

Draft February 9, 2021

**2019-20 Winter Mark-Selective Recreational Chinook Fisheries
In Marine Areas 5, 6, 7, 8-1, 8-2, 9, 10, 11, 12 and 13**

Post-season Report

DRAFT

November 23, 2020

Prepared by:

Ty Garber and Karen Kloempken

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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 stocks of natural-origin Chinook salmon for many years. Providing recreational anglers with opportunities to harvest abundant hatchery stocks while simultaneously protecting weaker, natural-origin stocks has proven to be a significant conservation and management challenge. The combination of large-scale hatchery marking (i.e., adipose fin clipping) programs and mark-selective harvest regulations makes it possible for anglers to pursue and harvest hatchery Chinook salmon while minimally impacting natural-origin 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 natural-origin) salmon encountered¹.

Since the Washington Department of Fish and Wildlife (WDFW) implemented the first marine mark-selective Chinook salmon fisheries in Marine 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 Marine Areas in Puget Sound during both the summer and winter seasons. Including the 2019-2020 management season, mark-selective fisheries for Chinook salmon have been conducted in Puget Sound for the last 17 summer (May through September) seasons and the last 15 winter (October through April) seasons.

During the 2019-20 winter season, October through April, WDFW implemented ten mark-selective Chinook salmon fisheries in Marine Areas 5, 6, 7, 8-1, 8-2, 9, 10, 11, 12 and 13. The Chinook MSF seasons in each area were scheduled as follows:

- Marine Area 5 from March 1 through April 30, 2020;
- Marine Area 6 from March 1 through April 15, 2020;
- Marine Area 7 from February 1 through April 15, 2020;
- Marine Areas 8-1 and 8-2 from February 1 through April 30, 2020;
- Marine Area 9 from February 1 through April 15, 2020;
- Marine Area 10 from January 1 through March 31, 2020;
- Marine Area 11 from January 1 through April 30, 2020;
- Marine Area 12 from October 1, 2019 through April 30, 2020; and
- Marine Area 13 from October 1, 2019 through April 30, 2020.

¹The 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 salmon. 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.

RESULTS

1) Marine Area 5 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented the sixth winter Chinook MSF in Marine Area 5 from March 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington state was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 30, 2020. Data collection methods used to monitor the Marine Area 5 Chinook MSF included dockside angler interviews with catch sampling.

WDFW dockside samplers conducted “Baseline Sampling” at selected access sites during the 2019-20 winter Chinook salmon MSF in Marine Area 5. Complete details of these methods are presented in a separate Methods Report (WDFW 2012a). Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Marine Area 5 baseline sample frame included two access sites, Olson’s Resort and Van Riper’s Resort in Sekiu, WA (Table 1.3), and a total of 15 site visits during the three-week season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Marine Area 5 fishery at the selected access site. The interview and catch-sampling procedures employed were identical to those used in other MSFs in Puget Sound. Marine Area 5 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and Coho salmon only), and 3) landed Chinook salmon size (fork length) and age (scales) composition. Samplers also inspected landed Chinook and Coho salmon for CWTs using wand detectors and acquired snouts when tags were present. Resulting tag data were used to estimate the unexpanded CWT-based composition of landed catch.

In contrast to the intensive “Murthy” survey design employed in some other areas, Marine Area 5 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook salmon impacts. However, Marine Area 5 baseline sampling observations will ultimately be combined with Catch Record Card (CRC) data, once they become available, to estimate catch and effort at the fishery-wide level (see WDFW and NWIFC 2013). While these descriptors of MSF impacts are not presented in this document, they will be available at a later date. In the following section, we present results from our monitoring activities during the Marine Area 5 winter 2019-2020 Chinook salmon MSF.

Table 1.1 Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the winter Chinook salmon MSF in Marine Area 5. 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish			Released Fish		
			Boats	Anglers	Chinook AD	Chinook UM	Chinook Unk	Chin AD	Chin UM	Chin Unk
9	1-Mar	1-Mar	8	15	0	0	0	12	0	0
10	2-Mar	8-Mar	12	25	7	0	0	9	2	5
11	9-Mar	15-Mar	3	7	3	0	0	11	1	0
12	16-Mar	22-Mar	24	49	4	0	0	7	8	0
13	23-Mar	24-Mar	0	0	0	0	0	0	0	0
Season Total			47	96	14	0	0	39	11	5

Table 1.2 Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the winter Chinook salmon MSF in Marine Area 5. 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish			Released Fish					
			Boats	Anglers	Coho AD	Coho UM	Pink	Coho AD	Coho UM	Coho Unk	Pink	Unknown	
9	1-Mar	1-Mar	8	15	0	0	0	0	0	0	0	0	5
10	2-Mar	8-Mar	12	25	0	0	0	2	0	1	0	0	1
11	9-Mar	15-Mar	3	7	0	0	0	0	0	0	0	0	0
12	16-Mar	22-Mar	24	49	0	0	0	0	0	0	0	0	2
13	23-Mar	24-Mar	0	0	0	0	0	0	0	0	0	0	0
Season Total			47	96	0	0	0	2	0	1	0	0	8

Table 1.3 List of sites sampled with the number of sampling events (site-days) during the winter Chinook salmon MSF in Marine Area 5.

Location Name	Number of Site Days Sampled Per Month		Total Site-Days	% of Total
	March			
Olson's Resort	1		1	6.67%
Van Riper's Resort	14		14	93.33%
Grand Total	15		15	100.00%

Table 1.4 Summary of CWTs recovered from Chinook salmon harvested during the 2019-20 winter Chinook salmon MSF in Marine Area 5. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	Hood Canal (100%)	Finch Cr 16.0222	Hoodsport Hatchery	1 (100%)	0
			Total	1	0

Table 1.5 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the winter Chinook salmon MSF in Marine Area 5.

Mark Type	Legal	Sublegal	Total
Marked	14	0	14
Unmarked	0	0	0
Total	14	0	14

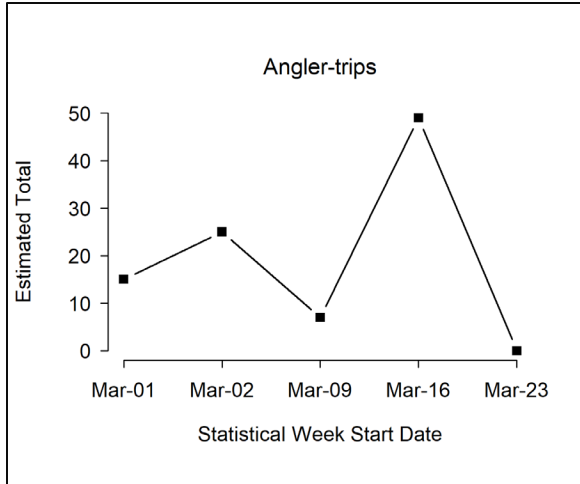


Figure 1.1 Temporal patterns in fishing effort during the 2019-2020 winter Chinook salmon MSF in Marine Area 5. Note: displayed values are sample observations (summed across sampled sites)

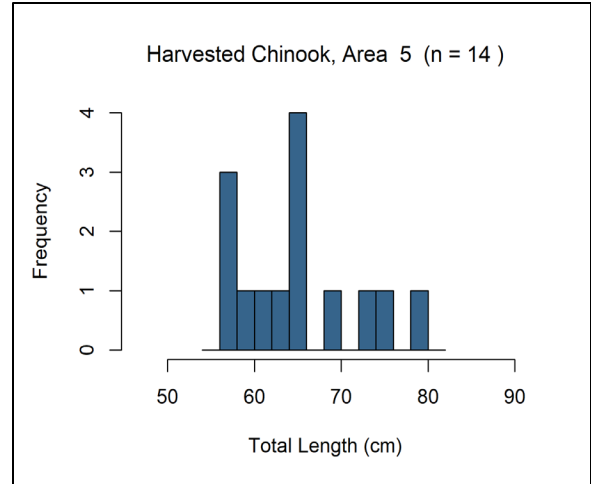


Figure 1.3 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 5. Note: displayed values are observations where lengths taken.

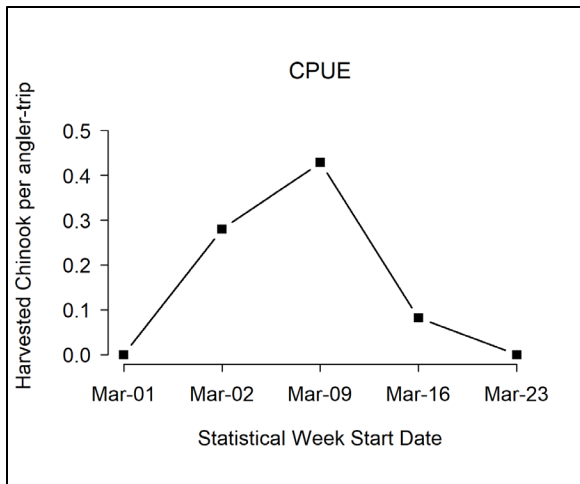


Figure 1.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 5.

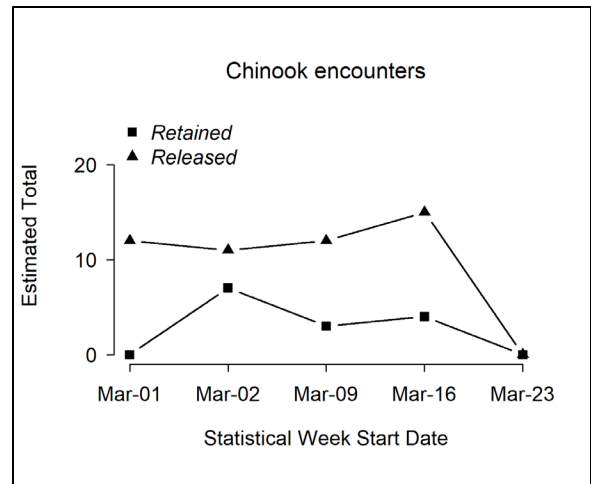


Figure 1.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 5. Note: displayed values are sample observations (summed across sampled sites)

Table 1.6 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2019-20 winter Chinook salmon 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 STR	0 1-trip STRs	0	0	0	0	0	NA	NA
Size/mark-status composition:		0.00	0.00	0.00	0.00			
Variance:		NA	NA	NA	NA			

Table 1.7 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 5. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	AD	UM	AD	UM
Kept	14	0	0	0
Released	0	2	39	9
Total	14	2	39	9
Size/mark-status composition	0.22	0.03	0.61	0.14
Bias-corrected size/mark composition ^a	0.19	0.03	0.61	0.17

^a This correction to the dockside encounter composition estimate follows the recommendation made in Conrad, Garber, and Rose (2020).

2) Marine Area 6 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented an eighth winter MSF in Marine Area 6 from March 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington state was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 15, 2020. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Marine Area 6 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, aerial effort surveys and a minimal collection of Salmon Trip Reports (STRs) from the angling public. 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 winter Chinook salmon MSF. In addition to the major components of the results described previously (page 3), we present aerial survey and dockside data used to estimate the sample fraction in Marine Area 6 (see WDFW 2012a, Aerial-Access Design). The four sites included in the Marine Area 6 dockside sample frame are John Wayne Marina, Port Angeles Boat Haven, Ediz Hook and Cornet Ramp, which have historically been, and are assumed to still be, the highest-use access sites for Marine Area 6 anglers. The Olympic Peninsula Derby took place from March 13-15, 2020 over portions of Marine Areas 6, 7 and 9. Total derby effort was allocated to each Marine Area using the proportion of effort that occurred in each area based on dockside sampling efforts at designated weigh-in stations during the derby. Total catch by Marine Area was obtained from the derby organizers.

Table 2.1 Sampling/estimation details on target parameters associated with the overall Marine Area 6 Chinook salmon MSF 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.)
		Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Boat trip	Season	Bias-corrected encounter proportions from the Dockside data were (Table 2.11) used to produce encounter and mortality estimates.
Aerial Surveys	Fraction of Area 6 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, f_{ij}).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see Table 2.12 $n=4$ surveys conducted out of $N=24$ days available in the season). Season-wide sample fraction was calculated as the average sample fraction over the four individual aerial surveys.
Voluntary Trip Reports (or STRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho salmon) that the angler may record on the STR form	Fish encounter	Season	STR data (Table 2.6) were not used to estimate the size/mark-status proportions (LM = 41%, LU = 6%, SM = 47%, SU = 6%) needed to produce encounter and mortality estimates due to low sample size.
Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook salmon	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.

Table 2.2 Estimates of total fishing effort and total Chinook salmon catch (retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 6. 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	
Mar	9	1-Mar	1-Mar	119	248	92	0	72	52	216
	10	2-Mar	8-Mar	193	369	98	0	77	55	230
	11	9-Mar	15-Mar	37	79	10	0	8	5	23
	12	16-Mar	22-Mar	338	632	133	0	105	75	313
	13	23-Mar	24-Mar	86	143	35	0	27	19	81
Sub-Total:				772	1,471	367	0	289	207	863
Olympic Peninsula Derby				315	536	82	0	65	46	193
Season Total:				1,087	2,007	449	0	354	253	1,056
Variance:				3,786	20,638	581	0	3,460	666	5,935
SE:				62	144	24	0	59	26	77
CV (%):				6%	7%	5%	0%	17%	10%	7%
95% CI:				967 - 1,208	1,725 - 2,288	402 - 496	0 - 0	239 - 469	203 - 304	905 - 1,207

Table 2.3 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2019-20 winter Chinook salmon MSF in Marine Area 6.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	245	8	253
Unmarked	0	0	0
Total	245	8	253

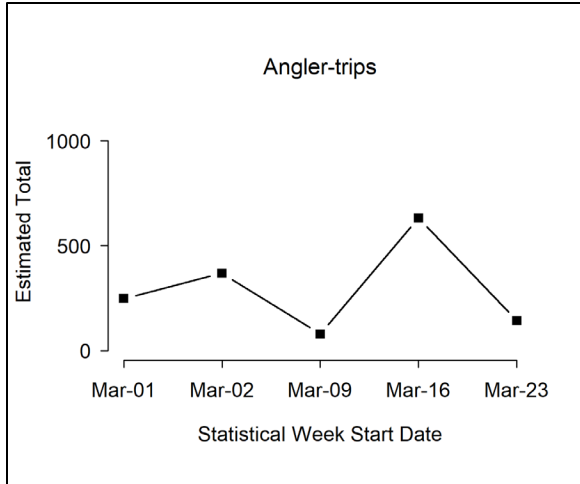


Figure 2.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 6.

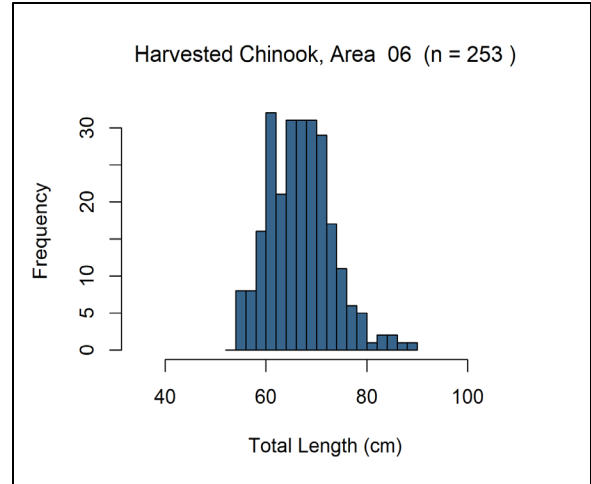


Figure 2.3 Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 6. Note: displayed values are observations where lengths were taken.

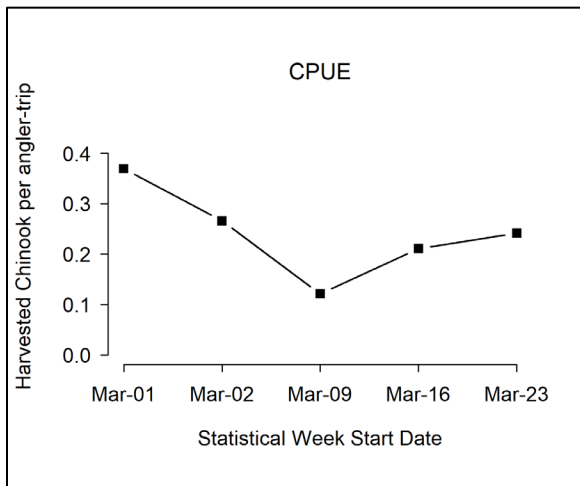


Figure 2.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 6.

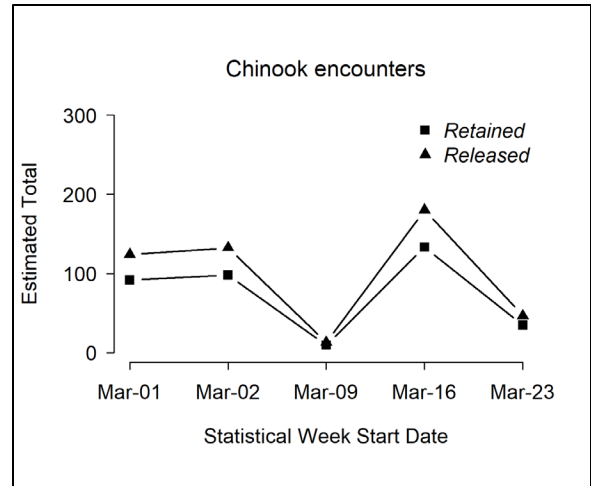


Figure 2.4 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 6.

Table 2.4 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 6. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Georgia Strait (3.2%)	R-Cowichan R	H-Cowichan River H	1 (3.2%)	0
WA	N Washington (6.5%)	Friday Cr 03.0017	Samish Hatchery	2 (6.5%)	0
		Hood Canal (12.9%)	Finch Cr 16.0222	Hoodsport Hatchery	3 (9.7%)
	Purdy Cr 16.0005		George Adams Hatchery	1 (3.2%)	0
	N Puget Sound (6.5%)	Tulalip Cr 07.0001	Bernie Gobin Hatch	1 (3.2%)	1
		Wallace R 07.0940	Wallace R Hatchery	1 (3.2%)	0
	Skagit River (12.9%)	Cascade R 03.1411	Marblemount Hatchery	4 (12.9%)	0
		Mid Puget Sound (29%)	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	3 (9.7%)
	Grovers Cr 15.0299		Grovers Cr Hatchery	1 (3.2%)	1
	Icy Cr 09.0125		Icy Cr Hatchery	3 (9.7%)	0
	Grovers Cr Hatchery		Grovers Cr Hatchery	2 (6.5%)	2
	S Puget Sound (29%)	Clear Cr 11.0013C	Clear Creek Hatchery	3 (9.7%)	3
		Kalama Cr 11.0017	Kalama Cr Hatchery	2 (6.5%)	0
		Minter Cr 15.0048	Minter Cr Hatchery	4 (12.9%)	0
Total				31	7

Table 2.5 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSF in Marine Area 6. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
Bernie Gobin Hatch	2016	1	1.8	1.37	1.8	0.2	0.014	0.12
Clear Creek Hatchery	2016	3	5.3	4.12	5.3	0.5	0.041	0.35
Grovers Cr Hatchery	2016	2	3.5	2.75	3.7	0.4	0.03	0.25
Grovers Cr Hatchery	2017	1	1.8	1.37	1.7	0.2	0.013	0.11
Total		7	12.4	9.62	12.6	1.3	0.098	0.83

Table 2.6 Total Chinook salmon encountered (retained and released) by charter and private-boat anglers logging their trips on STRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2019-20 winter Chinook salmon MSF in Marine Area 6. 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 STR	8 1-trip STRs	7	1	8	1	17	0.88	0.88
Size/mark-status composition:		0.41	0.06	0.47	0.06			
Variance:		(0.0151)	(0.0035)	(0.0156)	(0.0035)			

Table 2.7 Summary of season-wide fishery impact estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 6. 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	500	435	65	10	445	616	25	396 - 493	6
Legal UM	129	0	129	19	19	8	3	14 - 25	14
Sublegal AD	303	14	289	58	72	56	8	57 - 87	10
Sublegal UM	124	0	124	25	25	13	4	18 - 32	15
Total	1,056	449	607	112	561	693	26	509 - 612	5

Table 2.8 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters for the 2019-20 winter Chinook salmon MSF in Marine Area 6. 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	1180	526	654	11
	AD	2,681	1659	1022	1443
	Total	3,861	2,185	1,676	1454
	% Marked	69	76	61	99
Estimated (Creel) Encounters	UM	253	129	124	0
	AD	803	500	303	449
	Total	1,056	629	427	449
	% Marked	76	79	71	100

Table 2.9 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 6. 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)	219	1,751	1,970	44	517	561
Released Legal	77	104	181	19	10	29
Released Sublegal	131	204	335	25	58	83
Landed Only	11	1443	1454	0	449	449

Table 2.10 Monthly sample rates (Total retained Chinook salmon sampled / Estimated retained Chinook salmon) for the 2019-20 winter Chinook salmon MSF in Marine Area 6. AD = marked (adipose-clipped), UM = unmarked. Note: Observed retained fish may not have lengths recorded.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
March	9 -13	1 Mar - 24 Mar	449	0	449	280	0	280	62.4%
Season Total			449	0	449	280	0	280	62.4%

Table 2.11 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 6. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	AD	UM	AD	UM
Kept	245	0	8	0
Released	7	58	128	28
Total	252	58	136	28
Size/mark-status composition	0.53	0.12	0.29	0.06
Bias-corrected size/mark composition	0.47	0.12	0.29	0.12

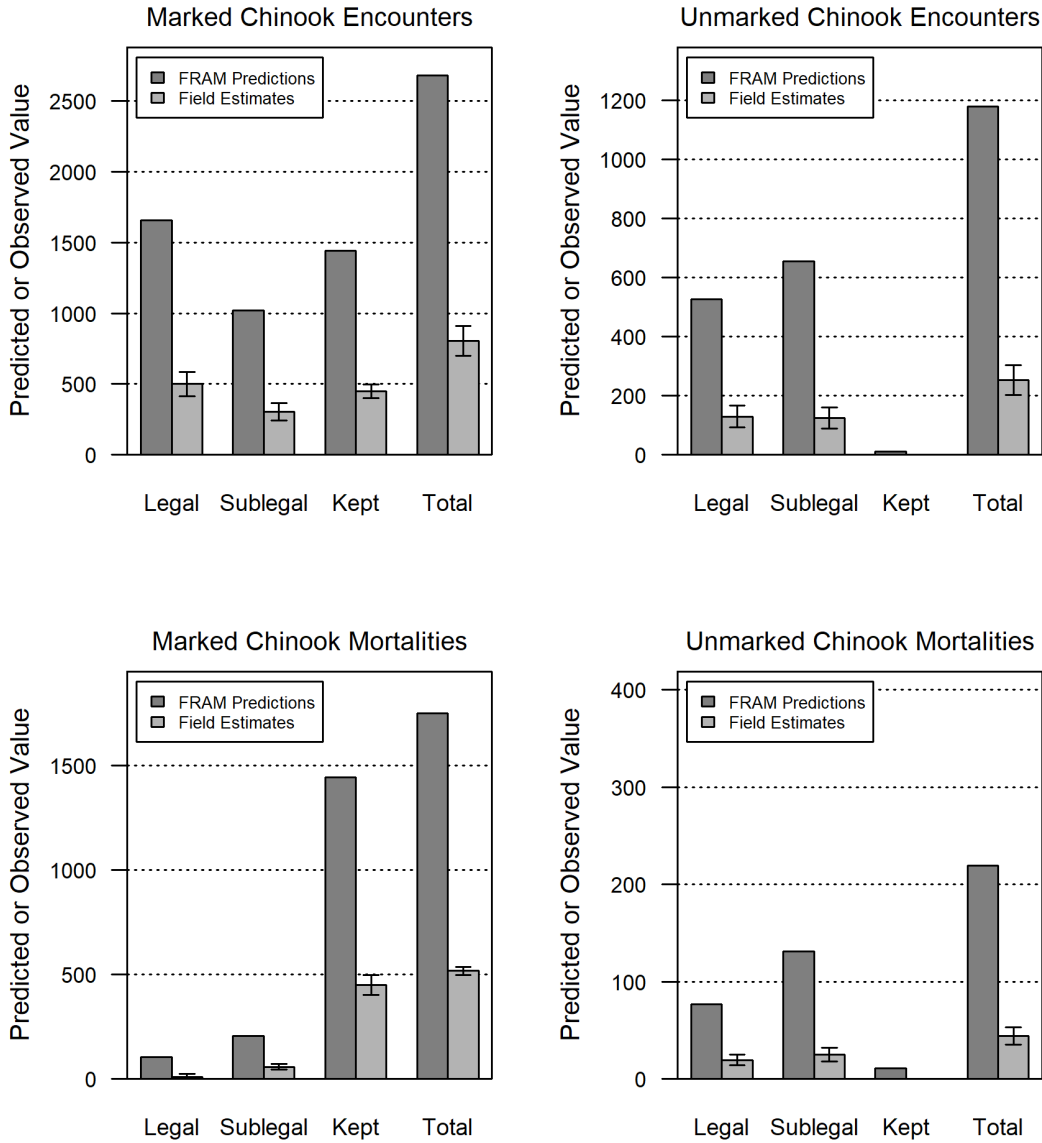


Figure 2.5 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters and mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 6. Error bars represent approximate 95% confidence intervals for field estimates.

