

**2020-2021 Winter Mark-Selective Recreational Chinook Fisheries  
In Marine Areas 5, 10 and 13**

**Post-season Report**

**DRAFT**

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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 encountered<sup>1</sup>.

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 2020-2021 management season, mark-selective fisheries for Chinook salmon have been conducted in Puget Sound for the last 18 summer (May through September) seasons and the last 16 winter (October through April) seasons.

During the 2020-2021 winter season, October through April, WDFW implemented three mark-selective Chinook salmon fisheries in Marine Areas 5, 10 and 13. The Chinook MSF seasons in each area were scheduled as follows:

- Marine Area 5 from March 1 through April 30, 2021;
- Marine Area 10 from January 1 through March 31, 2021;
- Marine Area 13 from October 1, 2020 through April 30, 2021.

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<sup>1</sup>The regulations specific to summer mark-selective fisheries in Puget Sound Marine Catch Areas allowed for the retention of up to two legal-sized (>22 inches [56 cm]) marked Chinook salmon per day and required the immediate release of all unmarked or sublegal Chinook 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 a winter Chinook MSF in Marine Area 5 from March 1, 2021 through April 30, 2021. 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 2020-2021 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 41 site visits during the nine-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 coded-wire tags (CWTs or tags) 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 in Puget Sound MSFs, 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 2020-2021 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 UK	Chinook AD	Chinook UM	Chinook UK
10	1-Mar	7-Mar	120	310	93	2	6	39	32	11
11	8-Mar	14-Mar	136	299	115	1	4	52	44	38
12	15-Mar	21-Mar	60	163	44	0	3	37	23	17
13	22-Mar	28-Mar	99	230	73	0	4	36	19	35
14	29-Mar	4-Apr	73	169	42	0	0	38	15	16
15	5-Apr	11-Apr	83	199	105	0	3	44	19	19
16	12-Apr	18-Apr	96	209	51	0	2	18	17	14
17	19-Apr	25-Apr	56	129	53	0	0	28	15	4
18	26-Apr	30-Apr	34	83	24	0	0	20	9	12
<b>Season Total</b>			<b>757</b>	<b>1791</b>	<b>600</b>	<b>3</b>	<b>22</b>	<b>312</b>	<b>193</b>	<b>166</b>

**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	Unknown Salmon	Coho AD	Coho UM	Coho UK	Pink	Sockeye	Unknown Salmon
10	1-Mar	7-Mar	120	310	20	1	0	1	0	0	12
11	8-Mar	14-Mar	136	299	8	2	0	0	1	1	9
12	15-Mar	21-Mar	60	163	0	0	0	0	0	0	2
13	22-Mar	28-Mar	99	230	0	0	0	0	0	0	15
14	29-Mar	4-Apr	73	169	0	0	0	0	0	0	14
15	5-Apr	11-Apr	83	199	0	0	0	0	0	0	4
16	12-Apr	18-Apr	96	209	0	0	1	1	0	0	12
17	19-Apr	25-Apr	56	129	0	1	0	0	0	0	0
18	26-Apr	30-Apr	34	83	0	0	0	0	0	0	3
<b>Season Total</b>			<b>757</b>	<b>1791</b>	<b>28</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>71</b>

**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.

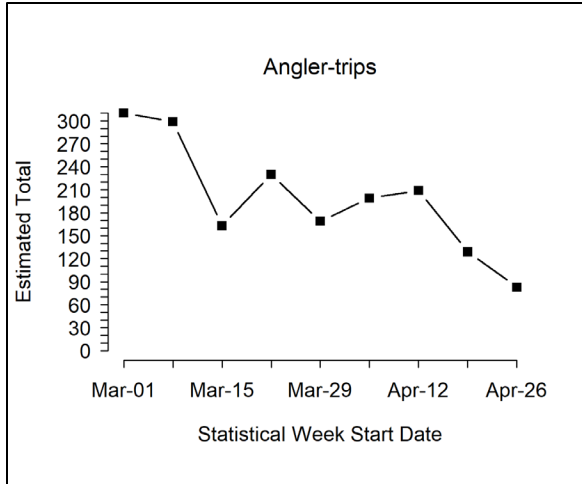
Location Name	Number of Site Days Sampled Per Month		Total Site-Days	% of Total
	March	April		
Olson's Resort	20	20	40	95.24%
Van Riper's Resort	0	2	2	4.76%
<b>Grand Total</b>	<b>20</b>	<b>22</b>	<b>42</b>	<b>100.00%</b>

**Table 1.4** Summary of CWTs recovered from Chinook salmon harvested during the 2020-2021 winter Chinook salmon MSF in Marine Area 5. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups.

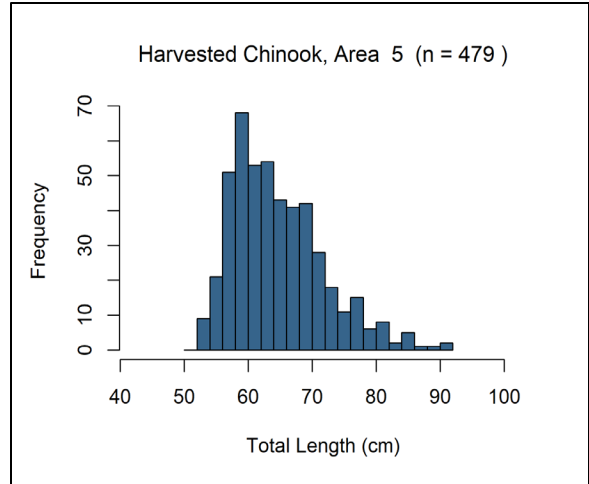
Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	N Washington (20%)	Lummi Hatchery -Pond	Lummi Sea Ponds	2 (3.3%)	0
		East Sound Bay (San)	Glenwood Springs	1 (1.7%)	0
		Friday Cr 03.0017	Samish Hatchery	2 (3.3%)	0
		Kendall Cr 01.0406	Kendall Cr Hatchery	4 (6.7%)	0
		Skookum Cr 01.0273	Skookum Cr Hatchery	3 (5%)	0
		Sol Duc R 20.0096	Solduc Hatchery	2 (3.3%)	0
	Hood Canal (6.7%)	Finch Cr 16.0222	Hoodsport Hatchery	3 (5%)	0
		Purdy Cr 16.0005	George Adams Hatchery	1 (1.7%)	0
	N Puget Sound (13.3%)	Whitehorse Springs	Fortson Pond Net Pen	3 (5%)	0
		Wallace R 07.0940	Wallace R Hatchery	5 (8.3%)	0
	Skagit River (6.7%)	Cascade R 03.1411	Marblemount Hatchery	1 (1.7%)	0
		Clark Cr 03.1421	Marblemount Hatchery	2 (3.3%)	0
		Co Line Pd2 03.1853B	Marblemount Hatchery	1 (1.7%)	0
	Mid Puget Sound (8.3%)	Grovers Cr Hatchery	Grovers Cr Hatchery	2 (3.3%)	2
		Icy Cr 09.0125	Icy Cr Hatchery	1 (1.7%)	0
		Big Soos Cr 09.0072	Soos Creek Hatchery	2 (3.3%)	0
	S Puget Sound (8.3%)	Minter Cr 15.0048	Minter Cr Hatchery	1 (1.7%)	0
		Clear Cr 11.0013C	Clear Creek Hatchery	1 (1.7%)	1
Deschutes R 13.0028		Minter Cr Hatchery	1 (1.7%)	0	
Kalama Cr 11.0017		Kalama Cr Hatchery	2 (3.3%)	0	
Col. Riv.	General Col. Riv. (1.7%)	Columbia R - General	Wells Hatchery	1 (1.7%)	0
	Upper Col. R (1.7%)	Entiat R 46.0042	Entiat Nfh	1 (1.7%)	0
	Cen. Col. R (6.7%)	Spring Cr 29.0159	Spring Cr Nfh	4 (6.7%)	4
	Lower Col. R(18.3%)	Willamette R M Fk-1	Dexter Ponds	2 (3.3%)	0
		Big Cr (Lwr Col R)	Big Cr Hatchery	2 (3.3%)	0
		Cowlitz R 26.0002	Cowlitz Salmon Hatchery	1 (1.7%)	0
		Santiam R S Fk	South Santiam Hatch	2 (3.3%)	0
		Bull Run R	Sandy Hatchery	1 (1.7%)	0
		Tanner Cr	Bonneville Hatchery	2 (3.3%)	0
Row R	Willamette Hatchery	1 (1.7%)	0		
CA	Cen. CA Coast (3.3%)	Half Moon Bay John Pr Net	Mok R Fish Ins	2 (3.3%)	0
	San Joaquin River (1.7%)	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	1 (1.7%)	0
Total				60	7

