

**2009-10 Winter Mark-Selective Recreational Chinook Fisheries
In Marine Areas 7, 8-1, 8-2, 9, 10, 11, and 12**

Post-season Report

REVISED DRAFT

March 31, 2011

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TABLE OF CONTENTS

LIST OF TABLES	ii
LIST OF FIGURES	vii
INTRODUCTION	1
Comprehensive Sampling and Monitoring Program	2
Reporting Efficiencies	2
RESULTS	4
1) Marine Area 7 Winter Mark-Selective Chinook Fishery	4
2) Marine Areas 8-1 & 8-2 Winter Mark-selective Chinook Fishery	17
3) Marine Area 9 Winter Mark-selective Chinook Fishery	31
4) Marine Area 10 Winter Mark-Selective Chinook Fishery	45
5) Marine Area 11 Mark-Selective Chinook Fishery	59
6) Marine Area 12 Mark-Selective Chinook Fishery	69
ACKNOWLEDGEMENTS	75
REFERENCES	76
APPENDICES	78
Appendix A-1. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-1 mark-selective Chinook fishery from November 1, 2009 through April 30, 2010.	79
Appendix A-2. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-2 mark-selective Chinook fishery from November 1, 2009 through April 30, 2010.	82
Appendix A-3. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010.....	84
Appendix A-4. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 11 mark-selective Chinook fishery from February 1, 2010 through April 30, 2010.	86
Appendix B-1. Coded Wire Tag (CWT) recoveries in the Area 7 winter mark-selective Chinook fishery, December 1, 2009 – April 30, 2010.	88
Appendix B-2. Coded-wire tag (CWT) recoveries in the winter Areas 8-1& 8-2 mark-selective Chinook fisheries, November 1, 2009 – April 30, 2010.	90
Appendix B-3. Coded-wire tag (CWT) recoveries in the winter Area 9 mark-selective Chinook fishery, November 1-30, 2009 and January 16 - April 15, 2010.	91
Appendix B-4. Coded-wire tag (CWT) recoveries in the winter Area 10 mark-selective Chinook fishery, October 1, 2009 – January 31, 2010.....	92
Appendix B-5. Coded-wire tag (CWT) recoveries in the winter Area 11 mark-selective Chinook fishery, February 1 – April 30, 2010.	92
Appendix B-6. Coded-wire tag (CWT) recoveries in the winter Area 12 mark-selective Chinook fishery, February 1 – April 30, 2010.	93

LIST OF TABLES

Table 7-1. Sampling/estimation details on target parameters associated with the overall Area 7 mark-selective fishery monitoring program. 5

Table 7-2. Estimates of total fishing effort and total salmon catch (harvest and releases) during the December 1, 2009 - April 30, 2010 Area 7 selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked. The lower 95% confidence interval for the estimated AD released Chinook is the actual number reported in the dockside creel..... 6

Table 7-3. Summary of total length samples collected from retained Chinook during dockside angler interviews and derby sampling, Area 7 mark-selective Chinook fishery, December 1, 2009 - April 30, 2010..... 8

Table 7-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 10

Table 7-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Variances associated with size/mark-status proportions and mark rates are provided in parentheses..... 11

Table 7-6. Total Chinook encountered (retained and released) by anglers reporting their catch on voluntary trip reports (VTRs), as compared to test fishing encounter data, with estimates of legal, sublegal, and overall mark rates. AD = marked (i.e., adipose-clipped), UM = unmarked. Note that the final dataset used for impact estimation was based on the test fishery and charter/private boat VTRs. Variances associated with size/mark-status proportions and mark rates are provided in parentheses..... 12

Table 7-7. Summary of season-wide fishery impact estimates for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error. 13

Table 7-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery..... 13

Table 7-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. 13

Table 7-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked. 15

Table 7-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the winter 2009-10 Area 7 mark-selective Chinook fishery, December 1, 2009 - April 30, 2010. ... 15

Table 7-12. Summary of aerial survey and dockside data used to estimate the fraction of Area 7 effort captured in the four-site sample frame during the December 1, 2009 – April 30, 2010 Area 7 mark-selective Chinook fishery. See Methods Report (WDFW 2011) for computational details and notation..... 16

Table 7-13. Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 7 winter mark-selective Chinook fishery..... 16

Table 8182-1. Sampling/estimation details on target parameters associated with the overall Areas 8-1 and 8-2 mark-selective fishery monitoring program. 18

Table 8182-2. Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2009 - April 30, 2010 Area 8-1 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked. 19

Table 8182-3. Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2009 - April 30, 2010 Area 8-2 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked. 20

Table 8182-4. Summary of length samples collected during dockside angler interviews from retained Chinook salmon, Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery..... 22

Table 8182-5. Summary of coded-wire tags recovered from Chinook salmon harvested during the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 23

Table 8182-6. Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the November 1, 2009- April 30, 2010 mark-selective Chinook fishery in Areas 8-1 and 8-2, with estimates of legal, sublegal, and overall mark rates. 23

Table 8182-7. Summary of season-wide fishery impact estimates for the Areas 8-1(upper panel) and 8-2 (lower panel) mark-selective Chinook fishery, November 1, 2009- April 30, 2010. Values may not add up perfectly due to rounding error..... 24

Table 8182-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the combined Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery..... 25

Table 8182-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the combined Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery..... 25

Table 8182-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery..... 27

Table 8182-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery. 27

Table 8182-12. Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) for the Area 8-2 November 1, 2009 - April 30, 2010 mark-selective Chinook fishery. (Note: There were no other species of salmon reported caught or released for the Area 8-1 fishery.) Values may not add exactly due to rounding error. 28

Table 8182-13. Summary of the total number of anglers intercepted in Area 8-1(left panel) and 8-2 (right panel) during on-the-water surveys conducted from November 1, 2009 - April 30, 2010. Grayed cells represent sites included in the dockside sample frame. 29

Table 8182-14. Summary of the total number of anglers intercepted in Area 8-1 (left panel) and 8-2 (right panel) during on-the-water surveys from January 26 – February 19, 2010. The surveys were conducted during a period in which there was a closure of the Everett Ramp (10th St) for dredging. Grayed cells represent sites included in the dockside sample frame. 29

Table 8182-15. Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Areas 8-1 and 8-2 winter mark-selective Chinook fisheries. 30

Table 9-1. Sampling/estimation details on target parameters associated with the overall Area 9 mark-selective fishery monitoring program. 32

Table 9-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective

fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status. 33

Table 9-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. 35

Table 9-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 9 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 36

Table 9-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. Variances associated with size/mark-status proportions and mark rates are provided in parentheses. 37

Table 9-6. Total Chinook encountered (retained and released) by private-boat anglers reporting their catch on voluntary trip reports (VTRs) compared to test fishery results, with estimates of legal, sublegal, and overall mark rates, during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions are provided in parentheses. ... 38

Table 9-7. Summary of season-wide fishery impact estimates for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error. 39

Table 9-8 Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. 39

Table 9-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. 40

Table 9-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. AD = marked (i.e., adipose-clipped), UM = unmarked. 41

Table 9-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the winter Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. 41

Table 9-12. Summary of aerial over flight and dockside data used to estimate the fraction of Area 9 effort captured in the four-site sample frame during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. See Methods Report (WDFW 2011) for computational details and notation. 42

Table 9-13. Fishery-total estimates of retained and released salmon (*other than Chinook*) for the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. Values may not add exactly due to rounding error. 43

Table 9-14. Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 9 winter mark-selective Chinook fishery. 44

Table 10-1. Sampling/estimation details on target parameters associated with the overall Area 10 mark-selective fishery monitoring program. 46

Table 10-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2009-10 (October 1, 2009 – January 31, 2010) Area 10 mark-selective fishery. Values

may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status..... 47

Table 10-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010..... 49

Table 10-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 10 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 50

Table 10-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Variances associated with season-total size/mark status proportions and mark rates are provided in parentheses. AD=adipose fin-clipped (marked); UM=adipose fin intact (unmarked)... 51

Table 10-6. Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the Area 10 mark-selective Chinook fishery (October 1, 2009 through January 31, 2010), with estimates of legal-size, sublegal-size, and overall mark rates. 52

Table 10-7. Summary of season-wide fishery impact estimates for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error. 53

Table 10-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. ... 53

Table 10-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery..... 53

Table 10-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery..... 55

Table 10-11. Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010. 55

Table 10-12. Fishery-total estimates of retained and released salmon (*other than Chinook*) for the Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010. Values may not add exactly due to rounding error. 56

Table 10-13. Summary of the total number of anglers intercepted in Area 10 during on-the-water surveys from October 1, 2009 – January 31, 2010. Grayed cells represent sites included in the dockside sample frame. See WDFW 2011 for detailed methods descriptions on calculating Area 10 site size measures during the Tengu Derby period (Tengu Derby is on Sundays only, from the last Sunday in October through last Sunday in December). 57

Table 10-14. Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 10 winter mark-selective Chinook fishery..... 58

Table 11-1. Sampling/estimation details on target parameters associated with the overall Area 11 mark-selective fishery monitoring program. 60

Table 11-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the February 1, 2010 – April 30, 2010 Area 11 mark-selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status..... 61

Table 11-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010. 63

Table 11-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 11 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 64

Table 11-5. Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the February 1 – April 30, 2010 Area 11 mark-selective Chinook fishery, with estimates of legal-size and overall mark rates..... 64

Table 11-6. Summary of season-wide fishery impact estimates for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error..... 65

Table 11-7. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. 65

Table 11-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. 66

Table 11-9. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery..... 67

Table 11-10. Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010. 67

Table 11-11 Season-total estimates of Chinook encounters by size/mark status, and total estimates of angler effort, summarized for all seasons to date of the Area 11 winter mark-selective Chinook fishery..... 68

Table 12-1. List of sites sampled, with the number of sampling events (site-days) during the Area 12 winter mark-selective Chinook fishery, February 1 through April 30, 2010. 70

Table 12-2. Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the Area 12 February 1-April 30, 2010 mark-selective Chinook fishery. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.AD = marked (i.e., adipose-clipped), UM = unmarked, UK = unknown mark status. 71

Table 12-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. 74

Table 12-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 12 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups. 74

Table 12-5. Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the Area 12 mark-selective Chinook fishery (February 1 – April 30, 2010), with estimates of legal-size, sublegal-size, and overall mark rates..... 74

LIST OF FIGURES

Figure 7-1. Temporal patterns in fishing effort during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.....	7
Figure 7-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.	7
Figure 7-3. Temporal patterns in Chinook encounters (retained and released) during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.	8
Figure 7-4. Length-frequency distribution for marked Chinook harvested and then sampled in dockside angler interviews, during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery.....	9
Figure 7-5. Length-frequency distributions of marked (<i>left panel</i>) and unmarked (<i>right panel</i>) Chinook encountered by test fishers during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Note that the vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).	12
Figure 7-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters (upper panel) and mortalities (lower panel) for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.	14
Figure 8182-1. Temporal patterns in fishing effort during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.	21
Figure 8182-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.	21
Figure 8182-3. Temporal patterns in Chinook encounters (retained and released) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.....	21
Figure 8182-4. Length-frequency distributions of retained marked Chinook sampled at dockside during the Areas 8-1 (left panel) and 8-2 (right panel) November 1, 2009- April 30, 2010 mark-selective Chinook fishery.....	22
Figure 8182- 5. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Areas 8-1 and 8-2 (combined) November 1, 2009- April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.	26
Figure 9- 1. Temporal patterns in fishing effort during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.....	34
Figure 9-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.	34
Figure 9-3. Temporal patterns in Chinook encounters (retained and released) during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.	35
Figure 9-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.....	36
Figure 9-5. Length-frequency distributions of marked (<i>left panel</i>) and unmarked (<i>right panel</i>) Chinook encountered by test fishers during the winter 2009-10 Area 9 (November 1-30, 2009 and January	

16-April 15, 2010) mark-selective Chinook fishery. Note that the vertical dashed line in the upper panel corresponds to the legal size limit (22 in or 56 cm). 38

Figure 9-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters (*upper panel*) and mortalities (*lower panel*) for the 2009-10 Area 9 winter mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates. ... 40

Figure 10-1. Temporal patterns in fishing effort during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010. 48

Figure 10-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010. 48

Figure 10-3. Temporal patterns in Chinook encounters (retained and released) during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010. 49

Figure 10-4. Length-frequency distribution for marked Chinook harvested and sampled dockside during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010. 50

Figure 10-5. Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. The dashed vertical line in the marked Chinook plot corresponds to the legal size limit (22 in or 56 cm). 52

Figure 10-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates. ... 54

Figure 11-1. Temporal patterns in fishing effort during the Area 11 winter mark-selective Chinook fishery from February 1 – April 30, 2010. 61

Figure 11-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 11 mark-selective Chinook fishery from February 1 – April 30, 2010. 62

Figure 11-3. Temporal patterns in Chinook encounters (retained and released) during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010. 62

Figure 11-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010. 63

Figure 11-5. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates. 66

Figure 12-1. Temporal patterns in fishing effort by week during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates. 72

Figure 12-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates. 72

Figure 12-3. Temporal patterns in Chinook encounters (retained and released) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates. 73

Figure 12-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. 73

INTRODUCTION

In recent years, abundant runs of hatchery Chinook salmon (*Oncorhynchus tshawytscha*) have been mixed with depressed runs of wild Chinook salmon in the marine environments of the Puget Sound and Strait of Juan de Fuca. Providing recreational anglers with opportunities to harvest abundant hatchery stocks while simultaneously protecting weaker, wild stocks has proven to be a significant conservation and management challenge. The combination of large-scale hatchery marking (i.e., fin clipping) programs and mark-selective harvest regulations makes it possible for anglers to pursue and harvest hatchery Chinook salmon while minimally impacting wild salmon populations. In such “mark-selective fisheries” (MSFs), anglers are generally allowed to retain adipose-fin clipped (“marked”) hatchery fish and are required to release unharmed any unclipped (“unmarked”, predominantly wild) salmon encountered¹.

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

WDFW implemented seven pilot mark-selective Chinook fisheries during the 2009-10 winter season (i.e., October 2009 through April 2010 period) in Puget Sound, in Areas 7, 8-1, 8-2, 9, 10, 11 and 12. The 2009-10 winter Chinook MSF seasons in each of the areas were as follows:

1. Area 7 from December 1, 2009 through April 30, 2010;
2. Areas 8-1 and 8-2 from November 1, 2009 through April 30, 2010;
3. Area 9 from November 1-30, 2009 and January 16 – April 15, 2010;
4. Area 10 from October 1, 2009 through January 31, 2010; and
5. Areas 11 and 12 from February 1 through April 30, 2010.

Consistent with the 2004 Puget Sound Chinook Harvest Management Plan (Puget Sound Indian Tribes and WDFW 2004) and the intent of previous mark-selective Chinook fisheries, the primary goal for these pilot fisheries was to provide meaningful opportunity to the recreational angling public while minimally impacting ESA-listed Puget Sound Chinook salmon.

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

Comprehensive Sampling and Monitoring Program

Given the pilot nature of the mark-selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12, WDFW's Puget Sound Sampling Unit (PSSU) was tasked with implementing a comprehensive sampling and monitoring program to collect the data needed to evaluate each pilot mark-selective Chinook fishery and its impact on unmarked salmon. As per state-tribal agreement (e.g., WDFW and NWIFC 2010), we developed area-specific sampling plans consisting of several comprehensive and complementary sampling components, including dockside creel sampling, test fishing, on-water or aerial effort surveys, and angler-completed voluntary trip reports (VTRs). We tailored area-specific sampling plans so that we could reliably estimate the following critical parameters needed for evaluating mark-selective fisheries: *i*) the mark rate of the targeted Chinook population, *ii*) the total number of Chinook salmon harvested (by size [legal or sublegal] and mark-status [marked or unmarked] group), *iii*) the total number of Chinook salmon released (by size and mark-status group), *iv*) the coded-wire tag- (CWT) and/or DNA-based stock composition of marked and unmarked Chinook mortalities², and *v*) the total mortality of marked and unmarked double index tag (DIT) CWT stocks. In addition, we acquired and analyzed relevant data characterizing other aspects of the pilot fisheries, including descriptors of fishing effort, fishing success (catch [landed Chinook] per unit effort), the length and age composition of encountered Chinook, and the overall intensity of our sampling efforts.

Reporting Efficiencies

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

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

At the July 2010 meeting we also agreed that a key efficiency in the annual reporting process would be for WDFW staff to produce a centralized Methods Report. The Methods Report would be a stand-alone document that includes the details of each area's Chinook MSF study design (for both winter and summer fisheries), sampling procedures, data analysis methods, and all equations used to generate estimates and variances. Thus, we refer the reader to our Methods Report (WDFW 2011) for detailed

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

descriptions of the diverse study designs and protocols used to monitor and evaluate the selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12 during winter 2009-10.

In the following pages, we report the results generated through our monitoring activities during the 2009-10 winter Areas 7, 8-1, 8-2, 9, 10, 11, and 12 mark-selective Chinook fisheries. We report results based on our new, more efficient reporting format agreed-to recently between state and tribal technical representatives, in which we focus on presenting data tables and figures rather than interpretive text (unless text is needed to specify noteworthy in-season adjustments or other circumstances unique to the particular season). We present 2009-10 winter Chinook MSF results in separate chapters (1 through 6) by area, and within each chapter the data are presented in a series of tables and figures generally according to the following sequence: *i*) estimates of fishery characteristics obtained from the dockside creel survey data, including catch and effort total estimates, Chinook length-frequency data, and CWT recovery results; *ii*) results from our recreational test fishery (where applicable); *iii*) results from our VTR collection efforts; *iv*) total mortality estimates of marked and unmarked DIT CWT stocks by hatchery and brood year; *v*) total fishery Chinook encounters and impacts—estimated based on creel survey and test fishery or VTR data—which we compare with pre-season expectations (i.e., based on Fishery Regulation Assessment Model [FRAM] predictions); *vi*) sample rate information based on dockside sampling of harvested Chinook; and *vii*) historical Chinook encounters estimates for each area's winter mark-selective Chinook fishery.

RESULTS

1) Marine Area 7 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 7 for the third winter season from December 1, 2009 through April 30, 2010. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 7 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, and aerial effort surveys, and collecting voluntary trip reports (VTRs) from the angling public. **Table 7-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2011).

In this section we present results from our monitoring activities during the Area 7 winter selective Chinook fishery from December 1, 2009 through April 30, 2010. In addition to the major components of the results described previously (page 3), aerial survey and dockside data used to estimate the sample fraction in Area 7 (see WDFW 2011, *Aerial-Access Design*) are presented. Total salmon harvest and release estimates presented in this chapter include only Chinook salmon because no other salmon were reported as retained or released during the Area 7 winter fishery.

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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish ¹	Catch rates (CPUE); length, age, and CWT composition of harvest ² ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks ¹	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 ¹ .
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 Table 7-12 ; $n=24$ surveys conducted out of $N=151$ days available in the season). To compute the season-wide sample fraction the aerial survey data were lumped across the season, due to low sample sizes for individual surveys.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based ³ stock composition; species composition of non-Chinook encounters.	Fish encounter	Season	Fisher’s Exact test was used to compare the size/mark status proportions of the test fishery data (Table 7-5) to the VTR data (Table 7-6). The χ^2 statistic was significant ($\chi^2 = 9.698$, 3 df; $P = 0.016$), indicating a difference between the two samples. However, due to the relatively small test fishery sample size ($n = 60$) and the much larger VTR sample size ($n = 180$), we felt that combining the test fishery and VTR data was a better representation of encountered Chinook proportions in Area 7. Thus, the combined totals were used to estimate the size/mark status proportions (LM=63.8%, LU=26.7%, SM=6.7%, SU=2.9%) needed to produce the estimates.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season	VTR and test fishery data were combined for subsequent impact estimation steps; see comment in row above.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

¹ To generate weekly catch and effort estimates, the four-day “weekday stratum” estimate for Monday-Thursday of each week (based on $n=2$ days sampled out of $N=8$ available weekdays per two-week period) is added to the “weekend stratum” (Friday-Sunday) estimate for the particular week (based on $n=2$ days sampled out of $N=3$ available weekend days per week). The eight-day weekday estimates for each two-week period are then split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the $n=2$ days sampled out of $N=8$ available weekdays in the appropriate variance equation (see WDFW 2011).

² The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

³ Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

Table 7-2. Estimates of total fishing effort and total salmon catch (harvest and releases) during the December 1, 2009 - April 30, 2010 Area 7 selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked. The lower 95% confidence interval for the estimated AD released Chinook is the actual number reported in the dockside creel.

Sample Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Dec	49	Dec-01	Dec-06	129	278	60	0	15	32	107
	50	Dec-07	Dec-13	173	339	97	0	25	51	173
	51	Dec-14	Dec-20	135	249	54	0	14	29	96
	52	Dec-21	Dec-27	205	441	70	0	18	37	124
	53/1	Dec-28	Jan-03	171	315	70	0	18	37	125
Jan	2	Jan-04	Jan-10	145	275	80	0	20	42	142
	3	Jan-11	Jan-17	183	391	88	0	22	47	157
	4	Jan-18	Jan-24	185	388	59	0	15	31	105
	5	Jan-25	Jan-31	241	519	61	0	15	32	108
Feb	6	Feb-01	Feb-07	274	569	87	0	22	46	154
	7	Feb-08	Feb-14	177	401	35	0	9	18	62
	8	Feb-15	Feb-21	260	513	50	0	13	26	88
	9	Feb-22	Feb-28	163	312	17	0	4	9	29
Mar	10	Mar-01	Mar-07	155	277	27	0	7	14	47
	11	Mar-08	Mar-14	98	192	31	0	8	16	54
	12	Mar-15	Mar-21	163	328	39	0	10	21	70
	13	Mar-22	Mar-28	500	1102	82	0	21	43	145
	14	Mar-29	Apr-04	66	128	8	0	2	4	14
Apr	15	Apr-05	Apr-11	211	384	76	0	19	40	135
	16	Apr-12	Apr-18	180	320	70	0	18	37	124
	17	Apr-19	Apr-25	151	304	42	0	11	22	75
	18	Apr-26	Apr-30	46	77	26	0	6	13	46
Private Fleet Subtotal				4,011	8,102	1,226	0	310	646	2,183
Texas Holdem Derby Dec 4-5, 2009				17	40	17	0	4	9	30
Roche Harbor Derby Feb 4-5, 2010				100	346	43	0	11	23	77
Anacortes Salmon Derby				500	1,100	132	0	33	69	235
Private Fleet + Derby Total				4,628	9,588	1,418	0	359	747	2,524
Variance:				80,845	361,371	11,249	0	39,723	9,586	50,922
Standard Error:				284	601	106	0	199	98	226
CV (%):				6%	6%	7%	-	56%	13%	9%
95% CI:				4,071-5,185	8,410-10,766	1,211-1,626	-	-32-750	555-939	2,082-2,967

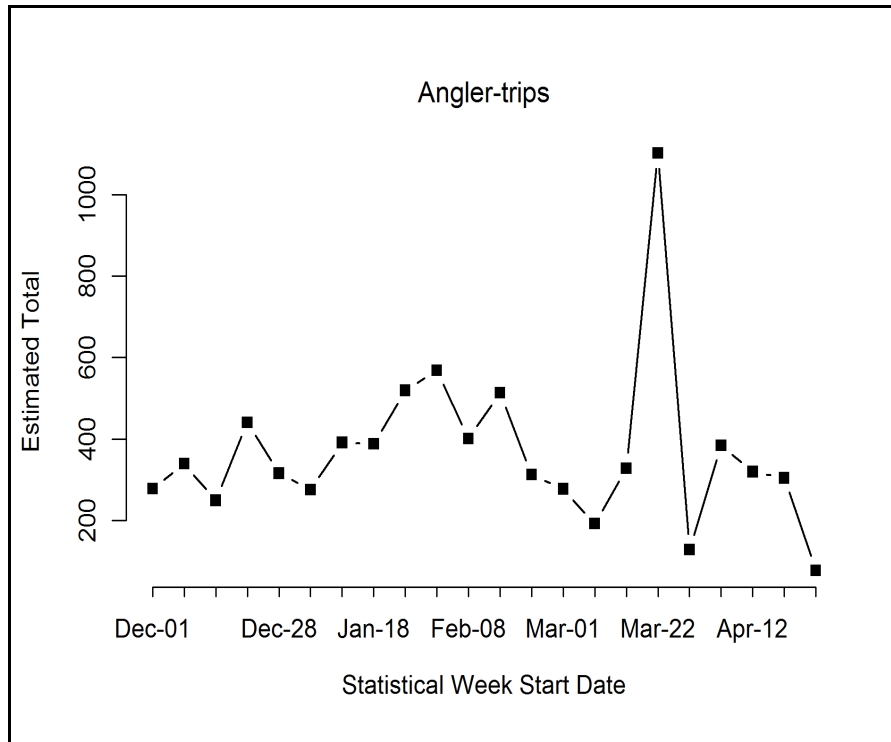


Figure 7-1. Temporal patterns in fishing effort during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.

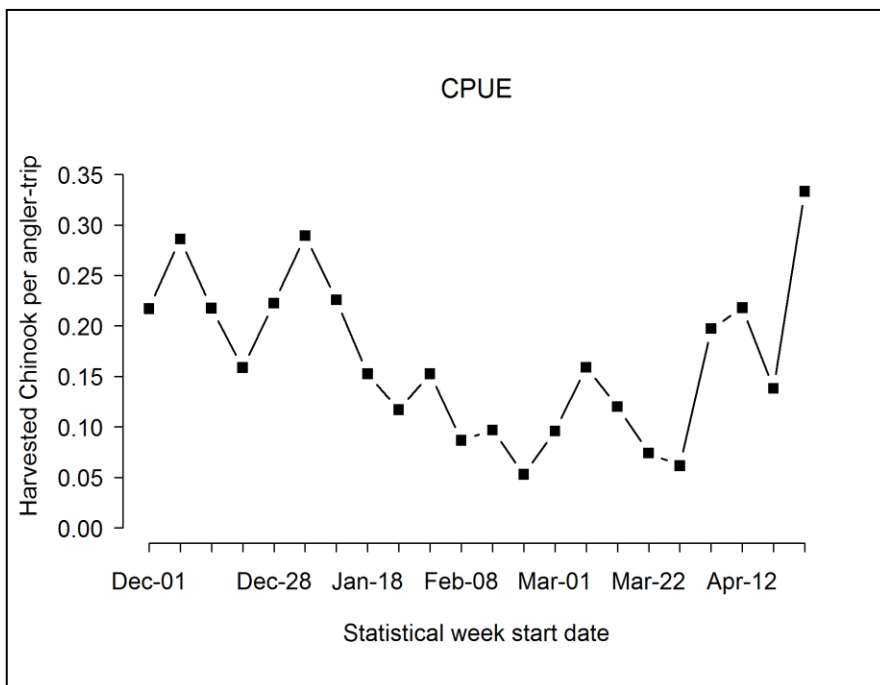


Figure 7-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.

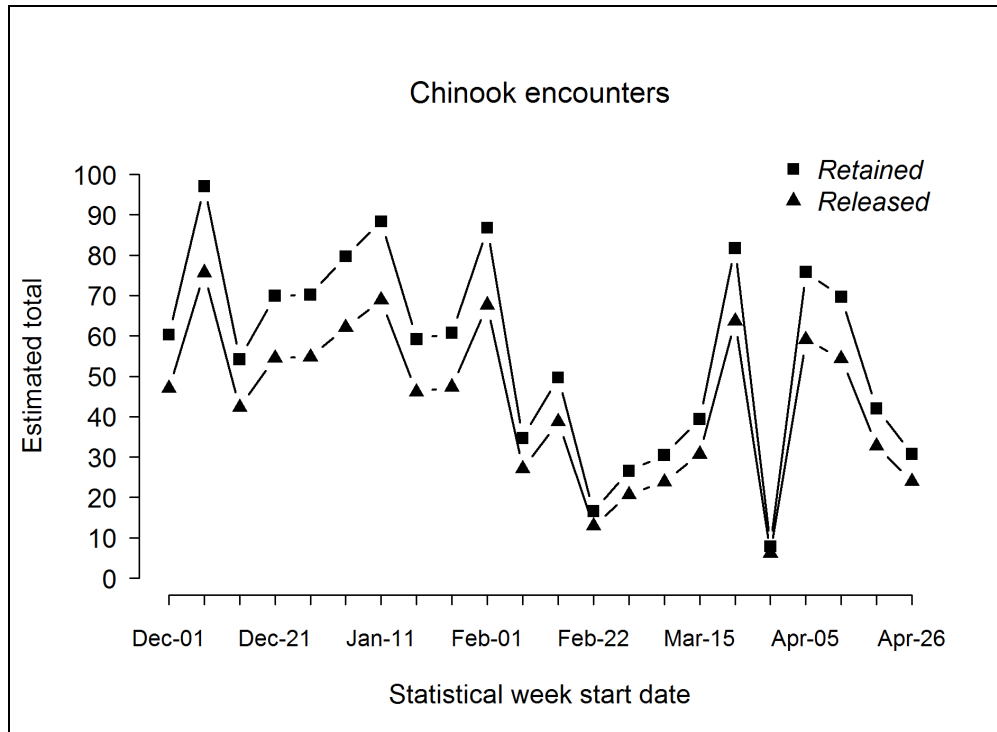


Figure 7-3. Temporal patterns in Chinook encounters (retained and released) during the Area 7 mark-selective Chinook fishery from December 1, 2009 through April 30, 2010.