Table 2.12 Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the four-site sample frame during the 2019-20 winter Chinook salmon MSF in Marine Area 6. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, f_{ij}
		Start Time	End Time	Total Boats, m_{ij}	Sampled Boats	Active Boats, X_{ij}	Total Boats, Sy_{ijk}	
1-Mar	WE	9:34	10:33	132	122	109	148	0.826
8-Mar	WE	9:33	10:23	57	69	57	69	1.000
17-Mar	WD	12:09	13:01	40	38	26	58	0.650
20-Mar	WE	9:43	10:35	29	28	25	32	0.862
Season Totals:				258	257	217	308	
Mean:				65	64	54	77	0.834
St Dev:				46	42	39	50	0.144
CV(%):				72.0%	65.8%	72.6%	64.5%	17.3%

Table 2.13 Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) during the 2019-20 winter Chinook salmon MSF in Marine Area 6. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status

Stat Week	Start Date	End Date	Released Salmon		
			Coho AD	Coho UK	Unknown Salmon
9	1-Mar	1-Mar	0	2	1
10	2-Mar	8-Mar	2	15	7
11	9-Mar	15-Mar	0	0	0
12	16-Mar	22-Mar	2	5	7
13	23-Mar	24-Mar	0	2	2
Season Total:			4	24	18
Variance:			2	75	2
Standard Error:			2	9	1
CV (%):			42	35	8
95% CI:			1 - 7	8 - 41	15 - 20

Table 2.14 Season-total estimates of Chinook salmon encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Marine Area 6 Winter Chinook salmon MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler- trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
6	Dec 1, 2012 - Apr 10, 2013	4,916	1,395	21	14	0	209	385	315	135	2,474
6	Dec 1, 2013 - Apr 10, 2014	4,323	2,117	13	72	0	316	372	742	165	3,797
6	Dec 1, 2014 - Apr 10, 2015	6,751	2,215	3	40	0	331	417	1,124	229	4,358
6	Oct 1, 2015 - Apr 10, 2016	9,014	397	0	47	0	59	188	1,385	366	2,441
6	Dec 1, 2016 - Apr 15, 2017	4,880	2,194	3	53	0	328	275	554	103	3,511
6	Mar 1, 2018 - Apr 8, 2018	2,220	1,083	0	35	0	162	269	671	67	2,287
6	Feb 1, 2019 - Apr 15, 2019	4,221	1,984	0	62	0	296	190	572	443	3,547
6	Mar 1, 2020 - Mar 24, 2020	2,007	435	0	14	0	65	129	289	124	1,056

3) Marine Area 7 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented a thirteenth consecutive winter MSF in Marine Area 7 from February 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 15, 2020. The PSSU implemented an intensive monitoring program in Marine Area 7 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, aerial effort surveys, test fishing and collection of STRs 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 7 winter fishery from February 1, 2020 through March 24, 2020. In addition to the major components of the results described previously, we present aerial survey and dockside data used to estimate the sample fraction in Marine Area 7 (see WDFW 2012a, Aerial-Access Design). The four sites included in the Marine Area 7 dockside sample frame are Washington Park Ramp, Bellingham Ramp, Cornet Ramp, and Friday Harbor which are assumed to be the highest-use access sites for Marine Area 7 anglers. Due to safety concerns and in an effort to improve sampling efficiencies, we modified the flight path of Marine Area 7 aerial surveys to exclude the area of open water north of Patos Island beginning in December 2012. An examination of flight survey data from previous years suggests that approximately 5% of the boats observed during flights were located in this area. Given the limited amount of effort occurring in this area we assumed the effect on effort and harvest estimates would be negligible.

Table 3.1 Sampling/estimation details on target parameters associated with the overall Marine Area 7 Chinook salmon MSF 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.
Aerial Surveys	Fraction of Marine Area 7 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, f_{ij}).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see Table 3.13 ; $n=10$ surveys conducted out of $N=53$ days available in the season).
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Chinook salmon length, age, and DNA-based ² stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	We used the test fishery data only to estimate the size/mark-status proportions (LM = 47%, LU = 7%, SM = 38%, SU = 8%; Table 3.6) needed to produce encounter and mortality estimates.
Voluntary Trip Reports (STRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho) that the angler may record on the STR form	Fish encounter	Season	STR data (Table 3.7) were not used for impact estimation steps due to the assumed higher data quality and sufficient sample size of test fishery data. See comment in row above.
Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook salmon	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 Chinook salmon catch (retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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	
Feb	5	1-Feb	2-Feb	65	130	38	0	39	14	91
	6	3-Feb	9-Feb	785	1681	395	0	407	148	950
	7	10-Feb	16-Feb	439	911	179	0	184	67	431
	8	17-Feb	23-Feb	422	787	145	0	150	55	349
	9	24-Feb	1-Mar	720	1568	254	0	261	95	611
Mar	10	2-Mar	8-Mar	386	781	144	0	148	54	346
	11	9-Mar	15-Mar	60	125	18	0	18	7	42
	12	16-Mar	22-Mar	635	1344	225	0	232	85	542
	13	23-Mar	24-Mar	65	147	27	0	28	10	65
Sub-Total:				3576	7,474	1426	0	1468	536	3,429
Resurrection Salmon Derby				83	330	62	0	64	23	149
Friday Harbor Classic				95	315	98	0	101	37	236
Roche Harbor Salmon Derby				100	343	172	2	177	63	414
Olympic Peninsula				0	0	0	0	0	0	0
Season Total:				3,854	8,462	1,758	2	1809	659	4,228
Variance:				533,021	2,402,359	100,438	0	470,237	35,631	794,903
SE:				730	1550	317	0	686	189	892
CV (%):				19%	18%	18%	0%	38%	29%	21%
95% CI:				2,423 - 5,285	5,424 - 11,500	1,137 - 2,379	2 - 2	465 - 3,153	289 - 1,029	2,480 - 5,975

Table 3.3 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the Area 7 Chinook salmon MSF.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	307	6	313
Unmarked	0	0	0
Total	307	6	313

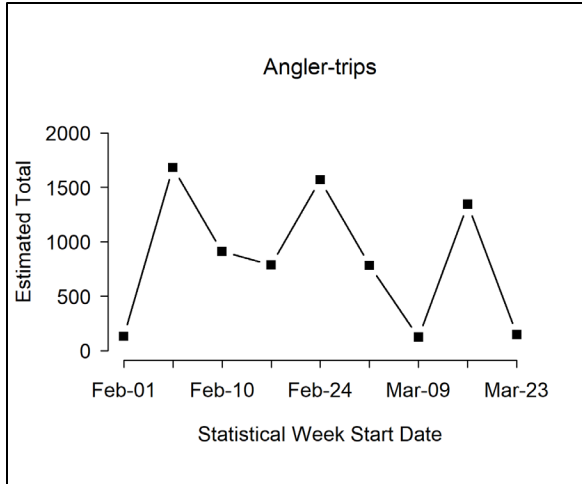


Figure 3.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 7.

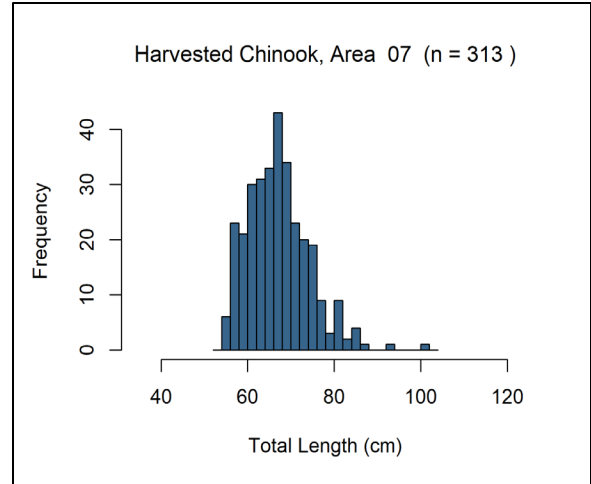


Figure 3.3 Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area. Note: displayed values are observations where lengths were taken.

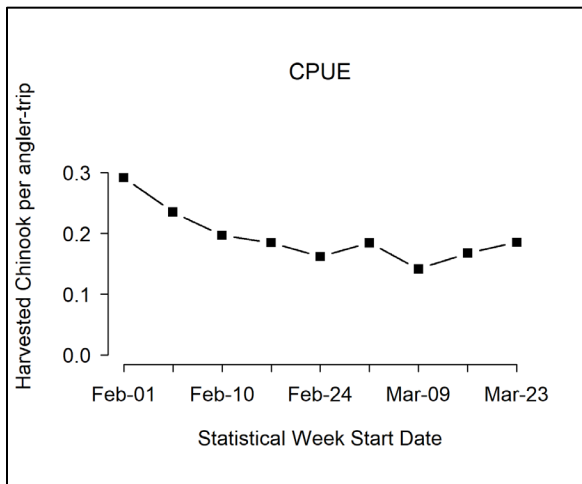


Figure 3.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 7.

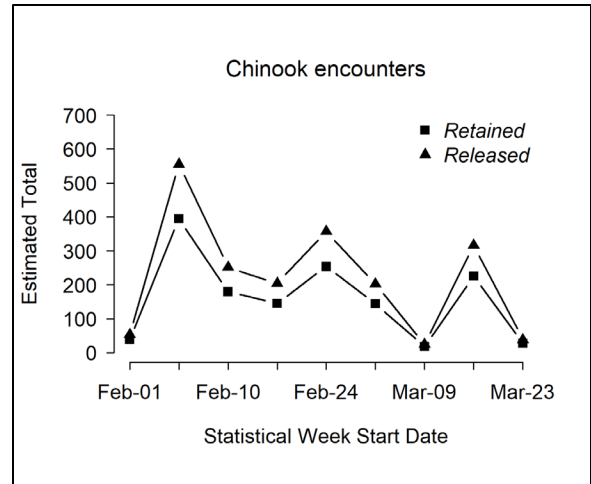


Figure 3.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 7.

Table 3.4 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 7. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Georgia Strait (6.5%)	R-Burrard In	H-Sandy Cove Seapen	1 (1.6%)	0
		R-Cowichan R	H-Cowichan River H	3 (4.8%)	0
WA	N Washington (24.2%)	Friday Cr 03.0017	Samish Hatchery	2 (3.2%)	0
		East Sound Bay (San)	Glenwood Springs	1 (1.6%)	0
		Kendall Cr 01.0406	Kendall Cr Hatchery	9 (14.5%)	0
		Skookum Cr 01.0273	Skookum Cr Hatchery	3 (4.8%)	0
		Hood Canal (6.5%)	Finch Cr 16.0222	Hoodsport Hatchery	3 (4.8%)
	N Puget Sound (16.1%)	Purdy Cr 16.0005	George Adams Hatchery	1 (1.6%)	0
		Tulalip Cr 07.0001	Bernie Gobin Hatch	5 (8.1%)	5
		Wallace R 07.0940	Wallace R Hatchery	3 (4.8%)	0
	Skagit River (27.4%)	Whitehorse Springs	Whitehorse Pond	2 (3.2%)	0
		Cascade R 03.1411	Marblemount Hatchery	17 (27.4%)	0
	Mid Puget Sound (9.7%)	Grovers Cr Hatchery	Grovers Cr Hatchery	1 (1.6%)	1
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	2 (3.2%)	0
		Big Soos Cr 09.0072	Soos Creek Hatchery	3 (4.8%)	0
	S Puget Sound (8.1%)	Big Soos Cr 09.0072	Soos Creek Hatchery	3 (4.8%)	0
		Kalama Cr 11.0017	Kalama Cr Hatchery	1 (1.6%)	0
Deschutes R 13.0028		Tumwater Falls Hatchery	1 (1.6%)	0	
CA	Central California Coast (1.6%)	Minter Cr 15.0048	Minter Cr Hatchery	3 (4.8%)	0
		Half Moon Bay John Pr Net	Mok R Fish Ins	1 (1.6%)	0
Total				62	6

Table 3.5 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
Bernie Gobin Hatch	2016	5	28.1	129.94	28.3	2.8	1.317	2.57
Grovers Cr Hatchery	2016	1	5.6	25.99	5.9	0.6	0.288	0.54
Total		6	33.7	155.92	34.2	3.4	1.605	3.1

Table 3.6 Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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	Hrs Fished	AD	UM	AD	UM	
6	4	27.5	9	1	5	1	16
7	4	27.1	10	2	7	2	21
8	4	26.2	6	0	5	2	13
9	4	22.7	8	2	9	1	20
10	4	20.3	2	1	2	0	5
11	4	19.9	6	0	7	2	15
12	2	9.4	4	1	0	0	5
13	1	2.8	0	0	1	0	1
Total	27	155.8	45	7	36	8	96
Size/mark-status composition:			.47	.07	.38	.08	
Variance:			(0.0026)	(0.0007)	(0.0025)	(0.0008)	
Legal size mark rate:			0.87				
Overall mark rate:			0.84				

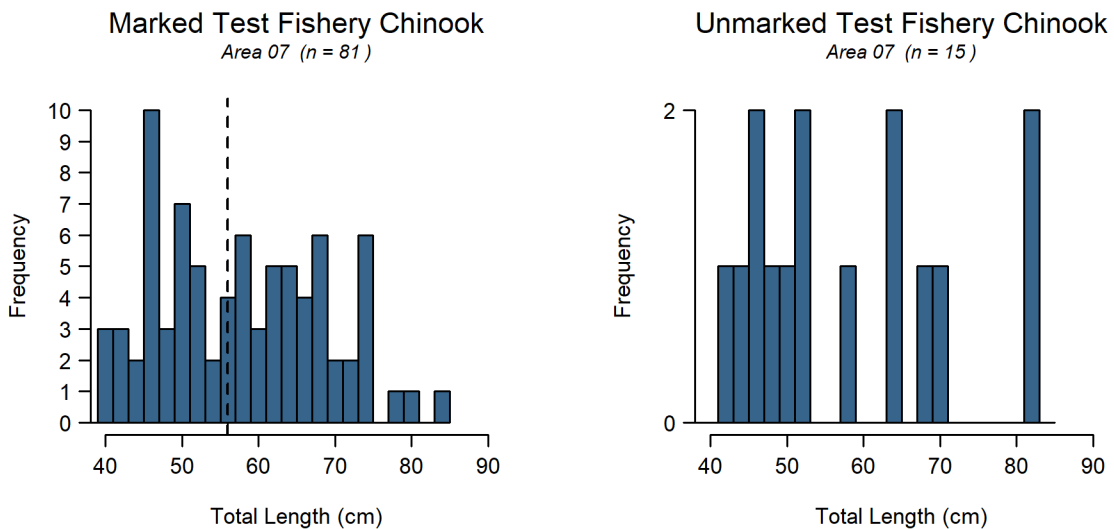


Figure 3.5 Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook salmon encountered by test fishers during the 2019-20 winter Chinook salmon MSF in Marine Area 7. The vertical dashed line in the left panel corresponds to the legal-size limit (22 in or 56 cm).

Table 3.7 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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
Charter STR	9 1-trip STRs, 14 Angler Trips	2	19	16	51	88	0.20	0.10
Size/mark-status composition:		0.02	0.22	0.18	0.58			
Variance:		(0.0003)	(0.0019)	(0.0017)	(0.0028)			

Table 3.8 Summary of season-wide fishery impact estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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	1,982	1,724	258	39	1,763	103,855	322	1,131 - 2,394	18%
Legal UM	308	0	308	46	46	369	19	9 - 84	42%
Sublegal AD	1,585	34	1,552	310	344	6,316	79	188 - 500	23%
Sublegal UM	352	2	350	70	72	770	28	18 - 126	39%
Total	4,228	1,760	2,468	465	2,225	111,309	334	1,571 - 2,879	15%

Table 3.9 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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	3380	1616	1764	16
	AD	6,372	3,749	2,623	3,261
	Total	9,752	5,365	4,387	3,277
	% Marked	65	70	60	100
Estimated (Creel) Encounters	UM	661	308	352	2
	AD	3,567	1,982	1,585	1,758
	Total	4,228	2,290	1,938	1,760
	% Marked	84	87	82	100

Table 3.10 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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)	610	4,022	4,632	118	2,107	2,225
Released Legal	241	236	477	46	39	85
Released Sublegal	353	525	878	70	310	380
Landed Only	16	3,261	3,277	2	1,758	1,760

Table 3.11 Monthly sample rates (Total retained Chinook salmon sampled¹ / Estimated retained Chinook salmon) for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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	
February	5 - 9	4 Feb - 3 Mar	1246	2	1248	235	0	235	18.8%
March	10 -13	4 Mar - 31 Mar	414	0	414	128	2	130	30.9%
Season Total			1,660	2	1,662	363	2	365	22.0%

¹ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWTs, from all sites sampled during the winter 2019-20 Marine Area 7 Chinook salmon MSF (the sample-frame sites included in the creel estimates and the fish sampled as part of derbies and other baseline sampling in the Marine Area).

Table 3.12 Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) during the 2019-20 winter Chinook salmon MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status

Week	Start Date	End Date	Released Salmon	
			Coho UK	Unknown Salmon
5	1-Feb	2-Feb	0	0
6	3-Feb	9-Feb	0	11
7	10-Feb	16-Feb	0	11
8	17-Feb	23-Feb	10	24
9	24-Feb	1-Mar	5	0
10	2-Mar	8-Mar	0	0
11	9-Mar	15-Mar	0	0
12	16-Mar	22-Mar	0	4
13	23-Mar	24-Mar	0	0
Season Total:			15	50
Variance:			103	679
Standard Error:			10	26
CV (%):			68	52
95% CI:			0 - 35	0 - 101

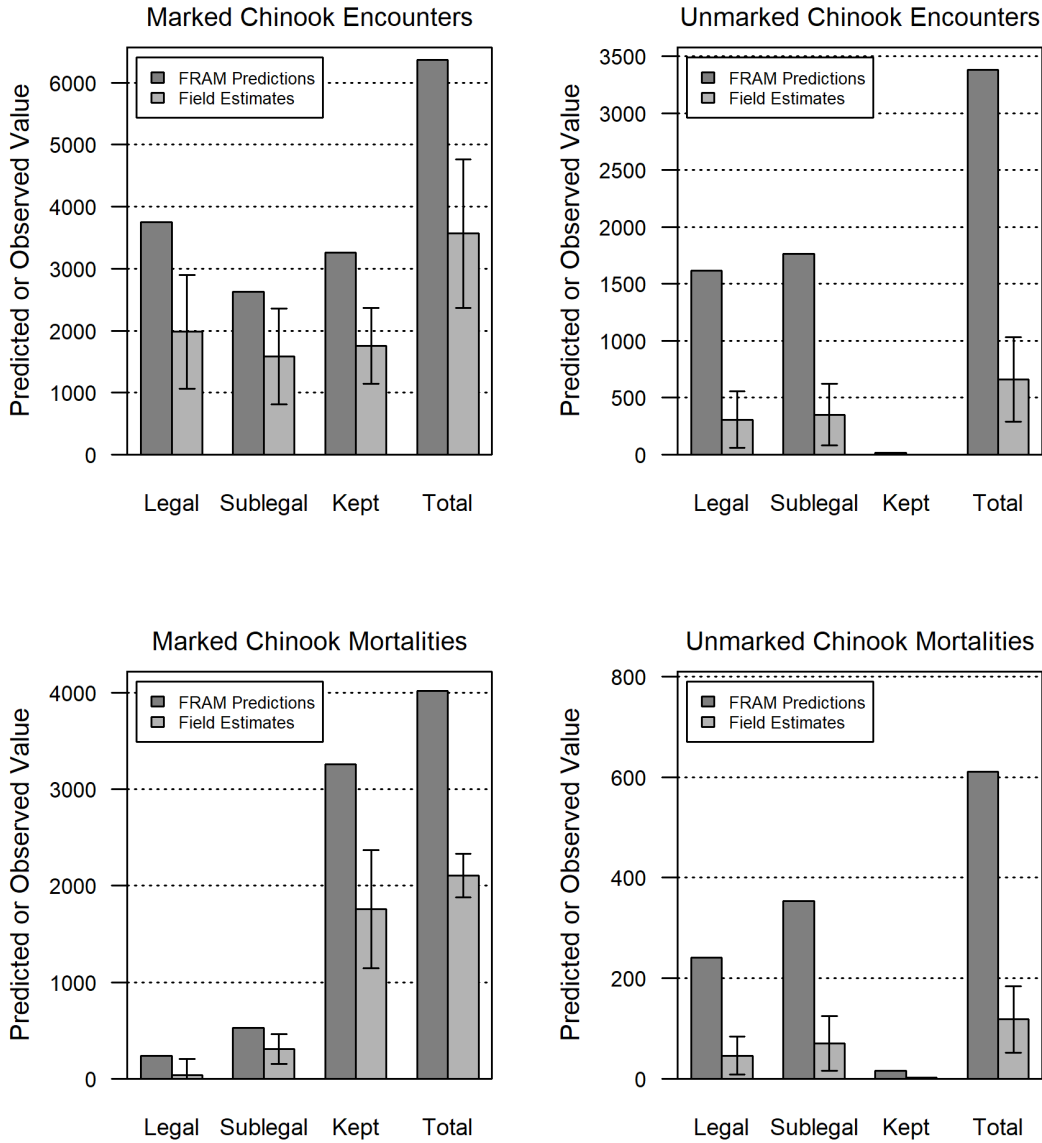


Figure 3.6 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters and mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 7. Error bars represent approximate 95% confidence intervals for field estimates.

