Marine Areas 9 and 10 Selective Chinook Fishery
July 16 – July 31, 2007
Post-season Report

DRAFT

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EXECUTIVE SUMMARY

During July 2007, a pilot recreational mark-selective fishery for Chinook salmon (*Oncorhynchus tshawytscha*, "Chinook") was implemented in Marine Catch Areas 9 and 10. This fishery represents the first experience using mark-selective regulations for Chinook in Marine Areas 9 and 10. The mark-selective regulations allow retention of adipose fin-clipped ("marked") hatchery Chinook salmon, while all "unmarked" Chinook must be released unharmed. Area 9 includes the marine waters inside and south of the Partridge Point - Point Wilson line, extending south and west of a line from Possession Point to Shipwreck, and north of the Apple Cove Point - Edwards Point line (Figure 1). Area 10 encompasses the marine waters extending south from the Apple Cove Point - Edwards Point line to a line projected true east-west through the north tip of Vashon Island (Figure 2).

The Areas 9 and 10 selective Chinook fishery began on July 16, 2007 with tremendous popularity among the angling public. This was the first time that Areas 9 and 10 were open for Chinook fishing during the summer since 1993, providing anglers a unique opportunity to catch Chinook salmon in the middle of an urban area. The selective Chinook fishery in Areas 9 and 10 was scheduled to begin on July 16, 2007 and continue through August 15 (31 days), or until the combined quota of 7,000 retained hatchery Chinook was attained (of which, only 1,700 Chinook could be harvested in Area 10), whichever occurred first. In total, the Area 9 selective Chinook fishery was open for 16 days, from July 16 through July 31. The Area 10 selective Chinook fishery was open for 13 days, from July 16 through July 28.

The pilot Chinook selective fishery in Areas 9 and 10 was patterned after the summer pilot Chinook selective fishery in Areas 5 and 6 (WDFW 2007b), which we have successfully conducted each summer season since 2003 in order to collect the data necessary to enable evaluation and planning of future mark-selective fisheries. The Areas 9 and 10 selective Chinook fishery was also patterned after the pilot seven-month winter selective Chinook fishery in Areas 8-1 and 8-2, which we have successfully conducted for two seasons, from October through April in 2005-06 and 2006-07 (WDFW 2007a and 2007c). The objectives of the Areas 9 and 10 pilot Chinook selective fishery were similar to the objectives of the Areas 5 and 6 pilot Chinook selective fishery and the Areas 8-1 and 8-2 selective Chinook fishery: 1) increase recreational fishing opportunity while meeting conservation goals for Puget Sound Chinook salmon defined by the Puget Sound Chinook Harvest Management Plan; and 2) collect information necessary to enable evaluation and planning of future potential Chinook mark-selective fisheries.

We implemented an intensive sampling design during the Chinook selective fishery in Areas 9 and 10 from July 16 through July 31, 2007. The study design consisted of comprehensive data collection strategies, including dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private (non-charter) boats, to obtain the critical data parameters needed to evaluate the selective fishery. Resulting data were used to estimate total salmon encounters and total effort, adipose mark rate by species, species composition of encounters, unmarked Chinook retention error, legal-size (22 inches or larger total length) versus sublegal-size (less than 22 inches) Chinook encounters, mortalities of retained and released Chinook, as well as mortalities of marked and unmarked double index tag (DIT) groups. Test fishing boats fished the entire proposed length of the fishery, from July 16 through August 15, in

order to collect information necessary to enable evaluation and planning of future potential Chinook mark-selective fisheries.

We contacted all known charter boat operators that fished in Areas 9 and 10 during the two-week fishery. During daily interviews, charter operators reported complete counts of salmon landed; further, based on private-fleet released:retained ratios, we estimated charter releases and combined these values with landings to quantify total charter encounters. Charter boats were ultimately treated separately and excluded from our creel survey estimates due to their high catch per unit of effort compared to private boats. We estimated total salmon encounters for private boats via the Murthy estimator method (Murthy 1957, Cochran 1977), incorporating dockside sampling and on-the-water surveys, while a complete census approach was used for charter boats.

In Area 9, for the period extending from July 16-31, we estimated via creel surveys that private-boat anglers retained a total of 4,938 Chinook (4,905 marked 33 unmarked or of undetermined mark status) in 18,160 angler trips, with an overall catch per unit of effort (CPUE) of 0.27 Chinook per angler trip. We also estimated that anglers released a total of 9,949 Chinook (2,070 marked, 3,465 unmarked, 3,353 unknown mark status, and 1,061 apportioned unidentified salmon). Thus, the total number of Chinook encountered (retained plus released) by private boats in Area 9 was estimated at 14,888. In addition, thirteen charter boats fished in Area 9 during the month life of its fishery, and reported a total retained Chinook catch of 334 (all legal/marked). Additionally, we estimated that charters encountered and released 363 Chinook during their Area-9 fishing activities. Adding charter and private-boat encounters together suggests that a total of 15,584 Chinook salmon were encountered by anglers in the Area-9 selective fishery.

In Area 10, for the the period extending from July 16-28, we estimated via creel surveys that private-boat anglers retained a total of 1,507 Chinook (1,469 marked and 38 unmarked) in 8,374 angler trips, with an overall CPUE of 0.18 Chinook per angler trip. We also estimated that anglers released a total of 6,777 Chinook (1,066 marked, 1,225 unmarked, 2,561 unknown mark status, and 1,924 apportioned unidentified salmon). Thus, the total number of Chinook encountered (retained plus released) by private boats in Area 10 was estimated at 8,284. In addition, thirteen charter boat operators fished in Area 10 and reported landing a total of 70 legal-marked Chinook during their Area-10 activities. Charter releases were estimated at 107 (55 marked, 52 unmarked) for Area 10. Combining Chinook encounters due to charter activity (177) to the estimated Chinook encounters for private boats (8,284) resulted in a total estimate of 8,461 Chinook encounters (1,577 retained and 6,884 released) in Area 10 during its 13-day season.

Thus, for Areas 9 and 10 combined, we estimated a total of 24,045 Chinook encounters (6,850 retained and 17,195 released) during the fishery. More than 95% of this total estimate encounters was due to private-boat fishing activities.

The test boats in each area fished with downriggers over 94% of the time, reflecting the primary gear type used by the recreational fleet. The Area 9 test boat fished for a total of 137 hours during the fishery, while the Area 10 test boat fished for a total of 125 hours. Over the course of the fishery, the test boat in Area 9 encountered a total of 183 Chinook (141 legal and 42

sublegal), while the test boat in Area 10 encountered a total of 138 Chinook (39 legal and 99 sublegal). Based on the combined test fishing data from July 16 through August 15, 77% of the Chinook encountered in Area 9 were legal-size, compared to 28% in Area 10. The adipose mark rate in Area 9 was 78% for legal-size Chinook and 83% for sublegal-size Chinook. In Area 10, the adipose mark rate was 72% for legal-size Chinook and 85% for sublegal-size Chinook.

A number of anglers who fished from private boats in Areas 9 and 10 submitted Voluntary Trip Reports (VTR's) containing information on each fish they encountered during the selective Chinook fishery. Participating anglers recorded a total of 163 Chinook encounters on VTR's for Areas 9 and 10 combined, of which 134 of the encounters (82%) were from Area 9. Of these 134 Chinook, 80 (60%) were legal-size, and 75% of these fish were marked. The 54 sublegal-size Chinook consisted of 31 marked and 23 unmarked (57% mark rate). A total of 29 Chinook encounters were recorded on VTR's in Area 10. Of these, 11 (38%) were legal-size, and 73% were marked. The 18 sublegal-size Chinook reported in Area 10 consisted of 16 marked and 2 unmarked (89% mark rate).

Samplers recovered 255 coded-wire tags from Chinook harvested during the Chinook selective fishery in Areas 9 and 10. Of these, 253 were Puget Sound stocks and two were Canadian stocks. Fifty-four of these CWT recoveries were double index tags. Chinook from George Adams, Grovers Creek and Nisqually hatcheries contributed the highest number of double index tags. We estimated that anglers caught and released 290 legal-size, unmarked double index tagged Chinook, and that the mortality of unmarked legal-size double index tagged Chinook due to this selective fishery was 29 fish.

We compared two methods for estimating total legal-size and sublegal-size Chinook encountered during the fishery. The first method used the total number of Chinook encounters estimated from creel surveys and apportioned the encounters into the four categories of legal-size marked, legal-size unmarked, sublegal-size marked, and sublegal-size unmarked based on the proportions of these groups encountered during test fishing. Chinook encounters due to charter activities were added to private-boat counts to yield the total number of legal and sublegal Chinook encounters (24,045 total encounters: 15,584 in Area 9 and 8,461 in Area 10). Results of the "Method 1" estimation approach indicated that anglers released an estimated 5,571 legal-size and marked Chinook, or 32% of the fish they could have kept.

The second method for estimating the number of Chinook encounters was based on the assumption that anglers kept all Chinook that were legal-size and marked. For this method, total encounters were estimated by dividing the number of legal-size marked fish that anglers retained by the weighted proportion of legal-size marked fish from the test boats. The number of encounters in the remaining three categories was then obtained by multiplying the total encounters by the proportions for each corresponding category. Using this method, we estimated the total encounters at 13,770 Chinook. The true number of encounters thus likely lies between Method-1 and Method-2 estimates; i.e., between 13,770 and 24,405 Chinook encounters.

Using the "Method 1" approach of estimating encounters from the creel surveys and a release mortality rate of 15% for legal-size fish and 20% for sublegal-size fish, we estimated the total mortalities of Chinook in the selective fishery at 9,870, of which 9% were unmarked. Using the encounters estimated by assuming anglers kept all legal fish ("Method 2") and a release mortality

rate of 15% for legal-size fish and 20% for sublegal-size size fish, we estimated total mortalities at 8,155 Chinook, of which 520 (6%) were unmarked fish.

Although we believe the true number of mortalities lies between our two estimates, we used the higher number to compare estimated mortalities against pre-season predictions of mortalities. This approach resulted in total and class-specific estimates (i.e., by size/mark-status groups) that were similar to and generally below the predicted mortalities of 680 unmarked legal-size and 543 unmarked sublegal-size Chinook produced in the final pre-season run of the Fishery Regulation Assessment Model (FRAM; Model 3907), suggesting the Areas 9 and 10 selective Chinook fishery neither hindered nor jeopardized the 2007 conservation and management goals for Puget Sound Chinook.

Due to the new Chinook selective fishery in Areas 9 and 10 that included the regulation requiring anglers to release salmon without bringing the fish on board their vessel, we worked throughout the season to educate anglers about the proper methods of releasing fish and fish identification. Dockside samplers offered anglers a "dehooker" and a pamphlet describing selective fisheries, how to identify salmon species and their mark status, and how to use the dehooker.

Compliance with existing regulations, and the regulation prohibiting bringing unmarked salmon on board a vessel, was considered an integral part of a successful fishery. We estimated unmarked retention error (number of unmarked Chinook retained divided by total unmarked Chinook encounters) at <1% in Area 9 and 2.5% in Area 10.

In summary, the fishery was successful with respect to the objective of implementing monitoring and sampling programs to obtain management information for evaluation and planning of potential future selective Chinook fisheries. Estimated encounters were less than pre-season predictions. Compliance with fishing regulations was good during the fishery. The estimated number of mortalities of unmarked double index coded wire tagged fish was negligible.

INTRODUCTION

In recent years, abundant runs of hatchery salmon have been mixed with depressed runs of wild salmon in the Northwest in both marine and freshwater environments. Providing opportunities to harvest abundant hatchery stocks while protecting wild stocks has been challenging. One tool for allowing harvest of abundant hatchery fish while limiting impacts on wild stocks is "selective fishing." In recreational selective fisheries, anglers are generally allowed to retain adipose fin clipped ("marked") hatchery fish and are required to release unclipped ("unmarked") fish. These unmarked fish are typically wild fish, but also include some unmarked hatchery fish.

While selective coho salmon (*Oncorhynchus kisutch*; "coho") fisheries have occurred in Oregon, Washington, and British Columbia at various times since 1998, and selective Chinook salmon (*O. tshawytscha*; "Chinook") fisheries have occurred in freshwater areas since 2000, a selective Chinook fishery had not been conducted in marine waters prior to 2003, when the first pilot summer Chinook selective fishery was initiated in Areas 5 and 6 (Thiesfeld and Hagen-Breaux 2005a). Each summer since 2003, we have successfully conducted the pilot Chinook selective fishery in Areas 5 and 6 to collect the data necessary to enable evaluation and planning of future mark-selective fisheries. Analyses of the selective Chinook fisheries in Areas 5 and 6 for the 2003 through 2006 seasons were presented in post-season reports (Thiesfeld and Hagen-Breaux, 2005a and 2005b; WDFW, 2005, 2006, and 2007b).