Table 7-3. Summary of total length samples collected from retained Chinook during dockside angler interviews and derby sampling, Area 7 mark-selective Chinook fishery, December 1, 2009 - April 30, 2010.

Mark Type	Number Sampled		Total
	Legal-size	Sublegal-size	
Marked	608	8	616
Unmarked	0	0	0
Total	608	8	616

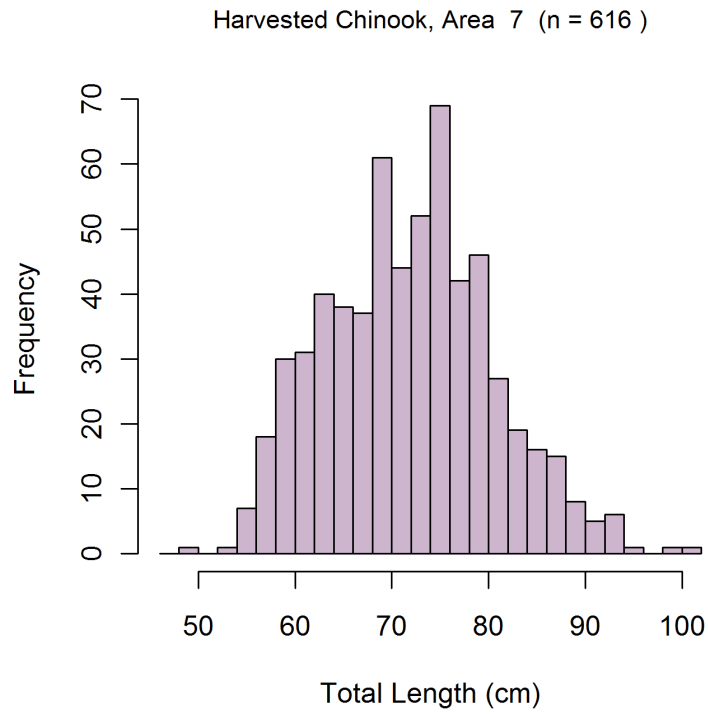


Figure 7-4. Length-frequency distribution for marked Chinook harvested and then sampled in dockside angler interviews, during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery.

Table 7-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
British Columbia-Fraser R.	R-Chilliwack River	H-Chilliwack R	1 (1.6%)	1
British Columbia-Vanc. Isl.	R-Cowichan River	H-Cowichan R	5 (8.2%)	
Hood Canal	Finch Creek	Hoodsport Hatchery	2 (3.3%)	
	Purdy Creek	George Adams Hatchry	4 (6.6%)	4
Lower Columbia River	Spring Creek	Spring Cr NFH	1 (1.6%)	1
Puget Sound-Central	Crisp Creek	Keta Creek Hatchery	1 (1.6%)	
	Elliott Bay Tribal Net Pen	Keta Creek Hatchery	1 (1.6%)	
	Green River	n/a	2 (3.3%)	
	Grovers Creek Hatchery	Grovers Cr Hatchery	1 (1.6%)	
	Voight Creek	Voights Cr Hatchery	5 (8.2%)	
Puget Sound-North	Baker River	(Blank)	1 (1.6%)	
	Cascade River	Marblemount Hatchery	8 (13.1%)	2
	County Line Creek	n/a	1 (1.6%)	
	East Sound Bay (San Juan Isl.)	Glenwood Springs	2 (3.3%)	
	Friday Creek	Samish Hatchery	4 (6.6%)	4
	Nooksack River-North Fork	Kendall Cr Hatchery	3 (4.9%)	3
	Tulalip Creek	Bernie Gobin Hatch	3 (4.9%)	
	Wallace River	Wallace R Hatchery	4 (6.6%)	3
	n/a	4 (6.6%)		
	Whitehorse Springs	Whitehorse Pond	3 (4.9%)	
Puget Sound-South	Chambers Creek	Garrison Hatchery	2 (3.3%)	
	Clear Creek	Clear Creek Hatchery	1 (1.6%)	
Upper Columbia River	Wenatchee River	Dryden Pond	1 (1.6%)	
		n/a	1 (1.6%)	
Grand Total			61	18

Table 7-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Variances associated with total size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	# Days	# Hours	AD	UM	AD	UM	
49	3	12.5	0	0	2	0	2
50	5	23.5	3	1	1	1	6
51	3	12.5	1	1	0	0	2
52	1	4.0	0	0	0	0	0
53/1	4	19.0	0	3	0	0	3
2	5	24.5	1	0	3	1	5
3	3	9.5	2	1	0	0	3
4	3	17.0	1	0	0	1	2
5	5	22.0	2	1	1	0	4
6	5	25.0	2	0	0	0	2
7	5	18.5	2	1	1	0	4
8	4	19.5	0	1	0	0	1
9	5	23.0	0	0	0	0	0
10	4	21.0	4	2	0	0	6
11	3	13.0	0	2	0	0	2
12	4	20.0	3	0	0	0	3
13	3	14.0	1	0	0	0	1
14	4	19.0	1	1	0	0	2
15	4	22.0	2	0	0	0	2
16	5	27.0	5	0	0	0	5
17	5	25.5	2	0	1	0	3
18	5	27.5	1	1	0	0	2
Total	72	348.0	33	15	9	3	60
Size/mark-status composition:			0.55 (0.00419)	0.25 (0.00318)	0.15 (0.00216)	0.05 (0.00081)	
Legal size mark rate:			0.69 (0.00457)				
Overall mark rate:			0.70 (0.00356)				

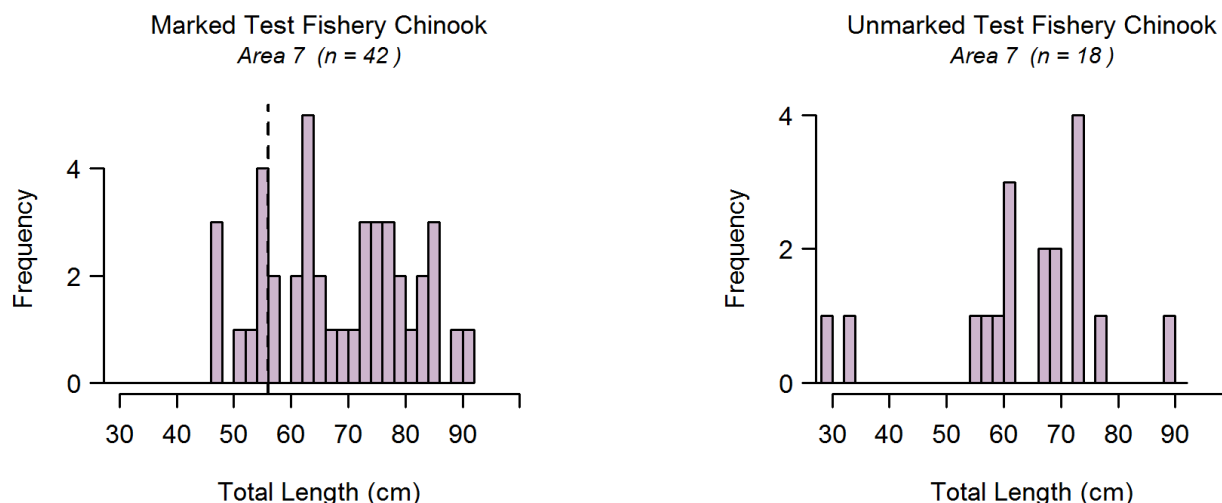


Figure 7-5. Length-frequency distributions of marked (*left panel*) and unmarked (*right panel*) Chinook encountered by test fishers during the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Note that the vertical dashed line in the left panel corresponds to the legal size limit (22 in or 56 cm).

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

Data source	Effort and Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
Test Fishery	72 Days, 144 Angler Trips	33	15	9	3	60	0.70	0.69
Test fishery size/mark status comp.:		0.550	0.250	0.150	0.050			
Variance:		(0.00419)	(0.00318)	(0.00216)	(0.00081)			
Private Boat VTR	79 1-trip VTR's, 140 Angler Trips	120	49	7	4	180	0.71	0.71
VTR size/mark status comp.:		0.667	0.272	0.039	0.022			
Variance:		(0.00124)	(0.00111)	(0.00021)	(0.00012)			
Grand Total		153	64	16	7	240	0.704	0.705
Total size/mark-status comp.:		0.638	0.267	0.067	0.029			
Variance:		(0.00097)	(0.00082)	(0.00026)	(0.00012)			

Fisher's Exact test was used to compare the size/mark status proportions of the test fishery data to the VTR data. The χ^2 statistic was significant ($\chi^2 = 9.698$, 3 df; $P = 0.016$), indicating a difference between the two samples. However, because of the relatively small test fishery sample size ($n = 60$) and the much larger VTR sample size ($n = 180$) we felt that combining the test fishery and VTR data was a better representation of encountered Chinook proportions in Area 7 during the 150 day season. Therefore, the combined totals were used to estimate the size/mark status proportions needed to produce the estimates of Chinook encounters and associated mortalities.

Table 7-7. Summary of season-wide fishery impact estimates for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

Total Encounters (E): 2,524 V(E): 50,922										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	1,609	1,400	209	0.15	31	1,431	11,851	109	1218 - 1645	8
Legal unmarked	673	0	673	0.15	101	101	198	14	73 - 129	14
Sublegal marked	168	18	150	0.20	30	48	120	11	27 - 70	23
Sublegal unmarked	74	0	74	0.20	15	15	32	6	4 - 26	38
All groups combined	2,524	1,418	1,106		177	1,596	12,201	110	1379 - 1812	7

Table 7-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	3,573	1,173	2,400	94
	Mark.	7,564	2,374	5,190	2,065
	Total	11,137	3,547	7,590	2,159
	% Mark.	68	67	68	96
Estimated (Creel) Encounters	Unmark.	747	673	74	0
	Mark.	1,778	1,609	168	1,418
	Total	2,524	2,282	242	1,418
	% Mark.	70	71	70	100

Table 7-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	741	3,253	3,994	116	1,480	1,596
Released Legal	167	150	317	101	31	132
Released Sublegal	480	1,038	1,518	15	30	45
Landed Only	94	2,065	2,159	0	1,418	1,418

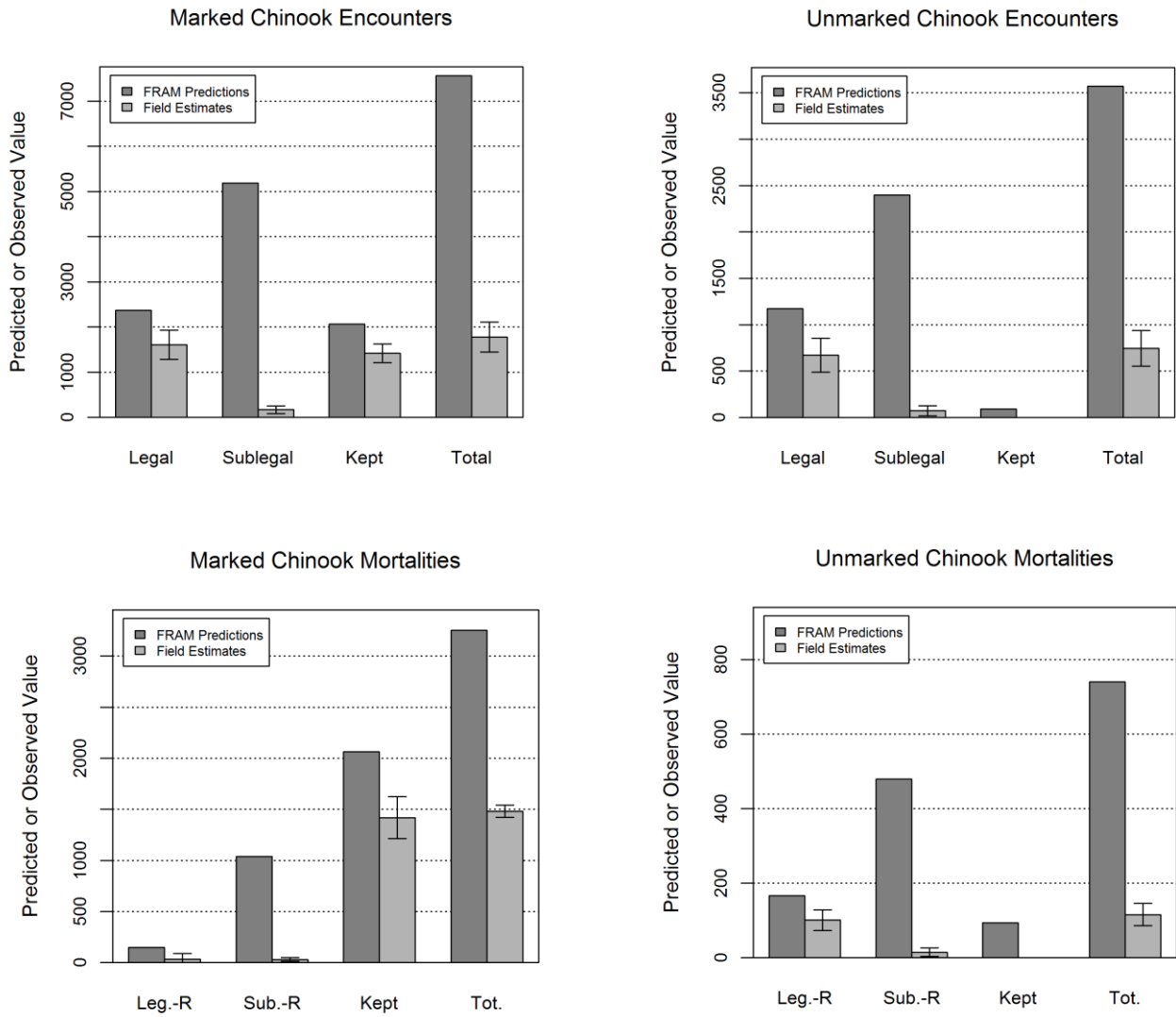


Figure 7-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters (*upper panel*) and mortalities (*lower panel*) for the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

Table 7-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 7 December 1, 2009 - April 30, 2010 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DIT's Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var (Est.)		Est.	var(Est.)	SE(est.)
George Adams Hatchery	2006	1	3.0	5.9	3.0	0.3	0.3	0.3
	2007	3	8.1	14.1	8.1	0.8	0.1	0.6
H-Chilliwack R	2007	1	1.7	1.2	1.7	0.2	0.0	0.1
Kendall Cr Hatchery	2006	1	1.7	1.2	1.7	0.2	0.0	0.1
	2007	2	5.0	7.5	5.1	0.5	0.1	0.4
Marblemount Hatchery	2006	2	4.2	5.0	4.0	0.4	0.0	0.3
Samish Hatchery	2006	1	2.7	4.4	2.7	0.3	0.0	0.2
	2007	3	8.6	16.2	8.6	0.9	0.2	0.7
Spring Cr NFH	2007	1	2.5	3.8	2.5	0.3	0.0	0.2
Wallace R Hatchery	2005	1	1.7	1.2	1.7	0.2	0.0	0.1
	2006	2	3.7	3.3	3.7	0.4	0.0	0.3
TOTAL		18	43.1	64.0	42.9	4.3	0.9	3.3

Table 7-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the winter 2009-10 Area 7 mark-selective Chinook fishery, December 1, 2009 - April 30, 2010.

Time period			Estimated Retained Chinook				Number Chinook Sampled				Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmarked	Unk.	Total	Marked	Unmarked	Unk.	Total	
December	49-53/1	Dec 1 - Jan 3	369	0	0	369	124	0	0	124	33.6%
January	2-5	Jan 4 - Jan 31	288	0	0	288	108	0	0	108	37.5%
February	6-9	Feb 1 - Feb 28	231	0	0	231	114	0	0	114	49.4%
March	10-13	Mar 1 - Mar 28	318	0	0	318	185	0	0	185	58.2%
April	14-18	Mar 29 - Apr 30	213	0	0	213	85	0	0	85	39.9%
Season Total			1,419	0	0	1,419	616	0	0	616	43.4%

^{1/} Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2009-10 Area 7 selective Chinook fishery (i.e., the four sample-frame sites included in the creel estimates, derby samples, and the fish sampled as part of baseline sampling in the Area).

Table 7-12. Summary of aerial survey and dockside data used to estimate the fraction of Area 7 effort captured in the four-site sample frame during the December 1, 2009 – April 30, 2010 Area 7 mark-selective Chinook fishery. See Methods Report (WDFW 2011) for computational details and notation.

Survey Date	Stratum	Aerial Survey Details			Dockside Sampling Details			Sample Fraction, f_{ij}
		Start Time	End Time	Total Boats, m_{ij}	Total Boats, Σy_{ijk}	Fishing Boats	Active Boats, X_{ij}	
01-Dec	Weekday	10:33	11:46	31	44	33	23	0.742
05-Dec	Weekend	11:00	12:06	53	84	19	12	0.226
12-Dec	Weekend	10:44	12:05	26	37	24	17	0.654
17-Dec	Weekend	10:25	11:50	7	23	13	4	0.571
27-Dec	Weekend	10:37	11:50	48	66	44	32	0.667
09-Jan	Weekend	9:28	10:35	11	21	19	10	0.909
16-Jan	Weekend	11:50	13:05	67	94	52	37	0.552
17-Jan	Weekend	10:42	11:34	11	39	7	2	0.182
21-Jan	Weekday	10:42	12:00	13	23	23	13	1.000
23-Jan	Weekend	9:50	11:15	70	87	61	49	0.700
30-Jan	Weekend	11:10	12:30	76	102	47	35	0.461
06-Feb	Weekend	11:05	12:40	79	116	75	51	0.646
13-Feb	Weekend	10:52	11:56	20	49	22	9	0.450
18-Feb	Weekday	10:45	11:56	21	43	31	15	0.714
20-Feb	Weekend	10:50	12:10	69	115	80	48	0.696
21-Feb	Weekend	11:00	12:20	80	126	71	45	0.563
05-Mar	Weekday	10:43	12:05	34	89	34	13	0.382
07-Mar	Weekend	10:47	12:02	33	54	49	30	0.909
13-Mar	Weekend	10:45	12:00	27	78	26	9	0.333
16-Mar	Weekday	10:40	11:48	16	53	10	3	0.188
21-Mar	Weekend	10:46	12:08	37	71	52	27	0.730
11-Apr	Weekend	10:33	11:42	79	180	73	32	0.405
17-Apr	Weekend	9:45	10:58	69	152	86	39	0.565
24-Apr	Weekend	10:20	11:35	27	51	19	10	0.370
Mean				40.84	67.90	38.42	23.89	0.60
Standard Dev.				25.71	33.98	21.60	16.34	0.22
CV(%)				62.9%	50.1%	56.2%	68.4%	37.3%

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

Area	Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
7	Feb 1 - 29, 2008	4,862	1,301	2	24	0	200	1042	244	155	2,967
7	Feb 1 - April 15, 2009	8,167	1,406	9	14	0	210	708	139	17	2,501
7	December 1, 2009 - April 30, 2010	9,589	1,400	0	18	0	209	673	150	74	2,524

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

The Washington Department of Fish and Wildlife (WDFW) implemented a winter mark-selective Chinook fishery (MSF) in Marine Areas 8-1 and 8-2 for the fifth time from November 1, 2009 through April 30, 2010. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Areas 8-1 and 8-2 during the November-April season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and distributing/collecting voluntary trip reports (VTR's) from the angling public. **Table 8182-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2011).

In this section we present results from our monitoring activities during the Areas 8-1 and 8-2 winter selective Chinook fisheries from November 1, 2009 through April 30, 2010. During the winter of 2009-10, an in-season adjustment was needed to our Areas 8-1/8-2 sample site frame due to special circumstances at Everett Ramp. On January 26, 2010, the Everett Ramp was closed to perform dredging activities in the launch/retrieve area. We analyzed historical effort data and relied on the historical knowledge of our veteran sampling supervisors to immediately shift sampling activities to alternative sites. We also conducted on-the-water effort surveys to determine where the fishing effort would shift and to calculate updated site size measures based on the boat survey data during the dredging period (see WDFW 2011 for detailed methods). The Everett Ramp reopened on Friday, February 19, 2010. From January 26 – February 19, we conducted 4 on-water effort surveys in Area 8-1, contacting 44 boats with 82 anglers. In Area 8-2, we conducted 3 on-water effort surveys, contacting 42 boats and 94 anglers (**Table 8182-14**).

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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish ¹	Catch rates (CPUE); length, age, and CWT composition of harvest ² ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks ¹	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 ¹ .
On-the-water Surveys	Proportion of total angler effort that uses sample-frame sites (i.e., “size measures” or “weights” of sampled sites) versus out-of-frame sites.	Total on-water boat and angler counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats and anglers.	Month	Approximately 2 boat surveys per month were conducted; the site size measures calculated from 2009-10 data were compared with the average size measures from previous seasons, and did not vary significantly from the past average size measures per site.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season (6 months)	VTR data were used in the estimation of total 8-1/8-2 Chinook encounters by size/mark group (LM=30.5%, LU=5.2%, SM=46.2%, SU=18.1%) and associated impacts (see Table 8182-6).
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season (6 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (6 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

¹ To generate weekly catch and effort estimates, the four-day “weekday stratum” estimate for Monday-Thursday of each week (based on $n=2$ days sampled out of $N=8$ available weekdays per two-week period) is added to the “weekend stratum” (Friday-Sunday) estimate for the particular week (based on $n=2$ days sampled out of $N=3$ available weekend days per week). The eight-day weekday estimates for each two-week period are then split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the $n=2$ days sampled out of $N=8$ available weekdays in the appropriate variance equation (see WDFW 2011).

² The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 8182-2. Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2009 - April 30, 2010 Area 8-1 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	Nov-01	Nov-01	21	50	14	0	32	16	63
	45	Nov-02	Nov-08	20	41	11	0	25	12	49
	46	Nov-09	Nov-15	31	64	10	0	23	11	45
	47	Nov-16	Nov-22	23	41	0	0	0	0	0
	48	Nov-23	Nov-29	64	116	5	0	11	6	22
Dec	49	Nov-30	Dec-06	124	213	3	0	8	4	15
	50	Dec-07	Dec-13	124	217	7	0	16	8	31
	51	Dec-14	Dec-20	114	192	26	0	59	29	114
	52	Dec-21	Dec-27	141	252	35	0	78	38	151
	53/1	Dec-28	Jan-03	104	208	47	0	105	52	204
Jan	2	Jan-04	Jan-10	55	101	22	0	49	24	96
	3	Jan-11	Jan-17	63	121	0	0	0	0	0
	4	Jan-18	Jan-24	55	99	17	0	38	19	73
	5	Jan-25	Jan-31	44	78	3	0	6	3	12
Feb	6	Feb-01	Feb-07	66	117	5	0	11	6	22
	7	Feb-08	Feb-14	32	66	0	0	0	0	0
	8	Feb-15	Feb-21	94	151	9	0	19	9	37
	9	Feb-22	Feb-28	70	123	0	0	0	0	0
Mar	10	Mar-01	Mar-07	99	196	20	0	44	22	86
	11	Mar-08	Mar-14	27	45	0	0	0	0	0
	12	Mar-15	Mar-21	24	46	3	0	6	3	11
	13	Mar-22	Mar-28	69	137	0	0	0	0	0
Apr	14	Mar-29	Apr-04	14	25	0	0	0	0	0
	15	Apr-05	Apr-11	64	173	8	0	18	9	36
	16	Apr-12	Apr-18	90	191	22	0	50	25	97
	17	Apr-19	Apr-25	52	92	12	0	26	13	50
	18	Apr-26	Apr-30	23	36	5	0	10	5	20
Total:				1,706	3,192	284	0	636	314	1,234
Variance				30,644	100,993	2,537	0	53,796	11,707	131,017
Standard Error:				175	318	50	0	232	108	362
CV (%):				10%	10%	18%	-	37%	35%	29%
95% CI:				1,363-2,049	2,569-3,815	185-383	-	181-1,090	102-526	524-1,943

Table 8182-3. Estimates of total fishing effort and total salmon catch (harvest and releases) during the November 1, 2009 - April 30, 2010 Area 8-2 selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	Nov-01	Nov-01	72	135	84	0	145	67	295
	45	Nov-02	Nov-08	216	459	49	4	85	35	174
	46	Nov-09	Nov-15	138	278	34	0	59	27	121
	47	Nov-16	Nov-22	37	63	10	0	17	8	34
	48	Nov-23	Nov-29	230	471	75	0	129	59	263
Dec	49	Nov-30	Dec-06	150	261	41	0	70	32	143
	50	Dec-07	Dec-13	159	273	59	0	102	47	208
	51	Dec-14	Dec-20	77	143	28	0	49	22	99
	52	Dec-21	Dec-27	122	258	26	0	45	21	92
	53/1	Dec-28	Jan-03	158	307	26	0	44	20	90
Jan	2	Jan-04	Jan-10	193	393	55	0	95	44	193
	3	Jan-11	Jan-17	106	181	13	0	23	11	47
	4	Jan-18	Jan-24	146	276	63	0	108	50	220
	5	Jan-25	Jan-31	134	243	15	0	26	12	53
Feb	6	Feb-01	Feb-07	129	226	10	0	17	8	34
	7	Feb-08	Feb-14	69	138	16	0	27	12	55
	8	Feb-15	Feb-21	263	497	33	0	56	26	115
	9	Feb-22	Feb-28	203	396	27	0	46	21	95
Mar	10	Mar-01	Mar-07	155	292	29	0	49	23	101
	11	Mar-08	Mar-14	110	197	14	0	24	11	49
	12	Mar-15	Mar-21	74	140	6	0	10	5	21
	13	Mar-22	Mar-28	128	259	12	0	21	10	43
Apr	14	Mar-29	Apr-04	37	65	9	0	15	7	31
	15	Apr-05	Apr-11	106	201	11	0	18	8	38
	16	Apr-12	Apr-18	99	187	22	0	37	17	76
	17	Apr-19	Apr-25	148	293	24	0	42	19	85
	18	Apr-26	Apr-30	56	102	36	0	62	29	127
Total:				3,516	6,732	825	4	1,422	651	2,902
Variance:				67,507	237,244	7,533	7	96,421	16,935	208,338
Standard Error:				260	487	87	3	311	130	456
CV (%):				7%	7%	11%	64%	22%	20%	16%
95% CI:				3,007-4,025	5,778-7,687	655-995	1-10	813-2,030	396-906	2,007-3,797

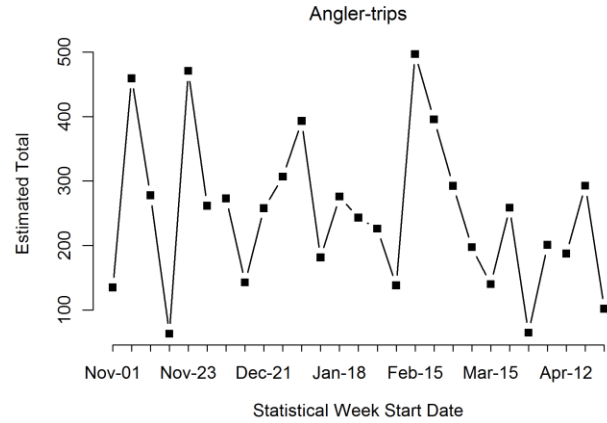
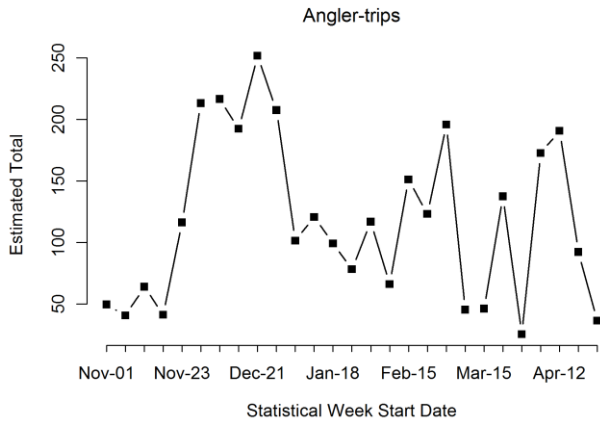


Figure 8182-1. Temporal patterns in fishing effort during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.