**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.

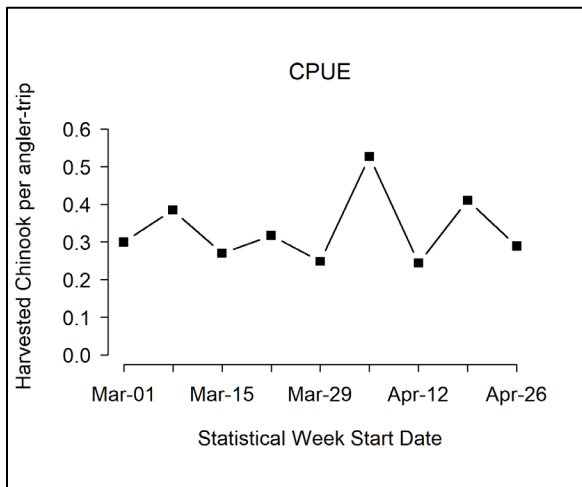
Mark Type	Legal	Sublegal	Total
Marked	449	30	479
Unmarked	2	0	2
Total	451	30	481



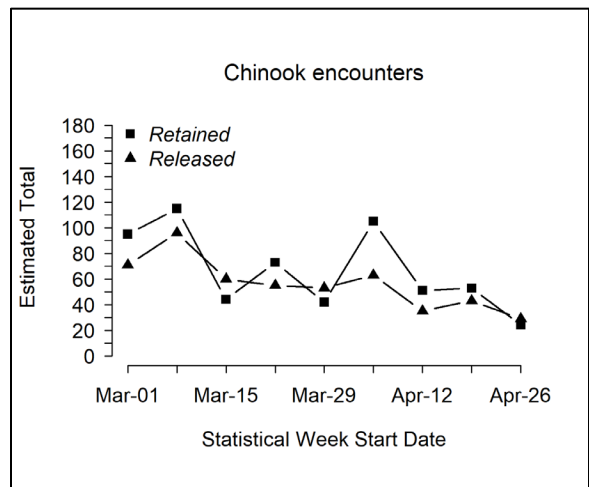
**Figure 1.1** Temporal patterns in fishing effort during the 2020-2021 winter Chinook salmon MSF in Marine Area 5. Note: displayed values are sample observations (summed across sampled sites)



**Figure 1.3** Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2020-2021 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 2020-2021 winter Chinook salmon MSF in Marine Area 5.



**Figure 1.4** Temporal patterns in Chinook salmon encounters (number retained and released) during the 2020-2021 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 2020-2021 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	1 1-trip STRs	1	0	0	0	1	1.00	1.00
Size/mark-status composition:		1.00	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 2020-2021 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	
	LM	LU	SM	SU
Kept	449	2	30	0
Released	24	127	287	66
Total	473	129	317	66
Size/mark-status composition	0.48	0.13	0.32	0.07
Bias Corrected <sup>a</sup>	0.43	0.13	0.32	0.12
Variance	0.0005	0.0002	0.0005	0.0001

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

## 2) Marine Area 10 Winter Mark-Selective Chinook Fishery

WDFW implemented a winter Chinook salmon MSF in Marine Area 10 from January 1, 2021 through January 18, 2021. The fisheries scheduled through March 31, 2021 closed prior to that when fisheries controls were met. The Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Marine Area 10 throughout the season 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 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 the following section we present results from our monitoring activities during the Marine Area 10 winter Chinook salmon MSF which occurred from January 1, 2021 through January 18, 2021, the last day of the fishery.

**Table 2.1** 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 <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release.	Two weeks	Creel estimates were produced for two-week estimation periods and stratified into “weekday” (Mon.-Thurs.) and “weekend” (Fri.-Sun.) day-type strata within weeks. For the weekday stratum we sampled $n=2$ days out of $N=8$ available weekdays per two-week period. For the weekend stratum we sampled $n=2$ days out of $N=3$ available weekend days per week
		Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Boat trip	Season	With a LM% CV of $\geq .2$ from test fishing and a large number of encounters reported in Dockside sampling, bias-corrected encounter proportions from the Dockside data ( <b>Table 2.10</b> ) were 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 2 boat surveys were conducted during the 2 ½ -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 <sup>2</sup> stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	Season-total size/mark-status encounters from the test fishery data and charter STR data were significantly different with compared with a Chi-Square test of independence ( $p$ -value $< .0001$ ) and were not combined. Test fishing data were not used to estimate total Chinook salmon encounters and associated impacts because LM% CV (.57) was greater than .2; LM=2%, LU=2%, SM=72%, SU=24%. (See <b>Table 2.4</b> ).
Voluntary Salmon 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 ( <b>Table 2.9</b> ) were not used to estimate total Chinook impacts because no LM Chinook were encountered; LM=20%, LU=0%, SM=60%, SU=20%.
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.