In addition, we have conducted the seven-month pilot selective Chinook fishery in Marine Catch Areas 8-1 and 8-2 for two seasons, from October 1 through April 30 during 2005-06 and 2006-07, to collect the data necessary to enable evaluation and planning of future mark-selective fisheries. The Areas 8-1 and 8-2 pilot selective Chinook fishery represents the first experience using mark-selective regulations for Chinook in marine waters during the winter blackmouth fishery season. Anglers in Puget Sound commonly use the term "blackmouth" to indicate immature Chinook. Analyses of the first two seasons of data from this pilot seven-month winter selective Chinook fishery were presented in post-season reports (WDFW 2007a, 2007c).

The Areas 9 and 10 selective Chinook fishery began on July 16, 2007 with tremendous popularity among the angling public. This was the first time that Areas 9 and 10 were open for Chinook fishing during the summer since 1993, providing anglers a unique opportunity to catch Chinook salmon in the middle of an urban area. Area 9 includes the marine waters inside and south of the Partridge Point - Point Wilson line, extending south and west of a line from Possession Point to Shipwreck, and north of the Apple Cove Point - Edwards Point line (Figure 1). Area 10 encompasses the marine waters extending south from the Apple Cove Point - Edwards Point line to a line projected true east-west through the north tip of Vashon Island (Figure 2).

Several marine area closures were in effect throughout the fishery in both Marine Areas 9 and 10, as follows: 1) the Hood Canal closure that included waters of Area 9 south of a line from Foulweather Bluff to Olele Point (Figure 1); 2) the Elliot Bay Closure which included waters of Elliot Bay east of a line from West Point to Alki Point, including the Duwamish Waterways upstream to the 1st Ave South Bridge; and 3) the Sinclair Inlet Fishery Area including waters of Sinclair Inlet and Port Orchard south of the Manette Bridge in Bremerton, south of a line drawn true west from Battle Point, and west of a line drawn true south from Point White (Figure 2).

The selective Chinook fishery in Areas 9 and 10 was scheduled to begin on July 16, 2007 and continue through August 15 (31 days), or until the combined quota of 7,000 retained hatchery Chinook was attained (of which, only 1,700 Chinook could be harvested in Area 10), whichever occurred first. In total, the Area 9 selective Chinook fishery was open for 16 days, from July 16 through July 31. The Area 10 selective Chinook fishery was open for 13 days, from July 16 through July 28.

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) reached agreement to consider selective Chinook sport fishing in Areas 9 and 10 during the summer of 2007 as part of a pilot program for the purpose of collecting information necessary to enable evaluation and planning of future potential Chinook mark-selective fisheries. The pilot Chinook selective fishery in Areas 9 and 10 was patterned after the summer pilot Chinook selective fishery in Areas 5 and 6 (WDFW 2007b), which we have successfully conducted each summer season since 2003, as well as the pilot seven-month winter selective Chinook fishery in Areas 8-1 and 8-2, which we have successfully conducted for two seasons, from October through April in 2005-06 and 2006-07 (WDFW 2007a, 2007c).

The objectives of the Areas 9 and 10 pilot Chinook selective fishery were similar to the objectives of the Areas 5 and 6 pilot Chinook selective fishery and the Areas 8-1 and 8-2 pilot selective Chinook fishery: 1) increase recreational fishing opportunity while meeting conservation goals for Puget Sound Chinook salmon defined by the Puget Sound Chinook Harvest Management Plan; and 2) collect information necessary to enable evaluation and planning of future potential Chinook mark-selective fisheries. It was thought that a pilot summer selective fishery in Areas 9 and 10 that was limited in time and area would allow managers to determine the success of monitoring and sampling programs for collection of essential information.

Anglers were allowed to retain two marked (adipose fin-clipped) Chinook salmon $\geq$ 22" (56 cm) as part of their daily limit, and were required to immediately release, unharmed, any unmarked Chinook caught. Integral to the selective fishery was the regulation stating, "Any salmon to be released may not be brought on board a vessel". Due to the new selective fishery-related regulations in Areas 9 and 10, we educated anglers throughout the fishery about alternative methods for properly releasing fish, other than netting the fish and bringing fish into the boat. Dockside samplers offered anglers a "dehooker" and a pamphlet describing selective fisheries, how to identify salmon species, how to identify mark status of salmon, and how to use the dehooker. In addition to marked Chinook, anglers were also allowed to retain other salmon species (no minimum size) during the Chinook selective fishery period, under a total combined daily limit of two salmon.

This report presents the methods, post-season data analyses, and results generated from our intensive monitoring of the selective Chinook fishery in Areas 9 and 10 during July 2007 -- from July 16 through July 31 in Area 9 and from July 16 through July 28 in Area 10. Our study design consisted of comprehensive data collection strategies, including dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private boats, to obtain the critical data parameters needed to evaluate the selective fishery. Resulting data were used to estimate total salmon encounters and total effort, adipose mark rate by species, species composition of encounters, unmarked Chinook retention error, legal-size (22 inches or larger

total length) versus sublegal-size (less than 22 inches) Chinook encounters, mortalities of retained and released Chinook, as well as mortalities of marked and unmarked double index tag (DIT) groups.

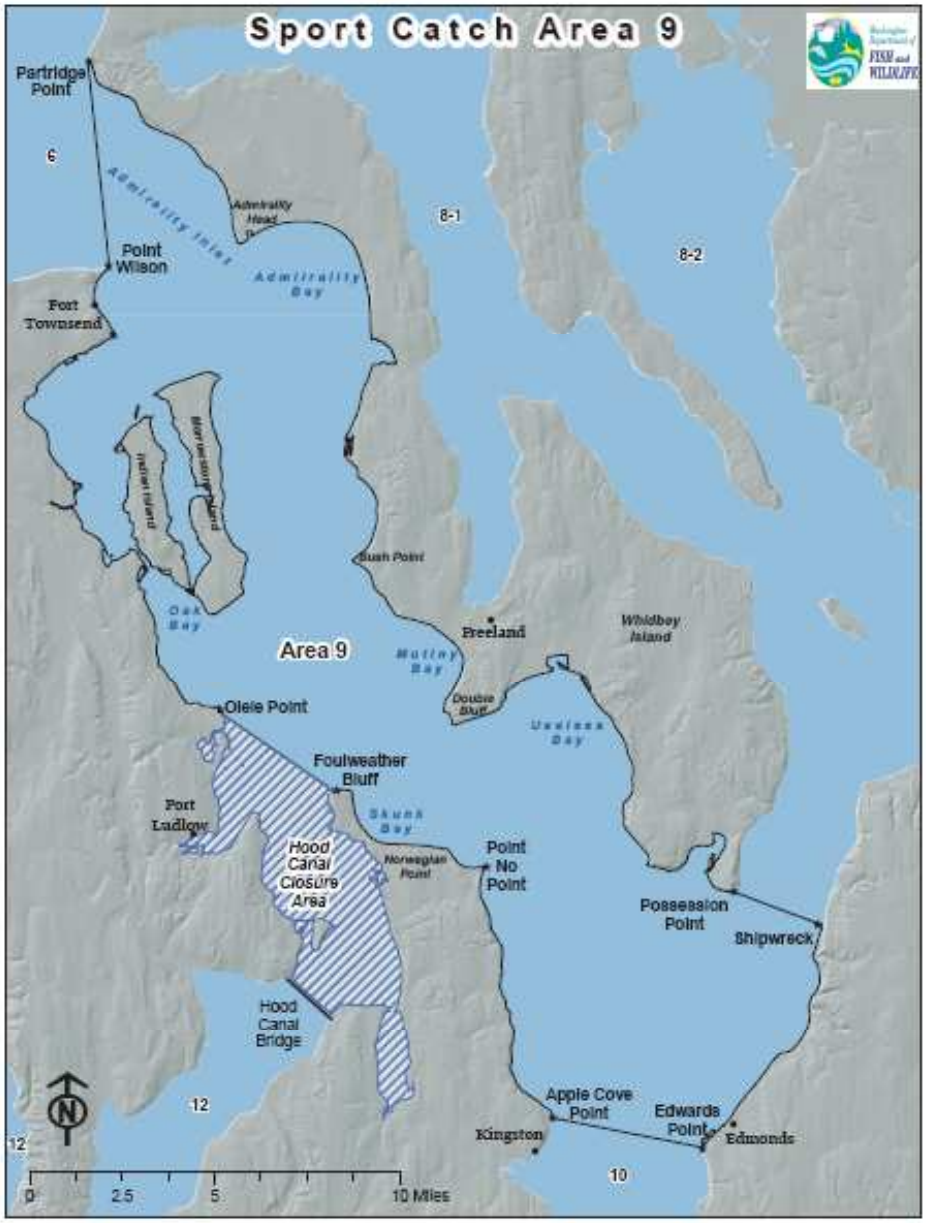

Figure 1. Map of Marine Catch Area 9 in Puget Sound, where the selective Chinook fishery occurred from July 16 through July 31, 2007.

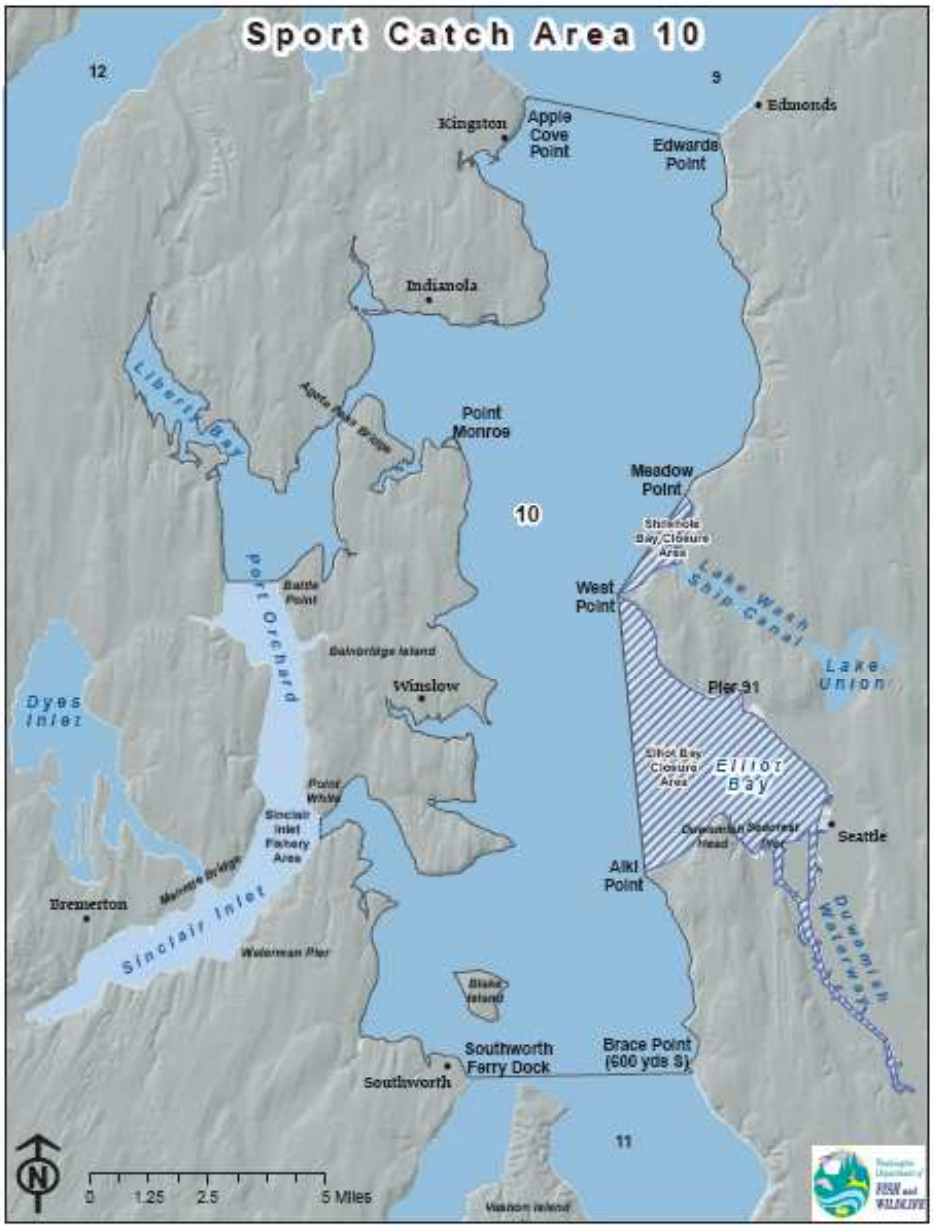

Figure 2. Map of Marine Catch Area 10 in Puget Sound, where the selective Chinook fishery occurred from July 16 through July 28, 2007.

