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**2018 Summer Mark-Selective Recreational Chinook Fisheries  
In Marine Areas 5, 6, 7, 9, 10, 11, 12 and 13**

**Post-season Report**

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## TABLE OF CONTENTS

TABLE OF CONTENTS.....	ii
LIST OF TABLES .....	iii
LIST OF FIGURES .....	x
LIST OF APPENDICIES .....	xiii
INTRODUCTION .....	1
RESULTS .....	2
1) Marine Area 5 Summer Mark-Selective Chinook Fishery .....	2
2) Marine Area 6 Summer Mark-Selective Chinook Fishery .....	11
3) Marine Area 7 Summer Mark-Selective Chinook Fishery .....	17
4) Marine Area 9 Summer Mark-Selective Chinook Fishery .....	28
5) Marine Area 10 Summer Mark-Selective Chinook Fishery .....	38
6) Marine Area 11 Summer Mark-Selective Chinook Fishery .....	49
7) Marine Area 12 Summer Mark-Selective Chinook Fishery .....	59
8) Marine Area 13 Summer Mark-Selective Chinook Fishery .....	65
9) Marine Area 7 Summer On-The-Water Survey.....	72
ACKNOWLEDGEMENTS.....	76
REFERENCES .....	77
APENDICIES .....	81
1) SITE WEIGHTS .....	81
2) CWT RECOVERIES .....	85
3) Marine Area 7 On-The-Water Survey .....	116

## LIST OF TABLES

<b>Table 1.1</b> Sampling/estimation details on target parameters associated with the overall Area 5 summer mark-selective fishery monitoring program.....	3
<b>Table 1.2</b> Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.....	4
<b>Table 1.3</b> Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 5. ....	4
<b>Table 1.4</b> Total Chinook salmon encountered (retained and released) by charter and private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during 2018 summer 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.....	4
<b>Table 1.5</b> Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 5. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.....	6
<b>Table 1.6</b> Comparison of modeled and estimated total Chinook encounters for the 2018 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.....	6
<b>Table 1.7</b> Comparison of modeled and estimated total Chinook mortalities for the 2018 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.....	6
<b>Table 1.8</b> Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 5. Sites in bold represent those included in the dockside sample frame.....	8
<b>Table 1.9</b> Monthly sample rates (Total retained Chinook sampled <sup>1</sup> / Estimated retained Chinook) for the 2018 summer Chinook MSF in Marine Area 5. AD = marked (adipose-clipped), UM = unmarked.....	8
<b>Table 1.10</b> Fishery-total estimates of retained and released salmon ( <i>other than Chinook</i> ) for the 2018 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. ....	8
<b>Table 1.11</b> Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 5. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.....	9
<b>Table 1.12</b> Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2018 summer Chinook MSF in Marine Area 5. AD = marked (adipose-clipped), UM = unmarked.	10
<b>Table 1.13</b> Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 5 summer Chinook MSF. Values may not add exactly due to rounding error. ....	10
<b>Table 2.1</b> Sampling/estimation details on target parameters associated with the overall Area 6 summer mark-selective fishery monitoring program.....	12
<b>Table 2.2</b> Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the summer Chinook salmon MSF in Marine Area 6. Note: displayed	

values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status, UD = undetermined mark-status. .... 13

**Table 2.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 Chinook salmon MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status, UD = undetermined mark-status. .... 13

**Table 2.4** List of sites sampled with the number of sampling events (site-days) during the summer 2018 Chinook salmon MSF in Marine Area 6. .... 13

**Table 2.5** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 6. .... 15

**Table 2.6** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 6, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses ..... 15

**Table 2.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 6. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups. .... 16

**Table 3.1** Sampling/estimation details on target parameters associated with the overall Area 7 Chinook MSF monitoring program. .... 18

**Table 3.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 Summer Chinook MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 19

**Table 3.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the Area 7 Chinook MSF. .... 19

**Table 3.4** Summary of season-wide fishery impact estimates for the 2017 summer Chinook 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. .... 21

**Table 3.5** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook MSF in Marine Area 7. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 21

**Table 3.6** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 7. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 21

**Table 3.7** Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the three-site sample frame during the 2018 summer Chinook salmon MSF in Marine Area 7. See Methods Report (WDFW 2012a) for computational details and notation. .... 23

**Table 3.8** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) in the 2018 summer Chinook MSF in Marine Area 7. .... 23

**Table 3.9** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates from the 2018 summer Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked. .... 23

**Table 3.10** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2018 summer Chinook 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..... 24

**Table 3.11** Summary of dockside creel observations of kept Chinook and reported released of Chinook by mark status during the 2018 summer Chinook MSF in Marine Area 7 by mark-status. .... 25

**Table 3.12** Beta regression results for legal-mark status from the released-to-retained ratio during the 2018 summer Chinook MSF in Marine Area 7. .... 25

**Table 3.13** Fishery-total estimates of retained and released salmon (other than Chinook) during the 2018 summer Chinook MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. .... 26

**Table 3.14** Summary of CWTs recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 7. The field “Number DITs” indicates the number of tags that belonged to double-index tag groups. .... 26

**Table 3.15** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2018 summer Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked 27

**Table 3.16** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 7 Summer Chinook 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. .... 27

**Table 4.1** Sampling/estimation details on target parameters associated with the overall Area 9 summer mark-selective fishery monitoring program..... 29

**Table 4.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked..... 30

**Table 4.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 9..... 30

**Table 4.4** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 9. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag groups. .... 30

**Table 4.5** Comparison of modeled and estimated total Chinook encounters for the 2018 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked. .... 32

**Table 4.6** Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 9. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked..... 32

**Table 4.7** Comparison of modeled and estimated total Chinook mortalities for the 2018 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked. .... 32

**Table 4.8** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs), with estimates of legal-size and overall (legal and

sublegal) mark rates during the 2017 summer Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses. .... 34

**Table 4.9** Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the summer 2018 Chinook salmon MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. .... 34

**Table 4.10** 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 2018 summer Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. .... 34

**Table 4.11** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) in the 2018 summer Chinook MSF in Marine Area 9. .... 35

**Table 4.12** Fishery-total estimates of retained and released salmon (*other than Chinook*) in the 2018 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status ..... 35

**Table 4.13** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 9. Sites in bold represent those included in the dockside sample frame. .... 36

**Table 4.14** 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 Area 9 summer Chinook MSF. Values may not add exactly due to rounding error. .... 37

**Table 5.1** Sampling/estimation details on target parameters associated with the overall Area 10 summer mark-selective fishery monitoring program. .... 39

**Table 5.2** Method 2 estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 40

**Table 5.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 10. .... 40

**Table 5.4** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 10. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag ..... 41

**Table 5.5** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook MSF in Marine Area 10. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked. .... 43

**Table 5.6** Summary of season-wide fishery impact estimates for the 2018 summer Chinook 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. .... 43

**Table 5.7** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 10. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked. .... 43

**Table 5.8** Monthly sample rates (Total retained Chinook salmon sampled<sup>1</sup> / Estimated retained Chinook salmon) in the 2018 summer Chinook MSF in Marine Area 10. .... 43

**Table 5.9** Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2018 summer Chinook 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..... 45

**Table 5.10** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs), with estimates of legal-size and overall (legal and sublegal) mark rates during the 2018 summer Chinook 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..... 45

**Table 5.11** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) in the 2018 summer Chinook MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. .... 46

**Table 5.12** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 10. Sites in bold represent those included in the dockside sample frame. .... 47

**Table 5.13** 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 2018 summer Chinook MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked..... 48

**Table 5.14** 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 Area 10 summer Chinook MSF. Values may not add exactly due to rounding error. .... 48

**Table 6.1** Sampling/estimation details on target parameters associated with the overall Area 11 summer mark-selective fishery monitoring program..... 50

**Table 6.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 11. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked..... 51

**Table 6.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 11. .... 51

**Table 6.4** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 53

**Table 6.5** Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 11. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked..... 53

**Table 6.6** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked. .... 53

**Table 6.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 11. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag ..... 55

**Table 6.8** 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 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked..... 55

**Table 6.9** Monthly sample rates (Total retained Chinook salmon sampled<sup>1</sup> / Estimated retained Chinook salmon) in the 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked. .... 55

**Table 6.10** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 11. Sites in bold represent those included in the dockside sample frame. .... 56

**Table 6.11** Fishery-total estimates of retained and released salmon (other than Chinook salmon) for the 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error. .... 57

**Table 6.12** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 11, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses..... 57

**Table 6.13** 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 11 summer Chinook MSF. Values may not add exactly due to rounding error. .... 58

**Table 7.1** Sampling/estimation details on target parameters associated with the overall Area 12 summer mark-selective fishery monitoring program..... 60

**Table 7.2** Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the summer 2018 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..... 61

**Table 7.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 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. .... 61

**Table 7.4** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 12. .... 63

**Table 7.5** List of sites sampled with the number of sampling events (site-days) during the 2018 summer Chinook MSF in Marine Area 12. .... 63

**Table 7.6** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook 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..... 63

**Table 7.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 12. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag..... 64

**Table 8.1** Sampling/estimation details on target parameters associated with the overall Area 13 mark-selective fishery monitoring program..... 66

**Table 8.2** Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample



observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark status..... 67

**Table 8.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 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. .... 68

**Table 8.4** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 13, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses..... 70

**Table 8.5** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 13. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag..... 70

**Table 8.6** List of sites sampled with the number of sampling events (site-days) during the 2018 summer Chinook MSF in Marine Area 13. .... 71

**Table 9.1** Sampling/estimation details on target parameters associated with the overall on-the-water survey and aerial survey comparison..... 73

**Table 9.2** Method 2 estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 7 using in-sample proportions from boat surveys. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked..... 74

**Table 9.3** Summary of boats encountered by day from aerial surveys, boat effort surveys, and dockside surveys during the 2018 summer Chinook MSF in Marine Area 7. Note: On all three sampling days, both aerial survey boat effort and dockside creel boat effort were more than effort surveyed by boat. .... 74

**Table 9.4** Summary boat survey effort used to estimate the fraction of effort captured in the three-site sample frame during the 2018 summer Chinook salmon MSF in Marine Area 7. .... 74

**Table 9.5** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 7. Sites in bold represent those included in the dockside sample frame..... 75

## LIST OF FIGURES

<b>Figure 1.1</b> Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 5. ....	5
<b>Figure 1.2</b> Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 5. ....	5
<b>Figure 1.3</b> Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 5. Note: displayed values are observations where lengths taken. ....	5
<b>Figure 1.4</b> Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 5. ....	5
<b>Figure 1.5</b> Comparison of modeled and estimated total Chinook encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 5. Error bars represent approximate 95% confidence intervals for field estimates. ....	7
<b>Figure 2.1</b> Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. ....	14
<b>Figure 2.2</b> Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. ....	14
<b>Figure 2.3</b> Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 5. Note: displayed values are observations where lengths taken. ....	14
<b>Figure 2.4</b> Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. ....	14
<b>Figure 3.1</b> Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 7. ....	20
<b>Figure 3.2</b> Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2018 summer Chinook MSF in Marine Area 7. ....	20
<b>Figure 3.3</b> Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area. ....	20
<b>Figure 3.4</b> Temporal patterns in Chinook salmon encounters (number retained and released) during the 2018 summer Chinook MSF in Marine Area 7. ....	20
<b>Figure 3.5</b> Comparison of modeled and estimated total Chinook encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 7. Error bars represent approximate 95% confidence intervals for field estimates. ....	22
<b>Figure 3.6</b> Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the 2018 summer Chinook MSF in Marine Area 7. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm). ....	24
<b>Figure 3.7</b> Beta regression results displaying the relationship between the released-to-retained ratio from dockside sampling data and the proportion of legal Chinook from the test fishery or VTR data, including parameters resulting from the beta regression model. The dotted lines represent 95% confidence bounds. ....	25
<b>Figure 4.1</b> Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 9. ....	31

**Figure 4.2** Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 9. .... 31

**Figure 4.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area Note: displayed values are observations where lengths taken. .... 31

**Figure 4.4** Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 9. .... 31

**Figure 4.5** Comparison of modeled and estimated total Chinook encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 9. Error bars represent approximate 95% confidence intervals for field estimates. .... 33

**Figure 4.6** Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the 2018 summer Chinook MSF in Marine Area 9. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm). 35

**Figure 5.1** Temporal patterns in fishing effort during the 2108 summer Chinook MSF in Marine Area 10. .... 42

**Figure 5.2** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 10. .... 42

**Figure 5.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 10. Note: displayed values are observations where lengths taken. .... 42

**Figure 5.4** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 10. .... 42

**Figure 5.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 10. Error bars represent approximate 95% confidence intervals for field estimates. .... 44

**Figure 5.6** Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook salmon encountered by test fishers during the 2018 summer Chinook MSF in Marine Area 10. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm). .... 46

**Figure 6.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 11. .... 52

**Figure 6.2** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 11. .... 52

**Figure 6.3** Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 11. Note: displayed values are observations where lengths taken. .... 52

**Figure 6.4** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 11. .... 52

**Figure 6.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 11. Error bars represent approximate 95% confidence intervals for field estimates. .... 54

**Figure 7.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 62

**Figure 7.2** Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 62

**Figure 7.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are observations where lengths taken. Note: displayed values are observations where lengths taken. .... 62

**Figure 7.4** Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 62

**Figure 8.1** Temporal patterns in fishing effort during the 2108 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 69

**Figure 8.2** Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 69

**Figure 8.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are observations where lengths taken. .... 69

**Figure 8.4** Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. .... 69

## LIST OF APPENDICIES

<b>Appendix 1.1</b> Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 5. ....	81
<b>Appendix 1.2</b> Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 9. ....	82
<b>Appendix 1.3</b> Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 10. ....	83
<b>Appendix 1.4</b> Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 11. ....	84
<b>Appendix 2.1</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 5. ....	85
<b>Appendix 2.2</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 6. ....	92
<b>Appendix 2.3</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 7. ....	97
<b>Appendix 2.4</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 9. ....	99
<b>Appendix 2.5</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 10. ....	104
<b>Appendix 2.6</b> Coded-wire tag (CWT) recoveries in the 2017 summer Chinook MSF in Marine Area 11. ....	111
<b>Appendix 2.7</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 12. ....	115
<b>Appendix 2.8</b> Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 13. ....	115
<b>Appendix 3.1</b> Date, Number of anglers, expected ramp of landing, and GPS coordinates of boats encountered on the Area 7 Summer on-the-water survey. ....	116

## INTRODUCTION

In the marine environments of the Strait of Juan de Fuca and Puget Sound, abundant runs of hatchery Chinook salmon (*Oncorhynchus tshawytscha*) have been mixed with depressed runs of natural-origin Chinook salmon. 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., 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 Puget Sound Marine Catch Areas during both the summer and winter seasons. Including the 2018 management season, mark-selective fisheries for Chinook salmon have been conducted in Puget Sound for the last 15 summer (May through September) seasons and the last 13 winter (October through April) seasons.

During the 2018 summer season, May through September, WDFW implemented eight mark-selective Chinook salmon fisheries in Areas 5, 6, 7, 9, 10, 11, 12 and 13. The Chinook MSF seasons in each area were scheduled as follows:

- Areas 5 from July 1 through August 15, 2018;
- Areas 6 from July 3 through August 15, 2018;
- Area 7 from July 1 through July 31, 2018;
- Area 9 from July 16 through August 15, 2018;
- Area 10 from July 16 through August 30, 2018;
- Area 11 from June 1 through September 30, 2018;
- Area 12 from July 1 through September 30, 2018; and
- Area 13 from May 1 through September 30, 2018.

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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 ( $\geq 22$  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 Summer Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a sixteenth consecutive summer Chinook MSF in Marine Area 5 from July 1 through August 15, 2018. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 5 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 and intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. During the summer 2018 mark-selective Chinook salmon fishery in Area 5 we maintained our enhanced VTR program to improve the return rate of VTRs, which provide estimates of Chinook salmon encounter rates by size class (legal or sublegal) and mark status (marked (adipose fin-clipped) or unmarked). **Table 1.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 5 summer Chinook MSF.

**Table 1.1** Sampling/estimation details on target parameters associated with the overall Area 5 summer mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish <sup>1</sup>	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.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site “size measures”) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	2 weekend boat surveys and 2 weekday surveys were conducted during the 2018 Area 5 summer Chinook MSF. As in-season observations suggested that sites and effort patterns did not change substantially in 2018 compared to past years, we incorporated data from these surveys into recent average site weights to compute catch and effort estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho salmon) that the angler may record on the VTR form	Fish encounter	Season	We used VTR data to estimate the size/mark-status proportions (LM = 20%, LU = 12%, SM = 47%, SU = 12%; <b>Table 1.4</b> ) 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.

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



**Table 1.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

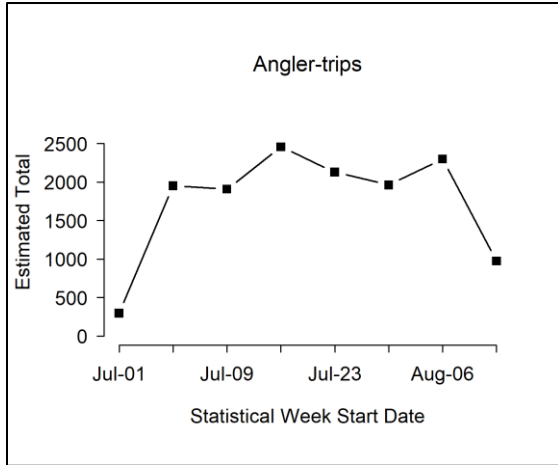
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
July	26	1-Jul	1-Jul	117	295	62	0	160	110	332
	27	2-Jul	8-Jul	843	1,950	482	0	1253	857	2,591
	28	9-Jul	15-Jul	835	1,906	471	0	1225	838	2,534
	29	16-Jul	22-Jul	1104	2,456	520	0	1351	924	2,795
	30	23-Jul	29-Jul	953	2,128	583	0	1517	1037	3,137
August	31	30-Jul	5-Aug	865	1,961	722	0	1877	1284	3,884
	32	6-Aug	12-Aug	1,013	2,298	840	0	2184	1494	4,519
	33	13-Aug	15-Aug	473	973	158	0	412	282	852
<b>Season Total:</b>				<b>6,202</b>	<b>13,967</b>	<b>3,839</b>	<b>0</b>	<b>9,980</b>	<b>6,827</b>	<b>20,645</b>
<b>Variance:</b>				119,818	656,826	279,647	0	2,891,834	658,338	9,601,434
<b>SE:</b>				346	810	529	0	1,701	811	3,099
<b>CV (%):</b>				6	6	14	0	17	12	15
<b>95% CI:</b>				5,524 - 6,881	12,379 - 15,556	2,802 - 4,875	0 - 0	6,646 - 13,313	5,236 - 8,417	14,572 - 26,718

**Table 1.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 5.

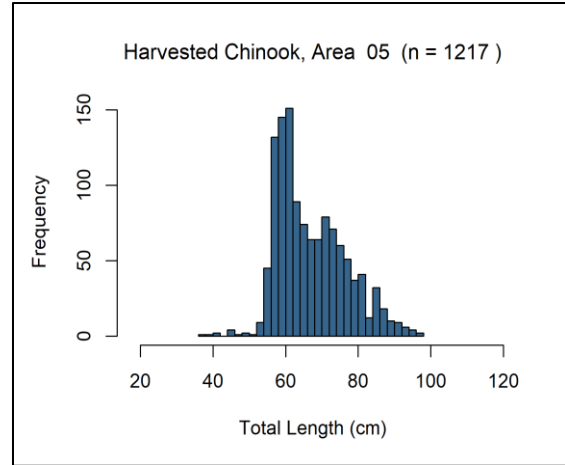
Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1151	66	1217
Unmarked	3	0	3
<b>Total</b>	<b>1154</b>	<b>66</b>	<b>1220</b>

**Table 1.4** Total Chinook salmon encountered (retained and released) by charter and private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during 2018 summer 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.

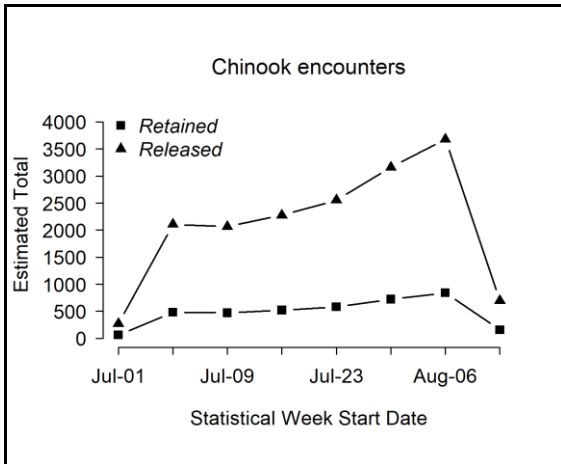
Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	155 1-trip VTRs, 297 Angler Trips	228	140	527	233	1128	0.67	0.62
Size/mark-status composition:		0.20	0.12	0.47	0.21			
Variance:		(0.0001)	(0.0001)	(0.0002)	(0.0001)			



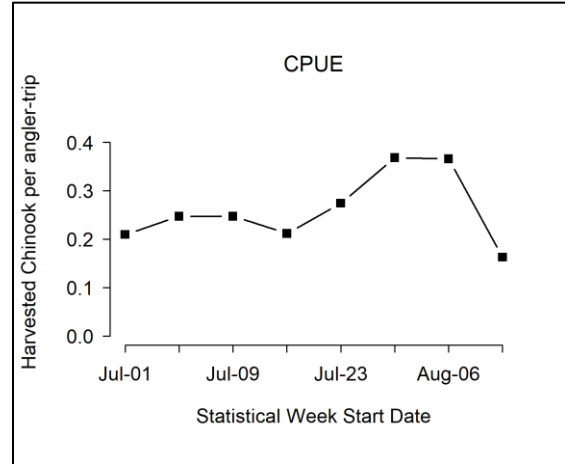
**Figure 1.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 5.



**Figure 1.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 5. Note: displayed values are observations where lengths taken.



**Figure 1.2** Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 5.



**Figure 1.4** Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 5.

**Table 1.5** Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 5. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

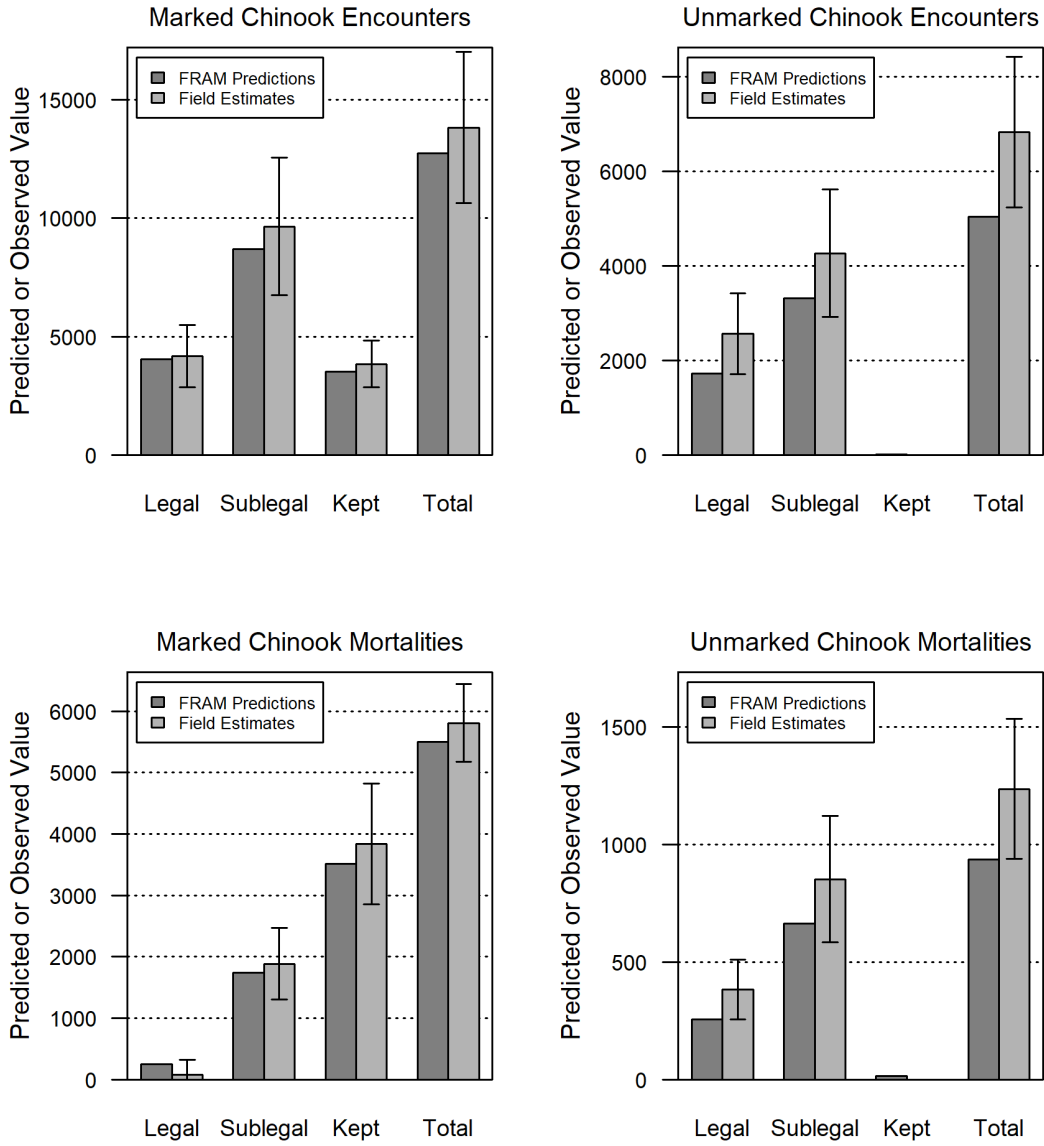
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	4,173	3,630	542	81	3,712	266,557	516	2,700 - 4,724	14
Legal UM	2,562	0	2,562	384	384	4,232	65	257 - 512	17
Sublegal AD	9,645	208	9,437	1887	2,096	89,000	298	1,511 - 2,680	14
Sublegal UM	4,264	0	4,264	853	853	18,810	137	584 - 1,122	16
<b>Total</b>	<b>20,645</b>	<b>3,839</b>	<b>16,806</b>	<b>3,206</b>	<b>7,045</b>	<b>378,599</b>	<b>615</b>	<b>5,839 - 8,251</b>	<b>9</b>

**Table 1.6** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	5,042	1,724	3,318	17
	AD	12,720	4,034	8,686	3,510
	Total	17,762	5,758	12,004	3,527
	% Marked	72	70	72	100
Estimated (Creel) Encounters	UM	6,827	2,562	4,264	0
	AD	13,818	4,173	9,645	3,839
	Total	20,645	6,735	13,910	3,839
	% Marked	67	62	69	100

**Table 1.7** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 5. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	938	5,501	6,439	1,237	5,807	7,045
Released Legal	257	254	511	384	81	466
Released Sublegal	664	1,737	2,401	853	1887	2,740
Landed Only	17	3,510	3,527	0	3,839	3,839



**Figure 1.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 5. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 1.8** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 5. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
Coho Resort	0	0.0000	4	0.0125
<b>Curley's Resort</b>	<b>7</b>	<b>0.0265</b>	<b>14</b>	<b>0.0438</b>
<b>Olson's East Docks</b>	<b>77</b>	<b>0.2917</b>	<b>92</b>	<b>0.2875</b>
<b>Olson's Ramp &amp; Docks</b>	<b>55</b>	<b>0.2083</b>	<b>50</b>	<b>0.1563</b>
Olson's West Docks	7	0.0265	7	0.0219
Olson's South Dock	21	0.0795	8	0.0250
Private	8	0.0303	1	0.0031
Unknown	22	0.0833	35	0.1094
<b>Van Riper's North</b>	<b>36</b>	<b>0.1364</b>	<b>60</b>	<b>0.1875</b>
<b>Van Riper's South</b>	<b>31</b>	<b>0.1174</b>	<b>49</b>	<b>0.1531</b>
<b>Total Anglers</b>	<b>264</b>	<b>1</b>	<b>320</b>	<b>1</b>

**Table 1.9** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) for the 2018 summer Chinook MSF in Marine Area 5. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
July	26 - 30	01 Jul - 30 Jul	2,118	0	2,118	781	2	783	37.00%
August	31 - 33	31 Jul - 15 Aug	1721	0	1721	732	1	733	42.60%
<b>Season Total</b>			<b>3,839</b>	<b>0</b>	<b>3,839</b>	<b>1513</b>	<b>3</b>	<b>1516</b>	<b>39.50%</b>

<sup>1</sup>/ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWT's, from all sites sampled during the 2018 summer Chinook MSF in Marine Area 5 (creel estimates and fish sampled as part of baseline sampling).