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

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

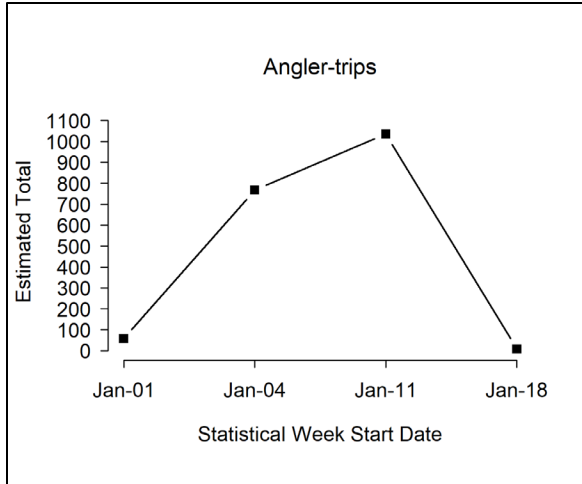
**Table 2.2** Estimates of total fishing effort and total Chinook salmon catch (retained and released) during the 2020-2021 winter Chinook salmon MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

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	
<b>Jan</b>	1	1-Jan	3-Jan	32	58	0	0	0	0	0
	2	4-Jan	10-Jan	389	767	92	0	715	209	1017
	3	11-Jan	17-Jan	483	1035	143	0	1111	325	1580
	4	18-Jan	18-Jan	5	8	0	0	0	0	0
<b>Season Total</b>				<b>909</b>	<b>1,868</b>	<b>235</b>	<b>0</b>	<b>1,827</b>	<b>535</b>	<b>2,597</b>
<b>Variance:</b>				7,728	24,863	909	0	220,542	19,807	411,098
<b>SE:</b>				88	158	30	0	470	141	641
<b>CV (%):</b>				10	8	13	0	26	26	25
<b>95% CI:</b>				737 - 1,081	1,559 - 2,177	176 - 294	0 - 0	906 - 2,747	259 - 811	1,340 - 3,853

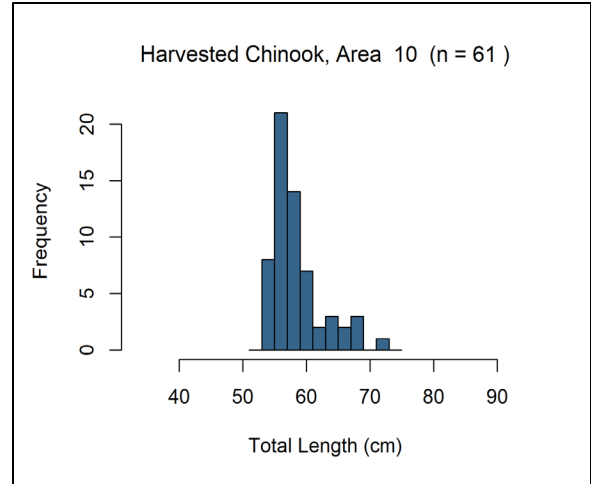
**Table 2.3** Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2020-2021 winter Chinook salmon MSF in Marine Area 10.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	45	16	61
Unmarked	0	0	0
<b>Total</b>	<b>45</b>	<b>16</b>	<b>61</b>

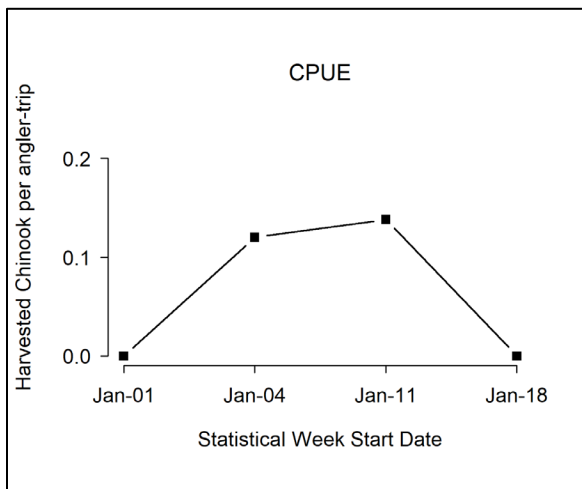




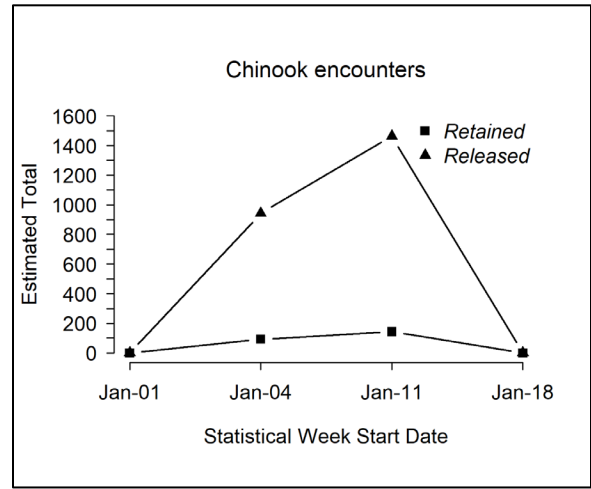
**Figure 2.1** Temporal patterns in fishing effort during the 2020-2021 winter Chinook salmon MSF in Marine Area 10.



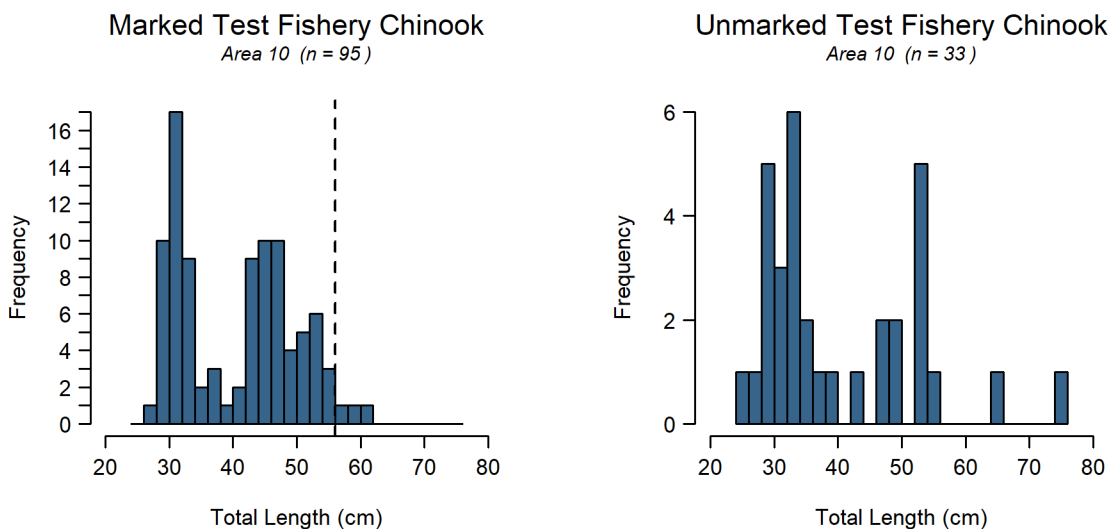
**Figure 2.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2020-2021 winter Chinook salmon MSF in Marine Area 10. Note: displayed values are observations where lengths were taken



**Figure 2.2** Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2020-2021 winter Chinook salmon MSF in Marine Area 10.