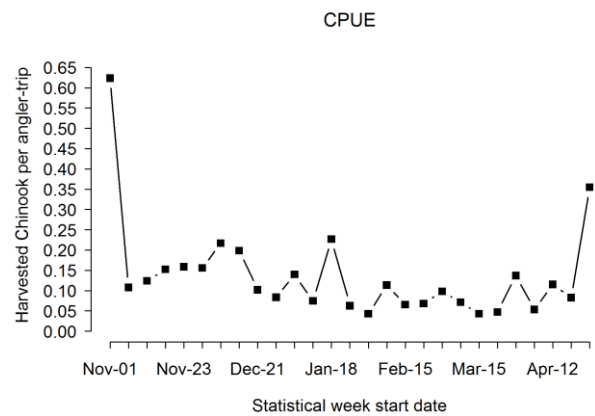
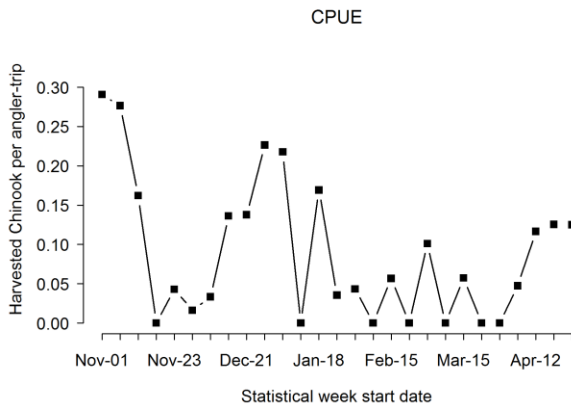


Figure 8182-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.

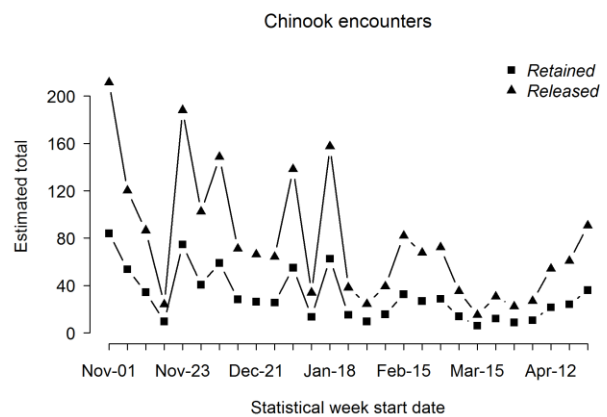
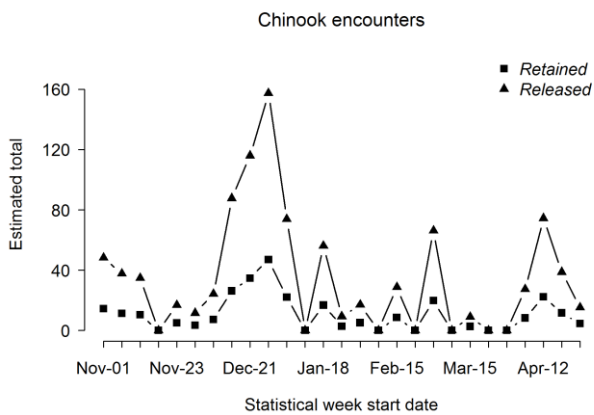


Figure 8182-3. Temporal patterns in Chinook encounters (retained and released) during the Areas 8-1 (left panel) and 8-2 (right panel) mark-selective Chinook fishery from November 1, 2009- April 30, 2010.

Table 8182-4. Summary of length samples collected during dockside angler interviews from retained Chinook salmon, Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Area 8-1	Mark Type	Number Sampled		Total
		Legal-size	Sublegal-size	
	Marked	103	4	107
	Unmarked	0	0	0
	Total	103	4	107

Area 8-2	Mark Type	Number Sampled		Total
		Legal-size	Sublegal-size	
	Marked	388	5	393
	Unmarked	1	0	1
	Total	389	5	394

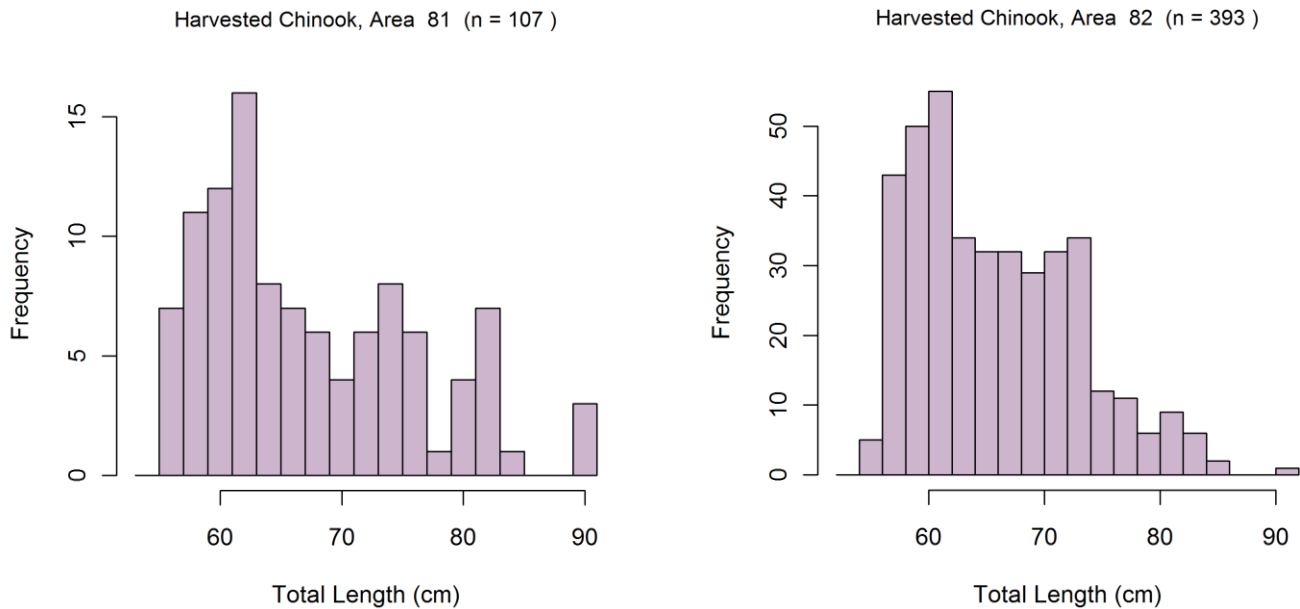


Figure 8182-4. Length-frequency distributions of retained marked Chinook sampled at dockside during the Areas 8-1 (*left panel*) and 8-2 (*right panel*) November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Table 8182-5. Summary of coded-wire tags recovered from Chinook salmon harvested during the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
British Columbia-Fraser R.	Chilliwack River	H-Chilliwack R	1 (3%)	1
Hood Canal	Finch Creek	Hoodsport Hatchery	2 (6%)	
	Purdy Creek	George Adams Hatchery	3 (9%)	3
Puget Sound-Central	Chambers Creek	Garrison Hatchery	2 (6%)	
	Green River	n/a	5 (14%)	
	Grovers Cr Hatchery	Grovers Cr Hatchery	3 (9%)	1
	Voight Creek	Voights Cr Hatchery	1 (3%)	
Puget Sound-North	Cascade River	Marblemount Hatchery	5 (14%)	3
	Clear Creek	Clear Creek Hatchery	3 (9%)	3
	Nooksack River	Kendall Cr Hatchery	1 (3%)	1
	Tulalip Creek	Bernie Gobin Hatchery	3 (9%)	
	Wallace River	Wallace R Hatchery		1 (3%)
n/a			5 (14%)	
Grand Total			35	13

Table 8182-6. Total Chinook encountered (retained and released) by private-boat anglers logging their trips on voluntary trip reports (VTRs) during the November 1, 2009- April 30, 2010 mark-selective Chinook fishery in Areas 8-1 and 8-2, with estimates of legal, sublegal, and overall mark rates.

Data Source	Effort and Sample Size	Legal-size		Sublegal-size		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR 8-1	25 1-trip VTR's, 42 Angler Trips	14	2	27	12	55	0.75	0.88
	Size/mark-status comp.	0.255	0.036	0.491	0.218			
	Variance	(0.00351)	(0.00065)	(0.00463)	(0.00316)			
Private Boat VTR 8-2	61 1-trip VTR's, 140 Angler Trips	50	9	70	26	155	0.77	0.85
	Size/mark-status comp.	0.323	0.058	0.452	0.168			
	Variance	(0.00142)	(0.00036)	(0.00161)	(0.00091)			
Totals (both areas)		64	11	97	38	210	0.77	0.85
Size/mark-status composition		0.305	0.052	0.462	0.181			
Variance		(0.00101)	(0.00024)	(0.00119)	(0.00071)			

Table 8182-7. Summary of season-wide fishery impact estimates for the Areas 8-1(upper panel) and 8-2 (lower panel) mark-selective Chinook fishery, November 1, 2009- April 30, 2010. Values may not add up perfectly due to rounding error.

Area 8-1 Total Encounters (E): 1,234 V(E): 131,017										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	314	273	41	0.15	6	279	2,732	52	177 - 382	19
Legal unmarked	45	0	45	0.15	7	7	24	5	-19	73
Sublegal marked	606	11	595	0.20	119	130	1,552	39	52 - 207	30
Sublegal unmarked	269	0	269	0.20	54	54	425	21	13 - 94	38
All groups combined	1,234	284	950		186	470	4,733	69	335 - 604	15
Area 8-2 Total Encounters (E): 2,902 V(E): 208,338										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	936	814	122	0.15	18	833	8,279	91	654 - 1011	11
Legal unmarked	169	4	164	0.15	25	29	89	9	17441	33
Sublegal marked	1,311	10	1,300	0.20	260	271	2,252	47	178 - 364	18
Sublegal unmarked	487	0	487	0.20	97	97	532	23	52 - 143	24
All groups combined	2,902	829	2,073		400	1,230	11,152	106	1023 - 1436	9

Table 8182-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the combined Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	6,129	1,119	5,010	67
	Mark.	10,832	1,692	9,140	1,472
	Total	16,961	2,811	14,150	1,539
	% Mark.	64	60	65	96
Estimated (Creel) Encounters	Unmark.	969	213	756	4
	Mark.	3,166	1,250	1,916	1,109
	Total	4,136	1,464	2,672	1,113
	% Mark.	77	85	72	100

Table 8182-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the combined Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	1,230	3,407	4,637	187	1,512	1,699
Released Legal	161	107	268	31	24	56
Released Sublegal	1,002	1,828	2,830	151	379	530
Landed Only	67	1,472	1,539	4	1,109	1,113

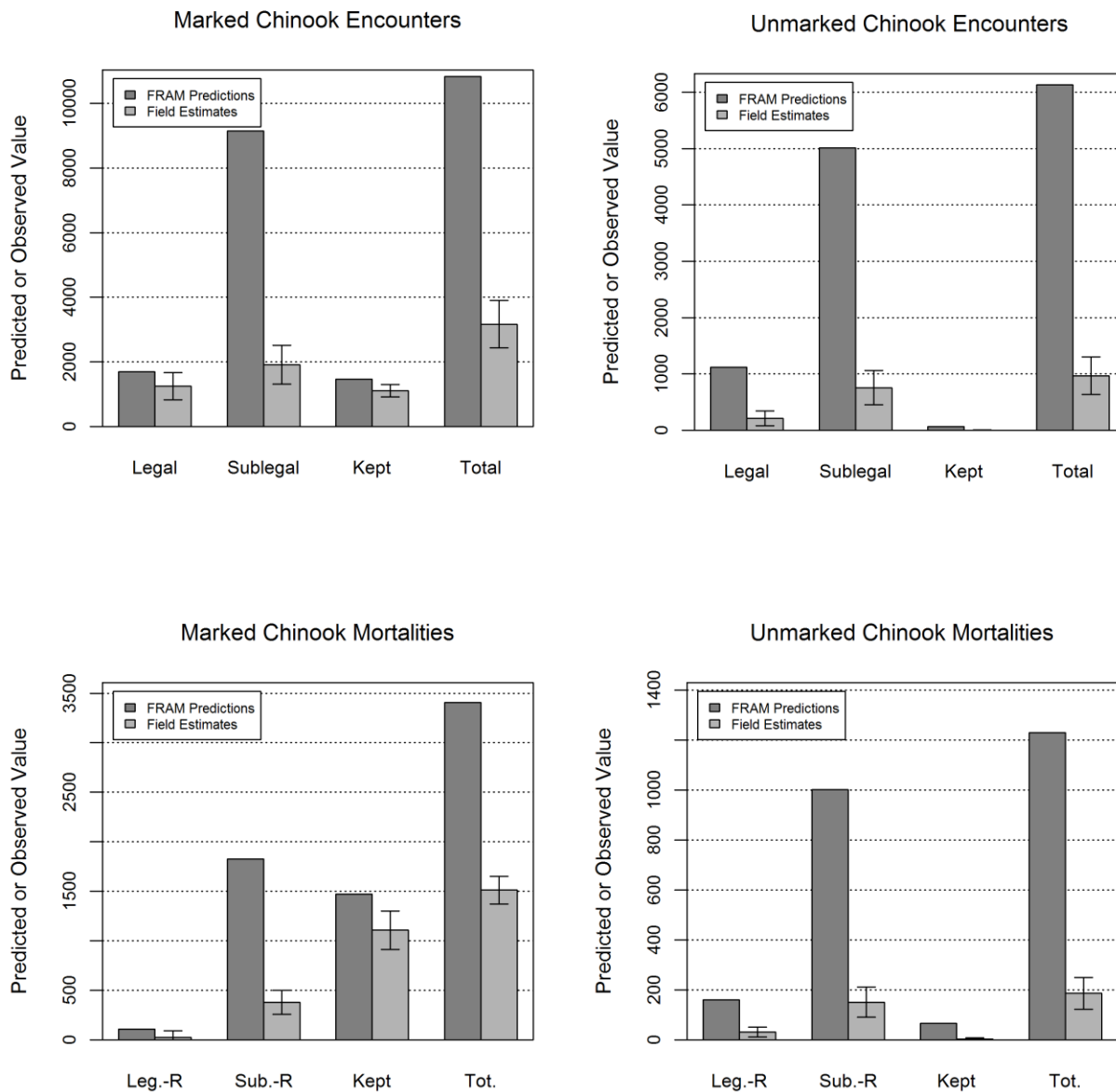


Figure 8182-5. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Areas 8-1 and 8-2 (combined) November 1, 2009- April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

Table 8182-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Hatchery	Brood Year	DITs Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(Est.)
Clear Creek Hatchery	2007	3	6.2	10.1	6.2	2.2	1.3	1.4
George Adams Hatchery	2006	3	9.0	22.1	9.0	0.9	0.2	0.7
Grovers Cr Hatchery	2006	1	2.2	2.5	2.1	0.2	0.0	0.2
Chilliwack River Hatchery	2007	1	2.2	2.5	2.2	0.2	0.0	0.2
Kendall Cr Hatchery	2006	1	2.2	2.5	2.0	0.2	0.0	0.1
Marblemount Hatchery	2006	3	6.7	8.7	6.3	0.6	0.1	0.5
Wallace R Hatchery	2006	1	2.2	2.5	2.2	0.2	0.0	0.2
TOTAL		13	30.5	50.9	30.0	4.5	1.7	3.2

Table 8182-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the Areas 8-1 and 8-2 November 1, 2009- April 30, 2010 mark-selective Chinook fishery.

Area	Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
	Month	Stat. Weeks	Dates	Marked	Unmark	Total	Marked	Unmark	Total	
Area 8-1	November	44-48	Nov 1 - Nov 29	40	0	40	18	0	18	45.0%
	December	49-53/1	Nov 30 - Jan 3	118	0	118	32	0	32	27.1%
	January	2-5	Jan 4 - Jan 31	42	0	42	11	0	11	26.2%
	February	6-9	Feb 1 - Feb 28	14	0	14	3	0	3	21.4%
	March	10-13	Mar 1 - Mar 28	23	0	23	21	0	21	91.3%
	April	14-18	Mar 29 - Apr 30	47	0	47	22	0	22	46.8%
	Season Total				284	0	284	107	0	107

Area	Time period			Estimated Retained Chinook			Number of Chinook sampled			Sample Rate
	Month	Stat. Weeks	Dates	Marked	Unmark	Total	Marked	Unmark	Total	
Area 8-2	November	44-48	Nov 1 - Nov 29	252	4	256	119	0	119	46.5%
	December	49-53/1	Nov 30 - Jan 3	180	0	180	105	0	105	58.3%
	January	2-5	Jan 4 - Jan 31	146	0	146	52	0	52	35.6%
	February	6-9	Feb 1 - Feb 28	86	0	86	26	0	26	30.2%
	March ^{2/}	10-13	Mar 1 - Mar 28	61	0	61	61	0	61	100.0%
	April	14-18	Mar 29 - Apr 30	102	0	102	29	0	29	28.4%
	Season Total				827	4	831	392	0	392

^{1/} Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2009-10 Areas 8-1 and 8-2 selective Chinook fishery. (i.e., the sample-frame sites included in the creel estimates and the fish sampled as part of baseline sampling in the Area).

^{2/} For the March sampling period (Mar 1-Mar 28) in Area 8-2, there were 2 additional salmon sampled (1 Ad and 1 UM), during 'baseline' sampling.

Table 8182-12. Fishery-total estimates of retained and released salmon (*other than Chinook salmon*) for the Area 8-2 November 1, 2009 - April 30, 2010 mark-selective Chinook fishery. (Note: There were no other species of salmon reported caught or released for the Area 8-1 fishery.) Values may not add exactly due to rounding error.

Area 8-2 Salmon Catch Estimates (Other Than Chinook), 2009-10									
Month	Week	Start Date	End Date	Est. Retained Chum	Est. Released Salmon				
					Coho AD	Coho UM	Coho UNK	Chum	Unk. Salmon
Nov	44	Nov-01	Nov-01	0	0	5	0	0	0
	45	Nov-02	Nov-08	2	0	0	2	2	4
	46	Nov-09	Nov-15	0	0	0	0	0	0
	47	Nov-16	Nov-22	0	0	0	0	0	0
	48	Nov-23	Nov-29	0	0	0	0	0	0
Dec	49	Nov-30	Dec-06	0	0	0	0	0	0
	50	Dec-07	Dec-13	0	0	0	0	0	0
	51	Dec-14	Dec-20	0	0	0	0	0	0
	52	Dec-21	Dec-27	0	0	2	2	0	0
	53/1	Dec-28	Jan-03	0	0	0	0	0	0
Jan	2	Jan-04	Jan-10	0	0	0	0	0	0
	3	Jan-11	Jan-17	0	0	0	0	0	0
	4	Jan-18	Jan-24	0	0	0	0	0	0
	5	Jan-25	Jan-31	0	5	0	0	0	0
Feb	6	Feb-01	Feb-07	0	5	0	0	0	0
	7	Feb-08	Feb-14	0	0	0	0	0	0
	8	Feb-15	Feb-21	0	0	0	0	0	0
	9	Feb-22	Feb-28	0	0	0	0	0	0
Mar	10	Mar-01	Mar-07	0	0	0	0	0	0
	11	Mar-08	Mar-14	0	0	0	0	0	0
	12	Mar-15	Mar-21	0	0	0	0	0	0
	13	Mar-22	Mar-28	0	0	0	0	0	3
Apr	14	Mar-29	Apr-04	0	0	0	0	0	3
	15	Apr-05	Apr-11	0	0	0	0	0	0
	16	Apr-12	Apr-18	0	0	0	0	0	0
	17	Apr-19	Apr-25	0	0	0	0	0	2
	18	Apr-26	Apr-30	0	0	0	0	0	0
Season Total:				2	11	7	4	2	12
Variance:				2	84	3	3	2	35
Standard Error:				1	9	2	2	1	6
CV (%):				64%	87%	24%	44%	64%	49%
95% CI:				1 - 5	2- 29	4-11	1-8	1 - 5	1-24

Table 8182-13. Summary of the total number of anglers intercepted in Area 8-1 (*left panel*) and 8-2 (*right panel*) during on-the-water surveys conducted from November 1, 2009 - April 30, 2010. Grayed cells represent sites included in the dockside sample frame.

Site Name	Total Anglers	Season Total (unadjusted) Size Measure	Site Name	Total Anglers	Season Total (unadjusted) Size Measure
Camano Island State Park	39	0.279	Bayside Marina	8	0.031
Cornet Bay Ramp	10	0.071	Camano State Park	24	0.093
Coupeville Ramp	1	0.007	Dagmars Landing	16	0.062
Dagmars Landing	3	0.021	Edmonds Marina	6	0.023
Everett Ramp (Norton)	16	0.114	Everett (Norton) Ramp	152	0.589
Holmes Harbor Ramp(Freeland Ramp)	2	0.014	Everett Marina	19	0.074
Kayak Point Ramp	1	0.007	Kayak Pt.	4	0.016
Maple Grove Ramp	31	0.221	Langley Ramp	4	0.016
Misc. Private Launch	28	0.200	Maple Grove Ramp	4	0.016
Oak Harbor Public	7	0.050	Marysville Ramp	9	0.035
Utsalady Ramp	2	0.014	Misc. Private Launch	6	0.023
Total Anglers	140	1.000	Mukilteo Public Ramp	4	0.016
			Sandy Hook Marina	2	0.008
			Total Anglers	258	1.000

Table 8182-14. Summary of the total number of anglers intercepted in Area 8-1 (*left panel*) and 8-2 (*right panel*) during on-the-water surveys from January 26 – February 19, 2010. The surveys were conducted during a period in which there was a closure of the Everett Ramp (10th St) for dredging. Grayed cells represent sites included in the dockside sample frame.

Site Name	Total Anglers	Season Total (unadjusted) Size Measure	Site Name	Total Anglers	Season Total (unadjusted) Size Measure
Camano Island State Park	36	0.462	Bayside Marina	6	0.064
Cornet Bay Ramp	4	0.051	Camano State Park	11	0.117
Coupeville Ramp	0	0.000	Dagmars Landing	3	0.032
Dagmars Landing	0	0.000	Edmonds Dry Storage	3	0.032
Holmes Harbor Ramp (Freeland Ramp)	0	0.000	Edmonds Sling	2	0.021
Kayak Point Ramp	0	0.000	Everett Marina	10	0.106
Maple Grove Ramp	20	0.256	Kayak Pt.	8	0.085
Misc. Private Launch	9	0.115	Langley Ramp	6	0.064
Oak Harbor Public	4	0.051	Langus Ramp	14	0.149
Utsalady Ramp	5	0.064	Marysville Ramp	4	0.043
Total Anglers	78	1.000	Misc. Private Launch	2	0.021
Mukilteo Public Ramp	4	0.667	Mukilteo Public Ramp	17	0.181
Sandy Hook Marina	2	0.333	Tulalip Ramp	8	0.085
Total Anglers	6	1.000	Total Anglers	94	1.000

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

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

3) Marine Area 9 Winter Mark-selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 9 for the third winter season from November 1 -30, 2009 and January 16 – April 15, 2010. WDFW’s Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 9 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, aerial effort surveys, and we distributed and collected voluntary trip reports (VTRs) from the angling public. **Table 9-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2011).

In this section we present results from our monitoring activities during the Area 9 winter selective Chinook fishery from November 1-30, 2009 and January 16-April 30, 2010. In addition to the major components of the results described previously (page 3), aerial survey and dockside data used to estimate the sample fraction in Area 9 (see WDFW 2011, *Aerial-Access Design*) are presented.

During the 2009-10 season of the Area 9 winter mark-selective fishery we made an in-season adjustment to our sample site frame due to special circumstances at Everett Ramp. Typically the four sites that we include in our sample site frame (as fixed sampling sites) to implement the aerial-access design in Area 9 include Everett Ramp, Port Townsend Ramp, Edmonds Dry Stack, and Kingston Ramp (i.e., see WDFW 2011, Section 3: *Aerial Access Design*). However, starting on January 26, 2010, the Everett Ramp was closed due to dredging activities in the launch/retrieve area. Thus, we analyzed historical effort data and relied on the historical knowledge of our veteran sampling supervisor in the Central Sound area, and after considering this information we elected to send samplers to Mukilteo ramp as an alternative sampling site in place of Everett Ramp for the dredging period only. We also conducted additional aerial effort surveys to assess the proportion of effort exiting the fishery at our sampled sites during the dredging period. The Everett Ramp reopened on Friday, February 19, 2010. From January 26 – February 19, 2010, we conducted 5 aerial effort surveys over Area 9 in which observers counted a total of 188 boats. Of the 188 boats, 53 were captured by the creel survey at the four sampling sites and were active during the flight.

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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish ¹	Catch rates (CPUE); length, age, and CWT composition of harvest ² ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks ¹	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 ¹ .
Aerial Surveys	Fraction of Area 9 effort (boats) captured in the four-site sample frame via creel surveys (Sample Fraction, f_{ij}).	Total boat counts at assumed peak effort time interval (instantaneous count); spatial distribution of fishing boats in the area.	Boats	Month	The sample fraction was calculated for individual aerial survey dates (see Table 9-12 ; $n=24$ surveys conducted out of $N=150$ days available in the season). Aerial survey data were combined based on three different time strata to calculate the overall sample fraction per time period, as shown in Table 9-12 .
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based ³ stock composition; species composition of non-Chinook encounters	Fish encounterer	Season	Test fishery data were used in estimating total Chinook encounters by size/mark group and associated impacts. These data were stratified by time period (Nov. 1-30 and Jan 16-Apr 15) to generate estimates. See Table 9-5 and row below for more details.
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 encounterer	Season	We compared the size/mark status proportions of the VTR data versus test fishery data using Fisher’s Exact Test. The χ^2 statistic was significant ($\chi^2 = 32.926$, 6 df; $P < 0.001$), indicating a difference among the samples. Therefore, only the test fishery data were used to estimate the size/mark status proportions needed to produce the estimates.
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

¹ To generate weekly catch and effort estimates, the four-day “weekday stratum” estimate for Monday-Thursday of each week (based on $n=2$ days sampled out of $N=8$ available weekdays per two-week period) is added to the “weekend stratum” (Friday-Sunday) estimate for the particular week (based on $n=2$ days sampled out of $N=3$ available weekend days per week). The eight-day weekday estimates for each two-week period are then split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the $n=2$ days sampled out of $N=8$ available weekdays in the appropriate variance equation (see WDFW 2011).

² The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

³ Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

Table 9-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status.

