public Ramp	0.5359	Point Defiance Boathouse	0.1417
8/1/2015	31	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/2/2015	31	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/6/2015	32	Point Defiance Public Ramp	0.4262	Gig Harbor Ramp	0.1185
8/7/2015	32	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/9/2015	32	Point Defiance Public Ramp	0.4815	Point Defiance Boathouse	0.1069
8/12/2015	33	Point Defiance Public Ramp	0.4262	Redondo Ramp	0.1931
8/14/2015	33	Point Defiance Public Ramp	0.4815	Gig Harbor Ramp	0.088
8/15/2015	33	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/18/2015	34	Point Defiance Public Ramp	0.4262	Redondo Ramp	0.1931
8/22/2015	34	Point Defiance Public Ramp	0.4815	Gig Harbor Ramp	0.088
8/23/2015	34	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/25/2015	35	Point Defiance Public Ramp	0.4262	Armeni Public Ramp	0.1025
8/28/2015	35	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
8/29/2015	35	Point Defiance Public Ramp	0.4815	Redondo Ramp	0.2578
9/3/2015	36	Point Defiance Public Ramp	0.328	Point Defiance Boathouse	0.2451
9/4/2015	36	Point Defiance Public Ramp	0.4617	Redondo Ramp	0.31
9/5/2015	36	Point Defiance Public Ramp	0.4617	Gig Harbor Ramp	0.1151
9/9/2015	37	Point Defiance Public Ramp	0.328	Gig Harbor Ramp	0.1162
9/11/2015	37	Point Defiance Public Ramp	0.4617	Gig Harbor Ramp	0.1151
9/13/2015	37	Point Defiance Public Ramp	0.4617	Redondo Ramp	0.31
9/17/2015	38	Point Defiance Public Ramp	0.328	Point Defiance Boathouse	0.2451
9/18/2015	38	Point Defiance Public Ramp	0.4617	Redondo Ramp	0.31
9/19/2015	38	Point Defiance Public Ramp	0.4617	Redondo Ramp	0.31
9/22/2015	39	Point Defiance Public Ramp	0.328	Gig Harbor Ramp	0.1162
9/26/2015	39	Point Defiance Public Ramp	0.4617	Gig Harbor Ramp	0.1151
9/27/2015	39	Point Defiance Public Ramp	0.4617	Redondo Ramp	0.31
9/28/2015	40	Point Defiance Public Ramp	0.328	Redondo Ramp	0.2872

Appendix B.1 Coded-wire tag (CWT) recoveries in the 2015 summer Chinook MSF in Marine Area 5.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
5	7/1/2015	636299	2012	Wallace R 07.0940	Wallace R Hatchery	WDFW	636364	56	79252	AD
5	7/1/2015	182068	2011	R-Chilliwack R	H-Chilliwack River H	CDFO	182467; 181982; 182385; 180279	69	79255	AD
5	7/1/2015	636096	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		56	79301	AD
5	7/1/2015	636580	2012	East Sound Bay (San)	Glenwood Springs	COOP		55	79302	AD
5	7/1/2015	220145	2012	Ske R@Pitt. Lndg	Lyons Ferry Hatchery	NEZP		62	79303	AD
5	7/1/2015	181874	2012	R-Puntledge R	H-Puntledge River H	CDFO		62	79312	AD
5	7/1/2015	220222	2012	Magrudor Corridor	Npt Hatchery	NEZP		52	79314	AD
5	7/1/2015	55407	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55408	57	79462	AD
5	7/2/2015	60468	2012	Half Moon Bay Johnson Pr	Feather R Hatchery	CDFW		58	79256	AD
5	7/2/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		57	79463	AD
5	7/3/2015	636434	2011	East Sound Bay (San)	Glenwood Springs	COOP		59	79261	AD
5	7/3/2015	211048	2012	County Line Cr3.2363	Marblemount Hatchery	WDFW		65	79350	AD
5	7/5/2015	211052	2012	Whitehorse Springs	Whitehorse Pond	STIL		53	79262	AD
5	7/5/2015	635670	2012	Selle R 24.0543	Selle Hatchery	WDFW		61	79345	AD
5	7/5/2015	636580	2012	East Sound Bay (San)	Glenwood Springs	COOP		55	79347	AD
5	7/6/2015	55480	2012	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		66	79263	AD
5	7/6/2015	182491	2012	R-Harrison R	H-Chehalis River H	CDFO		60	79264	AD
5	7/7/2015	55409	2012	Ltl White Salmon@Nfh	Ltl White Salmon Nfh	FWS		60	79265	AD
5	7/7/2015	90702	2012	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	90377	56	79266	AD
5	7/7/2015	220222	2012	Magrudor Corridor	Npt Hatchery	NEZP		58	79464	AD
5	7/7/2015	55623	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55624	56	79465	AD
5	7/11/2015	636299	2012	Wallace R 07.0940	Wallace R Hatchery	WDFW	636364	56	79466	AD
5	7/12/2015	636489	2012	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		55	79269	AD
5	7/12/2015	636166	2011	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	79271	AD
5	7/12/2015	182197	2011	R-Shuswap R Middle	H-Shuswap River, Middle,	CDFO		76	79353	AD
5	7/12/2015	636295	2012	Wetchee R 45.0030	Dryden Pond	WDFW		58	79467	AD
5	7/12/2015	636493	2013	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	211092	41	79602	UM
5	7/13/2015	211048	2012	County Line Cr3.2363	Marblemount Hatchery	WDFW		56	79273	AD
5	7/13/2015	211051	2012	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636286	65	79354	AD
5	7/13/2015	90577	2011	Willamette R M Fk-1	Willamette Hatchery	ODFW		74	79469	AD
5	7/16/2015	636444	2011	Ske L.Mon-Ltl Goos	Lyons Ferry Hatchery	WDFW		60	79274	AD
5	7/16/2015	60473	2012	Fort Baker Barge Release	Feather R Hatchery	CDFW		56	79275	AD
5	7/16/2015	211055	2012	White R 10.0031	White River Hatchery	MUCK		57	79332	UM