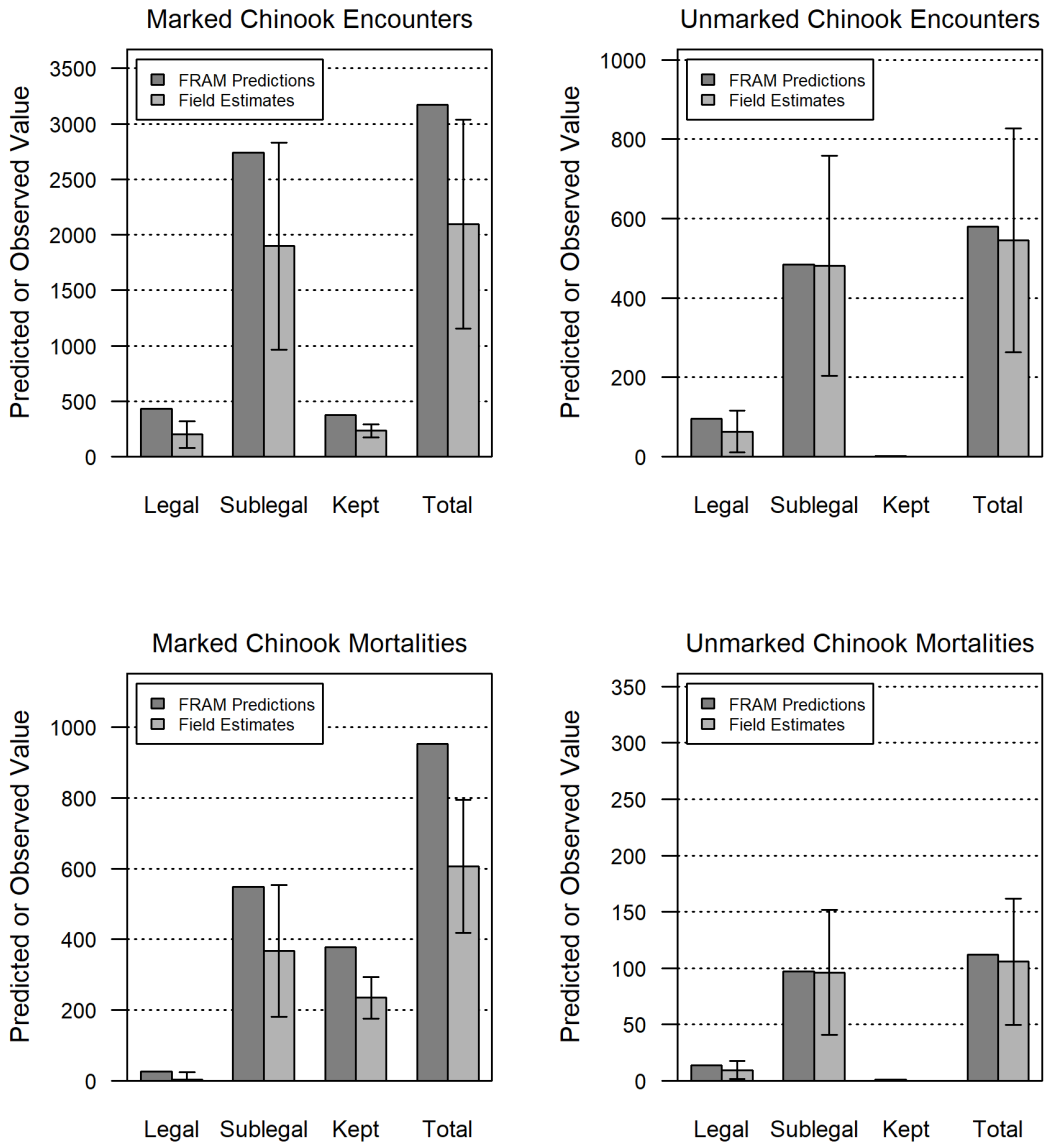
**Figure 2.4** Temporal patterns in Chinook salmon encounters (number retained and released) during the 2020-2021 winter Chinook salmon MSF in Marine Area 10.



**Figure 2.5** Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook salmon encountered by test fishers during the 2020-2021 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 2.4** Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2020-2021 winter Chinook salmon MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Surveys	Hrs Fished	AD	UM	AD	UM	
1	1	4.63	0	0	8	0	8
2	10	49.56	1	1	61	20	83
3	7	37.84	2	1	23	11	37
<b>Total</b>	<b>18</b>	<b>92.02</b>	<b>3</b>	<b>2</b>	<b>92</b>	<b>31</b>	<b>128</b>
<b>Size/mark-status composition:</b>			0.02	0.02	0.72	0.24	
<b>Variance:</b>			(0.0002)	(0.0001)	(0.0016)	(0.0014)	
<b>Legal size mark rate:</b>			0.60				
<b>Overall mark rate:</b>			0.74				



**Figure 2.6** Comparison of modeled (FRAM model run 3120) and estimated total Chinook salmon encounters and mortalities for the 2020-2021 winter Chinook salmon MSFs in Marine Area 10. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 2.5** Comparison of modeled (FRAM model run 3120) and estimated total Chinook salmon encounters for the 2020-2021 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	579	95	484	1
	AD	3,172	433	2,739	377
	Total	3,751	528	3,223	378
	% Marked	85	82	85	100
Estimated (Creel) Encounters	UM	535	62	473	0
	AD	2,062	199	1,862	235
	Total	2,597	262	2,335	235
	% Marked	79	76	80	100

**Table 2.6** Summary of season-wide fishery impact estimates for the 2020-2021 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	199	173	26	4	177	772	28	123 - 232	16
Legal UM	62	0	62	9	9	16	4	2 - 17	42
Sublegal AD	1,862	62	1,801	360	422	8,878	94	237 - 606	22
Sublegal UM	473	0	473	95	95	765	28	40 - 149	29
<b>Total</b>	<b>2,597</b>	<b>235</b>	<b>2,361</b>	<b>468</b>	<b>703</b>	<b>10,430</b>	<b>102</b>	<b>503 - 903</b>	<b>15</b>

**Table 2.7** Comparison of modeled (FRAM model run 3120) and estimated total Chinook salmon mortalities for the 2020-2021 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)	112	952	1,064	104	599	703
Released Legal	14	27	41	9	4	13
Released Sublegal	97	548	645	95	360	455
Landed Only	1	377	378	0	235	235

**Table 2.8** Monthly sample rates (Total retained Chinook salmon sampled/ Estimated retained Chinook salmon) in the 2020-2021 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	1-4	1 Jan - 18 Jan	235	0	235	65	0	65	27.60%
<b>Season Total</b>			<b>235</b>	<b>0</b>	<b>235</b>	<b>65</b>	<b>0</b>	<b>65</b>	<b>27.60%</b>

**Table 2.9** 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 2020-2021 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 VTR	3 1-trip VTRs	1	0	3	1	5	0.80	1.00
Size/mark-status composition:		0.20	0.00	0.60	0.20			
Variance:		(0.0400)	(0.0000)	(0.0600)	(0.0400)			

**Table 2.10** Dockside encounters (retained and released) by size-mark category during the 2020-2021 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	
	LM	LU	SM	SU
Kept	45	0	16	0
Released	9	15	433	108
Total	54	15	449	108
Size/mark-status composition	0.09	0.02	0.72	0.17
Bias Corrected	0.08	0.02	0.72	0.18
Variance	0.0002	0.0001	0.0007	0.0009