**Table 1.10** Fishery-total estimates of retained and released salmon (*other than Chinook*) for the 2018 summer Chinook MSF in Marine Area 5. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Start Date	End Date	Retained Salmon			Released Salmon		
			Coho AD	Coho UM	Chum	Coho AD	Coho UM	Coho UK
26	1-Jul	1-Jul	17	0	0	11	33	27
27	2-Jul	8-Jul	65	0	0	17	63	128
28	9-Jul	15-Jul	78	0	0	22	112	82
29	16-Jul	22-Jul	123	6	0	48	144	63
30	23-Jul	29-Jul	52	0	0	21	74	64
31	30-Jul	5-Aug	107	0	0	13	164	132
32	6-Aug	12-Aug	46	0	5	0	38	20
33	13-Aug	15-Aug	45	0	0	0	37	0
<b>Season Total:</b>			<b>532</b>	<b>6</b>	<b>5</b>	<b>133</b>	<b>665</b>	<b>516</b>
<b>Variance:</b>			10,911	33	22	2,209	13,459	21,685
<b>Standard Error:</b>			104	6	5	47	116	147
<b>CV (%):</b>			20	91	89	35	17	29
<b>95% CI:</b>			328 - 737	0 - 18	0 - 14	41 - 225	438 - 893	227 - 805

**Table 1.11** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 5. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Fraser River – Thompson River (15.3%)	R-Nicola R	H-Spius Creek H	1 (0.6%)	0
		R-Chilliwack R	H-Chilliwack River H	5 (2.8%)	0
		R-Shuswap R Low	H-Shuswap River, Middle,	2 (1.1%)	0
		R-Harrison R	H-Chehalis River H	19 (10.7%)	0
	Georgia Strait (6.8%)	R-Capilano R Up	H-Capilano River H	1 (0.6%)	0
		R-Sandy Cv	H-Sandy Cove Seapen	5 (2.8%)	0
		R-Cowichan R	H-Cowichan River H	5 (2.8%)	0
		R-Capilano R	H-Capilano River H	1 (0.6%)	0
WA	N Washington (4.5%)	Friday Cr 03.0017	Samish Hatchery	5 (2.8%)	0
		East Sound Bay (San)	Glenwood Springs	2 (1.1%)	0
		Kendall Cr 01.0406	Kendall Cr Hatchery	1 (0.6%)	0
	N Washington Coast (1.1%)	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	2 (1.1%)	0
	Strait of Juan De Fuca (7.9%)	Hoko R 19.0148	Hoko Falls Hatchery	10 (5.6%)	0
		Elwha R 18.0272	Elwha Hatchery	4 (2.3%)	0
	Hood Canal (19.8%)	Finch Cr 16.0222	Hoodsport Hatchery	26 (14.7%)	0
		Purdy Cr 16.0005	George Adams Hatchery	9 (5.1%)	2
	N Puget Sound (4%)	Wallace R 07.0940	Wallace R Hatchery	5 (2.8%)	1
		Tulalip Cr 07.0001	Bernie Gobin Hatch	2 (1.1%)	2
	Skagit River (3.4%)	Cascade R 03.1411	Marblemount Hatchery	2 (1.1%)	0
		Co Line Pd2 03.1853B	Marblemount Hatchery	4 (2.3%)	0
	Mid Puget Sound (22.6%)	Grovers Cr 15.0299	Grovers Cr Hatchery	7 (4%)	7
		Voight Cr 10.0414	Voights Cr Hatchery	1 (0.6%)	0
		Big Soos Cr 09.0072	Soos Creek Hatchery	10 (5.6%)	0
		Portage Bay/Ship Cnl	Issaquah Hatchery	3 (1.7%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	8 (4.5%)	0
		Lk Washington (King)	Issaquah Hatchery	1 (0.6%)	0
		Icy Cr 09.0125	Icy Cr Hatchery	4 (2.3%)	0
		Clarks Crk Hatchery	Clarks Crk Hatchery	6 (3.4%)	0
	S Puget Sound (5.6%)	Kalama Cr 11.0017	Kalama Cr Hatchery	1 (0.6%)	0
		Mcallister Springs Hatch	Clear Creek Hatchery	2 (1.1%)	0
		Clear Cr 11.0013C	Clear Creek Hatchery	5 (2.8%)	0
Minter Cr 15.0048		Minter Cr Hatchery	2 (1.1%)	0	
Col. Riv.	Upper Columbia R (1.1%)	Methow R 48.0002	Carlton Acclimation Pond	1 (0.6%)	0
		Wenatchee R 45.0030	Dryden Pond	1 (0.6%)	0
	Central Columbia R (1.1%)	Spring Cr 29.0159	Spring Cr Nfh	2 (1.1%)	2
	Lower Columbia R(1.1%)	Fallert Cr 27.0017	Fallert Cr Hatchery	1 (0.6%)	0
		Big Cr (Lwr Col R)	Big Cr Hatchery	1 (0.6%)	0
	Snake River (1.7%)	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	2 (1.1%)	0
Captain Johns Pd		Lyons Ferry Hatchery	1 (0.6%)	0	
CA	Klamath River – Trinity River (0.6%)	Iron Gate Hatchery	Iron Gate Hatchery	1 (0.6%)	0
	Central California Coast (0.6%)	Half Moon Bay John Pr Net	Mok R Fish Ins	1 (0.6%)	0
		Coleman Nfh	Coleman Nfh	2 (1.1%)	0
	Sacramento River (1.7%)	Feather At Gridley	Feather R Hatchery	1 (0.6%)	0
		San Joaquin River (1.1%)	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	2 (1.1%)
<b>Total</b>				<b>177</b>	<b>14</b>

**Table 1.12** 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 2018 summer Chinook MSF in Marine Area 5. 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	2014	1	3.1	6.75	3	0.3	0.063	0.25
Bernie Gobin Hatch	2015	1	3.1	6.75	3.2	0.3	0.068	0.26
George Adams Hatchery	2014	2	6.3	13.51	6.3	0.6	0.135	0.52
Grovers Cr Hatchery	2014	2	6.3	13.51	6.5	0.6	0.143	0.53
Grovers Cr Hatchery	2015	5	15.7	33.77	15.6	1.6	0.333	1.29
Spring Cr Nfh	2015	2	6.3	13.51	6.2	0.6	0.133	0.52
Wallace R Hatchery	2014	1	3.1	6.75	3.2	0.3	0.069	0.26
<b>Total</b>		<b>14</b>	<b>44</b>	<b>94.55</b>	<b>44</b>	<b>4.4</b>	<b>0.944</b>	<b>3.64</b>

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

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jul 5 - Aug 3, 2003	19,398	2,251	53	225	0	336	3,435	1,656	5,174	13,131
Jul 1 - Aug 10, 2004	25,174	2,706	0	194	0	404	4,017	1,167	2,462	10,950
Jul 1 - Aug 10, 2005	30,115	1,520	23	100	26	227	1,418	1,210	1,459	5,984
Jul 1 - Aug 14, 18-21, 2006	23,177	3,105	10	196	7	464	3,125	1,010	2,212	10,129
Jul 1 - Aug 9, 2007	18,830	2,969	23	280	94	444	2,509	1,371	1,118	8,808
Jul 1 - Aug 10, 2008	13,004	2,773	0	45	0	414	1,869	65	330	5,496
Jul 1 - Aug 6, 2009	23,662	4,843	78	1,115	362	724	6,210	9,823	14,309	37,463
Jul 1 - Aug 15, 2010	16,806	5,461	14	242	0	816	4,961	3,163	4,140	18,796
Jul 1 - Aug 15, 2011	24,848	4,259	70	276	22	636	9,275	1,593	5,319	21,450
Jul 1 - Aug 15, 2012	21,074	5,437	9	242	9	812	4,617	3,105	4,765	18,996
Jul 1 - Aug 15, 2013	25,725	7,473	77	933	81	1,117	7,188	8,173	8,702	33,743
Jul 1 - Aug 15, 2014	23,310	4,684	41	401	8	700	3,005	3,707	7,359	19,905
Jul 1 - Aug 15, 2015	21,313	4,434	35	316	17	663	7,562	14,302	8,445	35,774
Jul 1 - Aug 15, 2016	14,684	3,113	2	230	0	465	1,248	14,903	6,122	26,083
Jul 1 - Aug 15, 2017	17,144	2,202	2	107	4	329	1,601	8,542	4,341	17,129
Jul 1 - Aug 15, 2018	13,967	3,630	0	208	0	542	2,562	9,437	4,264	20,645

## 2) Marine Area 6 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a sixteenth consecutive summer Chinook MSF in Marine Area 6 from July 3 through August 15, 2018. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with intensive efforts to distribute and collect voluntary trip reports (VTRs) from the angling public. We maintained our enhanced VTR program to improve the return rate of voluntary trip reports, which provide estimates of Chinook salmon encounter rates by size class (legal or sublegal) and mark status (marked or unmarked).

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

**Table 2.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 6 summer Chinook MSF, including relative catch and effort patterns over the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.



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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the fishery).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	When CRC-based retained Chinook salmon estimates become available VTR data will be used in the estimation of total Chinook salmon encounters by size/mark group (LM = 48%, LU = 21%, SM = 21%, SU = 8%; <b>Table 2.5</b> ), along with associated impacts, using the methods described in WDFW & NWIFC (2013).
Overall Fishery Impacts Estimation	Total Chinook salmon encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook salmon estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook salmon estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

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

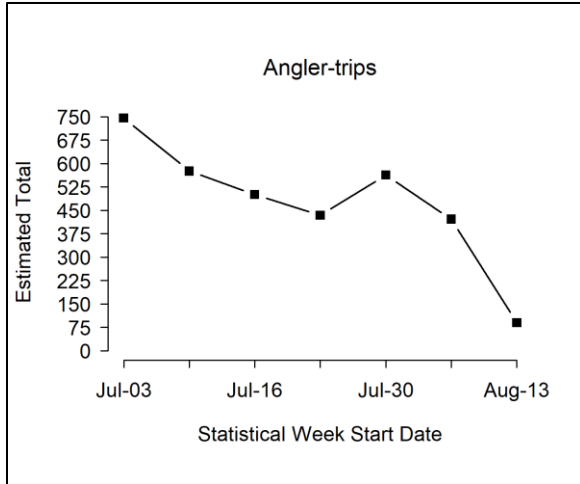
Stat Week	Start	End	Effort		Retained Fish				Released Fish		
			Boats	Anglers	Chin AD	Chin UM	Chin UD	Chin UK	Chin AD	Chin UM	Chin Unk
27	3-Jul	8-Jul	367	746	302	1	0	1	88	73	69
28	9-Jul	15-Jul	288	576	161	0	0	0	26	70	69
29	16-Jul	22-Jul	268	501	248	0	2	0	85	114	156
30	23-Jul	29-Jul	222	434	317	1	0	0	75	97	118
31	30-Jul	5-Aug	266	563	272	0	0	0	25	102	58
32	6-Aug	12-Aug	225	422	256	0	0	0	162	101	106
33	13-Aug	15-Aug	49	90	21	0	0	0	17	4	13
<b>Season Total</b>			<b>1685</b>	<b>3332</b>	<b>1577</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>478</b>	<b>561</b>	<b>589</b>

**Table 2.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 Chinook salmon MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status, UD = undetermined mark-status.

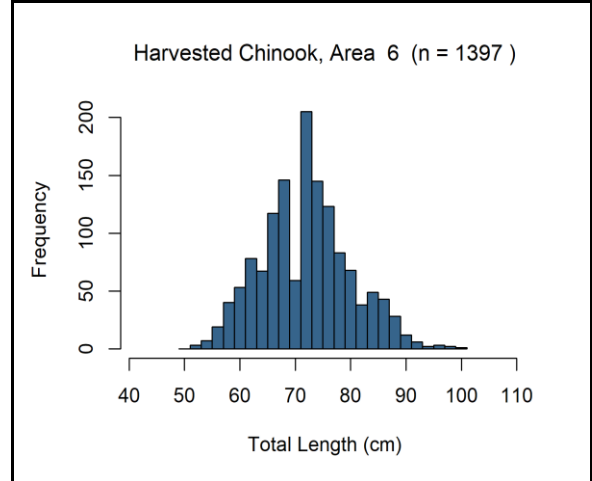
Stat Week	Start	End	Effort		Kept Fish	Released Fish				
			Boats	Anglers	Coho AD	Coho AD	Coho UM	Coho UNK	Sockeye	Unk. Salmon
27	3-Jul	8-Jul	367	746	3	4	2	0	0	4
28	9-Jul	15-Jul	288	576	1	0	0	1	0	0
29	16-Jul	22-Jul	268	501	0	0	0	1	0	1
30	23-Jul	29-Jul	222	434	0	0	0	0	0	0
31	30-Jul	5-Aug	266	563	0	1	0	0	0	3
32	6-Aug	12-Aug	225	422	0	0	1	0	0	1
33	13-Aug	15-Aug	49	90	0	0	0	0	1	0
<b>Season Total</b>			<b>1685</b>	<b>3332</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>9</b>

**Table 2.4** List of sites sampled with the number of sampling events (site-days) during the summer 2018 Chinook salmon MSF in Marine Area 6.

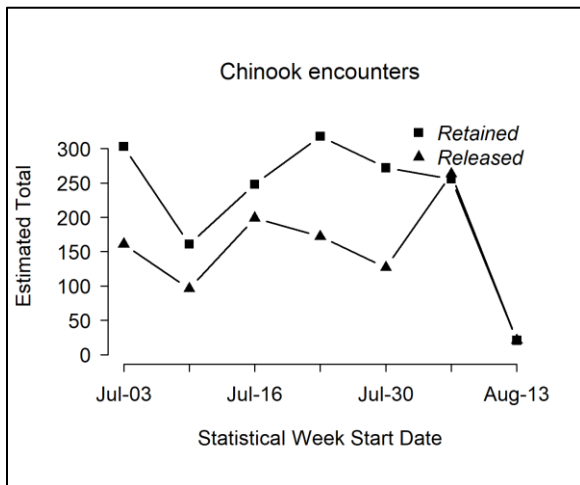
Location Name	Number of Site Days Sampled Per Month		Total Site-Days	% of Total
	July	August		
Bowman Bay Ramp	1	0	1	1.33%
Ediz Hook, Port Angeles Public Ramp	24	12	36	48.00%
Freshwater Bay Ramp	9	4	13	17.33%
John Wayne Marina	1	1	2	2.67%
Port Angeles West Ramp	17	6	23	30.67%
<b>Grand Total</b>	<b>52</b>	<b>23</b>	<b>75</b>	<b>100.00%</b>



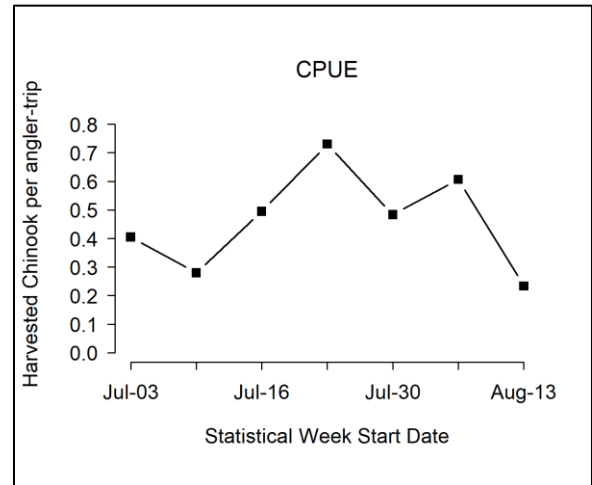
**Figure 2.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 2.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are observations where lengths taken.



**Figure 2.2** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 2.4** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 6. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

**Table 2.5** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 6.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1384	13	1397
Unmarked	2	0	2
<b>Total</b>	<b>1386</b>	<b>13</b>	<b>1399</b>

**Table 2.6** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 6, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	28 1-trip VTRs, 35 Angler Trips	47	21	21	9	98	0.69	0.69
Size/mark-status composition:		0.48	0.21	0.21	0.09			
Variance:		(0.0026)	(0.0017)	(0.0017)	(0.0009)			

**Table 2.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 6. The field “Number DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Fraser River – Thompson River (4.6%)	R-Harrison R	H-Chehalis River H	3 (2.8%)	0
		R-Shuswap R Low	H-Shuswap River, Middle,	2 (1.9%)	0
	Georgia Strait (1.9%)	R-Mamquam R	H-Tenderfoot Creek H	1 (0.9%)	0
		R-Cowichan R	H-Cowichan River H	1 (0.9%)	0
WA	N Washington (4.6%)	East Sound Bay (San)	Glenwood Springs	4 (3.7%)	0
		Friday Cr 03.0017	Samish Hatchery	1 (0.9%)	0
	N Washington Coast (0.9%)	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	1 (0.9%)	0
	Strait of Juan De Fuca (6.5%)	Hoko R 19.0148	Hoko Falls Hatchery	2 (1.9%)	0
		Elwha R 18.0272	Elwha Hatchery	5 (4.6%)	0
	Hood Canal (23.1%)	Finch Cr 16.0222	Hoodsport Hatchery	8 (7.4%)	0
		Purdy Cr 16.0005	George Adams Hatchery	17 (15.7%)	3
	N Puget Sound (3.7%)	Whitehorse Springs	Whitehorse Pond	3 (2.8%)	0
		Wallace R 07.0940	Wallace R Hatchery	1 (0.9%)	0
	Skagit River (5.6%)	Cascade R 03.1411	Marblemount Hatchery	2 (1.9%)	0
		Co Line Pd2 03.1853B	Marblemount Hatchery	4 (3.7%)	0
	Mid Puget Sound (36.1%)	Grovers Cr Hatchery	Grovers Cr Hatchery	1 (0.9%)	1
		Big Soos Cr 09.0072	Soos Creek Hatchery	8 (7.4%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	5 (4.6%)	0
		Clarks Crk Hatchery	Clarks Crk Hatchery	5 (4.6%)	0
		Portage Bay/Ship Cnl	Issaquah Hatchery	2 (1.9%)	0
		Icy Cr 09.0125	Icy Cr Hatchery	3 (2.8%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	13 (12%)	13
		Voight Cr 10.0414	Voights Cr Hatchery	2 (1.9%)	0
	S Puget Sound (10.2%)	Clear Cr 11.0013C	Clear Creek Hatchery	10 (9.3%)	3
Minter Cr 15.0048		Hupp Springs Rearing	1 (0.9%)	0	
Col. Riv.	Central Columbia River (0.9%)	Umatilla R	Bonneville Hatchery	1 (0.9%)	0
	Lower Columbia River (1.9%)	Big Cr (Lwr Col R)	Big Cr Hatchery	1 (0.9%)	0
		Klaskanine R N Fk	Klaskanine Hatchery	1 (0.9%)	0
<b>Total</b>				<b>108</b>	<b>20</b>

### **3) Marine Area 7 Summer Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a third consecutive summer Chinook MSF in Marine Area 7 from July 1 through July 30, 2018. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 7 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included intensive dockside creel sampling, on-the-water effort surveys, test fishing and collection of voluntary trip reports (VTRs) from the angling public. **Table 3.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 7 summer Chinook MSF.

**Table 3.1** Sampling/estimation details on target parameters associated with the overall Area 7 Chinook 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.
Aerial Surveys	Fraction of Area 7 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	The sample fraction was calculated for individual aerial survey dates (see <b>Table 3.7</b> $n=5$ surveys conducted out of $N=31$ days available in the season). Season-wide sample fraction was calculated as the average sample fraction over the 5 individual aerial surveys.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Due to a short season, and low test fishing and VTR encounters (LM = 30%, LU = 19%, SM = 22%, SU = 30% $n=27$ test fishing encounters; <b>Table 3.9</b> ); a CRC for Encounter <sup>1</sup> approach was used to estimate encounters (LM=53%, LU=21%, SM=18%, SU=7%, <b>Table 3.12</b> ).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook species (e.g., Coho) that the angler may record on the VTR form	Fish encounter	Season	VTR data proportions (LM=78%, LU=22%, SM=0%, SU=0%, $n=36$ VTR encounters; <b>Table 3.10</b> ), were not used to estimate encounters.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<sup>1</sup> <https://wdfw.wa.gov/publications/01620/wdfw01620.pdf>

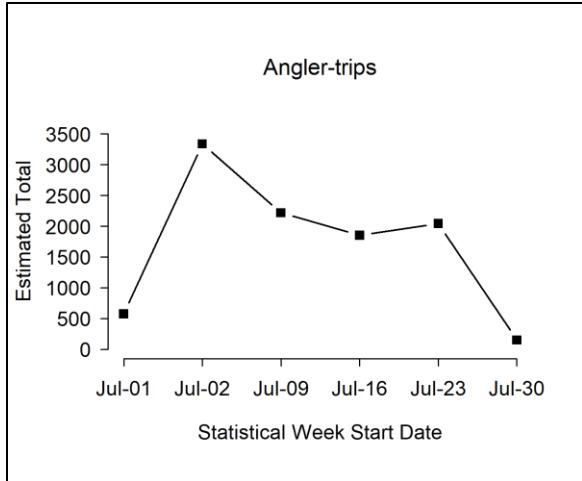
**Table 3.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 Summer Chinook MSF in Marine Area 7. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

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	
July	26	1-Jul	1-Jul	246	574	295	0	148	179	623
	27	2-Jul	8-Jul	1488	3,336	867	0	435	527	1,829
	28	9-Jul	15-Jul	1075	2,217	620	0	311	377	1,307
	29	16-Jul	22-Jul	858	1,852	220	4	110	129	464
	30	23-Jul	29-Jul	931	2,041	129	0	65	79	273
	31	30-Jul	31-Jul	70	150	5	0	3	3	11
<b>Subtotal:</b>				<b>4,668</b>	<b>10,170</b>	<b>2,137</b>	<b>4</b>	<b>1,072</b>	<b>1,294</b>	<b>4,507</b>
Bellingham Derby				136	407	154	0	77	94	325
<b>Season Total:</b>				<b>4,804</b>	<b>10,577</b>	<b>2,291</b>	<b>4</b>	<b>1,149</b>	<b>1,388</b>	<b>4,832</b>
<b>Variance:</b>				246,364	1,208,914	125,747	7	792,489	372,512	1,151,931
<b>SE:</b>				496	1100	355	3	890	610	1,073
<b>CV (%):</b>				10	10	15	63	77	44	22
<b>95% CI:</b>				3,831 - 5,776	8,422 - 12,732	1,596 - 2,986	1 - 9	228 - 2,894	192 - 2,584	2,728 - 6,936

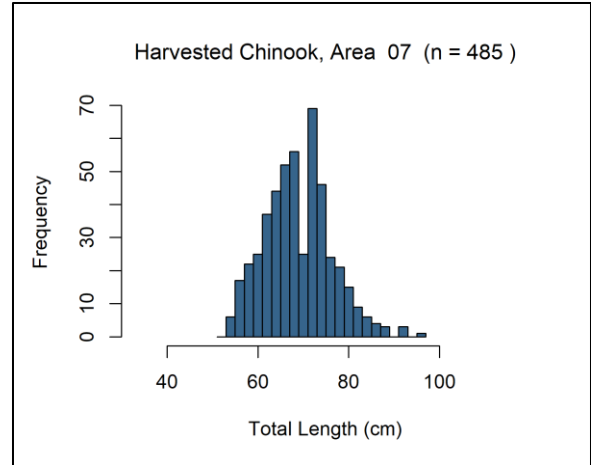
**Table 3.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the Area 7 Chinook MSF

Marked Type	Number Sampled		
	Legal-size	Sublegal-Size	Total
Marked	470	15	485
Unmarked	1	0	1
<b>Total</b>	<b>471</b>	<b>15</b>	<b>486</b>

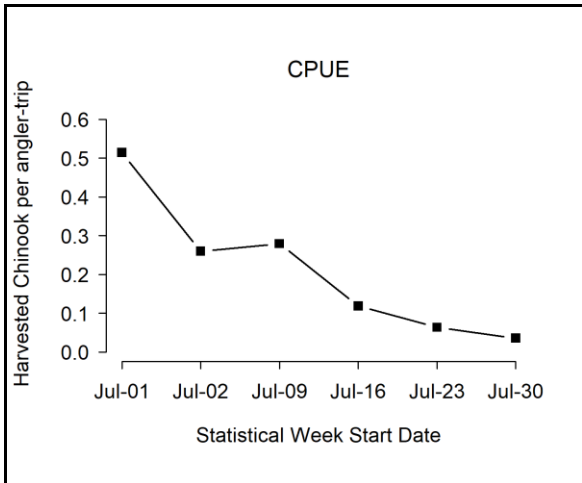




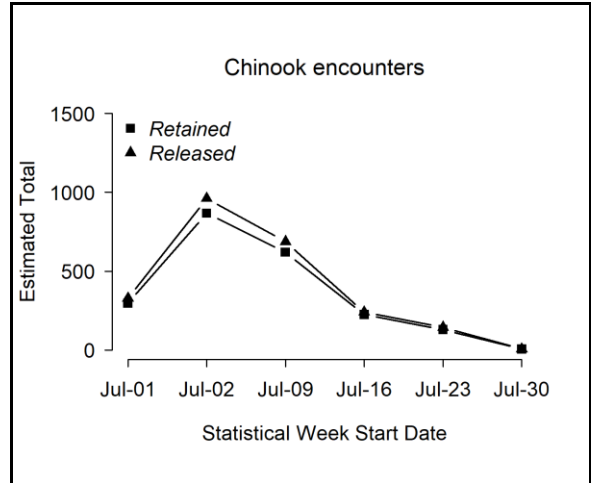
**Figure 3.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 7.



**Figure 3.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area



**Figure 3.2** Temporal patterns in CPUE (number of Chinook salmon landed per angler trip) during the 2018 summer Chinook MSF in Marine Area 7



**Figure 3.4** Temporal patterns in Chinook salmon encounters (number retained and released) during the 2018 summer Chinook MSF in Marine Area 7.

**Table 3.4** Summary of season-wide fishery impact estimates for the 2017 summer Chinook 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.

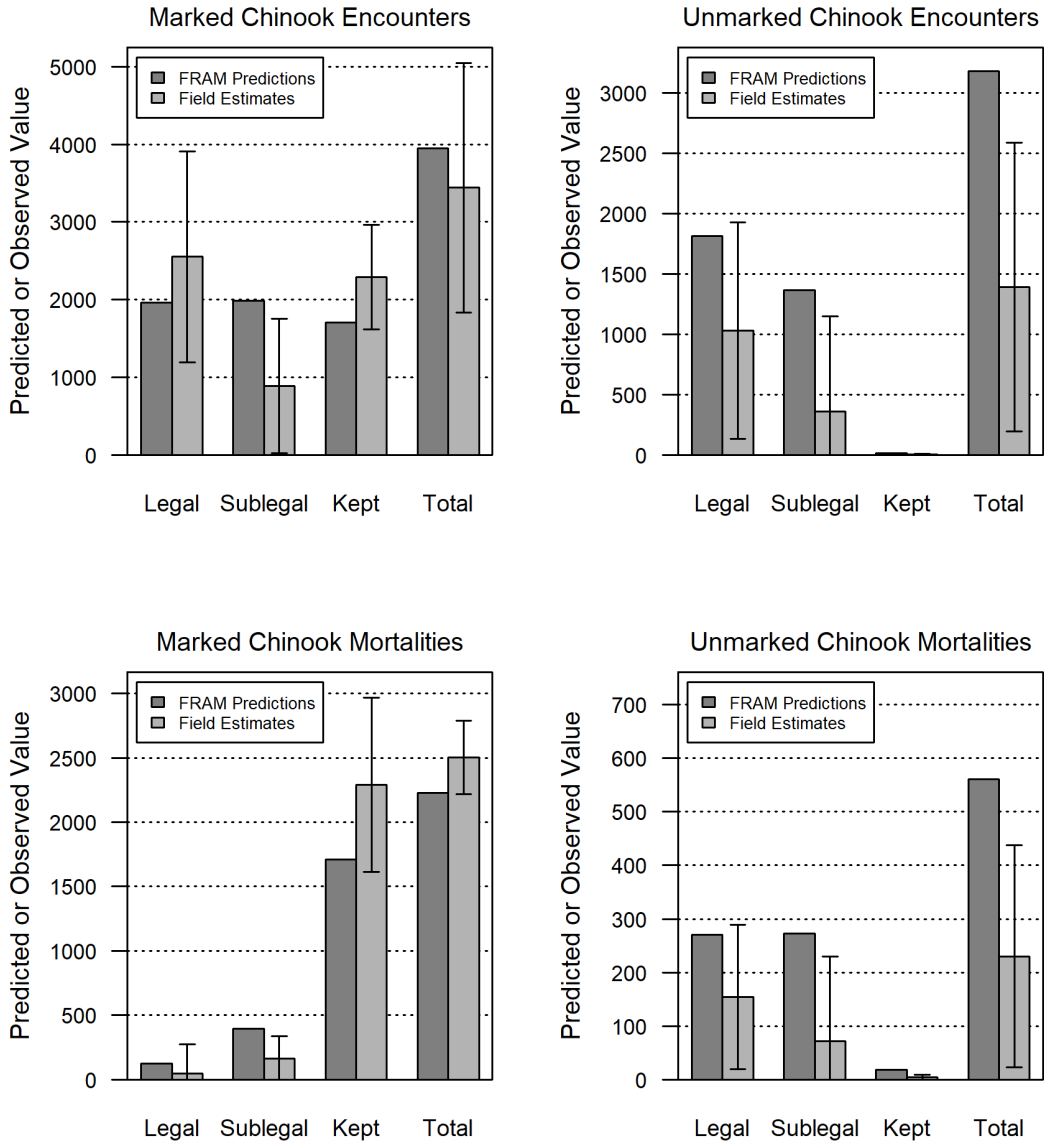
Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	2,552	2,220	332	50	2,270	131,783	363	1,558 - 2,981	16%
Legal UM	1,033	4	1028	154	158	4718	69	24 - 293	43%
Sublegal AD	888	71	817	163	234	8,238	91	56 - 412	39%
Sublegal UM	359	0	359	72	72	6,525	81	0 - 230	112%
<b>Total</b>	<b>4,832</b>	<b>2,295</b>	<b>2,537</b>	<b>439</b>	<b>2,735</b>	<b>151,265</b>	<b>389</b>	<b>1,972 - 3,497</b>	<b>14%</b>

**Table 3.5** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook 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	3177	1813	1364	18
	AD	3,950	1,964	1,986	1709
	Total	7,127	3,777	3,350	1727
	% Marked	55	52	59	99
Estimated (Creel) Encounters	UM	1,392	1033	359	4
	AD	3,440	2,552	888	2,291
	Total	4,832	3,584	1,248	2,295
	% Marked	71	71	71	100

**Table 3.6** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook 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)	561	2,229	2,790	230	2504	2735
Released Legal	270	123	393	154	50	204
Released Sublegal	273	397	670	72	163	235
Landed Only	18	1709	1727	4	2291	2295



**Figure 3.5** Comparison of modeled and estimated total Chinook encounters and mortalities for the 2016 summer Chinook MSF in Marine Area 7. Error bars represent approximate 95% confidence intervals for field estimates

**Table 3.7** Summary of aerial survey and dockside data used to estimate the fraction of effort captured in the three-site sample frame during the 2018 summer 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, $S_{yijk}$	
1-Jul	WE	12:21	13:53	226	126	78	365	0.3451
8-Jul	WE	9:38	10:53	268	228	131	466	0.4888
11-Jul	WD	9:55	10:48	148	68	23	438	0.1554
19-Jul	WD	9:57	10:58	106	85	46	196	0.4340
20-Jul	WE	10:09	11:07	141	126	63	282	0.4468
<b>Season Totals:</b>				<b>889</b>	<b>633</b>	<b>341</b>	<b>1747</b>	
Mean:				178	127	68	349	0.3740
St Dev:				67	62	41	112	0.1329
CV(%):				37.58%	49.09%	59.57%	31.95%	35.54%

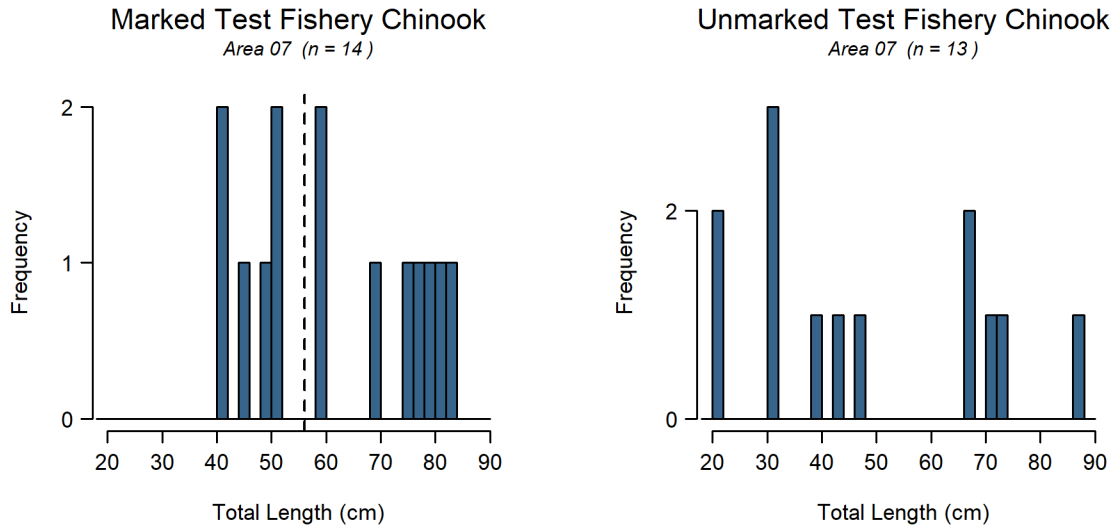
**Table 3.8** Monthly sample rates (Total retained Chinook sampled<sup>1</sup> / Estimated retained Chinook) in the 2018 summer Chinook MSF in Marine Area 7.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
July	26 - 31	1 Jul - 31 Jul	2,291	4	2,295	506	1	507	22.1
<b>Season Total</b>			<b>2,291</b>	<b>4</b>	<b>2,295</b>	<b>506</b>	<b>1</b>	<b>507</b>	<b>22.1</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the summer 2018 Area 10 Chinook MSF (creel estimates and the fish sampled as part of baseline sampling).