METHODS

An intensive sampling design was implemented in Areas 9 and 10 during the selective Chinook fishery period during July 2007 -- from July 16 through July 31 in Area 9 and from July 16 through July 28 in Area 10. The study design was based on Murthy's estimator (Murthy 1957, Cochran 1977) to obtain daily estimates of total catch and effort. The sampling design incorporated comprehensive data collection strategies consisting of dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private boats, as detailed below. Resulting data were used to estimate total salmon encounters and total effort, adipose mark rate by species, species composition of encounters, unmarked Chinook retention error, legal-size (22 inches or larger total length) versus sublegal-size Chinook encounters, mortalities of retained and released Chinook, as well as mortalities of marked and unmarked double index tag (DIT) groups.

Dockside Sampling

Effort and catch were estimated by creel surveys generally following the procedures outlined in "Puget Sound salmon sport catch estimation study-1990" (Washington Department of Fisheries and Northwest Indian Fisheries Commission 1992), except that expansion factors were determined in-season, rather than using previously determined effort levels.

For each sampling day, six ramp samplers were stationed at selected sampled sites in Area 9, and four ramp samplers were stationed at selected sampled sites in Area 10. Samplers interviewed anglers as they exited the fishery from sampled sites, to collect data on angler effort, numbers of landed and released fish by species, and the adipose mark status of all Chinook and Coho encountered. In addition, all Chinook and Coho were electronically sampled to detect coded-wire tag (CWT) presence. Snouts were collected from fish that detected positive for a CWT, and associated biological information was recorded (fork lengths, total lengths, and scale samples).

Sampling Strata and Shifts

Sampling strata were divided into weekday (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) strata. Each week we randomly selected two days from the Monday through Thursday stratum for dockside sampling. In addition, we sampled every Friday, Saturday, and Sunday. Due to the exacting nature of a quota fishery, additional sampling days were added to ensure accurate catch accounting of the fishery to remain within the quota. Dockside sampling shifts lasted from approximately dawn until dark in order to intercept all boats.

Sampled Sites

Sites to be sampled were selected as follows: Access sites in Areas 9 and 10 were divided into sampled and non-sampled sites. Access sites with low effort, as determined from boat survey data (see "Boat surveys" section below) were excluded in the sample. All anglers and fish exiting the fishery through the sampled sites were counted. Any boats that were missed at sampled sites were counted and recorded on the sampling forms.

In Areas 9 and 10, for each scheduled sampling day, two access sites (ramps or docks) were randomly selected for sampling based on a weighted random site selection process. A total of four shifts (an AM and PM in each area) were sampled per selected sampling day in each Area. A computer program developed by Mark Hino, WDFW Fish and Wildlife Biologist, was used to select the sampling sites based on their "size" or "weight" (i.e., the proportion of angler effort that on average uses the site; Murthy 1957, Cochran 1977). The computer application used a probability proportional to size without replacement cluster sampling scheme. The computer application required that the size measures of sampled sites in each Area sum to 1; thus, we used number of anglers from sampled sites to determine the adjusted size measures for these sites. The daily catch and effort estimates were expanded by an estimate of the proportion of effort that originated from these non-sampled access sites in each Area (see section below titled *Estimated Catch and Effort*), to compensate for leaving out the non-sampled sites from the sample frame at the time of site selection.

The sampled sites in Area 9 included the Port Townsend Boat Haven Ramp, Norton Street (Everett) Ramp, Kingston Public Ramp, Salsbury County Park Ramp, Mukilteo Lighthouse Park Ramp, and Fort Worden Ramp. The sampled sites in Area 10 included Armeni Public Ramp, Shilshole Public Ramp, and Kingston Public Ramp. The proportion of angler effort using these sampled sites, as compared to the non-sampled sites, is documented in the *Results* section below.

Dockside Fishing Method Question

During dockside interviews, samplers recorded the predominant (based on time) angling method that was employed by the boat being interviewed, for the boats that successfully encountered Chinook. Responses were recorded on the sampling form according to the following five fishing method categories:

1. Weight & Bait (W): Mooching or slow trolling with lead and herring/anchovy.

2. Downrigger Trolling (DR): Using either hardware or bait or any combination.

3. Jigging (J): Drifting, jerking pole up and down; for example using Buzz Bombs, Point Wilson Darts, or Crippled Herring.

4. Diver Trolling (DV): For example trolling with a Deep Six or a Pink Lady, using either hardware or bait or any combination.

5. Other (O): For example fly fishing, or trolling bucktails with or without weight.

We summarized the resulting information and instructed the test boat samplers on which method to employ in order to adequately represent the fishing methods used by the recreational fleet (see section below titled "Test Fishing").

Boat Surveys

On-the-water surveys were used to estimate the percent of effort from sampled sites (versus non-sampled sites) and the proportion of angler effort at each sampled site. Boat surveys covered the entire area to pick up effort from all launch sites. We asked boat occupants where they intended to tie up or exit the fishery rather than where they launched. All boats that were actively fishing were contacted. We excluded non-fishing vessels and charter boats from the boat survey data. Charter boats were treated separately and excluded from our Murthy estimate due to their significantly higher CPUE compared to private boats, and because charter vessels were not necessarily exiting the fishery via our "sampled sites," which precluded sampling their catch (see "Charter Boats" section below).

In each area, we scheduled two boat surveys per week, one in the weekday stratum and one in the weekend stratum. In addition, boat surveys were conducted if anything changed in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close). We calculated the size measures of Area 9 and Area 10 sites based on the most recently available boat survey data for weekend and weekday strata. Boat survey data were used to expand site estimates to all sites accessing the fishery and to provide in-season guidance to the dockside sampling site-selection process.

Estimated Catch and Effort

Private Anglers

The catch and effort (excluding charter vessels) observed at sampled sites was expanded to all access sites, based on their "size measure," to estimate total daily catch and effort in Areas 9 and 10. Sample data were combined and expanded to create stratum estimates of catch and effort with variances. We used a computer application developed in Microsoft Access by Kurt Reidinger, WDFW Fish and Wildlife Biologist, to enter the in-sample data, generate the expanded estimates, and produce the variances.

The formula for expanding catch and effort was:

$$\hat{Y} = \frac{\left[(1-P_2)*(E_1/P_1)+(1-P_1)*(E_2/P_2)\right]}{(2-P_1-P_2)}$$

where:

$\hat{Y}$ = daily estimator (e.g., anglers, marked Chinook retained, coho released, etc.),
P = proportion of effort (size measure) at site *1* and *2*, and
E = sampled (observed) estimator at site *1* and *2*.

The formula for the variance of this estimator was:

$$V\left(\hat{Y}\right) = \frac{(1-P_1)(1-P_2)(1-P_1-P_2)}{(2-P_1-P_2)^2} * \left[\frac{E_1}{P_1} - \frac{E_2}{P_2}\right]^2$$

If any boats were not interviewed during dockside sampling shifts, they were counted and recorded on the sampling forms. The average daily estimated catch for a given day and site was then multiplied by the observed number of missed boats, within the Microsoft Access estimation system, to estimate the unobserved catch. An analogous computation was made to account for the number of anglers not interviewed from the missed boats. These estimates, along with the count of missed boats, were added to the daily estimate totals at each site within the Access system.

For both Areas 9 and 10, the non-sampled sites were left out of the sample frame at the time of site selection, due to the draw-by-draw site selection process of the computer application that required the sum of the size measures of sampled sites to equal 1. To compensate for this potential bias, the daily catch and effort estimates were expanded by an estimate of the proportion of effort that originated from the non-sampled access sites. The formula for this adjustment was as follows:

$$\hat{Y}_{adj} = \frac{\hat{Y}}{(1 - \hat{p}_{nonsampled})} = \frac{\hat{Y}}{\hat{q}}$$

where:

$\hat{Y}_{adj}$ = daily estimator after expansion by an estimate of the proportion of effort that originated from the non-sampled access sites, and

$\hat{q}$ = expansion factor to account for the proportion of effort originating from non-sampled sites.

The variance of the adjusted daily estimate was approximated by:

$$V\left(\hat{Y}_{adj}\right) = \hat{Y}_{adj}^{\,2} * \left[\frac{\hat{V}(\hat{Y})}{\hat{Y}^2} + \frac{\hat{V}(\hat{q})}{\hat{q}^2}\right]$$

Harvest and effort estimates were based on the following assumptions: 1) Boat surveys are unbiased estimates of the proportion of anglers accessing fisheries from non-sampled sites; 2) The proportion of total anglers accessing the fishery at site 'A' represents the proportion of total catch landed at site 'A'; 3) All anglers exiting at a sampled site are interviewed and all anglers accurately report their catch (if any boats are missed they are counted and catch and effort estimates are expanded appropriately); and 4) Catch per unit effort does not differ significantly between sampled and non-sampled sites.

Numbers of fish encountered but released during the Chinook selective fishery were also estimated based on dockside interviews of anglers, as part of the catch and effort sampling program. Anglers were asked to report numbers of fish released by species. In addition to Chinook, released species reported included coho salmon, pink salmon (*O. gorbuscha*), and unidentified salmon. Samplers logged fish in the unidentified salmon category when anglers reported releasing salmon that they were unable to identify (to species) at the time of encounter

(e.g., suspected "shakers" that were quickly released outside the gunwales, as per regulations). Dockside interview data were expanded to obtain total fishery estimates of released salmon, by species and mark-status category, using the same methods as described above for total catch and effort estimates.

As an additional estimation step towards quantifying total Chinook encounters, we apportioned a percentage of released, unidentified salmon to the total estimated number of released Chinook, based on the proportions of known salmon species released from creel surveys. Given that this quantity—apportioned unidentified salmon (N_{AUS})—is derived from estimated quantities [total unidentified salmon (N_{US}, from the Murthy estimator and subsequent adjustments described above), and the proportion of Chinook in estimated releases ($p_{Chin} = N_{Chin} / \Sigma N_{ID'd\text{-}salmon}$)], its estimator and variance are:

$$N_{AUS} = N_{US} * p_{Chin}$$

$$V(N_{AUS}) = V(N_{US}) * p_{Chin}^2 + N_{US}^2 * V(p_{Chin}) + V(N_{US}) * V(p_{Chin}),$$

where, also based on estimates:

$$V(p_{Chin}) = p_{Chin}^2 * [V(N_{Chin}) / N_{Chin}^2 + V(N_{ID'd\ salmon}) / N_{ID'd\ salmon}^2] + V(N_{Chin}) * [V(N_{ID'd\ salmon}) / N_{ID'd\ salmon}^4]$$

Charter Boats

After consulting with the WDFW biometrician, we elected to separate charter vessels from non-charter vessels (i.e., "private boats") in generating total catch estimates for Areas 9 and 10. Specifically, charter boats were treated separately and excluded from our Murthy estimate due to their high catch per unit of effort compared to private boats (i.e., to reduce potential bias and improve precision about estimates). In addition, charter boats often exited the fishery via sites outside of our sample frame and their landed catch was therefore not susceptible to sampling. Thus, while we relied on the Murthy estimator method to quantify total salmon encounters for private boats in Areas 9 and 10, a complete census approach was used for charter boats.

To encourage daily reporting and therefore facilitate a complete charter census, we contacted all licensed charter-boat operators planning to fish in the Areas 9 or 10 selective Chinook fishery during July 2007, prior to the season opening. In doing so, we established a protocol for daily reporting (via telephone or email) of catch, so that charter landings could be tracked and incorporated into WDFW's daily assessment of each fishery's progress relative to established quotas. Additionally, we instructed charter captains on the proper use of voluntary trip report (VTR) forms (e.g., data collection and recording techniques) at this time; VTRs (described in detail below) provide a means for gaining more detailed information on total effort and encounters resulting from charter activities.

Although charter-boat operators were highly cooperative in reporting their daily landings during the Areas 9 and 10 fisheries, a low return rate on charter VTRs (as of 28 September 2007) prevented us from gaining a complete census of charter releases. Given this, we had to estimate the number of Chinook encountered and released by charters in order to account for charter releases in our full fishery-impact evaluation. We estimated the number of Chinook released by

charter anglers based on stratum-specific released:retained ratios (i.e., marked and unmarked releases per legal-marked fish kept) estimated for private-fleet anglers. In doing so, we assumed that the identity and mark-status of all charter encounters would have been accurately determined (i.e., we did not estimate unknown mark-status releases or unidentified released salmon for charter anglers) and that private and charter retained:released ratios are generally equivalent.

Test Fishing

We operated two test boats, one in Area 9 and the other in Area 10, for the month extending from July 16th (the opening day of the two fisheries) to August 15th (i.e., the last permitted day of the two fisheries if their respective quotas were not reached first). The crew on each boat consisted of two WDFW technicians per boat, fishing with one rod each. These test boat crews fished approximately five days per week (Monday through Friday) throughout the fishery.