Month	Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Nov	44	Nov-01	Nov-01	127	257	180	0	321	132	632
	45	Nov-02	Nov-08	298	594	284	4	506	204	998
	46	Nov-09	Nov-15	362	714	383	4	682	276	1,346
	47	Nov-16	Nov-22	125	187	80	0	143	59	281
	48	Nov-23	Nov-29	374	710	171	0	305	125	601
	49	Nov-30	Nov-30	29	44	20	0	36	15	70
Nov. Total:				1,315	2,506	1,118	8	1,992	810	3,928
Variance:				121,064	396,155	142,365	13	834,172	64,278	2,017,818
Standard Error:				348	629	377	4	913	254	1,420
CV (%):				26%	25%	34%	45%	46%	31%	36%
95% CI:				633-1,997	1,272-3,740	378-1,858	1-15	202-3,782	313-1,307	1,144-6,712
Month	Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Jan - Apr	3	Jan-16	Jan-17	329	681	115	0	103	46	264
	4	Jan-18	Jan-24	340	686	71	6	63	23	162
	5	Jan-25	Jan-31	260	487	40	8	35	8	91
	6	Feb-01	Feb-07	260	444	17	6	15	1	40
	7	Feb-08	Feb-14	169	277	31	0	27	12	71
	8	Feb-15	Feb-21	263	493	35	0	31	14	79
	9	Feb-22	Feb-28	183	348	14	0	13	6	32
	10	Mar-01	Mar-07	70	100	7	0	7	3	17
	11	Mar-08	Mar-14	74	100	11	0	9	4	24
	12	Mar-15	Mar-21	69	107	13	0	11	5	29
	13	Mar-22	Mar-28	109	208	15	0	13	6	34
	14	Mar-29	Apr-04	36	73	18	0	16	7	42
	15	Apr-05	Apr-11	158	275	44	0	39	18	100
	16	Apr-12	Apr-15	30	38	9	0	8	3	20
Jan. - April Total:				2,351	4,317	439	19	391	157	1,005
Variance:				53,655	193,236	4,002	175	26,236	3,624	40,002
Standard Error:				232	440	63	13	162	60	200
CV (%):				10%	10%	14%	69%	41%	38%	20%
95% CI:				1,897-2,805	3,455-5,178	315-563	2-45	73-708	39-275	613-1,397
Season Total:				3,666	6,823	1,557	27	2,382	968	4,934
Variance:				174,719	589,391	146,368	188	860,408	67,902	2,057,820
Standard Error:				418	768	383	14	928	261	1,435
CV (%):				11%	11%	25%	50%	39%	27%	29%
95% CI:				2,847-4,485	5,318-8,327	807-2,306	0-54	564-4,200	457-1,478	2,122-7,745

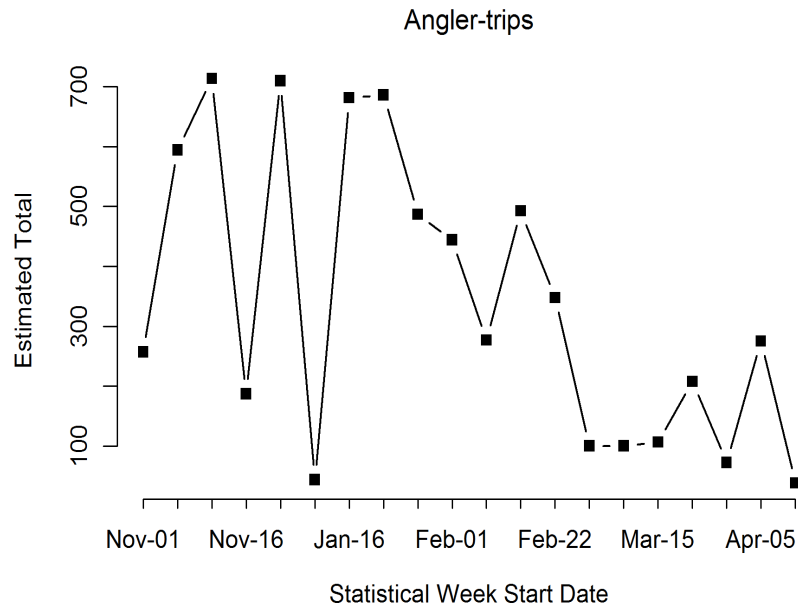


Figure 9-1. Temporal patterns in fishing effort during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

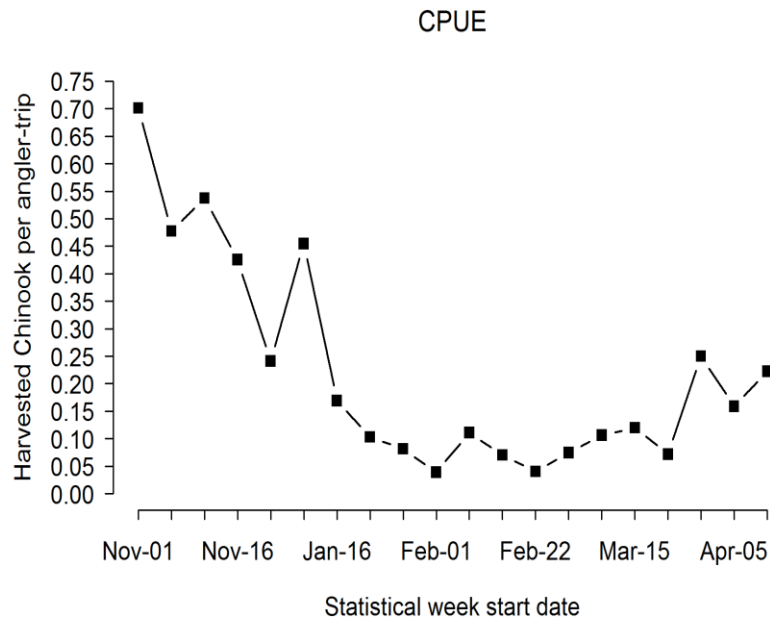


Figure 9-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

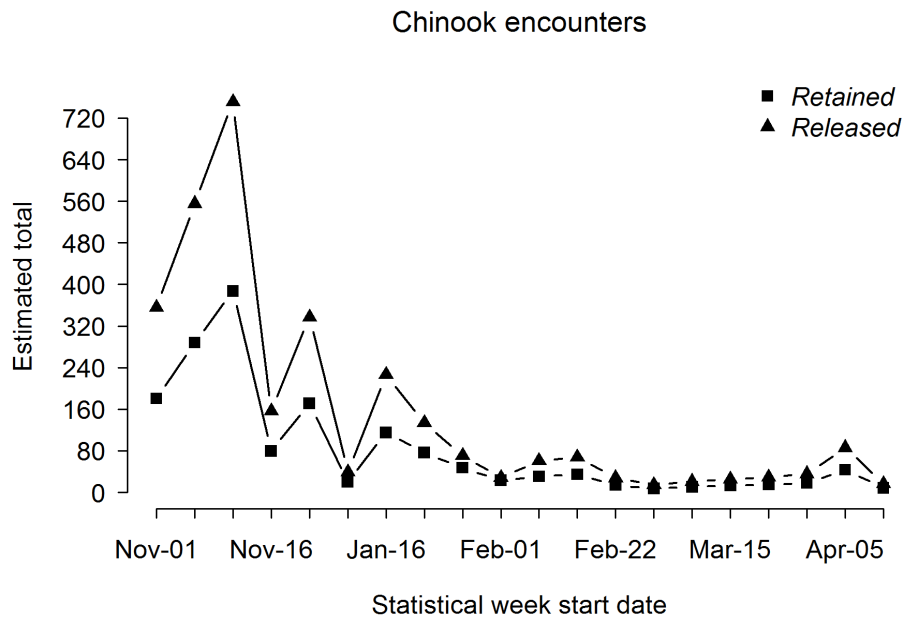


Figure 9-3. Temporal patterns in Chinook encounters (retained and released) during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

Table 9-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

Mark Type	Number Sampled November, 2009		Total
	Legal-size	Sublegal-size	
Marked	178	17	195
Unmarked	2	0	2
Nov. Total	180	17	197
Mark Type	Number Sampled January – April, 2010		Total
	Legal-size	Sublegal-size	
Marked	146	3	149
Unmarked	1	1	2
Jan. – Apr. Total	147	4	151
Season Total	327	21	348

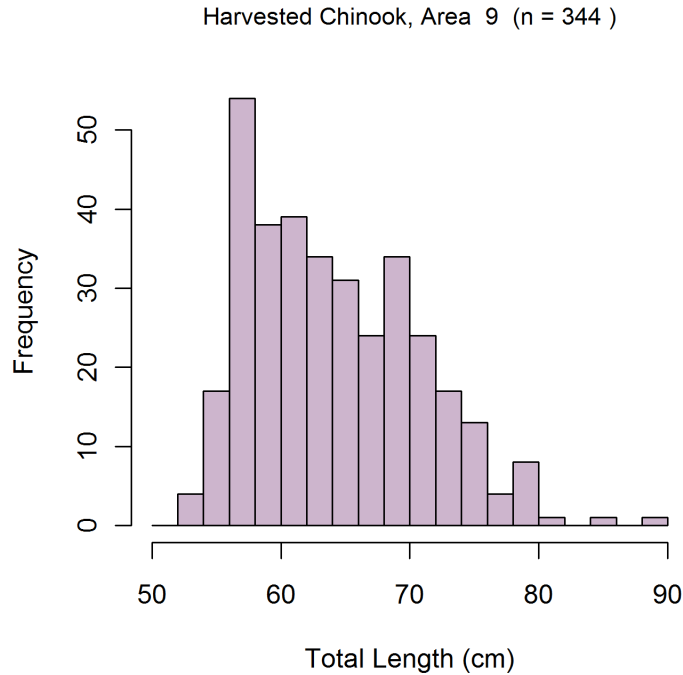


Figure 9-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

Table 9-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 9 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Hatchery	CWTs Recovered	No. DITs
British Columbia-Fraser R.	Chilliwack River	H-Chilliwack River	1 (3.6%)	1
Hood Canal	Finch Creek	Hoodsport Hatchery	2 (7.1%)	
	Ricks Pond (LLTK)	George Adams Hatchery	1 (3.6%)	
Puget Sound-Central	Big Soos Creek	Soos Creek Hatchery	1 (3.6%)	1
	Chambers Creek	Garrison Hatchery	4 (14.3%)	
		Lakewood Hatchery	1 (3.6%)	
	Green River	n/a	1 (3.6%)	
	Grovers Creek Hatchery	Grovers Creek Hatchery	2 (7.1%)	
Minter Creek	Hupp Springs Rearing	1 (3.6%)		
Puget Sound-North	Cascade River	Marblemount Hatchery	3 (10.7%)	1
	Friday Creek	Samish Hatchery	1 (3.6%)	1
	Nooksack River-North Fork	Kendall Creek Hatchery	3 (10.7%)	3
		Wallace River Hatchery	2 (7.1%)	2
	Wallace River	n/a	2 (7.1%)	
Whitehorse Springs	Whitehorse Pond	1 (3.6%)		
Puget Sound-South	Kalama Creek	Kalama Creek Hatchery	2 (7.1%)	
Grand Total			28	9

Table 9-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. Variances associated with size/mark-status proportions and mark rates are provided in parentheses.

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hours Fished	AD	UM	AD	UM	
45	4	20.0	24	7	22	7	60
46	3	16.8	14	4	27	6	51
47	3	6.1	2	0	9	1	12
48	4	15.3	3	0	13	5	21
Nov. Total	14	58.2	43	11	71	19	144
Size/mark-status composition: 0.299 (0.0015) 0.076 (0.0005) 0.493 (0.0017) 0.132 (0.0008) Legal size mark rate: 0.80 (0.0031) Overall mark rate: 0.79 (0.0012)							
4	4	20.3	2	0	4	1	7
5	5	24.6	3	0	5	1	9
6	4	21.5	4	0	2	0	6
7	5	23.5	1	0	3	2	6
8	3	16.6	1	0	0	0	1
9	3	10.9	0	0	0	1	1
10	4	19.1	6	0	0	0	6
11	4	17.4	2	1	0	0	3
12	5	22.4	2	0	4	0	6
13	5	25.9	0	3	1	0	4
14	2	5.5	1	0	0	0	1
15	4	14.8	4	0	0	1	5
16	3	11.1	2	0	0	0	2
Jan. - Apr. Total	51	233.6	28	4	19	6	57
Size/mark-status composition: 0.491 (0.0045) 0.070 (0.0012) 0.333 (0.0040) 0.105 (0.0017) Legal size mark rate: 0.88 (0.0035) Overall mark rate: 0.82 (0.0026)							
Season Total	65	291.8	71	15	90	25	201
Size/mark-status composition: 0.353 (0.0011) 0.075 (0.0003) 0.448 (0.0012) 0.124 (0.0005) Legal size mark rate: 0.83 (0.0017) Overall mark rate: 0.80 (0.0008)							

Table 9-6. Total Chinook encountered (retained and released) by private-boat anglers reporting their catch on voluntary trip reports (VTRs) compared to test fishery results, with estimates of legal, sublegal, and overall mark rates, during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. AD = marked (i.e., adipose-clipped), UM = unmarked. Variances associated with size/mark-status proportions are provided in parentheses.

Data Source	Angler Trips	Legal		Sublegal		Totals	Total Mark Rate	Legal Mark Rate
		AD	UM	AD	UM			
Charter Boat VTR	12 1-trip VTRs, 45 Angler Trips	30	6	22	3	61	0.85	0.83
	Size/mark-status comp. Variance	0.492 (0.00417)	0.098 (0.00148)	0.361 (0.00384)	0.049 (0.00078)			
Private Boat VTR	28 1-trip VTRs, 51 Angler Trips	38	6	6	2	52	0.85	0.86
	Size/mark-status comp. Variance	0.731 (0.00386)	0.115 (0.00200)	0.115 (0.00200)	0.038 (0.00073)			
Test Fishery	144 trips, 288 Angler Trips	71	15	90	25	201	0.80	0.83
	Size/mark-status comp. Variance	0.353 (0.00114)	0.075 (0.00035)	0.448 (0.00124)	0.124 (0.00054)			
Pooled data ^{1/}	384 Angler Trips	139	27	118	30	314	0.82	0.84
	Size/mark-status comp. Variance	0.443 (0.00079)	0.086 (0.00025)	0.376 (0.00075)	0.096 (0.00028)			

^{1/} Note: We did not use the pooled data (test fishery and VTR) for encounters and impacts estimation; we used test fishing data only for the subsequent impact estimation steps (i.e., see WDFW 2011).

Fisher’s Exact test was used to compare the size/mark status proportions of the test fishery data to VTR data from each source. The χ^2 statistic was significant ($\chi^2 = 32.926$, 6 df; $P < 0.001$) indicating a difference among the three samples. Therefore, only the test fishery data were used to estimate the size/mark status proportions needed to produce the estimates.

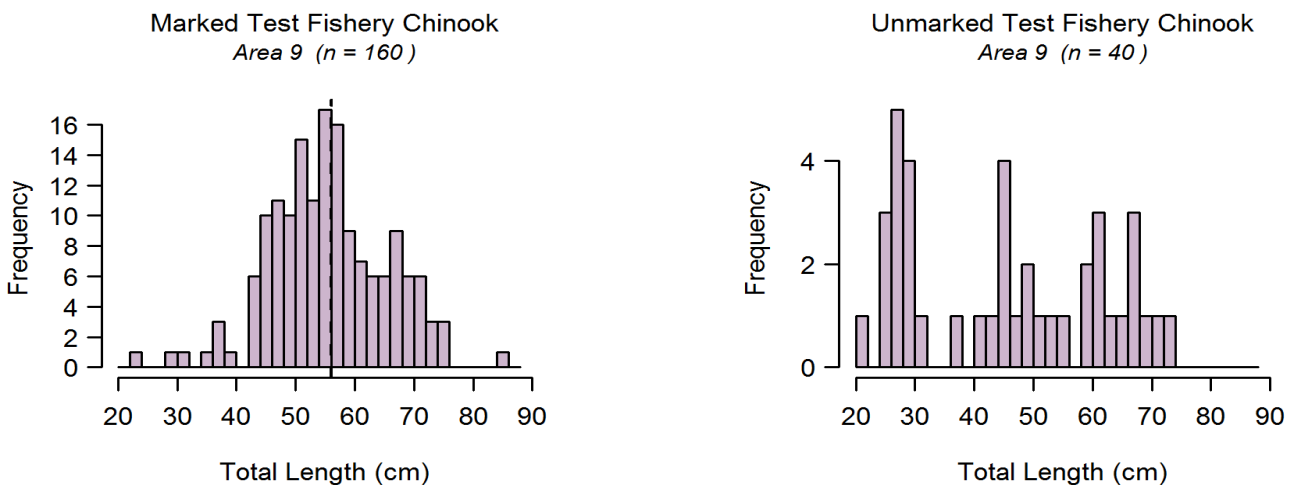


Figure 9-5. Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the winter 2009-10 Area 9 (November 1-30, 2009 and January 16-April 15, 2010) mark-selective Chinook fishery. Note that the vertical dashed line in the upper panel corresponds to the legal size limit (22 in or 56 cm).

Table 9-7. Summary of season-wide fishery impact estimates for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

<p style="text-align: center;">Total Encounters (E): 4,934 Var (E): 2,057,763</p>										
Size/mark group	Chinook Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	1,667	1,450	217	0.15	33	1,483	130,518	361	775 - 2191	24
Legal unmarked	371	18	353	0.15	53	71	551	23	25 - 117	33
Sublegal marked	2,272	106	2,166	0.20	433	540	22,517	150	245 - 834	28
Sublegal unmarked	624	10	615	0.20	123	133	2,014	45	45 - 221	34
All groups combined	4,934	1,584	3,350		642	2,225	155,601	394	1452 - 2999	18

Table 9-8 Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	3,654	959	2,695	58
	Mark.	11,699	2,859	8,840	2,487
	Total	15,353	3,818	11,535	2,545
	% Mark.	76	75	77	98
Estimated (Creel) Encounters	Unmark.	995	371	624	27
	Mark.	3,939	1,667	2,272	1,557
	Total	4,934	2,038	2,896	1,584
	% Mark.	80	82	78	98

Table 9-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	735	4,435	5,170	203	2,022	2,225
Released Legal	138	180	318	53	33	85
Released Sublegal	539	1,768	2,307	123	433	556
Landed Only	58	2,487	2,545	27	1,557	1,584

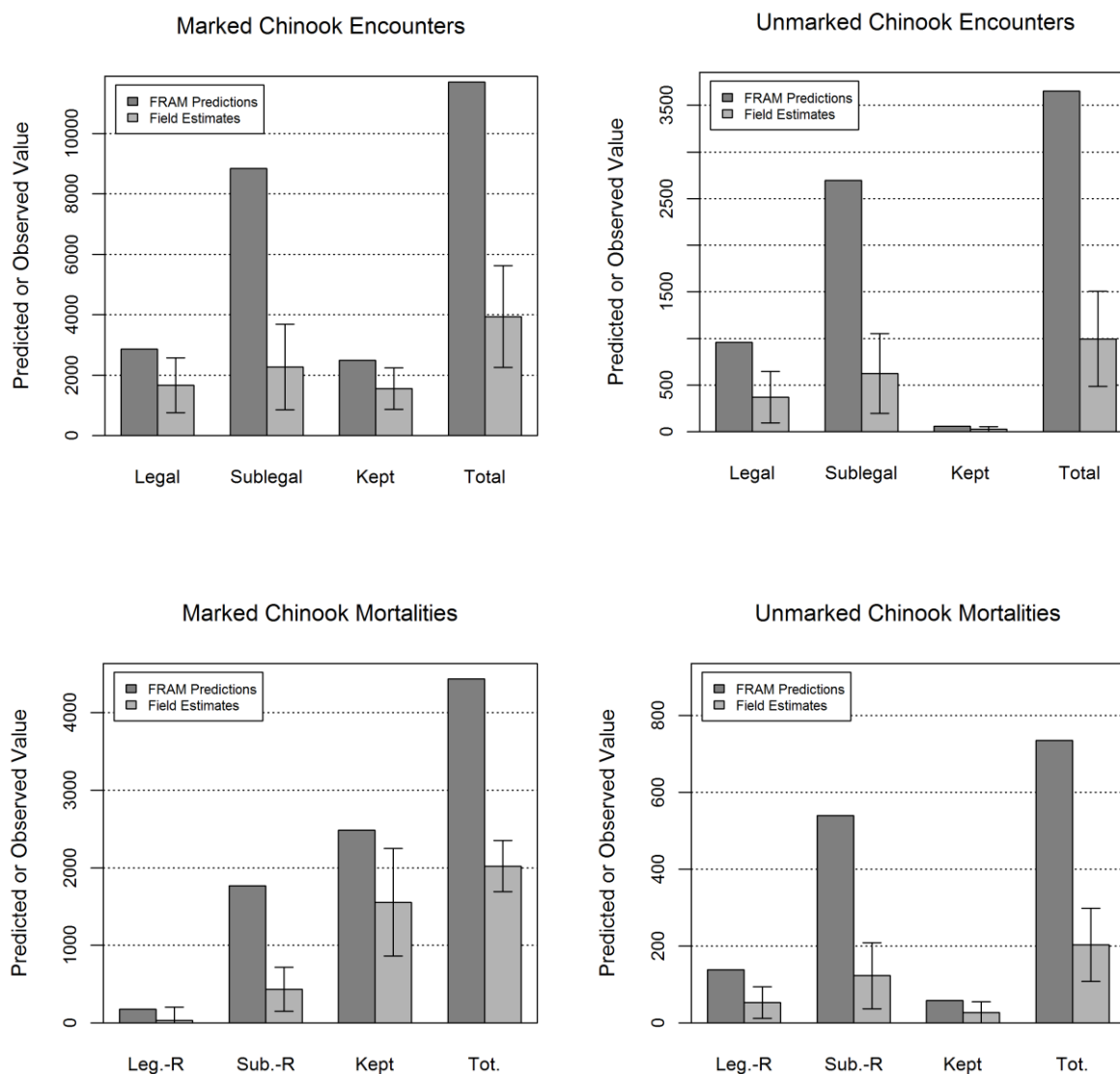


Figure 9-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters (*upper panel*) and mortalities (*lower panel*) for the 2009-10 Area 9 winter mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

Table 9-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. AD = marked (i.e., adipose-clipped), UM = unmarked.

Hatchery	Brood Year	DIT's Obs'd	AD DIT Harvest		UM DIT Enc	UM DIT Mortality		
			Est	var(Est.)		Est	var(Est.)	SE(est.)
H-Chilliwack River	2007	1	6.1	30.7	6.1	0.6	0.3	0.6
Kendall Cr Hatchery	2007	3	13.5	58.9	13.6	1.4	0.6	1.2
Marblemount Hatchery	2006	1	5.7	27.0	5.4	0.5	0.2	0.5
Samish Hatchery	2007	1	3.0	6.2	3.1	0.3	0.1	0.3
Soos Creek Hatchery	2006	1	5.7	27.0	5.7	0.6	0.3	0.5
Wallace River Hatchery	2006	2	11.4	53.9	11.4	1.1	0.5	1.0
TOTAL		9	45.5	203.6	45.4	4.5	2.0	4.1

Table 9-11. Monthly sample rates (Total retained Chinook sampled ^{1/} / Estimated retained Chinook) in the winter Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010.

Time period			Estimated Retained Chinook				Number of Chinook sampled				Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmark	Unk.	Total	Marked	Unmark	Unk.	Total	
November	44-49	Nov 1 - Nov 30	1,118	8	0	1,126	195	2	0	197	17.5%
January	3-5	Jan 16 - Jan 31	226	14	0	240	79	0	0	79	32.9%
February	6-9	Feb 1 - Feb 28	97	6	0	103	17	0	0	17	16.5%
March	10-13	Mar 1 - Mar 28	46	0	0	46	15	0	0	15	32.6%
April	14-16	Mar 29 - Apr 15	70	0	0	70	40	0	0	40	57.1%
Season Total			1,557	28	0	1,585	346	0	0	348	21.8%

^{1/} Number of retained Chinook sampled includes all retained Chinook inspected for CWT's, from all sites sampled during the winter 2009-10 Area 9 selective Chinook fishery (i.e., the sample-frame sites included in the creel estimates and the fish sampled as part of baseline sampling in the area).

Table 9-12. Summary of aerial over flight and dockside data used to estimate the fraction of Area 9 effort captured in the four-site sample frame during the winter 2009-10 (November 1-30, 2009 and January 16-April 15, 2010) Area 9 mark-selective Chinook fishery. See Methods Report (WDFW 2011) for computational details and notation.

Time Period	Survey Date	Stratum	Aerial Sampling Details			Dockside Sampling Details			Sample Fraction, f_{ij}
			Start Time	End Time	Total Boats, m_{ij}	Total Boats, Σy_{ijk}	Fishing Boats	Active Boats, X_{ij}	
November, 2009	01-Nov	Weekend	10:40	11:20	101	146	62	43	0.426
	07-Nov	Weekend	10:28	11:01	25	39	14	9	0.360
	14-Nov	Weekend	10:26	11:02	100	139	53	38	0.380
	20-Nov	Weekday	11:39	12:10	6	12	2	1	0.167
	21-Nov	Weekend	10:12	10:46	7	26	11	3	0.429
	28-Nov	Weekend	10:28	11:03	22	30	15	11	0.500
November Stratum Summary Statistics			Mean		44	65	26	18	0.377
			St Dev		45	61	25	18	0.114
			CV(%)		103.0%	92.7%	95.0%	104.4%	30.2%
January–April, 2010	16-Jan	Weekend	11:14	11:46	168	192	88	77	0.458
	17-Jan	Weekend	10:15	10:38	33	42	18	14	0.424
	21-Jan	Weekday	10:25	10:40	11	13	12	10	0.909
	23-Jan	Weekend	9:20	9:50	114	145	79	62	0.544
	20-Feb	Weekend	10:27	10:46	34	65	46	24	0.706
	21-Feb	Weekend	10:25	10:55	61	101	38	23	0.377
	05-Mar	Weekday	10:20	10:42	11	19	12	7	0.636
	07-Mar	Weekend	10:27	10:42	15	27	9	5	0.333
	13-Mar	Weekend	10:17	10:42	7	28	4	1	0.143
	16-Mar	Weekday	10:23	10:38	4	4	2	2	0.500
	21-Mar	Weekend	10:17	10:43	12	26	11	5	0.417
	27-Mar	Weekend	10:15	10:44	44	66	18	12	0.273
11-Apr	Weekend	10:10	10:32	69	93	35	26	0.377	
January - April Stratum Summary Statistics			Mean		45	63	29	21	0.469
			St Dev		49	56	28	23	0.198
			CV(%)		108.5%	88.9%	97.2%	113.5%	42.2%
Everett Ramp Closure Period, 2010	30-Jan	Saturday	10:30	11:07	39	68	21	12	0.308
	31-Jan	Sunday	10:32	11:12	40	56	24	17	0.425
	06-Feb	Saturday	10:32	11:00	60	92	26	17	0.283
	13-Feb	Saturday	10:19	10:49	25	38	6	4	0.160
	18-Feb	Thursday	10:20	10:45	24	40	5	3	0.125
Everett Ramp Closure Period Summary Statistics			Mean		38	59	16	11	0.260
			St Dev		15	22	10	7	0.121
			CV(%)		38.8%	37.9%	61.7%	64.2%	46.4%

Table 9-13. Fishery-total estimates of retained and released salmon (*other than Chinook*) in the Area 9 mark-selective Chinook fishery from November 1-30, 2009 and January 16-April 15, 2010. Values may not add exactly due to rounding error.

Stat Week	Est. Retained Salmon				Est. Released Salmon					
	Mark	Coho		Chum	Mark	Coho			Chum	Unk. Salmon
Unmark	Total	Unmark	Unk.		Total					
44	0	0	0	5	0	0	3	3	0	3
45	0	0	0	11	0	0	3	3	0	37
46	0	0	0	11	0	0	3	3	4	21
47	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	32
49	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	3
9	0	0	0	0	0	0	0	0	0	3
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	27	0	0	8	8	4	102
Grand Total Summary Statistics:										
Variance:	0	0	0	353	0	0	16	16	6	2,003
SE:	0	0	0	19	0	0	4	4	3	45
CV:	-	-	-	70.8%	-	-	49.6%	49.6%	63.6%	43.7%
95% CI:	-	-	-	5-63	-	-	3-16	3-16	1-9	15-190

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

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

4) Marine Area 10 Winter Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 10 for the third winter season from October 1, 2009 through January 31, 2010. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 10 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, test fishing, on-water effort surveys, and we distributed and collected voluntary trip reports (VTRs) from the angling public.

Table 10-1 summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2011). In the following section we present results from our monitoring activities during the Area 10 winter selective Chinook fishery from October 1, 2009 through January 31, 2010.

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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish ¹	Catch rates (CPUE); length, age, and CWT composition of harvest ² ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release.	Two weeks ¹	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 ¹ .
On-the-water Surveys (Boat Surveys)	Proportion of total angler effort accessing fishery via sample-frame sites (i.e., site “size measures”) versus out-of-frame sites. Size measures were used to select sites for dockside creel surveys using a probability proportional to size (PPS) site selection process, and to produce total-fishery creel estimates (see WDFW 2011).	Data on spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 2 boat surveys per month boat surveys ($n=8$) were conducted during the four- month fishery.
Test Fishing	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Chinook length, age, and DNA-based ³ stock composition; species composition of non-Chinook encounters	Fish encounter	Season	Season-total test fishery data were used in the estimation of total Chinook encounters by size/mark group and associated impacts; LM = 10.3%, LU = 2.1%, SM = 64.9%, SU = 22.7% (see Table 10-5).
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	Fisher’s Exact test was used to compare the size/mark status proportions of the test fishery data to VTR data. The χ^2 statistic was not significant ($\chi^2 = 9.897$, 6 df; $P = 0.121$), indicating no differences among the samples. However, only the test fishery data were used to estimate the size/mark status proportions needed to produce the estimates (see Tables 10-5 and 10-6).
Overall Fishery Impacts Estimation	Total Chinook encounters and mortalities, by size/mark-status group	Ratios of encounters and mortalities per kept Chinook	N/A	Season	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

¹ To generate weekly catch and effort estimates, the four-day “weekday stratum” estimate was added to the three-day “weekend stratum” estimate for the particular week. The eight-day weekday estimates for each two-week period were split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the $n=2$ days sampled out of $N=8$ available weekdays in the appropriate variance equation (see WDFW 2011).