**Table 2.11** Summary of CWTs recovered from Chinook salmon retained during the 2020-2021 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	N Puget Sound (50%)	Whitehorse Springs	Fortson Pond Net Pen	3 (50%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	1 (16.7%)	0
	Mid Puget Sound (50%)	Grovers Cr Hatchery	Grovers Cr Hatchery	2 (33.3%)	2
		Total		6	2

**Table 2.12** 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 2020-2021 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)
Grovers Cr Hatchery	2018	2	7.7	22	7.5	0.8	0.209	0.65
Total		2	7.7	22	7.5	0.8	0.209	0.65

**Table 2.13** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) during the 2020-2021 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	Retained Salmon		Released Salmon			
			Coho AD	Coho UM	Coho AD	Coho UM	Coho UK	Unknown Salmon
1	1-Jan	3-Jan	0	0	0	0	16	0
2	4-Jan	10-Jan	0	0	43	0	24	169
3	11-Jan	17-Jan	0	0	11	9	27	249
4	18-Jan	18-Jan	0	0	0	0	0	21
<b>Season Total:</b>			0	0	54	9	67	438
<b>Variance:</b>			NA	NA	311	27	594	10,537
<b>Standard Error:</b>			NA	NA	18	5	24	103
<b>CV (%):</b>			NA	NA	33%	55%	36%	23%
<b>95% CI:</b>			NA	NA	19 - 89	0 - 20	19 - 115	237 - 639

**Table 2.14** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2020-2021 winter Chinook salmon MSFs in Marine Area 10. Bold sites indicate those included in the dockside sample frame.

Site Name	Weekend Anglers	Season Total (unadjusted) Size Measure
<b>Armeni Public Ramp</b>	<b>31</b>	<b>0.0795</b>
Bayside Marina/Drystack	3	0.0077
<b>Brownsville Marina</b>	<b>16</b>	<b>0.0410</b>
Camano Island State Park Public Ramp	2	0.0051
Dagmar's Landing, Forklift Launch	8	0.0205
Duwamish Is Marina	2	0.0051
Eagle Harbor Waterfront Park	5	0.0128
Edmonds Boat Basin	30	0.0769
Edmonds Dry Storage	9	0.0231
Edmonds Marina	41	0.1051
Elliott Bay Marina	6	0.0154
Everett Marina	16	0.0410
Everett Ramp	41	0.1051
Evergreen Park Ramp	3	0.0077
Fay Bainbridge St Park Ramp	1	0.0026
Kingston Marina	11	0.0282
<b>Kingston Public Ramp</b>	<b>32</b>	<b>0.0821</b>
<b>Manchester Public Ramp</b>	<b>9</b>	<b>0.0231</b>
Narrows Marina	3	0.0077
Point Defiance Public Ramp	8	0.0205
Port Orchard Marina	2	0.0051
Port Orchard Public Ramp	3	0.0077
Poulsbo Ramp/Marina	1	0.0026
Private	12	0.0308
Redondo Ramp	3	0.0077
Shilshole Marina	20	0.0513
<b>Shilshole Public Ramp</b>	<b>63</b>	<b>0.1615</b>
South Park - Duwamish	3	0.0077
Suquamish Public Ramp	2	0.0051
Winslow City Ramp	2	0.0051
Zittels Marina	2	0.0051
<b>Total Anglers</b>	<b>390</b>	<b>1</b>

**Table 2.15** 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
Jan 1, 2021 - Jan 18, 2021	1,868	173	0	62	0	26	62	1801	473	2,597



### 3) Marine Area 13 Winter Mark-Selective Chinook Fishery

The WDFW implemented a Chinook salmon MSF in Marine Area 13 from October 1, 2020 through April 30, 2021. Data collection methods used to monitor the Marine Area 13 Chinook salmon MSF included dockside angler interviews (with catch sampling) and voluntary salmon 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 2020-2021 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 3.3**), and a total of 1,019 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.

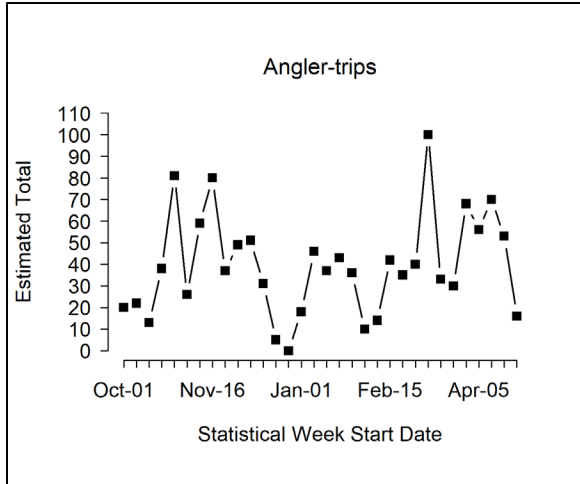
In contrast to the intensive “Murthy” survey design employed in other areas in Puget Sound, Marine Area 13 sampling results could not be used to produce fishery-total estimates of effort, encounters (retained catch + releases), and unmarked-DIT Chinook salmon impacts. However, Marine Area 13 Baseline 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 2020-2021 Chinook salmon MSF.

**Table 3.1** 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.

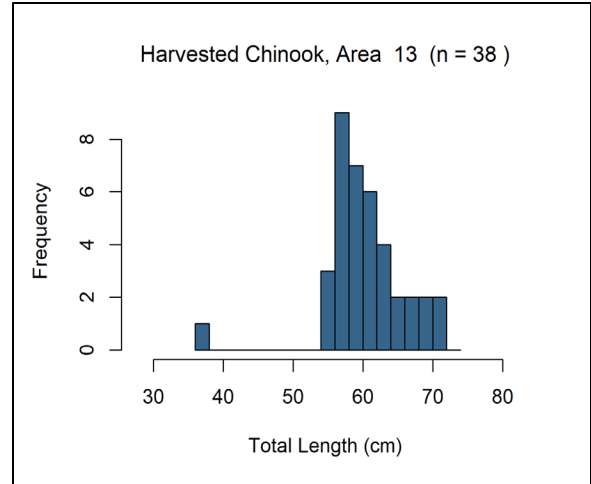
Stat Week	Start	End	Effort		Retained Fish			Released Fish		
			Boats	Anglers	Chinook AD	Chinook UM	Chinook UD	Chin AD	Chin UM	Chin UK
40	1-Oct	4-Oct	12	20	0	0	0	2	0	0
41	5-Oct	11-Oct	18	22	0	0	0	0	0	0
42	12-Oct	18-Oct	13	13	0	0	0	0	0	0
43	19-Oct	25-Oct	29	38	0	0	0	0	0	0
44	26-Oct	1-Nov	53	81	0	0	0	0	0	0
45	2-Nov	8-Nov	14	26	0	0	0	0	0	0
46	9-Nov	15-Nov	43	59	0	0	0	0	0	0
47	16-Nov	22-Nov	57	80	1	0	0	2	0	0
48	23-Nov	29-Nov	26	37	0	0	0	0	0	0
49	30-Nov	6-Dec	35	49	1	0	0	1	0	0
50	7-Dec	13-Dec	38	51	1	0	0	7	0	6
51	14-Dec	20-Dec	26	31	0	0	0	4	0	4
52	21-Dec	27-Dec	3	5	1	0	0	5	2	0
53	28-Dec	31-Dec	0	0	0	0	0	0	0	0
1	1-Jan	3-Jan	12	18	0	0	0	6	2	0
2	4-Jan	10-Jan	31	46	1	0	0	27	7	3
3	11-Jan	17-Jan	24	37	3	0	0	12	2	3
4	18-Jan	24-Jan	25	43	0	0	0	17	12	8
5	25-Jan	31-Jan	27	36	2	0	0	8	4	0
6	1-Feb	7-Feb	6	10	2	0	0	9	3	0
7	8-Feb	14-Feb	10	14	0	0	0	10	2	2
8	15-Feb	21-Feb	26	42	2	0	0	6	0	2
9	22-Feb	28-Feb	26	35	1	0	0	25	1	7
10	1-Mar	7-Mar	29	40	3	0	0	7	3	0
11	8-Mar	14-Mar	60	100	2	0	0	47	2	0
12	15-Mar	21-Mar	18	33	0	0	0	12	0	3
13	22-Mar	28-Mar	18	30	3	0	0	17	4	2
14	29-Mar	4-Apr	38	68	1	0	0	26	5	12
15	5-Apr	11-Apr	25	56	5	0	0	26	2	2
16	12-Apr	18-Apr	36	70	5	0	0	21	2	0
17	19-Apr	25-Apr	33	53	4	0	0	2	1	0
18	26-Apr	30-Apr	11	16	1	0	0	5	2	0
<b>Season Total</b>			<b>822</b>	<b>1,259</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>304</b>	<b>56</b>	<b>54</b>