Test-boat crews focused their fishing efforts at locations in Areas 9 and 10 that optimized their overall encounter rate (i.e., to increase precision) and mirrored choices made by the at-large private fleet. To better ensure the accuracy of test-fishing data, samplers fished for Chinook with similar methods and gear as did the recreational fleet. We prescribed the proportions of time that the test boats should spend fishing with different methods based on preceding dockside interview results. However, fishing methods were also adapted by test-boat crews in response to changing tides or other environmental conditions and due to observed changes in private-fleet behavior. At the end of each test-fishing day, the samplers summarized the amount of time they spent on fishing each method. In each area, the test-boat samplers fished predominately with downriggers (> 94% of the time), which was the predominant gear used by private anglers (see the *Results* section below).

For each test-boat hook-up, the encounter number, time sampled, species, mark status, and DNA vial number (if applicable) was recorded. Care was taken to handle all fish as gently as possible. Chinook were brought on board in a cotton mesh net and measured while still in the net. Samplers recorded the fork length, total length, and mark status for each Chinook on the scale card (legal-size Chinook were 22 inches and larger, while sublegal-size Chinook were less than 22 inches total length). Samplers collected three scales for each Chinook brought on board. Scales were collected following procedures outlined by the International North Pacific Fisheries Commission (1963), to enable age analysis of Chinook encountered in the fishery.

In addition, samplers used scissors to remove a 1-cm^2 section of tissue from the dorsal fin or the caudal fin of all Chinook brought on board, and then placed the sample in a solution of ethanol. Tissue samples were collected to obtain DNA for future genetic analysis of stock composition. All fish were released carefully and as soon as possible.

Data collected by the test boats were used to estimate species composition of encounters in the recreational fishery, the percent of fish encountered that were adipose fin-clipped (mark rate), and the proportions of Chinook that were legal-size versus sublegal-size. Test-fishing size/mark-status group (legal-marked, legal-unmarked, sublegal-marked, sublegal-unmarked) proportions were ultimately used to apportion private-fleet Chinook encounters to these same classes for use in fishery-impact estimation (Appendix A). In addition, Chinook size distributions were

contrasted between areas and mark-status groups (i.e., Area 9 vs. Area 10, and unmarked vs. marked lengths within areas) using two-tailed t-tests; significance was judged at $\alpha = 0.05$.

To determine the age composition of the Chinook sampled by the test boats, we relied on the scale-reading expertise of John Sneva and Lance Campbell, Fish and Wildlife Biologists from WDFW, who analyzed all of the Chinook scale samples collected during the test fishery.

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that were legal-size (22 inches or larger total length) versus sublegal-size (less than 22 inches) was obtained from private-boat anglers who submitted Voluntary Trip Reports (VTR's) during the mark selective Chinook fishery in Areas 9 and 10 in July 2007. Participating anglers were asked to attend a class lasting from 30-45 minutes during which they received information on salmon species identification and became familiar with the VTR forms, what data to collect, how to fill out the forms, and how to turn in the forms.

On the VTR form, anglers were asked to record the date, number of anglers, target species, CRC Area, the species (if they positively identified the fish), including each Chinook or coho encountered, whether the fish was kept or released, total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped. From this information, we estimated mark rates of legal and sublegal size Chinook and then compared these results with test-fishing data.

Coded Wire Tagged Chinook Impacts

To determine the number of mortalities of unmarked coded-wire tagged Chinook resulting from the Chinook selective fishery, we analyzed recovered coded-wire tags and separated out tags from double index tag (DIT) groups. We then applied the methods described by WDFW (2002) to estimate the number of unmarked Chinook with coded-wire tags that would have been encountered, and applied a 10% selective fishing mortality rate (*sfm*) to estimate the number of mortalities.

The analytical methods used to estimate unmarked mortalities in the selective fishery were developed by the Selective Fisheries Evaluation Committee – Analysis Work Group (SFEC-AWG 2002) and were evaluated by a workgroup consisting of State and Tribal biologists and statisticians, including members of SFEC-AWG (Joint Coho DIT Analysis Workgroup 2003). As indicated be SFEC-AWG, the goal of the analytical methods based on DIT groups is to estimate the number of unmarked mortalities in the selective fishery due to hook and release mortality. A key caveat with this approach is that the unmarked mortality estimate will be comparable to the number of *landed* marked mortalities and does not include adjustments for drop-off mortality or other types of mortality.

Thus, we used a selective fishery mortality rate (sfm) of 10% to estimate mortalities of the unmarked DIT fish encountered in the Areas 9 and 10 selective Chinook fishery, which is the sfm rate that is used in the Fishery Resource Assessment Model (FRAM) for legal-size Chinook. In addition, a drop-off mortality rate of 5% is added in FRAM, yielding a total sfm of 15% for

legal-size Chinook (Larrie Lavoy, WDFW, personal communication). We did not include the additional drop-off mortality rate of 5% for legal-size Chinook in the mortality analysis for unmarked DIT fish because the unmarked mortality estimate is comparable to the number of *landed* marked mortalities ($M_{a,i}^{MSF}$ in the equation below), determined from CWT's recovered at the dock, and drop-off mortality is not applicable to these retained Chinook.

Because the sampling rate changed throughout the fishery and among areas, we estimated encounters and mortalities for each recovered double index tag individually, and then summed the estimated mortalities for each hatchery and brood year. Variance and standard error were also estimated with methods described by WDFW (2002), and were estimated for individual tags, then summed for each hatchery and brood year.

The estimated number of unmarked mortalities was calculated by:

$$\hat{U}_a^{MSF} = \lambda^{REL} \hat{M}_a^{MSF} \, sfm$$

with associated variance:

$$Var(\hat{U}_a^{MSF}) \approx \left(\lambda^{REL}\right)^2 sfm^2 \hat{M}_a^{MSF} \frac{1-s}{s}.$$

where:

sfm = selective fishing mortality rate,

$U_{a,i}^{MSF}$ = aged a unmarked but tagged mortalities from stock i in the mark-selective fishery,

$M_{a,i}^{MSF}$ = aged a marked and tagged mortalities from stock i in the mark-selective fishery,

s = sampling rate of the catch,

λ^{REL} = unmarked to marked ratio at release for fish in a DIT group, and

$V(\hat{U})$ = variance of estimator U.

Legal and Sublegal Chinook Encounters and Mortalities

We estimated season-total Chinook encounters by size and mark status [legal-marked (LM), sublegal-marked (SM), legal-unmarked (LU), and sublegal-unmarked (SU)] using two different approaches, "Method 1" and "Method 2". For each method, we applied the same approach towards estimating mortality from encounters (retention and release), even though each method was based on different initial estimates. In addition, both methods were applied to derive point estimates and variances on a stratum-by-stratum basis, and then these values were summed across the 13- and 16-day seasons to obtain totals. While we provide a summarized description of Methods 1 and 2 below, Appendix A presents a more detailed description of the analytical procedure applied for assessing total impacts generated by the Area 9 and 10 selective fisheries.

The first method for estimating Chinook encounters (Method 1) was based on an assumption that our dockside interview data (creel surveys) yield unbiased estimates of retained and released Chinook encountered by mark-status group. While the reliability of our estimate of Chinook

kept is likely high, whether or not anglers accurately report all Chinook encountered and released during their fishing trip(s) is less certain. In general, we assume the reliability of reported releases declines during periods of high encounters and that anglers generally over-estimate the number of fish released; thus, Method-1 estimates are likely biased high, if at all. Ultimately, size/mark-specific estimates were derived using a combination of creel survey encounter estimates (Appendix A), test-fishery proportions (for apportioning total encounters to the four size/mark status groups), and dockside size/mark-status observations (for apportioning kept Chinook—estimated by mark-status group only—to the classes LM, LU, SM, and SM).

The second method (Method 2) generated an estimate of total Chinook encounters based on the estimates of retained Chinook from creel surveys. Specifically, encounters were estimated by expanding stratum-specific estimates of legal-size and marked Chinook retained by the test-fishery estimate of the proportion of legal-size marked fish in the at-large fishable population (i.e., *Total Encounters = No. LM Chinook kept / LM proportion in the fishable population*), and then were apportioned to class in the same manner as are Method-1 encounters. The accuracy of the Method 2 estimator thus depends on whether or not anglers retain all legal-marked Chinook encountered. If anglers sort their catch via releasing legal-size marked Chinook in hopes of catching a larger-size Chinook, we assume that Method-2 estimates will be biased low. Given that prior data from other Puget Sound selective Chinook fisheries indicate that anglers do release legal-size and marked Chinook on occasion (e.g., charter anglers typically release <10%; WDFW 2007a, 2007c), we believe that Method 2 provides a minimum estimate of Chinook encounters and mortality impacts due to the mark selective Chinook fishery in Areas 9 and 10.

We estimated total Chinook mortality resulting from the Areas 9 and 10 selective Chinook fishery, for each of the four size/mark status groups, by applying assumed mortality rates to LM, LU, SM, and SU retention and release estimates generated using Methods 1 and 2 above. For retained Chinook, the mortality estimate was equivalent to the total retention estimate for the applicable size/mark-status group. For released Chinook, we applied a mortality rate of 15% to legal-size marked and legal-size unmarked estimates and a mortality rate of 20% to sublegal-size marked and sublegal-size unmarked estimates. Similar to encounters, mortalities (and variances) were calculated for all categories on a stratum-by-stratum basis and then pooled across the seasons to estimate total Chinook mortalities.

In addition, total Chinook encounters and corresponding mortalities resulting from charter boat operations were incorporated into Method-1 and Method-2 estimates of encounters and mortalities. We added the reported Chinook encounters from charter vessels to the private-fleet estimates according to the appropriate retained/released and size/mark-status category. Appendix A presents the details of these and other estimation steps, as well as the equations for all estimators and their variances.

As a final step in our analysis, we compared observed season-total estimated Chinook encounters and mortalities for Areas 9 and 10 combined versus the pre-season modeled (FRAM Model 3907) number of Chinook encounters and mortalities, for each size and mark status category. Given that Method 1-based estimates likely provide a more conservative estimate of fishery impacts, we elected to use Method 1-based estimates of Chinook encounters and mortalities to compare with the modeled results.

RESULTS AND DISCUSSION

Sampled Sites

Sites included in the Area-9 sample frame included: Dagmars Landing, Port Townsend Boat Haven Ramp, Norton Street (Everett) Ramp, Kingston Public Ramp, Salsbury County Park Ramp, Mukilteo Lighthouse Park Ramp, and Fort Worden Ramp. The sites actually sampled are shown in Table 1 and Appendix F. Sampled sites for the first week were determined prior to the fishery based on historical catch and effort data and current ramp effort knowledge of sampling supervisors.

The Area-10 sample frame included: Armeni Public Ramp, Brownsville Ramp, Edmonds Marina (Dry Storage), Kingston Public Ramp, Manchester Public Ramp, Port Orchard Ramp, and Shilshole Public Ramp. The sites actually sampled appear in Table 1 and Appendix F. Sampled sites for the first week were determined prior to the fishery based on historical catch and effort data.

Boat Surveys

In Areas 9 and 10, we conducted a total of 4 boat surveys for each area during the fishery (Table 2). Boat surveys were used to estimate the percent of effort from sampled sites (versus non-sampled sites) and the proportion of angler effort at each access site.

We attempted to complete 1 weekday and 1 weekend boat survey in each area for each week that the fishery was open. Three weekday and one weekend boat surveys were conducted in Area 9 (Table 2). One weekend boat survey was canceled due to strong wind. Two weekday and two weekend surveys were conducted in Area 10 (Table 2). .

A summary of the boat survey data collected during the selective Chinook fishery in Areas 9 and 10 is presented in Tables 3 and 4 (all boat surveys combined). In Area 9, we surveyed a total of 577 boats and 1185 anglers over the fishery. Of these anglers, 49% exited the fishery via sampled sites. In Area 10, we surveyed a total of 423 boats and 815 anglers over the fishery. Of these anglers, 59% exited the Area 10 fishery via sampled sites.

Size Measures of Sampled Sites

The sites that were randomly selected for sampling in Areas 9 and 10, and the size measures determined for each site based on the boat survey data, are listed in Appendix F. Over the fishery, Norton St (Everett) Ramp dominated as the site with the highest overall size measure in Area 9, with a total size measure of 0.441 weekday and 0.515 weekend (adjusted size measure; Tables 3A and 3B). Shilshole Public Ramp dominated as the site with the highest size measure in Area 10, with a total weight of 0.375 weekday and 0.355 weekend over the 13-day fishery (adjusted size measure).

Table 1. List of 'sampled sites' for Areas 9 and 10, showing the number of days sampled per month per site and the proportion of total time that each site was sampled during the selective Chinook fishery from July 16 - 31, 2007 (28th Area 10).