**Table 3.9** Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates from the 2018 summer Chinook MSF in Marine Area 7. AD = marked (adipose-clipped), UM = unmarked.

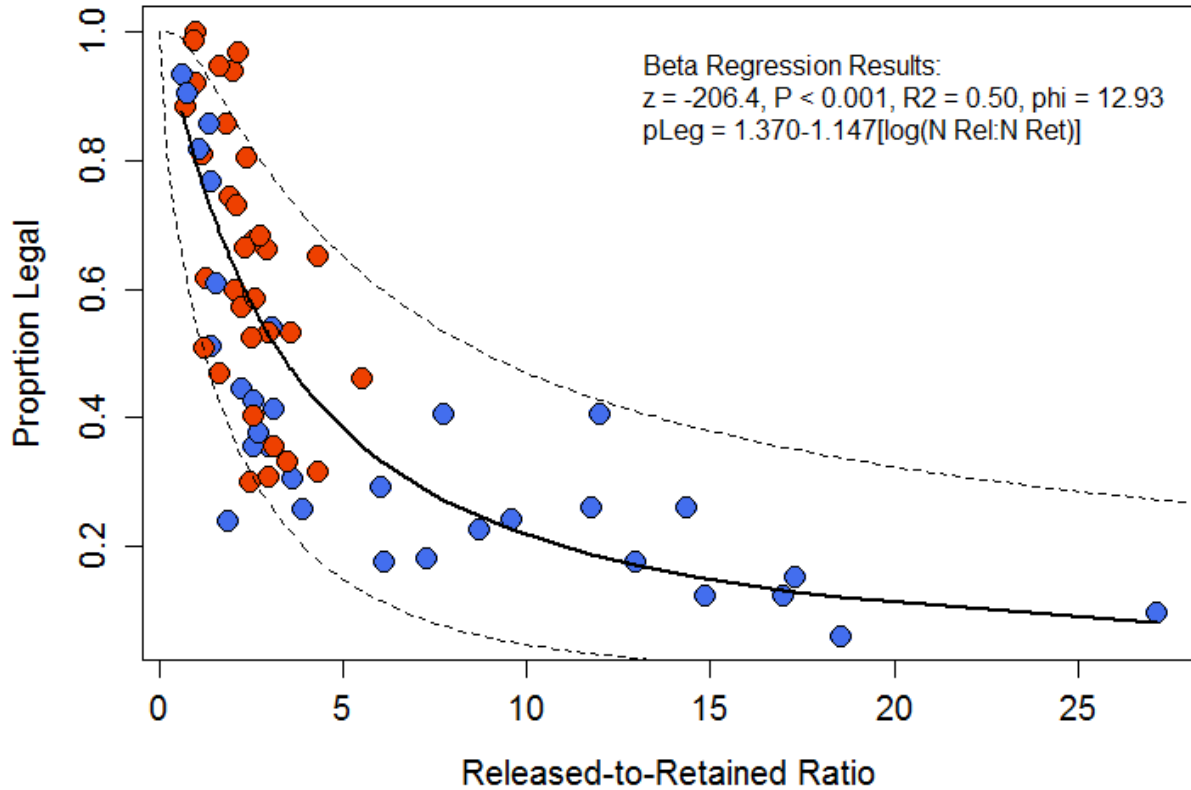
Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs Fished	AD	UM	AD	UM	
27	4	21.9	2	3	0	0	5
28	5	28.9	2	1	3	0	6
29	6	40.7	2	0	2	7	11
30	4	27.4	2	1	1	1	5
31	2	13.5	0	0	0	0	0
<b>Total</b>	<b>21</b>	<b>132.4</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>27</b>
<b>Size/mark-status composition:</b>			0.30	0.19	0.22	0.30	
<b>Legal size mark rate:</b>			0.62				
<b>Overall mark rate:</b>			0.52				



**Figure 3.6** Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the 2018 summer Chinook 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 3.10** Total Chinook encountered (retained and released) by private-boat anglers logging their trips on VTRs, with estimates of legal-size and overall (legal and sublegal) mark rates during the 2018 summer Chinook 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
Private VTR	Trips 1-trip VTRs, Anglers Angler Trips	1	3	0	0	4	0.25	0.25
Size/mark-status composition:		0.25	0.75	0.00	0.00			
Variance:		(0.0625)	(0.0625)	(0.0000)	(0.0000)			
Charter VTR	12 1-trip VTRs, 30 Angler Trips	27	5	0	0	32	0.84	0.84
Size/mark-status composition:		0.84	0.16	0.00	0.00			
Variance:		(0.0043)	(0.0043)	(0.0000)	(0.0000)			



**Figure 3.7** Beta regression results displaying the relationship between the released-to-retained ratio from dockside sampling data and the proportion of legal Chinook from the test fishery or VTR data, including parameters resulting from the beta regression model. The dotted lines represent 95% confidence bounds.

**Table 3.11** Summary of dockside creel observations of kept Chinook and reported released of Chinook by mark status during the 2018 summer Chinook MSF in Marine Area 7 by mark-status.

Catch Result	Marked	Unmarked	Unknown
Kept	506	1	0
Released	223	228	216

**Table 3.12** Beta regression results for legal-mark status from the released-to-retained ratio during the 2018 summer Chinook MSF in Marine Area 7.

	LM	LU	SM	SU
Size/mark-status composition:	52.81%	21.37%	18.38%	7.44%
Variance:	0.0071	0.0071	0.0071	0.0071

**Table 3.13** Fishery-total estimates of retained and released salmon (other than Chinook) during the 2018 summer Chinook MSF in Marine Area 7. 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	Retained Salmon		Released Salmon		
			Coho AD	Coho UM	Coho AD	Coho UM	Coho UK
26	1-Jul	1-Jul	0	0	0	0	0
27	2-Jul	8-Jul	0	0	5	12	12
28	9-Jul	15-Jul	0	0	5	0	0
29	16-Jul	22-Jul	0	4	0	0	16
30	23-Jul	29-Jul	12	4	4	4	0
31	30-Jul	31-Jul	0	0	0	0	0
<b>Season Total:</b>			<b>12</b>	<b>8</b>	<b>15</b>	<b>16</b>	<b>28</b>
<b>Variance:</b>			11	13	96	66	165
<b>Standard Error:</b>			3	4	10	8	13
<b>CV (%):</b>			27	45	66	50	45
<b>95% CI:</b>			6-19	1-15	0 - 34	0 - 32	3-54

**Table 3.14** Summary of CWTs recovered from Chinook salmon harvested during the 2018 summer Chinook 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	Fraser River – Thompson River (8.7%)	R-Shuswap R Low	H-Shuswap River,	3 (6.5%)	0
		R-Shuswap R Middle	H-Shuswap River	1 (2.2%)	0
	Georgia Strait (4.3%)	R-Cowichan R	H-Cowichan River H	2 (4.3%)	0
WA	N Washington (6.5%)	Friday Cr 03.0017	Samish Hatchery	1 (2.2%)	0
		East Sound Bay (San)	Glenwood Springs	2 (4.3%)	0
	Hood Canal (23.9%)	Purdy Cr 16.0005	George Adams Hatchery	6 (13%)	1
		Finch Cr 16.0222	Hoodsport Hatchery	5 (10.9%)	0
	N Puget Sound (4.3%)	Stillaguamish R -Sf	Brenner Hatchery	1 (2.2%)	0
		Wallace R 07.0940	Wallace R Hatchery	1 (2.2%)	0
	Skagit River (2.2%)	Co Line Pd2 03.1853B	Marblemount Hatchery	1 (2.2%)	0
	Mid Puget Sound (39.1%)	Big Soos Cr 09.0072	Soos Creek Hatchery	5 (10.9%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	5 (10.9%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	2 (4.3%)	2
		Clarks Crk Hatchery	Clarks Crk Hatchery	4 (8.7%)	0
		Voight Cr 10.0414	Voights Cr Hatchery	1 (2.2%)	0
S Puget Sound (10.9%)	Icy Cr 09.0125	Icy Cr Hatchery	1 (2.2%)	0	
	Clear Cr 11.0013C	Clear Creek Hatchery	5 (10.9%)	1	
<b>Total</b>				<b>46</b>	<b>4</b>

**Table 3.15** Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the 2018 summer Chinook 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)
Clear Creek Hatchery	2014	1	4.7	17.58	4.8	0.5	0.181	0.43
George Adams Hatchery	2014	1	4.7	17.58	4.7	0.5	0.176	0.42
Grovers Cr Hatchery	2015	2	9.4	35.16	9.4	0.9	0.347	0.83
<b>Total</b>		<b>4</b>	<b>18.9</b>	<b>70.32</b>	<b>18.9</b>	<b>1.9</b>	<b>0.703</b>	<b>1.68</b>

**Table 3.16** Season-total estimates of Chinook encounters by size/mark-status and total estimates of angler effort, summarized for all seasons to date of the Area 7 Summer Chinook 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	Jul 1, 2016 - Jul 31, 2016	9,553	1,292	0	42	0	193	1,485	1443	637	5,092
7	Jul 1, 2017 - Jul 31, 2017	17,535	3,608	22	7	0	539	2,941	4140	2370	13,627
7	Jul 1, 2018 - Jul 31, 2018	10,577	2,220	4	71	0	332	1,028	817	359	4,832



#### **4) Marine Area 9 Summer Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented a twelfth consecutive summer Chinook MSF in Marine Area 9 from July 16 through August 15, 2018. Due to in-season action, the fishery was closed on July, 29 2018 when the quota was reached. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 9 throughout the season to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included intensive dockside creel sampling, on-the-water effort surveys, test fishing and collection of voluntary trip reports (VTRs) from the angling public. **Table 4.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 9 summer Chinook MSF.

**Table 4.1** Sampling/estimation details on target parameters associated with the overall Area 9 summer mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	One week	Within weeks, estimates were produced by day-type strata (weekday/weekend). Each week we sampled every Friday, Saturday and Sunday, and we randomly selected $n=2$ out of $N=4$ weekdays (Monday-Thursday) for sampling.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site “size measures”) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 4 boat surveys (2 weekday and 2 weekend) were conducted during the two week fishery.
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook salmon length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook salmon encounters	Fish encounter	Season	Given sufficient sample size ( $n=78$ ) of fish caught in the test fishery, we used the test fishery data only to estimate the size/mark-status proportions (LM = 56%, LU = 9%, SM = 31%, SU = 4%; <b>Table 4.9</b> ) needed to produce encounter and mortality estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Encounter data for non-Chinook salmon species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	The size/mark-status proportions of VTR data (LM = 51%, LU = 19%, SM = 30%, SU = 0%; <b>Table 4.8</b> ) were not significantly different than those of the test fishery data. However, VTR data were not used in impact estimation due to the assumed higher data quality and sufficient sample sizes of the test fishery data.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

<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 4.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

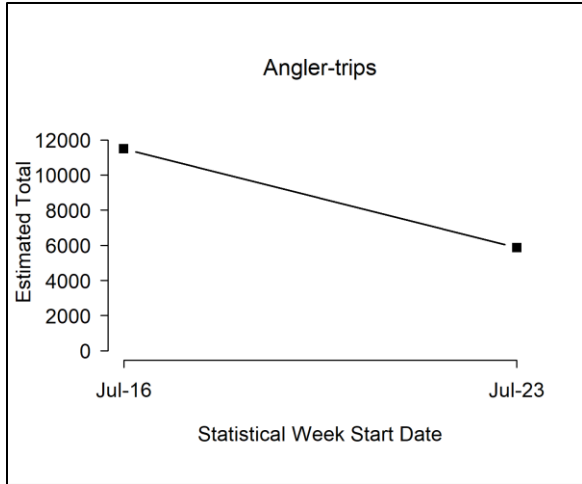
Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
July	29	16-Jul	22-Jul	5175	11,490	4401	0	3,296	1132	8,829
	30	23-Jul	29-Jul	2624	5,866	1627	3	1,219	416	3,265
<b>Season Total:</b>				<b>7,799</b>	<b>17,356</b>	<b>6,028</b>	<b>3</b>	<b>4,515</b>	<b>1,548</b>	<b>12,094</b>
<b>Variance:</b>				148,001	936,705	600,826	3	3,037,360	256,499	3,888,039
<b>SE:</b>				385	968	775	2	1,743	506	1,972
<b>CV (%):</b>				5	6	13	57	39	33	16
<b>95% CI:</b>				7,045 - 8,553	15,459 - 19,253	4,509 - 7,547	0 - 6	1,099 - 7,931	555 - 2,540	8,229 - 15,959

**Table 4.3** Summary of total length samples from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 9.

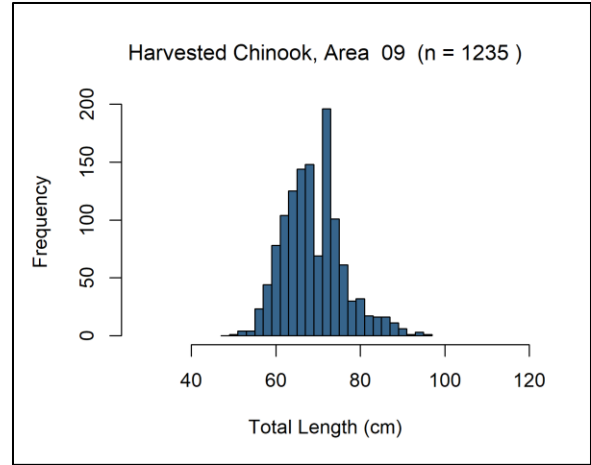
Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1216	19	1235
Unmarked	1	1	2
<b>Total</b>	<b>1217</b>	<b>20</b>	<b>1237</b>

**Table 4.4** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 9. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag groups.

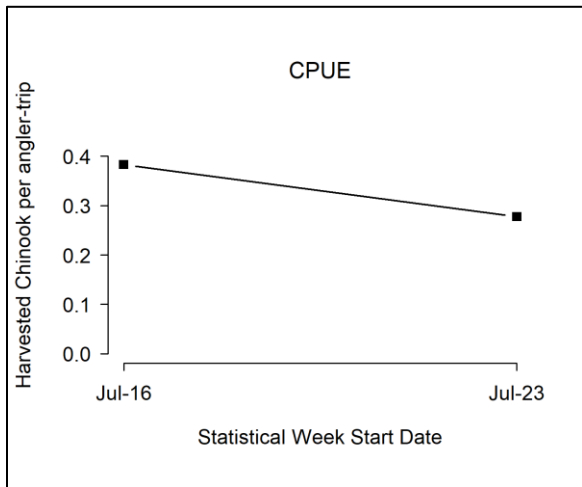
Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Fraser River – Thompson River (1%)	R-Harrison R	H-Chehalis River H	1 (1%)	0
WA	Hood Canal (20.6%)	Purdy Cr 16.0005	George Adams Hatchery	15 (14.7%)	1
		Finch Cr 16.0222	Hoodsport Hatchery	6 (5.9%)	0
	N Puget Sound (6.9%)	Tulalip Cr 07.0001	Bernie Gobin Hatch	2 (2%)	2
		Wallace R 07.0940	Wallace R Hatchery	4 (3.9%)	0
		Whitehorse Springs	Whitehorse Pond	1 (1%)	0
	Mid Puget Sound (61.8%)	Big Soos Cr 09.0072	Soos Creek Hatchery	9 (8.8%)	0
		Clarks Crk Hatchery	Clarks Crk Hatchery	9 (8.8%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	14 (13.7%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	13 (12.7%)	13
		Icy Cr 09.0125	Icy Cr Hatchery	13 (12.7%)	0
		Lk Washington (King)	Issaquah Hatchery	1 (1%)	0
		Voight Cr 10.0414	Voights Cr Hatchery	3 (2.9%)	0
		Issaquah Cr 08.0178	Issaquah Hatchery	1 (1%)	0
	S Puget Sound (9.8%)	Clear Cr 11.0013C	Clear Creek Hatchery	9 (8.8%)	2
		Minter Cr 15.0048	Minter Cr Hatchery	1 (1%)	0
<b>Total</b>				<b>102</b>	<b>18</b>



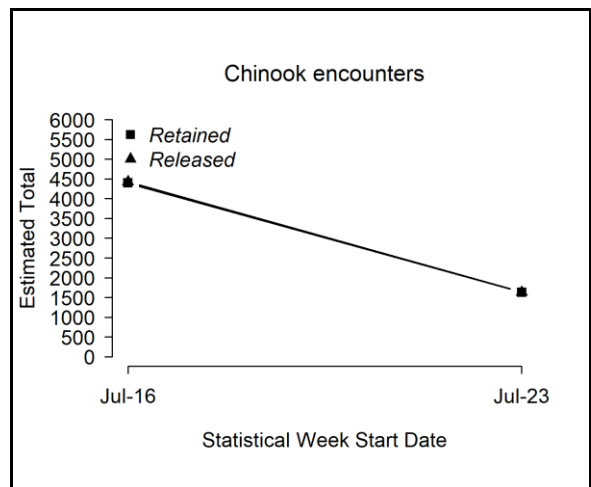
**Figure 4.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 9.



**Figure 4.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 9. Note: displayed values are observations where lengths taken.



**Figure 4.2** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 9.



**Figure 4.4** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 9.

**Table 4.5** Comparison of modeled and estimated total Chinook encounters for the 2018 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

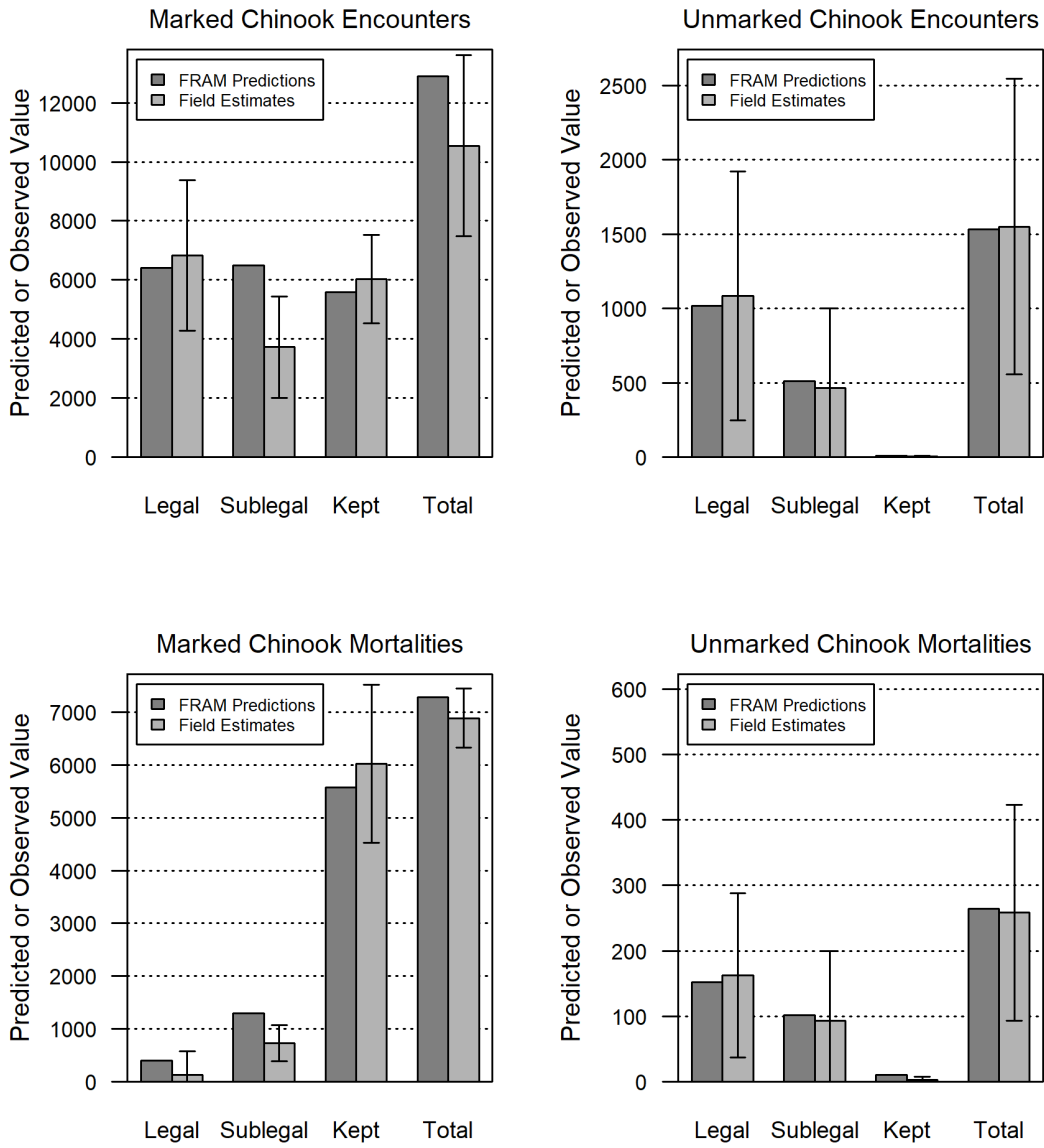
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	1,530	1019	511	10
	AD	12,899	6,411	6,488	5,577
	Total	14,429	7,430	6,999	5,587
	% Marked	89	86	93	100
Estimated (Creel) Encounters	UM	1551	1085	465	3
	AD	10,543	6,822	3721	6,028
	Total	12,094	7,908	4,186	6,031
	% Marked	87	86	89	100

**Table 4.6** Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 9. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	6,822	5,935	887	133	6,068	634,103	796	4,508 - 7,629	13
Legal UM	1085	1	1084	163	164	4,105	64	38 - 290	39
Sublegal AD	3,721	93	3,628	726	818	31,083	176	473 - 1,164	22
Sublegal UM	465	1	464	93	94	2968	54	0 - 201	58
<b>Total</b>	<b>12,094</b>	<b>6,031</b>	<b>6,063</b>	<b>1114</b>	<b>7,145</b>	<b>672,259</b>	<b>820</b>	<b>5,538 - 8,752</b>	<b>11</b>

**Table 4.7** Comparison of modeled and estimated total Chinook mortalities for the 2018 summer Chinook MSF in Marine Area 9. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	264	7,279	7,543	258	6,887	7,145
Released Legal	152	404	556	163	133	296
Released Sublegal	102	1298	1400	93	726	818
Landed Only	10	5,577	5,587	3	6,028	6,031



**Figure 4.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 9. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 4.8** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs), with estimates of legal-size and overall (legal and sublegal) mark rates during the 2018 summer Chinook MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	14 1-trip VTRs, 18 Angler Trips	19	7	11	0	37	0.81	0.73
Size/mark-status composition:		0.51	0.19	0.30	0.00			
Variance:		(0.0069)	(0.0043)	(0.0058)	(0.0000)			
Charter VTR	3 1-trip VTRs, 10 Angler Trips	6	2	2	2	12	0.67	0.75
Size/mark-status composition:		0.50	0.17	0.17	0.17			
Variance:		(0.0227)	(0.0126)	(0.0126)	(0.0126)			

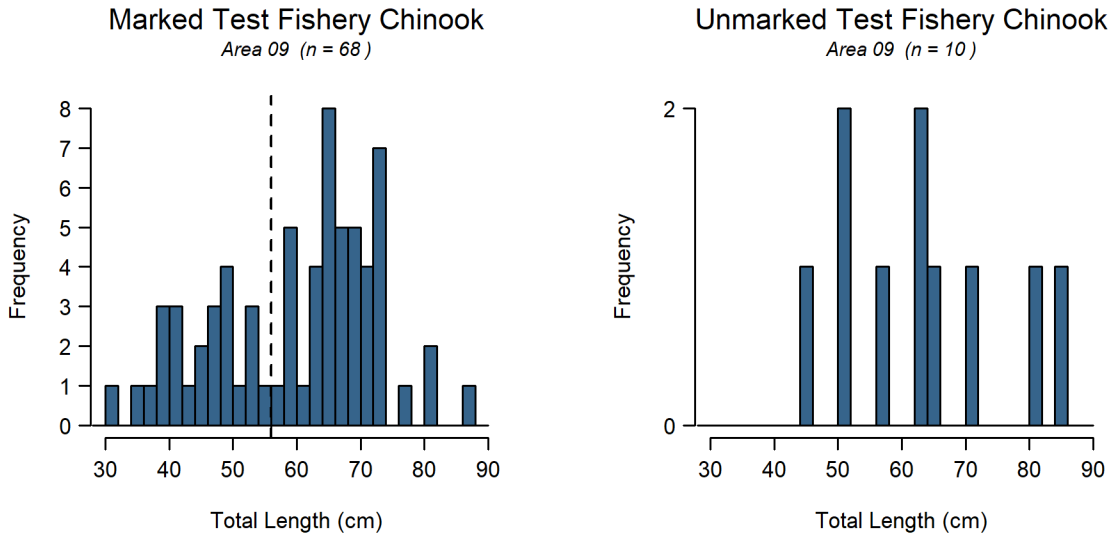
**Table 4.9** Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the summer 2018 Chinook salmon MSF in Marine Area 9. AD = marked (adipose-clipped), UM = unmarked.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs Fished	AD	UM	AD	UM	
29	6	35.2	30	5	12	2	49
30	6	36.0	14	2	12	1	29
<b>Total</b>	<b>12</b>	<b>71.2</b>	<b>44</b>	<b>7</b>	<b>24</b>	<b>3</b>	<b>78</b>
<b>Size/mark-status composition:</b>			0.56	0.09	0.31	0.04	
<b>Legal size mark rate:</b>			0.86				
<b>Overall mark rate:</b>			0.87				

Size and mark-status proportions were not significantly different between private boat VTR and test fishery data (df=3, p-value=.30), and only test fishing was used data to estimate encounters due to the assumed greater accuracy.