**Table 3.2** 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.

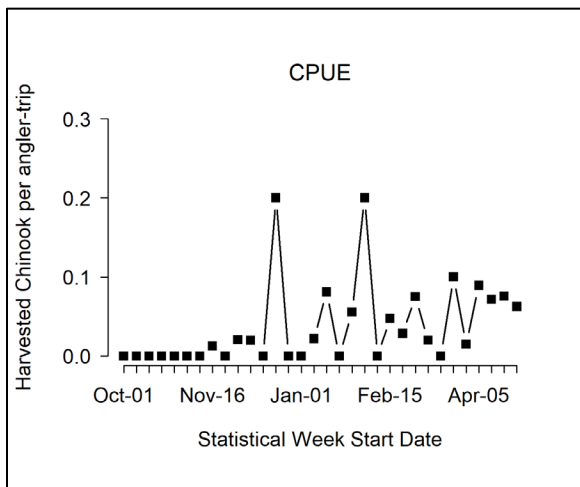
Stat Week	Start	End	Effort		Retained Fish			Released Fish					
			Boats	Anglers	Coho AD	Coho UM	Chum	Chum	Coho AD	Coho UM	Coho UD	Cutthroat	Unknown Salmon
40	1-Oct	4-Oct	12	20	1	0	0	0	0	1	0	0	1
41	5-Oct	11-Oct	18	22	0	0	1	3	0	0	0	12	0
42	12-Oct	18-Oct	13	13	0	0	3	0	0	0	1	0	0
43	19-Oct	25-Oct	29	38	0	0	1	3	0	0	0	0	0
44	26-Oct	1-Nov	53	81	1	0	17	5	5	0	0	0	23
45	2-Nov	8-Nov	14	26	0	0	14	3	0	0	0	1	0
46	9-Nov	15-Nov	43	59	0	0	39	35	0	0	0	0	0
47	16-Nov	22-Nov	57	80	0	0	13	7	2	0	0	7	17
48	23-Nov	29-Nov	26	37	0	0	4	0	0	0	0	1	12
49	30-Nov	6-Dec	35	49	1	0	3	3	5	0	0	5	56
50	7-Dec	13-Dec	38	51	1	0	0	0	2	0	0	9	11
51	14-Dec	20-Dec	26	31	1	0	0	0	7	4	0	8	0
52	21-Dec	27-Dec	3	5	2	0	0	0	0	0	0	0	0
53	28-Dec	31-Dec	0	0	0	0	0	0	0	0	0	0	0
1	1-Jan	3-Jan	12	18	1	0	0	0	0	0	0	0	0
2	4-Jan	10-Jan	31	46	5	0	0	0	8	2	0	4	6
3	11-Jan	17-Jan	24	37	7	0	0	0	3	1	0	13	0
4	18-Jan	24-Jan	25	43	0	0	0	0	7	7	2	0	0
5	25-Jan	31-Jan	27	36	1	0	0	0	1	2	2	0	0
6	1-Feb	7-Feb	6	10	4	0	0	0	0	1	0	2	0
7	8-Feb	14-Feb	10	14	0	0	0	0	0	1	0	4	1
8	15-Feb	21-Feb	26	42	0	0	0	0	2	1	0	0	6
9	22-Feb	28-Feb	26	35	2	0	0	0	1	0	0	0	0
10	1-Mar	7-Mar	29	40	1	0	0	0	0	1	0	3	0
11	8-Mar	14-Mar	60	100	2	0	0	0	23	11	3	6	5
12	15-Mar	21-Mar	18	33	0	0	0	0	0	2	0	2	0
13	22-Mar	28-Mar	18	30	0	0	0	0	0	0	0	12	0
14	29-Mar	4-Apr	38	68	2	0	0	0	4	4	1	0	1
15	5-Apr	11-Apr	25	56	1	0	0	0	0	0	0	0	0
16	12-Apr	18-Apr	36	70	0	0	0	0	0	0	0	21	1
17	19-Apr	25-Apr	33	53	1	0	0	0	1	0	0	3	0
18	26-Apr	30-Apr	11	16	0	0	0	0	0	0	0	0	0
<b>Season Total</b>			<b>822</b>	<b>1,259</b>	<b>34</b>	<b>0</b>	<b>95</b>	<b>59</b>	<b>71</b>	<b>38</b>	<b>9</b>	<b>113</b>	<b>140</b>



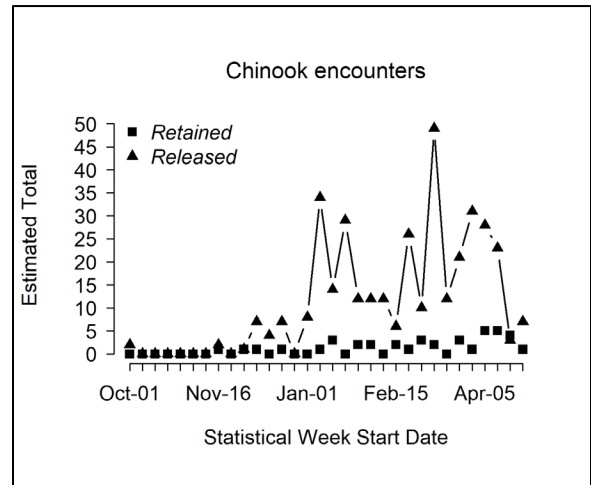
**Figure 3.1** Temporal patterns in fishing effort during the 2020-2021 winter Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 3.3** Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2020-2021 winter Chinook salmon MSF in Marine Area 13.