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
5	7/16/2015	181564	2011	R-Harrison R	H-Chehalis River H	CDFO		82	79333	AD
5	7/17/2015	211058	2012	Sol Duc R 20.0096	Lonesome Cr Hatchery	QUIL		52	79357	AD
5	7/17/2015	90702	2012	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	90377	54	79400	AD
5	7/19/2015	55409	2012	Ltl White Salmon@Nfh	Ltl White Salmon Nfh	FWS		61	79280	AD
5	7/22/2015	636299	2012	Wallace R 07.0940	Wallace R Hatchery	WDFW	636364	49	79282	AD
5	7/22/2015	636481	2012	Chelan R 47.0052	Chelan Falls Hatchery	WDFW		55	79472	AD
5	7/23/2015	90566	2011	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	090583; 090582; 090567	58	79283	AD
5	7/24/2015	636292	2012	Elwha R 18.0272	Elwha Hatchery	WDFW		71	79285	AD
5	7/24/2015	90376	2011	Santiam R S Fk	Willamette Hatchery	ODFW		72	79360	AD
5	7/24/2015	636292	2012	Elwha R 18.0272	Elwha Hatchery	WDFW		83	79473	AD
5	7/24/2015	90718	2012	Elk R	Elk R Hatchery	ODFW		69	79474	AD
5	7/25/2015	636584	2012	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		61	79287	AD
5	7/25/2015	184931	2011	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		83	79331	AD
5	7/25/2015	90702	2012	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	90377	51	79336	AD
5	7/25/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	75	79361	AD
5	7/26/2015	635773	2011	Columbia Near Wells	Wells Hatchery	WDFW		64	79288	AD
5	7/26/2015	90702	2012	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	90377	57	79337	AD
5	7/26/2015	636298	2012	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW	636297	66	79341	AD
5	7/26/2015	60392	2011	San Pablo Bay Net Pens	Feather R Hatchery	CDFW		54	79362	AD
5	7/26/2015	181971	2012	R-Chilliwack R	H-Chilliwack River H	CDFO		61	79475	AD
5	7/27/2015	90681	2012	Col R @ Rm 369.9	Ringold Springs Hatchery	WDFW		61	79363	AD
5	7/31/2015	181486	2011	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		84	79292	AD
5	7/31/2015	636266	2012	Cowlitz R 26.0002	Cowlitz Salmon Hatch	WDFW		54	79320	AD
5	7/31/2015	55623	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55624	65	79478	AD
5	8/1/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	80	79293	AD
5	8/1/2015	55407	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55408	55	79296	AD
5	8/1/2015	211067	2012	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		48	79323	AD
5	8/2/2015	636285	2012	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		61	79297	AD
5	8/2/2015	636580	2012	East Sound Bay (San)	Glenwood Springs	COOP		57	79298	AD
5	8/2/2015	60618	2013	Half Moon Bay Johnson Pr	Feather R Hatchery	CDFW		43	79299	AD
5	8/2/2015	220220	2012	Luke'S Gulch A F	Npt Hatchery	NEZP		69	79322	AD
5	8/3/2015	636503	2012	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636502	56	44263	AD
5	8/3/2015	60465	2012	San Pablo Bay Net Pens	Feather R Hatchery	CDFW		74	52610	AD
5	8/4/2015	636467	2012	Fallert Cr 27.0017	Fallert Cr Hatchery	WDFW		52	44926	AD
5	8/5/2015	182197	2011	R-Shuswap R Middle	H-Shuswap River, Middle,	CDFO		72	79342	AD
5	8/5/2015	210487	2012	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636288	56	79365	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
5	8/6/2015	211047	2012	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		69	79480	AD
5	8/7/2015	636574	2012	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		57	44270	AD
5	8/8/2015	55479	2011	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		82	79325	AD
5	8/9/2015	636503	2012	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636502	54	79110	AD
5	8/9/2015	636484	2012	Chelan R 47.0052	Chelan Falls Hatchery	WDFW		60	79485	AD
5	8/9/2015	55479	2011	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		81	79488	AD
5	8/12/2015	636266	2012	Cowlitz R 26.0002	Cowlitz Salmon Hatch	WDFW		58	40067	AD
5	8/12/2015	210959	2010	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		83	79126	AD
5	8/13/2015	211006	2011	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		74	79103	AD
5	8/13/2015	635979	2010	Klickitat Hatchery (Ykfp)	Klickitat Hatchery (Ykfp)	YAKA		69	79369	AD
5	8/13/2015	211004	2011	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636091	69	79397	AD
5	8/14/2015	182379	2011	R-Puntledge R	H-Puntledge River H	CDFO		76	70040	AD
5	8/14/2015	55479	2011	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		78	79131	AD
5	8/14/2015	55480	2012	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		69	79132	AD
5	8/14/2015	211006	2011	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		82	79133	AD
5	8/14/2015	211006	2011	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		80	79134	AD
5	8/14/2015	60465	2012	San Pablo Bay Net Pens	Feather R Hatchery	CDFW		67	79135	AD
5	8/14/2015	211006	2011	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		82	80019	AD
5	8/15/2015	55479	2011	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	FWS		74	77480	AD
5	8/15/2015	90669	2011	Santiam R & N Fk-1	Marion Forks Hatch	ODFW		78	79137	AD
5	8/15/2015	181971	2012	R-Chilliwack R	H-Chilliwack River H	CDFO		62	79138	AD
5	8/15/2015	211006	2011	Hoko R 19.0148	Hoko Falls Hatchery	MAKA		76	79493	AD
5	8/15/2015	60464	2012	San Pablo Bay Net Pens	Feather R Hatchery	CDFW		60	80043	AD
5	8/15/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	59	80045	AD
5	8/21/2015	635673	2012	Cowlitz R 26.0002	Cowlitz Salmon Hatch	WDFW		51	79041	AD
5	9/6/2015	60585	2013	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	CDFW		51	80493	AD