² The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

³ Though samples were collected, DNA-based estimates of stock composition are not yet available for this fishery.

Table 10-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the winter 2009-10 (October 1, 2009 – January 31, 2010) Area 10 mark-selective fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Oct	40	Oct-01	Oct-04	462	856	3	3	18	4	27
	41	Oct-05	Oct-11	571	1,054	18	0	117	45	179
	42	Oct-12	Oct-18	80	172	4	0	29	11	44
	43	Oct-19	Oct-25	149	287	45	0	292	111	449
	44	Oct-26	Nov-01	198	314	65	0	425	162	651
Nov	45	Nov-02	Nov-08	146	222	61	0	398	152	611
	46	Nov-09	Nov-15	91	183	9	0	57	22	88
	47	Nov-16	Nov-22	3	6	0	0	0	0	0
	48	Nov-23	Nov-29	204	389	29	0	191	73	292
	49	Nov-30	Dec-06	138	260	21	0	136	52	209
Dec	50	Dec-07	Dec-13	117	213	39	0	257	98	395
	51	Dec-14	Dec-20	129	216	14	0	94	36	144
	52	Dec-21	Dec-27	210	386	34	0	225	86	345
	53/1	Dec-28	Jan-03	116	247	9	0	62	24	95
Jan	2	Jan-04	Jan-10	96	174	20	0	129	49	198
	3	Jan-11	Jan-17	78	126	23	0	153	58	234
	4	Jan-18	Jan-24	117	239	0	0	0	0	0
	5	Jan-25	Jan-31	126	216	0	0	0	0	0
Season Total:				3,031	5,560	395	3	2,583	981	3,962
Variance:				44,823	170,457	13879	4	755,582	96817	1,740,111
Standard Error:				212	413	118	2	869	311	1,319
CV (%):				7.0%	7.4%	29.8%	69.5%	33.6%	31.7%	33.3%
95% CI:				2,616-3,446	4,750-6,369	164-626	1-6	880-4,287	371-1,591	1,377-6,548

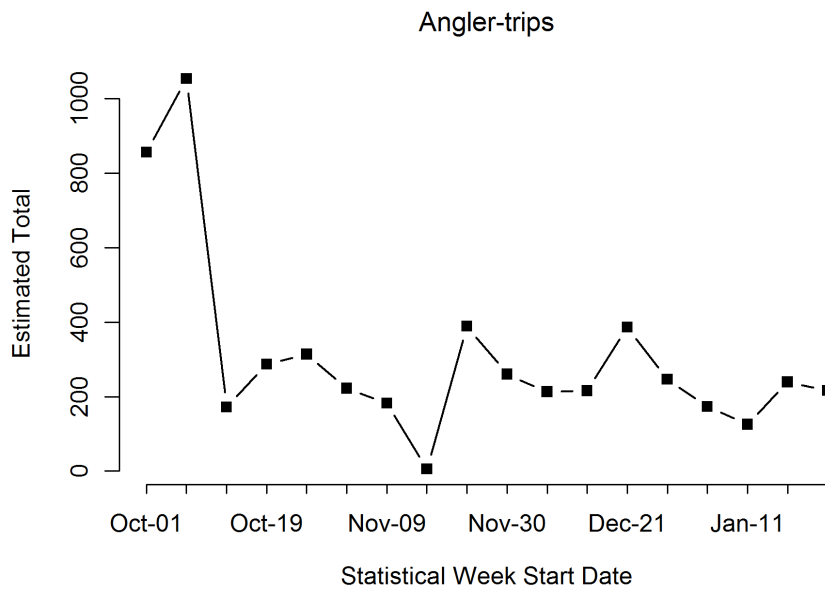


Figure 10-1. Temporal patterns in fishing effort during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010.

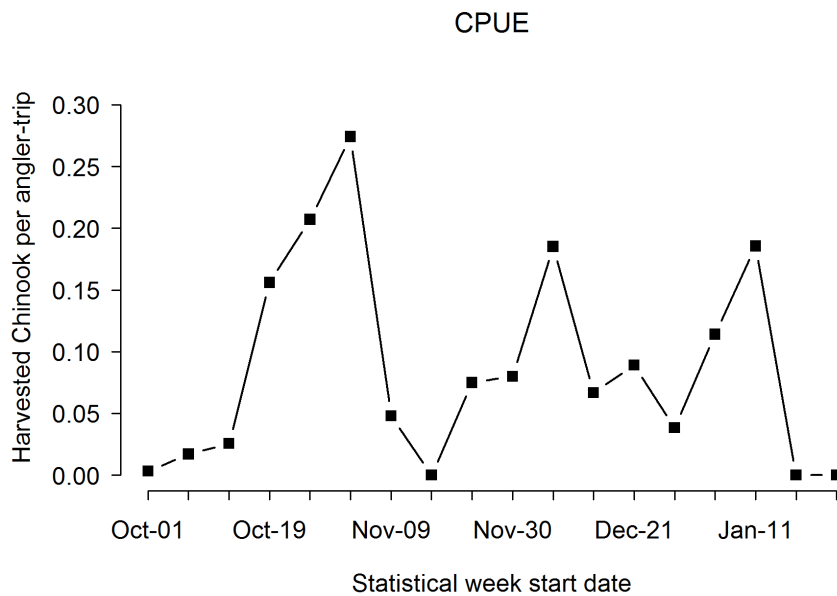


Figure 10-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010.

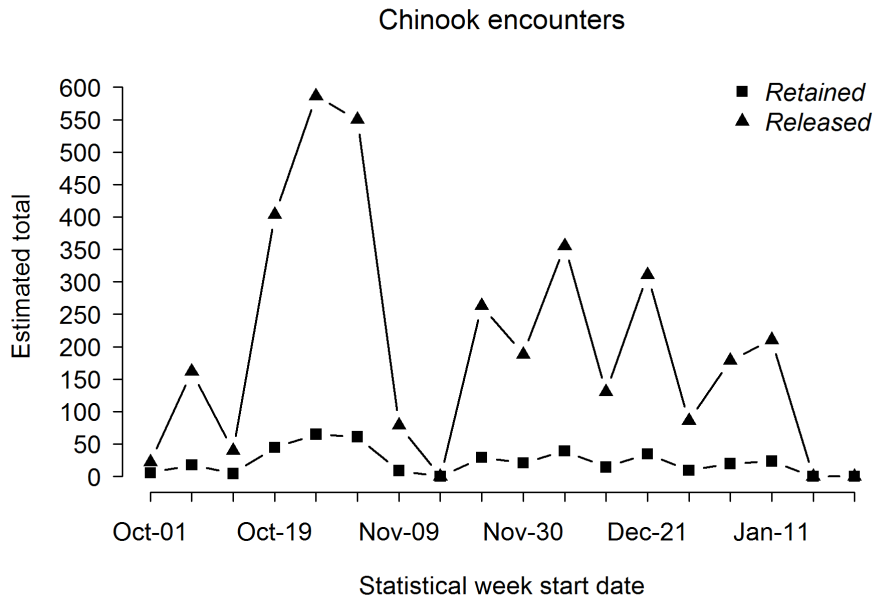


Figure 10-3. Temporal patterns in Chinook encounters (retained and released) during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010.

Table 10-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010.

Mark Type	Number Sampled		Total
	Legal-size	Sublegal-size	
Marked	85	10	95
Unmarked	0	1	1
Total	85	11	96

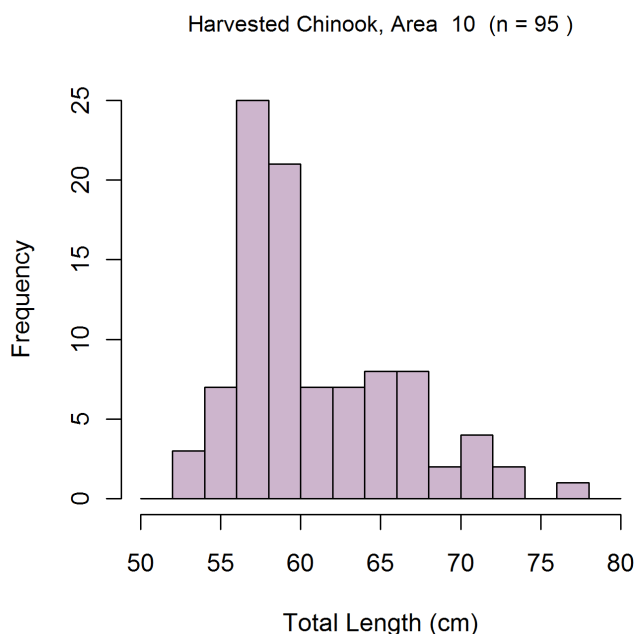


Figure 10-4. Length-frequency distribution for marked Chinook harvested and sampled dockside during the Area 10 mark-selective Chinook fishery from October 1, 2009 – January 31, 2010.

Table 10-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 10 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Location	CWTs Recovered	No. DITs
British Columbia-Fraser R.	Chilliwack River	H-Chilliwack R	1 (9.1%)	1
	Harrison River	H-Chehalis R	1 (9.1%)	
Hood Canal	Purdy Creek	George Adams Hatchery	1 (9.1%)	1
Lower Columbia River	Big Creek	Big Creek (Lwr Col R)	1 (9.1%)	1
		Big Creek Hatchery	1 (9.1%)	1
Puget Sound-Central	Elliott Bay Tribal Net Pen	Keta Creek Hatchery	1 (9.1%)	
	Voight Creek	Voights Cr Hatchery	1 (9.1%)	
Puget Sound-North	Issaquah Creek	Issaquah Hatchery	1 (9.1%)	
	Wallace River	n/a	1 (9.1%)	
	Whitehorse Springs	Whitehorse Pond	1 (9.1%)	
Puget Sound-South	Clear Creek	Clear Creek Hatchery	1 (9.1%)	1
Grand Total			11	5

Table 10-5. Composition of test fishery Chinook encounters and associated mark-rate and size/mark-status proportion estimates the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Variances associated with season-total size/mark status proportions and mark rates are provided in parentheses. AD=adipose fin-clipped (marked); UM=adipose fin intact (unmarked).

Stat Week	Fishing Effort		Legal		Sublegal		Total
	Days	Hours Fished	AD	UM	AD	UM	
40	1	6.8	0	0	3	1	4
41	5	23.4	3	2	34	10	49
42	5	25.5	1	0	31	7	39
43	4	22.6	3	1	16	10	30
44	3	12.1	3	1	18	12	34
45	3	17.4	2	0	9	2	13
46	3	16.8	4	0	8	7	19
47	1	4.0	0	0	2	0	2
48	3	18.3	4	0	21	3	28
49	5	19.6	3	1	39	14	57
50	5	17.7	9	1	23	8	41
51	4	18.0	3	0	10	3	16
52	3	14.5	2	1	3	5	11
53/1	3	14.6	1	0	19	2	22
2	5	27.6	3	1	29	4	37
3	4	16.5	2	0	6	7	15
4	2	8.7	0	0	1	0	1
5	3	13.8	0	1	0	0	1
Total	62	297.9	43	9	272	95	419
Size/mark-status composition: 0.103 (0.0002) 0.021 (0.0001) 0.649 (0.0005) 0.227 (0.0004) Legal size mark rate: 0.83 (0.0028) Overall mark rate: 0.75 (0.0004)							

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

Data source	Effort & Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
Charter Boat VTR	7 1-trip VTRs, 26 Angler Trips	8	5	44	14	71	73.2%	61.5%
	Size/mark-status comp.:	0.113	0.070	0.620	0.197			
	Variance:	(0.00143)	(0.00094)	(0.00337)	(0.00226)			
Private Boat VTR	27 1-trip VTRs, 37 Angler Trips	15	12	123	38	188	73.4%	55.6%
	Size/mark-status comp.:	0.080	0.064	0.654	0.202			
	Variance:	(0.00039)	(0.00032)	(0.00121)	(0.00086)			
Pooled data	34 1-trip VTRs, 63 Angler Trips	23	17	167	52	259	73.4%	57.5%
	Size/mark-status comp.:	0.089	0.066	0.645	0.201			
	Variance:	(0.00031)	(0.00024)	(0.00089)	(0.00062)			

Fisher’s Exact test was used to compare the size/mark status proportions of the test fishery data to VTR data from each source. The χ^2 statistic was not significant ($\chi^2 = 9.897$, 6 df; $P = 0.121$), indicating no differences among the three samples. However, only the test fishery data were used to estimate the size/mark status proportions needed to produce the estimates.

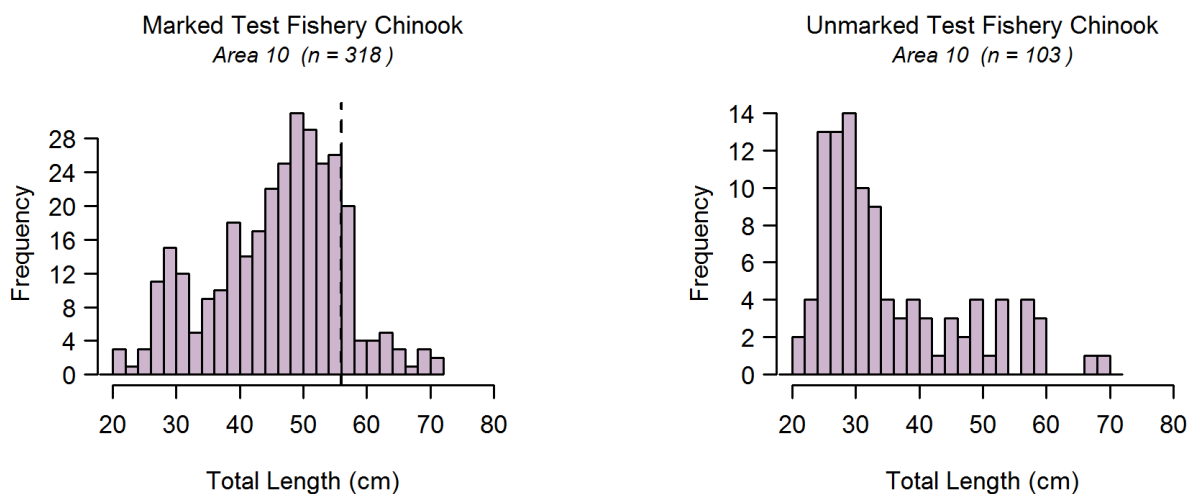


Figure 10-5. Length-frequency distributions of marked (left panel) and unmarked (right panel) Chinook encountered by test fishers during the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. The dashed vertical line in the marked Chinook plot corresponds to the legal size limit (22 in or 56 cm).

Table 10-7. Summary of season-wide fishery impact estimates for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

Total Encounters (E): 3,962 V(E): 1,740,111										
Size/mark group	Chinook Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	407	354	53	0.15	8	362	11,988	109	147 - 576	30
Legal unmarked	85	2	83	0.15	12	15	37	6	40264	41
Sublegal marked	2,572	42	2,531	0.20	506	548	29,945	173	209 - 887	32
Sublegal unmarked	898	0	898	0.20	180	180	3,812	62	59 - 301	34
All groups combined	3,962	398	3,564		706	1,104	45,782	214	685 - 1524	19

Table 10-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	3,943	748	3,195	45
	Mark.	9,411	1,996	7,415	1,736
	Total	13,354	2,744	10,610	1,781
	% Mark.	71	73	70	98
Estimated (Creel) Encounters	Unmark.	984	85	898	3
	Mark.	2,979	407	2,572	395
	Total	3,962	492	3,471	398
	% Mark.	75	83	74	99

Table 10-9. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	791	3,345	4,136	195	909	1,104
Released Legal	107	126	233	12	8	20
Released Sublegal	639	1,483	2,122	180	506	686
Landed Only	45	1,736	1,781	3	395	398

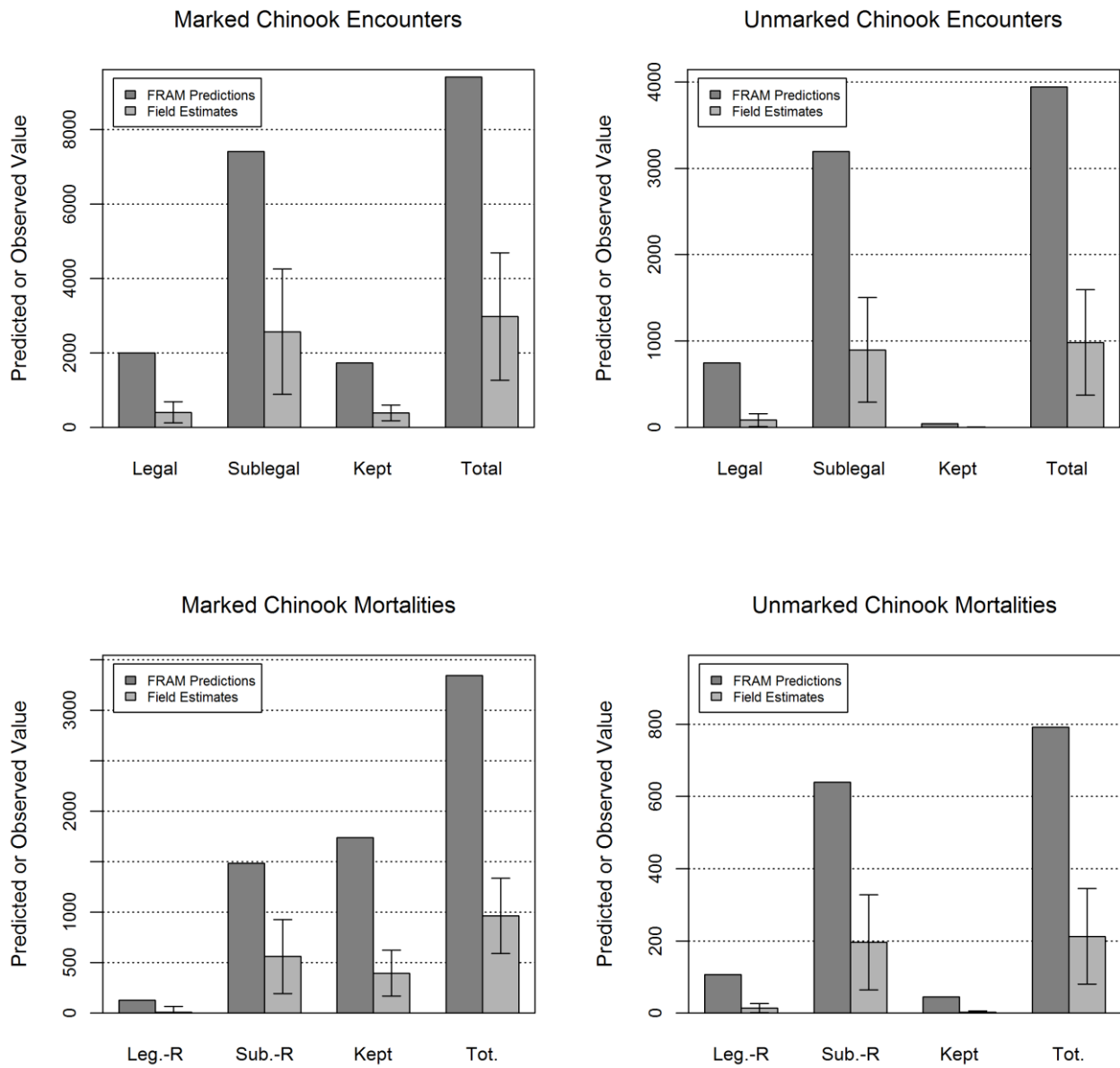


Figure 10-6. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

Table 10-10. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 10 October 1, 2009 - January 31, 2010 mark-selective Chinook fishery.

Hatchery	Brood Year	DIT's Obs'd	AD DIT Harvest		UM DIT Enc	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(est.)
Clear Creek Hatchery	2007	1	5.4	23.4	5.4	0.5	0.2	0.5
George Adams Hatchery	2006	1	3.6	9.6	3.6	0.4	0.1	0.3
Chilliwack River Hatchery	2007	1	0.0	0.0	5.4	0.5	0.2	0.5
Big Creek Hatchery (Lwr Col R)	2006	2	7.3	19.1	7.3	0.2	0.2	0.6
TOTAL		5	16.3	52.1	21.7	1.6	0.8	1.9

Table 10-11. Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010.

Time period			Estimated Retained Chinook				Number Retained Chinook Sampled ^{1/}				Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmark	Unk.	Total	Marked	Unmark	Unk.	Total	
October	40-44	Oct 1 - Nov 1	135	3	0	138	37	1	0	38	27.5%
November	45-48	Nov 2 - Nov 29	99	0	0	99	24	0	0	24	24.2%
December	49-53/1	Nov 30 - Jan 3	118	0	0	118	22	0	0	22	18.6%
January	2-5	Jan 4 - Jan 31	43	0	0	43	12	0	0	12	27.9%
Season Total			395	3	0	398	95	1	0	96	24.1%

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

Table 10-12. Fishery-total estimates of retained and released salmon (*other than Chinook*) for the Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010. Values may not add exactly due to rounding error.

Stat Week	Est. Effort		Est. Retained Salmon				Est. Released Salmon						
	Boats	Anglers	Coho			Chum	Coho				Pink	Cutthroat Trout	Unk. Salmon
			Mark	Unmark	Total		Mark	Unmark	Unk.	Total			
40	462	856	98	146	244	5	34	4	104.8	143	3	0	270
41	571	1054	32	41	72	29	4	8	27	39	0	33	643
42	80	172	0	0	0	15	0	6	4	11	0	0	9
43	149	287	0	3	3	0	0	3	11	14	0	0	158
44	198	314	3	0	3	2	3	8	0	11	0	0	118
45	146	222	0	0	0	0	0	0	0	0	0	0	66
46	91	183	0	0	0	0	0	0	0	0	0	0	0
47	3	6	0	0	0	0	0	0	0	0	0	0	0
48	204	389	0	0	0	0	3	0	0	3	0	0	11
49	138	260	0	0	0	0	4	0	0	4	0	0	0
50	117	213	0	0	0	0	0	0	0	0	0	0	0
51	129	216	3	0	3	0	0	0	0	0	0	0	0
52	210	386	0	0	0	0	0	0	2	2	0	0	31
53	67	141	0	0	0	0	0	0	0	0	0	0	6
1	49	106	0	0	0	0	0	4	0	4	0	0	0
2	96	174	0	0	0	0	0	0	0	0	0	0	0
3	78	126	0	0	0	0	0	0	0	0	0	0	0
4	117	239	0	0	0	0	0	0	0	0	0	0	0
5	126	216	0	0	0	0	0	0	0	0	0	0	0
Total	3,031	5,560	136	190	325	51	48	34	149	230	3	33	1,312
Grand Total Summary Statistics:													
Variance:	224,703	1,080,790	1,100	1,250	2,250	415	318	120	2,130	2,567	5	996	65,048
SE:	474	1,040	33	35	47	20	18	11	46	51	2	32	255
CV:	15.6%	18.7%	24.4%	18.7%	14.6%	39.9%	37.2%	32.5%	31.0%	22.0%	72.2%	95.7%	19.4%
95% CI:	2,102-3,960	3,522-7,597	71-201	120-259	232-418	11-91	13-83	12-55	58-239	131-330	1-7	3-95	812-1,811

Table 10-13. Summary of the total number of anglers intercepted in Area 10 during on-the-water surveys from October 1, 2009 – January 31, 2010. Grayed cells represent sites included in the dockside sample frame. See WDFW 2011 for detailed methods descriptions on calculating Area 10 site size measures during the Tengu Derby period (Tengu Derby is on Sundays only, extending from the last Sunday in October through last Sunday in December).

Site Name	Total Anglers (less 'Tengu' Armeni Ramp anglers)	Season Total (unadjusted) Size Measure	Total Anglers (with 'Tengu' Armeni Ramp anglers)	Season Total (unadjusted) Size Measure
1st Ave South Ramp	2	0.003	3	0.004
Armeni Ramp	106	0.176	180	0.244
Bay Marina (Miller Bay)	0	0.000	0	0.000
Bayside	2	0.003	4	0.005
Blake Island	1	0.002	1	0.001
Bremerton	2	0.003	2	0.003
Brownsville Marina	5	0.008	5	0.007
Brownsville Ramp	27	0.045	27	0.037
Camano Is St Park			2	0.003
Des Moines Marina	5	0.008	5	0.007
Eagle Harbor Ramp	2	0.003	6	0.008
Edmonds Marina	37	0.061	37	0.050
Edmonds Marina Dry Storage	45	0.075	50	0.068
Edmonds Sling	13	0.022	13	0.018
Elliott Bay Marina	12	0.020	14	0.019
Everett Marina	0	0.000	0	0.000
Everett Ramp (Norton)	5	0.008	5	0.007
Harbor Island	3	0.005	3	0.004
Harper Ramp	0	0.000	0	0.000
Jacobsen's Dry Stack	2	0.003	2	0.003
Kingston Public	52	0.086	55	0.075
Kingston Wet	12	0.020	12	0.016
Lake Union	3	0.005	3	0.004
Liberty Bay	0	0.000	0	0.000
Manchester	51	0.085	67	0.091
Miller Bay	0	0.000	0	0.000
Mukilteo Ramp	0	0.000	0	0.000
Narrows Marina	0	0.000	0	0.000
Point Defiance Ramp	0	0.000	0	0.000
Port Madison Marina	0	0.000	0	0.000
Port Orchard Marina	0	0.000	0	0.000
Port Orchard Ramp	5	0.008	5	0.007
Poulsbo Marina	4	0.007	4	0.005
Private Buoy/moorage	16	0.027	18	0.024
Redondo ramp	0	0.000	0	0.000
Sandy Hook (Cultus Bay)	0	0.000	0	0.000
Seacrest Boat House	0	0.000	6	0.008
Shilshole Marina	24	0.040	24	0.033
Shilshole Ramp	160	0.266	178	0.242
Southpark	2	0.003	2	0.003
Southworth	2	0.003	2	0.003
Winslow Ramp	2	0.003	2	0.003
Yukon Harbor Ramp	0	0.000	0	0.000
Total Anglers	602	1.000	737	1.000

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

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

5) Marine Area 11 Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 11 for the first time during the winter season from February 1 through April 30, 2010. WDFW's Puget Sound Sampling Unit (PSSU) implemented an intensive monitoring program in Area 11 throughout the season in order to collect the data needed to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. Sampling activities included dockside creel sampling, on-the-water effort surveys, and collecting and distributing voluntary trip reports (VTRs) from the angling public. **Table 11-1** summarizes the parameters estimated and the sampling activities associated with each parameter. Specific procedures used for collecting these data and estimating critical data parameters are presented in detail in our separate Methods Report (WDFW 2011). In this section we present results from our monitoring activities during the Area 11 winter selective Chinook fishery from February 1 through April 30, 2010.

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

Activity	Focal Parameter(s)	Secondary Parameter(s)	Sample Unit(s)	Finest Estimation Time Step	Comments
Dockside Creel Sampling	Fishing effort (boat & angler trips); kept and released fish ¹	Catch rates (CPUE); length, age, and CWT composition of harvest ² ; collection of angler fishing methods.	Angler trip; kept fish; reported fish release	Two weeks ¹	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 ¹ .
On-the-water Surveys (Boat Surveys)	Proportion of total angler effort accessing fishery via sample-frame sites (i.e., site “size measures”) versus out-of-frame sites. Size measures were used to select sites for dockside creel surveys using a probability proportional to size (PPS) site selection process, and to produce total-fishery creel estimates (see WDFW 2011).	Data on spatial distribution of recreational fishing boats in the area.	Boats and anglers	Month	A total of 2 boat surveys per month ($n=6$) were conducted during the three-month fishery.
Voluntary Trip Reports (VTRs)	Size (legal/sublegal) and mark-status composition (marked, unmarked) of encountered Chinook	Encounter data for non-Chinook species (e.g., coho) that the angler may record on the VTR form	Fish encounter	Season (3 months)	VTR data were used in the estimation of total Area 11 Chinook encounters by size/mark group (LM=62.5%, LU=14.3%, SM=21.4%, SU=1.8%) and associated impacts (see Table 11-5).
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 (3 months)	Estimated on a monthly time step but considered at the season-total level.
Coded-wire tag (CWT) Impacts Estimation	Marked/unmarked double-index tag (DIT) encounters and mortalities	N/A	N/A	Season (3 months)	The temporal resolution of DIT impacts is constrained by the total number of tags recovered.

¹ To generate weekly catch and effort estimates, the four-day “weekday stratum” estimate was added to the three-day “weekend stratum” estimate for the particular week. The eight-day weekday estimates for each two-week period were split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the $n=2$ days sampled out of $N=8$ available weekdays in the appropriate variance equation (see WDFW 2011).