**Figure 3.2** Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2020-2021 winter Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 3.4** Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2020-2021 winter Chinook salmon MSF in Marine Area 13.

**Table 3.3** List of sites sampled with the number of sampling events (site-days) during the 2020-2021 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	April		
Allyn Dock/Pier	0	1	1	0	0	0	0	2	0.20%
Allyn Public Ramp	0	1	2	4	5	12	9	33	3.24%
Arcadia Ramp	1	0	1	1	3	2	1	9	0.88%
Bayshore (John's Creek)	3	0	0	0	0	0	0	3	0.29%
Boston Harbor Ramp	13	6	14	16	10	16	6	81	7.95%
Concrete Dock	0	0	3	5	5	2	2	17	1.67%
East Bay Marina	10	5	15	14	9	14	7	74	7.26%
Fox Island Public Ramp	0	0	4	3	4	4	4	19	1.86%
Fox Island Sand Spit	0	0	3	2	5	3	2	15	1.47%
Grapeview Public Ramp	3	3	2	4	5	15	12	44	4.32%
Harstine Is. Ramp	8	3	2	8	8	16	17	62	6.08%
Home Public Ramp	0	2	6	2	4	12	5	31	3.04%
Horsehead Bay Ramp	0	0	1	1	1	1	4	8	0.79%
Joemma Beach Ramp	0	0	1	0	2	8	3	14	1.37%
John's Creek	1	1	0	0	0	0	0	2	0.20%
Kennedy Creek Mouth	8	5	2	0	0	0	0	15	1.47%
Landover	0	0	0	1	3	3	2	9	0.88%
Longbranch Marina	0	0	0	0	0	1	6	7	0.69%
Longbranch Public Ramp	0	1	5	1	4	11	9	31	3.04%
Luhr Beach Ramp	11	2	15	26	19	27	23	123	12.07%
McLane Creek Shore	1	5	0	0	0	0	0	6	0.59%
Narrows Marina	9	15	19	12	7	8	10	80	7.85%
Narrows Park	2	1	10	8	7	7	8	43	4.22%
Narrows Ramp	3	1	0	0	0	0	1	5	0.49%
Perry Creek	2	15	6	0	0	0	0	23	2.26%
Port of Shelton Ramp	0	0	0	0	0	1	0	1	0.10%
Priest Point Park	2	4	0	0	0	0	0	6	0.59%
Shorecrest Mason Co. Ramp	1	0	0	0	0	1	0	2	0.20%
Solo Point	1	0	7	3	4	12	12	39	3.83%
South Allyn Shore	1	0	0	0	0	0	0	1	0.10%
Steamboat Island Bridge	6	5	1	0	0	0	0	12	1.18%
Steilacoom Public Ramp	10	7	7	1	1	1	0	27	2.65%
Tolmie State Park	1	0	0	0	0	0	0	1	0.10%
Vaughn Public Ramp	0	4	6	2	4	9	7	32	3.14%
Wauna Ramp	0	1	1	1	0	0	2	5	0.49%
Wauna Shore	2	7	11	4	6	7	4	41	4.02%
Wollochet Bay Public Ramp	0	0	1	4	6	3	2	16	1.57%
Zittels Marina	13	1	11	15	11	15	14	80	7.85%
<b>Grand Total</b>	<b>112</b>	<b>96</b>	<b>157</b>	<b>138</b>	<b>133</b>	<b>211</b>	<b>172</b>	<b>1,019</b>	<b>100.00%</b>

**Table 3.4** Summary of total lengths from retained Chinook salmon collected during dockside angler interviews in the 2020-2021 winter Chinook salmon MSF in Marine Area 13.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	34	4	38
Unmarked	0	0	0
<b>Total</b>	<b>34</b>	<b>4</b>	<b>38</b>

**Table 3.5** Summary of CWTs recovered from Chinook salmon retained during the 2020-2021 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	N Puget Sound (50%)	Whitehorse Springs	Fortson Pond Net Pen	2 (50%)	0
	Mid Puget Sound (25%)	Icy Cr 09.0125	Icy Cr Hatchery	1 (25%)	0
	S Puget Sound (25%)	Chambers Cr 12.0007	Garrison Hatchery	1 (25%)	0
			Total	4	0

**Table 3.6** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on STRs during the 2020-2021 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 3.7** Dockside encounters (retained and released) by size-mark category during the 2020-2021 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	34	0	4	0
Released	0	11	304	45
Total	34	11	308	45
Size/mark-status composition	0.09	0.03	0.77	0.11
Bias Corrected	0.08	0.03	0.77	0.12
Variance	0.0003	0.0001	0.0007	0.0006

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## APPENDICES

### 1) SITE WEIGHTS

**Appendix 1** Size measures by sample date, for sites sampled during dockside creel surveys for the 2020-2021 winter Chinook MSF in Marine Area 10.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
1/2/2021	1	Shilshole Public Ramp	0.3407	Armeni Public Ramp	0.1600
1/3/2021	1	Shilshole Public Ramp	0.3407	Armeni Public Ramp	0.1600
1/5/2021	2	Shilshole Public Ramp	0.3407	Manchester Public Ramp	0.1845
1/7/2021	2	Armeni Public Ramp	0.1600	Manchester Public Ramp	0.1845
1/8/2021	2	Shilshole Public Ramp	0.3407	Armeni Public Ramp	0.1600
1/9/2021	2	Shilshole Public Ramp	0.3407	Kingston Public Ramp	0.1842
1/10/2021	2	Armeni Public Ramp	0.1600	Shilshole Public Ramp	0.3407
1/11/2021	2	Shilshole Public Ramp	0.3407	Kingston Public Ramp	0.1842
1/13/2021	2	Shilshole Public Ramp	0.3407	Edmonds Boat Loft (Priv. fork lift)	0.1306
1/15/2021	2	Armeni Public Ramp	0.1600	Kingston Public Ramp	0.1842
1/16/2021	2	Shilshole Public Ramp	0.3407	Armeni Public Ramp	0.1600
1/17/2021	2	Armeni Public Ramp	0.1600	Manchester Public Ramp	0.1845