**Table 4.10** 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 2018 summer Chinook 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)
Bernie Gobin Hatch	2015	2	9.8	37.79	9.8	1	0.38	0.87
Clear Creek Hatchery	2014	2	9.8	37.79	9.9	1	0.388	0.88
George Adams Hatchery	2014	1	4.9	18.9	4.9	0.5	0.189	0.43
Grovers Cr Hatchery	2015	13	63.4	245.64	62.9	6.3	2.421	5.61
<b>Total</b>		<b>18</b>	<b>87.8</b>	<b>340.12</b>	<b>87.5</b>	<b>8.7</b>	<b>3.379</b>	<b>7.8</b>



**Figure 4.6** Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook salmon encountered by test fishers during the 2018 summer Chinook MSF in Marine Area 9. The vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

**Table 4.11** Monthly sample rates (Total retained Chinook salmon sampled<sup>1</sup> / Estimated retained Chinook) in the 2018 summer Chinook MSF in Marine Area 9.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
July	29 - 30	16 Jul - 29 Jul	6,028	3	6,031	1504	2	1506	25.00%
<b>Season Total</b>			<b>6,028</b>	<b>3</b>	<b>6,031</b>	<b>1504</b>	<b>2</b>	<b>1506</b>	<b>25.00%</b>

<sup>1</sup> Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the Area 9 selective fishery

**Table 4.12** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) in the 2018 summer Chinook MSF in Marine Area 9. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status

Week	Start Date	End Date	Retained Salmon			Released Salmon		
			Coho AD	Coho UM	Pink	Coho AD	Coho UM	Coho UK
29	16-Jul	22-Jul	308	3	9	112	244	114
30	23-Jul	29-Jul	141	3	0	67	67	42
<b>Season Total:</b>			<b>449</b>	<b>6</b>	<b>9</b>	<b>179</b>	<b>311</b>	<b>156</b>
<b>Variance:</b>			21611	6	68	1171	7259	1474
<b>Standard Error:</b>			147	3	8	34	85	38
<b>CV (%):</b>			33	40	88	19	27	25
<b>95% CI:</b>			161 - 737	1 - 11	0 - 26	112 - 246	144 - 478	81 - 231



**Table 4.13** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 9. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
Armeni Public Ramp	5	0.0106	3	0.0052
Bayside Marina/Drystack	2	0.0043	2	0.0035
Bush Point Ramp and Beach	2	0.0043	4	0.0070
Coupeville Public Ramp	6	0.0128	10	0.0174
Dagmar's Landing, Forklift Launch	2	0.0043	2	0.0035
Driftwood Key Marina	9	0.0191	15	0.0261
Eagle Harbor Waterfront Park	4	0.0085	0	0.0000
Edmonds Boat Basin (Public Sling)	14	0.0298	17	0.0296
<b>Edmonds Dry Storage</b>	<b>24</b>	<b>0.0511</b>	<b>17</b>	<b>0.0296</b>
Edmonds Marina	52	0.1106	57	0.0993
Eglon Public Ramp	5	0.0106	6	0.0105
Elliott Bay Marina	4	0.0085	5	0.0087
Everett Marina	17	0.0362	45	0.0784
<b>Everett Ramp</b>	<b>54</b>	<b>0.1149</b>	<b>116</b>	<b>0.2021</b>
<b>Fort Casey Public Ramp and Shore (Keystone)</b>	<b>65</b>	<b>0.1383</b>	<b>42</b>	<b>0.0732</b>
Fort Flagler Ramps-Marrowstone Is	7	0.0149	2	0.0035
Fort Worden Ramp	9	0.0191	15	0.0261
Foss Tug Dock	0	0.0000	2	0.0035
Hadlock Public Ramp	7	0.0149	2	0.0035
Kingston Marina	0	0.0000	10	0.0174
<b>Kingston Public Ramp</b>	<b>11</b>	<b>0.0234</b>	<b>37</b>	<b>0.0645</b>
Lagoon Point Ramp and Beach	11	0.0234	0	0.0000
Langley Marina/Ramp	2	0.0043	0	0.0000
Mats Mats Bay Ramp	0	0.0000	2	0.0035
<b>Mukilteo Lighthouse Park</b>	<b>12</b>	<b>0.0255</b>	<b>39</b>	<b>0.0679</b>
Mystery Bay Dock/Moorage	3	0.0064	0	0.0000
Oak Bay Beach Ramp	2	0.0043	0	0.0000
Point Hudson Marina	9	0.0191	8	0.0139
Point No Point Beach	1	0.0021	0	0.0000
Port Ludlow Marina/Beach Launch	5	0.0106	0	0.0000
Port Orchard Public Ramp	0	0.0000	4	0.0070
Port Townsend Boat Haven (Docks)	26	0.0553	6	0.0105
<b>Port Townsend Boat Haven Ramp</b>	<b>53</b>	<b>0.1128</b>	<b>36</b>	<b>0.0627</b>
Port of Everett Waterfront	0	0.0000	2	0.0035
Possession Waterfront Beach Park	11	0.0234	0	0.0000
Private	9	0.0191	12	0.0209
Salmon Club Ramp	3	0.0064	0	0.0000
Salsbury County Park Ramp	4	0.0085	14	0.0244
Shilshole Marina	10	0.0213	27	0.0470
Shilshole Public Ramp	8	0.0170	15	0.0261
Unknown	2	0.0043	0	0.0000
<b>Total Anglers</b>	<b>470</b>	<b>1</b>	<b>574</b>	<b>1</b>

**Table 4.14** 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 Area 9 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jul 16 - Jul 31, 2007	18,160	5,094	13	146	20	711	1,111	1,286	317	8,697
Jul 16 - Aug 15, 2008	20,399	4,035	3	10	0	597	1,608	3,212	3,826	13,290
Jul 16 - Aug 31, 2009	42,219	3,090	20	139	0	462	1,272	8,256	2,905	16,143
Jul 16 - Aug 31, 2010	31,200	5,282	33	10	6	740	2,125	750	249	9,194
Jul 16 - Aug 31, 2011	37,862	2,285	19	78	6	339	1,142	2,150	1,070	7,090
Jul 16 - Aug 19, 2012	24,886	6,972	12	101	2	1,039	2,351	5,168	4,721	20,366
Jul 16 - Aug 4, 2013	20,501	4,667	18	39	0	697	1,174	1,750	397	8,742
Jul 16 - Aug 15, 2014	23,113	2,865	6	4	0	428	668	745	299	5,015
Jul 16 - Jul 26, 2015	14,118	2,277	13	35	7	340	1,502	1,481	131	5,786
Jul 16, 2016 - Aug 15, 2016	14,911	2,861	9	112	0	427	912	4,886	2104	11,311
Jul 16, 2017 - Jul 30, 2017	18,548	5,264	0	191	3	787	1261	9,388	2266	19,160
Jul 16, 2018 - Jul 29, 2018	17,356	5,935	1	93	1	887	1084	3,628	464	12,094

## **5) Marine Area 10 Summer Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented an eleventh summer Chinook MSF in Marine Area 10 from July 16 through August 30, 2018. Due to in-season action, the fishery was closed on August 16, 2018 when the quota was reached. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 10 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included intensive dockside creel sampling, on-the-water effort surveys, test fishing and collection of voluntary trip reports (VTRs) 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 this section we present results from our monitoring activities during the Area 10 summer Chinook MSF.

**Table 5.1** Sampling/estimation details on target parameters associated with the overall Area 10 summer mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release.	One week	Within weeks, estimates were produced by day-type strata (weekday/weekend). Each week we sampled every Friday, Saturday and Sunday, and we randomly selected $n=2$ out of $N=4$ weekdays (Monday-Thursday) for sampling.
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., site “size measures”) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 8 boat surveys (5 weekday and 3 weekend) were conducted during the month long fishery.
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	A sufficient number of fish caught in the test fishery ( $n=144$ ; LM=47%, LU=9%, SM=34%, SU=10 %; <b>Table 5.9</b> ) due to assumed higher accuracy only test fishing data was used to estimate encounters.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho salmon) that the angler may record on the VTR form	Fish encounter	Season	The size/mark-status proportions of VTR data (LM = 29%, LU = 13%, SM = 37%, SU = 21%; <b>Table 5.10</b> ) were similar to those of the test fishery data, but with the sufficient size of the test fishing data set and the assumption that test fishing data was more accurate only test fishing data was used.
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 5.2** Method 2 estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 10. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

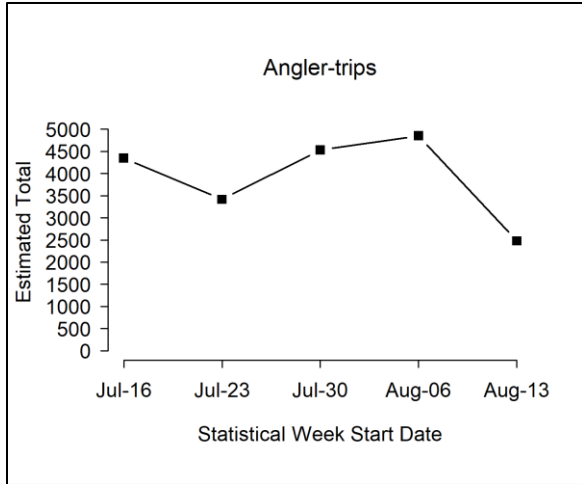
Month	Stat Week	Start Date	End Date	Estimated Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
<b>Jul</b>	29	16-Jul	22-Jul	2158	4344	914	23	836	381	2153
	30	23-Jul	29-Jul	1725	3,415	582	5	532	252	1371
	31	30-Jul	5-Aug	2,167	4,529	1205	8	1102	525	2840
<b>Aug</b>	32	6-Aug	12-Aug	2,388	4,849	1279	0	1169	565	3013
	33	13-Aug	16-Aug	1,239	2,479	862	0	788	381	2030
<b>Subtotal:</b>				<b>9,677</b>	<b>19,616</b>	<b>4,841</b>	<b>35</b>	<b>4,427</b>	<b>2103</b>	<b>11,407</b>
South King Co. PSA Derby				5	6	9	0	8	4	21
<b>Season Total</b>				<b>9,682</b>	<b>19,622</b>	<b>4,850</b>	<b>35</b>	<b>4,435</b>	<b>2107</b>	<b>11,428</b>
<b>Variance:</b>				224,487	939,636	84,296	76	1,012,845	179,740	1,491,260
<b>Standard Error:</b>				474	969	290	9	1006	424	1221
<b>CV (%):</b>				5	5	6	25	23	20	11
<b>95% CI:</b>				8,754 - 10,611	17,722 - 21,522	4,281 - 5,419	18 - 53	2,462 - 6,407	1,276 - 2,938	9,034 - 13,821

**Table 5.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 10.

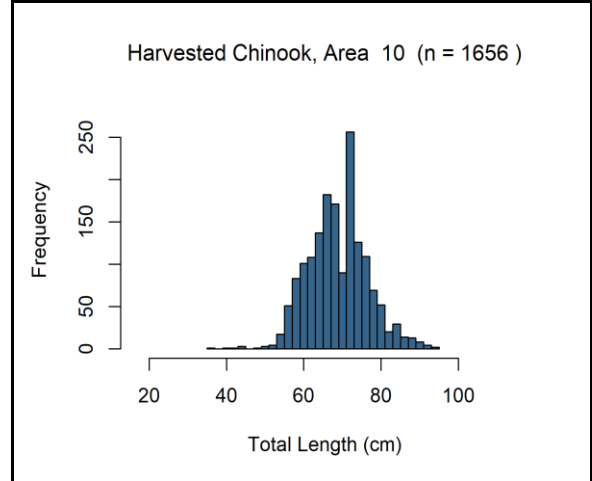
Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1603	53	1656
Unmarked	6	4	10
<b>Total</b>	<b>1609</b>	<b>57</b>	<b>1666</b>

**Table 5.4** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 10. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag

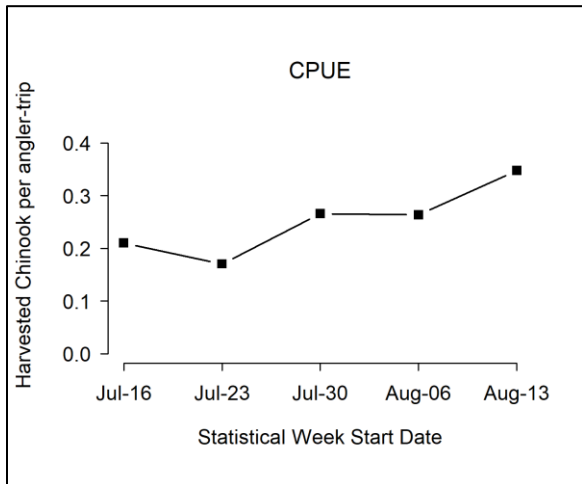
Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Fraser River – Thompson River (0.6%)	R-Chilliwack R	H-Chilliwack River H	1 (0.6%)	0
	Western Vancouver Island (0.6%)	R-Robertson Cr	H-Robertson Creek H	1 (0.6%)	0
WA	N Washington (1.9%)	East Sound Bay (San)	Glenwood Springs	1 (0.6%)	0
		Friday Cr 03.0017	Samish Hatchery	2 (1.3%)	0
	Strait of Juan De Fuca (0.6%)	Elwha R 18.0272	Elwha Hatchery	1 (0.6%)	0
	Hood Canal (8.2%)	Finch Cr 16.0222	Hoodsport Hatchery	5 (3.2%)	0
		Purdy Cr 16.0005	George Adams Hatchery	8 (5.1%)	2
	N Puget Sound (4.4%)	Tulalip Cr 07.0001	Bernie Gobin Hatch	2 (1.3%)	2
		Wallace R 07.0940	Wallace R Hatchery	5 (3.2%)	0
	Mid Puget Sound (63.9%)	Clarks Crk Hatchery	Clarks Crk Hatchery	12 (7.6%)	0
		Issaquah Cr 08.0178	Issaquah Hatchery	2 (1.3%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	12 (7.6%)	0
		Big Soos Cr 09.0072	Soos Creek Hatchery	8 (5.1%)	0
		Icy Cr 09.0125	Icy Cr Hatchery	26 (16.5%)	0
		Voight Cr 10.0414	Voights Cr Hatchery	6 (3.8%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	29 (18.4%)	29
		Portage Bay/Ship Cnl	Issaquah Hatchery	5 (3.2%)	0
		Lk Washington (King)	Issaquah Hatchery	1 (0.6%)	0
		S Puget Sound (19.6%)	Kalama Cr 11.0017	Kalama Cr Hatchery	3 (1.9%)
	Mcallister Springs Hatch		Clear Creek Hatchery	1 (0.6%)	0
	Clear Cr 11.0013C		Clear Creek Hatchery	16 (10.1%)	3
	Minter Cr 15.0048		Minter Cr Hatchery	8 (5.1%)	0
Minter Cr Tr 15.0051	Hupp Springs Rearing		2 (1.3%)	0	
Minter Cr 15.0048	Hupp Springs Rearing		1 (0.6%)	0	
<b>Total</b>				<b>158</b>	<b>36</b>



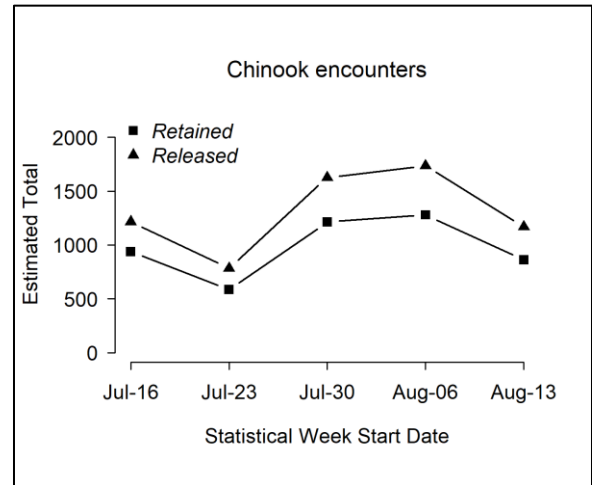
**Figure 5.1** Temporal patterns in fishing effort during the 2108 summer Chinook MSF in Marine Area 10.



**Figure 5.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 10. Note: displayed values are observations where lengths taken.



**Figure 5.2** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 10.



**Figure 5.4** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 10.

**Table 5.5** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook 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	3,033	1049	1984	21
	AD	12,400	5,428	6,972	4,722
	Total	15,433	6,477	8,956	4,743
	% Marked	80	84	78	100
Estimated (Creel) Encounters	UM	2143	1032	1111	35
	AD	9,285	5,396	3,889	4,850
	Total	11,428	6,428	5,000	4,886
	% Marked	81	84	78	99

**Table 5.6** Summary of season-wide fishery impact estimates for the 2018 summer Chinook 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	5,396	4,695	702	105	4,800	93,756	306	4,200 - 5,400	6
Legal UM	1032	21	1010	152	173	2002	45	85 - 261	26
Sublegal AD	3,889	155	3,733	747	902	15,558	125	657 - 1,146	14
Sublegal UM	1111	14	1097	219	234	3,779	61	113 - 354	26
<b>Total</b>	<b>11,428</b>	<b>4,886</b>	<b>6,542</b>	<b>1223</b>	<b>6,108</b>	<b>115,095</b>	<b>339</b>	<b>5,444 - 6,773</b>	<b>6</b>

**Table 5.7** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 10. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped) and UM = unmarked.

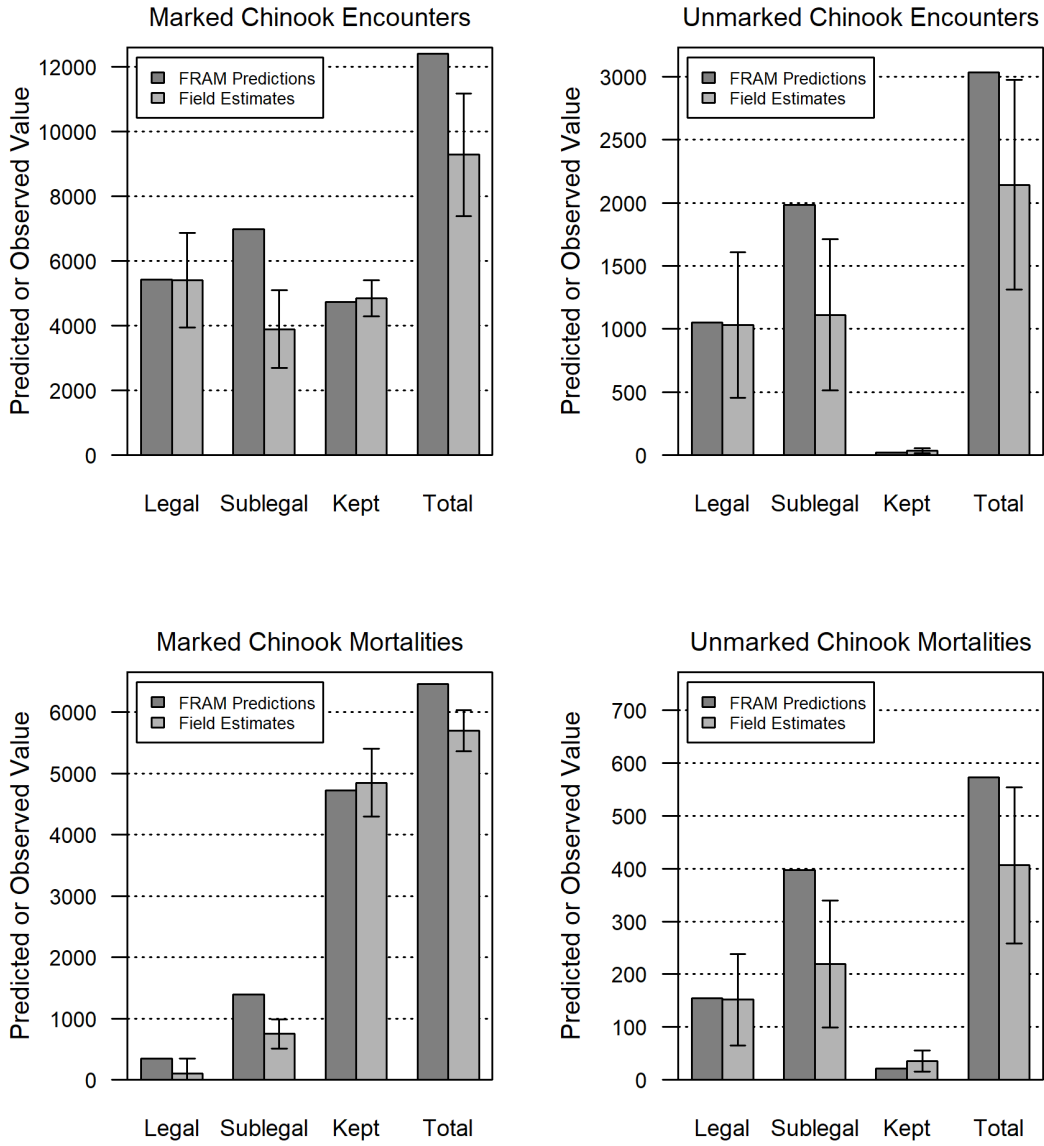
Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	573	6,458	7,031	406	5,702	6,108
Released Legal	155	342	497	152	105	257
Released Sublegal	397	1394	1791	219	747	966
Landed Only	21	4,722	4,743	35	4,850	4,886

**Table 5.8** Monthly sample rates (Total retained Chinook salmon sampled<sup>1/</sup> / Estimated retained Chinook salmon) in the 2018 summer Chinook 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	
July	29 - 30	16 Jul - 29 Jul	1495	28	1523	443	9	452	29.70%
August	31 - 33	30 Jul - 16 Aug	3355	8	3362	1335	4	1339	39.80%
<b>Season Total</b>			<b>4,850</b>	<b>35</b>	<b>4,886</b>	<b>1778</b>	<b>13</b>	<b>1791</b>	<b>36.70%</b>

<sup>1/</sup> Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWT's, from all sites sampled during the summer 2018 Area 10 Chinook MSF (creel estimates and the fish sampled as part of baseline sampling).





**Figure 5.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 10. Error bars represent approximate 95% confidence intervals for field estimates.

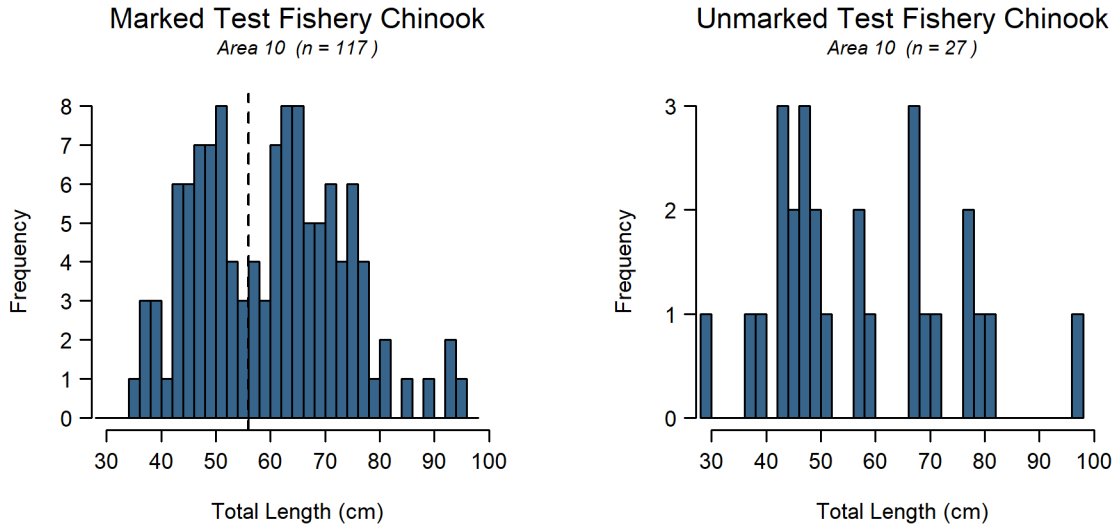
**Table 5.9** Composition of test fishery Chinook salmon encounters and associated mark-rate and size/mark-status proportion estimates for the 2018 summer Chinook MSF in Marine Area 10. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hrs Fished	AD	UM	AD	UM	
29	5	21.30	11	2	16	4	33
30	6	22.22	4	1	9	3	17
31	7	52.88	24	3	9	3	39
32	7	49.39	15	3	10	2	30
33	4	37.58	14	4	5	2	25
<b>Total</b>	<b>29</b>	<b>183.37</b>	<b>68</b>	<b>13</b>	<b>49</b>	<b>14</b>	<b>144</b>
<b>Size/mark-status composition:</b>			0.47	0.09	0.34	0.10	
<b>Legal size mark rate:</b>			0.84				
<b>Overall mark rate:</b>			0.81				

Size and mark-status proportions were not significantly different between private boat VTR and test fishery data (df=3, p-value=0.11). However, based on sufficient sample size and assumed higher data quality, we used only test fishery data to estimate the size/mark-status proportions needed to produce Chinook salmon encounter and mortality estimates for the Area 10 summer Chinook MSF.

**Table 5.10** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs), with estimates of legal-size and overall (legal and sublegal) mark rates during the 2018 summer Chinook 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	18 1-trip VTRs, 23 Angler Trips	11	5	14	8	38	0.66	0.69
Size/mark-status composition:		0.29	0.13	0.37	0.21			
Variance:		(0.0056)	(0.0031)	(0.0063)	(0.0045)			
Charter VTR	5 1-trip VTRs, 20 Angler Trips	15	2	12	2	31	0.87	0.88
Size/mark-status composition:		0.39	0.05	0.32	0.05			
Variance:		(0.0083)	(0.0020)	(0.0079)	(0.0020)			



**Figure 5.6** Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook salmon encountered by test fishers during the 2018 summer Chinook 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 5.11** Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) in the 2018 summer Chinook 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 UK	Chum	Sockeye	Coho AD	Coho UM	Coho UK
29	16-Jul	22-Jul	854	285	5	0	0	181	198	360
30	23-Jul	29-Jul	538	156	0	0	0	154	33	303
31	30-Jul	5-Aug	500	155	0	0	3	75	48	268
32	6-Aug	12-Aug	586	211	10	3	0	92	60	295
33	13-Aug	16-Aug	340	164	0	0	0	49	5	213
<b>Season Total:</b>			<b>2818</b>	<b>971</b>	<b>15</b>	<b>3</b>	<b>3</b>	<b>551</b>	<b>345</b>	<b>1439</b>
<b>Variance:</b>			29704	3359	17	2	2	8910	2208	11177
<b>Standard Error:</b>			172	58	4	1	1	94	47	106
<b>CV (%):</b>			6	6	27	49	54	17	14	7
<b>95% CI:</b>			2,480 - 3,155	857 - 1,084	7 - 23	0 - 5	0 - 6	366 - 736	253 - 437	1,232 - 1,646

**Table 5.12** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 10. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
<b>Armeni Public Ramp</b>	<b>54</b>	<b>0.0607</b>	<b>77</b>	<b>0.0985</b>
Bayside Marina/Drystack	7	0.0079	5	0.0064
Bremerton Yacht Club	7	0.0079	2	0.0026
<b>Brownsville Marina/Dock/Ramp</b>	<b>15</b>	<b>0.0169</b>	<b>33</b>	<b>0.0422</b>
Camano Island State Park Public Ramp	2	0.0022	1	0.0013
Commencement Bay Marina Services	0	0.0000	1	0.0013
Dagmar's Landing, Forklift Launch	2	0.0022	4	0.0051
Des Moines Marina	12	0.0135	5	0.0064
Dockton Ramp, Vashon Is	2	0.0022	0	0.0000
Driftwood Key Marina	2	0.0022	0	0.0000
Eagle Harbor Waterfront Park	16	0.0180	10	0.0128
Edmonds Boat Basin	30	0.0337	28	0.0358
Edmonds Dry Storage	76	0.0854	29	0.0371
Edmonds Marina	134	0.1506	82	0.1049
Elliott Bay Marina	12	0.0135	11	0.0141
Everett Marina	18	0.0202	13	0.0166
Everett Ramp	53	0.0596	56	0.0716
Evergreen Park Ramp	4	0.0045	6	0.0077
First Avenue South Public Ramp	2	0.0022	0	0.0000
Fort Ward Ramp	2	0.0022	0	0.0000
Gig Harbor Marina	0	0.0000	1	0.0013
Keyport Ramp	1	0.0011	0	0.0000
Kingston Marina	19	0.0213	12	0.0153
<b>Kingston Public Ramp</b>	<b>65</b>	<b>0.0730</b>	<b>53</b>	<b>0.0678</b>
Lagoon Point Ramp and Beach	2	0.0022	0	0.0000
<b>Manchester Public Ramp</b>	<b>12</b>	<b>0.0135</b>	<b>5</b>	<b>0.0064</b>
Mukilteo Lighthouse Park	7	0.0079	8	0.0102
Narrows Marina	2	0.0022	2	0.0026
Point Defiance Boathouse	2	0.0022	0	0.0000
Point Defiance Public Ramp	0	0.0000	4	0.0051
Port Madison Marina	1	0.0011	0	0.0000
Port Orchard Marina	0	0.0000	9	0.0115
Port Orchard Public Ramp	1	0.0011	9	0.0115
Port Townsend Boat Haven	0	0.0000	2	0.0026
Possession Waterfront Beach Park	3	0.0034	2	0.0026
Poulsbo Ramp/Marina	4	0.0045	7	0.0090
Private	25	0.0281	29	0.0371
Redondo Ramp	4	0.0045	2	0.0026
Shilshole Marina	117	0.1315	61	0.0780
<b>Shilshole Public Ramp</b>	<b>161</b>	<b>0.1809</b>	<b>204</b>	<b>0.2609</b>
South Park - Duwamish	0	0.0000	2	0.0026
Tyee Marina/Ramp	0	0.0000	3	0.0038
Unknown	6	0.0067	0	0.0000
Winslow City Ramp	2	0.0022	4	0.0051
Winslow Marina	6	0.0067	0	0.0000
<b>Total Anglers</b>	<b>890</b>	<b>1</b>	<b>782</b>	<b>1</b>

**Table 5.13** 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 2018 summer Chinook 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)
Bernie Gobin Hatch	2014	1	2.9	5.67	2.8	0.3	0.053	0.23
Bernie Gobin Hatch	2015	1	2.9	5.67	2.9	0.3	0.057	0.24
Clear Creek Hatchery	2014	3	5.9	11.33	8.9	3.5	5.784	2.86
George Adams Hatchery	2014	2	5.9	11.33	5.9	0.6	0.113	0.48
Grovers Cr Hatchery	2014	7	20.5	39.67	21.1	2.1	0.42	1.71
Grovers Cr Hatchery	2015	22	61.6	119.01	61.1	6.1	1.173	4.96
<b>Total</b>		<b>36</b>	<b>99.7</b>	<b>192.69</b>	<b>102.8</b>	<b>12.9</b>	<b>7.6</b>	<b>10.49</b>

**Table 5.14** 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 Area 10 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jul 16 - Jul 28, 2007	8,374	1,469	30	70	8	209	497	3,101	723	6,107
Jul 16 - Aug 15, 2008	13,808	1,027	3	4	0	128	510	189	385	2,246
Jul 16 - Aug 31, 2009	23,179	1,505	22	116	0	220	82	2,488	1,017	5,450
Jul 16 - Aug 31, 2010	21,636	2,950	33	37	9	432	1,026	1,024	1,665	7,178
Jul 16 - Aug 31, 2011	27,753	2,548	14	94	14	372	1,872	964	694	6,573
Jul 16 - Aug 19, 2012	17,823	2,976	17	88	17	443	377	6,343	1,950	12,212
Jul 16 - Aug 18, 2013	27,317	3,434	6	77	17	512	298	2,149	1,603	8,097
Jul 16 - Aug 7, 2014	11,892	1,063	4	0	4	159	322	1,629	322	3,503
Jul 16,- Aug 15, 2016	9,314	1,032	0	53	0	154	274	1,087	593	3,192
Jul 16,- Aug 15, 2017	13,466	2,072	0	153	0	310	741	4,134	1112	8,522
Jul 16 - Aug 16, 2018	19,622	4,695	21	155	14	702	1010	3,733	1097	11,428

## **6) Marine Area 11 Summer Mark-Selective Chinook Fishery**

The Washington Department of Fish and Wildlife (WDFW) implemented its twelfth consecutive summer Chinook MSF in Marine Area 11 from June 1 through September 30, 2018. Due to in-season action, the fishery was closed on August, 25 2018 when the quota was reached.

WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 11 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling and collection of voluntary trip reports (VTRs) from the angling public. **Table 6.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section, we present results from our monitoring activities during the Area 11 summer Chinook MSF.

**Table 6.1** Sampling/estimation details on target parameters associated with the overall Area 11 summer mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish	Catch rates (CPUE); length, age, and CWT composition of harvest <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.
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 3 weekday and 5 weekend boat surveys were conducted during the three month fishery.
Voluntary Trip Reports (VTRs)	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 VTR form	Fish encounter	Season	We used VTR data to estimate the size/mark-status proportions (LM = 33%, LU = 12%, SM = 42%, SU = 14%; <b>Table 6.16</b> ) 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.

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

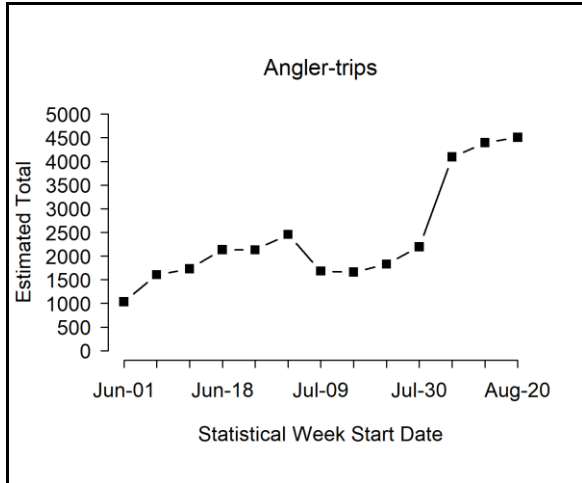
**Table 6.2** Estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 11. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
<b>Jun</b>	22	1-Jun	3-Jun	644	1,034	348	0	541	306	1,195
	23	4-Jun	10-Jun	1,039	1,605	428	3	663	372	1,466
	24	11-Jun	17-Jun	1,072	1,729	354	0	550	311	1,215
	25	18-Jun	24-Jun	1,310	2,137	386	5	598	333	1,322
	26	25-Jun	1-Jul	1,260	2,131	270	0	419	237	927
<b>Jul</b>	27	2-Jul	8-Jul	1,683	2,456	321	3	498	278	1,100
	28	9-Jul	15-Jul	893	1,685	97	0	151	85	333
	29	16-Jul	22-Jul	879	1,661	186	2	288	161	637
	30	23-Jul	29-Jul	1,050	1,828	357	0	554	313	1,224
	31	30-Jul	5-Aug	1,229	2,196	350	0	542	307	1,199
<b>Aug</b>	32	6-Aug	12-Aug	2,379	4,094	817	4	1,268	713	2,802
	33	13-Aug	19-Aug	2,412	4,395	1,000	0	1,551	877	3,427
	34	20-Aug	25-Aug	2,262	4,509	585	15	907	498	2,004
<b>Subtotal</b>				<b>18,113</b>	<b>31,460</b>	<b>5499</b>	<b>33</b>	<b>8529</b>	<b>4789</b>	<b>18,850</b>
RCAW Derby				25	75	8	0	12	7	27
PSA 7-UP Derby				76	226	75	0	116	66	257
Gig Harbor Derby				93	280	58	0	90	51	199
<b>Season Total:</b>				<b>18,307</b>	<b>32,041</b>	<b>5,640</b>	<b>33</b>	<b>8,748</b>	<b>4913</b>	<b>19,333</b>
<b>Variance:</b>				1,059,206	2,140,971	199,851	65	9,927,214	2,558,645	20,789,558
<b>SE:</b>				1029	1463	447	8	3151	1600	4560
<b>CV (%):</b>				6	5	8	24	36	33	24
<b>95% CI:</b>				16,290 - 20,324	29,173 - 34,909	4,764 - 6,516	17 - 49	2,572 - 14,923	1,778 - 8,048	10,397 - 28,270

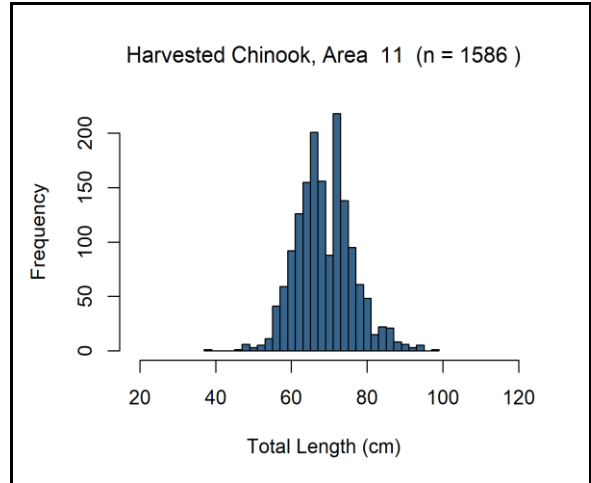
**Table 6.3** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 11.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	1540	46	1586
Unmarked	7	2	9
<b>Total</b>	<b>1547</b>	<b>48</b>	<b>1595</b>

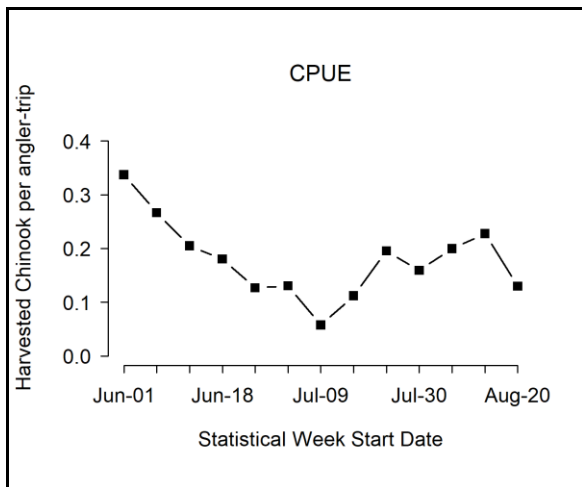




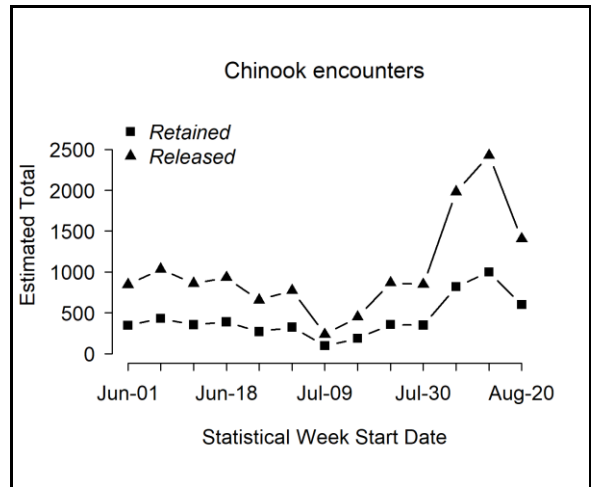
**Figure 6.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 11.



**Figure 6.3** Length-frequency distributions of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 11. Note: displayed values are observations where lengths taken.



**Figure 6.2** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 11.



**Figure 6.4** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 11.

**Table 6.4** Comparison of modeled and estimated total Chinook salmon encounters for the 2018 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

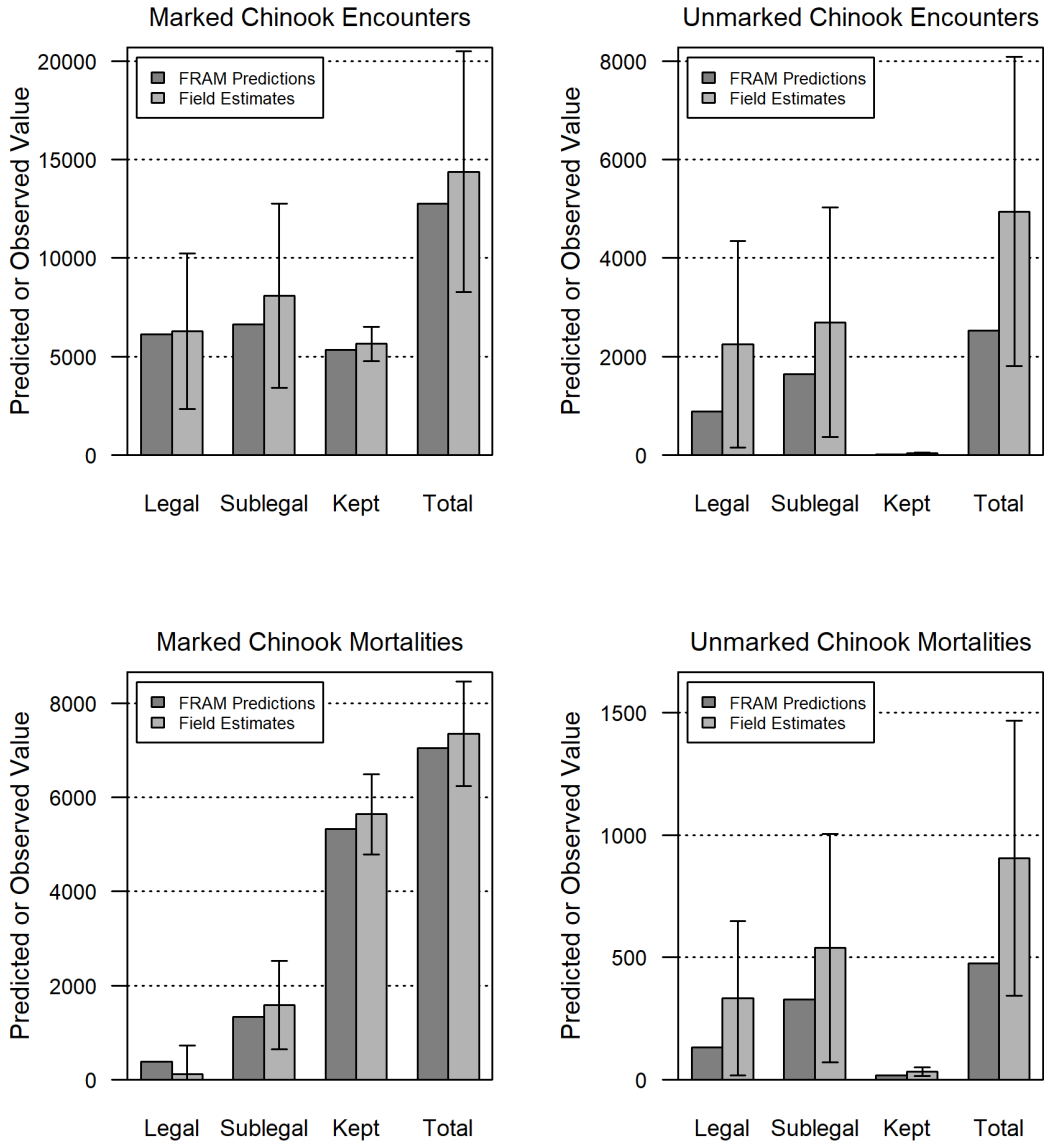
Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	UM	2526	889	1637	18
	AD	12,765	6,122	6643	5,326
	Total	15,291	7,011	8,280	5,344
	% Marked	83	87	80	100
Estimated (Creel) Encounters	UM	4946	2248	2698	33
	AD	14,388	6,295	8,093	5,640
	Total	19,333	8,543	10,791	5,673
	% Marked	74	74	75	99

**Table 6.5** Summary of season-wide fishery impact estimates for the 2018 summer Chinook MSF in Marine Area 11. Release mortality rate = 0.15 for legal fish and 0.20 for sublegal fish. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Size/mark group	Encounters	Retained	Released	Release Mortality	Total Mortality	Var	SE	95% CI	CV (%)
Legal AD	6,295	5,476	818	123	5,599	284,318	533	4,554 - 6,644	10
Legal UM	2248	26	2222	333	359	25818	161	44 - 674	45
Sublegal AD	8,093	164	7,929	1586	1749	228,265	478	813 - 2,686	27
Sublegal UM	2698	7	2690	538	545	56580	238	79 - 1,012	44
Total	19,333	5,673	13,660	2580	8,253	594,981	771	6,741 - 9,765	9

**Table 6.6** Comparison of modeled and estimated total Chinook salmon mortalities for the 2018 summer Chinook MSF in Marine Area 11. Values may not add up perfectly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	UM	AD	Total	UM	AD	Total
Total (Landed + Released)	476	7,041	7,517	904	7,348	8,253
Released Legal	131	386	517	333	123	456
Released Sublegal	327	1329	1656	538	1586	2124
Landed Only	18	5,326	5,344	33	5,640	5,673



**Figure 6.5** Comparison of modeled and estimated total Chinook salmon encounters and mortalities for the 2018 summer Chinook MSF in Marine Area 11. Error bars represent approximate 95% confidence intervals for field estimates.

**Table 6.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 11. The field "Number DITs" corresponds to the number of recovered CWTs that belonged to double-index tag

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Georgia Strait (1%)	R-Burrard In	H-Sandy Cove Seapen	1 (1%)	0
	N Washington (1%)	East Sound Bay (San)	Glenwood Springs	1 (1%)	0
WA	Hood Canal (10.4%)	Finch Cr 16.0222	Hoodsport Hatchery	7 (7.3%)	0
		Purdy Cr 16.0005	George Adams Hatchery	3 (3.1%)	1
	N Puget Sound (1%)	Wallace R 07.0940	Wallace R Hatchery	1 (1%)	0
	Skagit River (1%)	Cascade R 03.1411	Marblemount Hatchery	1 (1%)	0
		Big Soos Cr 09.0072	Soos Creek Hatchery	8 (8.3%)	0
	Mid Puget Sound (59.4%)	Icy Cr 09.0125	Icy Cr Hatchery	20 (20.8%)	0
		Clarks Crk Hatchery	Clarks Crk Hatchery	10 (10.4%)	0
		Grovers Cr 15.0299	Grovers Cr Hatchery	8 (8.3%)	8
		Voight Cr 10.0414	Voights Cr Hatchery	3 (3.1%)	0
		Gorst Cr 15.0216	Gorst Cr Rearing Pnd	7 (7.3%)	0
		Lk Washington (King)	Issaquah Hatchery	1 (1%)	0
		S Puget Sound (26%)	Kalama Cr 11.0017	Kalama Cr Hatchery	6 (6.2%)
	Clear Cr 11.0013C		Clear Creek Hatchery	13 (13.5%)	3
	Minter Cr 15.0048		Minter Cr Hatchery	4 (4.2%)	0
	Mcallister Springs Hatch		Clear Creek Hatchery	1 (1%)	0
Minter Cr 15.0048	Hupp Springs Rearing		1 (1%)	0	
<b>Total</b>				<b>96</b>	<b>12</b>

**Table 6.8** 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 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DITs Obs	Est. A D	var(Est. AD)	UM DIT Enc	Est. UM	var(Est. UM)	SE(Est. UM)
Clear Creek Hatchery	2014	1	3.6	9.09	3.6	0.4	0.093	0.31
Clear Creek Hatchery	2016	2	7.1	18.19	7.1	0.7	0.182	0.6
George Adams Hatchery	2014	1	3.6	9.09	3.6	0.4	0.091	0.3
Grovers Cr Hatchery	2015	8	28.5	72.74	28.2	2.8	0.717	2.39
<b>Total</b>		<b>12</b>	<b>42.7</b>	<b>109.11</b>	<b>42.5</b>	<b>4.3</b>	<b>1.083</b>	<b>3.61</b>

**Table 6.9** Monthly sample rates (Total retained Chinook salmon sampled<sup>1</sup> / Estimated retained Chinook salmon) in the 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked.

Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
Month	Stat Weeks	Dates	AD	UM	Total	AD	UM	Total	
June	22 - 26	1 Jun - 1 Jul	1787	8	1795	519	2	521	29.00%
July	27 - 30	2 Jul - 29 Jul	961	6	967	366	2	368	38.10%
August	31 - 34	30 Jul - 25 Aug	2892	19	2911	721	5	726	24.90%
<b>Season Total</b>			<b>5,640</b>	<b>33</b>	<b>5,673</b>	<b>1606</b>	<b>9</b>	<b>1615</b>	<b>28.50%</b>

<sup>1</sup>/ Number of retained Chinook salmon sampled includes all retained Chinook salmon inspected for CWT's, from all sites sampled during the summer 2018 Area 11 Chinook MSF (creel estimates and the fish sampled as part of baseline sampling).

**Table 6.10** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 11. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
<b>Armeni Public Ramp</b>	<b>7</b>	<b>0.0224</b>	<b>39</b>	<b>0.0396</b>
Breakwater Marina (Warters)	5	0.0160	22	0.0224
Browns Point Ramp	1	0.0032	2	0.0020
Brownsville Marina/Dock/Ramp	5	0.0160	2	0.0020
Chambers Bay Beach	1	0.0032	0	0.0000
Commencement Bay Marina	3	0.0096	15	0.0152
Dash Point Shore	0	0.0000	4	0.0041
Day Island Marina	4	0.0128	2	0.0020
Des Moines Marina	14	0.0447	79	0.0803
Dockton Ramp, Vashon Is	8	0.0256	8	0.0081
Duwamish Yacht Club	0	0.0000	3	0.0030
Eagle Harbor Waterfront Park	1	0.0032	0	0.0000
Edmonds Marina	2	0.0064	2	0.0020
Elliott Bay Marina	0	0.0000	4	0.0041
Evergreen Park Ramp	0	0.0000	2	0.0020
Foss Tug Dock	1	0.0032	0	0.0000
Fox Island Public Ramp	0	0.0000	3	0.0030
Gardiner Ramp	3	0.0096	3	0.0030
Gig Harbor Marina	18	0.0575	31	0.0315
<b>Gig Harbor Ramp</b>	<b>27</b>	<b>0.0863</b>	<b>50</b>	<b>0.0508</b>
Hartstene Is. Ramp	0	0.0000	2	0.0020
Horsehead Bay Ramp	2	0.0064	2	0.0020
Hylebos Boat Haven	0	0.0000	2	0.0020
Jensen Point	0	0.0000	2	0.0020
Longbranch Marina	0	0.0000	2	0.0020
Longbranch Public Ramp	1	0.0032	0	0.0000
Manchester Public Ramp	2	0.0064	21	0.0213
Narrows Marina	9	0.0288	32	0.0325
Olalla Public Ramp	3	0.0096	4	0.0041
Point Defiance Beach	2	0.0064	2	0.0020
<b>Point Defiance Boathouse</b>	<b>42</b>	<b>0.1342</b>	<b>97</b>	<b>0.0986</b>
<b>Point Defiance Public Ramp</b>	<b>82</b>	<b>0.2620</b>	<b>298</b>	<b>0.3028</b>
Port Orchard Public Ramp	0	0.0000	9	0.0091
Private	15	0.0479	62	0.0630
Quartermaster Marina (Vashon Is)	0	0.0000	1	0.0010
<b>Redondo Ramp</b>	<b>46</b>	<b>0.1470</b>	<b>140</b>	<b>0.1423</b>
Shilshole Marina	0	0.0000	4	0.0041
Shilshole Public Ramp	0	0.0000	5	0.0051
Silverdale Waterfront Ramp	0	0.0000	4	0.0041
Solo Point (Tatsolo Pt-Ft Lewis) Rm	0	0.0000	2	0.0020
Steilacoom Public Ramp	0	0.0000	2	0.0020
Tacoma Yacht Club	2	0.0064	2	0.0020
Tyee Marina/Ramp	5	0.0160	10	0.0102
Vashon Yacht Club	1	0.0032	0	0.0000
Wollochet Bay Public Ramp	1	0.0032	0	0.0000
Zittels Marina	0	0.0000	8	0.0081
<b>Total Anglers</b>	<b>313</b>	<b>1</b>	<b>984</b>	<b>1</b>

**Table 6.11** Fishery-total estimates of retained and released salmon (other than Chinook salmon) for the 2018 summer Chinook MSF in Marine Area 11. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status. Values may not add exactly due to rounding error.

Stat Week	Start Date	End Date	Retained Salmon			Released Salmon		
			Coho AD	Coho UM	Coho UK	Coho AD	Coho UM	Coho UK
22	1-Jun	3-Jun	0	0	0	0	0	0
23	4-Jun	10-Jun	0	0	0	3	0	0
24	11-Jun	17-Jun	0	0	0	0	0	0
25	18-Jun	24-Jun	22	0	0	17	0	0
26	25-Jun	1-Jul	27	0	0	13	0	0
27	2-Jul	8-Jul	3	0	0	3	26	11
28	9-Jul	15-Jul	0	9	0	7	8	21
29	16-Jul	22-Jul	58	24	0	9	11	0
30	23-Jul	29-Jul	49	10	0	25	4	12
31	30-Jul	5-Aug	24	23	0	27	0	16
32	6-Aug	12-Aug	78	36	0	49	8	9
33	13-Aug	19-Aug	151	58	0	53	4	10
34	20-Aug	25-Aug	330	180	29	5	0	20
<b>Season Total:</b>			<b>741</b>	<b>341</b>	<b>29</b>	<b>211</b>	<b>61</b>	<b>99</b>
<b>Variance:</b>			11086	2924	65	2929	373	873
<b>Standard Error:</b>			105	54	8	54	19	30
<b>CV (%):</b>			14	16	28	26	32	30
<b>95% CI:</b>			534 - 947	235 - 447	13 - 44	105 - 317	23 - 99	41 - 157

**Table 6.12** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 11, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	13 1-trip VTRs, 15 Angler Trips	14	5	18	6	43	0.74	0.74
Size/mark-status composition:		0.33	0.12	0.42	0.14			
Variance:		(0.0052)	(0.0024)	(0.0058)	(0.0029)			

**Table 6.13** 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 11 summer Chinook MSF. Values may not add exactly due to rounding error.

Season Dates	Effort (Angler-trips)	Retained Chinook				Released Chinook				Total Encounters
		LM	LU	SM	SU	LM	LU	SM	SU	
Jun 1 - Sept 30, 2007	78,958	10,192	74	354	21	1,511	3,015	8,033	2,357	25,558
Jun 1 - Sept 30, 2008	65,728	7,277	18	100	5	1,087	1,999	1,969	248	12,703
Jun 1 - Sept 30, 2009	80,157	3,149	20	117	17	470	1,269	3,820	3,302	12,164
Jun 1 - Sept 30, 2010	54,594	3,883	64	27	0	580	1,105	900	405	6,965
Jun 1 - Sept 30, 2011	69,919	2,559	9	77	12	382	2,120	1,932	1,579	8,670
Jun 1 - Sept 30, 2012	56,065	4,894	57	72	14	731	2,665	2,649	1,157	12,240
Jun 1 - Sept 30, 2013	64,509	3,056	35	55	0	457	1,289	1,214	669	6,774
Jun 1 - Sept 30, 2014	39,426	2,912	20	11	0	435	1,585	2,142	861	7,966
Jun 1 - Sept 30, 2015	40,858	1,447	10	41	3	216	748	2,491	1599	6,556
Jun 24 - Aug 19, 2016	13,766	1,437	4	40	0	215	443	1,359	298	3,794
Jun 1 - Sep 30, 2017	35,899	3,276	20	265	36	489	1056	2,962	1685	9,789
Jun 1, 2018 - Aug 25, 2018	32,041	5,476	26	164	7	818	2222	7,929	2690	19,333

## 7) Marine Area 12 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a seventh consecutive summer Chinook MSF in Marine Area 12 from July 1 through September 30, 2018. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with efforts to distribute and collect voluntary trip reports (VTRs) from the angling public.

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

**Table 7.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 12 summer Chinook MSF, including relative catch and effort patterns over the course of the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.



**Table 7.1** Sampling/estimation details on target parameters associated with the overall Area 12 summer mark-selective fishery monitoring program.

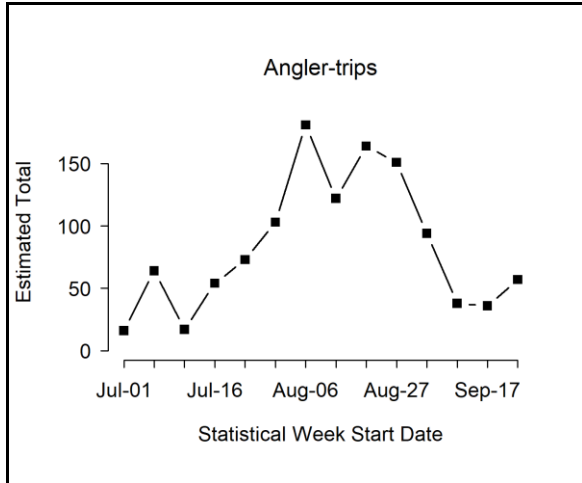
Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the fishery).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	When CRC-based retained Chinook estimates become available VTR data will be used in the estimation of total Chinook encounters by size/mark group (LM = 43%, LU = 0%, SM = 43%, SU = 14%; <b>Table 7.6</b> ), along with associated impacts, using the methods described in WDFW & NWIFC (2013).
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

**Table 7.2** Observations of fishing effort, Chinook salmon retained, and reported Chinook salmon releases, by week, for the summer 2018 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.