Table 3.13 Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the three-site sample frame during the 2019-20 winter Chinook salmon MSF in Marine Area 7. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, f_{ij}
		Start Time	End Time	Total Boats, m_{ij}	Sampled Boats	Active Boats, X_{ij}	Total Boats, S_{yijk}	
3-Feb	WD	12:37	13:41	72	54	40	97	0.556
9-Feb	WE	11:18	12:22	260	140	120	303	0.462
19-Feb	WD	9:54	10:58	95	49	41	114	0.432
21-Feb	WE	10:06	11:12	78	50	35	111	0.449
23-Feb	WE	10:06	11:16	13	6	1	78	0.077
1-Mar	WE	10:33	11:34	151	110	85	195	0.563
8-Mar	WE	10:23	11:31	129	69	50	178	0.388
11-Mar	WD	10:50	11:59	16	5	1	80	0.063
17-Mar	WD	13:01	14:00	57	19	12	90	0.211
20-Mar	WE	10:36	11:50	68	55	33	113	0.485
Season Totals:				939	557	418	1361	
Mean:				94	56	42	136	0.368
St Dev:				73	43	37	71	0.185
CV(%):				77.3%	77.3%	88.8%	52.0%	50.3%

Table 3.14 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 7. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	AD	UM	AD	UM
Kept	307	0	6	0
Released	31	110	209	82
Total	338	110	215	82
Size/mark-status composition	0.45	0.15	0.29	0.11
Bias-corrected size/mark composition	0.40	0.15	0.29	0.16

Table 3.15 Season-total estimates of Chinook salmon encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Marine Area 7 Winter Chinook salmon MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler- trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
7	Feb 1 - Feb 29, 2008	4,862	1,301	2	24	0	200	1,042	244	155	2,967
7	Feb 1 - Apr 15, 2009	8,167	1,406	9	14	0	210	708	139	17	2,501
7	Dec 1, 2009 - Apr 30, 2010	9,589	1,400	0	18	0	209	673	150	74	2,524
7	Dec 1, 2010 - Apr 30, 2011	11,814	2,368	4	10	0	354	1,988	521	531	5,776
7	Dec 1, 2011 - Apr 30, 2012	10,536	2,359	0	54	0	353	1,446	1,935	678	6,825
7	Dec 1, 2012 - Apr 30, 2013	10,322	3,469	3	106	0	518	1,363	817	332	6,609
7	Dec 1, 2013 - Apr 30, 2014	12,382	3,359	11	86	0	502	1,591	941	493	6,982
7	Oct 1 2014 - Feb 15, 2015	9,092	3,423	16	47	0	511	1,062	3,857	1,077	9,992
7	Oct 1 2015- April 30, 2016	11,242	2,523	3	143	0	377	2,147	5,843	2,525	13,562
7	Oct 1 - Apr 21 2017	11,547	4,820	18	233	6	720	2,004	3,811	2,016	13,625
7	Jan 1, 2018 - Apr 30, 2018	8,789	2,156	0	70	0	322	976	2,108	976	6,609
7	Jan 1, 2019 - Apr 15, 2019	13,236	3,701	15	61	0	553	1,532	2,002	1,031	8,894
7	Feb 1, 2020 - Mar 24, 2020	8,462	1,724	0	34	2	258	308	1,552	350	4,228

4) Marine Areas 8-1 & 8-2 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented a fifteenth consecutive winter Chinook salmon MSF in Marine Areas 8-1 and 8-2 from February 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 30, 2020. The PSSU implemented an intensive monitoring program in Marine Areas 8-1 and 8-2 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and collection of STRs 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 the following section we present results from our monitoring activities during the Marine Areas 8-1 and 8-2 winter Chinook salmon MSF from February 1, 2020 through March 24, 2020, when the fishery occurred.

Table 4.1 Sampling/estimation details on target parameters associated with the overall Marine Areas 8-1 and 8-2 Chinook salmon MSF 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.)
		Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Boat trip	Season	Because the encounter proportions from the Dockside sampling were very similar for areas 8-1 and 8-2, these data were combined and bias-corrected encounter proportions from the Dockside data (Table 4.12) used to produce encounter and mortality estimates.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., “size measures” or “weights” of sampled sites) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats and anglers.	Month	A total of 4 boat surveys were conducted during the nine-week fishery. The results of these surveys were incorporated into multi-year site-weight averages.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Chinook salmon length, age, and DNA-based ² stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	Only 5 Chinook were caught by the test fishery in Area 8-1 (Table 4.11), so these data were not used to produce encounter and mortality estimates.
Voluntary Trip Reports (STRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho) that the angler may record on the STR form	Fish encounter	Season (6 months)	STR data (Table 4.10) were not used to estimate the size/mark-status proportions (LM = 0%, LU = 25%, SM = 75%, SU = 0%) needed to produce encounter and mortality estimates due to low sample size.

Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook salmon	N/A	Season (6 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire Tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (6 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

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 Chinook salmon catch (retained and releases) during the 2019-20 winter Chinook salmon MSF in Marine Area 8-1. 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	
Feb	5	1-Feb	2-Feb	0	0	0	0	0	0	0
	6	3-Feb	9-Feb	78	111	3	0	11	3	17
	7	10-Feb	16-Feb	53	61	6	0	21	5	32
	8	17-Feb	23-Feb	44	92	7	0	26	7	40
	9	24-Feb	1-Mar	50	118	23	0	88	22	133
Mar	10	2-Mar	8-Mar	32	71	9	0	35	9	52
	11	9-Mar	15-Mar	9	19	4	0	16	4	24
	12	16-Mar	22-Mar	41	79	14	0	51	13	77
	13	23-Mar	24-Mar	3	6	0	0	0	0	0
Sub-Total:				308	556	66	0	248	62	376
Everett Blackmouth Derby				41	123	14	0	53	13	80
Season Total:				349	679	80	0	300	76	456
Variance:				3,255	8,868	249	0	4,642	205	9,638
SE:				57	94	16	0	68	14	98
CV (%):				16	14	20	0	23	19	22
95% CI:				237 - 461	494 - 864	49 - 111	0 - 0	167 - 434	48 - 104	263 - 648

Table 4.3 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the Marine Area 8-1 Chinook salmon MSF.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	27	0	27
Unmarked	0	0	0
Total	27	0	27

Table 4.4 Estimates of total fishing effort and total Chinook salmon catch (retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 8-2. 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	
Feb	5	1-Feb	2-Feb	0	0	0	0	0	0	0
	6	3-Feb	9-Feb	225	531	41	0	143	37	221
	7	10-Feb	16-Feb	145	336	42	2	147	36	227
	8	17-Feb	23-Feb	180	355	23	2	81	19	124
	9	24-Feb	1-Mar	292	588	55	0	192	49	295
Mar	10	2-Mar	8-Mar	165	328	24	0	85	22	131
	11	9-Mar	15-Mar	101	220	18	4	64	13	99
	12	16-Mar	22-Mar	354	761	75	0	263	67	406
	13	23-Mar	24-Mar	57	121	21	0	73	19	112
Sub-Total:				1518	3,240	299	8	1047	260	1615
Everett Blackmouth Derby				31	93	19	0	66	17	102
Season Total:				1,549	3,333	318	8	1114	277	1717
Variance:				34,402	173,121	2,368	13	44,964	2,252	92,235
SE:				185	416	49	4	212	47	304
CV (%):				12	12	15	45	19	17	18
95% CI:				1,186 - 1,913	2,517 - 4,148	223 - 414	1 - 15	698 - 1,529	184 - 370	1,122 - 2,312

Table 4.5 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the Area 8-2 Chinook salmon MSF.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	106	6	112
Unmarked	4	0	4
Total	110	6	116

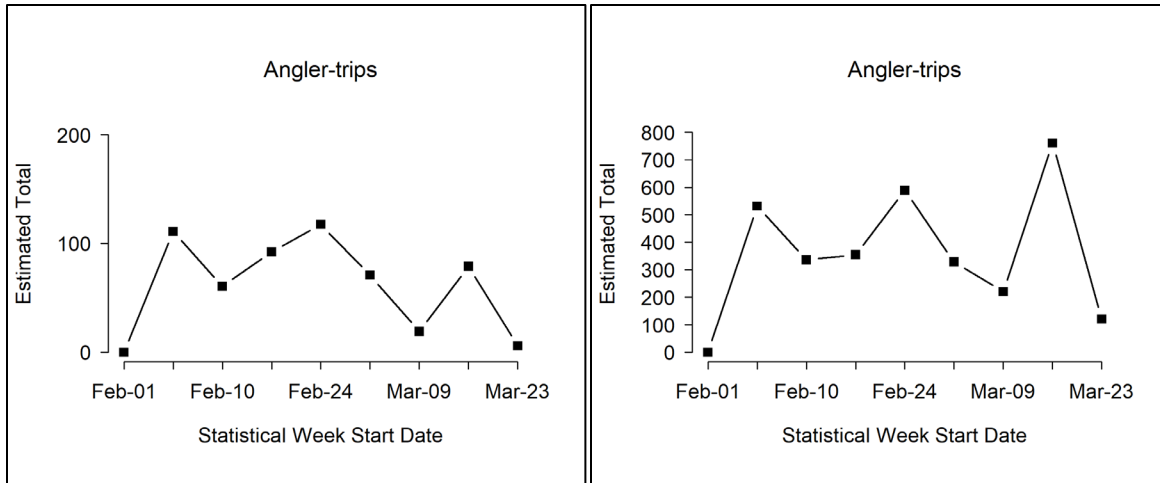


Figure 4.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (left panel) and 8-2 (right panel).

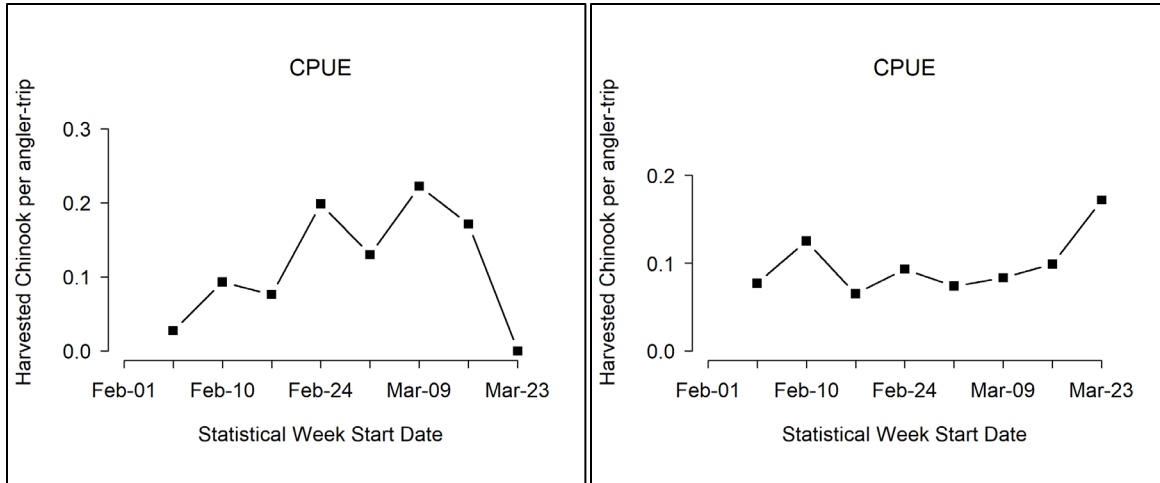


Figure 4.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (left panel) and 8-2 (right panel).

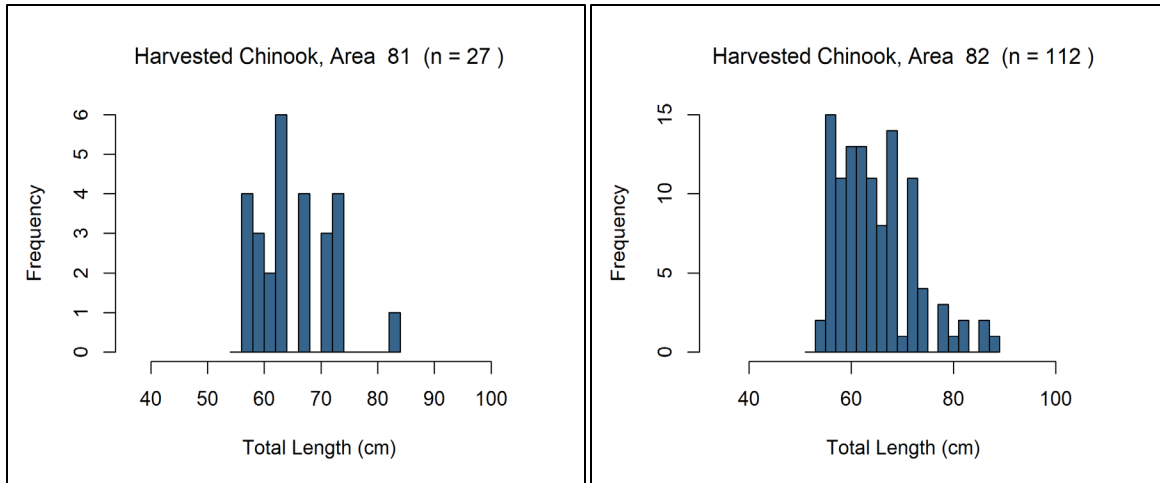


Figure 4.3 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (left panel) and 8-2 (right panel). Note: displayed values are observations where lengths were taken.

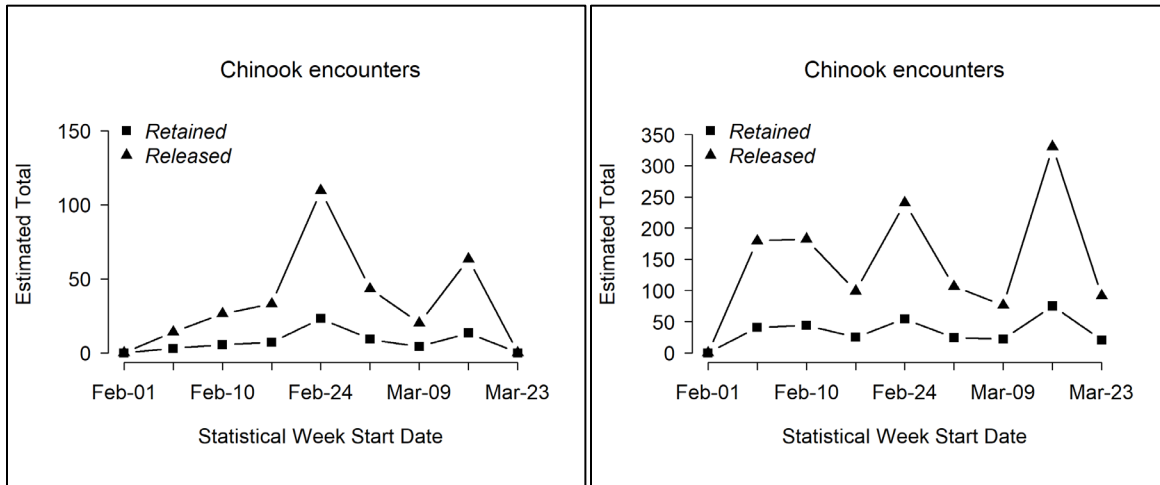


Figure 4.4 Temporal patterns in Chinook encounters (retained and released) during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (left panel) and 8-2 (right panel).

Table 4.6 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	N Puget Sound (25%)	Whitehorse Springs	Whitehorse Pond	1 (25%)	0
	Mid Puget Sound (25%)	Icy Cr 09.0125	Icy Cr Hatchery	1 (25%)	0
	S Puget Sound (50%)	Clear Cr 11.0013C	Clear Creek Hatchery	1 (25%)	1
		Minter Cr 15.0048	Minter Cr Hatchery	1 (25%)	0
	Total			4	1

Table 4.7 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSFs in Marine Area 8-1 AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
Clear Creek Hatchery	2017	1	2.8	5.2	2.8	0.3	0.052	0.23
Total		1	2.8	5.2	2.8	0.3	0.052	0.23

Table 4.8 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-2. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	N Puget Sound (5.3%)	Wallace R 07.0940	Wallace R Hatchery	1 (5.3%)	0
		Whitehorse Springs	Whitehorse Pond	1 (5.3%)	0
	Skagit River (5.3%)	County Line Cr3.2363	Marblemount Hatchery	1 (5.3%)	0
	Mid Puget Sound (63.2%)	Big Soos Cr 09.0072	Soos Creek Hatchery	1 (5.3%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	1 (5.3%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	3 (15.8%)	3
		Icy Cr 09.0125	Icy Cr Hatchery	7 (36.8%)	0
	S Puget Sound (21.1%)	Deschutes R 13.0028	Tumwater Falls Hatchery	1 (5.3%)	0
		Minter Cr 15.0048	Minter Cr Hatchery	2 (10.5%)	0
		Minter Cr Tr 15.0051	Hupp Springs Rearing	1 (5.3%)	0
	Total				19

Table 4.9 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSFs in Marine Area 8-2 AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
Grovers Cr Hatchery	2017	3	8.4	15.31	8.1	0.8	0.141	0.65
Total		3	8.4	15.31	8.1	0.8	0.141	0.65

Table 4.10 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (*upper panel*), 8-2 (*middle panel*) and combined (*lower panel*), 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 provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
8-1 Private STR	4 1-trip STRs	1	0	12	3	16	0.81	1.00
Size/mark-status composition:		0.06	0.00	0.75	0.19			
Variance:		(0.0039)	(0.0000)	(0.0125)	(0.0102)			
Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
8-2 Private STR	2 1-trip STRs	0	2	6	0	8	0.75	0.00
Size/mark-status composition:		0.00	0.25	0.75	0.00			
Variance:		(0.0000)	(0.0268)	(0.0268)	(0.0000)			

Table 4.11 Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 8-1. 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	Hrs Fished	AD	UM	AD	UM	
12	2	12.0	0	0	1	0	1
13	2	8.4	0	0	3	1	4
Total	4	20.4	0	0	4	1	5
Size/mark-status composition:			0.00	0.00	0.80	0.20	
Variance:			(0.0000)	(0.0000)	(0.0400)	(0.0400)	
Legal size mark rate:			0.00				
Overall mark rate:			0.80				

Table 4.12 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Areas 8-1 and 8-2. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters					
Data Source	Status	Legal		Sublegal	
		LM	LU	SM	SU
8-1	Kept	27	0	0	0
	Released	5	5	90	6
	Total	32	5	90	6
	Size/mark-status composition	0.24	0.04	0.68	0.05
	Bias-corrected size/mark composition	0.21	0.04	0.68	0.07
8-2	Kept	106	4	6	0
	Released	5	25	303	49
	Total	111	29	309	49
	Size/mark-status composition	0.22	0.06	0.62	0.10
	Bias-corrected size/mark composition	0.20	0.06	0.62	0.12
Combined	Kept	133	4	6	0
	Released	10	30	393	55
	Total	143	34	399	55
	Size/mark-status composition	0.23	0.05	0.63	0.09
	Bias-corrected size/mark composition	0.20	0.05	0.63	0.11

Table 4.13 Summary of season-wide fishery impact estimates for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (*upper panel*) and 8-2 (*lower panel*). 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	92	80	12	2	82	265	16	50 - 114	20
Legal UM	25	0	25	4	4	1	1	2 - 6	28
Sublegal AD	288	0	288	58	58	158	13	33 - 82	22
Sublegal UM	51	0	51	10	10	6	3	5 - 15	25
Total	456	80	376	73	153	430	21	113 - 194	14

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	346	301	45	7	308	2,313	48	214 - 402	16
Legal UM	93	8	84	13	21	26	5	11 - 31	24
Sublegal AD	1086	17	1069	214	231	1574	40	153 - 309	17
Sublegal UM	192	0	192	38	38	68	8	22 - 55	21
Total	1,717	326	1391	272	598	3,981	63	474 - 722	11

Table 4.14 Comparison of modeled (FRAM model run 2719. UPDATE) and estimated total Chinook salmon encounters for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 and 8-2, combined. 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	894	254	640	8
	AD	3,437	915	2,522	796
	Total	4,331	1,169	3,162	804
	% Marked	79	78	80	99
Estimated (Creel) Encounters	UM	361	117	244	8
	AD	1812	438	1374	398
	Total	2,173	555	1618	406
	% Marked	83	79	85	98

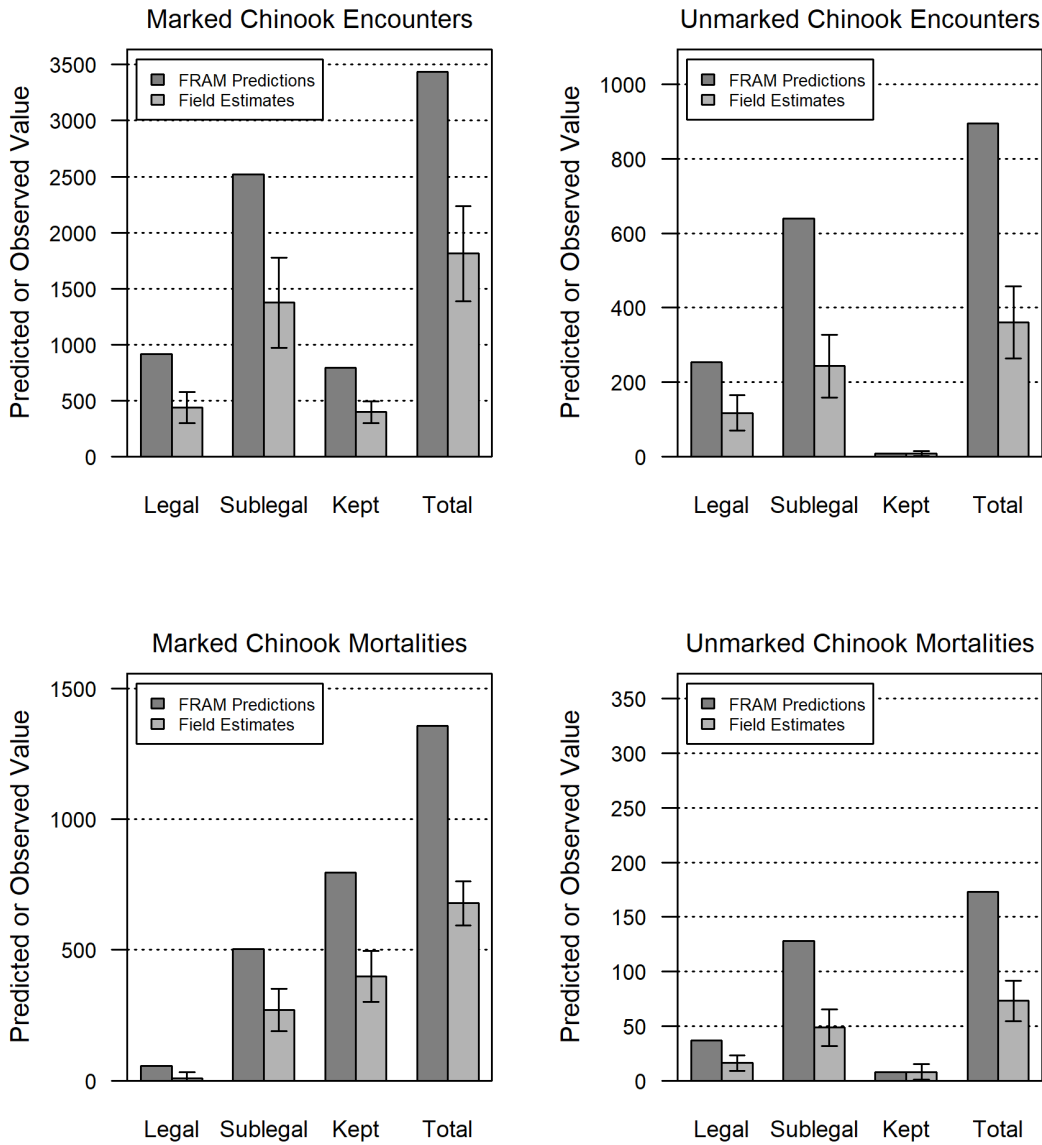


Figure 4.5 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters and mortalities for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 and 8-2, combined. Error bars represent approximate 95% confidence intervals for field estimates.