Appendix B.2 Coded-wire tag (CWT) recoveries in the 2015 summer Chinook MSF in Marine Area 6.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
6	7/1/2015	210963	2010	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	635695	83	71869	AD
6	7/1/2015	211016	2011	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		61	77430	AD
6	7/1/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		64	80251	AD
6	7/1/2015	636367	2011	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636366	74	80252	AD
6	7/1/2015	636197	2011	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		63	80255	AD
6	7/1/2015	636489	2012	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	80257	AD
6	7/2/2015	636365	2012	Friday Cr 03.0017	Samish Hatchery	WDFW	636486	57	77431	AD
6	7/2/2015	636092	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211011	71	77440	UM
6	7/2/2015	635283	2010	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		77	79003	AD
6	7/2/2015	636503	2012	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636502	54	79004	AD
6	7/2/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		62	79005	AD
6	7/2/2015	636417	2011	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		74	79006	AD
6	7/2/2015	211016	2011	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		65	79007	AD
6	7/2/2015	636099	2011	Friday Cr 03.0017	Samish Hatchery	WDFW	636098	73	79008	AD
6	7/3/2015	636584	2012	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		55	77441	AD
6	7/3/2015	636434	2011	East Sound Bay (San)	Glenwood Springs	COOP		0	79402	AD
6	7/3/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	0	79403	AD
6	7/3/2015	636168	2011	May Cr 07.0943	Wallace R Hatchery	WDFW	636169	64	79407	AD
6	7/3/2015	636365	2012	Friday Cr 03.0017	Samish Hatchery	WDFW	636486	54	79408	AD
6	7/3/2015	636580	2012	East Sound Bay (San)	Glenwood Springs	COOP		59	80256	AD
6	7/5/2015	636580	2012	East Sound Bay (San)	Glenwood Springs	COOP		65	77436	AD
6	7/5/2015	636289	2012	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		69	77437	AD
6	7/5/2015	636166	2011	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	77811	AD
6	7/9/2015	636096	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		73	77442	AD
6	7/9/2015	55407	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55408	75	77445	AD
6	7/9/2015	90365	2012	Tanner Cr (Bnville)	Bonneville Hatchery	ODFW		63	77446	AD
6	7/9/2015	55623	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS	55624	66	77809	AD
6	7/10/2015	182564	2012	R-Robertson Cr	H-Robertson Creek H	CDFO		74	77812	AD
6	7/10/2015	636292	2012	Elwha R 18.0272	Elwha Hatchery	WDFW		70	77813	AD
6	7/11/2015	636434	2011	East Sound Bay (San)	Glenwood Springs	COOP		79	65921	AD
6	7/11/2015	181490	2011	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		84	77434	AD
6	7/11/2015	636292	2012	Elwha R 18.0272	Elwha Hatchery	WDFW		71	79448	AD
6	7/12/2015	211051	2012	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636286	54	77438	AD
6	7/16/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		76	79445	AD
6	7/18/2015	636099	2011	Friday Cr 03.0017	Samish Hatchery	WDFW	636098	70	79009	AD