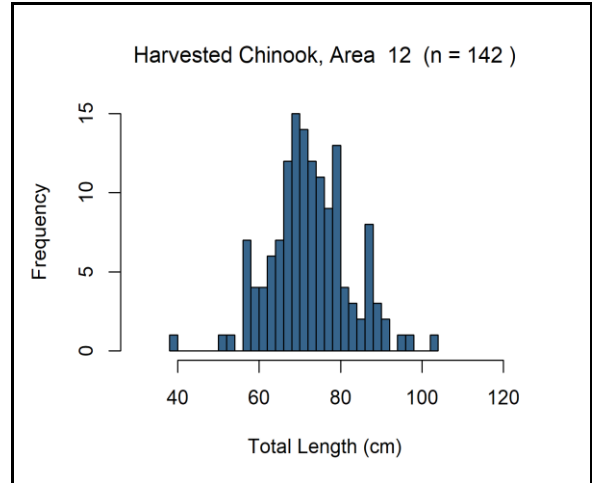
Stat Week	Start	End	Effort		Retained Fish				Released Fish		
			Boats	Anglers	Chin AD	Chin UM	Chin UD	Chin UK	Chin AD	Chin UM	Chin Unk
26	1-Jul	1-Jul	6	16	3	0	0	0	3	1	0
27	2-Jul	8-Jul	31	64	2	0	0	0	5	1	1
28	9-Jul	15-Jul	10	17	1	0	0	0	1	0	0
29	16-Jul	22-Jul	29	54	2	0	0	0	4	0	0
30	23-Jul	29-Jul	41	73	2	0	0	0	11	3	0
31	30-Jul	5-Aug	52	103	10	0	0	0	3	0	0
32	6-Aug	12-Aug	90	181	43	0	0	0	8	4	2
33	13-Aug	19-Aug	63	122	22	0	0	0	6	2	5
34	20-Aug	26-Aug	81	164	32	0	0	0	7	9	10
35	27-Aug	2-Sep	81	151	22	0	0	0	1	1	2
36	3-Sep	9-Sep	47	94	4	0	0	0	7	0	0
37	10-Sep	16-Sep	25	38	1	0	0	0	0	0	0
38	17-Sep	23-Sep	20	36	0	0	0	0	3	1	1
39	24-Sep	30-Sep	27	57	0	0	0	1	0	0	0
<b>Season Total</b>			<b>603</b>	<b>1170</b>	<b>144</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>59</b>	<b>22</b>	<b>21</b>

**Table 7.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 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.

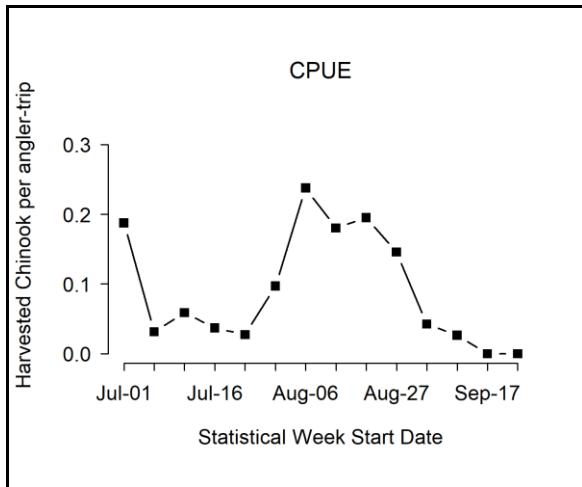
Stat Week	Start	End	Effort		Retained Fish		Released Fish				
			Boats	Anglers	Coho AD	Coho UM	Chum	Coho AD	Coho UNK	Cutthroat	UNK Salmon
26	1-Jul	1-Jul	6	16	0	0	0	0	0	0	1
27	2-Jul	8-Jul	31	64	0	0	0	0	0	4	1
28	9-Jul	15-Jul	10	17	0	0	0	0	0	5	0
29	16-Jul	22-Jul	29	54	0	0	0	0	0	0	0
30	23-Jul	29-Jul	41	73	0	0	0	2	0	0	0
31	30-Jul	5-Aug	52	103	0	0	0	0	0	4	0
32	6-Aug	12-Aug	90	181	0	0	0	0	0	0	0
33	13-Aug	19-Aug	63	122	1	0	1	0	0	0	0
34	20-Aug	26-Aug	81	164	4	1	0	0	2	2	0
35	27-Aug	2-Sep	81	151	1	0	0	0	0	3	1
36	3-Sep	9-Sep	47	94	0	1	0	0	0	0	0
37	10-Sep	16-Sep	25	38	2	2	0	0	0	1	0
38	17-Sep	23-Sep	20	36	2	7	1	1	0	0	0
39	24-Sep	30-Sep	27	57	0	1	0	1	0	36	0
<b>Season Total</b>			<b>603</b>	<b>1170</b>	<b>10</b>	<b>12</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>55</b>	<b>3</b>



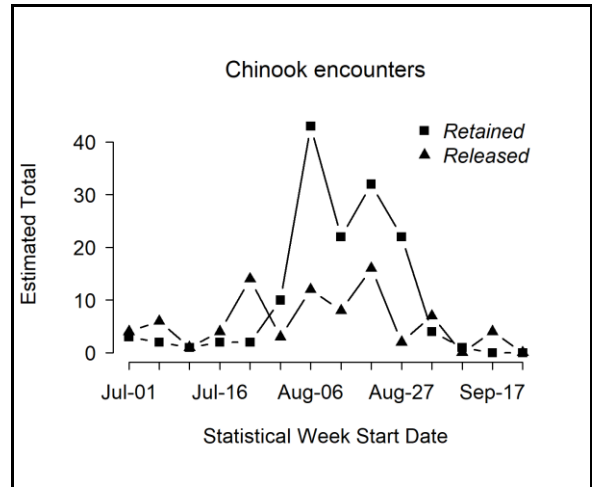
**Figure 7.1** Temporal patterns in fishing effort during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 7.3** Length-frequency distribution of retained marked Chinook sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are observations where lengths taken. Note: displayed values are observations where lengths taken.



**Figure 7.2** Temporal patterns in CPUE (landed Chinook per angler trip) during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 7.4** Temporal patterns in Chinook encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 12. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

**Table 7.4** Number of total length samples collected from retained Chinook salmon collected during dockside angler interviews in the 2018 summer Chinook MSF in Marine Area 12.

Mark Type	Number Sampled		
	Legal-size	Sublegal-size	Total
Marked	139	3	142
Unmarked	0	0	0
<b>Total</b>	<b>139</b>	<b>3</b>	<b>142</b>

**Table 7.5** List of sites sampled with the number of sampling events (site-days) during the 2018 summer Chinook MSF in Marine Area 12.

Location Name	Number of Site Days Sampled Per Month			Total Site-Days	% of Total
	July	August	September		
Big Beef Beach	0	0	2	2	0.96%
Dewatto Creek Watch	0	1	0	1	0.48%
Hoodspout Shore	6	8	3	17	8.17%
Misery Point Ramp	1	2	4	7	3.37%
Pleasant Harbor Boat Ramp	5	1	1	7	3.37%
Pleasant Harbor Marina	1	0	1	2	0.96%
Quilcene Bay Ramp	0	14	6	20	9.62%
Saltwater Park Ramp	23	23	27	73	35.10%
Summertide Resort	0	0	1	1	0.48%
Tahuya Ramp	0	2	5	7	3.37%
Triton Cove State Park	7	1	1	9	4.33%
Twanoh State Park	0	0	1	1	0.48%
Union Ramp	20	20	21	61	29.33%
<b>Grand Total</b>	<b>63</b>	<b>72</b>	<b>73</b>	<b>208</b>	<b>1</b>

**Table 7.6** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook 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 VTR	3 1-trip VTRs, 3 Angler Trips	3	0	3	1	7	0.86	1.00
Size/mark-status composition:		0.43	0.00	0.43	0.14			
Variance:		(0.0408)	(0.0000)	(0.0408)	(0.0204)			

**Table 7.7** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 12. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
BC	Fraser River – Thompson River (12.5%)	R-Harrison R	H-Chehalis River H	1 (12.5%)	0
WA	Hood Canal (87.5%)	Finch Cr 16.0222	Hoodsport Hatchery	3 (37.5%)	0
		Purdy Cr 16.0005	George Adams Hatchery	4 (50%)	2
<b>Total</b>				<b>8</b>	<b>2</b>

## 8) Marine Area 13 Summer Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a twelfth consecutive summer Chinook MSF in Marine Area 13 from May 1 through September 30, 2018. WDFW's Puget Sound Sampling Unit (PSSU) implemented a "Baseline Sampling" program (see WDFW 2012a for details) consisting of dockside angler interviews with catch sampling along with efforts to distribute and collect voluntary trip reports (VTRs) from the angling public.

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

**Table 8.1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2012a). In this section we present results from our monitoring activities during the Area 13 summer Chinook MSF, including relative catch and effort patterns over the course of the season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

**Table 8.1** Sampling/estimation details on target parameters associated with the overall Area 13 mark-selective fishery monitoring program.

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Angler Interviews (Baseline Sampling)	Observed (in-sample) fishing effort (boat & angler trips); kept and released fish.	Catch rates (CPUE); length, age, and CWT composition of harvest <sup>1</sup> ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Week	Observed catch per angler trip and species composition data obtained from baseline sampling will ultimately be combined with Catch Record Card (CRC) data to produce fishery-total estimates at a later time (approximately one year following the fishery).
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook salmon	Encounter data for non-Chinook salmon species (e.g., Coho salmon) that the angler may record on the VTR form	Fish encounter	Season	When CRC-based retained Chinook salmon estimates become available VTR data may be used in the estimation of total Chinook salmon encounters by size/mark group (LM = 55%, LU = 3%, SM = 32%, SU = 10%; <b>Table 8.4</b> ), along with associated impacts, using the methods described in WDFW & NWIFC (2013).
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	Will be estimated at a later date using the CRC-based retained Chinook salmon estimate, when it becomes available.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	Will be estimated at a later date using the CRC-based retained Chinook salmon estimate, when it becomes available. The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

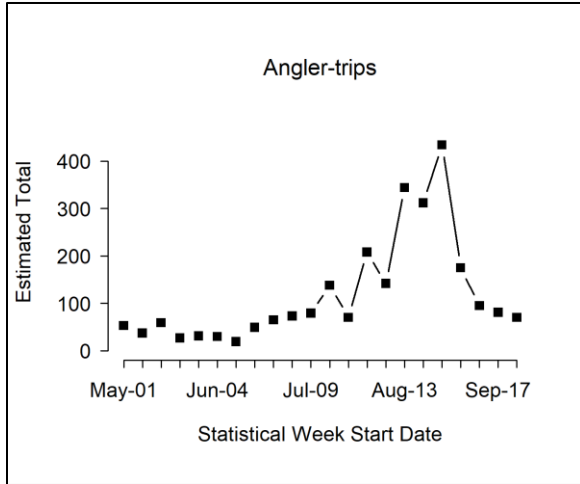
**Table 8.2** Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark status.

Stat Week	Start	End	Effort		Retained Fish				Released Fish		
			Boats	Anglers	Chin AD	Chin UM	Chin UD	Chin UK	Chin AD	Chin UM	Chin Unk
18	1-May	6-May	30	53	2	0	0	0	14	1	4
19	7-May	13-May	24	37	6	0	0	0	3	0	17
20	14-May	20-May	33	59	9	0	1	0	11	5	23
21	21-May	27-May	19	27	8	0	0	0	7	1	1
22	28-May	3-Jun	20	31	12	0	0	0	12	1	0
23	4-Jun	10-Jun	20	30	11	0	0	0	18	0	2
24	11-Jun	17-Jun	11	19	10	0	0	0	7	1	0
25	18-Jun	24-Jun	31	49	16	0	0	0	7	1	2
26	25-Jun	1-Jul	41	65	13	0	0	0	18	2	0
27	2-Jul	8-Jul	46	73	7	0	0	0	17	0	2
28	9-Jul	15-Jul	38	79	5	0	0	0	11	2	1
29	16-Jul	22-Jul	70	138	3	0	0	0	17	2	0
30	23-Jul	29-Jul	39	70	5	0	0	0	7	1	0
31	30-Jul	5-Aug	112	208	10	0	0	0	9	1	7
32	6-Aug	12-Aug	80	142	24	0	0	0	8	1	1
33	13-Aug	19-Aug	194	344	107	0	0	0	27	3	0
34	20-Aug	26-Aug	159	312	68	0	0	0	32	5	1
35	27-Aug	2-Sep	238	434	98	0	0	0	45	12	4
36	3-Sep	9-Sep	93	175	20	0	0	0	13	0	0
37	10-Sep	16-Sep	54	95	1	0	0	0	4	0	0
38	17-Sep	23-Sep	48	81	0	0	0	0	1	0	0
39	24-Sep	30-Sep	39	70	0	0	0	0	1	0	0
<b>Season Total</b>			<b>1439</b>	<b>2591</b>	<b>435</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>289</b>	<b>39</b>	<b>65</b>

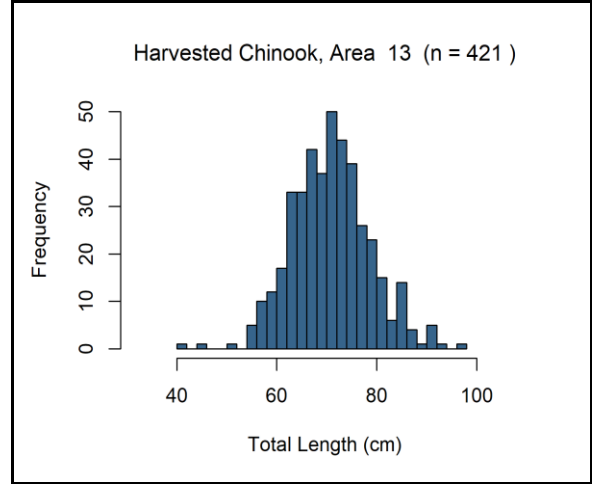


**Table 8.3** Observations of fishing effort, salmon retained (other than Chinook), and reported salmon releases (other than Chinook), by week, for the summer 2018 Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates. AD = marked (adipose-clipped), UM = unmarked, UK = unknown mark-status, UD = undetermined mark-status.

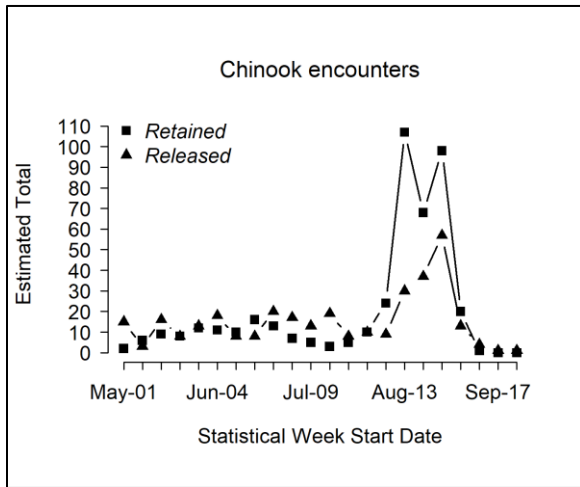
Stat Week	Start	End	Effort		Retained Fish		Released Fish								
			Boats	Anglers	Coho AD	Coho UM	Chin AD	Chin UM	Chin Unk	Coho AD	Coho UM	Coho Unk	Cutthroat	Pink	Unk. Salmon
18	1-May	6-May	30	53	0	0	14	1	4	0	0	0	42	0	0
19	7-May	13-May	24	37	0	0	3	0	17	0	0	0	5	0	0
20	14-May	20-May	33	59	0	0	11	5	23	0	0	0	0	0	0
21	21-May	27-May	19	27	0	0	7	1	1	0	0	0	0	0	0
22	28-May	3-Jun	20	31	0	0	12	1	2	0	0	0	2	0	0
23	4-Jun	10-Jun	20	30	0	0	18	0	2	0	0	0	0	0	0
24	11-Jun	17-Jun	11	19	0	0	7	1	0	0	0	0	0	0	0
25	18-Jun	24-Jun	31	49	0	0	7	1	2	0	0	0	0	0	0
26	25-Jun	1-Jul	41	65	0	0	18	2	0	1	2	1	9	0	0
27	2-Jul	8-Jul	46	73	0	0	17	0	2	0	0	0	3	0	0
28	9-Jul	15-Jul	38	79	1	0	11	2	1	0	1	0	5	0	0
29	16-Jul	22-Jul	70	138	3	0	17	2	0	1	0	0	0	0	0
30	23-Jul	29-Jul	39	70	0	0	7	1	0	0	0	0	0	0	0
31	30-Jul	5-Aug	112	208	1	0	9	1	7	1	0	0	1	0	1
32	6-Aug	12-Aug	80	142	0	0	8	1	1	2	0	0	0	0	0
33	13-Aug	19-Aug	194	344	1	0	27	3	0	0	0	0	0	0	5
34	20-Aug	26-Aug	159	312	0	0	32	5	1	2	0	0	0	0	0
35	27-Aug	2-Sep	238	434	15	2	45	12	4	2	0	3	0	0	3
36	3-Sep	9-Sep	93	175	9	0	13	0	0	0	0	0	0	0	2
37	10-Sep	16-Sep	54	95	2	0	4	0	0	2	1	2	3	0	0
38	17-Sep	23-Sep	48	81	2	0	1	0	0	0	1	2	1	1	1
39	24-Sep	30-Sep	39	70	8	0	1	0	0	4	0	0	1	0	0
<b>Season Total</b>			<b>1439</b>	<b>2591</b>	<b>42</b>	<b>2</b>	<b>289</b>	<b>39</b>	<b>67</b>	<b>15</b>	<b>5</b>	<b>8</b>	<b>72</b>	<b>1</b>	<b>12</b>



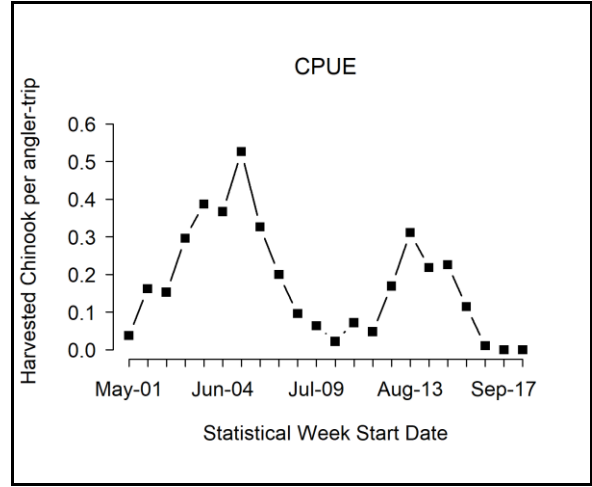
**Figure 8.1** Temporal patterns in fishing effort during the 2018 summer Chinook salmon MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 8.3** Length-frequency distribution of retained marked Chinook salmon sampled in dockside angler interviews during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are observations where lengths taken.



**Figure 8.2** Temporal patterns in Chinook salmon encounters (retained and released) during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.



**Figure 8.4** Temporal patterns in CPUE (landed Chinook salmon per angler trip) during the 2018 summer Chinook MSF in Marine Area 13. Note: displayed values are sample observations (summed across sampled sites) and not fishery-total estimates.

**Table 8.4** Total Chinook salmon encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the 2018 summer Chinook MSF in Marine Area 13, with estimates of legal-size and overall (legal and sublegal) mark rates. AD = marked (adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Data Source	Effort and Sample Size	Legal		Sublegal		Totals	Mark Rate	
		AD	UM	AD	UM		Overall	Legal
Private VTR	36 1-trip VTRs, 40 Angler Trips	39	2	23	7	71	0.87	0.95
Size/mark-status composition:		0.55	0.03	0.32	0.10			
Variance:		(0.0035)	(0.0004)	(0.0031)	(0.0013)			

**Table 8.5** Summary of coded-wire tags recovered from Chinook salmon harvested during the 2018 summer Chinook MSF in Marine Area 13. The field “Number DITs” corresponds to the number of recovered CWTs that belonged to double-index tag

Release Domain	Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
WA	N Washington (7.7%)	Friday Cr 03.0017	Samish Hatchery	1 (7.7%)	0
	Hood Canal (7.7%)	Purdy Cr 16.0005	George Adams Hatchery	1 (7.7%)	0
	Mid Puget Sound (30.8%)	Clarks Crk Hatchery	Clarks Crk Hatchery	2 (15.4%)	0
		Icy Cr 09.0125	Icy Cr Hatchery	2 (15.4%)	0
	S Puget Sound (53.8%)	Clear Cr 11.0013C	Clear Creek Hatchery	3 (23.1%)	0
		Kalama Cr 11.0017	Kalama Cr Hatchery	1 (7.7%)	0
		Mcallister Springs Hatch	Clear Creek Hatchery	2 (15.4%)	0
		Minter Cr 15.0048	Minter Cr Hatchery	1 (7.7%)	0
	Total				13

**Table 8.6** List of sites sampled with the number of sampling events (site-days) during the 2018 summer Chinook MSF in Marine Area 13.

Location Name	Number of Site Days Sampled Per Month					Total Site-Days	% of Total
	May	June	July	August	September		
Allyn Public Ramp	1	1	0	1	2	5	1.07%
Arcadia Ramp	0	0	4	0	5	9	1.92%
Boston Harbor Ramp/Marina	7	3	18	28	17	73	15.60%
Burfoot Park Shore	0	0	0	0	2	2	0.43%
Concrete Dock	1	3	2	0	0	6	1.28%
East Bay Marina/Ramp	3	4	9	1	2	19	4.06%
Evergreen, Sunset Beach	1	0	0	0	0	1	0.21%
Fox Island Public Ramp	1	3	1	0	2	7	1.50%
Fox Island Sand Spit	1	2	0	0	0	3	0.64%
Grapeview Public Ramp	0	1	0	0	1	2	0.43%
Hartstene Is. Ramp	2	1	5	2	8	18	3.85%
Home Public Ramp	1	3	3	0	5	12	2.56%
Horsehead Bay Ramp	0	1	0	0	0	1	0.21%
Joemma Beach Ramp	0	0	0	0	1	1	0.21%
Lake Bay Marina	0	0	0	0	1	1	0.21%
Landover	1	0	0	0	0	1	0.21%
Longbranch Public Ramp	1	1	3	1	6	12	2.56%
Luhr Beach Ramp	20	18	20	24	18	100	21.37%
Narrows Marina	5	8	4	4	6	27	5.77%
Narrows Park	1	3	2	0	3	9	1.92%
Narrows Ramp	1	0	0	1	1	3	0.64%
Solo Point	7	9	7	5	16	44	9.40%
Solo Point Shore	2	0	0	0	0	2	0.43%
Steamboat Island Bridge	0	0	0	0	3	3	0.64%
Steilacoom Public Ramp	2	5	1	1	1	10	2.14%
Tolmie State Park	0	0	0	0	1	1	0.21%
Vaughn Public Ramp	2	2	3	0	4	11	2.35%
Wauna Ramp	2	1	1	0	3	7	1.50%
Wauna Shore	2	1	1	0	1	5	1.07%
Wollochet Bay Public Ramp	0	1	0	0	0	1	0.21%
Zittels Marina	15	10	19	9	19	72	15.38%
<b>Grand Total</b>	<b>79</b>	<b>81</b>	<b>103</b>	<b>77</b>	<b>128</b>	<b>468</b>	<b>1</b>

## **9) Marine Area 7 Summer On-The-Water Survey**

The Washington Department of Fish and Wildlife (WDFW) conducted three on-the-water boat surveys simultaneously with aerial surveys on July 11, 2018, July 19, 2018, and July 20, 2018 in accordance with the List of Agreed to Fisheries (2018-2019). WDFW concurrently utilized three on-the-water survey boats to survey Marine Area 7 launching out of Port Townsend Boat Haven, Skyline Marina, and Washington Park Boat Ramp. On all three survey days more boats were surveyed from the air and sampled at in-sample dockside locations than counted in the on-the-water survey.

**Table 9.1** Sampling/estimation details on target parameters associated with the overall on-the-water survey and aerial survey comparison

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.
Aerial Surveys	Fraction of Area 7 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, $f_{ij}$ ).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Season	Three aerial surveys and on-the-water surveys were concurrently conducted on Jul-11, Jul-19, and Jul-20. <b>Table 9.2</b> summarizes total boat counts from these surveys along with dockside boat counts from in-sample locations on those days.
On-the-water Surveys	Fraction of Area 7 effort (boats) captured in the four-site sample frame via creel surveys		Boats	Season	Season-wide sample fraction was calculated as the average sample fraction over the 3 individual on-the-water surveys ( <b>Table 9.3</b> ).
Test Fishing	Size (legal/sublegal) and mark-status (marked/unmarked) composition of encountered Chinook	Chinook length, age, and DNA-based <sup>2</sup> stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Due to a short season, and low test fishing and VTR encounters (LM = 30%, LU = 19%, SM = 22%, SU = 30% $n=27$ test fishing encounters; <b>Table 3.9</b> ); a CRC for Encounter <sup>1</sup> approach was used to estimate encounters (LM=53%, LU=21%, SM=18%, SU=7%, <b>Table 3.12</b> ).

**Table 9.2** Method 2 estimates of total fishing effort and total salmon catch (harvest and releases) during the 2018 summer Chinook MSF in Marine Area 7 using in-sample proportions from boat surveys. Values may not add exactly due to rounding error. AD = marked (adipose-clipped), UM = unmarked.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Total Est. Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
July	26	1-Jul	1-Jul	287	670	345	0	173	209	727
	27	2-Jul	8-Jul	1,749	3,920	1,018	0	511	619	2,147
	28	9-Jul	15-Jul	1,260	2,599	726	0	364	441	1,531
	29	16-Jul	22-Jul	1,004	2,165	257	5	129	151	542
	30	23-Jul	29-Jul	1,090	2,390	152	0	76	92	320
	31	30-Jul	31-Jul	83	179	6	0	3	4	13
<b>Subtotal:</b>				<b>5,473</b>	<b>11,923</b>	<b>2,504</b>	<b>5</b>	<b>1,256</b>	<b>1,516</b>	<b>5,280</b>
Bellingham Derby				136	407	154	0	77	94	325
<b>Season Total:</b>				<b>5,609</b>	<b>12,330</b>	<b>2,658</b>	<b>5</b>	<b>1,333</b>	<b>1,610</b>	<b>5,605</b>
<b>Variance:</b>				205,469	1,005,144	125,837	8	891,312	440,803	1,267,567
<b>SE:</b>				453	1,003	355	3	944	664	1,126
<b>CV (%):</b>				8.3%	8.4%	14.2%	57.8%	75.2%	43.8%	21.3%
<b>95% CI:</b>				4,584-6,361	9,959-13,889	1,808-3,199	1-10	228-3,106	215-2,818	3,073-7,487

**Table 9.3** Summary of boats encountered by day from aerial surveys, boat effort surveys, and dockside surveys during the 2018 summer Chinook MSF in Marine Area 7. Note: On all three sampling days, both aerial survey boat effort and dockside creel boat effort were more than effort surveyed by boat.

Survey Date	Stratum	Aerial Survey	Boat Survey	Sampled Boats
11-Jul	WD	148	31	68
19-Jul	WD	106	47	85
20-Jul	WE	141	67	126

**Table 9.4** Summary boat survey effort used to estimate the fraction of effort captured in the three-site sample frame during the 2018 summer Chinook salmon MSF in Marine Area 7.

Date	Stratum	Boats In-Sample	Total Boats	In-Sample Proportion
11-Jul	WD	10	31	0.3226
19-Jul	WD	15	47	0.3191
20-Jul	WE	20	67	0.2985
Totals		45	145	
Mean:		15	48	0.3134
Std Dev:		5	18	0.0130
CV(%)		33.33%	37.32%	4.15%

**Table 9.5** Summary of the total number of anglers intercepted during on-the-water surveys conducted for the 2018 summer Chinook MSF in Marine Area 7. Sites in bold represent those included in the dockside sample frame.