Table 4.15 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon mortalities for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 and 8-2, combined. 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)	173	1,357	1,530	73	678	751
Released Legal	37	57	94	16	9	25
Released Sublegal	128	504	632	49	271	320
Landed Only	8	796	804	8	398	406

Table 4.16 Monthly sample rates (Total retained Chinook salmon sampled¹ / Estimated retained Chinook salmon) for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 (upper panel) and 8-2 (lower panel).

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
February	5 - 9	1 Feb - 1 Mar	39	0	39	17	0	17	43.60%
March	10 -13	2 Mar - 24 Mar	41	0	41	11	0	11	26.80%
Season Total			80	0	80	28	0	28	35.00%

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
February	5 - 9	1 Feb - 1 Mar	161	4	165	71	3	74	44.80%
March	10 -13	2 Mar - 24 Mar	158	4	161	43	1	44	27.30%
Season Total			318	8	326	114	4	118	36.10%

¹ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWTs, from all sites sampled during the winter 2019-20 Marine Area 8-1, 8-2 Chinook salmon MSFs (the sample-frame sites included in the creel estimates and the fish sampled as part of derbies and other baseline sampling in the Marine Area).

Table 4.17 Fishery-total estimates of retained and released salmon (other than Chinook salmon) during the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 and 8-2. AD = marked (adipose-clipped), UM = Unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error.

Month	Stat Week	Start Date	End Date	8-2 Retained	8-2 Released		
				Unknown Salmon	Coho AD	Coho UK	Unknown Salmon
Feb	5	1-Feb	2-Feb	0	0	0	0
	6	3-Feb	9-Feb	0	0	0	4
	7	10-Feb	16-Feb	0	0	0	0
	8	17-Feb	23-Feb	0	2	6	6
	9	24-Feb	1-Mar	2	0	6	31
Mar	10	2-Mar	8-Mar	0	0	0	8
	11	9-Mar	15-Mar	0	0	0	0
	12	16-Mar	22-Mar	0	0	2	0
	13	23-Mar	24-Mar	0	0	0	0
Season Total:				2	2	13	50
Variance:				2	2	100	232
SE:				1	1	10	15
CV (%):				64	61	74	31
95% CI:				0 - 5	0 - 5	0 - 33	20 - 79

Table 4.18 Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2019-20 winter Chinook salmon MSFs in Marine Areas 8-1 and 8-2. Bold sites indicate those included in the dockside sample frame.

Area		Total Anglers		Season Total (unadjusted) Size Measure	
		WD	WE	WD	WE
8-1	Camano Island State Park	7	0	0.7000	0.0000
	Everett Ramp	1	10	0.1000	0.7143
	Maplegrove Ramp, Camano Is	1	2	0.1000	0.1429
	Oak Harbor Marina	1	2	0.1000	0.1429
Area 8-1 Total Anglers		10	14	1	1
8-2	Bayside Marina/Drystack	0	2	0.0952	0.0000
8-2	Camano Island State Park	0	2	0.0952	0.0000
8-2	Dagmar's Landing	0	2	0.0952	0.0000
8-2	Everett Marina	0	1	0.0476	0.0000
8-2	Everett Ramp	0	14	0.6667	0.0000
Area 8-2 Total Anglers		0	21	1	0

Table 4.19 Season-total estimates of Chinook salmon encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Marine Areas 8-1 and 8-2 winter Chinook salmon MSFs. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Area	Season Dates	Effort (Angler-trips)	Retained				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
8-1	Oct 1, 2005 - Apr 30, 2006	3,976	303	0	39	0	45	188	763	575	1,914
8-1	Oct 1, 2006 - Apr 30, 2007	3,454	278	8	37	4	42	118	1,437	857	2,781
8-1	Nov 1, 2007 - Apr 30, 2008	3,288	638	5	36	0	95	304	1,345	577	3,000
8-1	Jan 1, 2009 - Apr 30, 2009	2,518	396	12	7	0	59	45	1,443	909	2,870
8-1	Nov 1, 2009 - Apr 30, 2010	3,192	273	0	11	0	41	45	595	269	1,234
8-1	Nov 1, 2010 - Apr 30, 2011	2,398	87	0	9	0	13	15	91	69	283
8-1	Nov 1, 2011 - Apr 30, 2012	2,767	284	0	7	0	42	136	1,027	272	1,768
8-1	Nov 1, 2012 - Apr 30, 2013	2,046	268	0	14	0	40	88	955	793	2,158
8-1	Nov 1, 2013 - Apr 30, 2014	1,579	97	0	3	0	15	34	70	37	255
8-1	Nov 1, 2014 - Apr 30, 2015	1,927	151	0	0	0	23	35	416	658	1,282
8-1	Nov 1, 2015 - Apr 30, 2016	2,312	448	2	44	0	67	150	1764	594	3,069
8-1	Nov 1, 2016 - Apr 30, 2017	2774	452	0	17	0	68	243	295	104	1,179
8-1	Nov 1, 2017 - Apr 30, 2018	2325	470	19	0	0	70	51	610	192	1,411
8-1	Dec 1, 2018 - Apr 10, 2019	2044	387	0	4	0	58	127	313	64	953
8-1	Feb 1, 2020 - Mar 24, 2020	679	80	0	0	0	12	25	288	51	456
8-2	Oct 1, 2005 - Apr 30, 2006	8,521	735	40	35	0	106	618	1,706	876	4,116
8-2	Oct 1, 2006 - Apr 30, 2007	7,848	766	18	95	3	113	183	10,486	5,407	17,071
8-2	Nov 1, 2007 - Apr 30, 2008	5,678	795	15	74	3	114	181	942	303	2,428
8-2	Jan 1, 2009 - Apr 30, 2009	5,946	495	15	14	0	74	18	1,557	468	2,641
8-2	Nov 1, 2009 - Apr 30, 2010	6,732	814	4	10	0	122	164	1,300	487	2,902
8-2	Nov 1, 2010 - Apr 30, 2011	3,505	111	0	5	0	17	20	122	88	363
8-2	Nov 1, 2011 - Apr 30, 2012	5,197	470	2	27	0	70	223	1,683	450	2,925
8-2	Nov 1, 2012 - Apr 30, 2013	4,260	346	0	17	0	52	113	1,231	1,021	2,780
8-2	Nov 1, 2013 - Apr 30, 2014	4,076	369	0	13	0	55	127	266	139	970
8-2	Nov 1, 2014 - Apr 30, 2015	3,953	186	0	2	0	28	43	510	810	1,578
8-2	Nov 1, 2015 - Apr 30, 2016	4,525	486	0	42	0	73	165	1920	645	3,331
8-2	Nov 1, 2016 - Apr 30, 2017	5,850	823	0	27	0	123	149	1218	100	2,440
8-2	Nov 1, 2017 - Apr 30, 2018	4,467	599	0	48	0	89	89	729	244	1,799
8-2	Dec 1, 2018 - Apr 10, 2019	6,730	1,231	0	55	2	184	404	956	200	3,033
8-2	Feb 1, 2020 - Mar 24, 2020	3,333	301	8	17	0	45	84	1069	192	1,717

5) Marine Area 9 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented a thirteenth consecutive winter Chinook salmon MSF in Marine Area 9 from February 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 15, 2020. The PSSU implemented an intensive monitoring program in Marine Area 9 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, aerial effort surveys, test fishing and collection of STRs from the angling public. **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 the following section we present results from our monitoring activities during the Marine Area 9 winter Chinook salmon MSF. In addition to the major components of the results described previously (page 3), we present the aerial survey and dockside data used to estimate the sample fraction in Marine Area 9 (see WDFW 2012a, *Aerial-Access Design*). The four sites included in the Area 9 dockside sample frame are Port Townsend Ramp, Kingston Ramp, Everett Ramp and Edmonds Ramp, which are assumed to be the highest-use access sites for Area 9 anglers. The Olympic Peninsula Derby took place from March 13-15, 2020 over portions of Marine Areas 6 and 9. Total derby effort was allocated to each Marine Area using the proportion of effort that occurred in each area based on dockside sampling efforts at designated weigh-in stations during the derby. Total catch by Marine Area was obtained from the derby organizers.

Table 5.1 Sampling/estimation details on target parameters associated with the overall Marine Area 9 winter Chinook salmon MSF 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.
Aerial Surveys	Fraction of Marine Area 9 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, f_{ij}).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Month	The sample fraction was calculated for individual aerial survey dates (see Table 5.13 ; $n=9$ surveys conducted out of $N=53$ days available in the season).
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Chinook salmon length, age, and DNA-based ² stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	We did not use the test fishery data to estimate the size/mark-status proportions (LM = 14%, LU = 5%, SM = 57% and SU = 23%); see Table 5.10 needed to produce encounter and mortality estimates, due to low sample size and the CV for the estimate of %LM was > 20%.
Voluntary Trip Reports (STRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho) that the angler may record on the STR form	Fish encounter	Season	STR data (Table 5.9) were used to estimate the size/mark-status proportions (LM = 36%, LU = 13%, SM = 43%, SU = 7%) needed to produce encounter and mortality estimates.
Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook salmon	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 5.2 Estimates of total fishing effort and total Chinook salmon catch (retained and released) during the 2019-20 winter Chinook salmon 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	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Feb	5	1-Feb	2-Feb	4	8	0	0	0	0	0
	6	3-Feb	9-Feb	550	1174	121	0	172	76	368
	7	10-Feb	16-Feb	276	570	88	0	125	55	267
	8	17-Feb	23-Feb	256	472	62	0	88	39	189
	9	24-Feb	1-Mar	354	705	63	0	89	39	191
Mar	10	2-Mar	8-Mar	212	387	49	3	70	28	150
	11	9-Mar	15-Mar	55	112	11	0	15	7	33
	12	16-Mar	22-Mar	406	846	71	0	101	45	216
	13	23-Mar	24-Mar	67	138	12	0	17	7	36
Sub-Total:				2179	4,411	476	3	677	296	1,452
Olympic Peninsula Derby				126	284	62	0	88	39	189
Everett Blackmouth Derby				78	234	36	0	51	23	110
Season Total:				2,383	4,929	574	3	816	358	1,751
Variance:				135,022	626,608	13,025	3	83,047	9,638	178,340
SE:				367	792	114	2	288	98	422
CV (%):				15%	16%	20%	61%	35%	27%	24%
95% CI:				1,663 - 3,103	3,378 - 6,481	350 - 797	0 - 6	251 - 1,381	166 - 550	923 - 2,578

Table 5.3 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the during the 2019-20 winter Chinook salmon MSF in Area 9.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	159	7	166
Unmarked	1	0	1
Total	160	7	167

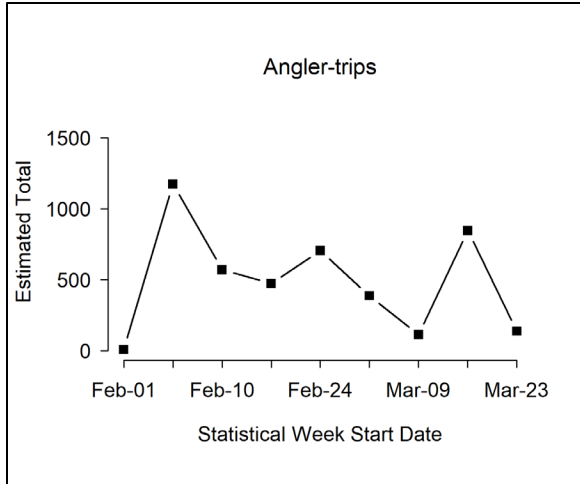


Figure 5.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 9.

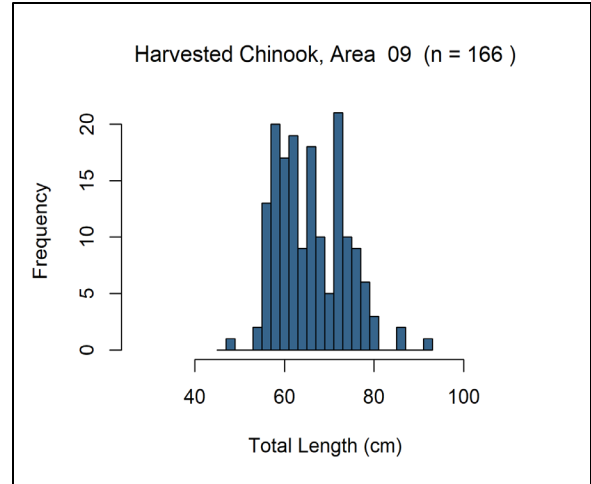


Figure 5.3 Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 9. Note: displayed values are observations where lengths were taken.

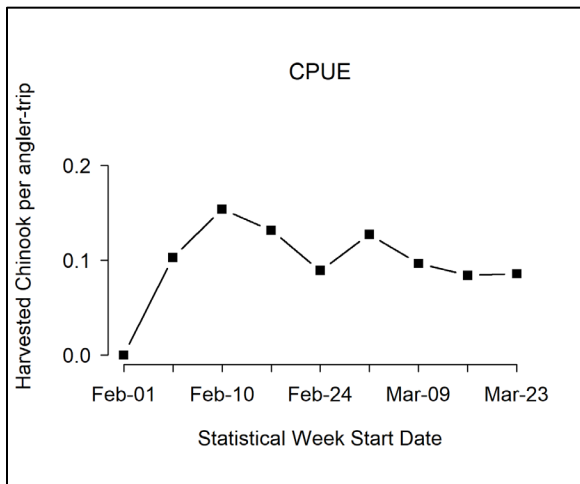


Figure 5.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 9.

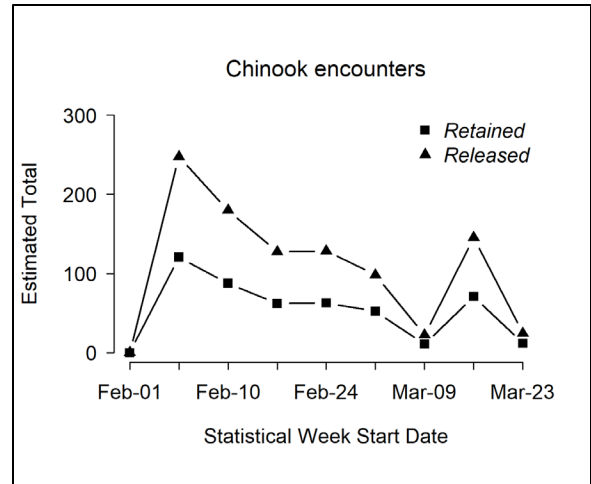


Figure 5.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 9.

Table 5.4 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 9. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Thompson River (3.3%)	R-Chilliwack R	H-Chilliwack River H	1 (3.3%)	0
WA	N Washington (6.7%)	Skookum Cr 01.0273	Skookum Cr Hatchery	1 (3.3%)	0
		Kendall Cr 01.0406	Kendall Cr Hatchery	1 (3.3%)	0
	Hood Canal (10%)	Purdy Cr 16.0005	George Adams Hatchery	2 (6.7%)	0
		Finch Cr 16.0222	Hoodsport Hatchery	1 (3.3%)	0
	N Puget Sound (16.7%)	Stillaguamish R -Sf	Brenner Hatchery	1 (3.3%)	0
		Wallace R 07.0940	Wallace R Hatchery	2 (6.7%)	0
		Whitehorse Springs	Whitehorse Pond	2 (6.7%)	0
	Skagit River (3.3%)	Cascade R 03.1411	Marblemount Hatchery	1 (3.3%)	0
	Mid Puget Sound (30%)	Big Soos Cr 09.0072	Soos Creek Hatchery	1 (3.3%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	4 (13.3%)	4
		Icy Cr 09.0125	Icy Cr Hatchery	3 (10%)	0
		Sammamish R 08.0057	Issaquah Hatchery	1 (3.3%)	0
	S Puget Sound (26.7%)	Deschutes R 13.0028	Tumwater Falls Hatchery	1 (3.3%)	0
Kalama Cr 11.0017		Kalama Cr Hatchery	2 (6.7%)	0	
Minter Cr 15.0048		Minter Cr Hatchery	5 (16.7%)	0	
Col Riv	Central Columbia River (3.3%)	Spring Cr 29.0159	Spring Cr Nfh	1 (3.3%)	1
Total				30	5

Table 5.5 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
Grovers Cr Hatchery	2017	4	13.8	33.89	13.3	1.3	0.313	1.12
Spring Cr Nfh	2017	1	3.5	8.47	3.5	0.3	0.085	0.29
Total		5	17.3	42.36	16.7	1.7	0.398	1.41

Table 5.6 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters for the 2019-20 winter Chinook salmon 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	1471	460	1011	5
	AD	3,207	1,468	1,739	1277
	Total	4,678	1,928	2,750	1282
	% Marked	69	76	63	100
Estimated (Creel) Encounters	UM	361	235	126	3
	AD	1,390	632	758	574
	Total	1,751	866	884	577
	% Marked	79	73	86	99

Table 5.7 Summary of season-wide fishery impact estimates for the 2019-20 winter Chinook salmon 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	632	550	82	12	562	12,950	114	339 - 785	20
Legal UM	235	3	232	35	38	154	12	13 - 62	33
Sublegal AD	758	24	734	147	171	1,711	41	90 - 252	24
Sublegal UM	126	0	126	25	25	118	11	4 - 47	43
Total	1,751	577	1,174	219	796	14,933	122	556 - 1,035	15

Table 5.8 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 7. 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)	275	1,717	1,992	63	733	796
Released Legal	68	92	160	35	12	47
Released Sublegal	202	348	550	25	147	172
Landed Only	5	1,277	1282	3	574	577