Area 9 Sampled Sites	Sample Days During Fishery	Total Days Sampled	% of Total
Norton Street (Everett) Ramp	12	12	**46.2%**
Port Townsend Boat Haven Ramp	7	7	**26.9%**
Kingston Public Ramp	4	4	**15.4%**
Salsbury County Park Ramp	1	1	**3.8%**
Mukilteo Lighthouse Park Ramp	1	1	**3.8%**
Fort Worden Ramp	1	1	**3.8%**
TOTAL	**26**	**26**	**100.0%**

Area 10 Sampled Sites	Sample Days During Fishery	Total Days Sampled	% of Total
Shilshole Public Ramp	10	10	**50.0%**
Armeni Public Ramp	8	8	**40.0%**
Kingston Public Ramp	2	2	**10.0%**
TOTAL	**20**	**20**	**100.0%**

Table 2. Summary of monthly boat surveys conducted in Areas 9 and 10 during the selective Chinook fishery from July 16 – 31, 2007.

Boat Surveys: Areas 9 and 10			
Area 9		**Area 10**	
Month	**Boat Survey Dates**	**Month**	**Boat Survey Dates**
Weekday	16th, 24th, 31st	Weekday	17th, 27th,
Weekend	21st	Weekend	22nd, 28th
Total Number		**Total Number**	

Table 3A. Summary of the total number of anglers intercepted in Area 9 during weekday on-the-water surveys, and proportion of angler effort per access site (size measures), during the selective Chinook fishery in Area 9 from July 16 – 31, 2007. Highlighted rows indicate sites that were in the sample frame.

Site	Total Anglers	Size Measure	Total Anglers Sampled Sites	Adjusted Size Measure Sampled Sites
Armeni Ramp	3	0.004		
Bayside Marine (Everett)	3	0.004		
Brinnon	3	0.004		
Bush Point (Prvt)	4	0.005		
Camani Island State Park	2	0.003		
Cape George Marina	2	0.003		
Columbia Beach	3	0.004		
Dagmars Landing	12	0.015	12	0.032
Dagmars Marina	2	0.003		
Driftwood Key Marina	31	0.039		
Driftwood Key Ramp	7	0.009		
Eagle Harbor Waterfront Park	3	0.004		
Edmonds Marina Dry Storage	19	0.024		
Edmonds Marina Moorage	77	0.097		
Edmonds Marina Sling	28	0.035		
Eglon Public Ramp	11	0.014		
Elliot Bay Marina	2	0.003		
Everett Marina	23	0.029		
Everett Public Ramp	166	0.210	166	0.441
Fort Casey Public Ramp	18	0.015		
Fort Warden Ramp	31	0.039	31	0.082
Hadlock Public Ramp	2	0.003		
Kingston Public Ramp	39	0.049	39	0.104
Kingston Marina	4	0.005		
Laconner Public Marina	2	0.003		
Lagoon Point Ramp	25	0.032		
Langley Marina	2	0.003		
Langley Ramp	2	0.003		
Marrowstone Island Private Moorage	4	0.005		
Max Welton Ramp (Whidbey)	2	0.003		
Mukilteo Lighthouse Park Ramp	76	0.096	76	0.202
Mutiny Bay Private Moorage	4	0.005		
Mutiny Bay Ramp	10	0.013		
Whidbey Naval Station (Private)	2	0.003		
Oak Bay (Private)	2	0.003		
Point No Point Beach Launch	3	0.004		
Port Hadlock Marina (Moorage)	2	0.003		
Port Hadlock Ramp	7	0.009		
Port Ludlow Marina	5	0.006		
Port Townsed Moorage	8	0.010		
Port Townsed Ramp	46	0.058	46	0.122
Port Townsed Salmon Club	8	0.010		
Possession Ramp	15	0.019		
Private Buoy (General 9)	13	0.016		
Whidbey Island (Private)	6	0.008		
Salsbury County Park Ramp	6	0.008	6	0.016
Sandy Hook (Whidbey Island Private)	7	0.009		
Shillshole Marina	13	0.016		
Skunk Bay (Private Moorage)	26	0.033		
Tyee Marina	1	0.001		
Total Anglers	792	1.000	376	1.000

Table 3B. Summary of the total number of anglers intercepted in Area 9 during weekend on-the-water surveys, and proportion of angler effort per access site (size measures), during the selective Chinook fishery in Area 9 July 16 – 31, 2007. Highlighted rows indicate sites that were in the sample frame.

Site	Total Anglers	Size Measure	Total Anglers Sampled Sites	Adjusted Size Measure Sampled Sites
14th St Ramp (Ballard)	2	0.005		
Camano Island State Park Ramp	2	0.005		
Dagmars Landing	8	0.020	8	0.040
Armeni Ramp	6	0.015		
Driftwood Key Marina	11	0.028		
Eagle Harbor Waterfront Park	2	0.005		
Edmonds Marina Dry Storage	18	0.046		
Edmonds Marina Moorage	29	0.074		
Edmonds Marina Sling	7	0.018		
Eglon Public Ramp	5	0.013		
Elliot Bay Marina	1	0.003		
Everett Marina	13	0.033		
Everett Public Ramp	104	0.265	104	0.515
Fort Casey Public Ramp	16	0.041		
Fort Flagler Ramps (Marrowstone)	7	0.018		
Fort Warden Ramp	8	0.020	8	0.040
Harbor Island Marina	2	0.005		
Kingston Public Ramp	13	0.033	13	0.064
Lagoon Point Ramp	5	0.013		
Lake Union (Private Moorage)	2	0.005		
Langus Ramp (Snohomish River)	2	0.005		
Manchester Public Ramp	2	0.005		
Marysville Slough	2	0.005		
Max Welton Ramp (Whidbey)	2	0.005		
Misery Point Ramp	3	0.008		
Mukilteo Lighthouse Park Ramp	42	0.107	42	0.208
Port Hadlock Marina (Moorage)	2	0.005		
Port Hadlock Ramp	4	0.010		
Port Ludlow Marina	1	0.003		
Port Townsed Moorage	6	0.015		
Port Townsed Ramp	20	0.051	20	0.099
Port Townsed Salmon Club	4	0.010		
Possession Ramp	3	0.008		
Salsbury County Park Ramp	7	0.018	7	0.035
Sandy Hook (Whidbey Island Private)	6	0.015		
Shillshole Marina	3	0.008		
Shillshole Public Ramp	23	0.059		
Total Anglers	393	1.000	202	1.000

Table 4A. Summary of the total number of anglers intercepted in Area 10 during weekday on-the-water surveys, and proportion of angler effort per access site (size measures), during the selective Chinook fishery in Area 10 July 16 – 28, 2007. Highlighted rows indicate sites that were in the sample frame.

Site	Total Anglers	Size Measure	Total Anglers Sampled Sites	Adjusted Size Measure Sampled Sites
Alkai Ramp	11	0.028		
Armeni Ramp	46	0.116	46	0.178
Ballard Marina	1	0.003		
Brownsville Marina	17	0.043		
Brownsville Ramp	12	0.030	12	0.046
Dash Point Ramp	1	0.003		
Des Moines Marina	4	0.010		
Eagle Harbor Marina	1	0.003		
Eagle Harbor Moorage	1	0.003		
Edmonds Beach Launch	3	0.008		
Edmonds Marina Dry Storage	31	0.078	31	0.120
Edmonds Marina Moorage	28	0.071		
Edmonds Marina Sling	14	0.035		
Elliot Bay Marina	3	0.008		
Everett Public Ramp	4	0.010		
Fairview Marina	2	0.005		
First Ave South Ramp	4	0.010		
Jensen Point Ramp (Vashon Island)	3	0.008		
Kingston Public Ramp	43	0.109	43	0.166
Lake Union Moorage	1	0.003		
Manchester Public Ramp	21	0.053	21	0.081
Miller Bay Moorage (Kitsap)	5	0.013		
Port Orchard Marina	6	0.015		
Port Orchard Ramp	9	0.023	9	0.035
Poulsbo Marina	2	0.005		
Private Launch/Moorage	10	0.025		
Sandy Hook (Whidbey Island)	2	0.005		
Shillshole Marina	9	0.023		
Shillshole Ramp	97	0.246	97	0.375
Simpson Marina	2	0.005		
Suquamish Public Ramp	2	0.005		
Total Anglers	**395**	**1.000**	**259**	**1.000**

Table 4B. Summary of the total number of anglers intercepted in Area 10 during weekend on-the-water surveys, and proportion of angler effort per access site (size measures), during the selective Chinook fishery in Area 10 July 16 – 28, 2007. Highlighted rows indicate sites that were in the sample frame.

Site	Total Anglers	Size Measure	Total Anglers Sampled Sites	Adjusted Size Measure Sampled Sites
Alkai Point Ramp	16	0.038		
Armeni Ramp	29	0.069	29	0.132
Ballard Boat Deck	2	0.005		
Bay Marina	1	0.002		
Brownsville Marina	4	0.010		
Brownsville Ramp	21	0.050	21	0.095
Des Moines Marina Moorage	10	0.024		
Eagle Harbor Moorage	2	0.005		
Edmonds Marina Dry Storage	16	0.038	16	0.073
Edmonds Marina Moorage	28	0.067		
Edmonds Marina Sling	25	0.060		
Elliot Bay Marina	2	0.005		
First Ave Ramp	8	0.019		
Fort Ward Ramp	4	0.010		
Harbor Island Marina	2	0.005		
Kingston Public Ramp	43	0.102	43	0.195
Kingston Marina	10	0.024		
Lake Union Moorage	19	0.045		
Manchester Public Ramp	24	0.057	24	0.109
Ole and Charlies Marina	2	0.005		
Port Orchard Marina	4	0.010		
Port Orchard Ramp	9	0.021	9	0.041
Private Bainbridge Island	2	0.005		
Private Launch/Moorage	12	0.029		
Narrows Ramp	3	0.007		
Redondo Ramp	9	0.021		
Seattle Dry Stack	1	0.002		
Shillshole Marina	27	0.064		
Shillshole Ramp	78	0.186	78	0.355
Southworth Beach Launch	3	0.007		
Tyee Marina	3	0.007		
Vashon Ferry Beach Launch	1	0.002		
Total Anglers	420	1.000	220	1.000

Estimates of Catch and Effort: Private Boats

Area 9

For private boats fishing in Area 9 during the summer selective Chinook fishery, we estimated that a total of 4,938 Chinook (4,905 marked, 28 unmarked, and 5 of undetermined mark status) were retained in 18,160 angler trips (Table 5). We estimated that anglers released a total of 8,888 Chinook (2,070 marked, 3,465 unmarked, and 3,353 unknown mark status) (Table 5). In addition, given the estimate of 1,160 released salmon of unknown species (i.e., 'Unk. Salmon' in Table 5) and stratum-specific proportions of Chinook salmon among positively identified salmon releases [% Chinook mean: 88.5%, (SD: 13.1%)], we apportioned 1,061 additional fish to the released Chinook category for total fishery-impact estimation. Thus, the total number of Chinook encountered (retained plus released, inclusive of apportioned unidentified salmon) by private boats in Area 9 during the 16-day fishery was estimated at 14,887. In addition to Chinook, anglers kept an estimated 709 coho (501 marked and 208 unmarked) and 50 pink salmon; an estimated 1,138 coho (296 marked, 328 unmarked, and 513 unknown mark status) and 50 pink salmon were also encountered and released.

Area 10

For private boats fishing in Area 10 during the summer selective fishery, we estimated that a total of 1,507 Chinook (1,469 marked and 38 unmarked) were retained in 8,374 angler trips (Table 6). We estimated that anglers released a total of 4,852 Chinook (1,066 marked, 1,225 unmarked, and 2,561 unknown mark status) (Table 6). In addition, given the estimate of 2,194 released salmon of unknown species (i.e., 'Unk. Salmon' in Table 6) and the stratum-specific proportions of Chinook salmon among positively identified salmon releases [% Chinook mean: 89.4%, (SD: 4.3%)], we apportioned 1,924 additional fish to the released Chinook category for total fishery-impact estimation. Thus, the total number of Chinook encountered (retained plus released, inclusive of apportioned unidentified salmon) by private boats in Area 10 during the 13-day fishery was estimated at 8,284. Also, we estimated that anglers retained 831 coho (530 marked and 301 unmarked) and 44 pink salmon. Total estimates of non-Chinook salmon releases for the 13-day fishery included 647 coho (124 marked, 118 unmarked, and 406 unknown mark status), and 17 pink salmon (Table 6).

Table 5. Estimates of salmon catch and effort for private boats in Marine Area 9 with standard errors, based on dockside angler interviews during the Chinook Selective Fishery from July 16-31, 2007. Values may not add exactly due to rounding error.