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
6	7/18/2015	181971	2012	R-Chilliwack R	H-Chilliwack River H	CDFO		66	79010	AD
6	7/19/2015	181489	2011	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		78	79444	AD
6	7/25/2015	636299	2012	Wallace R 07.0940	Wallace R Hatchery	WDFW	636364	65	79406	AD
6	7/25/2015	635199	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		69	79421	AD
6	7/26/2015	636503	2012	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636502	66	77439	AD
6	8/1/2015	211051	2012	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636286	59	77433	AD
6	8/1/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	69	79011	AD
6	8/2/2015	182069	2012	R-Cowichan R	H-Cowichan River H	CDFO		63	77435	AD
6	8/5/2015	636267	2012	Cowlitz R 26.0002	Cowlitz Salmon Hatch	WDFW		59	77444	AD
6	8/6/2015	211052	2012	Whitehorse Springs	Whitehorse Pond	STIL		76	77447	AD
6	8/7/2015	636292	2012	Elwha R 18.0272	Elwha Hatchery	WDFW		71	77448	AD
6	8/7/2015	211051	2012	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636286	82	77449	AD
6	8/8/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	78	77471	AD
6	8/8/2015	636168	2011	May Cr 07.0943	Wallace R Hatchery	WDFW	636169	68	77473	AD
6	8/8/2015	90702	2012	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	90377	75	79014	AD
6	8/15/2015	211051	2012	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636286	71	79409	AD

Appendix B.3 Coded-wire tag (CWT) recoveries in the 2015 summer Chinook MSF in Marine Area 9.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
9	7/16/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	74155	AD
9	7/16/2015	636489	2012	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	74159	AD
9	7/16/2015	182072	2012	R-Cowichan R	H-Cowichan River H	CDFO		65	74160	AD
9	7/17/2015	211004	2011	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636091	81	74163	AD
9	7/17/2015	636367	2011	Purdy Cr 16.0005	George Adams Hatchry	WDFW	636366	83	74164	AD
9	7/18/2015	636166	2011	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		88	74161	AD
9	7/21/2015	211048	2012	County Line Cr3.2363	Marblemount Hatchery	WDFW		72	77244	AD
9	7/21/2015	636164	2011	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		83	77245	AD
9	7/24/2015	211011	2011	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	636092	79	77238	AD
9	7/25/2015	210998	2011	Palmer Hatchery	Keta Creek Complex	MUCK		67	74162	AD
9	7/25/2015	182385	2011	R-Chilliwack R	H-Chilliwack River H	CDFO	182068; 182467; 181982; 180279	84	77242	AD
9	7/25/2015	636496	2013	Cascade R 03.1411	Marblemount Hatchery	WDFW	636495	41	77243	AD
9	7/26/2015	636197	2011	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		82	77240	AD

Appendix B.4 Coded-wire tag (CWT) recoveries in the 2015 summer Chinook MSF in Marine Area 11.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
11	8/2/2015	636285	2012	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		58	87599	AD
11	8/3/2015	636197	2011	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		75	85008	AD
11	8/7/2015	55407	2012	Spring Cr 29.0159	Spring Cr Nfh	FWS		80	85009	AD
11	8/8/2015	635199	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		76	85010	AD
11	8/8/2015	636197	2011	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		70	85102	AD
11	8/13/2015	636197	2011	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		65	85103	AD
11	8/14/2015	635199	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		76	62874	AD
11	8/14/2015	635199	2011	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		77	87598	AD
11	8/15/2015	211016	2011	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		72	85165	AD
11	8/15/2015	635589	2010	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		72	87600	AD
11	8/22/2015	211067	2012	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		73	62872	AD
11	8/23/2015	211004	2011	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		68	62875	AD
11	9/5/2015	636196	2011	Chambers Cr 12.0007	Garrison Hatchery	WDFW		66	85016	AD

Appendix B.5 Coded-wire tag (CWT) recoveries in the 2015 summer Chinook MSF in Marine Area 13.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL (cm)	Label	Recovery Mark
13	8/16/2015	636674	2013	Purdy Cr 16.0005	George Adams Hatchry	WDFW		48	39467	AD
13	8/30/2015	211004	2011	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		76	87963	AD