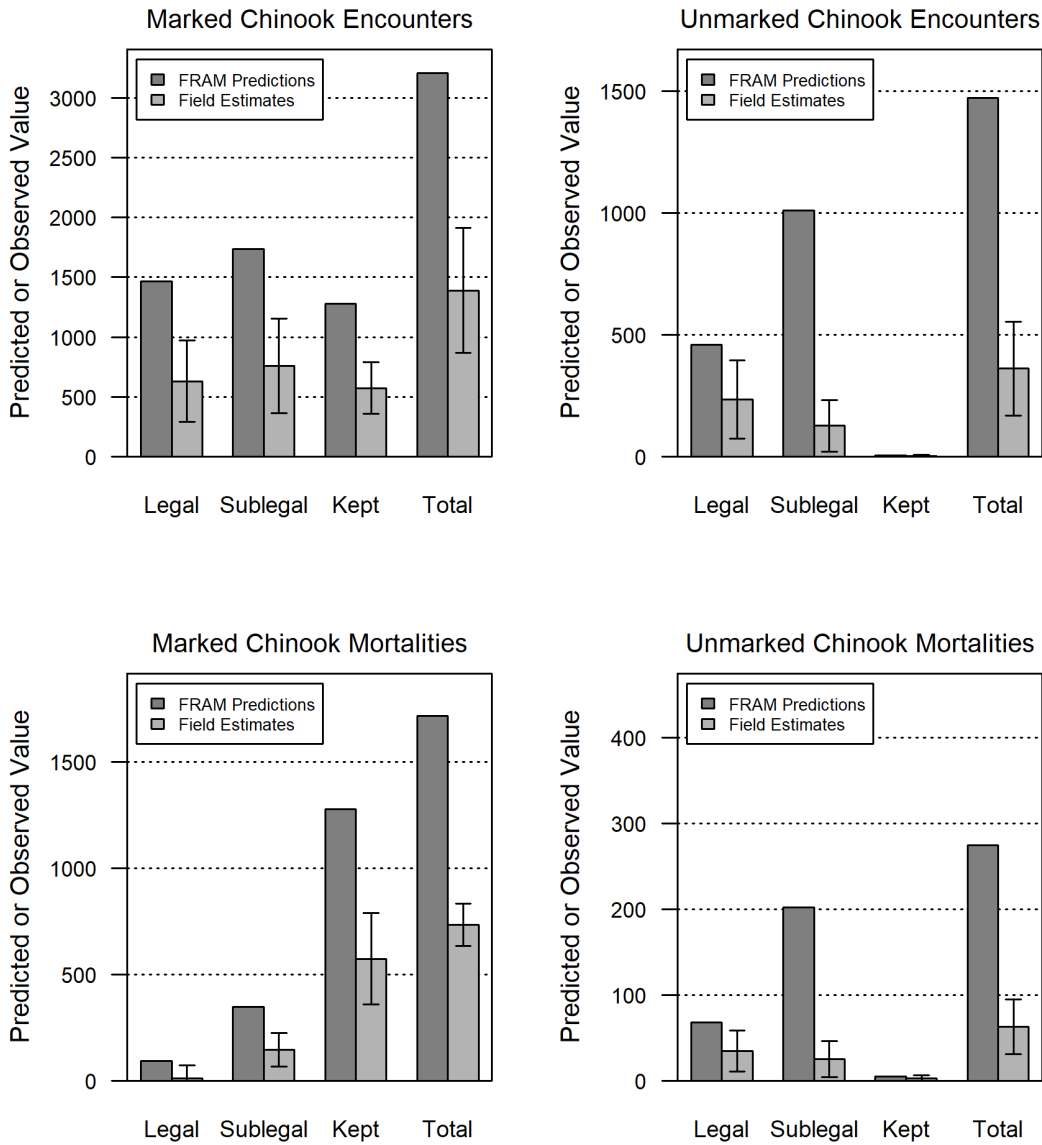


Figure 5.5 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters and mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 9. Error bars represent approximate 95% confidence intervals for field estimates

Table 5.9 Total Chinook salmon encountered (retained and released) by private-boat and charter anglers logging their trips on STRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2019-20 winter Chinook salmon 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 STR	20 1-trip STRs	35	13	42	7	97	0.79	0.73
Size/mark-status composition:		0.36	0.13	0.43	0.07			
Variance:		(0.0024)	(0.0012)	(0.0026)	(0.0007)			

Table 5.10 Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs Fished	AD	UM	AD	UM	
5	1	5.43	0	0	1	0	1
6	2	13.39	3	0	3	2	8
7	3	19.11	1	0	6	1	8
8	3	19.66	2	0	3	2	7
9	2	13.30	0	0	6	1	7
10	1	6.43	0	1	0	0	1
11	1	3.22	0	0	1	1	2
12	3	17.49	0	0	3	3	6
13	1	6.90	0	1	1	0	2
Total	17	104.94	6	2	24	10	42
Size/mark-status composition:			0.14	0.05	0.57	0.24	
Variance:			(0.0030)	(0.0011)	(0.0060)	(0.0044)	
Legal size mark rate:			0.75				
Overall mark rate:			0.71				

Table 5.11 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 9. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters					
Status	Legal		Sublegal		
	LM	LU	SM	SU	
Kept	159	1	7	0	
Released	12	47	256	64	
Total	171	48	263	64	
Size/mark-status composition		0.31	0.09	0.48	0.12
Bias-corrected size/mark composition		0.28	0.09	0.48	0.15

Table 5.12 Monthly sample rates (Total retained Chinook salmon sampled¹ / Estimated retained Chinook salmon) in the 2019-20 winter Chinook salmon 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	
February	6 - 9	1 Feb - 1 Mar	333	0	333	131	0	131	39.30%
March	10 - 13	2 Mar - 24 Mar	205	3	208	41	1	42	20.20%
Season Total			538	3	541	172	1	173	32.00%

¹ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWTs, from all sites sampled during the winter 2019-20 Marine Area 9 Chinook salmon MSF (the sample-frame sites included in the creel estimates and the fish sampled as part of derbies and other baseline sampling in the Marine Area).

Table 5.13 Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the four-site sample frame during the 2019-20 winter Chinook salmon MSF in Marine Area 9. See Methods Report (WDFW 2012a) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, f_{ij}
		Start Time	End Time	Total Boats, m_{ij}	Sampled Boats	Active Boats, X_{ij}	Total Boats, $S_{Y_{ijk}}$	
3-Feb	WD	12:14	12:36	69	40	31	89	0.449
9-Feb	WE	10:54	11:14	179	124	94	236	0.525
19-Feb	WD	9:33	9:50	36	27	19	51	0.528
21-Feb	WE	9:31	10:01	40	33	21	63	0.525
23-Feb	WE	9:32	9:59	8	9	6	12	0.750
1-Mar	WE	9:02	9:34	106	65	45	153	0.425
8-Mar	WE	9:04	9:32	66	53	31	113	0.470
17-Mar	WD	11:40	12:09	48	21	15	67	0.313
20-Mar	WE	9:14	9:42	29	32	17	55	0.586
Season Totals:				581	404	279	839	
Mean:				65	45	31	93	0.508
St Dev:				51	34	26	67	0.120
CV(%):				79.4%	75.7%	84.5%	71.8%	23.7%

Table 5.14 Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) during the 2019-20 winter Chinook salmon 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		
			Unknown	Coho UM	Coho UK	Unknown
5	1-Feb	2-Feb	0	0	0	0
6	3-Feb	9-Feb	0	0	7	52
7	10-Feb	16-Feb	0	0	4	4
8	17-Feb	23-Feb	0	4	3	24
9	24-Feb	1-Mar	0	7	0	24
10	2-Mar	8-Mar	0	0	9	9
11	9-Mar	15-Mar	0	0	0	0
12	16-Mar	22-Mar	3	0	0	18
13	23-Mar	24-Mar	0	0	0	0
Season Total:			3	11	23	129
Variance:			3	51	83	1765
Standard Error:			2	7	9	42
CV (%):			61%	66%	40%	32%
95% CI:			0 - 6	0 - 25	5 - 40	47 - 212

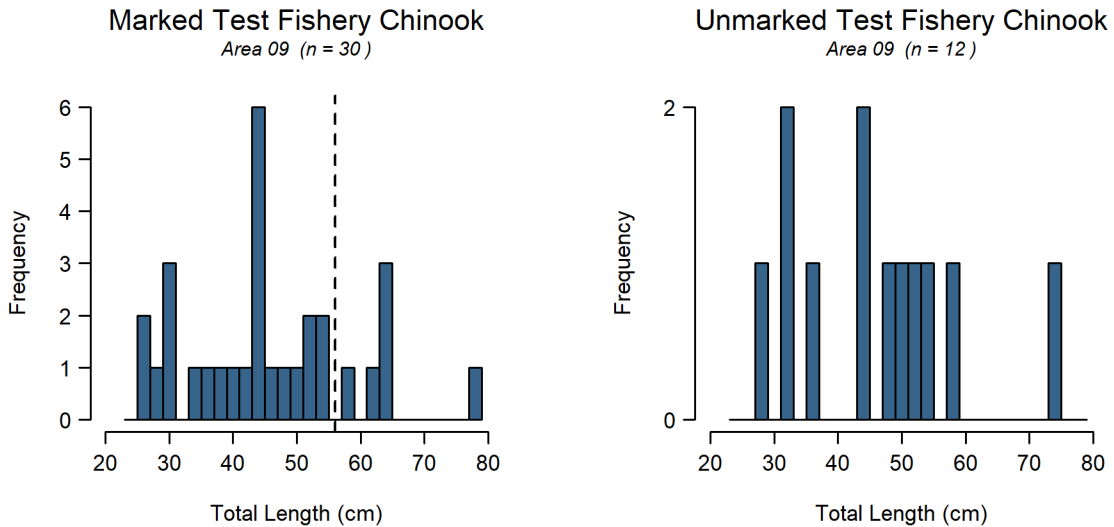


Figure 5.6 Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook salmon encountered by test fishers during the 2019-20 winter Chinook salmon MSF in Marine Area 9. The vertical dashed line in the left panel corresponds to the legal-size limit (22 in or 56 cm)

Table 5.15 Season-total estimates of Chinook salmon encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Marine Area 9 Winter Chinook salmon MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Season Dates	Effort (Angler- trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jan 16, 2007 - Apr 15, 2008	6,887	1,333	3	72	0	195	304	1,288	375	3,570
Nov 1-30, 2008 & Jan 16 - Apr 15, 2009	7,064	871	14	14	0	130	158	3,520	2,837	7,545
Nov 1-30, 2009 & Jan 16 - Apr 15, 2010	6,823	1,450	18	106	10	217	353	2,166	615	4,934
Nov 1-30, 2010 & Jan 16 - Apr 15, 2011	4,425	428	0	3	0	64	117	583	422	1,618
Nov 1-30, 2011 & Jan 16 - Apr 15, 2012	4,361	421	0	34	3	63	140	1,433	548	2,642
Nov 1-30, 2012 & Jan 16 - Apr 15, 2013	6,801	1,504	0	31	18	225	469	2,617	986	5,849
Nov 1-30, 2013 & Jan 16 - Apr 15, 2014	7,910	2,003	0	61	19	299	767	2,460	611	6,221
Nov 1-30, 2014 & Jan 16 - Apr 15, 2015	9,192	1,476	21	46	0	221	432	2,554	679	5,427
Jan 16, 2016 - Apr 15, 2016	9,330	1,894	0	95	0	283	371	4,444	1,204	8,290
Nov 1-30, 2017 & Feb 16 - Apr 15, 2018	7,954	2,688	6	189	0	402	1,136	4,378	739	9,539
Jan 1, 2019 - Apr 15, 2019	12,051	3,626	7	119	0	542	857	1,558	457	7,167
Feb 1, 2020 - Mar 24, 2020	4,929	550	3	24	0	82	232	734	126	1,751

6) Marine Area 10 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented a thirteenth consecutive winter Chinook salmon MSF in Marine Area 10 from January 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been March 31, 2020. The PSSU implemented an intensive monitoring program in Marine Area 10 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, test fishing and collection of STRs from the angling public. **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 the following section we present results from our monitoring activities during the Marine Area 10 winter Chinook salmon MSF which occurred from January 1, 2020 through March 24, 2020, the last day of the fishery.

Table 6.1 Sampling/estimation details on target parameters associated with the overall Marine Area 10 winter Chinook salmon MSF 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
		Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Boat trip	Season	Because no LM Chinook were encountered in the test fishery or VTR, but 46 legal-size Chinook were reported in Dockside sampling, bias-corrected encounter proportions from the Dockside data (Table 6.10) used to produce encounter and mortality estimates.
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 were conducted during the nine-week fishery. The results of these surveys were incorporated into multi-year site-weight averages.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook salmon	Chinook salmon length, age, and DNA-based ² stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	Season-total size/mark-status proportions from the test fishery data and charter STR data (p -value=.65) were not used to estimate total Chinook salmon encounters and associated impacts because no LM Chinook were encountered; LM=0%, LU=0%, SM=68%, SU=32%. (See Table 6.4).
Voluntary Trip Reports (STRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho) that the angler may record on the STR form	Fish encounter	Season	Private STR data (Table 6.9) were not used to estimate total Chinook impacts because no LM Chinook were encountered; LM=0%, LU=0%, SM=64%, SU=36%.
Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook salmon	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT)	Marked/unmarked double-index tag (DIT)	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

Impacts Estimation	encounters and mortalities				
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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 6.2 Estimates of total fishing effort and total Chinook salmon catch (retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 10. 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	
Jan	1	1-Jan	5-Jan	104	252	4	0	26	7	37
	2	6-Jan	12-Jan	118	234	0	0	0	0	0
	3	13-Jan	19-Jan	49	86	9	0	65	17	91
	4	20-Jan	26-Jan	25	61	0	0	0	0	0
	5	27-Jan	2-Feb	97	168	7	0	54	14	75
Feb	6	3-Feb	9-Feb	193	365	13	0	96	26	135
	7	10-Feb	16-Feb	123	310	7	0	54	14	75
	8	17-Feb	23-Feb	93	199	5	0	36	10	51
	9	24-Feb	1-Mar	124	232	0	0	0	0	0
Mar	10	2-Mar	8-Mar	80	139	5	0	34	9	47
	11	9-Mar	15-Mar	63	117	0	0	0	0	0
	12	16-Mar	22-Mar	146	308	5	0	36	10	51
	13	23-Mar	24-Mar	23	46	0	0	0	0	0
Season Total				1,238	2,517	55	0	400	108	563
Variance:				40,411	164,185	331	0	25,531	1,216	47,551
SE:				201	405	18	0	160	35	218
CV (%):				16	16	33	0	40	32	39
95% CI:				844 - 1,632	1,723 - 3,311	20 - 91	0 - 0	87 - 714	39 - 176	136 - 991

Table 6.3 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2019-20 winter Chinook salmon MSF in Marine Area 10.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	26	7	33
Unmarked	0	0	0
Total	26	7	33

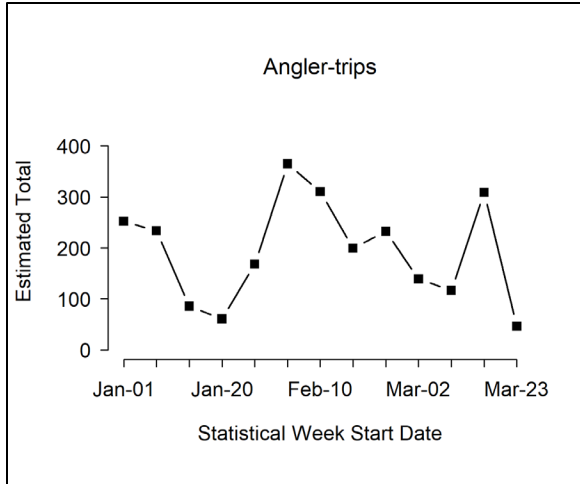


Figure 6.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 10.

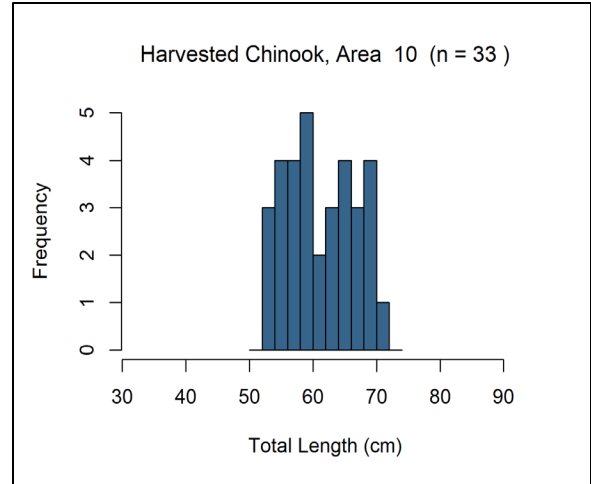


Figure 6.3 Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 10. Note: displayed values are observations where lengths were taken.

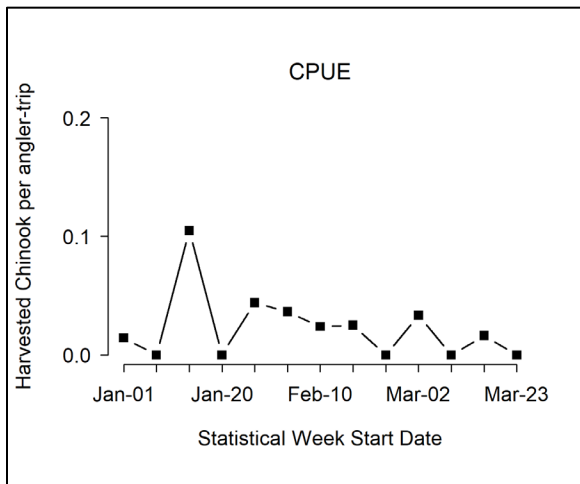


Figure 6.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 10.

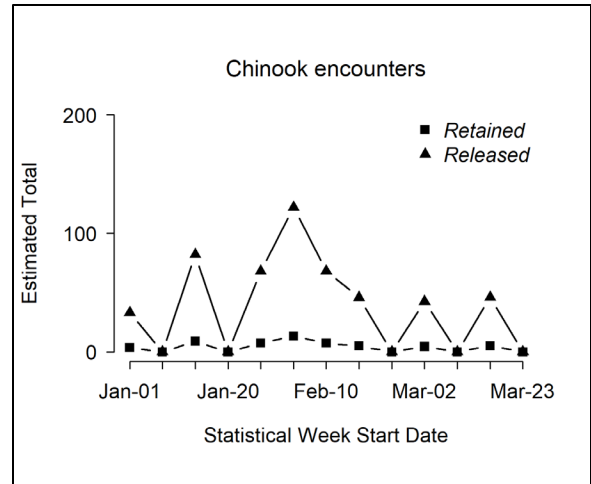


Figure 6.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 10.

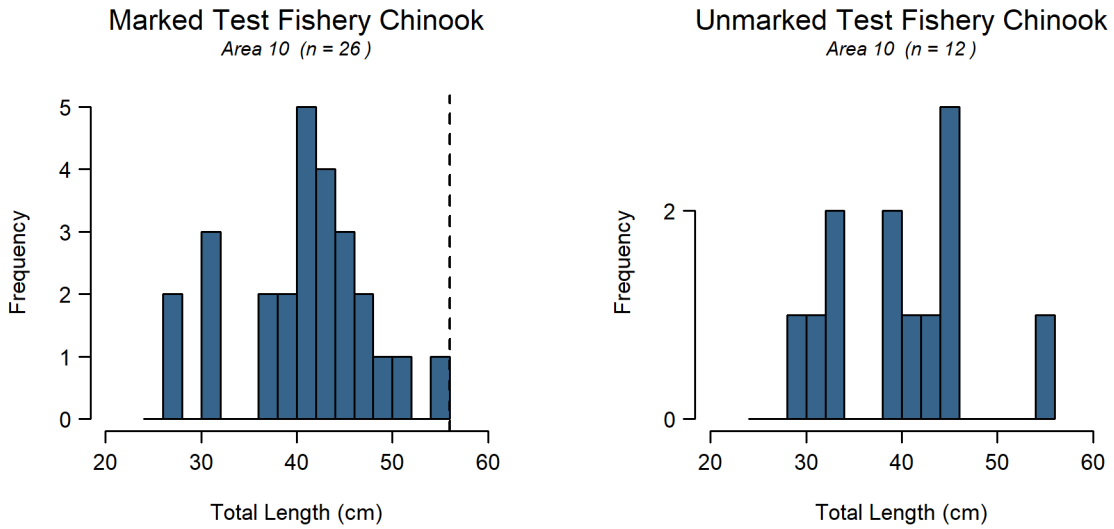


Figure 6.5 Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook salmon encountered by test fishers during the 2019-20 winter Chinook salmon MSF in Marine Area 10. The vertical dashed line in the left panel corresponds to the legal-size limit (22 in or 56 cm).

Table 6.4 Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs. Fished	AD	UM	AD	UM	
1	3	9.65	0	0	1	1	2
2	3	17.83	0	0	4	1	5
3	1	6.97	0	0	2	1	3
4	1	5.81	0	0	2	1	3
5	1	4.13	0	0	0	2	2
6	2	2.13	0	0	3	0	3
7	2	8.79	0	0	0	2	2
8	2	12.30	0	0	4	2	6
9	1	6.23	0	0	4	0	4
11	2	12.50	0	0	2	1	3
12	2	10.76	0	0	4	1	5
Total	20	97.09	0	0	26	12	38
Size/mark-status composition:			0.00	0.00	0.68	0.32	
Variance:			(0.0000)	(0.0000)	(0.0058)	(0.0058)	
Legal size mark rate:							
Overall mark rate:			0.68				

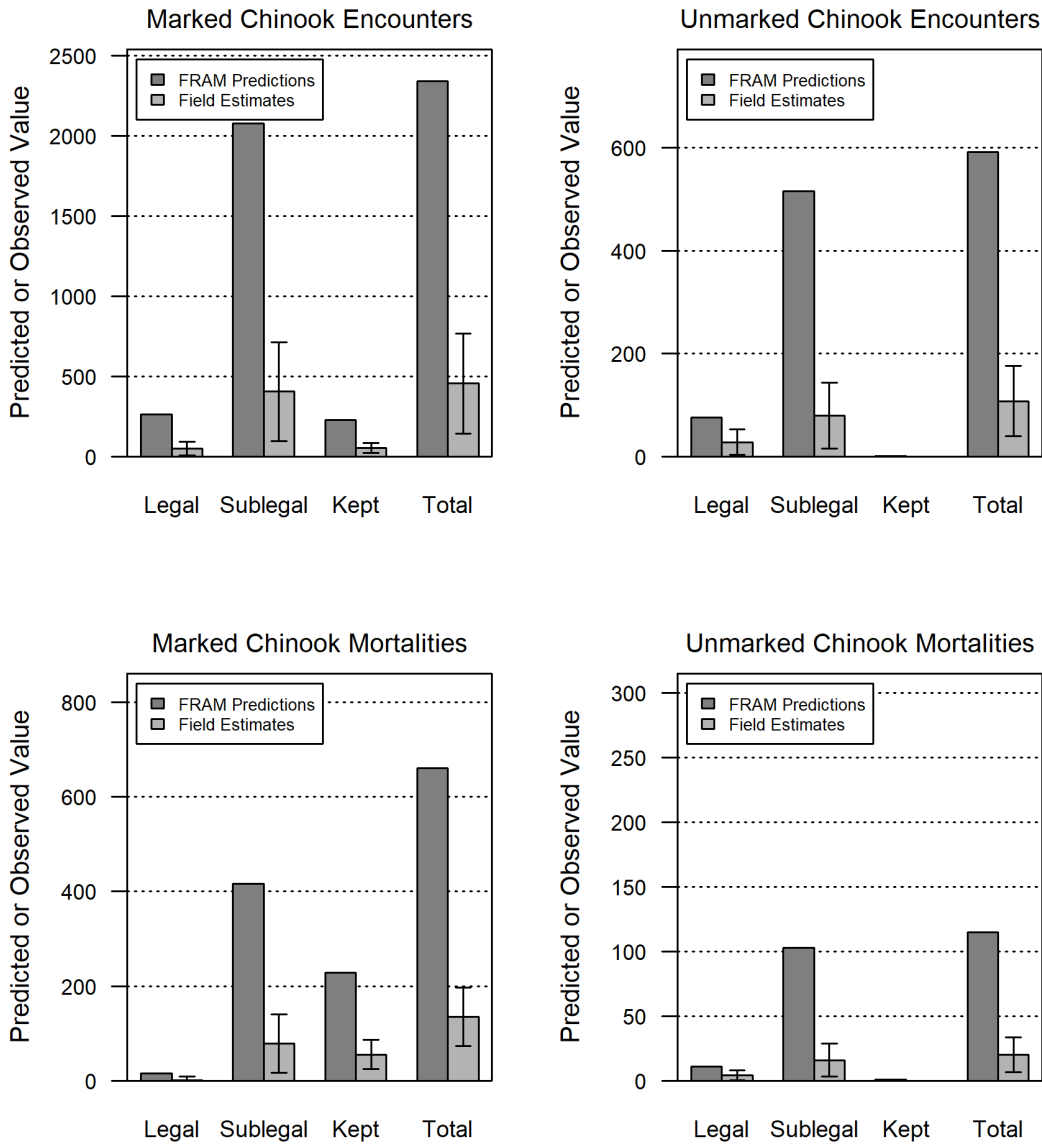


Figure 6.6 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters and mortalities for the 2019-20 winter Chinook salmon MSFs in Marine Area 10. Error bars represent approximate 95% confidence intervals for field estimates.