Stratum		Est. Effort		Estimated Retained Catch						Estimated Releases									
Start Date	End Date	Anglers	Boats	Chinook			Coho		Pink	Chinook				Coho				Unk. Salmon	Pink
				Marked	Unmark	UD	Marked	Unmark		Marked	Unmark	Unk.	Total	Marked	Unmark	Unk.	Total		
16-Jul	19-Jul	4,856	2,302	2,335	12	0	100	41	6	656	1,254	1,003	2,913	35	65	164	264	386	0
Standard Error		748	315	362	9	0	42	24	5	223	206	185	356	28	51	130	143	99	0
20-Jul	20-Jul	1,132	549	363	0	3	12	6	0	84	249	253	586	9	0	9	17	90	0
Standard Error		125	46	60	0	1	6	3	0	43	72	128	153	4	0	4	6	46	0
21-Jul	21-Jul	2,260	997	364	2	2	33	17	2	206	254	299	759	14	0	24	38	196	2
Standard Error		51	39	9	1	1	17	8	1	45	49	141	155	7	0	12	14	99	1
22-Jul	22-Jul	1,009	434	165	0	0	7	14	0	60	115	115	290	2	7	7	17	74	10
Standard Error		51	30	36	0	0	4	7	0	30	3	58	65	1	4	4	5	37	5
23-Jul	26-Jul	2,833	1,392	593	4	0	29	18	0	368	555	596	1,519	18	14	63	95	193	4
Standard Error		442	195	86	2	0	8	9	0	99	151	163	244	5	7	19	20	72	2
27-Jul	27-Jul	1,827	878	342	3	0	27	8	5	217	358	334	909	8	3	35	45	64	0
Standard Error		388	193	126	1	0	13	4	3	7	100	57	115	4	1	17	18	32	0
28-Jul	28-Jul	1,571	688	205	5	0	122	73	5	180	310	319	809	16	24	19	59	80	27
Standard Error		311	152	90	2	0	15	7	2	92	8	163	188	7	19	10	22	10	14
29-Jul	29-Jul	1,494	645	249	2	0	126	20	12	164	194	233	591	190	186	153	529	46	7
Standard Error		277	104	75	1	0	51	10	6	85	16	63	107	164	166	96	252	24	4
30-Jul	30-Jul	416	214	71	0	0	16	4	8	39	105	34	178	0	0	14	14	8	0
Standard Error		17	13	37	0	0	11	3	6	12	45	8	47	0	0	2	2	6	0
31-Jul	31-Jul	761	427	216	0	0	29	7	11	96	71	167	334	4	29	26	58	22	0
Standard Error		222	157	107	0	0	18	5	7	30	16	77	84	2	18	16	24	14	0
Season total		18,160	8,525	4,905	28	5	501	208	50	2,070	3,465	3,353	8,888	296	328	513	1,138	1,160	50
Statistics for grand Total Estimates:																			
Standard Error		1,072	488	431	10	2	75	32	12	285	292	375	554	167	176	165	293	174	15
CV		5.9%	5.7%	8.8%	36.7%	35.9%	15.0%	15.2%	24.9%	13.8%	8.4%	11.2%	6.2%	56.2%	53.7%	32.2%	25.8%	15.0%	30.8%
Upper 95% CI		20,262	9,482	5,750	48	9	649	270	74	2,629	4,038	4,087	9,974	623	673	837	1,712	1,501	80
Lower 95% CI		16,058	7,568	4,061	8	2	354	146	26	1,512	2,892	2,618	7,802	42[a]	42[a]	190	563	819	20

[a] In cases where lower 95% confindence bounds were less than observed totals, we report the latter.

Table 6. Estimates of salmon catch and effort for private boats in Marine Area 10 with standard errors, based on dockside angler interviews during the Chinook Selective Fishery from July 16-28, 2007. Values may not add exactly due to rounding error.

Stratum		Est. Effort		Estimated Retained Catch						Estimated Releases									
Start Date	End Date	Anglers	Boats	Chinook			Coho		Pink	Chinook				Coho				Unk. Salmon	Pink
				Marked	Unmark	UD	Marked	Unmark		Marked	Unmark	Unk.	Total	Marked	Unmark	Unk.	Total		
16-Jul	19-Jul	1,750	910	273	6	0	128	87	9	322	212	322	856	17	37	128	181	328	9
Standard Error		186	99	76	5	0	45	39	8	117	40	80	147	14	34	79	87	216	8
20-Jul	20-Jul	466	229	37	0	0	0	0	0	26	28	179	233	7	0	10	18	58	0
Standard Error		56	25	11	0	0	0	0	0	4	2	53	53	2	0	0	2	19	0
21-Jul	21-Jul	1,067	475	77	0	0	40	40	0	156	97	244	497	9	11	26	46	309	0
Standard Error		44	11	1	0	0	1	7	0	15	4	24	29	5	9	16	19	40	0
22-Jul	22-Jul	753	347	130	3	0	23	54	0	82	67	312	460	16	0	30	47	79	0
Standard Error		45	17	31	2	0	2	28	0	21	33	100	107	13	0	21	25	40	0
23-Jul	26-Jul	2,080	1,081	451	18	0	117	26	0	211	511	570	1,292	13	51	78	141	240	0
Standard Error		544	273	122	7	0	59	3	0	63	291	179	347	11	27	32	44	74	0
27-Jul	27-Jul	521	277	140	0	0	32	95	0	49	83	261	393	0	0	28	28	314	0
Standard Error		54	42	16	0	0	1	40	0	18	15	17	29	0	0	6	6	26	0
28-Jul	28-Jul	1,738	821	362	11	0	190	0	34	220	228	673	1,121	61	19	106	187	866	8
Standard Error		58	59	17	4	0	22	0	12	54	13	20	59	41	11	36	56	172	7
Season total		8,374	4,140	1,469	38	0	530	301	44	1,066	1,225	2,561	4,852	124	118	406	647	2,194	17
Statistics for grand Total Estimates:																			
Standard Error		586	302	149	10	0	78	63	15	147	296	229	402	47	45	97	117	293	11
CV		7.0%	7.3%	10.1%	25.4%	0.0%	14.7%	20.8%	34.0%	13.7%	24.2%	9.0%	8.3%	38.2%	38.7%	23.8%	18.0%	13.3%	63.2%
Upper 95% CI		9,523	4,731	1,761	57	0	682	424	73	1,353	1,806	3,010	5,641	216	207	596	876	2,768	38
Lower 95% CI		7,225	3,549	1,177	19	0	378	178	15	779	645	2,111	4,064	31	28	217	418	1,620	2[a]

[a] In cases where lower 95% confindence bounds were less than observed totals, we report the latter.

Angler Effort Trends

Angler effort in areas 9 and 10 was high overall and persistent across all sampled days for the respective 16- and 13-day selective-harvest Chinook seasons. In total, 26,534 angler trips (18,160 in 9 and 8,374 in 10) and 12,665 boat trips (8,525 in 9 and 4,140 in 10) were made in order to pursue Chinook salmon in the Areas 9 and 10 fisheries. Daily Murthy estimates indicate that anglers: 1) made nearly 2,000 trips per day in areas 9 and 10 combined, on average; 2) expended more effort on weekends than weekdays (Area 9: 1,549 angler trips per day on weekend and 819 on weekdays; Area 10: 909 and 487, respectively); and 3) fished more intensively in Area 9 than 10 (18,160 vs. 8,374 total angler trips). Temporal trends in angler effort for days when dockside sampling occurred during the two selective-fishery seasons are presented in Figures 3 (Area 9) and 4 (Area 10).

Catch per Unit of Effort (CPUE)

Area 9

For private boats fishing in Area 9, anglers kept 0.27 Chinook salmon per trip on average (i.e., based on season-total catch and effort). Daily CPUE was high (0.47 Chinook kept per angler) at the open of the fishery and then dropped off quickly during the first open weekend, after which it hovered around 0.20 Chinook per angler for the second two thirds of the season (Figure 5).

Area 10

Area-10 anglers experienced somewhat lower catch rates than Area-9 anglers, with a season-wide CPUE of 0.18 Chinook retained per angler trip (Figure 6). In contrast to Area 9, however, catch rates were relatively low for the first week of the fishery (average CPUE for the 4 days sampled during the first week: 0.13 Chinook per angler trip) and relatively high on its closing day (the maximum catch rate, 0.27 Chinook per angler trip, was observed on the second-to-last day of the fishery). Thus, the general temporal CPUE pattern for Area 10 was one of low initial catch rates rising towards a peak near the July 28th close of the fishery.

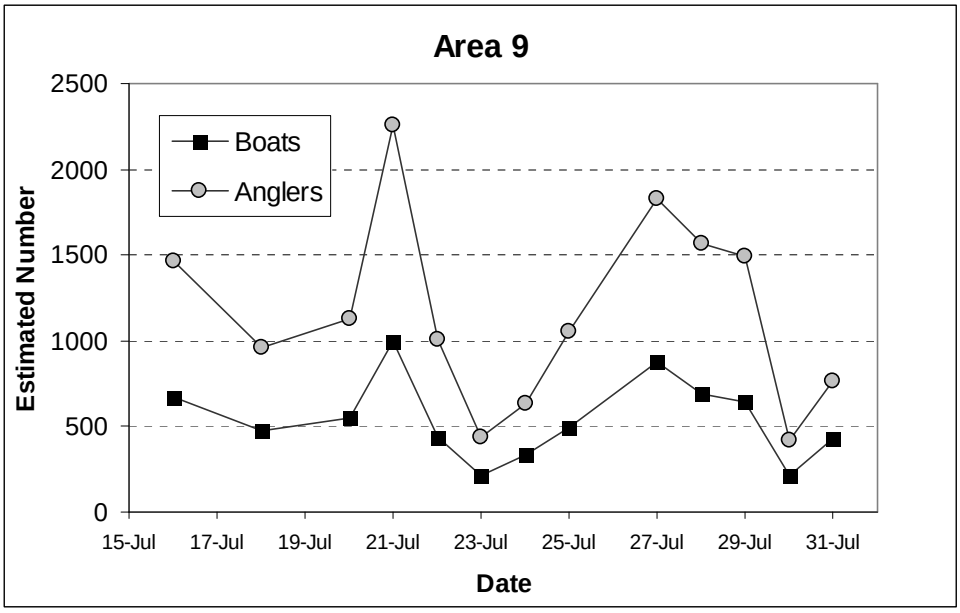

Figure 3. Estimated number of private boats and anglers in Marine Area 9 for days sampled during the during the Chinook selective fishery from July 16-31, 2007.

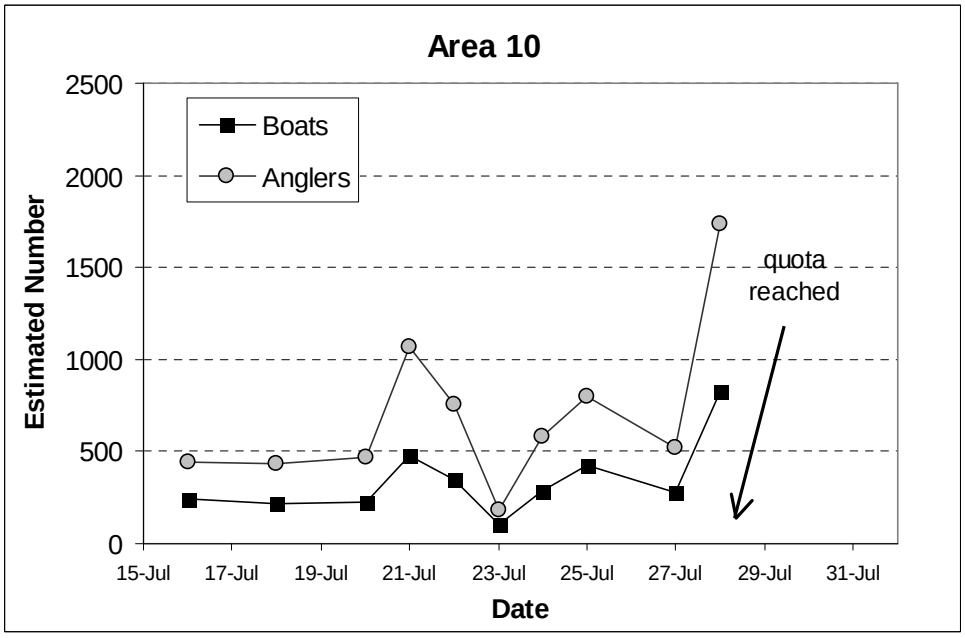

Figure 4. Estimated number of private boats and anglers in Marine Area 10 for days sampled during the Chinook selective fishery from July 16-28, 2007.