² The length and CWT composition of landed catch was assessed on a season-wide basis for impact estimation.

Table 11-2. Estimates of total fishing effort and total salmon catch (harvest and reported releases) during the February 1, 2010 – April 30, 2010 Area 11 mark-selective Chinook fishery. Values may not add exactly due to rounding error. AD = marked (i.e., adipose-clipped), UM = unmarked, UNK = unknown mark status.

Month	Stat Week	Start Date	End Date	Est. Effort		Est. Retained Chinook		Est. Released Chinook		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
Feb	6	Feb-01	Feb-07	205	341	32	0	16	9	56
	7	Feb-08	Feb-14	206	331	49	0	24	14	87
	8	Feb-15	Feb-21	213	400	12	0	6	4	22
	9	Feb-22	Feb-28	290	183	23	0	11	6	40
Mar	10	Mar-01	Mar-07	157	272	17	0	8	5	30
	11	Mar-08	Mar-14	134	227	9	3	4	0	16
	12	Mar-15	Mar-21	124	224	4	0	2	1	6
	13	Mar-22	Mar-28	102	158	23	0	11	7	41
	14	Mar-29	Apr-04	37	72	14	0	7	4	25
Apr	15	Apr-05	Apr-11	87	169	21	0	10	6	37
	16	Apr-12	Apr-18	174	261	53	0	26	15	95
	17	Apr-19	Apr-25	239	356	56	0	28	16	100
	18	Apr-26	Apr-30	67	103	14	0	7	4	24
Season Total:				2,034	3,096	326	3	161	90	580
Variance:				35,090	70,049	2,892	3	5,970	1,095	12,948
Standard Error:				187	265	54	2	77	33	114
CV (%):				9.2%	8.5%	16.5%	64.1%	48.0%	36.6%	19.6%
95% CI:				1,667-2,401	2,578-3,615	220-431	1-6	9-312	26-155	357-803

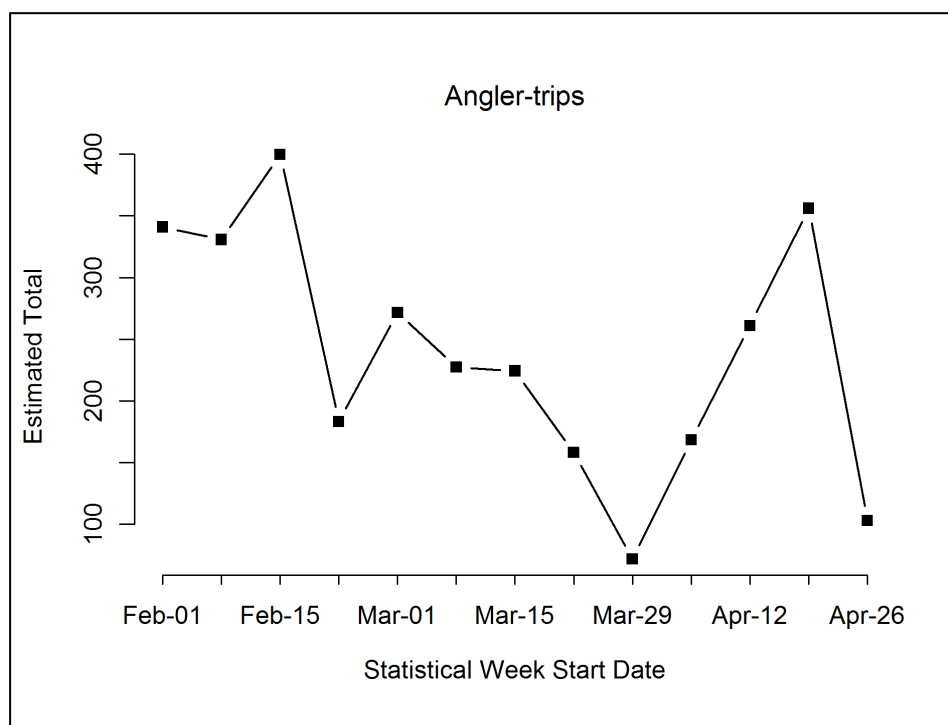


Figure 11-1. Temporal patterns in fishing effort during the Area 11 winter mark-selective Chinook fishery from February 1 – April 30, 2010.

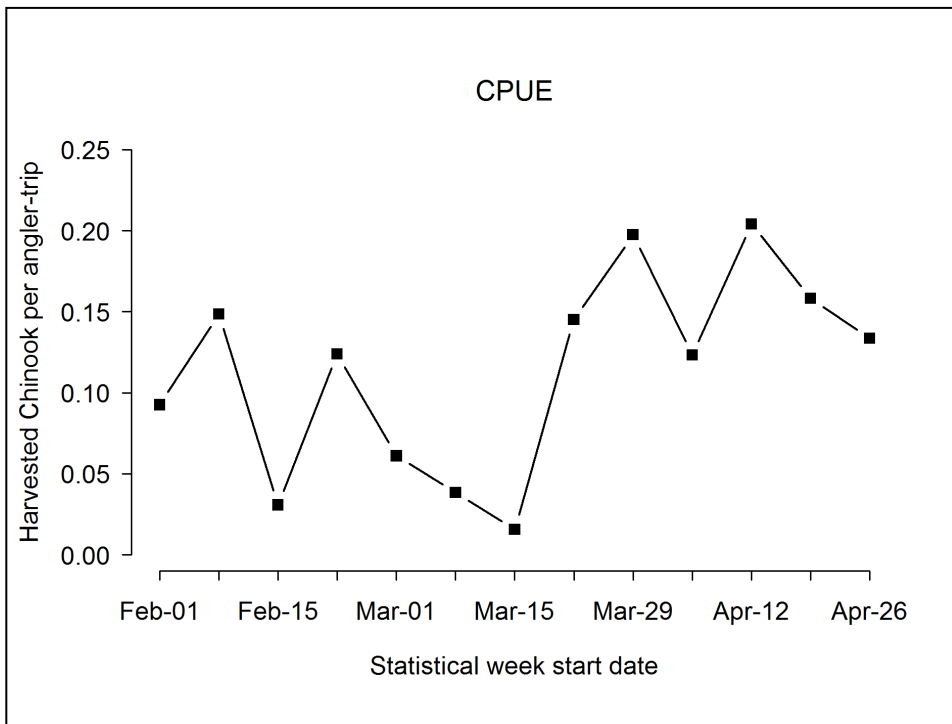


Figure 11-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Areas 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

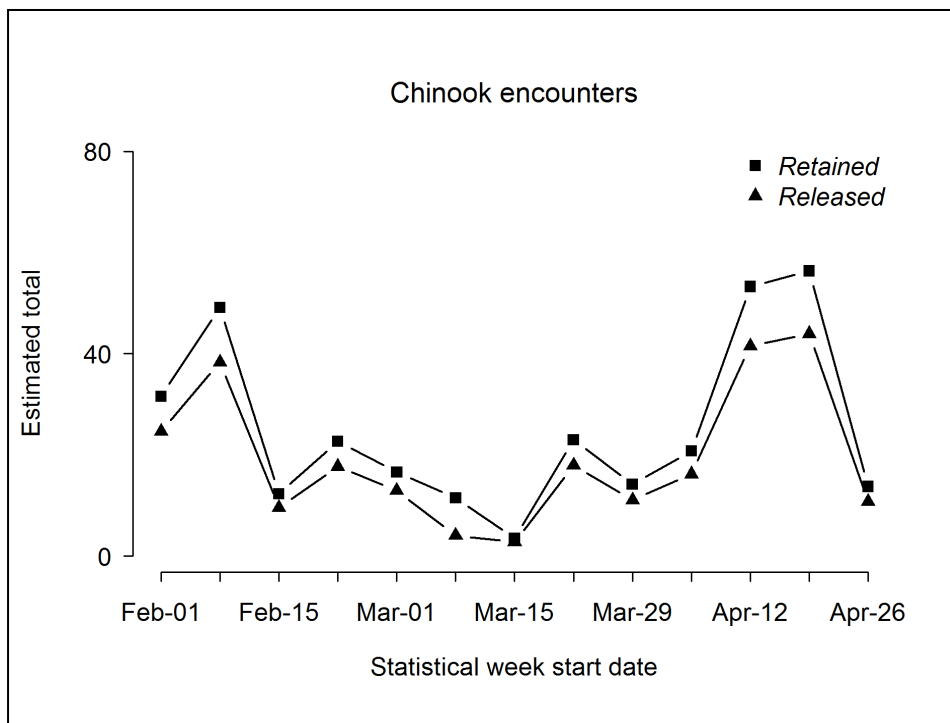


Figure 11-3. Temporal patterns in Chinook encounters (retained and released) during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

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

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
11	Marked	90	3	93
	Unmarked	0	0	0
	Undetermined	0	0	0
Total		90	3	93

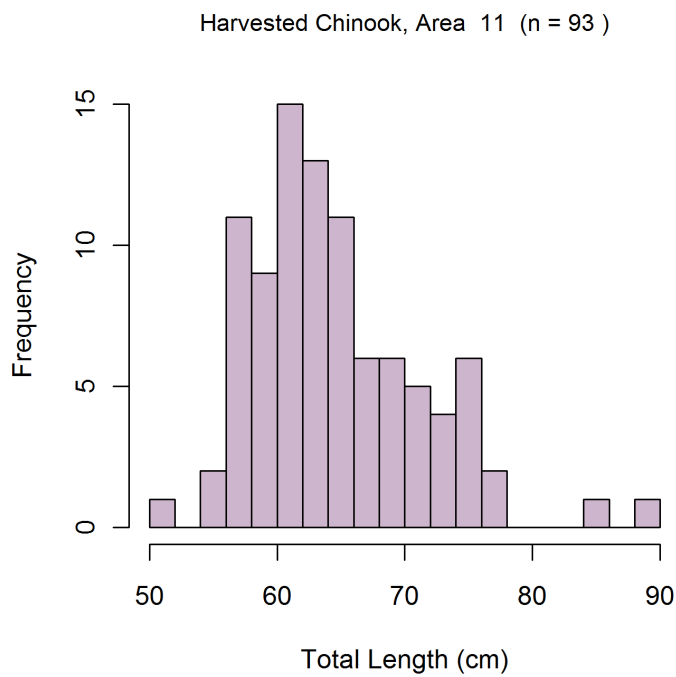


Figure 11-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

Table 11-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 11 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region ^{1/}		Release Site	Rearing Location	CWTs Recovered	No. DITs
Washington	Hood Canal	Purdy Creek	George Adams Hatchery	1	1
		Ricks Pond (LLTK)		1	
	Puget Sound-Central	Grovers Creek Hatchery	Grovers Creek Hatchery	1	
	Puget Sound-North	Whitehorse Springs	Whitehorse Pond	2	
	Puget Sound-South	Chambers Creek	Garrison Hatchery	1	
Grand Total				6	1
^{1/} Unofficial release regions. Puget Sound regions were designated based on the WDFW marine catch area containing the river/stream network where juvenile releases originated (i.e., Areas 11 and 13 = South; Areas 9 and 10 = Central; and Areas 7, 8-1, and 8-2 = North).					

Table 11-5. Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the February 1 – April 30, 2010 Area 11 mark-selective Chinook fishery, with estimates of legal-size and overall mark rates. AD = Adipose fin-clipped (marked); UM = Unmarked.

Data source	Effort & Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	38 1-trip VTRs, 63 Angler Trips	35	8	12	1	56	83.9%	81.4%
Size/mark-status composition:		0.625	0.143	0.214	0.018			
Variance:		(0.00426)	(0.00223)	(0.00306)	(0.00032)			

Table 11-6. Summary of season-wide fishery impact estimates for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. Values may not add up perfectly due to rounding error.

Total Encounters (E): 580 V(E): 12,948										
Size/mark group	Encounters	No. Retained	No. Rel'd	Rel. Mort. Rate	Rel. Mort.	Total Mortality	Var	SE	95% CI	CV (%)
Legal marked	362	315	47	0.15	7	322	2,950	54	216 - 429	17
Legal unmarked	83	3	80	0.15	12	15	25	5	40323	34
Sublegal marked	124	11	114	0.20	23	33	103	10	13 - 53	31
Sublegal unmarked	10	0	10	0.20	2	2	4	2	-8	100
All groups combined	580	329	251		44	373	3,083	56	264 - 481	15

Table 11-7. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery.

Data Source	Group	Total Encounters	Legal	Sublegal	Landed Only
FRAM Encounters	Unmark.	578	118	460	7
	Mark.	1,804	314	1,490	274
	Total	2,382	432	1,950	281
	% Mark.	76	73	76	98
Estimated (Creel) Encounters	Unmark.	93	83	10	3
	Mark.	487	362	124	326
	Total	580	445	135	329
	% Mark.	84	81	92	99

Table 11-8. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook mortalities for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery.

Mortality Category	FRAM Chinook Mortalities			Estimated Chinook Mortalities		
	Unmark.	Mark.	Total	Unmark.	Mark.	Total
Total (Landed + Released)	116	592	708	17	356	373
Released Legal	17	20	37	12	7	19
Released Sublegal	92	298	390	2	23	25
Landed Only	7	274	281	3	326	329

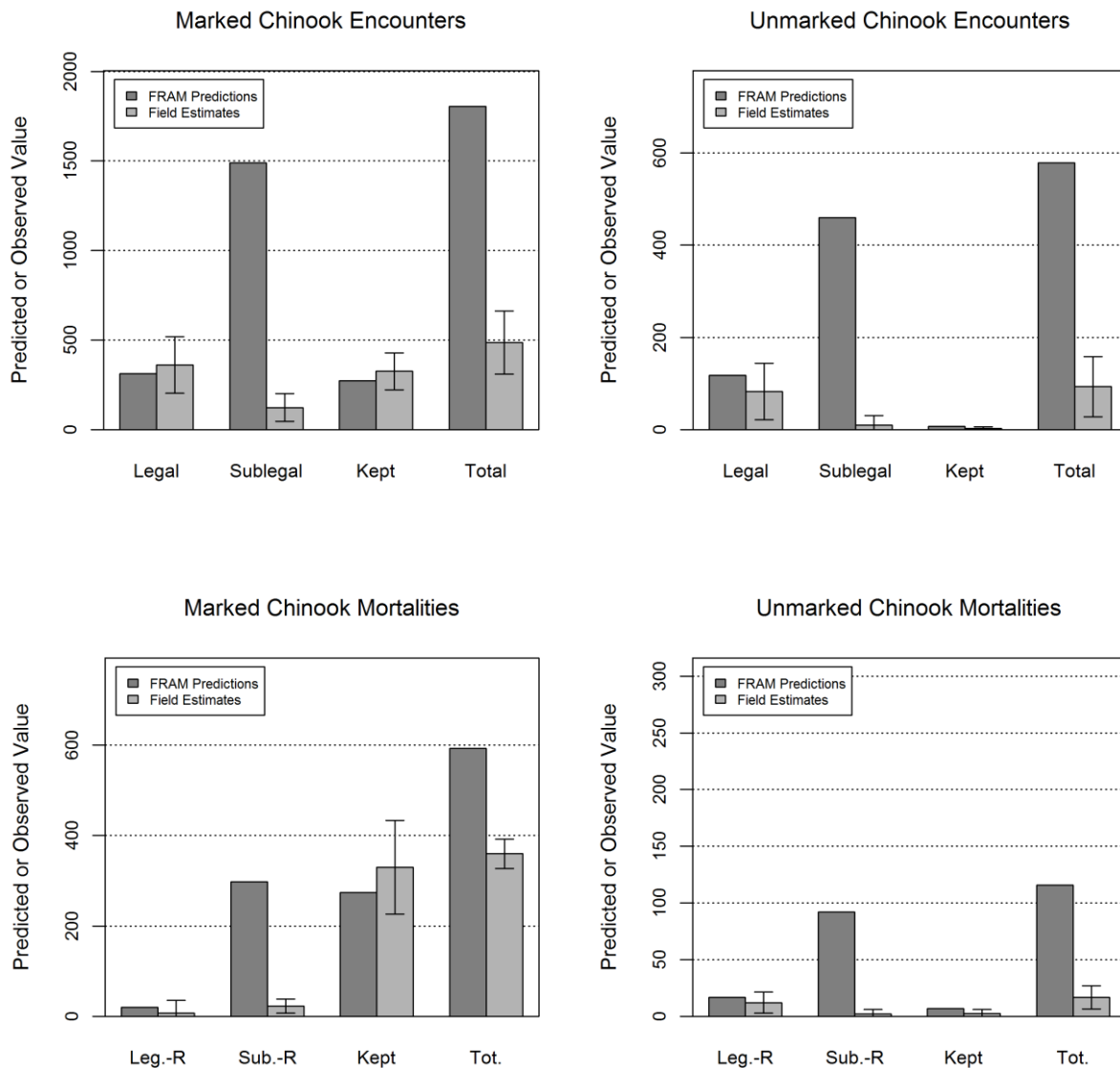


Figure 11-5. Comparison of modeled (i.e., using FRAM, model run 2309) and estimated total Chinook encounters and mortalities for the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery. Error bars represent approximate 95% confidence intervals for field estimates.

Table 11-9. Summary of double-index tagged (DIT) Chinook kept by anglers, and estimated total mortality of unmarked DIT Chinook due to hook-and-release impacts resulting from the Area 11 February 1 – April 30, 2010 mark-selective Chinook fishery.

Hatchery	Brood Year	DIT's Obs'd	AD DIT Harvest		UM DIT Enc.	UM DIT Mortality		
			Est.	var(Est.)		Est.	var(Est.)	SE(est.)
George Adams Hatchery	2006	1	4.2	13.1	4.2	0.4	0.1	0.4
TOTAL		1	4.2	13.1	4.2	0.4	0.1	0.4

Table 11-10. Monthly sample rates (Total retained Chinook sampled / Estimated retained Chinook) in the winter Area 11 mark-selective Chinook fishery from February 1 – April 30, 2010.

Time period			Estimated Retained Chinook				Number of Chinook sampled				Sample Rate
Month	Stat. Weeks	Dates	Marked	Unmark	Unk	Total	Marked	Unmark	Unk.	Total	
February	6-9	Feb 1 - Feb 28	116	0	0	116	39	0	0	39	33.6%
March	10-13	Mar 1 - Mar 28	53	3	0	56	16	0	0	16	28.6%
April	14-18	Mar 29 - Apr 30	158	0	0	158	38	0	0	38	24.1%
Season Total			327	3	0	330	93	0	0	93	28.2%

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

Area	Season Dates	Effort (Angler Trips)	Retained Chinook				Released Chinook				Total Encounters
			LM	LU	SM	SU	LM	LU	SM	SU	
11	February 1 - April 30, 2010	3,096	315	3	11	0	47	80	114	10	580

6) Marine Area 12 Mark-Selective Chinook Fishery

The Washington Department of Fish and Wildlife (WDFW) implemented a mark-selective Chinook fishery (MSF) in Marine Area 12 for the first time during the winter season from February 1 through April 30, 2010. Data collection methods used to monitor the Area 12 mark-selective Chinook fishery included dockside angler interviews (with catch sampling) and voluntary trip reports provided by private anglers. From these activities, we were able to estimate catch rates (i.e., CPUE), mark rates (based on VTRs), and landed-catch composition (age, length, and CWT). Additionally, we described relative catch and effort patterns over the three-month (February 1 – April 30, 2010) season based on the assumption that baseline-sampling observations of these parameters are good indicators of associated fishery-wide trends.

WDFW dockside samplers conducted “Baseline Sampling” at selected Area 12 access sites during the 2010 Area 12 winter mark-selective Chinook fishery. Complete details of the Baseline Sampling methods are presented in a separate Methods Report (WDFW 2011). Briefly, Baseline Sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sample effort. The Area 12 baseline sample frame included 13 different access sites (**Table 12-1**), each of which was visited on an average of 16 days during the three-month season. Site visits ranged from short (e.g., “no effort” samples) to full-day (8+ hours) sampling events. When present, samplers interviewed all anglers exiting the Area 12 fishery at the selected access site. The interview and catch-sampling procedures employed in Area 12 were identical to those used in other mark-selective fisheries. Thus, Area 12 samplers acquired information about: 1) angling effort (boat and angler trips, trip length), 2) encounters composition (retained and/or released) by species and mark status (marked vs. unmarked, Chinook and coho salmon only), and 3) landed Chinook size (fork and total length) and age (scales were collected and ultimately read) composition. Samplers also inspected landed Chinook and coho salmon for CWTs using wand detectors and acquired snouts when tags were present; resulting tag data were used to estimate the CWT-based composition (unexpanded) of landed catch.

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

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

Table 12-1. List of sites sampled, with the number of sampling events (site-days) during the Area 12 winter mark-selective Chinook fishery, February 1 through April 30, 2010.

Location	Number Site-Days Sampled per Month			Total Site-Days	% of Total
	Feb	Mar	Apr		
Hood Canal Public Ramp (Tacoma Light)	11	12	13	36	17.2%
Kingston Public Ramp	1	1	0	2	1.0%
Misery Point Ramp	16	21	17	54	25.8%
Pleasant Harbor Boat Ramp (WDFW)	8	13	14	35	16.7%
Point Whitney Ramp	0	0	1	1	0.5%
Quilcene Bay Ramp	0	0	9	9	4.3%
Salisbury County Park Ramp	6	13	15	34	16.3%
Tahuya Ramp	2	2	0	4	1.9%
Termination Point Ramp	0	0	2	2	1.0%
Triton Cove State Park	3	8	10	21	10.0%
Twanoh State Park	3	0	0	3	1.4%
Tyee Marina/Ramp	0	1	0	1	0.5%
Union Ramp	6	1	0	7	3.3%
Grand Total	56	72	81	209	100.0%

Table 12-2. Observations of fishing effort, salmon harvest, and reported salmon releases, by week, for the Area 12 February 1-April 30, 2010 mark-selective Chinook fishery. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates. AD = marked (i.e., adipose-clipped), UM = unmarked, UK = unknown mark status.

Month	Stat Week	Start Date	End Date	Effort		Retained Chinook		Other Species Kept		Released Chinook			Other Species Released				
				Boats	Anglers	AD	UM	AD Coho	UM Coho	AD	UM	UK	Ad Coho	UM Coho	UK Coho	Cutthroat Trout	Unknown Salmon
Feb	6	1-Feb	7-Feb	60	113	21	0	0	0	25	5	11	0	0	0	0	1
	7	8-Feb	14-Feb	92	214	33	0	0	0	29	14	20	0	0	1	0	3
	8	15-Feb	21-Feb	16	34	6	0	0	0	7	4	2	0	0	0	0	0
	9	22-Feb	28-Feb	36	70	8	0	0	0	9	3	6	0	0	0	0	0
Mar	10	1-Mar	7-Mar	91	201	36	0	0	0	46	5	32	0	0	0	0	0
	11	8-Mar	14-Mar	14	27	7	0	0	0	8	1	9	0	0	0	0	0
	12	15-Mar	21-Mar	20	36	5	0	0	0	8	6	6	0	0	0	0	0
	13	22-Mar	28-Mar	11	20	1	0	0	0	0	1	1	0	0	0	3	0
Apr	14	29-Mar	4-Apr	3	3	0	0	0	0	0	0	1	0	0	0	0	0
	15	5-Apr	11-Apr	5	9	0	0	0	0	0	0	0	0	0	0	0	0
	16	12-Apr	18-Apr	17	27	2	0	0	0	0	0	0	0	0	0	0	0
	17	19-Apr	25-Apr	9	12	3	0	0	0	0	0	9	0	0	0	0	0
	18	26-Apr	30-Apr	1	2	0	0	0	0	0	0	0	0	0	0	18	0
Season Total:				375	768	122	0	0	0	132	39	97	0	0	1	21	4

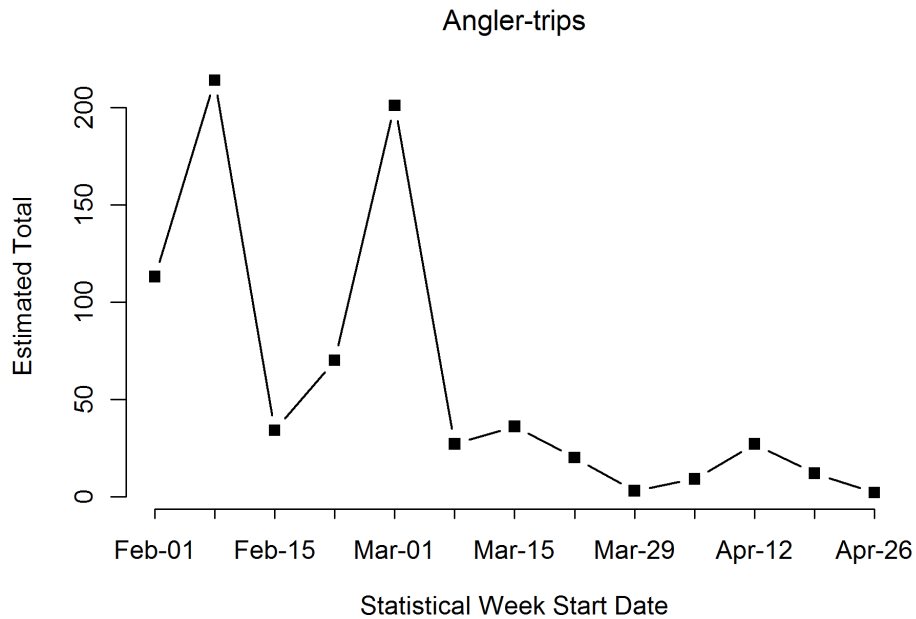


Figure 12-1. Temporal patterns in fishing effort by week during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.

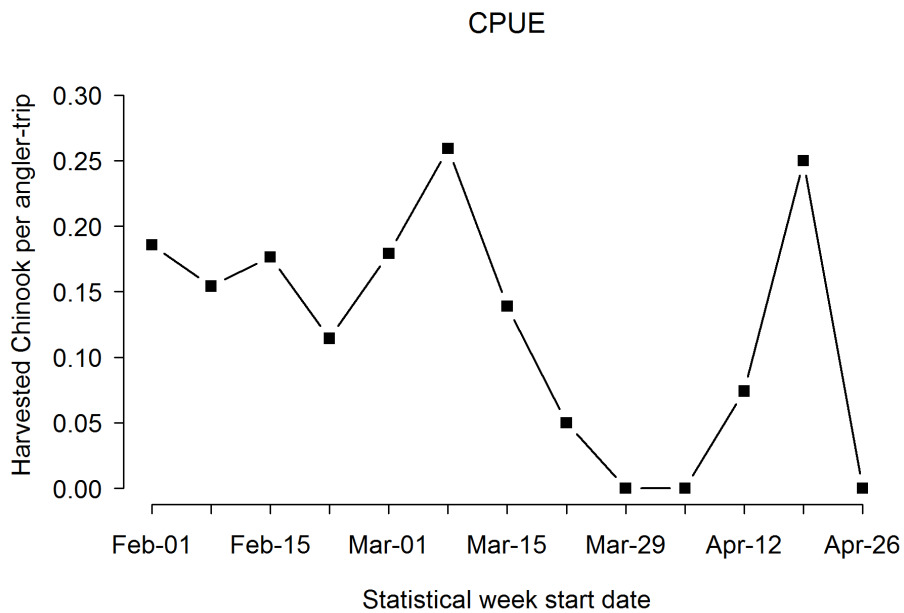


Figure 12-2. Temporal patterns in CPUE (landed Chinook per angler trip) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.

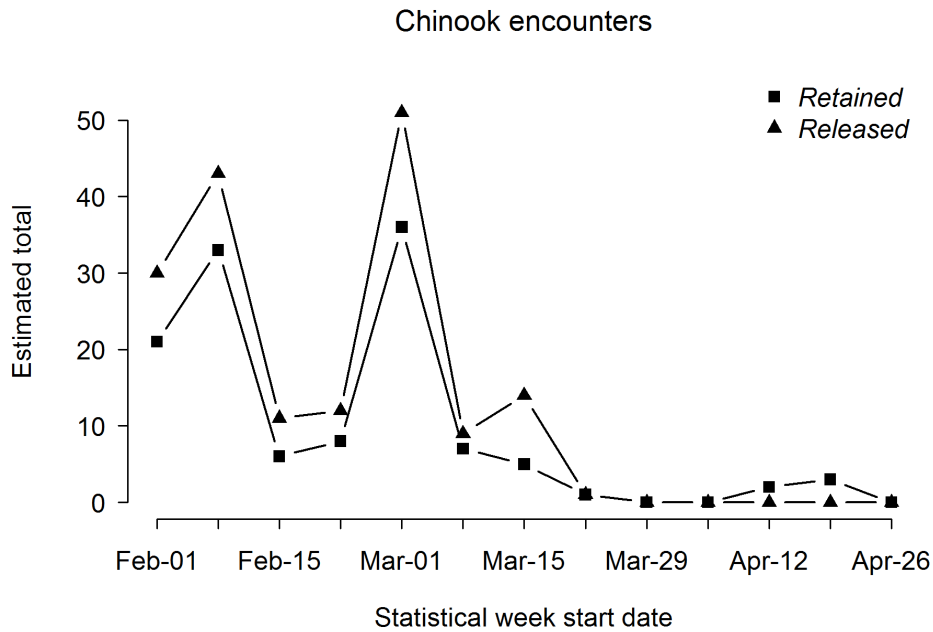


Figure 12-3. Temporal patterns in Chinook encounters (retained and released) during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010. Note: displayed values are sample observations (i.e., summed across sampled sites) and not fishery-total estimates.