Table 6.5 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon encounters for the 2019-20 winter Chinook salmon MSF in Marine Area 10. 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	591	76	515	1
	AD	2,342	263	2,079	229
	Total	2,933	339	2,594	230
	% Marked	80	78	80	100
Estimated (Creel) Encounters	UM	108	28	79	0
	AD	456	50	406	55
	Total	563	78	485	55
	% Marked	81	64	84	100

Table 6.6 Summary of season-wide fishery impact estimates for the 2019-20 winter Chinook salmon MSF in Marine Area 10. 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	50	44	7	1	45	235	15	15 - 75	34
Legal UM	28	0	28	4	4	4	2	0 - 8	45
Sublegal AD	406	12	394	79	91	1,024	32	28 -153	35
Sublegal UM	79	0	79	16	16	42	6	3 - 29	41
Total	563	55	508	100	155	1,304	36	84 - 226	23

Table 6.7 Comparison of modeled (FRAM model run 2719) and estimated total Chinook salmon mortalities for the 2019-20 winter Chinook salmon MSF in Marine Area 10. 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)	115	661	776	20	135	155
Released Legal	11	16	27	4	1	5
Released Sublegal	103	416	519	16	79	95
Landed Only	1	229	230	0	55	55

Table 6.8 Monthly sample rates (Total retained Chinook salmon sampled¹ / Estimated retained Chinook salmon) in the 2019-20 winter Chinook salmon MSF in Marine Area 10.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
January	1 - 5	1 Jan - 2 Feb	22	0	22	27	0	27	125.50%
February	6 - 9	3 Feb - 1 Mar	29	0	29	6	0	6	20.50%
March	10 - 13	2 Mar - 24 Mar	9	0	9	3	0	3	33.00%
Season Total			59	0	59	36	0	36	60.70%

¹ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWTs, from all sites sampled during the winter 2019-20 Marine Area 10 Chinook salmon MSF (the sample-frame sites included in the creel estimates and the fish sampled as part of derbies and other baseline sampling in the Marine Area). In the Jan. 1 through Feb. 2 timeframe, 17 fish were sampled on 1/19/2020 that were from baseline sampling, outside the intensive monitoring, which accounts for the 125%.

Table 6.9 Total Chinook salmon encountered (retained and released) by private-boat and charter boat anglers logging their trips on STRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2019-20 winter Chinook salmon MSF in Marine Area 10. 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 STR	2 1-trip STRs	0	0	7	4	11	0.64	
Size/mark-status composition:		0.00	0.00	0.64	0.36			
Variance:		(0.0000)	(0.0000)	(0.0231)	(0.0231)			

Table 6.10 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 10. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	AD	UM	AD	UM
Kept	26	0	7	0
Released	4	15	209	39
Total	30	15	216	39
Size/mark-status composition	0.10	0.05	0.72	0.13
Bias Corrected	0.09	0.05	0.72	0.14

Table 6.11 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 10. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	Hood Canal (50%)	Finch Cr 16.0222	Hoodsport Hatchery	1 (50%)	0
	S Puget Sound (50%)	Minter Cr 15.0048	Minter Cr Hatchery	1 (50%)	0
			Total		2

Table 6.12 Summary of double-index tagged (DIT) Chinook salmon kept by anglers, and estimated total mortality of unmarked DIT Chinook salmon due to hook-and-release impacts resulting from the 2019-20 winter Chinook salmon MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est.AD	var(Est.AD)	UM DIT Enc	Est.UM	var(Est.UM)	SE(Est.UM)
No DIT recoveries.								

Table 6.13 Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) during the 2019-20 winter Chinook salmon MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status

Week	Start Date	End Date	Released Salmon		
			Coho UM	Coho UK	Unknown Salmon
1	1-Jan	5-Jan	0	0	73
2	6-Jan	12-Jan	0	0	151
3	13-Jan	19-Jan	0	0	0
4	20-Jan	26-Jan	0	3	0
5	27-Jan	2-Feb	0	0	34
6	3-Feb	9-Feb	0	4	32
7	10-Feb	16-Feb	13	0	5
8	17-Feb	23-Feb	0	0	3
9	24-Feb	1-Mar	0	5	107
10	2-Mar	8-Mar	0	4	45
11	9-Mar	15-Mar	0	0	0
12	16-Mar	22-Mar	0	5	55
13	23-Mar	24-Mar	0	0	0
Season Total:			13	21	506
Variance:			104	56	50594
Standard Error:			10	7	225
CV (%):			81%	35%	44%
95% CI:			0 - 33	6 - 36	65 - 946

Table 6.14 Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2019-20 winter Chinook salmon MSFs in Marine Area 10. Bold sites indicate 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	3	0.1154	24	0.1333
Bainbridge Is/Agate Pass, Bch launch	0	0.0000	2	0.0111
Brownsville Marina/Dock/Ramp	2	0.0769	4	0.0222
Camano Island State Park Public Ramp	0	0.0000	2	0.0111
Dagmar's Landing, Forklift Launch	1	0.0385	3	0.0167
Des Moines Marina	0	0.0000	3	0.0167
Eagle Harbor Waterfront Park	0	0.0000	1	0.0056
Edmonds Boat Basin	0	0.0000	6	0.0333
Edmonds Dry Storage	2	0.0769	5	0.0278
Edmonds Marina	2	0.0769	11	0.0611
Elliott Bay Marina	2	0.0769	6	0.0333
Everett Ramp	7	0.2692	28	0.1556
Gig Harbor Marina	0	0.0000	6	0.0333
Kingston Marina	0	0.0000	4	0.0222
Kingston Public Ramp	2	0.0769	13	0.0722
Manchester Public Ramp	3	0.1154	5	0.0278
Point Defiance Public Ramp	0	0.0000	4	0.0222
Port Orchard Marina	0	0.0000	1	0.0056
Port Orchard Public Ramp	0	0.0000	2	0.0111
Possession Waterfront Beach Park	0	0.0000	2	0.0111
Private	0	0.0000	4	0.0222
Redondo Ramp	0	0.0000	2	0.0111
Shilshole Marina	0	0.0000	9	0.0500
Shilshole Public Ramp	2	0.0769	33	0.1833
Total Anglers	26	1	180	1

Table 6.15 Season-total estimates of Chinook salmon encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 10 Winter Chinook salmon MSF. Values may not add exactly due to rounding error. LM = legal-sized marked, LU = legal-sized unmarked, SM = sublegal-sized marked, SU = sublegal-sized unmarked.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Dec 1, 2007 - Jan 31, 2008	2,544	539	21	96	0	80	163	1,860	361	3,120
Dec 1, 2008 - Jan 31, 2009	2,029	247	0	4	0	37	36	1,010	462	1,796
Oct 1, 2009 - Jan 31 2010	5,560	354	2	42	0	53	83	2,531	898	3,962
Oct 1, 2010 - Jan 31, 2011	4,461	150	0	13	0	22	53	814	740	1,792
Oct 1, 2011 - Jan 31, 2012	4,615	227	5	15	9	34	183	2,870	1,230	4,573
Oct 1, 2012 - Jan 31, 2013	5,321	121	0	0	0	18	27	1,183	549	1,897
Oct 1, 2013 - Jan 31, 2014	6,216	328	4	22	4	49	122	1,852	584	2,964
Oct 1, 2014 - Jan 31, 2015	7,109	215	0	0	0	32	87	622	314	1,270
Oct 1, 2015 – Oct 18, 2016	4,110	63	0	55	25	9	29	1043	337	1,561
Nov 1, 2016 - Jan 23, 2017	1,841	225	0	5	0	34	86	1806	690	2,846
Nov 1, 2017 - Feb 28, 2018	1,836	235	0	82	0	35	48	1410	429	2,239
Jan 1, 2019 - Jan 19, 2019	1,700	721	5	66	0	108	161	928	249	2,237
Jan 1, 2020 - Mar 24, 2020	2,517	44	0	12	0	7	28	394	79	563

7) Marine Area 11 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented an eleventh consecutive winter Chinook salmon MSF in Marine Area 11 from January 1, 2020 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season. Data collection methods used to monitor the Marine Area 11 Chinook salmon MSF included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (CPUE), mark rates (based on STRs), and landed-catch composition (age, length, and CWT). Additionally, we described relative catch and effort patterns throughout the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends

WDFW dockside samplers conducted “Baseline Sampling” at selected access sites during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Complete details of these methods are presented in a separate Methods Report (WDFW 2012a). Briefly, Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Marine Area 11 baseline sample frame included seven different access sites (**Table 7.3**), and a total of 141 site visits during the thirteen-week season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Marine Area 11 fishery at the selected access site. The interview and catch-sampling procedures employed were identical to those used in other MSFs. Marine Area 11 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and Coho salmon only), and 3) landed Chinook salmon size (fork length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and Coho salmon for CWTs using wand detectors and acquired snouts when tags were present; resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

In contrast to the intensive “Murthy” survey design employed in other areas, Marine Area 11 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook salmon impacts. However, Marine Area 11 baseline sampling observations will ultimately be combined with Catch Record Card (CRC) data, once they become available, to estimate catch and effort at the fishery-total level. While these descriptors of MSF impacts are not presented in this document, they will be available at a later date. In the following section we present results from our monitoring activities during the Marine Area 11 winter 2019-20 Chinook salmon MSF.

Table 7.1 Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the winter Chinook salmon MSF in Marine Area 11. 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish			Released Fish				
			Boats	Anglers	Chinook AD	Chinook UM	Chinook UD	Chin AD	Chin UM	Chin Unk	Cutthroat	Unknown Salmon
1	1-Jan	5-Jan	15	26	1	0	0	7	0	0	0	0
2	6-Jan	12-Jan	5	7	0	0	0	0	0	0	0	0
3	13-Jan	19-Jan	16	23	4	0	0	12	2	0	0	0
4	20-Jan	26-Jan	22	40	2	0	0	9	0	5	0	1
5	27-Jan	2-Feb	14	22	2	0	0	8	2	9	0	0
6	3-Feb	9-Feb	32	45	2	0	0	4	2	1	0	0
7	10-Feb	16-Feb	16	25	1	0	0	3	0	0	0	0
8	17-Feb	23-Feb	26	37	0	0	0	8	2	0	0	0
9	24-Feb	1-Mar	23	33	5	0	0	12	4	4	0	0
10	2-Mar	8-Mar	31	44	2	0	0	3	1	7	0	0
11	9-Mar	15-Mar	6	9	2	0	0	1	0	0	0	0
12	16-Mar	22-Mar	27	44	1	0	0	6	1	0	2	0
13	23-Mar	24-Mar	1	2	0	0	0	0	0	0	0	0
Season Total			234	357	22	0	0	73	14	26	2	1

Table 7.2 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2019-20 winter Chinook salmon MSF in Marine Area 11.

Mark Type	Number Sampled		Total
	Legal-size	Sublegal size	
Marked	20	0	20
Unmarked	0	0	0

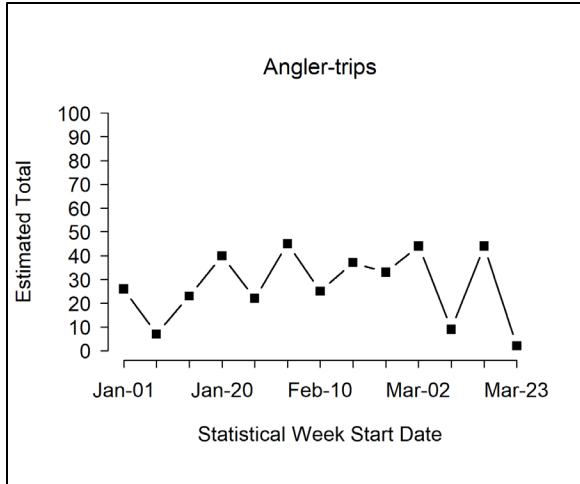


Figure 7.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

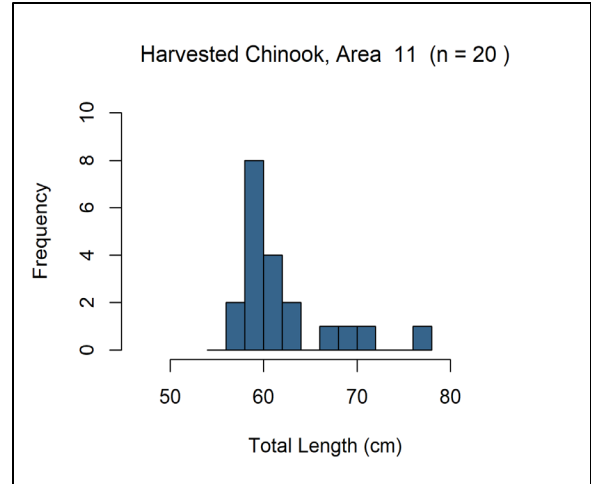


Figure 7.3 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

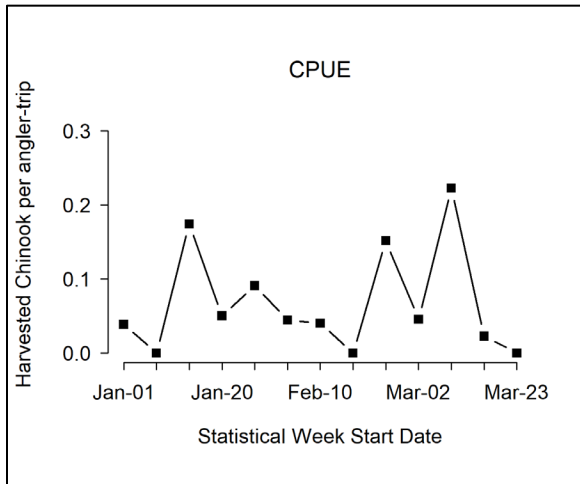


Figure 7.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates

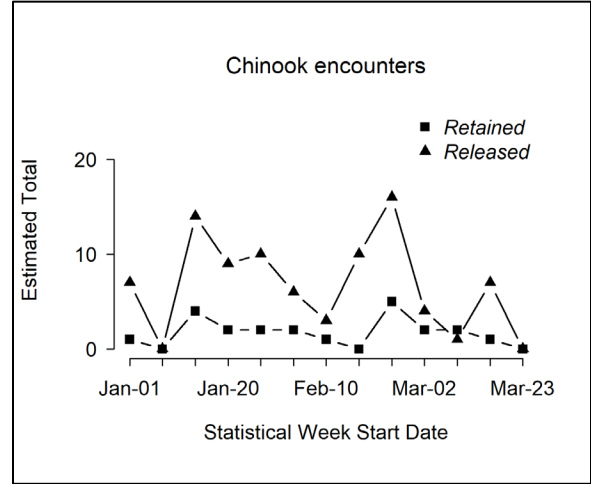


Figure 7.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

Table 7.3 List of sites sampled with the number of sampling events (site-days) during the winter Chinook salmon MSF in Marine Area 11.

Location Name	Number of Site Days Sampled Per Month			Total Site-Days	% of Total
	January	February	March		
Dash Point Dock	0	1	0	1	0.71%
Gig Harbor Ramp	6	8	7	21	14.89%
Olalla Public Ramp	4	2	5	11	7.80%
Point Defiance Boathouse Dock	1	1	1	3	2.13%
Point Defiance Boathouse	14	22	12	48	34.04%
Point Defiance Public Ramp	15	21	19	55	39.01%
Redondo Ramp	0	1	1	2	1.42%
Grand Total	40	56	45	141	100.00%

Table 7.4 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 11. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
No CWTs Recovered					

Table 7.5 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2019-20 winter Chinook salmon 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 STR	4 1-trip STRs	1	0	6	0	7	1.00	1.00
Size/mark-status composition:		0.14	0.00	0.86	0.00			
Variance:		(0.0204)	(0.0000)	(0.0204)	(0.0000)			

Table 7.6 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 11. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	LM	LU	SM	SU
Kept	20	0	0	0
Released	0	9	73	5
Total	20	9	73	5
Size/mark-status composition				
	0.19	0.08	0.68	0.05
Bias-corrected size/mark composition				
	0.17	0.08	0.68	0.07

8) Marine Area 12 Winter Mark-Selective Chinook Salmon Fishery

WDFW implemented a eleventh consecutive winter Chinook salmon MSF in Marine Area 12 from October 1, 2019 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through remainder of the winter season, which would have been April 30, 2020. Data collection methods used to monitor the Marine Area 12 Chinook salmon MSF included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (CPUE), mark rates (based on STRs), and landed-catch composition (age, length, and CWT). Additionally, we described relative catch and effort patterns throughout the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

WDFW dockside samplers conducted “Baseline Sampling” at selected access sites during the 2019-20 winter Chinook salmon MSF in Marine 12. Complete details of these methods are presented in a separate Methods Report (WDFW 2012a). Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Marine Area 12 baseline sample frame included 17 different access sites (**Table 8.3**), and a total of 306 site visits during the six-month season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Marine Area 12 fishery at the selected access site. The interview and catch-sampling procedures employed were identical to those used in other MSFs Marine Area 12 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and Coho salmon only), and 3) landed Chinook salmon size (fork and total length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and Coho salmon for CWTs using wand detectors and acquired snouts when tags were present. Resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

In contrast to the intensive “Murthy” survey design employed in other areas, Area 12 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook salmon impacts. However, Marine Area 12 baseline sampling observations will ultimately be combined with Catch Record Card (CRC) data, once they become available, to estimate catch and effort at the fishery-total level. While these descriptors of MSF impacts are not presented in this document, they will be available at a later date. In the following section we present results from our monitoring activities during the Area 12 winter 2019-20 Chinook salmon MSF.

Table 8.1 Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the 2019-20 winter Chinook salmon 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.

Stat Week	Start	End	Effort		Retained Fish			Released Fish			
			Boats	Anglers	Chinook AD	Chinook UM	Chinook UD	Chin AD	Chin UM	Chin UD	Unknown Salmon
40	1-Oct	6-Oct	35	61	0	0	0	0	1	0	0
41	7-Oct	13-Oct	38	66	0	0	0	0	0	0	0
42	14-Oct	20-Oct	15	24	0	0	0	1	0	0	0
43	21-Oct	27-Oct	21	32	0	0	0	0	0	0	0
44	28-Oct	3-Nov	9	15	0	0	0	1	2	0	0
45	4-Nov	10-Nov	21	30	0	0	0	10	0	0	0
46	11-Nov	17-Nov	41	59	0	0	0	0	0	0	0
47	18-Nov	24-Nov	4	6	0	0	0	3	1	0	0
48	25-Nov	1-Dec	3	6	0	0	0	3	0	0	0
49	2-Dec	8-Dec	5	9	1	0	0	7	0	0	0
50	9-Dec	15-Dec	5	10	0	0	0	0	0	0	0
51	16-Dec	22-Dec	4	10	1	0	0	4	0	0	0
52	23-Dec	29-Dec	9	16	2	0	0	4	0	0	0
53	30-Dec	31-Dec	6	9	0	0	0	4	2	0	0
1	1-Jan	5-Jan	2	3	0	0	0	0	0	0	0
2	6-Jan	12-Jan	5	9	0	0	1	1	0	0	1
3	13-Jan	19-Jan	15	31	1	0	0	5	0	0	0
4	20-Jan	26-Jan	1	1	0	0	0	0	0	0	0
5	27-Jan	2-Feb	8	13	0	0	0	3	1	0	0
6	3-Feb	9-Feb	15	31	5	1	0	33	5	6	0
7	10-Feb	16-Feb	3	6	0	0	0	0	0	0	0
8	17-Feb	23-Feb	14	23	1	0	0	5	1	7	0
9	24-Feb	1-Mar	9	15	1	0	0	13	3	0	0
10	2-Mar	8-Mar	7	16	0	0	1	0	0	0	0
11	9-Mar	15-Mar	2	3	0	0	0	0	0	0	0
12	16-Mar	22-Mar	12	23	1	0	0	5	0	1	0
13	23-Mar	24-Mar	0	0	0	0	0	0	0	0	0
Season Total			309	527	13	1	2	102	16	14	1

Table 8.2 Observations of fishing effort, other than Chinook salmon retained, and reported other than Chinook salmon releases, by week, for the winter Chinook salmon 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish				Released Fish				
			Boats	Anglers	Coho AD	Coho UM	Coho UD	Chum	Chum	Coho AD	Coho UM	Coho UK	Cutthroat
40	1-Oct	6-Oct	35	61	2	18	0	0	0	1	3	0	5
41	7-Oct	13-Oct	38	66	0	58	1	0	0	2	5	1	40
42	14-Oct	20-Oct	15	24	0	14	0	5	2	1	0	0	0
43	21-Oct	27-Oct	21	32	0	3	0	14	0	0	0	0	22
44	28-Oct	3-Nov	9	15	0	8	0	4	3	0	0	0	15
45	4-Nov	10-Nov	21	30	0	2	0	14	19	0	0	0	8
46	11-Nov	17-Nov	41	59	0	3	0	24	19	0	3	0	2
47	18-Nov	24-Nov	4	6	0	0	0	0	0	1	0	0	0
48	25-Nov	1-Dec	3	6	0	0	0	0	0	0	0	0	4
49	2-Dec	8-Dec	5	9	0	0	0	0	0	0	0	0	0
50	9-Dec	15-Dec	5	10	0	0	0	0	0	0	0	0	1
51	16-Dec	22-Dec	4	10	0	0	0	0	0	0	0	0	0
52	23-Dec	29-Dec	9	16	0	0	0	0	0	0	0	0	0
53	30-Dec	31-Dec	6	9	0	0	0	0	0	0	0	0	0
1	1-Jan	5-Jan	2	3	0	0	0	0	0	0	0	0	0
2	6-Jan	12-Jan	5	9	0	0	0	0	0	0	0	0	0
3	13-Jan	19-Jan	15	31	0	0	0	0	0	0	0	0	0
4	20-Jan	26-Jan	1	1	0	0	0	0	0	0	0	0	1
5	27-Jan	2-Feb	8	13	0	0	0	0	0	0	0	0	0
6	3-Feb	9-Feb	15	31	0	0	0	0	0	2	0	0	1
7	10-Feb	16-Feb	3	6	0	0	0	0	0	0	0	0	1
8	17-Feb	23-Feb	14	23	0	0	0	0	0	0	0	0	1
9	24-Feb	1-Mar	9	15	0	0	0	0	0	0	0	0	0
10	2-Mar	8-Mar	7	16	0	0	0	0	0	0	0	0	0
11	9-Mar	15-Mar	2	3	0	0	0	0	0	5	0	1	0
12	16-Mar	22-Mar	12	23	0	0	0	0	0	0	0	0	0
13	23-Mar	24-Mar	0	0	0	0	0	0	0	0	0	0	0
Season Total			309	527	2	106	1	61	43	12	11	2	101