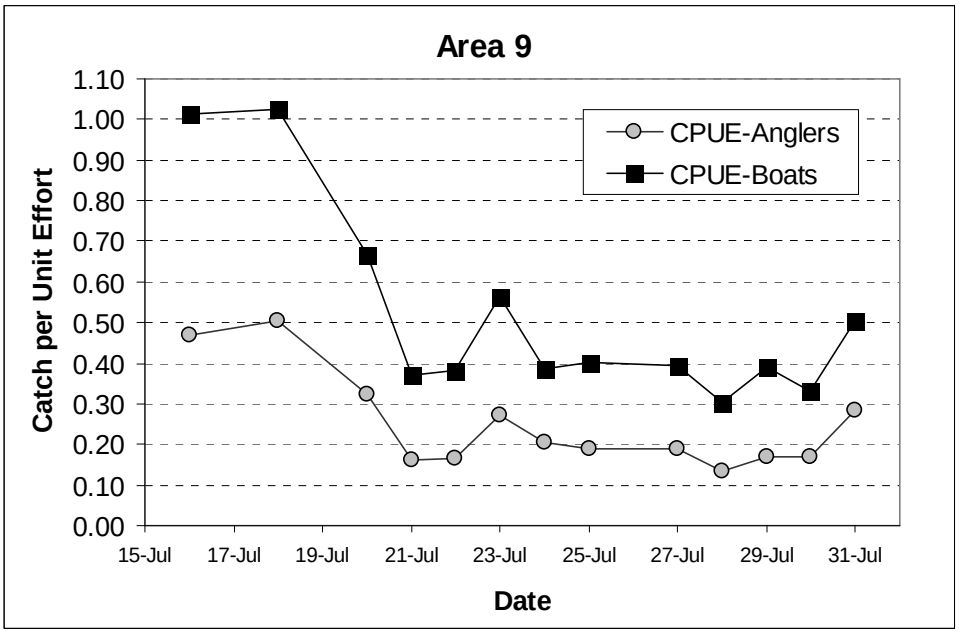

Figure 5. Daily catch per unit effort (CPUE), based on creel survey estimates, for days sampled in Marine Area 9 during the Chinook selective fishery from July 16-31, 2007.

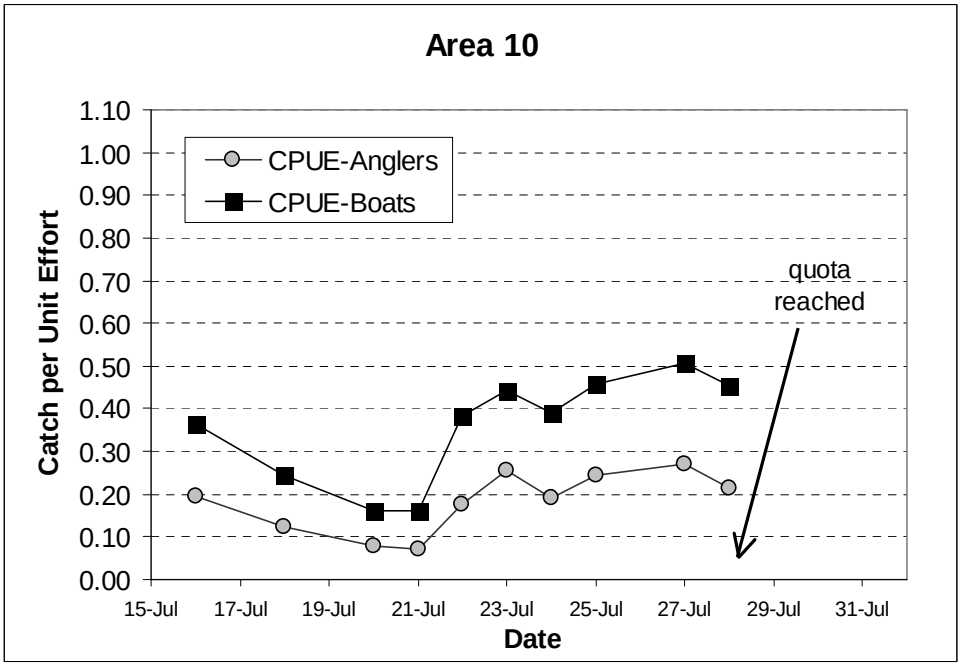

Figure 6. Daily catch per unit effort (CPUE) , based on creel survey estimates, for days sampled in Marine Area 10 during the Chinook selective fishery from July 16-28, 2007.

Estimated Chinook Encounters: Private Boats

Area 9

Based on the days sampled in the Area-9 fishery, private boats retained an estimated average of 278 Chinook per day over the 16 days of the fishery (Figure 7). The daily catch of Chinook peaked on the first day of the fishery (based on sampled days only), with an estimated 636 Chinook retained; daily catch then declined continuously until it reached its minimum (71 Chinook retained) on the second-to-last day of the fishery (Table 7A).

Daily Chinook encounters (retained plus released, inclusive of apportioned unidentified releases) also peaked on the first day of the fishery; we estimated that 1,629 Chinook were encountered (686 retained and 943 released) at this time. In contrast to Chinook retention, which exhibited a monotonic decline after an initial peak, a second total-encounters peak occurred during the second weekend of the fishery. The second peak was driven primarily by in increase in the number of Chinook salmon released per day (Figure 7). Overall, the mean daily Chinook encounter estimate (for days sampled only) for the Area 9 season was 885 (278 retained and 607 released).

Area 10

For days sampled in Area 10, private boats retained an estimated average of 125 Chinook per day over the 13 days of its selective-harvest season. In contrast to Area 9, where catch estimates were higher overall and declined across the duration of the fishery, daily Chinook landings increased continuously from the start to the close of the Area-10 fishery (Figure 8; Table 7B); daily catch was low initially (77 Chinook retained per day on average for the first week) and then rose to a season peak on the last day of the fishery (28 July; 373 Chinook total retained). The temporal trend in daily total encounters (retained plus released, inclusive of apportioned unidentified releases) mirrored that of total catch (Figure 8) – the maximum estimate of daily encounters also occurred on the 28th of July, with anglers encountering a total of 2,232 (373 retained and 1,859 released) Chinook salmon on that day. The season-wide mean daily encounter estimate for sampled days was 709 Chinook (125 retained and 584 released).

Combined Areas

For Areas 9 and 10 combined, private boats retained a total of 6,446 Chinook during the ~2-week long selective Chinook season. Of this total, 6,375 were marked and 71 were unmarked (Tables 7A and 7B). Private anglers released a total of 16,725 Chinook during the course of the fishery in the combined areas, and the released-to-retained ratio averaged 1.21 (0.49 for marked-only-releases and 0.73 for unmarked releases) for known mark-status and definitively identified salmon. Thus, the total number of Chinook encountered (retained plus released, inclusive of apportioned unidentified salmon releases) was estimated at 23,171 (14,887 in Area 9 and 8,283 in Area 10) (Tables 7A, 7B, and 8). Further, creel-survey estimates indicated that that 66.6% of the Chinook encountered (legal + sublegal) in Area 9 and 66.7% in Area 10 were marked (e.g., Table 8). The observed (in-sample) data collected during dockside angler interviews, which were used to generate the total estimates, are presented by stratum in Appendices C and D.

Charter Boats: Chinook Encounters

Thirteen charter-boat operators reported taking clients fishing in areas 9 and 10 during their respective selective seasons. Based on 113 charter trips made (79 in Area 9 and 33 in Area 10), charter captains reported landing a total catch of 404 Chinook salmon (334 in 9 and 70 in 10) and experienced a CPUE of 3.6 Chinook *per charter trip* on average (4.2 in Area 9, 2.1 in Area 10). Considering charter and private-fleet landings in combination, charter catch approximated 5% (4.5% in Area 9 and 6.4% in Area 10) of the total marked-Chinook landings for the Areas 9 and 10 selective fisheries (Table 8).

Due to logistic constraints, we did not obtain a complete census of Chinook salmon releases resulting from charter-boat operations in either area 9 or 10. In order to account for charter releases in total fishery-impact estimation, we estimated these values for marked and unmarked groups on a stratum-by-stratum basis using private-fleet retained:released ratios for both of these classes of fish. Given this approach, we estimated that charter boats encountered and released 132 marked and 230 unmarked Chinook in Area 9 and 55 marked and 52 unmarked Chinook in Area 10 during the course of the Areas 9 and 10 selective fishery. Thus, charter boat operations resulted in a total of 873 (696 in Area 9, 177 in Area 10) Chinook encounters (retained + released). Stratum-specific censused-catch and estimated-release values for charter-boat operations in areas 9 and 10 appear in Tables 7A and 7B.

Total Chinook Encounters: Areas 9 and 10 Combined

In Area 9, adding encounters for private boats (14,887) to charter encounters (697) resulted in an estimated total of 15,584 (5,272 retained, 10,311 released) Chinook encounters for this 16-day fishery (Tables 7A and 8). 95.5, 93.7, and 96.5% of the Chinook encounter, retention, and release totals accounted for within the fishery were due to private-fleet activity.

Based on the combination of Chinook encounters for private boats (8,284) and charter boats (177), we estimated that anglers fishing in Area 10 encountered a total of 8,461 (1,577 retained, 6,884 released) during this 13-day fishery (Tables 7B and 8). Similar to Area 9, private-fleet activities generated ~95% (total, retained, and released) of Area 10 selective-fishery impact.

Based on the combination of marine-area estimates, a total of 6,850 Chinook salmon were retained and 17,195 released (inclusive of apportioned, unidentified salmon releases) by anglers fishing in areas 9 and 10 between 16 and 31 July. Thus, an estimated total of 24,045 Chinook salmon were encountered by anglers overall.

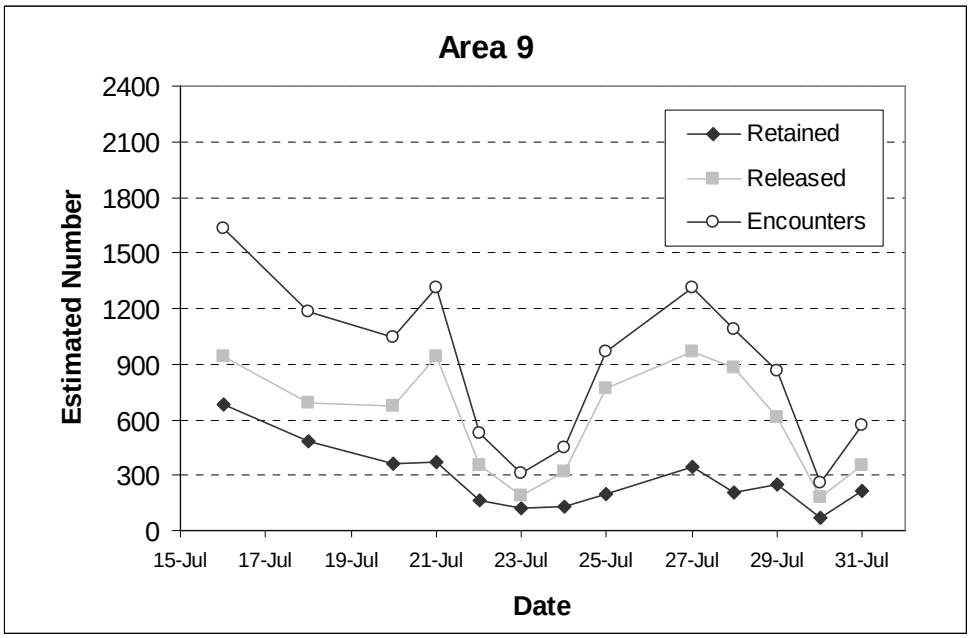

Figure 7. Daily Chinook retention and release (inclusive of apportioned unidentified salmon releases) estimates for private boats sampled in Marine Area 9 during the Chinook selective fishery from July 16-31, 2007.