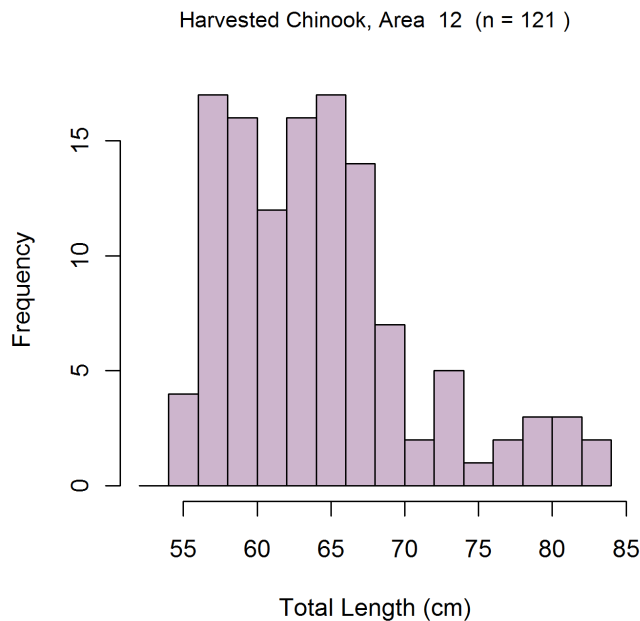


Figure 12-4. Length-frequency distribution for marked Chinook harvested and sampled at dockside during the Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010.

Table 12-3. Summary of total length samples collected from retained Chinook during dockside angler interviews in the winter Area 12 mark-selective Chinook fishery from February 1 – April 30, 2010.

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
12	Marked	117	4	121
	Unmarked	0	0	0
Total		117	4	121

Table 12-4. Summary of coded-wire tags recovered from Chinook salmon harvested during the winter 2009-10 Area 12 mark-selective Chinook fishery. The field “No. DITs” corresponds to the number of tags that belonged to double-index tag groups.

Release Region	Release Site	Rearing Hatchery	CWTs Recovered	No. DITs
Hood Canal	Finch Creek	Hoodspout Hatchery	4 (18.2%)	
	John Creek	Regional Fisheries Enhancement Group 6-Hood Canal	1 (4.5%)	
	Purdy Creek	George Adams Hatchery	6 (27.3%)	6
	Ricks Pond (LLTK)	George Adams Hatchery	3 (13.6%)	
Puget Sound-North	Friday Creek	Samish Hatchery	4 (18.2%)	4
	Whitehorse Springs	Whitehorse Pond	1 (4.5%)	
Puget Sound-South	Clear Creek	Clear Creek Hatchery	2 (9.1%)	2
Idaho-Snake River	Snake River Hills Canyon Dam	Oxbow Hatchery	1 (4.5%)	
Grand Total			22	12

Table 12-5. Total Chinook encountered (retained and released) by charter and private (non-charter) boat anglers reporting their catch on voluntary trip reports (VTRs) during the Area 12 mark-selective Chinook fishery (February 1 – April 30, 2010), with estimates of legal-size and overall mark rates.

Data source	Effort & Sample Size	Legal		Sublegal		Total	Mark Rates	
		AD	UM	AD	UM		Overall	Legal
Private Boat VTR	9 1-trip VTRs, 15 Angler Trips	2	6	8	4	20	50.0%	25.0%
Size/mark-status composition:		0.100	0.300	0.400	0.200			
Variance:		(0.00474)	(0.01105)	(0.01263)	(0.00842)			

ACKNOWLEDGEMENTS

This review of the 2009-10 winter mark-selective Chinook fisheries in Areas 7, 8-1, 8-2, 9, 10, 11, and 12 is the result of the dedicated efforts of several individuals. First, we thank the WDFW Puget Sound Sampling Unit (PSSU) field supervisors and their staff, who successfully implemented comprehensive sampling programs during the winter 2009-10 mark-selective Chinook fisheries. The PSSU field staff have conducted the dockside creel surveys, test fishery sampling, on-the-water effort surveys, aerial surveys, voluntary trip report program, angler education, as well as compiled, error-checked, and delivered high-quality monitoring data to enable mark-selective fishery evaluations. In particular, from Central Sound, we thank Slim Simpson (Central Sound Sampling Supervisor), Jeff McKee, Kathy Young-Berg, Sue Kraemer, Pete Sergeeff, Toby Black, Courtney Adkins, Jim Pykonen, Mike Petronelli, and April Bosley. From the Strait of Juan de Fuca/Peninsula area, we thank Larry Bennett (Peninsula Sampling Supervisor), Connie Warren, Jessica Slipper, and Ken Wall. From North Sound, we thank Steve Axtell (North Sampling Supervisor), Al Esparza, Marcus Thompson, Dean Toba, Patrick Morrison, Lynn Stricker, Mary Mureau, Jim Repoz, Angela Foster, Alan (Skeeter) Lowe, Nathan Layman, and Area 7 test fishers Phil Colwell and Chad Paul. From South Sound as well as Hood Canal and the Kitsap Peninsula, we thank Dan O'Brien (South Sound Supervisor), Justin Terry, John Moore, Scott Walker, Cara Crowley, Mary Raymond, and Dave Parrao. Additionally, we thank WDFW pilots Marty Kimbrel, Jim Hodgson, and Kevin Nelsen and samplers Mark Baltzell, Chris Moran, Ellie Heikilla, Brant Boelts, Lee Dyer, and Brianna Murphy for their time in surveying Areas 7 and 9 from the sky.

At the WDFW Headquarters in Olympia, we thank both Lance Campbell and John Sneva for their scale-reading expertise. We also thank Gil Lensegrav and the CWT Lab staff for their help and expertise in providing decoded CWT data. Also at the Olympia Headquarters office, Lee Dyer provided substantial help with personnel logistics and support services for the winter 2009-10 mark-selective fishery sampling projects. Mark Baltzell provided timely in-season creel estimates, scheduled all boat surveys and aerial surveys, and produced post-season analyses and reports. Karen Kloempken managed the WDFW sampling databases and provided finalized post-season data. Are Strom completed "R" programming updates and database development to enable efficient analyses of selective fishery data and produce tables and figures our post-season selective fishery reports.

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

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APPENDICES

Appendix A-1. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-1 mark-selective Chinook fishery from November 1, 2009 through April 30, 2010.

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
11/1/2009	44	0.3188	Camano Is St Park Ramp	1/30/2010	5	0.0615	Oak Harbor Marina And Ramp
11/1/2009	44	0.2242	Oak Harbor Marina And Ramp	1/31/2010	5	0.5538	Camano Is St Park Ramp
11/4/2009	45	0.3188	Camano Is St Park Ramp	1/31/2010	5	0.0615	Oak Harbor Marina And Ramp
11/4/2009	45	0.1131	Everett (Norton) Ramp	2/1/2010	6	0.5538	Camano Is St Park Ramp
11/7/2009	45	0.3188	Camano Is St Park Ramp	2/1/2010	6	0.3077	Maple Grove Ramp
11/7/2009	45	0.2242	Oak Harbor Marina And Ramp	2/6/2010	6	0.5538	Camano Is St Park Ramp
11/8/2009	45	0.3188	Camano Is St Park Ramp	2/6/2010	6	0.0615	Oak Harbor Marina And Ramp
11/8/2009	45	0.2662	Maple Grove Ramp	2/7/2010	6	0.5538	Camano Is St Park Ramp
11/9/2009	46	0.3188	Camano Is St Park Ramp	2/7/2010	6	0.0909	Utsalady Ramp
11/9/2009	46	0.1131	Everett (Norton) Ramp	2/10/2010	7	0.5538	Camano Is St Park Ramp
11/14/2009	46	0.3188	Camano Is St Park Ramp	2/10/2010	7	0.3077	Maple Grove Ramp
11/14/2009	46	0.2242	Oak Harbor Marina And Ramp	2/13/2010	7	0.5538	Camano Is St Park Ramp
11/15/2009	46	0.3188	Camano Is St Park Ramp	2/13/2010	7	0.0615	Oak Harbor Marina And Ramp
11/15/2009	46	0.2662	Maple Grove Ramp	2/14/2010	7	0.5538	Camano Is St Park Ramp
11/19/2009	47	0.3188	Camano Is St Park Ramp	2/14/2010	7	0.3077	Maple Grove Ramp
11/19/2009	47	0.2662	Maple Grove Ramp	2/18/2010	8	0.5538	Camano Is St Park Ramp
11/20/2009	47	0.3188	Camano Is St Park Ramp	2/18/2010	8	0.3077	Maple Grove Ramp
11/20/2009	47	0.0319	Utsalady Ramp	2/20/2010	8	0.4149	Camano Is St Park Ramp
11/21/2009	47	0.3188	Camano Is St Park Ramp	2/20/2010	8	0.092	Oak Harbor Marina And Ramp
11/21/2009	47	0.2242	Oak Harbor Marina And Ramp	2/21/2010	8	0.4149	Camano Is St Park Ramp
11/24/2009	48	0.3188	Camano Is St Park Ramp	2/21/2010	8	0.1105	Everett (Norton) Ramp
11/24/2009	48	0.1131	Everett (Norton) Ramp	2/22/2010	9	0.4149	Camano Is St Park Ramp
11/28/2009	48	0.3188	Camano Is St Park Ramp	2/22/2010	9	0.182	Maple Grove Ramp
11/28/2009	48	0.2242	Oak Harbor Marina And Ramp	2/27/2010	9	0.4149	Camano Is St Park Ramp
11/29/2009	48	0.3188	Camano Is St Park Ramp	2/27/2010	9	0.092	Oak Harbor Marina And Ramp
11/29/2009	48	0.2662	Maple Grove Ramp	2/28/2010	9	0.4149	Camano Is St Park Ramp
12/1/2009	49	0.1524	Camano Is St Park Ramp	2/28/2010	9	0.182	Maple Grove Ramp
12/1/2009	49	0.1827	Maple Grove Ramp	3/2/2010	10	0.4237	Camano Is St Park Ramp
12/5/2009	49	0.1524	Camano Is St Park Ramp	3/2/2010	10	0.1629	Everett (Norton) Ramp
12/5/2009	49	0.2447	Everett (Norton) Ramp	3/5/2010	10	0.4237	Camano Is St Park Ramp
12/6/2009	49	0.1524	Camano Is St Park Ramp	3/5/2010	10	0.0124	Utsalady Ramp
12/6/2009	49	0.2722	Oak Harbor Marina And Ramp	3/7/2010	10	0.4237	Camano Is St Park Ramp

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
12/10/2009	50	0.1524	Camano Is St Park Ramp	3/7/2010	10	0.092	Oak Harbor Marina And Ramp
12/10/2009	50	0.2722	Oak Harbor Marina And Ramp	3/8/2010	11	0.4237	Camano Is St Park Ramp
12/12/2009	50	0.1524	Camano Is St Park Ramp	3/8/2010	11	0.1629	Everett (Norton) Ramp
12/12/2009	50	0.2447	Everett (Norton) Ramp	3/13/2010	11	0.4237	Camano Is St Park Ramp
12/13/2009	50	0.1524	Camano Is St Park Ramp	3/13/2010	11	0.092	Oak Harbor Marina And Ramp
12/13/2009	50	0.2722	Oak Harbor Marina And Ramp	3/14/2010	11	0.4237	Camano Is St Park Ramp
12/17/2009	51	0.1524	Camano Is St Park Ramp	3/14/2010	11	0.272	Maple Grove Ramp
12/17/2009	51	0.1827	Maple Grove Ramp	3/16/2010	12	0.4237	Camano Is St Park Ramp
12/18/2009	51	0.1524	Camano Is St Park Ramp	3/16/2010	12	0.092	Oak Harbor Marina And Ramp
12/18/2009	51	0.2447	Everett (Norton) Ramp	3/19/2010	12	0.4237	Camano Is St Park Ramp
12/19/2009	51	0.1524	Camano Is St Park Ramp	3/19/2010	12	0.1629	Everett (Norton) Ramp
12/19/2009	51	0.2722	Oak Harbor Marina And Ramp	3/21/2010	12	0.4237	Camano Is St Park Ramp
12/21/2009	52	0.1524	Camano Is St Park Ramp	3/21/2010	12	0.272	Maple Grove Ramp
12/21/2009	52	0.2447	Everett (Norton) Ramp	3/22/2010	13	0.4237	Camano Is St Park Ramp
12/26/2009	52	0.1524	Camano Is St Park Ramp	3/22/2010	13	0.1629	Everett (Norton) Ramp
12/26/2009	52	0.2722	Oak Harbor Marina And Ramp	3/27/2010	13	0.4237	Camano Is St Park Ramp
12/27/2009	52	0.1524	Camano Is St Park Ramp	3/27/2010	13	0.092	Oak Harbor Marina And Ramp
12/27/2009	52	0.1031	Coupeville Public Ramp	3/28/2010	14	0.4237	Camano Is St Park Ramp
12/29/2009	53	0.3518	Camano Is St Park Ramp	3/28/2010	14	0.272	Maple Grove Ramp
12/29/2009	53	0.1761	Oak Harbor Marina And Ramp	4/1/2010	14	0.4237	Camano Is St Park Ramp
1/2/2010	1	0.3518	Camano Is St Park Ramp	4/1/2010	14	0.272	Maple Grove Ramp
1/2/2010	1	0.1761	Oak Harbor Marina And Ramp	4/2/2010	14	0.4237	Camano Is St Park Ramp
1/3/2010	1	0.3518	Camano Is St Park Ramp	4/2/2010	14	0.092	Oak Harbor Marina And Ramp
1/3/2010	1	0.0883	Everett (Norton) Ramp	4/4/2010	14	0.4237	Camano Is St Park Ramp
1/6/2010	2	0.3518	Camano Is St Park Ramp	4/4/2010	14	0.1629	Everett (Norton) Ramp
1/6/2010	2	0.23	Maple Grove Ramp	4/8/2010	15	0.4237	Camano Is St Park Ramp
1/9/2010	2	0.3518	Camano Is St Park Ramp	4/8/2010	15	0.092	Oak Harbor Marina And Ramp
1/9/2010	2	0.0883	Everett (Norton) Ramp	4/9/2010	15	0.4237	Camano Is St Park Ramp
1/10/2010	2	0.3518	Camano Is St Park Ramp	4/9/2010	15	0.272	Maple Grove Ramp
1/10/2010	2	0.1761	Oak Harbor Marina And Ramp	4/11/2010	15	0.4237	Camano Is St Park Ramp
1/13/2010	3	0.3518	Camano Is St Park Ramp	4/11/2010	15	0.092	Oak Harbor Marina And Ramp
1/13/2010	3	0.23	Maple Grove Ramp	4/13/2010	16	0.4237	Camano Is St Park Ramp
1/16/2010	3	0.3518	Camano Is St Park Ramp	4/13/2010	16	0.092	Oak Harbor Marina And Ramp
1/16/2010	3	0.0883	Everett (Norton) Ramp	4/16/2010	16	0.4237	Camano Is St Park Ramp

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
1/17/2010	3	0.3518	Camano Is St Park Ramp	4/16/2010	16	0.1629	Everett (Norton) Ramp
1/17/2010	3	0.1761	Oak Harbor Marina And Ramp	4/17/2010	16	0.4237	Camano Is St Park Ramp
1/21/2010	4	0.3518	Camano Is St Park Ramp	4/17/2010	16	0.272	Maple Grove Ramp
1/21/2010	4	0.0883	Everett (Norton) Ramp	4/19/2010	17	0.4237	Camano Is St Park Ramp
1/23/2010	4	0.3518	Camano Is St Park Ramp	4/19/2010	17	0.092	Oak Harbor Marina And Ramp
1/23/2010	4	0.1761	Oak Harbor Marina And Ramp	4/24/2010	17	0.4237	Camano Is St Park Ramp
1/24/2010	4	0.3518	Camano Is St Park Ramp	4/24/2010	17	0.272	Maple Grove Ramp
1/24/2010	4	0.088	Utsalady Ramp	4/25/2010	17	0.4237	Camano Is St Park Ramp
1/26/2010	5	0.5538	Camano Is St Park Ramp	4/25/2010	17	0.1629	Everett (Norton) Ramp
1/26/2010	5	0.3077	Maple Grove Ramp	4/28/2010	18	0.4237	Camano Is St Park Ramp
1/30/2010	5	0.5538	Camano Is St Park Ramp	4/28/2010	18	0.092	Oak Harbor Marina And Ramp

Appendix A-2. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 8-2 mark-selective Chinook fishery from November 1, 2009 through April 30, 2010.

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
11/1/2009	44	0.2343	Camano Is St Park	1/30/2010	5	0.3469	Mukilteo Lighthouse Ramp
11/1/2009	44	0.6459	Everett (Norton) Ramp	1/31/2010	5	0.2245	Camano Is St Park
11/4/2009	45	0.0136	Mukilteo Lighthouse Ramp	1/31/2010	5	0.3469	Mukilteo Lighthouse Ramp
11/4/2009	45	0.6459	Everett (Norton) Ramp	2/1/2010	6	0.2245	Camano Is St Park
11/7/2009	45	0.0711	Dagmar's Landing (Forklift Launch)	2/1/2010	6	0.3469	Mukilteo Lighthouse Ramp
11/7/2009	45	0.6459	Everett (Norton) Ramp	2/6/2010	6	0.3469	Mukilteo Lighthouse Ramp
11/8/2009	45	0.2343	Camano Is St Park	2/6/2010	6	0.0816	Marysville Public Ramp
11/8/2009	45	0.6459	Everett (Norton) Ramp	2/7/2010	6	0.2245	Camano Is St Park
11/9/2009	46	0.2343	Camano Is St Park	2/7/2010	6	0.3469	Mukilteo Lighthouse Ramp
11/9/2009	46	0.6459	Everett (Norton) Ramp	2/10/2010	7	0.2245	Camano Is St Park
11/14/2009	46	0.2343	Camano Is St Park	2/10/2010	7	0.3469	Mukilteo Lighthouse Ramp
11/14/2009	46	0.6459	Everett (Norton) Ramp	2/13/2010	7	0.3469	Mukilteo Lighthouse Ramp
11/15/2009	46	0.6459	Everett (Norton) Ramp	2/13/2010	7	0.0816	Marysville Public Ramp
11/15/2009	46	0.0267	Bayside Marina Drystack	2/14/2010	7	0.1633	Kayak St Pk Ramp
11/19/2009	47	0.2343	Camano Is St Park	2/14/2010	7	0.3469	Mukilteo Lighthouse Ramp
11/19/2009	47	0.6459	Everett (Norton) Ramp	2/18/2010	8	0.2245	Camano Is St Park
11/20/2009	47	0.0711	Dagmar's Landing (Forklift Launch)	2/18/2010	8	0.3469	Mukilteo Lighthouse Ramp
11/20/2009	47	0.6459	Everett (Norton) Ramp	2/20/2010	8	0.0709	Dagmar's Landing (Forklift Launch)
11/21/2009	47	0.2343	Camano Is St Park	2/20/2010	8	0.6557	Everett (Norton) Ramp
11/21/2009	47	0.6459	Everett (Norton) Ramp	2/21/2010	8	0.1697	Camano Is St Park
11/24/2009	48	0.2343	Camano Is St Park	2/21/2010	8	0.6557	Everett (Norton) Ramp
11/24/2009	48	0.6459	Everett (Norton) Ramp	2/22/2010	9	0.1697	Camano Is St Park
11/28/2009	48	0.0136	Mukilteo Lighthouse Ramp	2/22/2010	9	0.6557	Everett (Norton) Ramp
11/28/2009	48	0.6459	Everett (Norton) Ramp	2/27/2010	9	0.1697	Camano Is St Park
11/29/2009	48	0.2343	Camano Is St Park	2/27/2010	9	0.6557	Everett (Norton) Ramp
11/29/2009	48	0.6459	Everett (Norton) Ramp	2/28/2010	9	0.0709	Dagmar's Landing (Forklift Launch)
12/1/2009	49	0.1696	Camano Is St Park	2/28/2010	9	0.6557	Everett (Norton) Ramp
12/1/2009	49	0.6604	Everett (Norton) Ramp	3/2/2010	10	0.2352	Camano Is St Park
12/5/2009	49	0.1696	Camano Is St Park	3/2/2010	10	0.6123	Everett (Norton) Ramp
12/5/2009	49	0.6604	Everett (Norton) Ramp	3/5/2010	10	0.6123	Everett (Norton) Ramp
12/6/2009	49	0.1458	Dagmar's Landing (Forklift Launch)	3/5/2010	10	0.046	Bayside Marina Drystack
12/6/2009	49	0.6604	Everett (Norton) Ramp	3/7/2010	10	0.2352	Camano Is St Park
12/10/2009	50	0.1696	Camano Is St Park	3/7/2010	10	0.6123	Everett (Norton) Ramp
12/10/2009	50	0.6604	Everett (Norton) Ramp	3/8/2010	11	0.2352	Camano Is St Park

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
12/12/2009	50	0.1696	Camano Is St Park	3/8/2010	11	0.6123	Everett (Norton) Ramp
12/12/2009	50	0.6604	Everett (Norton) Ramp	3/13/2010	11	0.0606	Dagmar's Landing (Forklift Launch)
12/13/2009	50	0.1458	Dagmar's Landing (Forklift Launch)	3/13/2010	11	0.6123	Everett (Norton) Ramp
12/13/2009	50	0.6604	Everett (Norton) Ramp	3/14/2010	11	0.2352	Camano Is St Park
12/17/2009	51	0.1696	Camano Is St Park	3/14/2010	11	0.6123	Everett (Norton) Ramp
12/17/2009	51	0.6604	Everett (Norton) Ramp	3/16/2010	12	0.6123	Everett (Norton) Ramp
12/18/2009	51	0.1696	Camano Is St Park	3/16/2010	12	0.0106	Edmonds Marina Dry Storage
12/18/2009	51	0.6604	Everett (Norton) Ramp	3/19/2010	12	0.2352	Camano Is St Park
12/19/2009	51	0.6604	Everett (Norton) Ramp	3/19/2010	12	0.6123	Everett (Norton) Ramp
12/19/2009	51	0.0267	Bayside Marina Drystack	3/21/2010	12	0.2352	Camano Is St Park
12/21/2009	52	0.1696	Camano Is St Park	3/21/2010	12	0.6123	Everett (Norton) Ramp
12/21/2009	52	0.6604	Everett (Norton) Ramp	3/22/2010	13	0.2352	Camano Is St Park
12/26/2009	52	0.1696	Camano Is St Park	3/22/2010	13	0.6123	Everett (Norton) Ramp
12/26/2009	52	0.6604	Everett (Norton) Ramp	3/27/2010	13	0.2352	Camano Is St Park
12/27/2009	52	0.1458	Dagmar's Landing (Forklift Launch)	3/27/2010	13	0.6123	Everett (Norton) Ramp
12/27/2009	52	0.6604	Everett (Norton) Ramp	3/28/2010	13	0.0228	Mukilteo Lighthouse Ramp
12/29/2009	53	0.2424	Camano Is St Park	3/28/2010	13	0.6123	Everett (Norton) Ramp
12/29/2009	53	0.6418	Everett (Norton) Ramp	4/1/2010	14	0.0606	Dagmar's Landing (Forklift Launch)
1/2/2010	1	0.6418	Everett (Norton) Ramp	4/1/2010	14	0.6123	Everett (Norton) Ramp
1/2/2010	1	0.0317	Bayside Marina Drystack	4/2/2010	14	0.2352	Camano Is St Park
1/3/2010	1	0.2424	Camano Is St Park	4/2/2010	14	0.6123	Everett (Norton) Ramp
1/3/2010	1	0.6418	Everett (Norton) Ramp	4/4/2010	14	0.2352	Camano Is St Park
1/6/2010	2	0.6418	Everett (Norton) Ramp	4/4/2010	14	0.6123	Everett (Norton) Ramp
1/6/2010	2	0.011	Edmonds Marina Dry Storage	4/8/2010	15	0.0606	Dagmar's Landing (Forklift Launch)
1/9/2010	2	0.2424	Camano Is St Park	4/8/2010	15	0.6123	Everett (Norton) Ramp
1/9/2010	2	0.6418	Everett (Norton) Ramp	4/9/2010	15	0.2352	Camano Is St Park
1/10/2010	2	0.2424	Camano Is St Park	4/9/2010	15	0.6123	Everett (Norton) Ramp
1/10/2010	2	0.6418	Everett (Norton) Ramp	4/11/2010	15	0.2352	Camano Is St Park
1/13/2010	3	0.2424	Camano Is St Park	4/11/2010	15	0.6123	Everett (Norton) Ramp
1/13/2010	3	0.6418	Everett (Norton) Ramp	4/13/2010	16	0.2352	Camano Is St Park
1/16/2010	3	0.059	Dagmar's Landing (Forklift Launch)	4/13/2010	16	0.6123	Everett (Norton) Ramp
1/16/2010	3	0.642	Everett (Norton) Ramp	4/16/2010	16	0.2352	Camano Is St Park
1/17/2010	3	0.242	Camano Is St Park	4/16/2010	16	0.6123	Everett (Norton) Ramp
1/17/2010	3	0.642	Everett (Norton) Ramp	4/17/2010	16	0.6123	Everett (Norton) Ramp
1/21/2010	4	0.2424	Camano Is St Park	4/17/2010	16	0.046	Bayside Marina Drystack
1/21/2010	4	0.6418	Everett (Norton) Ramp	4/19/2010	17	0.2352	Camano Is St Park

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
1/23/2010	4	0.6418	Everett (Norton) Ramp	4/19/2010	17	0.6123	Everett (Norton) Ramp
1/23/2010	4	0.0317	Bayside Marina Drystack	4/24/2010	17	0.0606	Dagmar's Landing (Forklift Launch)
1/24/2010	4	0.2424	Camano Is St Park	4/24/2010	17	0.6123	Everett (Norton) Ramp
1/24/2010	4	0.6418	Everett (Norton) Ramp	4/25/2010	17	0.2352	Camano Is St Park
1/26/2010	5	0.2424	Camano Is St Park	4/25/2010	17	0.6123	Everett (Norton) Ramp
1/26/2010	5	0.6418	Everett (Norton) Ramp	4/28/2010	18	0.2352	Camano Is St Park
1/30/2010	5	0.0612	Dagmar's Landing (Forklift Launch)	4/28/2010	18	0.6123	Everett (Norton) Ramp

Appendix A-3. Size measures by sample date, for sites sampled during dockside creel surveys in the Area 10 mark-selective Chinook fishery from October 1, 2009 through January 31, 2010.