## 2) CWT RECOVERIES

Appendix 2 Coded-wire tag (CWT) recoveries from the 2020-2021 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	2-Mar-21	637142	2017	Cascade R 03.1411	Marblemount Hatchery	WDFW		76	CWT00049650	AD
5	2-Mar-21	211331	2018	Lummi Hatchery -Pond	Lummi Sea Ponds	LUMMI		57	CWT00049651	AD
5	2-Mar-21	637230	2017	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	CWT00049653	AD
5	2-Mar-21	637439	2018	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		52	CWT00049654	AD
5	2-Mar-21	637227	2017	Wallace R 07.0940	Wallace R Hatchery	WDFW		68	CWT00049655	AD
5	5-Mar-21	637348	2018	Clark Cr 03.1421	Marblemount Hatchery	WDFW		56	CWT00049652	AD
5	6-Mar-21	211315	2018	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		60	CWT00046394	AD
5	7-Mar-21	91271	2017	Santiam R S Fk	South Santiam Hatch	ODFW		66	CWT00049032	AD
5	7-Mar-21	637227	2017	Wallace R 07.0940	Wallace R Hatchery	WDFW		61	CWT00049033	AD
5	7-Mar-21	211262	2017	Sol Duc R 20.0096	Solduc Hatchery	QUIL		62	CWT00049969	AD
5	8-Mar-21	637353	2018	Friday Cr 03.0017	Samish Hatchery	WDFW		55	CWT00049031	UM
5	8-Mar-21	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		58	CWT00049905	AD
5	11-Mar-21	637227	2017	Wallace R 07.0940	Wallace R Hatchery	WDFW		66	CWT00049906	AD
5	12-Mar-21	61475	2017	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	CDFW		69	CWT00049028	AD
5	12-Mar-21	637524	2018	Purdy Cr 16.0005	George Adams Hatchery	WDFW		55	CWT00049029	AD
5	12-Mar-21	637373	2018	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		56	CWT00049030	AD
5	13-Mar-21	61484	2017	Half Moon Bay John Pr Net	Mok R Fish Ins	CDFW		66	CWT00046396	AD
5	14-Mar-21	91124	2016	Row R (Willamette R Cst)	Willamette Hatchery	ODFW		79	CWT00049025	AD
5	14-Mar-21	211322	2018	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211323; 637442; 637443	62	CWT00049026	AD
5	14-Mar-21	637350	2018	Wallace R 07.0940	Wallace R Hatchery	WDFW		60	CWT00049027	AD
5	16-Mar-21	637229	2017	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		51	CWT00049024	AD
5	20-Mar-21	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		80	CWT00046397	AD
5	21-Mar-21	61484	2017	Half Moon Bay John Pr Net	Mok R Fish Ins	CDFW		65	CWT00046398	AD
5	26-Mar-21	211348	2018	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		54	CWT00049022	AD
5	26-Mar-21	637369	2018	Deschutes R 13.0028	Minter Cr Hatchery	WDFW		55	CWT00049023	AD
5	27-Mar-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		55	CWT00046399	AD
5	27-Mar-21	211331	2018	Lummi Hatchery -Pond	Lummi Sea Ponds	LUMMI		55	CWT00046400	AD
5	27-Mar-21	637230	2017	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		66	CWT00049021	AD
5	28-Mar-21	637348	2018	Clark Cr 03.1421	Marblemount Hatchery	WDFW		61	CWT00049019	AD

5	30-Mar-21	637174	2016	Friday Cr 03.0017	Samish Hatchery	WDFW		74	CWT00049020	AD
5	3-Apr-21	56018	2017	Entiat R 46.0042	Entiat Nfh	USFWS		68	CWT00048901	AD
5	3-Apr-21	91285	2018	Tanner Cr (Bnville)	Bonneville Hatchery	ODFW		72	CWT00048902	AD
5	3-Apr-21	637221	2017	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		73	CWT00048903	AD
5	4-Apr-21	211317	2018	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		53	CWT00048904	AD
5	4-Apr-21	91269	2017	Santiam R S Fk	South Santiam Hatch	ODFW		70	CWT00048905	AD
5	4-Apr-21	90569	2018	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW		57	CWT00048906	AD
5	5-Apr-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		56	CWT00048907	AD
5	5-Apr-21	91265	2017	Willamette R M Fk-1	Dexter Ponds (Willam	ODFW		62	CWT00048908	AD
5	5-Apr-21	637246	2018	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		50	CWT00048909	AD
5	6-Apr-21	56163	2018	Spring Cr 29.0159	Spring Cr Nfh	USFWS	56025	62	CWT00048910	AD
5	9-Apr-21	637393	2017	East Sound Bay (San)	Glenwood Springs	COOP		64	CWT00048911	AD
5	10-Apr-21	91266	2017	Willamette R M Fk-1	Dexter Ponds (Willam	ODFW		68	CWT00048912	AD
5	10-Apr-21	56163	2018	Spring Cr 29.0159	Spring Cr Nfh	USFWS	56025	55	CWT00048913	AD
5	11-Apr-21	637232	2017	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		60	CWT00048914	AD
5	11-Apr-21	211321	2018	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637438; 211320; 637437	53	CWT00048916	AD
5	12-Apr-21	211322	2018	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211323; 637442; 637443	55	CWT00048917	AD
5	12-Apr-21	637383	2017	Cowlitz R 26.0002	Cowlitz Salmon Hatchery	WDFW		61	CWT00048918	AD
5	12-Apr-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		56	CWT00048919	AD
5	12-Apr-21	211290	2017	Skookum Cr 01.0273	Skookum Cr Hatchery	LUMMI		61	CWT00048920	AD
5	16-Apr-21	91285	2018	Tanner Cr (Bnville)	Bonneville Hatchery	ODFW		60	CWT00048921	AD
5	17-Apr-21	91227	2017	Bull Run R	Sandy Hatchery	ODFW		72	CWT00048922	AD
5	17-Apr-21	211262	2017	Sol Duc R 20.0096	Solduc Hatchery	QUIL		64	CWT00048923	AD
5	17-Apr-21	90569	2018	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW		56	CWT00048924	AD
5	18-Apr-21	637373	2018	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW		54	CWT00049968	AD
5	19-Apr-21	56161	2018	Spring Cr 29.0159	Spring Cr Nfh	USFWS	56019	61	CWT00048925	AD
5	24-Apr-21	211343	2018	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		55	CWT00048926	AD
5	24-Apr-21	211149	2017	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		62	CWT00048927	AD
5	24-Apr-21	56161	2018	Spring Cr 29.0159	Spring Cr Nfh	USFWS	56019	58	CWT00048928	AD
5	26-Apr-21	636988	2016	Columbia R - General	Wells Hatchery	DCPUD		87	CWT00048929	AD
5	27-Apr-21	637227	2017	Wallace R 07.0940	Wallace R Hatchery	WDFW		74	CWT00048930	AD

**Appendix 3** Coded-wire tag (CWT) recoveries from the 2020-2021 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	9-Jan-21	211322	2018	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211323; 637442; 637443	50	CWT00039316	AD
10	9-Jan-21	637444	2018	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		54	CWT00049277	AD
10	10-Jan-21	211323	2018	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211322; 637442; 637443	54	CWT00039317	AD
10	16-Jan-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		65	CWT00041160	AD
10	16-Jan-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		56	CWT00049278	AD
10	17-Jan-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		58	CWT00041161	AD

**Appendix 4** Coded-wire tag (CWT) recoveries from the 2020-2021 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	26-Jan-21	637450	2018	Chambers Cr 12.0007	Garrison Hatchery	WDFW		55	CWT00047741	AD
13	8-Mar-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		59	CWT00051804	AD
13	24-Mar-21	211313	2018	Whitehorse Springs	Fortson Pond Net Pen	STIL		55	CWT00041162	AD
13	7-Apr-21	637413	2018	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00047763	AD