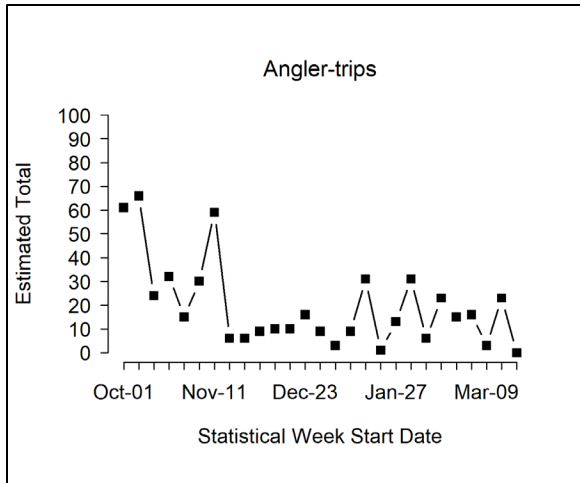


Figure 8.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

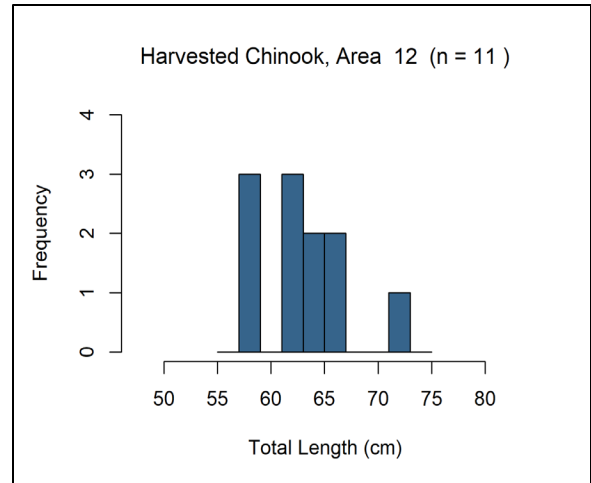


Figure 8.3 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

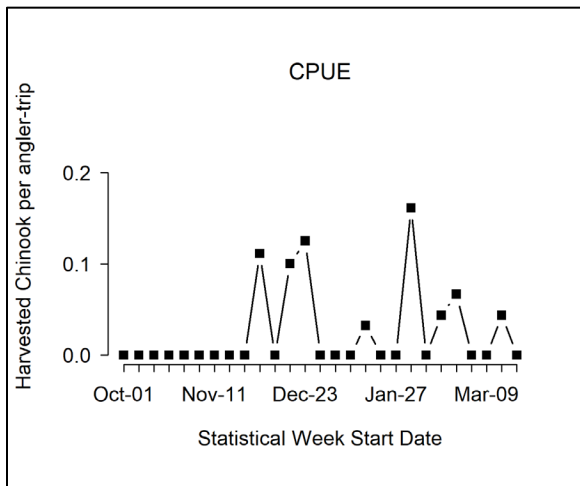


Figure 8.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates

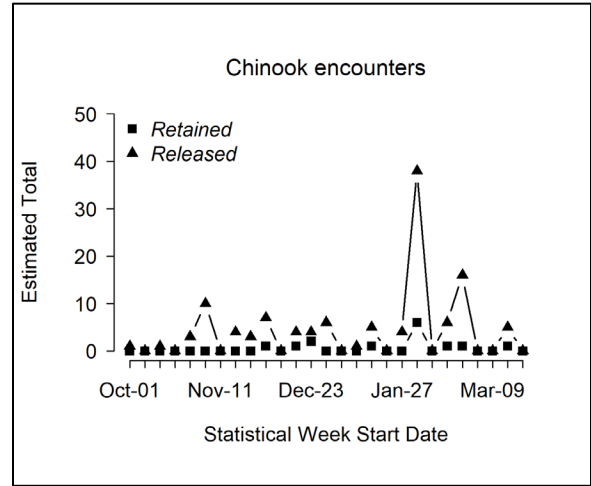


Figure 8.4 Temporal patterns in Chinook salmon encounters (number retained and released) during the 2019-20 winter Chinook salmon MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

Table 8.3 List of sites sampled with the number of sampling events (site-days) during the 2019-20 winter Chinook salmon MSF in Marine Area 12.

Location Name	Number of Site Days Sampled Per Month						Total Site-Days	% of Total
	October	November	December	January	February	March		
Belfair Park	0	6	1	0	0	0	7	2.29%
Big Beef Beach	3	0	0	0	1	1	5	1.63%
Hoodspout Shore	1	7	0	0	0	0	8	2.61%
Menard's Landing	1	0	0	0	0	0	1	0.33%
Misery Point Ramp	13	9	17	16	18	12	85	27.78%
Olympic View Marina	0	0	3	5	5	3	16	5.23%
Pleasant Harbor Boat Ramp	17	3	4	4	12	8	48	15.69%
Pleasant Harbor Marina	2	0	1	3	2	0	8	2.61%
Potlatch State Park, Hood Canal Ramp	0	1	0	0	0	0	1	0.33%
Quilcene Bay Ramp	1	4	2	3	2	1	13	4.25%
Saltwater Park Ramp	11	4	5	2	3	3	28	9.15%
Skokomish Tide Flats	15	2	0	1	1	0	19	6.21%
Summertime Resort	1	0	1	0	0	0	2	0.65%
Tahuya Ramp	3	5	2	0	1	0	11	3.59%
Triton Cove State Park	6	3	3	0	5	4	21	6.86%
Twanoh State Park	4	4	1	1	1	0	11	3.59%
Union Ramp	12	4	2	2	2	0	22	7.19%
Grand Total	90	52	42	37	53	32	306	100.00%

Table 8.4 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2019-20 winter Chinook salmon MSF in Marine Area 12.

Mark Type	Number Sampled		Total
	Legal-size	Sublegal size	
Marked	11	0	11
Unmarked	1	0	1
Total	12	0	12

Table 8.5 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 12. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
No CWTS recovered.					

Table 8.6 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2019-20 winter Chinook salmon MSF in Marine Area 12, 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 STR	3 1-trip STRs	3	1	2	6	12	0.42	0.75
Size/mark-status composition:		0.25	0.08	0.17	0.50			
Variance:		(0.0170)	(0.0069)	(0.0126)	(0.0227)			

Table 8.7 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 12. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	LM	LU	SM	SU
Kept	11	1	0	0
Released	0	4	102	12
Total	11	5	102	12
Size/mark-status composition	0.08	0.04	0.78	0.09
Bias-corrected size/mark composition	0.08	0.04	0.78	0.10

9) Marine Area 13 Winter Mark-Selective Chinook Salmon Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented the sixth winter Chinook salmon MSF in Marine Area 13 from October 1, 2019 through March 24, 2020. Due to the COVID-19 pandemic all fishing in Washington State was closed on March 25, 2020 and remained closed through the remainder of the winter season, which would have been April 30, 2020. Data collection methods used to monitor the Marine Area 13 Chinook salmon MSF included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (CPUE) and mark rates (based on STRs). Additionally, we described relative catch and effort patterns throughout the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

WDFW dockside samplers conducted “Baseline Sampling” at selected access sites during the 2019-20 winter Chinook salmon MSF in Marine Area 13. Complete details of these methods are presented in a separate Methods Report (WDFW 2012a). Briefly, Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Marine Area 13 baseline sample frame included 35 different access sites (**Table 9.3**), and a total of 705 site visits during the six-month season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Marine Area 13 fishery at the selected access site. The interview and catch-sampling procedures employed were identical to those used in other MSFs. Marine Area 13 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and Coho salmon only), and 3) landed Chinook salmon size (fork length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and Coho salmon for CWTs using wand detectors and acquired snouts when tags were present. Resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

In contrast to the intensive “Murthy” survey design employed in other areas, Marine Area 13 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook salmon impacts. However, Marine Area 13 Baseline Sampling observations will ultimately be combined with Catch Record Card (CRC) data, once they become available, to estimate catch and effort at the fishery-total level. While these descriptors of MSF impacts are not presented in this document, they will be available at a later date. In the following section we present results from our monitoring activities during the Marine Area 13 winter 2019-20 Chinook salmon MSF.

Table 9.1 Observations of fishing effort, other than Chinook salmon retained, and reported other than Chinook salmon releases, by week, for the winter Chinook salmon 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish			Released Fish		
			Boats	Anglers	Chinook AD	Chinook UM	Chinook UD	Chin AD	Chin UM	Chin Unk
40	1-Oct	6-Oct	15	22	0	0	0	0	0	3
41	7-Oct	13-Oct	14	18	0	0	0	2	0	0
42	14-Oct	20-Oct	26	26	0	0	0	0	0	0
43	21-Oct	27-Oct	15	18	0	0	0	0	0	0
44	28-Oct	3-Nov	26	37	3	0	0	0	0	0
45	4-Nov	10-Nov	29	39	0	0	0	0	0	0
46	11-Nov	17-Nov	12	12	0	0	0	0	0	0
47	18-Nov	24-Nov	1	1	0	0	0	0	0	0
48	25-Nov	1-Dec	7	8	0	0	0	0	0	0
49	2-Dec	8-Dec	13	18	0	0	0	0	0	0
50	9-Dec	15-Dec	11	18	0	0	0	1	0	0
51	16-Dec	22-Dec	12	16	0	0	0	5	1	0
52	23-Dec	29-Dec	21	24	1	0	0	6	1	0
53	30-Dec	31-Dec	3	6	0	0	0	2	0	0
1	1-Jan	5-Jan	1	1	0	0	0	0	0	0
2	6-Jan	12-Jan	0	0	0	0	0	0	0	0
3	13-Jan	19-Jan	11	12	0	0	0	1	0	0
4	20-Jan	26-Jan	8	10	0	0	0	0	2	0
5	27-Jan	2-Feb	10	14	0	0	0	2	0	0
6	3-Feb	9-Feb	8	9	0	0	0	4	0	0
7	10-Feb	16-Feb	7	11	1	0	0	0	0	3
8	17-Feb	23-Feb	6	7	0	0	0	1	0	0
9	24-Feb	1-Mar	8	11	0	0	0	2	1	0
10	2-Mar	8-Mar	13	15	1	0	0	7	1	0
11	9-Mar	15-Mar	16	19	1	0	0	2	0	0
12	16-Mar	22-Mar	30	39	1	0	0	3	1	0
13	23-Mar	24-Mar	2	2	0	0	0	0	0	0
Season Total			325	413	8	0	0	38	7	6

Draft February 9, 2021

Table 9.2 Observations of fishing effort, other than Chinook salmon retained, and reported other than Chinook salmon releases, by week, for the winter Chinook salmon 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, UD = undetermined mark-status.

Stat Week	Start	End	Effort		Retained Fish			Released Fish						
			Boats	Anglers	Coho AD	Coho UM	Chum	Chum	Coho AD	Coho UM	Coho UD	Cutthroat	Unknown Salmon	
40	1-Oct	6-Oct	15	22	2	0	0	0	0	0	0	0	0	3
41	7-Oct	13-Oct	14	18	2	1	1	0	0	1	0	0	0	14
42	14-Oct	20-Oct	26	26	1	0	2	13	0	0	0	3	0	0
43	21-Oct	27-Oct	15	18	0	0	2	2	0	0	0	2	2	2
44	28-Oct	3-Nov	26	37	0	0	5	0	0	0	0	0	0	20
45	4-Nov	10-Nov	29	39	0	0	30	7	0	0	0	0	0	3
46	11-Nov	17-Nov	12	12	0	0	0	0	0	0	0	0	0	0
47	18-Nov	24-Nov	1	1	0	0	0	0	0	0	0	0	0	0
48	25-Nov	1-Dec	7	8	0	0	0	0	0	0	0	0	0	0
49	2-Dec	8-Dec	13	18	0	0	0	0	1	0	0	0	0	0
50	9-Dec	15-Dec	11	18	2	0	0	0	0	0	0	3	0	0
51	16-Dec	22-Dec	12	16	0	0	0	0	4	0	0	0	0	0
52	23-Dec	29-Dec	21	24	0	0	0	0	5	1	0	2	0	0
53	30-Dec	31-Dec	3	6	0	0	0	0	0	0	0	0	0	0
1	1-Jan	5-Jan	1	1	0	0	0	0	0	1	0	0	0	0
2	6-Jan	12-Jan	0	0	0	0	0	0	0	0	0	0	0	0
3	13-Jan	19-Jan	11	12	0	0	0	0	3	1	0	0	0	0
4	20-Jan	26-Jan	8	10	0	0	0	0	0	0	0	13	0	0
5	27-Jan	2-Feb	10	14	0	0	0	0	5	1	0	0	0	0
6	3-Feb	9-Feb	8	9	0	0	0	0	0	1	0	2	0	0
7	10-Feb	16-Feb	7	11	0	0	0	0	0	0	0	3	0	0
8	17-Feb	23-Feb	6	7	0	0	0	0	0	1	0	1	0	0
9	24-Feb	1-Mar	8	11	0	0	0	0	3	0	2	0	0	0
10	2-Mar	8-Mar	13	15	0	0	0	0	1	1	0	0	0	0
11	9-Mar	15-Mar	16	19	0	0	0	0	4	2	1	0	0	0
12	16-Mar	22-Mar	30	39	1	0	0	0	0	4	0	1	0	0
13	23-Mar	24-Mar	2	2	0	0	0	0	0	0	0	0	0	0
Season Total			325	413	8	1	40	22	26	14	3	30	42	

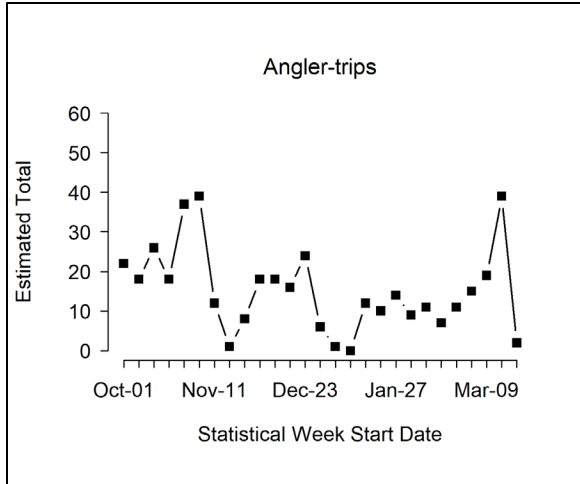


Figure 9.1 Temporal patterns in fishing effort during the 2019-20 winter Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

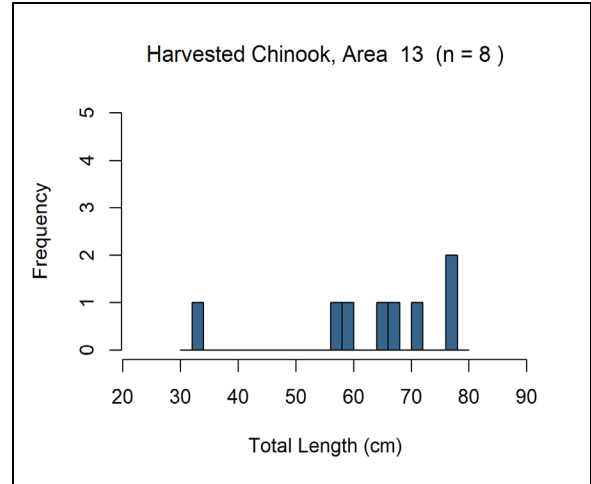


Figure 9.3 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 13.

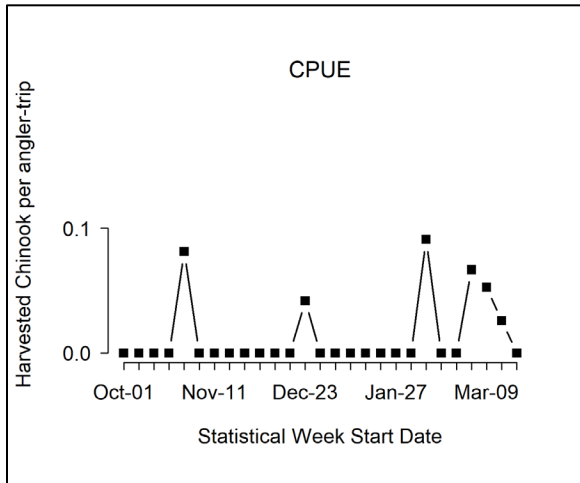


Figure 9.2 Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2019-20 winter Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

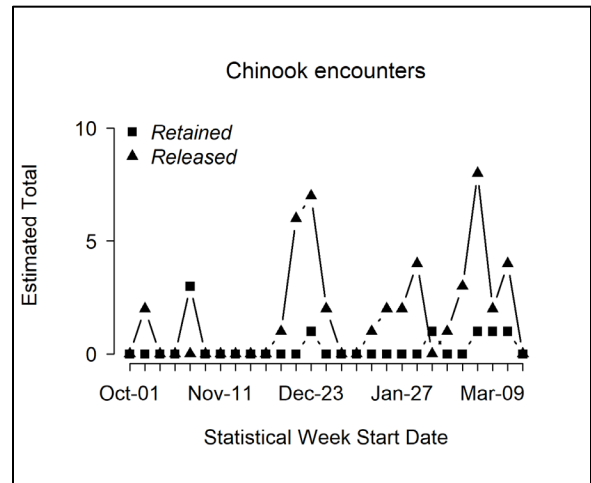


Figure 9.4 Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2019-20 winter Chinook salmon MSF in Marine Area 13.

Table 9.3 List of sites sampled with the number of sampling events (site-days) during the 2019-20 winter Chinook salmon MSF in Marine Area 13.

Location Name	Number of Site Days Sampled Per Month						Total Site-Days	% of Total
	October	November	December	January	February	March		
Allyn Public Ramp	9	1	1	2	4	3	20	2.84%
Arcadia Ramp	4	0	1	0	0	3	8	1.13%
Bayshore (John's Creek)	8	0	0	0	0	0	8	1.13%
Boston Harbor Ramp/Marina	14	5	7	12	12	10	60	8.51%
Concrete Dock	1	1	2	1	1	0	6	0.85%
East Bay Marina/Ramp	3	4	9	17	18	13	64	9.08%
Fox Island Public Ramp	2	1	6	2	4	1	16	2.27%
Fox Island Sand Spit	0	1	6	2	3	2	14	1.99%
Fox Island Shore	2	0	0	0	1	0	3	0.43%
Grapeview Public Ramp	2	0	1	1	2	2	8	1.13%
Hartstene Is. Ramp (aka Latimer's Landing)	8	0	1	3	4	4	20	2.84%
Home Public Ramp	0	2	4	1	1	6	14	1.99%
Horsehead Bay Ramp	0	1	2	2	2	0	7	0.99%
John's Creek	1	0	0	0	0	0	1	0.14%
Kennedy Creek Mouth	8	4	4	0	0	0	16	2.27%
Landover	0	0	0	0	0	1	1	0.14%
Lemons Beach	0	0	2	0	0	0	2	0.28%
Longbranch Marina	0	0	4	0	0	1	5	0.71%
Longbranch Public Ramp	0	2	5	0	1	7	15	2.13%
Luhr Beach Ramp	14	9	16	19	18	15	91	12.91%
McLane Creek Shore	0	2	4	0	0	0	6	0.85%
Narrows Marina	13	8	12	7	3	4	47	6.67%
Narrows Park	4	2	4	3	4	1	18	2.55%
Perry Creek	1	3	6	0	0	0	10	1.42%
Priest Point Park	7	0	0	0	0	0	7	0.99%
Solo Point	7	3	8	12	12	8	50	7.09%
Steamboat Island Bridge	1	2	0	0	0	1	4	0.57%
Steilacoom Public Ramp	7	1	2	0	3	1	14	1.99%
Titlow Beach	1	0	0	0	0	0	1	0.14%
Tolmie State Park	4	0	0	0	0	0	4	0.57%
Vaughn Public Ramp	0	1	2	2	1	9	15	2.13%
Wauna Ramp	2	3	5	1	1	6	18	2.55%
Wauna Shore	1	3	12	10	9	14	49	6.95%
Wollochet Bay Public Ramp	1	2	4	2	2	1	12	1.70%
Zittel's Marina	9	8	14	13	15	12	71	10.07%
Grand Total	134	69	144	112	121	125	705	100.00%

Table 9.4 Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2019-20 winter Chinook salmon MSF in Marine Area 13.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	7	1	8
Unmarked	0	0	0
Total	7	1	8

Table 9.5 Summary of CWTs recovered from Chinook salmon retained during the 2019-20 winter Chinook salmon MSF in Marine Area 13. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	Mid Puget Sound (100%)	Big Soos Cr 09.0072	Soos Creek Hatchery	1 (100%)	0
Total				1	0

Table 9.6 Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2019-20 winter Chinook salmon 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 STR	0 1-trip STRs	0	0	0	0	0	NA	NA
Size/mark-status composition:		0.00	0.00	0.00	0.00			
Variance:		NA	NA	NA	NA			

Table 9.7 Dockside encounters (retained and released) by size-mark category during the 2019-20 winter Chinook salmon MSF in Marine Area 13. Retained fish were sampled for mark-status and length, released fish by size-mark status were reported by the angler.