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
10/1/2009	40	0.283	Armeni Public Ramp	12/1/2009	49	0.277	Armeni Public Ramp
10/1/2009	40	0.434	Shilshole Public Ramp	12/1/2009	49	0.398	Shilshole Public Ramp
10/2/2009	40	0.434	Shilshole Public Ramp	12/5/2009	49	0.108	Manchester Public Ramp
10/2/2009	40	0.136	Kingston Public Ramp	12/5/2009	49	0.398	Shilshole Public Ramp
10/3/2009	40	0.283	Armeni Public Ramp	12/6/2009	49	0.78	Armeni Public Ramp
10/3/2009	40	0.434	Shilshole Public Ramp	12/6/2009	49	0.136	Shilshole Public Ramp
10/7/2009	41	0.283	Armeni Public Ramp	12/10/2009	50	0.398	Shilshole Public Ramp
10/7/2009	41	0.434	Shilshole Public Ramp	12/10/2009	50	0.102	Edmonds Marina Dry Stack
10/9/2009	41	0.048	Manchester Public Ramp	12/12/2009	50	0.398	Shilshole Public Ramp
10/9/2009	41	0.434	Shilshole Public Ramp	12/12/2009	50	0.115	Kingston Public Ramp
10/10/2009	41	0.283	Armeni Public Ramp	12/13/2009	50	0.78	Armeni Public Ramp
10/10/2009	41	0.434	Shilshole Public Ramp	12/13/2009	50	0.136	Shilshole Public Ramp
10/13/2009	42	0.283	Armeni Public Ramp	12/17/2009	51	0.28	Armeni Public Ramp
10/13/2009	42	0.434	Shilshole Public Ramp	12/17/2009	51	0.39	Shilshole Public Ramp
10/16/2009	42	0.283	Armeni Public Ramp	12/18/2009	51	0.15	Manchester Public Ramp
10/16/2009	42	0.434	Shilshole Public Ramp	12/18/2009	51	0.39	Shilshole Public Ramp
10/18/2009	42	0.434	Shilshole Public Ramp	12/19/2009	51	0.28	Armeni Public Ramp
10/18/2009	42	0.136	Kingston Public Ramp	12/19/2009	51	0.39	Shilshole Public Ramp
10/19/2009	43	0.283	Armeni Public Ramp	12/21/2009	52	0.39	Shilshole Public Ramp
10/19/2009	43	0.434	Shilshole Public Ramp	12/21/2009	52	0.08	Edmonds Marina Dry Stack
10/24/2009	43	0.434	Shilshole Public Ramp	12/26/2009	52	0.39	Shilshole Public Ramp
10/24/2009	43	0.136	Kingston Public Ramp	12/26/2009	52	0.1	Kingston Public Ramp
10/25/2009	43	0.78	Armeni Public Ramp	12/27/2009	52	0.638	Armeni Public Ramp
10/25/2009	43	0.136	Shilshole Public Ramp	12/27/2009	52	0.155	Shilshole Public Ramp
10/27/2009	44	0.283	Armeni Public Ramp	12/29/2009	53	0.216	Armeni Public Ramp
10/27/2009	44	0.434	Shilshole Public Ramp	12/29/2009	53	0.333	Shilshole Public Ramp

SAMPLEDATE	WEEK	SITESIZE	LOCATION	SAMPLEDATE	WEEK	SITESIZE	LOCATION
10/30/2009	44	0.048	Manchester Public Ramp	1/2/2010	1	0.226	Manchester Public Ramp
10/30/2009	44	0.434	Shilshole Public Ramp	1/2/2010	1	0.333	Shilshole Public Ramp
11/1/2009	44	0.78	Armeni Public Ramp	1/3/2010	1	0.226	Armeni Public Ramp
11/1/2009	44	0.136	Shilshole Public Ramp	1/3/2010	1	0.333	Shilshole Public Ramp
11/4/2009	45	0.434	Shilshole Public Ramp	1/6/2010	2	0.333	Shilshole Public Ramp
11/4/2009	45	0.1	Edmonds Marina Dry Stack	1/6/2010	2	0.098	Edmonds Marina Dry Stack
11/7/2009	45	0.283	Armeni Public Ramp	1/9/2010	2	0.216	Armeni Public Ramp
11/7/2009	45	0.434	Shilshole Public Ramp	1/9/2010	2	0.333	Shilshole Public Ramp
11/8/2009	45	0.78	Armeni Public Ramp	1/10/2010	2	0.333	Shilshole Public Ramp
11/8/2009	45	0.136	Shilshole Public Ramp	1/10/2010	2	0.128	Kingston Public Ramp
11/9/2009	46	0.434	Shilshole Public Ramp	1/13/2010	3	0.17	Armeni Public Ramp
11/9/2009	46	0.136	Kingston Public Ramp	1/13/2010	3	0.321	Shilshole Public Ramp
11/14/2009	46	0.434	Shilshole Public Ramp	1/16/2010	3	0.245	Manchester Public Ramp
11/14/2009	46	0.1	Edmonds Marina Dry Stack	1/16/2010	3	0.321	Shilshole Public Ramp
11/15/2009	46	0.78	Armeni Public Ramp	1/17/2010	3	0.321	Shilshole Public Ramp
11/15/2009	46	0.136	Shilshole Public Ramp	1/17/2010	3	0.123	Edmonds Marina Dry Stack
11/19/2009	47	0.225	Armeni Public Ramp	1/21/2010	4	0.17	Armeni Public Ramp
11/19/2009	47	0.408	Shilshole Public Ramp	1/21/2010	4	0.321	Shilshole Public Ramp
11/20/2009	47	0.092	Manchester Public Ramp	1/23/2010	4	0.321	Shilshole Public Ramp
11/20/2009	47	0.408	Shilshole Public Ramp	1/23/2010	4	0.142	Kingston Public Ramp
11/21/2009	47	0.408	Shilshole Public Ramp	1/24/2010	4	0.245	Manchester Public Ramp
11/21/2009	47	0.142	Kingston Public Ramp	1/24/2010	4	0.321	Shilshole Public Ramp
11/24/2009	48	0.408	Shilshole Public Ramp	1/26/2010	5	0.137	Armeni Public Ramp
11/24/2009	48	0.133	Edmonds Marina Dry Stack	1/26/2010	5	0.291	Shilshole Public Ramp
11/28/2009	48	0.092	Manchester Public Ramp	1/30/2010	5	0.291	Shilshole Public Ramp
11/28/2009	48	0.408	Shilshole Public Ramp	1/30/2010	5	0.137	Kingston Public Ramp
11/29/2009	48	0.78	Armeni Public Ramp	1/31/2010	5	0.137	Armeni Public Ramp
11/29/2009	48	0.136	Shilshole Public Ramp	1/31/2010	5	0.291	Shilshole Public Ramp

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

SAMPLEDATE	WEEK	SITESIZE	LOCATIONCODE	SAMPLEDATE	WEEK	SITESIZE	LOCATIONCODE
2/1/2010	6	0.194	Point Defiance Boat House	3/16/2010	12	0.6349	Point Defiance Public Ramp
2/1/2010	6	0.7015	Point Defiance Public Ramp	3/19/2010	12	0.0794	Gig Harbor Ramp
2/6/2010	6	0.194	Point Defiance Boat House	3/19/2010	12	0.6349	Point Defiance Public Ramp
2/6/2010	6	0.7015	Point Defiance Public Ramp	3/21/2010	12	0.2222	Point Defiance Boat House
2/7/2010	6	0.194	Point Defiance Boat House	3/21/2010	12	0.6349	Point Defiance Public Ramp
2/7/2010	6	0.7015	Point Defiance Public Ramp	3/22/2010	13	0.2222	Point Defiance Boat House
2/10/2010	7	0.194	Point Defiance Boat House	3/22/2010	13	0.6349	Point Defiance Public Ramp
2/10/2010	7	0.7015	Point Defiance Public Ramp	3/27/2010	13	0.0794	Gig Harbor Ramp
2/13/2010	7	0.194	Point Defiance Boat House	3/27/2010	13	0.6349	Point Defiance Public Ramp
2/13/2010	7	0.7015	Point Defiance Public Ramp	3/28/2010	13	0.2222	Point Defiance Boat House
2/14/2010	7	0.194	Point Defiance Boat House	3/28/2010	13	0.6349	Point Defiance Public Ramp
2/14/2010	7	0.7015	Point Defiance Public Ramp	4/1/2010	14	0.0794	Gig Harbor Ramp
2/18/2010	8	0.194	Point Defiance Boat House	4/1/2010	14	0.6349	Point Defiance Public Ramp
2/18/2010	8	0.7015	Point Defiance Public Ramp	4/2/2010	14	0.2222	Point Defiance Boat House
2/20/2010	8	0.194	Point Defiance Boat House	4/2/2010	14	0.6349	Point Defiance Public Ramp
2/20/2010	8	0.7015	Point Defiance Public Ramp	4/4/2010	14	0.2222	Point Defiance Boat House
2/21/2010	8	0.194	Point Defiance Boat House	4/4/2010	14	0.6349	Point Defiance Public Ramp
2/21/2010	8	0.7015	Point Defiance Public Ramp	4/8/2010	15	0.2439	Point Defiance Boat House
2/22/2010	9	0.194	Point Defiance Boat House	4/8/2010	15	0.561	Point Defiance Public Ramp
2/22/2010	9	0.7015	Point Defiance Public Ramp	4/9/2010	15	0.0976	Gig Harbor Ramp
2/27/2010	9	0.194	Point Defiance Boat House	4/9/2010	15	0.561	Point Defiance Public Ramp
2/27/2010	9	0.7015	Point Defiance Public Ramp	4/11/2010	15	0.2439	Point Defiance Boat House
2/28/2010	9	0.194	Point Defiance Boat House	4/11/2010	15	0.561	Point Defiance Public Ramp
2/28/2010	9	0.7015	Point Defiance Public Ramp	4/13/2010	16	0.2439	Point Defiance Boat House
3/2/2010	10	0.2222	Point Defiance Boat House	4/13/2010	16	0.561	Point Defiance Public Ramp
3/2/2010	10	0.6349	Point Defiance Public Ramp	4/16/2010	16	0.065	Armeni Public Ramp
3/6/2010	10	0.2222	Point Defiance Boat House	4/16/2010	16	0.561	Point Defiance Public Ramp
3/6/2010	10	0.6349	Point Defiance Public Ramp	4/17/2010	16	0.2439	Point Defiance Boat House
3/7/2010	10	0.2222	Point Defiance Boat House	4/17/2010	16	0.561	Point Defiance Public Ramp
3/7/2010	10	0.6349	Point Defiance Public Ramp	4/19/2010	17	0.25	Point Defiance Boat House
3/8/2010	11	0.2222	Point Defiance Boat House	4/19/2010	17	0.55	Point Defiance Public Ramp
3/8/2010	11	0.6349	Point Defiance Public Ramp	4/24/2010	17	0.25	Point Defiance Boat House
3/13/2010	11	0.0794	Gig Harbor Ramp	4/24/2010	17	0.55	Point Defiance Public Ramp
3/13/2010	11	0.6349	Point Defiance Public Ramp	4/25/2010	17	0.25	Point Defiance Boat House
3/14/2010	11	0.2222	Point Defiance Boat House	4/25/2010	17	0.55	Point Defiance Public Ramp

SAMPLEDATE	WEEK	SITESIZE	LOCATIONCODE	SAMPLEDATE	WEEK	SITESIZE	LOCATIONCODE
3/14/2010	11	0.6349	Point Defiance Public Ramp	4/28/2010	18	0.25	Point Defiance Boat House
3/16/2010	12	0.2222	Point Defiance Boat House	4/28/2010	18	0.55	Point Defiance Public Ramp

Appendix B-1. Coded Wire Tag (CWT) recoveries in the Area 7 winter mark-selective Chinook fishery, December 1, 2009 – April 30, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
7	12/4/2009	210735	2006	County Line Cr3.2363		WDFW		72	62060	AD Fin Clp
7	3/27/2010	633486	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633487	76	42884	AD Fin Clp
7	12/27/2009	633867	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW		76	62062	AD Fin Clp
7	2/6/2010	633967	2006	Green R 09.0001		WDFW		70	42938	AD Fin Clp
7	2/27/2010	633966	2006	Wallace R 07.0940		WDFW		71	42939	AD Fin Clp
7	3/27/2010	210721	2006	Crisp Cr 09.0113	Keta Creek Hatchery	MUCK		62	42888	AD Fin Clp
7	4/16/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	64	62098	AD Fin Clp
7	12/4/2009	210571	2005	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		76	42871	AD Fin Clp
7	1/3/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	66	60256	AD Fin Clp
7	1/21/2010	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		59	42936	AD Fin Clp
7	3/6/2010	633391	2006	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ		66	42880	AD Fin Clp
7	1/8/2010	633389	2006	Friday Cr 03.0017	Samish Hatchery	WDFW	633390	69	42913	AD Fin Clp
7	1/31/2010	633889	2006	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		66	42915	AD Fin Clp
7	2/4/2010	633867	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW		75	62071	AD Fin Clp
7	2/5/2010	185357	2007	R-Cowichan R	H-Cowichan R	CDFO		62	42918	AD Fin Clp
7	2/6/2010	210741	2007	Whitehorse Springs	Whitehorse Pond	STIL		64	42919	AD Fin Clp
7	2/6/2010	185357	2007	R-Cowichan R	H-Cowichan R	CDFO		65	42921	AD Fin Clp
7	3/22/2010	634080	2006	East Sound Bay (San)	Glenwood Springs	WDFW		78	42895	AD Fin Clp
7	3/27/2010	186242	2007	R-Chilliwack R	H-Chilliwack R	CDFO	186240, 186241	64	42883	AD Fin Clp
7	3/27/2010	210777	2007	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		59	42886	AD Fin Clp
7	3/27/2010	634284	2007	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		57	42889	AD Fin Clp
7	3/27/2010	633869	2007	Cascade R 03.1411	Marblemount Hatchery	WDFW		52	42890	AD Fin Clp
7	3/27/2010	185359	2007	R-Cowichan R	H-Cowichan R	CDFO		70	42891	AD Fin Clp
7	3/27/2010	633887	2006	Wallace R 07.0940	Wallace R Hatchery	WDFW	633888	71	42892	AD Fin Clp
7	3/27/2010	633381	2005	Wallace R 07.0940	Wallace R Hatchery	WDFW	633380	82	42893	AD Fin Clp
7	3/27/2010	186219	2007	R-Cowichan R	H-Cowichan R	CDFO		72	42894	AD Fin Clp
7	3/27/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	56	42896	AD Fin Clp
7	3/28/2010	210720	2006	Elliott Bay Tribal Np	Keta Creek Hatchery	MUCK		65	42898	AD Fin Clp
7	3/28/2010	185358	2007	R-Cowichan R	H-Cowichan R	CDFO		69	42899	AD Fin Clp
7	4/18/2010	633486	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633487	78	42867	AD Fin Clp
7	1/6/2010	633967	2006	Green R 09.0001		WDFW		70	42934	AD Fin Clp
7	1/9/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	56	42935	AD Fin Clp
7	1/23/2010	633966	2006	Wallace R 07.0940		WDFW		59	42937	AD Fin Clp

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
7	3/14/2010	633387	2006	Nooksack R -NF 01.0120	Kendall Cr Hatchery	WDFW	633888	84	62052	AD Fin Clp
7	12/19/2009	633869	2007	Cascade R 03.1411	Marblemount Hatchery	WDFW		57	60253	AD Fin Clp
7	12/19/2009	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	56	60254	AD Fin Clp
7	12/26/2009	633875	2006	Purdy Cr 16.0005	George Adams Hatchery	WDFW	633876	71	42933	AD Fin Clp
7	12/26/2009	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	59	60255	AD Fin Clp
7	1/3/2010	210745	2006	Baker R 03.0435		WDFW		73	42912	AD Fin Clp
7	3/27/2010	633966	2006	Wallace R 07.0940		WDFW		67	42897	AD Fin Clp
7	4/11/2010	210777	2007	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		55	32731	AD Fin Clp
7	12/4/2009	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		71	32969	AD Fin Clp
7	2/6/2010	633887	2006	Wallace R 07.0940	Wallace R Hatchery	WDFW	633888	73	42920	AD Fin Clp
7	1/3/2010	633364	2005	Cascade R 03.1411	Marblemount Hatchery	WDFW		83	62069	AD Fin Clp
7	1/16/2010	633966	2006	Wallace R 07.0940		WDFW		67	62066	AD Fin Clp
7	4/18/2010	210733	2006	Whitehorse Springs	Whitehorse Pond	COOP		91	62072	AD Fin Clp
7	4/19/2010	634274	2007	Nooksack R -NF 01.0120	Kendall Cr Hatchery	WDFW	634275	75	62074	AD Fin Clp
7	12/5/2009	633375	2005	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		69	32970	AD Fin Clp
7	4/23/2010	634274	2007	Nooksack R -NF 01.0120	Kendall Cr Hatchery	WDFW	634275	69	62075	AD Fin Clp
7	12/27/2009	633889	2006	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		68	62063	AD Fin Clp
7	12/1/2009	633592	2005	Wenatchee R 45.0030	Dryden Pond	WDFW		68	62059	AD Fin Clp
7	2/7/2010	633468	2005	Wallace R 07.0940	Wallace R Hatchery	WDFW		85	60257	AD Fin Clp
7	2/14/2010	634283	2007	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		53	42916	AD Fin Clp
7	3/5/2010	634583	2007	East Sound Bay (San)	Glenwood Springs	WDFW		67	62050	AD Fin Clp
7	12/11/2009	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		62	62061	AD Fin Clp
7	1/10/2010	633869	2007	Cascade R 03.1411	Marblemount Hatchery	WDFW		55	62064	AD Fin Clp
7	1/10/2010	633889	2006	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		70	62065	AD Fin Clp
7	3/27/2010	633971	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		79	42887	AD Fin Clp
7	2/5/2010	634184	2006	Wenatchee R 45.0030		WDFW		63	42917	AD Fin Clp
7	2/6/2010	210733	2006	Whitehorse Springs	Whitehorse Pond	COOP		74	62070	AD Fin Clp
7	4/18/2010	54274	2007	Spring Cr 29.0159	Spring Cr NFH	FWS	542750 542760 54200	76	62073	AD Fin Clp

Appendix B-2. Coded-wire tag (CWT) recoveries in the winter Areas 8-1& 8-2 mark-selective Chinook fisheries, November 1, 2009 – April 30, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
81	11/7/2009	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270634272	66	54641	AD Fin Clp
81	2/21/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270634272	59	42805	AD Fin Clp
81	4/17/2010	633967	2006	Green R 09.0001		WDFW		82	42808	AD Fin Clp
81	4/25/2010	633488	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633489,633490, 633000	64	42809	AD Fin Clp
81	11/7/2009	210777	2007	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		57	42870	AD Fin Clp
81	11/14/2009	633966	2006	Wallace R 07.0940		WDFW		58	58213	AD Fin Clp
81	12/26/2009	633966	2006	Wallace R 07.0940		WDFW		69	32972	AD Fin Clp
81	12/26/2009	633966	2006	Wallace R 07.0940		WDFW		69	32971	AD Fin Clp
81	3/20/2010	633966	2006	Wallace R 07.0940		WDFW		80	54728	AD Fin Clp
82	11/22/2009	633967	2006	Green R 09.0001		WDFW		66	58255	AD Fin Clp
82	11/1/2009	633875	2006	Purdy Cr 16.0005	George Adams Hatchry	WDFW	633876	64	58207	AD Fin Clp
82	11/1/2009	633867	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW		74	58208	AD Fin Clp
82	11/1/2009	633889	2006	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		66	58479	AD Fin Clp
82	11/14/2009	633966	2006	Wallace R 07.0940		WDFW		70	54644	AD Fin Clp
82	3/6/2010	633967	2006	Green R 09.0001		WDFW		56	58220	AD Fin Clp
82	11/29/2009	633887	2006	Wallace R 07.0940	Wallace R Hatchery	WDFW	633888	69	58215	AD Fin Clp
82	12/19/2009	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		54	42873	AD Fin Clp
82	12/19/2009	633486	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633487	62	54721	AD Fin Clp
82	12/27/2009	633967	2006	Green R 09.0001		WDFW		70	32973	AD Fin Clp
82	11/14/2009	186242	2007	R-Chilliwack R	H-Chilliwack R	CDFO	186240,186241	56	54645	AD Fin Clp
82	1/23/2010	633486	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633487	76	54724	AD Fin Clp
82	1/30/2010	633967	2006	Green R 09.0001		WDFW		55	54725	AD Fin Clp
82	3/27/2010	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	56	58219	AD Fin Clp
82	4/4/2010	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	63	54729	AD Fin Clp
82	4/14/2010	633466	2007	Chambers Cr 12.0007	Garrison Hatchery	WDFW		55	54730	AD Fin Clp
82	4/23/2010	634297	2007	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		55	54731	AD Fin Clp
82	1/23/2010	633971	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		69	58217	AD Fin Clp
82	2/28/2010	210777	2007	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		63	54727	AD Fin Clp
82	12/13/2009	210777	2007	Tulalip Cr 07.0001	Bernie Gobin Hatch	TULA		56	54650	AD Fin Clp
82	12/19/2009	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		69	42874	AD Fin Clp
82	12/19/2009	633867	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW		68	42875	AD Fin Clp
82	3/18/2010	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		71	42807	AD Fin Clp
82	11/8/2009	633387	2006	Nooksack R -Nf 01.0120	Kendall Cr Hatchery	WDFW	633388	70	58212	AD Fin Clp
82	11/28/2009	633579	2006	Grovers Cr 15.0299	Grovers Cr Hatchery	SUQ	210737	65	54646	AD Fin Clp
82	12/12/2009	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	55	54649	AD Fin Clp

Appendix B-3. Coded-wire tag (CWT) recoveries in the winter Area 9 mark-selective Chinook fishery, November 1-30, 2009 and January 16 - April 15, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
9	1/22/2010	633969	2006	Chambers Cr 12.0007	Lakewood Hatchery	WDFW		69	54723	AD Fin Clp
9	11/4/2009	633887	2006	Wallace R 07.0940	Wallace R Hatchery	WDFW	633888	62	58326	AD Fin Clp
9	11/8/2009	633975	2006	Minter Cr 15.0048	Hupp Springs Rearing	WDFW		58	58302	Unmarked
9	11/8/2009	633967	2006	Green R 09.0001		WDFW		60	58303	AD Fin Clp
9	2/14/2010	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		72	56769	AD Fin Clp
9	11/8/2009	210744	2006	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		64	54642	AD Fin Clp
9	11/4/2009	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		69	50774	AD Fin Clp
9	1/23/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	50	49781	AD Fin Clp
9	4/10/2010	634274	2007	Nooksack R -NF 01.0120	Kendall Cr Hatchery	WDFW	634275	77	49512	AD Fin Clp
9	3/27/2010	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		58	56774	AD Fin Clp
9	11/28/2009	633886	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		62	54647	AD Fin Clp
9	2/20/2010	186240	2007	R-Chilliwack R	H-Chilliwack R	CDFO	186241, 186242	60	56770	AD Fin Clp
9	2/21/2010	634274	2007	Nooksack R -NF 01.0120	Kendall Cr Hatchery	WDFW	634275	63	56771	AD Fin Clp
9	3/17/2010	210787	2007	Whitehorse Springs	Whitehorse Pond	STIL		69	58306	AD Fin Clp
9	3/19/2010	633965	2006	Ricks Pd (Lltk)	George Adams Hatchery	WDFW		75	58218	AD Fin Clp
9	11/1/2009	633869	2007	Cascade R 03.1411	Marblemount Hatchery	WDFW		53	58084	AD Fin Clp
9	11/29/2009	633966	2006	Wallace R 07.0940		WDFW		59	54648	AD Fin Clp
9	11/1/2009	633968	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		59	58203	AD Fin Clp
9	11/1/2009	633867	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW		70	58204	AD Fin Clp
9	11/1/2009	633882	2006	Big Soos Cr 09.0072	Soos Creek Hatchery	WDFW	633883	63	58205	AD Fin Clp
9	11/1/2009	633887	2006	Wallace R 07.0940	Wallace R Hatchery	WDFW	633888	57	58206	AD Fin Clp
9	11/1/2009	633971	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		65	58209	AD Fin Clp
9	11/1/2009	634274	2007	Nooksack R -Nf 01.0120	Kendall Cr Hatchery	WDFW	634275	55	58480	AD Fin Clp
9	11/14/2009	633487	2006	Cascade R 03.1411	Marblemount Hatchery	WDFW	633486	71	54643	AD Fin Clp
9	11/14/2009	210801	2007	Kalama Cr 11.0017	Kalama Cr Hatchery	NISQ		52	58214	AD Fin Clp
9	11/14/2009	633964	2006	Chambers Cr 12.0007	Garrison Hatchery	WDFW		67	58304	AD Fin Clp
9	1/31/2010	633966	2006	Wallace R 07.0940		WDFW		73	54726	AD Fin Clp
9	1/17/2010	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		60	58257	AD Fin Clp

Appendix B-4. Coded-wire tag (CWT) recoveries in the winter Area 10 mark-selective Chinook fishery, October 1, 2009 – January 31, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
10	12/4/2009	186241	2007	R-Chilliwack R	H-Chilliwack R	CDFO	186240,186242, 186000	57	58216	Unmarked
10	10/9/2009	185558	2007	R-Harrison R	H-Chehalis R	CDFO		53	58200	AD Fin Clp
10	10/10/2009	210720	2006	Elliott Bay Tribal Np	Keta Creek Hatchery	MUCK		64	58201	AD Fin Clp
10	10/11/2009	633875	2006	Purdy Cr 16.0005	George Adams Hatchry	WDFW	633876	69	58254	AD Fin Clp
10	11/1/2009	633966	2006	Wallace R 07.0940		WDFW		61	58301	AD Fin Clp
10	12/29/2009	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	56	58305	AD Fin Clp
10	11/24/2009	633885	2006	Issaquah Cr 08.0178	Issaquah Hatchery	WDFW		73	58256	AD Fin Clp
10	11/28/2009	210787	2007	Whitehorse Springs	Whitehorse Pond	STIL		63	57350	AD Fin Clp
10	10/4/2009	94646	2007	Big Cr (Lwr Col R)	Big Cr (Lwr Col R)	ODFW	94662	56	58197	AD Fin Clp
10	10/4/2009	94646	2007	Big Cr (Lwr Col R)	Big Cr Hatchery	ODFW	94662	56	58197	AD Fin Clp
10	10/5/2009	633889	2006	Voight Cr 10.0414	Voights Cr Hatchery	WDFW		65	58324	AD Fin Clp

Appendix B-5. Coded-wire tag (CWT) recoveries in the winter Area 11 mark-selective Chinook fishery, February 1 – April 30, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
11	3/6/2010	210790	2007	Grovers Cr Hatchery	Grovers Cr Hatchery	SUQ		69	62603	AD Fin Clp
11	2/21/2010	210787	2007	Whitehorse Springs	Whitehorse Pond	STIL		57	58258	AD Fin Clp
11	2/1/2010	210787	2007	Whitehorse Springs	Whitehorse Pond	STIL		52	51667	AD Fin Clp
11	2/1/2010	633965	2006	Ricks Pd (LLTK)	George Adams Hatchry	WDFW		59	51683	AD Fin Clp
11	4/17/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	74	51700	AD Fin Clp
11	4/25/2010	633466	2007	Chambers Cr 12.0007	Garrison Hatchery	WDFW		68	54045	AD Fin Clp

Appendix B-6. Coded-wire tag (CWT) recoveries in the winter Area 12 mark-selective Chinook fishery, February 1 – April 30, 2010.

Area	Recovery Date	Tag Code	Brood Year	Release Site	Rearing Hatchery	Release Agency	DIT Code	FKL (cm)	Label	Mark
12	2/1/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	60	51901	AD Fin Clp
12	2/1/2010	633965	2006	Ricks Pd (LLTK)	George Adams Hatchry	WDFW		58	51902	AD Fin Clp
12	2/7/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	64	56966	AD Fin Clp
12	2/13/2010	633971	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		74	56969	AD Fin Clp
12	2/13/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	60	56973	AD Fin Clp
12	4/25/2010	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	62	56975	AD Fin Clp
12	3/6/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	64	51907	AD Fin Clp
12	3/20/2010	633965	2006	Ricks Pd (LLTK)	George Adams Hatchry	WDFW		69	62604	AD Fin Clp
12	2/9/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	60	51904	AD Fin Clp
12	3/6/2010	633971	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		77	51906	AD Fin Clp
12	2/13/2010	210788	2007	Clear Cr 11.0013c	Clear Creek Hatchery	NISQ	634277	53	56967	AD Fin Clp
12	2/13/2010	634283	2007	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		60	56968	AD Fin Clp
12	3/1/2010	210787	2007	Whitehorse Springs	Whitehorse Pond	STIL		70	56772	AD Fin Clp
12	3/2/2010	633965	2006	Ricks Pd (LLTK)	George Adams Hatchry	WDFW		61	56972	AD Fin Clp
12	3/3/2010	634272	2007	Friday Cr 03.0017	Samish Hatchery	WDFW	634270, 634271	62	51905	AD Fin Clp
12	3/8/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	64	56974	AD Fin Clp
12	3/15/2010	107502	2007	Snake@ Hlls Cnyon Dm	Oxbow Hatchery	IDFG		60	56773	AD Fin Clp
12	2/6/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	67	49684	AD Fin Clp
12	4/23/2010	634384	2007	John Cr 16.0253	Rfeg 6 Hood Canal	WDFW		53	60102	AD Fin Clp
12	2/8/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	55	56768	AD Fin Clp
12	2/13/2010	633886	2006	Finch Cr 16.0222	Hoodsport Hatchery	WDFW		74	56970	AD Fin Clp
12	2/13/2010	634271	2007	Purdy Cr 16.0005	George Adams Hatchry	WDFW	634270, 634272	60	56971	AD Fin Clp