Site Name	Weekday Anglers	Season Total (unadjusted) Size Measure	Weekend Anglers	Season Total (unadjusted) Size Measure
<b>Bellingham Ramp (Glenn St.) Squalicum Harbor</b>	<b>19</b>	<b>0.1086</b>	<b>14</b>	<b>0.0915</b>
Bellingham-6th St Ramp	1	0.0057	0	0.0000
Blaine Ramp	2	0.0114	0	0.0000
Blakely Island	4	0.0229	0	0.0000
Brandt's Landing-Ditch, Orcas Is	0	0.0000	2	0.0131
Cap Sante Moorage & Sling	0	0.0000	5	0.0327
<b>Coronet Bay Public Ramp</b>	<b>18</b>	<b>0.1029</b>	<b>0</b>	<b>0.0000</b>
Deer Harbor Moorage, Orcas Is	0	0.0000	4	0.0261
Everett Marina	5	0.0286	0	0.0000
Everett Ramp (formerly Norton Street Ramp (2010))	1	0.0057	0	0.0000
Fairharbor - Nyne's Marina	0	0.0000	2	0.0131
Island Marina/Sling, Lopez Is	2	0.0114	0	0.0000
La Conner Marina/Sling (Port of Skagit-Dry Storage)	0	0.0000	4	0.0261
La Conner Moorage	0	0.0000	9	0.0588
Lonesome Cove Beach, San Juan Is	1	0.0057	0	0.0000
Obstruction Pass Ramp, Orcas Is	0	0.0000	1	0.0065
<b>Port of Friday Harbor Marina, San Juan Is</b>	<b>7</b>	<b>0.0400</b>	<b>10</b>	<b>0.0654</b>
Private	3	0.0171	7	0.0458
Roche Harbor Moorage and Ramp, San Juan Is	4	0.0229	0	0.0000
Rosario Resort Moorage/Ramp, Orcas Is	0	0.0000	4	0.0261
Sandy Point Marina/Ramp	5	0.0286	5	0.0327
Shaw Moorage, Shaw Is	1	0.0057	1	0.0065
Shipyard Cove Marina & Ramp	2	0.0114	0	0.0000
Skyline Marina/Sling (Flounder Bay)	31	0.1771	27	0.1765
Swinomish Channel Ramp	2	0.0114	9	0.0588
Twin Rivers Campground	0	0.0000	3	0.0196
Unknown	48	0.2743	23	0.1503
Utsalady Ramp, Camano Is	0	0.0000	2	0.0131
<b>Washington Park Launch Ramp</b>	<b>14</b>	<b>0.0800</b>	<b>19</b>	<b>0.1242</b>
West Beach Rsrst Dock/Ramp, Orcas Is	4	0.0229	2	0.0131
West Sound Marina/Sling, Orcas Is	1	0.0057	0	0.0000
<b>Total Anglers</b>	<b>175</b>	<b>1</b>	<b>153</b>	<b>1</b>

Note: List of GPS locations of boat encounter, number of anglers and expected ramp of landing available for each on-the-water boat interview available in **Appendix 3.1**



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## APENDICIES

### 1) SITE WEIGHTS

**Appendix 1.1** Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 5.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/1/2018	26	Olsons Ramp (1159)	0.3281	Olsons East Docks (1159)	0.222
7/3/2018	27	Olsons Ramp (1159)	0.2004	Olsons West Docks (1159)	0.1034
7/7/2018	27	Olsons Ramp (1159)	0.3281	Van Riper's South	0.1732
7/8/2018	27	Olsons Ramp (1159)	0.3281	Van Riper's North	0.121
7/11/2018	28	Olsons Ramp (1159)	0.2004	Olsons East Docks (1159)	0.2879
7/13/2018	28	Olsons Ramp (1159)	0.3281	Van Riper's North	0.121
7/15/2018	28	Olsons Ramp (1159)	0.3281	Van Riper's South	0.1732
7/19/2018	29	Olsons Ramp (1159)	0.2004	Olsons West Docks (1159)	0.1034
7/20/2018	29	Olsons East Docks (1159)	0.222	Van Riper's North	0.121
7/21/2018	29	Olsons East Docks (1159)	0.222	Van Riper's North	0.121
7/25/2018	30	Olsons Ramp (1159)	0.2004	Van Riper's South	0.1595
7/28/2018	30	Van Riper's North	0.121	Olsons West Docks (1159)	0.0752
7/29/2018	30	Olsons East Docks (1159)	0.222	Curleys Resort	0.0805
7/31/2018	31	Olsons West Docks (1159)	0.1034	Van Riper's South	0.1595
8/3/2018	31	Van Riper's South	0.1987	Van Riper's North	0.1668
8/5/2018	31	Olsons Ramp (1159)	0.3296	Van Riper's North	0.1668
8/7/2018	32	Olsons Ramp (1159)	0.2417	Van Riper's North	0.1856
8/10/2018	32	Olsons East Docks (1159)	0.157	Van Riper's North	0.1668
8/12/2018	32	Olsons Ramp (1159)	0.3296	Van Riper's South	0.1987
8/15/2018	33	Olsons West Docks (1159)	0.2265	Van Riper's South	0.1205

**Appendix 1.2** Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 9.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/16/2018	29	Norton Street (Everett) Ramp	0.3778	Port Townsend Boat Haven Ramp	0.2023
7/19/2018	29	Norton Street (Everett) Ramp	0.3778	Port Townsend Boat Haven Ramp	0.2023
7/20/2018	29	Norton Street (Everett) Ramp	0.386	Kingston Public Ramp	0.0781
7/21/2018	29	Norton Street (Everett) Ramp	0.386	Fort Casey Public Ramp (Keystone)	0.1729
7/22/2018	29	Norton Street (Everett) Ramp	0.386	Port Townsend Boat Haven Ramp	0.1678
7/26/2018	30	Norton Street (Everett) Ramp	0.3778	Port Townsend Boat Haven Ramp	0.2023
7/27/2018	30	Norton Street (Everett) Ramp	0.386	Fort Casey Public Ramp (Keystone)	0.1729
7/28/2018	30	Norton Street (Everett) Ramp	0.386	Fort Casey Public Ramp (Keystone)	0.1729
7/29/2018	30	Norton Street (Everett) Ramp	0.386	Port Townsend Boat Haven Ramp	0.1678

**Appendix 1.3** Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 10.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/16/2018	29	Shilshole Public Ramp	0.4991	Kingston Public Ramp	0.1714
7/19/2018	29	Shilshole Public Ramp	0.4991	Armeni Public Ramp	0.1828
7/20/2018	29	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/21/2018	29	Shilshole Public Ramp	0.4591	Armeni Public Ramp	0.2176
7/22/2018	29	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/24/2018	30	Shilshole Public Ramp	0.4991	Armeni Public Ramp	0.1828
7/25/2018	30	Shilshole Public Ramp	0.4991	Kingston Public Ramp	0.1714
7/27/2018	30	Shilshole Public Ramp	0.4591	Brownsville Marina/Dock/Ramp	0.103
7/28/2018	30	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/29/2018	30	Shilshole Public Ramp	0.4591	Armeni Public Ramp	0.2176
7/31/2018	31	Shilshole Public Ramp	0.5025	Armeni Public Ramp	0.1775
8/2/2018	31	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/3/2018	31	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/4/2018	31	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/5/2018	31	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/7/2018	32	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/8/2018	32	Shilshole Public Ramp	0.4624	Manchester Public Ramp	0.0757
8/10/2018	32	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/11/2018	32	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/12/2018	32	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/14/2018	33	Shilshole Public Ramp	0.4624	Armeni Public Ramp	0.2656
8/15/2018	33	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/17/2018	33	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/18/2018	33	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/19/2018	33	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752



**Appendix 1.4** Size measures by sample date, for sites sampled during dockside creel surveys for the 2018 summer Chinook MSF in Marine Area 11.

Sample Date	Week	Location #1	Site Size	Location #2	Site Size
7/16/2018	29	Shilshole Public Ramp	0.4991	Kingston Public Ramp	0.1714
7/19/2018	29	Shilshole Public Ramp	0.4991	Armeni Public Ramp	0.1828
7/20/2018	29	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/21/2018	29	Shilshole Public Ramp	0.4591	Armeni Public Ramp	0.2176
7/22/2018	29	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/24/2018	30	Shilshole Public Ramp	0.4991	Armeni Public Ramp	0.1828
7/25/2018	30	Shilshole Public Ramp	0.4991	Kingston Public Ramp	0.1714
7/27/2018	30	Shilshole Public Ramp	0.4591	Brownsville Marina/Dock/Ramp	0.103
7/28/2018	30	Shilshole Public Ramp	0.4591	Kingston Public Ramp	0.1505
7/29/2018	30	Shilshole Public Ramp	0.4591	Armeni Public Ramp	0.2176
7/31/2018	31	Shilshole Public Ramp	0.5025	Armeni Public Ramp	0.1775
8/2/2018	31	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/3/2018	31	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/4/2018	31	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/5/2018	31	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/7/2018	32	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/8/2018	32	Shilshole Public Ramp	0.4624	Manchester Public Ramp	0.0757
8/10/2018	32	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/11/2018	32	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/12/2018	32	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/14/2018	33	Shilshole Public Ramp	0.4624	Armeni Public Ramp	0.2656
8/15/2018	33	Shilshole Public Ramp	0.4624	Kingston Public Ramp	0.1321
8/17/2018	33	Shilshole Public Ramp	0.4208	Kingston Public Ramp	0.1623
8/18/2018	33	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752
8/19/2018	33	Shilshole Public Ramp	0.4208	Armeni Public Ramp	0.2752

## 2) CWT RECOVERIES

**Appendix 2.1** Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 5.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
5	1-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		66	CWT00020803	AD
5	3-Jul-18	636961	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		68	CWT00020060	AD
5	3-Jul-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		60	CWT00020804	AD
5	3-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	75	CWT00020805	AD
5	5-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		59	CWT00020061	AD
5	5-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		59	CWT00020062	AD
5	5-Jul-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		64	CWT00020806	AD
5	5-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		53	CWT00020807	AD
5	5-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		56	CWT00020808	AD
5	5-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		66	CWT00020809	AD
5	5-Jul-18	60754	2015	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	CDFW		61	CWT00020810	AD
5	5-Jul-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		58	CWT00021002	AD
5	5-Jul-18	636954	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		53	CWT00021003	AD
5	5-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	CWT00021004	AD
5	6-Jul-18	636824	2014	Wallace R 07.0940	Wallace R Hatchery	WDFW	636825	80	CWT00012035	AD
5	6-Jul-18	55963	2015	Coleman Nfh	Coleman Nfh	USFWS		57	CWT00012038	AD
5	6-Jul-18	183279	2014	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		86	CWT00012039	AD
5	6-Jul-18	211155	2015	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211156	61	CWT00019952	AD
5	6-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		70	CWT00019953	AD
5	6-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00019954	AD
5	6-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		58	CWT00019955	AD
5	6-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		51	CWT00019956	AD
5	6-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		53	CWT00021005	AD
5	7-Jul-18	211163	2015	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		55	CWT00012040	AD
5	7-Jul-18	183597	2014	R-Nicola R	H-Spius Creek H	CDFO		64	CWT00012041	AD

Draft; January 28, 2019

5	7-Jul-18	636667	2013	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00012042	AD
5	7-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		62	CWT00012043	AD
5	7-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		55	CWT00019958	AD
5	7-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		62	CWT00020063	AD
5	7-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		57	CWT00020064	AD
5	7-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		63	CWT00020065	AD
5	7-Jul-18	211123	2014	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211122		CWT00020812	AD
5	8-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00020066	AD
5	8-Jul-18	636898	2014	Methow R 48.0002	Carlton Acclimation Pond	WDFW		72	CWT00020067	AD
5	8-Jul-18	211165	2015	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		62	CWT00020068	AD
5	9-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		70	CWT00020069	AD
5	9-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		57	CWT00020070	AD
5	10-Jul-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		68	CWT00020813	AD
5	10-Jul-18	183982	2015	R-Cowichan R	H-Cowichan River H	CDFO		64	CWT00020814	AD
5	11-Jul-18	183285	2014	R-Cowichan R	H-Cowichan River H	CDFO		63	CWT00012044	AD
5	12-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	CWT00012045	AD
5	12-Jul-18	183981	2015	R-Cowichan R	H-Cowichan River H	CDFO		59	CWT00012047	AD
5	14-Jul-18	60759	2015	San Joaq Shrm Isl Net Pen	Mok R Fish Ins	CDFW		57	CWT00019960	AD
5	14-Jul-18	183691	2015	R-Chilliwack R	H-Chilliwack River H	CDFO		67	CWT00019962	AD
5	14-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		72	CWT00020815	AD
5	14-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		53	CWT00020816	AD
5	15-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		56	CWT00012050	AD
5	15-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		56	CWT00012051	AD
5	15-Jul-18	183967	2015	R-Harrison R	H-Chehalis River H	CDFO		63	CWT00019963	AD
5	15-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		62	CWT00019964	AD
5	15-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		83	CWT00020072	AD
5	15-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW			CWT00020819	AD
5	15-Jul-18	183391	2014	R-Harrison R	H-Chehalis River H	CDFO		88	CWT00020820	AD
5	16-Jul-18	55894	2015	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	USFWS		62	CWT00012052	AD
5	19-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		78	CWT00020825	AD

Draft; January 28, 2019

5	19-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW			CWT00020826	AD
5	19-Jul-18	182869	2015	R-Capilano R Up	H-Capilano River H	CDFO			CWT00020827	AD
5	19-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW			CWT00020828	AD
5	19-Jul-18	183385	2014	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		74	CWT00020910	AD
5	20-Jul-18	211165	2015	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW			CWT00020829	AD
5	21-Jul-18	182696	2014	R-Capilano R	H-Capilano River H	CDFO		78	CWT00012053	AD
5	21-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW			CWT00012054	AD
5	21-Jul-18	636886	2014	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		73	CWT00019965	AD
5	21-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	53	CWT00020076	AD
5	21-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		75	CWT00020077	AD
5	22-Jul-18	184073	2015	R-Cowichan R	H-Cowichan River H	CDFO		58	CWT00019966	AD
5	22-Jul-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		82	CWT00019967	AD
5	22-Jul-18	183469	2015	R-Chilliwack R	H-Chilliwack River H	CDFO		65	CWT00019969	AD
5	22-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		65	CWT00020830	AD
5	22-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		57	CWT00020831	AD
5	22-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		59	CWT00020832	AD
5	22-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		54	CWT00020833	AD
5	23-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		65	CWT00020834	AD
5	23-Jul-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		73	CWT00020836	AD
5	23-Jul-18	636788	2015	Fallert Cr 27.0017	Fallert Cr Hatchery	WDFW		73	CWT00020837	AD
5	23-Jul-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		58	CWT00020838	AD
5	24-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		72	CWT00019970	AD
5	24-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	83	CWT00019971	AD
5	25-Jul-18	55760	2015	Spring Cr 29.0159	Spring Cr Nfh	USFWS	55761	56	CWT00012055	AD
5	25-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW			CWT00020839	AD
5	25-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		73	CWT00020840	AD
5	26-Jul-18	55894	2015	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	USFWS		66	CWT00020841	AD
5	26-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	CWT00020842	AD
5	26-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		54	CWT00020843	AD
5	26-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	CWT00020844	AD

Draft; January 28, 2019

5	26-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW			CWT00020845	AD
5	27-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	77	CWT00012056	AD
5	27-Jul-18	220360	2014	Captain Johns Pd	Lyons Ferry Hatchery	NPT		81	CWT00012057	AD
5	27-Jul-18	55760	2015	Spring Cr 29.0159	Spring Cr Nfh	USFWS	55761	80	CWT00020079	AD
5	28-Jul-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		56	CWT00019973	AD
5	28-Jul-18	182867	2015	R-Sandy Cv	H-Sandy Cove Seapen	CDFO		69	CWT00020082	AD
5	29-Jul-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		81	CWT00012059	AD
5	29-Jul-18	182867	2015	R-Sandy Cv	H-Sandy Cove Seapen	CDFO		61	CWT00012060	AD
5	29-Jul-18	183967	2015	R-Harrison R	H-Chehalis River H	CDFO		58	CWT00012061	AD
5	29-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	68	CWT00020083	AD
5	29-Jul-18	636933	2015	Wetchee R 45.0030	Dryden Pond	WDFW		57	CWT00020084	AD
5	29-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		56	CWT00020847	AD
5	30-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		79	CWT00019974	AD
5	31-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		68	CWT00020849	AD
5	31-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		51	CWT00020850	AD
5	1-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		76	CWT00020085	AD
5	1-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		64	CWT00020087	AD
5	2-Aug-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		60	CWT00020851	AD
5	2-Aug-18	60769	2015	Half Moon Bay John Pr Net	Mok R Fish Ins	CDFW		55	CWT00020852	AD
5	3-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	CWT00019981	AD
5	3-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW			CWT00020855	AD
5	4-Aug-18	183964	2015	R-Harrison R	H-Chehalis River H	CDFO		62	CWT00012062	AD
5	4-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		70	CWT00012063	AD
5	4-Aug-18	636945	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		54	CWT00012065	AD
5	4-Aug-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		73	CWT00012066	AD
5	4-Aug-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		59	CWT00012069	AD
5	4-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00019982	AD
5	4-Aug-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		54	CWT00019983	AD
5	4-Aug-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		63	CWT00020088	AD
5	4-Aug-18	637192	2016	Purdy Cr 16.0005	George Adams Hatchery	WDFW		67	CWT00020089	AD

Draft; January 28, 2019

5	4-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		64	CWT00020090	AD
5	4-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00020091	AD
5	4-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		65	CWT00020856	AD
5	5-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	64	CWT00012072	AD
5	5-Aug-18	211163	2015	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		68	CWT00012073	AD
5	5-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00019984	AD
5	5-Aug-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		56	CWT00019985	AD
5	5-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		56	CWT00020092	AD
5	5-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		65	CWT00020093	AD
5	5-Aug-18	637024	2015	Lk Washington (King)	Issaquah Hatchery	WDFW		59	CWT00020857	AD
5	5-Aug-18	636886	2014	Lyons Ferry Rel.Site	Lyons Ferry Hatchery	WDFW		57	CWT00020858	AD
5	6-Aug-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		61	CWT00020094	AD
5	6-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		74	CWT00020095	
5	6-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	CWT00020096	AD
5	6-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		73	CWT00020859	AD
5	6-Aug-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		57	CWT00020860	AD
5	6-Aug-18	182866	2015	R-Sandy Cv	H-Sandy Cove Seapen	CDFO		77	CWT00020861	AD
5	7-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		66	CWT00019986	AD
5	7-Aug-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		73	CWT00020097	AD
5	7-Aug-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		68	CWT00020099	AD
5	7-Aug-18	186043	2015	R-Cowichan R	H-Cowichan River H	CDFO		59	CWT00020862	AD
5	9-Aug-18	60784	2015	Iron Gate Hatchery	Iron Gate Hatchery	CDFW		54	CWT00012076	AD
5	9-Aug-18	183392	2014	R-Harrison R	H-Chehalis River H	CDFO		75	CWT00012077	AD
5	9-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		54	CWT00012078	AD
5	9-Aug-18	183469	2015	R-Chilliwack R	H-Chilliwack River H	CDFO		61	CWT00012079	AD
5	9-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	54	CWT00012080	AD
5	10-Aug-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		78	CWT00012081	AD
5	10-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	54	CWT00012082	AD
5	10-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		67	CWT00020100	AD
5	10-Aug-18	183469	2015	R-Chilliwack R	H-Chilliwack River H	CDFO		67	CWT00020863	AD

Draft; January 28, 2019

5	10-Aug-18	636945	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		67	CWT00020864	AD
5	10-Aug-18	636897	2015	Kendall Cr 01.0406	Kendall Cr Hatchery	WDFW			CWT00020865	AD
5	11-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		54	CWT00012085	AD
5	11-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		56	CWT00012086	AD
5	11-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		67	CWT00012087	AD
5	11-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		53	CWT00012090	AD
5	11-Aug-18	637167	2016	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		42	CWT00012091	AD
5	11-Aug-18	56075	2016	Coleman Nfh	Coleman Nfh	USFWS		43	CWT00012092	AD
5	11-Aug-18	183964	2015	R-Harrison R	H-Chehalis River H	CDFO		65	CWT00013827	AD
5	11-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		60	CWT00019980	AD
5	11-Aug-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		65	CWT00019990	AD
5	11-Aug-18	183967	2015	R-Harrison R	H-Chehalis River H	CDFO		58	CWT00020101	AD
5	11-Aug-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		62	CWT00020144	AD
5	11-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH			CWT00020866	AD
5	11-Aug-18	211130	2014	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		78	CWT00020867	AD
5	11-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		56	CWT00020868	AD
5	11-Aug-18	182866	2015	R-Sandy Cv	H-Sandy Cove Seapen	CDFO		57	CWT00020870	AD
5	12-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		69	CWT00012095	AD
5	12-Aug-18	91012	2016	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW		55	CWT00019979	AD
5	12-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		64	CWT00019991	AD
5	12-Aug-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		55	CWT00019992	AD
5	12-Aug-18	184382	2016	R-Chilliwack R	H-Chilliwack River H	CDFO		53	CWT00019993	AD
5	12-Aug-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		60	CWT00020872	AD
5	12-Aug-18	182866	2015	R-Sandy Cv	H-Sandy Cove Seapen	CDFO			CWT00020873	AD
5	12-Aug-18	60732	2015	Feather At Gridley	Feather R Hatchery	CDFW			CWT00020875	AD
5	13-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		67	CWT00012096	AD
5	13-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		52	CWT00012097	AD
5	13-Aug-18	637147	2016	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ			CWT00012098	AD
5	13-Aug-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	71	CWT00019994	AD
5	14-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		61	CWT00012099	AD

*Draft; January 28, 2019*

5	14-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00020502	AD
5	14-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		60	OSP14628	AD



**Appendix 2.2** Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 6.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
6	3-Jul-18	182681	2014	R-Mamquam R	H-Tenderfoot Creek H	CDFO		78	CWT00011711	AD
6	3-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00011712	AD
6	3-Jul-18	636781	2014	Cascade R 03.1411	Marblemount Hatchery	WDFW		60	CWT00011832	AD
6	3-Jul-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		73	CWT00011833	AD
6	3-Jul-18	183981	2015	R-Cowichan R	H-Cowichan River H	CDFO		61	CWT00011834	AD
6	3-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		75	CWT00012211	AD
6	3-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	65	CWT00020315	AD
6	3-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	66	CWT00020316	AD
6	3-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	CWT00020317	AD
6	3-Jul-18	636954	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		57	CWT00020318	AD
6	3-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00020319	AD
6	3-Jul-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		70	CWT00020320	AD
6	3-Jul-18	90824	2015	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW		68	CWT00020321	AD
6	5-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		68	CWT00011713	AD
6	5-Jul-18	211132	2014	Whitehorse Springs	Whitehorse Pond	STIL		80	CWT00011714	AD
6	7-Jul-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		82	CWT00011715	AD
6	7-Jul-18	636667	2013	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		64	CWT00011716	AD
6	7-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		76	CWT00011717	AD
6	7-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		84	CWT00012216	AD
6	7-Jul-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		56	CWT00012217	AD
6	7-Jul-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		77	CWT00012218	AD
6	7-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		61	CWT00012219	AD
6	8-Jul-18	636894	2014	East Sound Bay (San)	Glenwood Springs	COOP		63	CWT00011719	AD
6	10-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	55	CWT00012230	AD
6	11-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		52	CWT00017504	AD

6	11-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	95	CWT00020322	AD
6	13-Jul-18	183389	2014	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		74	CWT00012229	AD
6	14-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		67	CWT00020323	AD
6	15-Jul-18	636894	2014	East Sound Bay (San)	Glenwood Springs	COOP		74	CWT00011720	AD
6	15-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		72	CWT00011721	AD
6	15-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		67	CWT00020325	AD
6	15-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		52	CWT00020326	AD
6	15-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		68	CWT00020327	AD
6	15-Jul-18	636945	2015	Cascade R 03.1411	Marblemount Hatchery	WDFW		63	CWT00020328	AD
6	16-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00008860	AD
6	16-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	CWT00011722	AD
6	18-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		58	CWT00012226	AD
6	18-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		71	CWT00012228	AD
6	19-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		64	CWT00011837	AD
6	19-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		76	CWT00012225	AD
6	20-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	66	CWT00011835	AD
6	20-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		76	CWT00011836	AD
6	20-Jul-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		92	CWT00011839	AD
6	20-Jul-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		85	CWT00012227	AD
6	20-Jul-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		74	CWT00020329	AD
6	21-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		53	CWT00011723	AD
6	21-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		75	CWT00011838	AD
6	22-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		72	CWT00011724	AD
6	22-Jul-18	90945	2014	Umatilla R	Bonneville Hatchery	ODFW		73	CWT00011725	AD
6	22-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		67	CWT00011841	AD
6	22-Jul-18	636776	2014	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		79	CWT00011842	AD
6	22-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		73	CWT00011843	AD

6	22-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	68	CWT00011844	AD
6	23-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		53	CWT00011840	AD
6	23-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		64	CWT00011845	AD
6	25-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		65	CWT00011726	AD
6	25-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		69	CWT00011727	AD
6	26-Jul-18	183966	2015	R-Harrison R	H-Chehalis River H	CDFO		71	CWT00011728	AD
6	26-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		71	CWT00011729	AD
6	26-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	68	CWT00020330	AD
6	26-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		63	CWT00020331	AD
6	26-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00020332	AD
6	26-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	59	CWT00020333	AD
6	27-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		66	CWT00011730	AD
6	27-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		72	CWT00011731	AD
6	27-Jul-18	636963	2015	Elwha R 18.0272	Elwha Hatchery	WDFW		73	CWT00011732	AD
6	27-Jul-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		76	CWT00011733	AD
6	27-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		78	CWT00011734	AD
6	27-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00012231	AD
6	28-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	67	CWT00011735	AD
6	28-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00011736	
6	28-Jul-18	636943	2015	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ	211169	60	CWT00011737	UM
6	28-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	79	CWT00011846	AD
6	28-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		68	CWT00011847	AD
6	28-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		57	CWT00011848	AD
6	28-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		66	CWT00012212	AD
6	28-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	66	CWT00012213	AD
6	29-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	63	CWT00011738	AD
6	29-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		57	CWT00011739	AD
6	29-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	55	CWT00011849	AD

6	29-Jul-18	636796	2014	Klaskanine R N Fk	Klaskanine Hatchery	ODFW		80	CWT00011850	AD
6	29-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		65	CWT00011851	AD
6	29-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		63	CWT00011852	AD
6	29-Jul-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		63	CWT00011853	AD
6	30-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		84	CWT00020335	AD
6	3-Aug-18	183972	2015	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		68	CWT00011740	AD
6	3-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	CWT00011741	AD
6	3-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00011857	AD
6	3-Aug-18	211213	2016	Whitehorse Springs	Whitehorse Pond	STIL		51	CWT00011859	AD
6	4-Aug-18	211133	2014	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW		78	CWT00011742	AD
6	4-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	65	CWT00011743	AD
6	4-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		75	CWT00011854	AD
6	5-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		73	CWT00011744	AD
6	5-Aug-18	211164	2015	Hoko R 19.0148	Hoko Falls Hatchery	MAKAH		67	CWT00011745	AD
6	5-Aug-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	79	CWT00011861	AD
6	5-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00020336	AD
6	6-Aug-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		66	CWT00011855	AD
6	6-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	70	CWT00011856	AD
6	7-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		66	CWT00011860	AD
6	9-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	70	CWT00011746	AD
6	10-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		63	CWT00012232	AD
6	10-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		48	CWT00012233	AD
6	10-Aug-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		69	CWT00020198	AD
6	10-Aug-18	55894	2015	Tsoo-Yess R 20.0015	Makah Nfh On Tsoo-Yess R	USFWS		63	CWT00020199	AD
6	11-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		66	CWT00011863	AD
6	11-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		63	CWT00012235	AD
6	11-Aug-18	211162	2015	Whitehorse Springs	Whitehorse Pond	STIL		51	CWT00020201	AD

*Draft; January 28, 2019*

6	11-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		62	CWT00020337	AD
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**Appendix 2.3** Coded-wire tag (CWT) recoveries in the 2018 summer 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-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	81	CWT00011218	AD
7	1-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		61	CWT00011219	AD
7	1-Jul-18	183984	2015	R-Cowichan R	H-Cowichan River H	CDFO		62	CWT00016626	AD
7	1-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		67	CWT00017602	AD
7	1-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		60	CWT00017703	AD
7	1-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		71	CWT00017808	AD
7	3-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		62	CWT00017702	AD
7	6-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	42948	AD
7	7-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		75	CWT00011220	AD
7	7-Jul-18	636961	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		63	CWT00016522	AD
7	7-Jul-18	182595	2014	R-Shuswap R Middle	H-Shuswap River, Middle,	CDFO		68	CWT00016810	AD
7	7-Jul-18	211183	2015	Stillaguamish R -Sf	Brenner Hatchery	STIL		51	CWT00017704	AD
7	8-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		51	CWT00016523	AD
7	8-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00016524	AD
7	8-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		56	CWT00016525	AD
7	8-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		65	CWT00017603	AD
7	8-Jul-18	183385	2014	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		78	CWT00017705	AD
7	11-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		56	CWT00017706	AD
7	11-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		56	CWT00017707	AD
7	13-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		59	97577	AD
7	13-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	56	84966	AD
7	13-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		75	84968	AD
7	13-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	84969	AD
7	13-Jul-18	183280	2014	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		68	84970	AD
7	13-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	84971	AD
7	13-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		51	84974	AD
7	13-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		57	CWT00016526	AD
7	13-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		63	CWT00017708	AD
7	14-Jul-18	183981	2015	R-Cowichan R	H-Cowichan River H	CDFO		64	97583	AD
7	14-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	84972	AD
7	14-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		69	84973	AD
7	14-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		50	CWT00017709	AD

7	14-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		70	CWT00017710	AD
7	15-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	77	97587	AD
7	15-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		70	97588	AD
7	15-Jul-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		64	CWT00011221	AD
7	21-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		58	CWT00016527	AD
7	21-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		62	CWT00016528	AD
7	21-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		59	CWT00017605	AD
7	21-Jul-18	211165	2015	Co Line Pd2 03.1853B	Marblemount Hatchery	WDFW			CWT00017711	AD
7	23-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		74	CWT00017712	AD
7	24-Jul-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		70	CWT00017010	AD
7	25-Jul-18	183973	2015	R-Shuswap R Low	H-Shuswap River, Middle,	CDFO		65	CWT00016812	AD
7	28-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		78	CWT00011222	AD
7	29-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	54	CWT00016627	AD
7	29-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		67	CWT00017606	AD

**Appendix 2.4** Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 9.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
9	16-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		61	CWT00008776	AD
9	16-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		64	CWT00008777	AD
9	16-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00008778	AD
9	16-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	67	CWT00008780	AD
9	16-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		62	CWT00009027	AD
9	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		67	CWT00009076	AD
9	16-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		62	CWT00009077	AD
9	16-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00009078	AD
9	16-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00009079	AD
9	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		61	CWT00009080	AD
9	16-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		60	CWT00009082	AD
9	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		64	CWT00009422	AD
9	16-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		71	CWT00012133	AD
9	16-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		55	CWT00012134	AD
9	16-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ			CWT00012135	AD
9	16-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		67	CWT00012136	AD
9	16-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00013423	AD
9	16-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00015031	AD
9	16-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		61	CWT00015041	AD
9	16-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00015042	AD
9	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		58	CWT00015053	AD
9	16-Jul-18	636954	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		57	CWT00015054	AD



9	16-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		68	CWT00015055	AD
9	16-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		67	CWT00015241	AD
9	19-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		51	CWT00008861	AD
9	19-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	54	CWT00008862	AD
9	19-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		68	CWT00009085	AD
9	19-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	61	CWT00009086	AD
9	19-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		65	CWT00012137	AD
9	19-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		61	CWT00012138	AD
9	19-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	70	CWT00012139	AD
9	19-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00015033	AD
9	20-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		55	CWT00008785	AD
9	20-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		64	CWT00009087	AD
9	20-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00009088	AD
9	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00009089	AD
9	20-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		67	CWT00015044	AD
9	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		61	CWT00015045	AD
9	20-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		60	CWT00015056	AD
9	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		55	CWT00015057	AD
9	20-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		63	CWT00015065	AD
9	20-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		67	CWT00020249	AD
9	21-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		53	CWT00008787	AD
9	21-Jul-18	636667	2013	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		80	CWT00008789	AD
9	21-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00009090	AD
9	21-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	59	CWT00009092	AD
9	21-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00009093	AD