Dockside Encounters				
Status	Legal		Sublegal	
	LM	LU	SM	SU
Kept	7	0	1	0
Released	2	3	36	4
Total	9	3	37	4
Size/mark-status composition	0.17	0.06	0.70	0.08
Bias-corrected size/mark composition	0.15	0.06	0.70	0.09

ACKNOWLEDGEMENTS

This review of the 2019-20 winter mark-selective Chinook salmon fisheries in Marine Areas 5, 6, 7, 9, 10, 11, 12, and 13 is the result of the dedicated efforts of many individuals. First, we thank the WDFW Puget Sound Sampling Unit (PSSU) field supervisors and their staff, who successfully implemented the comprehensive sampling programs during the winter 2019-20 Chinook salmon MSFs. The PSSU field staff have conducted the dockside creel surveys, test fishery sampling, on-the-water effort surveys, aerial surveys, voluntary trip report program, angler education, as well as compiled, error-checked, and delivered high-quality monitoring data to enable the evaluation of these MSFs. In particular, from Central Sound, we thank Jeff McKee, (Central Sound Sampling Supervisor), Kathy Young-Berg, April Bosley, Sue Kraemer, Pete Sergeeff, Mary Raymond, Corey Corrick, Matt Larson, and Mack Hunter. From the Strait of Juan de Fuca/Peninsula area, we thank Larry Bennett (Peninsula Sampling Supervisor), Connie Konopaski, Lorena McGovern, Will Jasper, Hope Anderson, and Steve Sapp. From North Sound, we thank Chad Paul (North Sampling Supervisor), Samantha Bund, Nathan Layman, Patrick Morrison, Lynn Stricker, Angela Foster, Dyanne Dalrymple, Vanessa Jimenez, Catherine Harris, Henry Kei, and Marine Area 7 test fishers Ky Zech, Trevor James, and Phil Colwell. From South Sound as well as Hood Canal and the Kitsap Peninsula, we thank Justin Terry (South Sound Supervisor), Marcus Thompson, Ryan Ollerman, Scott Walker, Cara Crowley, Maria Garcia-Rojas, John Pahutski and Sharyn Wolfenbarger. Additionally, we thank WDFW pilot Marty Kimbrel, Kenmore Air Pilots Chuck Perry, Steve Bjorling and Larry Graff, and samplers Brant Boelts, Karen Kloempken, John Edwards, Sarah Golden, Anja Huff, for their time surveying Areas 6, 7 and 9 from the sky.

At the WDFW Headquarters in Olympia, we thank Gil Lensegrav and the CWT Lab staff for their help and expertise in providing decoded CWT data. John Edwards, Brant Boelts and Sarah Golden provided substantial help with quality control and flow of data, in addition to personnel logistics and support services for the winter 2019-20 MSF sampling projects. Ann Stephenson, John Edwards and Karen Kloempken supervised the sampling unit activities. Karen Kloempken provided timely in-season creel estimates, scheduled all boat surveys and aerial surveys, and worked with the WDFW Selective Fisheries Biologist, Ty Garber, to produce post-season analyses and reports. Also, Karen Kloempken managed the WDFW sampling databases and provided finalized post-season data. Ann Stephenson provided final review of the document. 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.

We extend a special thanks to Robert Conrad with the 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 Oliver Miler for his 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.

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APPENDICES

1) SITE WEIGHTS

Appendix 1 Size measures by sample date, for sites sampled during dockside creel surveys for the 2019-20 winter Chinook MSF in Marine Area 8-1.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
2/1/2020	5	Camano Island State Park Public Ramp	0.3763	Maple Grove Ramp; Camano Is	0.2804
2/3/2020	6	Camano Island State Park Public Ramp	0.3763	Norton Street (Everett) Ramp	0.1196
2/7/2020	6	Camano Island State Park Public Ramp	0.3763	Oak Harbor Marina & Public Ramp	0.1333
2/9/2020	6	Camano Island State Park Public Ramp	0.3763	Maple Grove Ramp; Camano Is	0.2804
2/13/2020	7	Camano Island State Park Public Ramp	0.3763	Oak Harbor Marina & Public Ramp	0.1333
2/14/2020	7	Camano Island State Park Public Ramp	0.3763	Maple Grove Ramp; Camano Is	0.2804
2/16/2020	7	Camano Island State Park Public Ramp	0.3763	Oak Harbor Marina & Public Ramp	0.1333
2/19/2020	8	Camano Island State Park Public Ramp	0.3763	Norton Street (Everett) Ramp	0.1196
2/21/2020	8	Camano Island State Park Public Ramp	0.3763	Maple Grove Ramp; Camano Is	0.2804
2/23/2020	8	Camano Island State Park Public Ramp	0.3763	Oak Harbor Marina & Public Ramp	0.1333
2/25/2020	9	Camano Island State Park Public Ramp	0.3763	Maple Grove Ramp; Camano Is	0.2804
2/29/2020	9	Camano Island State Park Public Ramp	0.3763	Norton Street (Everett) Ramp	0.1196
3/1/2020	9	Camano Island State Park Public Ramp	0.5487	Maple Grove Ramp; Camano Is	0.1964
3/4/2020	10	Camano Island State Park Public Ramp	0.5487	Oak Harbor Marina & Public Ramp	0.0596
3/6/2020	10	Camano Island State Park Public Ramp	0.5487	Norton Street (Everett) Ramp	0.1364
3/8/2020	10	Camano Island State Park Public Ramp	0.5487	Norton Street (Everett) Ramp	0.1364
3/11/2020	11	Camano Island State Park Public Ramp	0.5487	Norton Street (Everett) Ramp	0.1364
3/13/2020	11	Camano Island State Park Public Ramp	0.5487	Maple Grove Ramp; Camano Is	0.1964
3/15/2020	11	Camano Island State Park Public Ramp	0.5487	Maple Grove Ramp; Camano Is	0.1964
3/17/2020	12	Camano Island State Park Public Ramp	0.5487	Norton Street (Everett) Ramp	0.1364
3/20/2020	12	Camano Island State Park Public Ramp	0.5487	Maple Grove Ramp; Camano Is	0.1964
3/21/2020	12	Camano Island State Park Public Ramp	0.5487	Norton Street (Everett) Ramp	0.1364

Appendix 2 Size measures by sample date, for sites sampled during dockside creel surveys for the 2019-20 winter Chinook MSF in Marine Area 8-2.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
2/1/2020	5	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/3/2020	6	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/7/2020	6	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/9/2020	6	Dagmar's Landing; Forklift Launch	0.0707	Norton Street (Everett) Ramp	0.6975
2/13/2020	7	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/14/2020	7	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/16/2020	7	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/19/2020	8	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/21/2020	8	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/23/2020	8	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/25/2020	9	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
2/29/2020	9	Camano Island State Park Public Ramp	0.1406	Norton Street (Everett) Ramp	0.6975
3/1/2020	9	Dagmar's Landing; Forklift Launch	0.0601	Norton Street (Everett) Ramp	0.6329
3/4/2020	10	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/6/2020	10	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/8/2020	10	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/11/2020	11	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/13/2020	11	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/15/2020	11	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/17/2020	12	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/20/2020	12	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329
3/21/2020	12	Camano Island State Park Public Ramp	0.1503	Norton Street (Everett) Ramp	0.6329

Appendix 3 Size measures by sample date, for sites sampled during dockside creel surveys for the 2019-20 winter Chinook MSF in Marine Area 10.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
1/2/2020	1	Edmonds Boat Loft (Priv. fork lift)	0.1374	Manchester Public Ramp	0.1967
1/3/2020	1	Shilshole Public Ramp	0.331	Kingston Public Ramp	0.1804
1/5/2020	1	Armeni Public Ramp	0.5282	Manchester Public Ramp	0.065
1/7/2020	2	Shilshole Public Ramp	0.331	Kingston Public Ramp	0.1804
1/11/2020	2	Armeni Public Ramp	0.1545	Manchester Public Ramp	0.1967
1/12/2020	2	Shilshole Public Ramp	0.2672	Armeni Public Ramp	0.5282
1/15/2020	3	Shilshole Public Ramp	0.331	Manchester Public Ramp	0.1967
1/17/2020	3	Armeni Public Ramp	0.1545	Kingston Public Ramp	0.1804
1/18/2020	3	Shilshole Public Ramp	0.331	Kingston Public Ramp	0.1804
1/23/2020	4	Shilshole Public Ramp	0.331	Edmonds Boat Loft (Priv. fork lift)	0.1374
1/24/2020	4	Shilshole Public Ramp	0.331	Kingston Public Ramp	0.1804
1/26/2020	4	Armeni Public Ramp	0.5282	Shilshole Public Ramp	0.2672
1/28/2020	5	Shilshole Public Ramp	0.331	Edmonds Boat Loft (Priv. fork lift)	0.1374
1/31/2020	5	Shilshole Public Ramp	0.331	Armeni Public Ramp	0.1545
2/2/2020	5	Armeni Public Ramp	0.6033	Shilshole Public Ramp	0.1649
2/3/2020	6	Shilshole Public Ramp	0.3722	Kingston Public Ramp	0.1333
2/7/2020	6	Shilshole Public Ramp	0.3722	Manchester Public Ramp	0.1361
2/9/2020	6	Armeni Public Ramp	0.6033	Kingston Public Ramp	0.0779
2/13/2020	7	Shilshole Public Ramp	0.3722	Kingston Public Ramp	0.1333
2/14/2020	7	Shilshole Public Ramp	0.3722	Kingston Public Ramp	0.1333
2/16/2020	7	Armeni Public Ramp	0.6033	Shilshole Public Ramp	0.1649
2/19/2020	8	Shilshole Public Ramp	0.3722	Kingston Public Ramp	0.1333
2/21/2020	8	Shilshole Public Ramp	0.3722	Armeni Public Ramp	0.2722
2/23/2020	8	Armeni Public Ramp	0.6033	Shilshole Public Ramp	0.1649
2/25/2020	9	Armeni Public Ramp	0.2722	Manchester Public Ramp	0.1361
2/29/2020	9	Shilshole Public Ramp	0.3722	Kingston Public Ramp	0.1333
3/1/2020	9	Armeni Public Ramp	0.241	Shilshole Public Ramp	0.2651
3/4/2020	10	Shilshole Public Ramp	0.2651	Armeni Public Ramp	0.241
3/6/2020	10	Shilshole Public Ramp	0.2651	Kingston Public Ramp	0.1831
3/8/2020	10	Armeni Public Ramp	0.241	Shilshole Public Ramp	0.2651
3/11/2020	11	Armeni Public Ramp	0.241	Kingston Public Ramp	0.1831
3/13/2020	11	Kingston Public Ramp	0.1831	Edmonds Boat Loft (Priv. fork lift)	0.106
3/15/2020	11	Shilshole Public Ramp	0.2651	Armeni Public Ramp	0.241
3/17/2020	12	Shilshole Public Ramp	0.2651	Armeni Public Ramp	0.241
3/20/2020	12	Shilshole Public Ramp	0.2651	Armeni Public Ramp	0.241
3/21/2020	12	Armeni Public Ramp	0.241	Kingston Public Ramp	0.1831

2) CWT RECOVERIES

Appendix 4 Coded-wire tag (CWT) recoveries from the 2019-20 winter 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	20-Mar-20	637082	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		61	CWT00047301	AD

Appendix 5 Coded-wire tag (CWT) recoveries from the 2019-20 winter 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	1-Mar-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	CWT00040703	AD
6	1-Mar-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		65	CWT00043598	AD
6	1-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		67	CWT00047414	AD
6	1-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00047415	AD
6	1-Mar-20	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		63	CWT00047496	AD
6	1-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		65	CWT00049003	AD
6	2-Mar-20	637192	2016	Purdy Cr 16.0005	George Adams Hatchery	WDFW		63	CWT00047494	AD
6	2-Mar-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		61	CWT00047495	AD
6	5-Mar-20	211275	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211276; 637248	64	CWT00047530	AD
6	6-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		62	CWT00043326	AD
6	6-Mar-20	211219	2016	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	637158	61	CWT00047416	AD
6	6-Mar-20	637146	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		76	CWT00047417	AD
6	7-Mar-20	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		69	CWT00040109	AD
6	7-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		74	CWT00047531	AD
6	7-Mar-20	636912	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		85	CWT00049004	AD
6	8-Mar-20	637174	2016	Friday Cr 03.0017	Samish Hatchery	WDFW		65	CWT00047418	AD
6	8-Mar-20	637147	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00047419	AD
6	8-Mar-20	211220	2016	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637159	55	CWT00047420	AD
6	12-Mar-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	CWT00047529	AD
6	13-Mar-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		81	70992	AD
6	13-Mar-20	185082	2017	R-Cowichan R	H-Cowichan River H	CDFO		58	80122	AD
6	13-Mar-20	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		66	80125	AD
6	13-Mar-20	211220	2016	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637159	64	80126	AD
6	15-Mar-20	211220	2016	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637159	73	79731	AD
6	15-Mar-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		70	80121	AD

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Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
6	17-Mar-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		72	CWT00047118	AD
6	21-Mar-20	637225	2017	Friday Cr 03.0017	Samish Hatchery	WDFW		51	CWT00040113	AD
6	21-Mar-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	79	CWT00040114	AD
6	21-Mar-20	637146	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		70	CWT00043145	AD
6	21-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		72	CWT00043585	AD
6	21-Mar-20	211219	2016	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	637158	70	CWT00047111	AD

Appendix 6 Coded-wire tag (CWT) recoveries from the 2019-20 winter Chinook MSF in Marine Area 7.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
7	1-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		58	CWT00044201	AD
7	2-Feb-20	637146	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		64	CWT00044202	AD
7	3-Feb-20	211219	2016	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	637158	70	CWT00040701	AD
7	3-Feb-20	184265	2017	R-Cowichan R	H-Cowichan River H	CDFO		59	CWT00044203	AD
7	3-Feb-20	636912	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		82	CWT00044204	AD
7	7-Feb-20	636945	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		78	84976	AD
7	7-Feb-20	211213	2016	Whitehorse Springs	Whitehorse Pond	STIL		62	84979	AD
7	7-Feb-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		66	84980	AD
7	7-Feb-20	637135	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		74	84981	AD
7	7-Feb-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	84982	AD
7	7-Feb-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	72	84983	AD
7	7-Feb-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		73	84984	AD
7	7-Feb-20	211290	2017	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		59	84985	AD
7	7-Feb-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		61	84986	AD
7	7-Feb-20	637157	2016	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		70	84987	AD
7	7-Feb-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		70	84988	AD
7	7-Feb-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		79	84989	AD
7	7-Feb-20	636945	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		72	87977	AD
7	8-Feb-20	637168	2016	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		70	84990	AD
7	8-Feb-20	60952	2016	Half Moon Bay John Pr Net	Mok R Fish Ins	CDFW		58	84991	AD
7	8-Feb-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		64	84992	AD
7	8-Feb-20	637192	2016	Purdy Cr 16.0005	George Adams Hatchery	WDFW		66	CWT00044205	AD
7	9-Feb-20	637168	2016	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		68	CWT00040106	AD
7	9-Feb-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		64	CWT00040107	AD

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Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
7	9-Feb-20	637393	2017	East Sound Bay (San)	Glenwood Springs	COOP		57	CWT00040314	AD
7	9-Feb-20	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		65	CWT00044206	AD
7	14-Feb-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		71	84940	AD
7	14-Feb-20	184299	2016	R-Cowichan R	H-Cowichan River H	CDFO		70	84993	AD
7	14-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		55	84994	AD
7	14-Feb-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		68	84995	AD
7	14-Feb-20	185082	2017	R-Cowichan R	H-Cowichan River H	CDFO		58	84996	AD
7	14-Feb-20	637146	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		60	84997	AD
7	14-Feb-20	637157	2016	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		70	84998	AD
7	14-Feb-20	211292	2017	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		60	84999	AD
7	14-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		55	85000	AD
7	15-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		60	5	AD
7	15-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		64	74198	AD
7	15-Feb-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	63	74200	AD
7	15-Feb-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		61	84703	AD
7	15-Feb-20	184166	2016	R-Burrard In	H-Sandy Cove Seapen	CDFO		57	84704	AD
7	15-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		62	84941	AD
7	15-Feb-20	637223	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		57	84942	AD
7	15-Feb-20	637157	2016	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		74	84943	AD
7	15-Feb-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		72	84945	AD
7	15-Feb-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	62	84947	AD
7	15-Feb-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		55	84948	AD
7	15-Feb-20	637168	2016	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	84949	AD
7	19-Feb-20	211290	2017	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		57	CWT00044207	AD
7	19-Feb-20	637174	2016	Friday Cr 03.0017	Samish Hatchery	WDFW		62	CWT00044208	AD
7	21-Feb-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	CWT00040702	AD
7	21-Feb-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	72	CWT00044209	AD
7	22-Feb-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		65	CWT00040108	AD
7	1-Mar-20	637225	2017	Friday Cr 03.0017	Samish Hatchery	WDFW		53	CWT00040316	AD
7	1-Mar-20	211231	2016	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211232	62	CWT00040676	AD
7	1-Mar-20	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		64	CWT00040726	AD
7	1-Mar-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		71	CWT00044210	AD
7	1-Mar-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		79	CWT00044212	AD

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Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
7	6-Mar-20	211213	2016	Whitehorse Springs	Whitehorse Pond	STIL		77	CWT00044299	AD
7	8-Mar-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		81	CWT00041014	AD
7	17-Mar-20	637162	2016	Deschutes R 13.0028	Tumwater Falls Hatchery	WDFW		55	CWT00041015	AD
7	21-Mar-20	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		64	CWT00040112	AD
7	22-Mar-20	637258	2017	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		54	CWT00040115	AD

Appendix 7 Coded-wire tag (CWT) recoveries from the 2019-20 winter Chinook MSF in Marine Area 8-1.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
81	1-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		63	CWT00044102	AD
81	21-Mar-20	211279	2017	Whitehorse Springs	Whitehorse Pond	STIL		55	72225	AD
81	21-Mar-20	211274	2017	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	211273; 637251; 637252	53	CWT00042402	AD
81	22-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		77	72233	AD

Appendix 8 Coded-wire tag (CWT) recoveries from the 2019-20 winter Chinook MSF in Marine Area 8-2.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
82	2-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		63	CWT00041013	AD
82	9-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		64	CWT00040675	AD
82	9-Feb-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		74	CWT00044101	AD
82	14-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		61	CWT00039874	AD
82	14-Feb-20	211276	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211275; 637248	53	CWT00039875	AD
82	15-Feb-20	637258	2017	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		56	CWT00039876	AD
82	16-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00039877	AD
82	16-Feb-20	637380	2017	Minter Cr Tr 15.0051	Hupp Springs Rearing	WDFW		55	CWT00039878	UM
82	21-Feb-20	637231	2017	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		53	CWT00039879	UM
82	21-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00039880	AD
82	22-Feb-20	211279	2017	Whitehorse Pond	Whitehorse Springs	STIL		58	CWT00039881	AD
82	28-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		65	CWT00044103	AD
82	1-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		54	CWT00039882	AD

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Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
82	1-Mar-20	211276	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211275; 637248	53	CWT00041588	AD
82	13-Mar-20	637234	2017	Deschutes R 13.0028	Tumwater Falls Hatchery	WDFW		54	CWT00039883	AD
82	21-Mar-20	211280	2017	County Line Cr3.2363	Marblemount Hatchery	WDFW		62	72230	AD
82	22-Mar-20	211276	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211275; 637248	52	72231	AD
82	22-Mar-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		72	72232	AD
82	23-Mar-20	637147	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		69	CWT00039885	AD

Appendix 9 Coded-wire tag (CWT) recoveries from the 2019-20 winter 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	2-Feb-20	211275	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211276; 637248	55	CWT00039871	AD
9	2-Feb-20	637230	2017	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		53	CWT00042401	AD
9	2-Feb-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		73	CWT00043549	AD
9	3-Feb-20	637161	2016	Cascade R 03.1411	Marblemount Hatchery	WDFW		70	87625	AD
9	3-Feb-20	637258	2017	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		59	CWT00039872	AD
9	3-Feb-20	637157	2016	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		76	CWT00040089	AD
9	9-Feb-20	637258	2017	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		58	CWT00039873	AD
9	9-Feb-20	637375	2017	Purdy Cr 16.0005	George Adams Hatchery	WDFW		58	CWT00042252	AD
9	16-Feb-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		62	CWT00042209	AD
9	19-Feb-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00040090	AD
9	21-Feb-20	211276	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211275; 637248	54	CWT00040091	AD
9	23-Feb-20	211279	2017	Whitehorse Springs	Whitehorse Pond	STIL		61	CWT00043589	AD
9	28-Feb-20	637234	2017	Deschutes R 13.0028	Tumwater Falls Hatchery	WDFW		44	CWT00043596	AD
9	1-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		64	CWT00042210	AD
9	1-Mar-20	184474	2017	R-Chilliwack R	H-Chilliwack River H	CDFO		62	CWT00043595	AD
9	6-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		62	CWT00042211	AD
9	8-Mar-20	637170	2016	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		67	CWT00043588	AD
9	13-Mar-20	211242	2016	Stillaguamish R -Sf	Brenner Hatchery	STIL		68	70995	AD
9	13-Mar-20	637192	2016	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	70996	AD

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Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
9	13-Mar-20	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		69	70997	AD
9	15-Mar-20	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		72	87681	AD
9	15-Mar-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		62	87682	AD
9	21-Mar-20	637311	2017	Sammamish R 08.0057	Issaquah Hatchery	WDFW		63	51273	AD
9	21-Mar-20	211275	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211276; 637248	62	51274	AD
9	21-Mar-20	55827	2017	Spring Cr 29.0159	Spring Cr Nfh	USFWS	55826	55	51275	AD
9	21-Mar-20	637171	2016	Wallace R 07.0940	Wallace R Hatchery	WDFW		69	72228	AD
9	21-Mar-20	637229	2017	Finch Cr 16.0222	Hoodspport Hatchery	WDFW		53	72229	AD
9	21-Mar-20	211276	2017	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	637249; 211275; 637248	67	CWT00040092	AD
9	21-Mar-20	211290	2017	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		53	CWT00043597	AD
9	22-Mar-20	211279	2017	Whitehorse Springs	Whitehorse Pond	STIL		52	CWT00039884	AD

Appendix 10 Coded-wire tag (CWT) recoveries from the 2019-20 winter Chinook MSF in Marine Area 10.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
10	19-Jan-20	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		58	CWT00039870	AD
10	19-Jan-20	637229	2017	Finch Cr 16.0222	Hoodspport Hatchery	WDFW		65	CWT00039869	AD

Appendix 11 Coded-wire tag (CWT) recoveries from the 2019-20 winter 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	31-Oct-19	637168	2016	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		73	CWT00051545	AD