9	21-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		61	CWT00009094	AD
9	21-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		68	CWT00009461	AD
9	21-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		64	CWT00009603	AD
9	21-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00009606	AD
9	21-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		63	CWT00015059	AD
9	21-Jul-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		80	CWT00015060	AD
9	21-Jul-18	636813	2014	Finch Cr 16.0222	Hoodspport Hatchery	WDFW		89	CWT00020250	AD
9	22-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		64	CWT00008867	AD
9	22-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		58	CWT00009096	AD
9	22-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	69	CWT00009097	AD
9	22-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		62	CWT00009466	AD
9	22-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	71	CWT00009467	AD
9	22-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		60	CWT00009510	AD
9	22-Jul-18	636950	2015	Finch Cr 16.0222	Hoodspport Hatchery	WDFW		59	CWT00015049	AD
9	22-Jul-18	211213	2016	Whitehorse Springs	Whitehorse Pond	STIL		48	CWT00015050	AD
9	26-Jul-18	637022	2015	Issaquah Cr 08.0178	Issaquah Hatchery	WDFW		75	CWT00009098	AD
9	26-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		61	CWT00009468	AD
9	26-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		71	CWT00009509	AD
9	26-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		71	CWT00012140	AD
9	26-Jul-18	636794	2014	Wallace R 07.0940	Wallace R Hatchery	WDFW		64	CWT00012141	AD
9	27-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		71	CWT00008868	AD
9	27-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		63	CWT00008869	AD
9	27-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		81	CWT00009101	AD
9	27-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		55	CWT00009423	AD

9	27-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		55	CWT00009425	AD
9	27-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		55	CWT00009441	AD
9	27-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		56	CWT00009471	AD
9	27-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		60	CWT00009473	AD
9	27-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		60	CWT00009618	AD
9	27-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		56	CWT00012146	AD
9	27-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		65	CWT00012147	AD
9	27-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		62	CWT00015039	AD
9	27-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		56	CWT00015040	AD
9	27-Jul-18	637024	2015	Lk Washington (King)	Issaquah Hatchery	WDFW		64	CWT00020255	AD
9	28-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00008796	AD
9	28-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		69	CWT00008797	AD
9	28-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		66	CWT00008800	AD
9	28-Jul-18	211155	2015	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211156	74	CWT00009427	AD
9	28-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		69	CWT00009443	AD
9	28-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		69	CWT00009474	AD
9	28-Jul-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		69	CWT00009513	AD
9	28-Jul-18	211155	2015	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211156	63	CWT00009515	AD
9	28-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		62	CWT00009818	AD
9	28-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	70	CWT00009819	AD
9	28-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		73	CWT00012142	AD
9	28-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00012143	AD
9	28-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	65	CWT00012144	AD
9	28-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	59	CWT00012145	AD
9	28-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00014902	AD
9	28-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00014903	AD

Draft; January 28, 2019

9	28-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		66	CWT00020251	AD
9	29-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00009445	AD
9	29-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		61	CWT00009477	AD
9	29-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		79	CWT00009823	AD
9	29-Jul-18	636810	2014	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		73	CWT00015207	AD

**Appendix 2.5** Coded-wire tag (CWT) recoveries in the 2018 summer 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	16-Jul-18	637165	2016	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		41	CWT00008781	UM
10	16-Jul-18	184383	2016	R-Chilliwack R	H-Chilliwack River H	CDFO		52	CWT00009028	AD
10	16-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00009081	AD
10	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		59	CWT00015063	AD
10	16-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		53	CWT00015069	AD
10	16-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		52	CWT00015070	AD
10	16-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00015095	AD
10	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		61	CWT00015242	AD
10	16-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		62	CWT00015243	AD
10	16-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		74	CWT00015244	AD
10	16-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		58	CWT00021802	AD
10	17-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	60	CWT00015085	AD
10	17-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		77	CWT00015086	AD
10	19-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		55	CWT00008783	AD
10	19-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		57	CWT00015066	AD
10	19-Jul-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	73	CWT00015202	AD
10	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		54	CWT00008786	AD
10	20-Jul-18	636810	2014	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		70	CWT00009602	AD
10	20-Jul-18	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		63	CWT00015078	AD
10	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00015088	AD
10	20-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		59	CWT00015089	AD
10	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		56	CWT00015098	AD
10	20-Jul-18	636928	2015	Minter Cr Tr 15.0051	Hupp Springs Rearing	WDFW		53	CWT00015099	UM
10	20-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00021806	AD
10	20-Jul-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		56	CWT00021807	AD

10	21-Jul-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		76	CWT00008788	AD
10	21-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		48	CWT00009804	AD
10	21-Jul-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		53	CWT00015203	AD
10	21-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		60	CWT00015205	AD
10	22-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		52	CWT00008792	AD
10	22-Jul-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		59	CWT00008793	AD
10	22-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		54	CWT00009610	AD
10	22-Jul-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		65	CWT00009805	AD
10	24-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		53	CWT00008794	AD
10	24-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		52	CWT00009612	AD
10	24-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	72	CWT00009614	AD
10	24-Jul-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	71	CWT00009615	AD
10	24-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	69	CWT00009812	AD
10	24-Jul-18	211123	2014	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211122	70	CWT00015206	AD
10	25-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		52	CWT00009616	AD
10	25-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	75	CWT00009707	AD
10	25-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		51	CWT00009810	AD
10	25-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	61	CWT00009813	AD
10	27-Jul-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		80	87620	AD
10	27-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		56	CWT00009816	AD
10	28-Jul-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		61	CWT00008798	
10	28-Jul-18	636833	2014	Elwha R 18.0272	Elwha Hatchery	WDFW		85	CWT00008799	AD
10	28-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	62	CWT00009821	AD
10	28-Jul-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	70	CWT00021814	AD
10	29-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	72	CWT00008801	AD
10	29-Jul-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		71	CWT00009517	AD

10	29-Jul-18	211155	2015	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA	211156	63	CWT00009715	AD
10	29-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	73	CWT00014905	AD
10	29-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00015101	AD
10	29-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		66	CWT00021815	AD
10	31-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		59	CWT00009518	AD
10	31-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		51	CWT00009620	AD
10	2-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		63	CWT00009429	AD
10	2-Aug-18	636810	2014	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		76	CWT00009462	AD
10	2-Aug-18	183799	2015	R-Robertson Cr	H-Robertson Creek H	CDFO		68	CWT00009622	AD
10	2-Aug-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00009822	AD
10	2-Aug-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		76	CWT00015104	AD
10	2-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		55	CWT00015253	AD
10	3-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		55	CWT00009448	AD
10	3-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00009450	AD
10	3-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		74	CWT00009827	AD
10	3-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		64	CWT00015107	AD
10	3-Aug-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW			CWT00015208	AD
10	3-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA			CWT00015209	AD
10	4-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		62	70973	AD
10	4-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		56	CWT00009402	AD
10	4-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		58	CWT00009431	AD
10	4-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		50	CWT00009451	AD
10	4-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		50	CWT00009452	AD
10	4-Aug-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		70	CWT00009454	AD
10	4-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		60	CWT00009455	AD
10	4-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		64	CWT00009456	AD
10	4-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	74	CWT00009625	AD

10	4-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		54	CWT00009717	AD
10	4-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW			CWT00009718	
10	4-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		54	CWT00009719	AD
10	4-Aug-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		54	CWT00009834	AD
10	4-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		55	CWT00009835	AD
10	4-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00009836	AD
10	4-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00015108	AD
10	4-Aug-18	636927	2015	Minter Cr Tr 15.0051	Hupp Springs Rearing	WDFW		44	CWT00021816	UM
10	4-Aug-18	211230	2016	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		54	CWT00021817	AD
10	5-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		72	CWT00009403	AD
10	5-Aug-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		62	CWT00009404	AD
10	5-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		82	CWT00009406	AD
10	5-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		68	CWT00009432	AD
10	5-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00009458	AD
10	5-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		64	CWT00009459	AD
10	5-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		54	CWT00009460	AD
10	5-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		66	CWT00009480	AD
10	5-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	59	CWT00009512	AD
10	5-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		61	CWT00009514	AD
10	5-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		66	CWT00009522	AD
10	5-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		70	CWT00009626	AD
10	5-Aug-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	73	CWT00009720	AD
10	5-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00009840	AD
10	5-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		68	CWT00009841	AD
10	5-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	68	CWT00009842	AD
10	5-Aug-18	637022	2015	Issaquah Cr 08.0178	Issaquah Hatchery	WDFW		78	CWT00009843	AD



10	5-Aug-18	637127	2016	Lk Washington (King)	Issaquah Hatchery	WDFW		42	CWT00009844	AD
10	5-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		68	CWT00014908	AD
10	5-Aug-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		58	CWT00014909	AD
10	5-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		57	CWT00015112	AD
10	5-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	59	CWT00015113	
10	5-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		64	CWT00021819	AD
10	7-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		58	CWT00009433	AD
10	7-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		56	CWT00009527	AD
10	7-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		71	CWT00009721	AD
10	7-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00015255	AD
10	8-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		62	CWT00009629	AD
10	8-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		73	CWT00009630	AD
10	8-Aug-18	637022	2015	Issaquah Cr 08.0178	Issaquah Hatchery	WDFW		70	CWT00009633	AD
10	8-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		65	CWT00009845	AD
10	8-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	72	CWT00009846	AD
10	8-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		73	CWT00014911	AD
10	9-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	65	CWT00014912	AD
10	10-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	74	CWT00009435	AD
10	10-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		63	CWT00009531	AD
10	10-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		61	CWT00009635	AD
10	11-Aug-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		74	CWT00009407	AD
10	11-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00009409	AD
10	11-Aug-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00009482	AD
10	11-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	63	CWT00009532	AD

10	11-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		75	CWT00009533	AD
10	11-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	61	CWT00009637	AD
10	11-Aug-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		76	CWT00009638	AD
10	11-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		52	CWT00009640	AD
10	11-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		65	CWT00014914	AD
10	11-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00014915	AD
10	11-Aug-18	636819	2014	Friday Cr 03.0017	Samish Hatchery	WDFW		82	CWT00015216	AD
10	12-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		67	CWT00008872	AD
10	12-Aug-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		60	CWT00009410	AD
10	12-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	58	CWT00009642	AD
10	12-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		61	CWT00009854	AD
10	12-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW		71	CWT00009855	AD
10	12-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	76	CWT00009856	AD
10	12-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		71	CWT00009858	AD
10	12-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	66	CWT00015116	AD
10	12-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	65	CWT00015256	AD
10	12-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW			CWT00015257	AD
10	14-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		70	CWT00009860	AD
10	14-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		68	CWT00015220	AD

10	15-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	67	CWT00009412	AD
10	15-Aug-18	636816	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	211137	80	CWT00009725	UM
10	15-Aug-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		58	CWT00009726	AD
10	15-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		64	CWT00009859	AD
10	15-Aug-18	637023	2015	Portage Bay/Ship Cnl	Issaquah Hatchery	WDFW			CWT00009861	AD
10	15-Aug-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		68	CWT00009862	AD
10	15-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	68	CWT00015118	AD
10	15-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	70	CWT00015119	AD
10	15-Aug-18	211134	2014	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636815	78	CWT00015120	AD
10	15-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		56	CWT00015259	AD
10	16-Aug-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	60	CWT00008874	AD

**Appendix 2.6** Coded-wire tag (CWT) recoveries in the 2017 summer Chinook MSF in Marine Area 11.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
11	1-Jun-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		67	CWT00009904	AD
11	1-Jun-18	636916	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		55	CWT00013734	AD
11	1-Jun-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		59	CWT00013735	AD
11	1-Jun-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	72	CWT00013800	AD
11	2-Jun-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		60	CWT00009905	AD
11	2-Jun-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00017259	AD
11	2-Jun-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		53	CWT00024203	AD
11	3-Jun-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	61	CWT00024204	AD
11	5-Jun-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		56	CWT00013717	AD
11	5-Jun-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	61	CWT00017258	AD
11	5-Jun-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00024205	AD
11	8-Jun-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		58	CWT00010202	AD
11	8-Jun-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00010203	AD
11	10-Jun-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00009906	AD
11	10-Jun-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		51	CWT00022202	AD
11	14-Jun-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		59	CWT00010205	AD
11	19-Jun-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		70	CWT00013709	AD
11	19-Jun-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		68	CWT00022203	AD
11	20-Jun-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	78	CWT00013716	AD
11	20-Jun-18	211163	2015	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		60	CWT00024207	AD
11	22-Jun-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		62	CWT00013801	AD
11	22-Jun-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		59	CWT00022204	AD
11	22-Jun-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		63	CWT00027305	AD

11	23-Jun-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		60	87548	AD
11	23-Jun-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		58	CWT00010206	AD
11	23-Jun-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		71	CWT00010207	AD
11	23-Jun-18	637024	2015	Lk Washington (King)	Issaquah Hatchery	WDFW		81	CWT00010208	AD
11	23-Jun-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	62	CWT00010209	AD
11	24-Jun-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		64	CWT00013710	AD
11	24-Jun-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		63	CWT00014743	AD
11	29-Jun-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		69	CWT00010210	AD
11	29-Jun-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		54	CWT00010211	AD
11	3-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	CWT00013713	AD
11	5-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	67	CWT00017240	AD
11	6-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		68	CWT00010213	AD
11	6-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		62	CWT00010214	AD
11	6-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		74	CWT00010215	AD
11	7-Jul-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00022205	AD
11	7-Jul-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		61	CWT00022206	AD
11	8-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	70	CWT00022207	AD
11	8-Jul-18	637165	2016	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		41	CWT00022208	UM
11	16-Jul-18	636924	2015	Wallace R 07.0940	Wallace R Hatchery	WDFW		58	CWT00021902	AD
11	20-Jul-18	636909	2015	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		55	CWT00010107	UM
11	21-Jul-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		94	CWT00024208	AD
11	23-Jul-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	66	CWT00010106	AD
11	23-Jul-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		78	CWT00024209	AD
11	23-Jul-18	637047	2015	East Sound Bay (San)	Glenwood Springs	COOP		66	CWT00027308	AD
11	27-Jul-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		58	CWT00022209	AD

11	28-Jul-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		68	CWT00022210	AD
11	28-Jul-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		57	CWT00022211	AD
11	28-Jul-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		77	CWT00022212	AD
11	3-Aug-18	211220	2016	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637159	62	CWT00009907	AD
11	3-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		58	CWT00027309	AD
11	4-Aug-18	636789	2014	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		74	56589	AD
11	4-Aug-18	636822	2014	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		63	56590	AD
11	4-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		59	65047	AD
11	4-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	65048	AD
11	4-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		64	CWT00010217	AD
11	5-Aug-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		68	CWT00010218	AD
11	5-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		75	CWT00027310	AD
11	6-Aug-18	636958	2015	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		62	CWT00010221	AD
11	6-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		56	CWT00010222	AD
11	7-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		57	CWT00027311	AD
11	8-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		63	CWT00009525	AD
11	10-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		68	CWT00010223	AD
11	10-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		63	CWT00024210	AD
11	10-Aug-18	184166	2016	R-Burrard In	H-Sandy Cove Seapen	CDFO		55	CWT00027312	AD
11	10-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		69	CWT00027313	AD
11	11-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		63	12281	AD
11	11-Aug-18	636817	2014	Cascade R 03.1411	Marblemount Hatchery	WDFW		69	12422	AD
11	11-Aug-18	636917	2015	Gorst Cr 15.0216	Gorst Cr Rearing Pnd	SUQ		66	56836	AD
11	11-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		59	56837	AD
11	12-Aug-18	211220	2016	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	637159	53	CWT00022213	AD

11	15-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		44	CWT00027315	AD
11	17-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		52	CWT00024211	AD
11	18-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		67	CWT00009727	AD
11	18-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		76	CWT00024212	AD
11	18-Aug-18	211137	2014	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ	636816	65	CWT00027316	AD
11	19-Aug-18	211169	2015	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	636943	67	CWT00009529	AD
11	19-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		66	CWT00010225	AD
11	21-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		55	CWT00021826	AD
11	21-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		61	CWT00021829	AD
11	21-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		66	CWT00022216	AD
11	22-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		67	CWT00027318	AD
11	23-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		61	CWT00010226	AD
11	24-Aug-18	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		55	CWT00010228	AD
11	24-Aug-18	636811	2014	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		62	CWT00010229	AD
11	24-Aug-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		74	CWT00010231	AD
11	24-Aug-18	636909	2015	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		70	CWT00024214	UM
11	24-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		66	CWT00024215	AD
11	25-Aug-18	636957	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		56	CWT00010110	AD
11	25-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		68	CWT00010232	AD
11	25-Aug-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		77	CWT00024216	AD
11	25-Aug-18	211148	2014	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		73	CWT00024217	AD
11	25-Aug-18	637168	2016	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW		58	CWT00027320	AD
11	25-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		72	CWT00027406	AD

**Appendix 2.7** Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 12.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
12	4-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		75	CWT00014817	AD
12	5-Aug-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	82	CWT00014816	AD
12	9-Aug-18	183965	2015	R-Harrison R	H-Chehalis River H	CDFO		66	CWT00014815	AD
12	10-Aug-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		79	CWT00017295	AD
12	12-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		67	CWT00014813	AD
12	18-Aug-18	636827	2014	Purdy Cr 16.0005	George Adams Hatchery	WDFW	636828	76	CWT00014823	AD
12	23-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		67	CWT00017293	AD
12	24-Aug-18	636950	2015	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	CWT00009909	AD
12	6-Sep-18	636813	2014	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		78	CWT00017294	AD

**Appendix 2.8** Coded-wire tag (CWT) recoveries in the 2018 summer Chinook MSF in Marine Area 13.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Codes	FL(cm)	Label	Recovery Mark
13	26-May-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		60	CWT00013733	AD
13	31-May-18	211187	2015	Clarks Crk Hatchery	Clarks Crk Hatchery	PUYA		71	CWT00024202	AD
13	27-Jun-18	636960	2015	Purdy Cr 16.0005	George Adams Hatchery	WDFW		76	CWT00013715	AD
13	29-Jun-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		60	CWT00027306	AD
13	4-Aug-18	636925	2015	Icy Cr 09.0125	Icy Cr Hatchery	WDFW		65	70967	AD
13	5-Aug-18	637173	2016	Minter Cr 15.0048	Minter Cr Hatchery	WDFW		57	CWT00024402	AD
13	12-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		73	CWT00027402	AD
13	15-Aug-18	211230	2016	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		54	CWT00015005	AD
13	19-Aug-18	211163	2015	Mcallister Springs Hatch	Clear Creek Hatchery	NISQ		69	CWT00014738	AD
13	23-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		71	CWT00009908	AD
13	24-Aug-18	211170	2015	Clear Cr 11.0013C	Clear Creek Hatchery	NISQ		59	CWT00021702	AD
13	28-Aug-18	636946	2015	Friday Cr 03.0017	Samish Hatchery	WDFW		78	CWT00027321	AD
13	5-Sep-18	211229	2016	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		56	CWT00024404	AD



### 3) Marine Area 7 On-The-Water Survey

**Appendix 3.1** Date, Number of anglers, expected ramp of landing, and GPS coordinates of boats encountered on the Area 7 Summer on-the-water survey.

Date	Anglers	Landing Ramp	Location of Encounter (GPS)	
			Latitude	Longitude
11-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.555883	-122.67644
11-Jul	1	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.531332	-122.73111
11-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.532489	-122.73033
11-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.534459	-122.72959
11-Jul	1	Washington Park Launch Ramp	48.538125	-122.73146
11-Jul	4	Coronet Bay Public Ramp	48.543742	-122.72648
11-Jul	1	Coronet Bay Public Ramp	48.545193	-122.72614
11-Jul	2	Unknown	48.545267	-122.72597
11-Jul	4	Skyline Marina/Sling (Flounder Bay)	48.54758	-122.72743
11-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.549281	-122.72729
11-Jul	5	Skyline Marina/Sling (Flounder Bay)	48.548664	-122.72865
11-Jul	2	Blakely Island	48.54666	-122.73033
11-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.513759	-122.78309
11-Jul	3	Private	48.578943	-122.74335
11-Jul	2	Washington Park Launch Ramp	48.587565	-122.74212
11-Jul	1	Everett Ramp (formerly Norton Street Ramp (2010))	48.593516	-122.73575
11-Jul	2	Coronet Bay Public Ramp	48.594354	-122.73439
11-Jul	2	Unknown	48.595741	-122.7336
11-Jul	1	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.597013	-122.73292
11-Jul	3	Unknown	48.604986	-122.72696
11-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.601581	-122.72772
11-Jul	1	Bellingham-6th St Ramp	48.599611	-122.73018
11-Jul	3	Unknown	48.498885	-122.94301
11-Jul	5	Port of Friday Harbor Marina, San Juan Is	48.50464	-122.94179
11-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.649823	-123.01441
11-Jul	2	Blaine Ramp	48.763679	-122.92242
11-Jul	3	Everett Marina	48.350982	-123.06514
11-Jul	2	Everett Marina	48.352054	-123.05469
11-Jul	1	Unknown	48.452512	-123.01455
11-Jul	2	Coronet Bay Public Ramp	48.453991	-123.02748
11-Jul	2	Roche Harbor Moorage and Ramp, San Juan Is	48.56123	-123.17819
19-Jul	1	Shaw Moorage, Shaw Is	48.459182	-123.04104
19-Jul	2	Unknown	48.463721	-123.05341
19-Jul	1	Unknown	48.483205	-123.10064
19-Jul	3	Unknown	48.56145	-123.17818

19-Jul	2	Unknown	48.560919	-123.17875
19-Jul	2	Unknown	48.69318	-123.22157
19-Jul	2	Unknown	48.690488	-123.21622
19-Jul	1	Lonesome Cove Beach, San Juan Is	48.617447	-123.09491
19-Jul	2	Port of Friday Harbor Marina, San Juan Is	48.612763	-123.09597
19-Jul	2	Island Marina/Sling, Lopez Is	48.611533	-123.09545
19-Jul	2	Roche Harbor Moorage and Ramp, San Juan Is	48.608841	-123.09143
19-Jul	2	Shipyard Cove Marina & Ramp	48.508984	-122.94025
19-Jul	1	West Sound Marina/Sling, Orcas Is	48.596614	-122.95289
19-Jul	2	Coronet Bay Public Ramp	48.653127	-123.01275
19-Jul	4	West Beach Rsrst Dock/Ramp, Orcas Is	48.679555	-122.97901
19-Jul	2	Unknown	48.685173	-122.96916
19-Jul	6	Unknown	48.705083	-123.00326
19-Jul	1	Sandy Point Marina/Ramp	48.769138	-122.91854
19-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.765387	-122.92181
19-Jul	3	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.714003	-122.87422
19-Jul	1	Coronet Bay Public Ramp	48.659302	-122.73988
19-Jul	1	Washington Park Launch Ramp	48.532889	-122.84975
19-Jul	2	Washington Park Launch Ramp	48.534605	-122.84327
19-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.533065	-122.81276
19-Jul	5	Skyline Marina/Sling (Flounder Bay)	48.655702	-122.75162
19-Jul	5	Skyline Marina/Sling (Flounder Bay)	48.657576	-122.74791
19-Jul	4	Unknown	48.657941	-122.74596
19-Jul	2	Washington Park Launch Ramp	48.55756	-122.67516
19-Jul	3	Unknown	48.55386	-122.67534
19-Jul	3	Unknown	48.52893	-122.72643
19-Jul	1	Unknown	48.528929	-122.72729
19-Jul	1	Unknown	48.527938	-122.72871
19-Jul	2	Swinomish Channel Ramp	48.527268	-122.7286
19-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.533409	-122.72668
19-Jul	2	Unknown	48.535023	-122.72686
19-Jul	2	Washington Park Launch Ramp	48.54033	-122.72538
19-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.542417	-122.72727
19-Jul	2	Unknown	48.570848	-122.7418
19-Jul	4	Washington Park Launch Ramp	48.578478	-122.74493
19-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.589532	-122.7432
19-Jul	4	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.593389	-122.74298
19-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.593435	-122.73657
19-Jul	2	Sandy Point Marina/Ramp	48.605458	-122.72978
19-Jul	2	Blakely Island	48.581142	-122.79016
19-Jul	2	Sandy Point Marina/Ramp	48.547769	-122.77739

19-Jul	1	Unknown	48.543929	-122.78272
19-Jul	6	Coronet Bay Public Ramp	48.540378	-122.78738
20-Jul	4	Washington Park Launch Ramp	48.351369	-123.03328
20-Jul	5	Port of Friday Harbor Marina, San Juan Is	48.364489	-123.04583
20-Jul	2	Unknown	48.453267	-123.02367
20-Jul	4	Port of Friday Harbor Marina, San Juan Is	48.45645	-123.03014
20-Jul	2	La Conner Marina/Sling (Port of Skagit-Dry Storage)	48.458328	-123.043
20-Jul	3	Unknown	48.455999	-123.05024
20-Jul	2	Unknown	48.561361	-123.17822
20-Jul	2	Unknown	48.562878	-123.17923
20-Jul	2	Unknown	48.566065	-123.17839
20-Jul	3	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.572303	-123.17766
20-Jul	2	Unknown	48.570451	-123.18017
20-Jul	1	Shaw Moorage, Shaw Is	48.612172	-123.095
20-Jul	2	Unknown	48.544581	-122.92461
20-Jul	2	West Beach Rsrt Dock/Ramp, Orcas Is	48.683502	-122.97727
20-Jul	1	Deer Harbor Moorage, Orcas Is	48.687637	-123.06732
20-Jul	2	Utsalady Ramp, Camano Is	48.684458	-123.06
20-Jul	3	Deer Harbor Moorage, Orcas Is	48.713085	-122.95041
20-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.757472	-122.91972
20-Jul	5	Sandy Point Marina/Ramp	48.777777	-122.90175
20-Jul	2	Brandt's Landing-Ditch, Orcas Is	48.712543	-122.94803
20-Jul	3	Unknown	48.659697	-122.73971
20-Jul	1	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.653167	-122.75161
20-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.48533	-122.71409
20-Jul	1	Washington Park Launch Ramp	48.487346	-122.7154
20-Jul	1	Port of Friday Harbor Marina, San Juan Is	48.600624	-122.80019
20-Jul	1	La Conner Moorage	48.59297	-122.80024
20-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.587926	-122.65655
20-Jul	2	Washington Park Launch Ramp	48.563052	-122.67353
20-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.561599	-122.67365
20-Jul	2	La Conner Marina/Sling (Port of Skagit-Dry Storage)	48.558541	-122.67714
20-Jul	2	Washington Park Launch Ramp	48.530474	-122.72634
20-Jul	1	Private	48.533349	-122.727
20-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.535741	-122.72577
20-Jul	3	Twin Rivers Campground	48.539545	-122.72666
20-Jul	5	Skyline Marina/Sling (Flounder Bay)	48.541731	-122.72662
20-Jul	3	Swinomish Channel Ramp	48.543267	-122.72683
20-Jul	4	La Conner Moorage	48.548198	-122.72574
20-Jul	2	Private	48.548539	-122.72834
20-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.554734	-122.72751

20-Jul	2	Swinomish Channel Ramp	48.558817	-122.72897
20-Jul	1	Cap Sante Moorage & Sling	48.572792	-122.74186
20-Jul	1	Washington Park Launch Ramp	48.579178	-122.7429
20-Jul	2	Cap Sante Moorage & Sling	48.584518	-122.74354
20-Jul	1	Washington Park Launch Ramp	48.590067	-122.73935
20-Jul	2	Washington Park Launch Ramp	48.592766	-122.7342
20-Jul	2	Washington Park Launch Ramp	48.594109	-122.73358
20-Jul	1	Unknown	48.594149	-122.73583
20-Jul	2	Unknown	48.593708	-122.73655
20-Jul	4	Swinomish Channel Ramp	48.5932	-122.73616
20-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.59565	-122.73323
20-Jul	2	Washington Park Launch Ramp	48.595835	-122.73337
20-Jul	1	Obstruction Pass Ramp, Orcas Is	48.595654	-122.73258
20-Jul	5	Skyline Marina/Sling (Flounder Bay)	48.597977	-122.73111
20-Jul	2	Fairharbor - Nyne's Marina	48.604404	-122.72728
20-Jul	2	Cap Sante Moorage & Sling	48.562696	-122.77093
20-Jul	2	Bellingham Ramp (Glenn St.) Squalicum Harbor	48.54033	-122.78443
20-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.536413	-122.78465
20-Jul	4	Skyline Marina/Sling (Flounder Bay)	48.537076	-122.78248
20-Jul	3	Skyline Marina/Sling (Flounder Bay)	48.539407	-122.77188
20-Jul	4	La Conner Moorage	48.540151	-122.76894
20-Jul	4	Rosario Resort Moorage/Ramp, Orcas Is	48.536743	-122.76799
20-Jul	2	Private	48.537369	-122.77023
20-Jul	1	Skyline Marina/Sling (Flounder Bay)	48.532192	-122.781
20-Jul	2	Skyline Marina/Sling (Flounder Bay)	48.518853	-122.78147
20-Jul	2	Washington Park Launch Ramp	48.515728	-122.7829
20-Jul	2	Private	48.514139	-122.78493
20-Jul	2	Unknown	48.514881	-122.78438