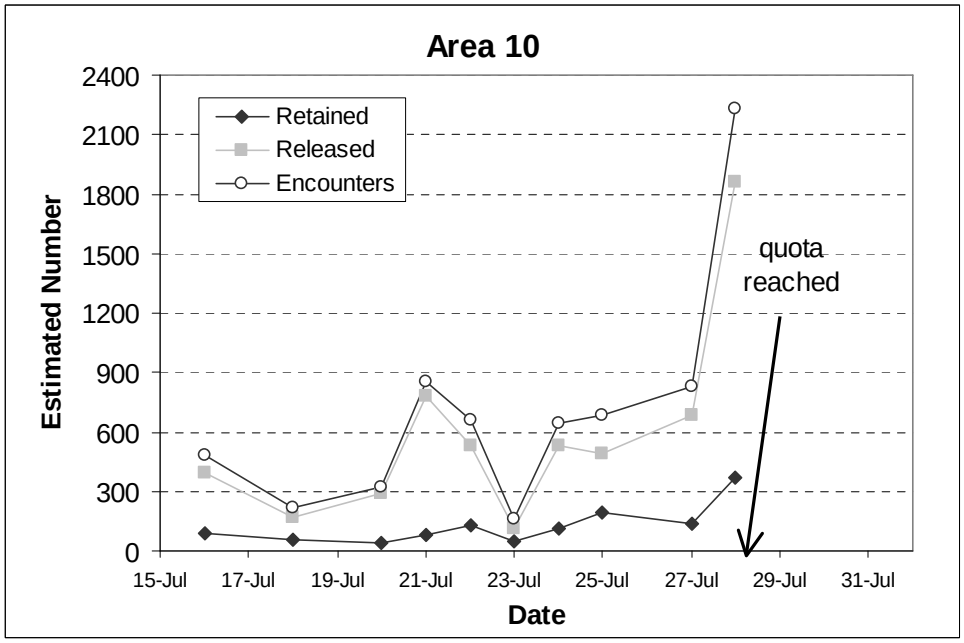

Figure 8. Daily Chinook retention and release (inclusive of apportioned unidentified salmon releases) estimates for private boats sampled in Marine Area 10 during the Chinook selective fishery from July 16-28, 2007.

Table 7A. Total Chinook encounters estimated for private (non-charter) vessels and censused from charter vessels in Marine Area 9, during the Chinook selective fishery that occurred from July 16-31, 2007.

Area	Start Date	End Date	Fishing Method[a]	Effort[b]	CHINOOK ENCOUNTERS							
					Retained		Released					
					Marked	Unmark	Total	Mark	Unmark	Unk.	UnID'd Salmon[c]	Encounters (Kept + Released)
9	16-Jul	19-Jul	Private	4,856	2,335	12	3,267	656	1,254	1,003	354	5,614
			Charter	21	117	0	96	33	63	0	0	213
	Total 16-19 Jul			--	**2,452**	**12**	**3,362**	**689**	**1,316**	**1,003**	**354**	**5,827**
	20-Jul	20-Jul	Private	1,132	363	3	674	84	249	253	88	1,041
			Charter	8	62	0	57	14	42	0	0	119
	Total 20 Jul			--	**425**	**3**	**731**	**99**	**291**	**253**	**88**	**1,159**
	21-Jul	21-Jul	Private	2,260	364	5	945	206	254	299	186	1,314
			Charter	8	45	0	57	25	31	0	0	102
	Total 21 Jul			--	**409**	**5**	**1,002**	**231**	**285**	**299**	**186**	**1,416**
	22-Jul	22-Jul	Private	1,009	165	0	358	60	115	115	68	523
			Charter	5	35	0	37	13	24	0	0	72
	Total 22 Jul			--	**200**	**0**	**395**	**72**	**139**	**115**	**68**	**595**
	23-Jul	26-Jul	Private	2,833	593	4	1,700	368	555	596	181	2,297
			Charter	22	50	0	78	31	47	0	0	128
	Total 23-26 Jul			--	**643**	**4**	**1,778**	**399**	**601**	**596**	**181**	**2,425**
	27-Jul	27-Jul	Private	1,827	342	3	970	217	358	334	61	1,314
			Charter	2	2	0	3	1	2	0	0	5
	Total 27 Jul			--	**344**	**3**	**973**	**218**	**360**	**334**	**61**	**1,320**
	28-Jul	28-Jul	Private	1,571	205	5	882	180	310	319	72	1,092
			Charter	3	4	0	10	4	6	0	0	14
	Total 28 Jul			--	**209**	**5**	**891**	**184**	**317**	**319**	**72**	**1,105**
	29-Jul	29-Jul	Private	1,494	249	2	615	164	194	233	24	867
			Charter	5	11	0	16	7	9	0	0	27
	Total 29 Jul			--	**260**	**2**	**631**	**171**	**203**	**233**	**24**	**893**
	30-Jul	30-Jul	Private	416	71	0	186	39	105	34	8	257
			Charter	2	3	0	6	2	4	0	0	9
	Total 30 Jul			--	**74**	**0**	**192**	**41**	**109**	**34**	**8**	**266**
	31-Jul	31-Jul	Private	761	216	0	353	96	71	167	19	569
			Charter	3	5	0	4	2	2	0	0	9
	Total 31 Jul			--	**221**	**0**	**357**	**98**	**73**	**167**	**19**	**578**
	Area 9 Total 16-31 July			--	**5,239**	**33**	**10,311**	**2,202**	**3,696**	**3,353**	**1,061**	**15,584**

[a] The Murthy method was method used to estimate total salmon encounters for private boats; encounter data for Charter vessels were collected via a complete census and are treated as such (excluding charter releases).

[b] Private and charter effort are reported as angler-trips and charter-days, respectively, given the absence of anglers-per-boat information for charter trips.

[c] Estimated from 'Unk. Salmon' (Tables 5 and 6); the value displayed is an apportioning based on positively identified salmon catch composition.

Table 7B. Total Chinook encounters estimated for private (non-charter) vessels and censused from charter vessels in Marine Area 10, during the Chinook selective fishery that occurred from July 16-28, 2007.

Area	Start Date	End Date	Fishing Method[a]	Effort[b]	CHINOOK ENCOUNTERS							
					Retained		Released					
					Marked	Unmark	Total	Mark	Unmark	Unk.	UnID'd Salmon[c]	Encounters (Kept + Released)
10	16-Jul	19-Jul	Private	1,750	273	6	1,124	322	212	322	268	1,403
			Charter	14	24	0	47	28	19	0	0	71
	Total 16-19 Jul			--	**297**	**6**	**1,171**	**350**	**231**	**322**	**268**	**1,474**
	20-Jul	20-Jul	Private	466	37	0	287	26	28	179	54	324
			Charter	1	2	0	3	1	1	0	0	5
	Total 20 Jul			--	**39**	**0**	**290**	**27**	**29**	**179**	**54**	**329**
	21-Jul	21-Jul	Private	1,067	77	0	779	156	97	244	282	856
			Charter	2	2	0	7	4	3	0	0	9
	Total 21 Jul			--	**79**	**0**	**786**	**160**	**99**	**244**	**282**	**865**
	22-Jul	22-Jul	Private	753	130	3	532	82	67	312	72	664
			Charter	1	0	0	0	0	0	0	0	0
	Total 22 Jul			--	**130**	**3**	**532**	**82**	**67**	**312**	**72**	**664**
	23-Jul	26-Jul	Private	2,080	451	18	1,509	211	511	570	216	1,977
			Charter	5	7	0	11	3	8	0	0	18
	Total 23-26 Jul			--	**458**	**18**	**1,520**	**215**	**519**	**570**	**216**	**1,996**
	27-Jul	27-Jul	Private	521	140	0	687	49	83	261	293	827
			Charter	4	12	0	11	4	7	0	0	23
	Total 27 Jul			--	**152**	**0**	**698**	**53**	**90**	**261**	**293**	**850**
	28-Jul	28-Jul	Private	1,738	362	11	1,859	220	228	673	738	2,233
			Charter	6	23	0	28	14	15	0	0	51
	Total 28 Jul			--	**385**	**11**	**1,888**	**234**	**243**	**673**	**738**	**2,284**
	Area 9 Total 16-31 July			--	**1,539**	**38**	**6,884**	**1,121**	**1,277**	**2,561**	**1,924**	**8,461**

[a] The Murthy method was method used to estimate total salmon encounters for private boats; encounter data for Charter vessels were collected via a complete census and are treated as such (excluding charter releases).

[b] Private and charter effort are reported as angler-trips and charter-days, respectively, given the absence of anglers-per-boat information for charter trips.

[c] Estimated from 'Unk. Salmon' (Tables 5 and 6); the value displayed is an apportioning based on positively identified salmon catch composition.

Table 8. Private-fleet and charter estimates of Chinook salmon retained and released by mark status groups during the Chinook Selective Fishery in Marine Areas 9 and 10 from July 16-31 and 16-28, respectively. Values may not add exactly due to rounding error.

Area	Angler group	Retained		Released				Total encounters (retained + released)
		Marked	Unmarked	Marked	Unmarked	Unknown	Apportioned UnID'd salmon	
Area 9	Private	4,905	33	2,070	3,465	3,353	1,061	**14,887**
	Charter	334	0	132	230	0	0	**697**
Area 10	Private	1,469	38	1,066	1,225	2,561	1,924	**8,284**
	Charter	70	0	55	52	0	0	**177**
Combined 9 & 10		**6,779**	**71**	**3,324**	**4,973**	**5,913**	**2,985**	**24,045**

Dockside Length Analysis

In Area 9, dockside samplers collected a total of 568 length samples from retained Chinook (559 ad-marked, 8 unmarked, and 1 undefined mark status) during the 16-day selective Chinook fishery (Table 9). Four of the unmarked Chinook and the one fish with an undefined mark status were legal-size Chinook. Of the 559 ad-marked retained Chinook, 541 were legal-size and 18 were sublegal-size. Thus, 3.2% of the length samples collected from retained ad-marked Chinook in Area 9 were sublegal size (Figure 9). The average size of the 18 marked sublegal-size Chinook was 52.7 cm total length.

In Area 10, dockside samplers collected a total of 374 length samples from retained Chinook (366 ad-marked, 8 unmarked, and 0 undefined mark status) during the 12 - day selective Chinook fishery (Table 9). 7 of the unmarked Chinook were legal-size fish. Of the 366 ad-marked retained Chinook, 344 were legal-size and 22 were sublegal-size. Thus, 6.4% of the length samples collected from retained ad-marked Chinook in Area 10 were sublegal size (Figure 9). The average size of the 22 marked sublegal-size Chinook was 50.6 cm total length.
For Areas 9 and 10 combined, a total of 925 ad-marked retained Chinook were sampled, of which 885 were legal-size and 40 were sublegal-size (Table 9). Thus, 4.3% of the length samples were from sublegal-size Chinook for the two areas combined (Figure 9). The average size of the 40 retained sublegal-size Chinook was 51.7 cm total length, approximately 3.8 cm under the legal size limit (55.8 cm).

Table 9. Summary of length samples collected from retained Chinook during dockside angler interviews in the Areas 9 and 10 selective Chinook fishery from July 16 – 31, 2007

Area	Mark Type	Number Sampled		
		Legal-size	Sublegal-size	Total
9	Ad-marked	541	18	559
	Unmarked	4	4	8
	Undefined	1	0	1
	Total	**546**	**22**	**568**
10	Ad-marked	344	22	366
	Unmarked	7	1	8
	Undefined	0	0	0
	Total	**351**	**23**	**374**
Combined Areas 9 & 10	Ad-marked	885	40	925
	Unmarked	11	5	16
	Undefined	1	0	1
	Total	**897**	**45**	**942**

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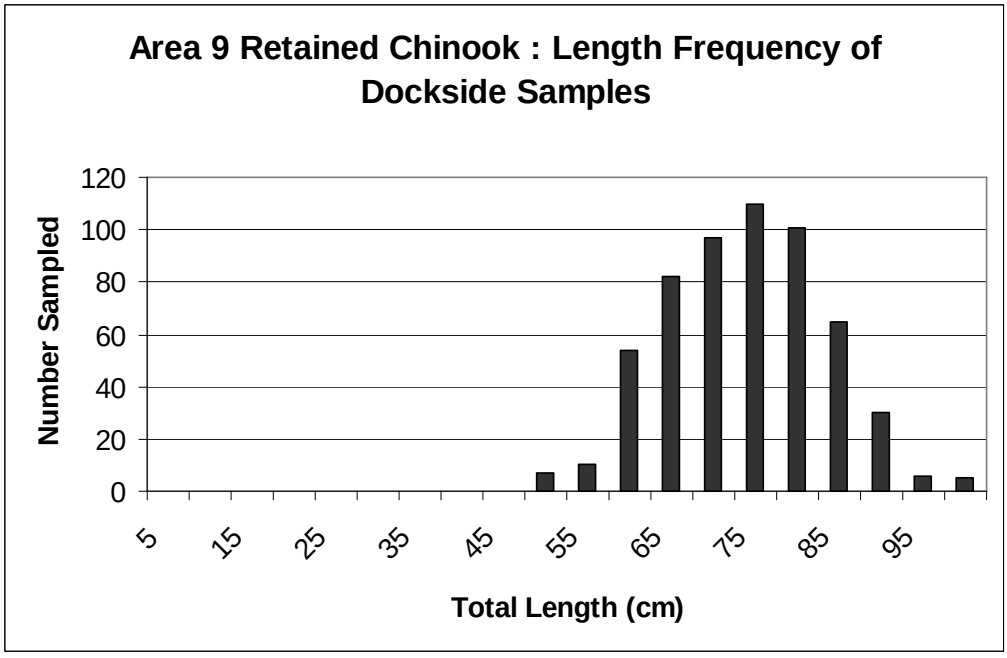


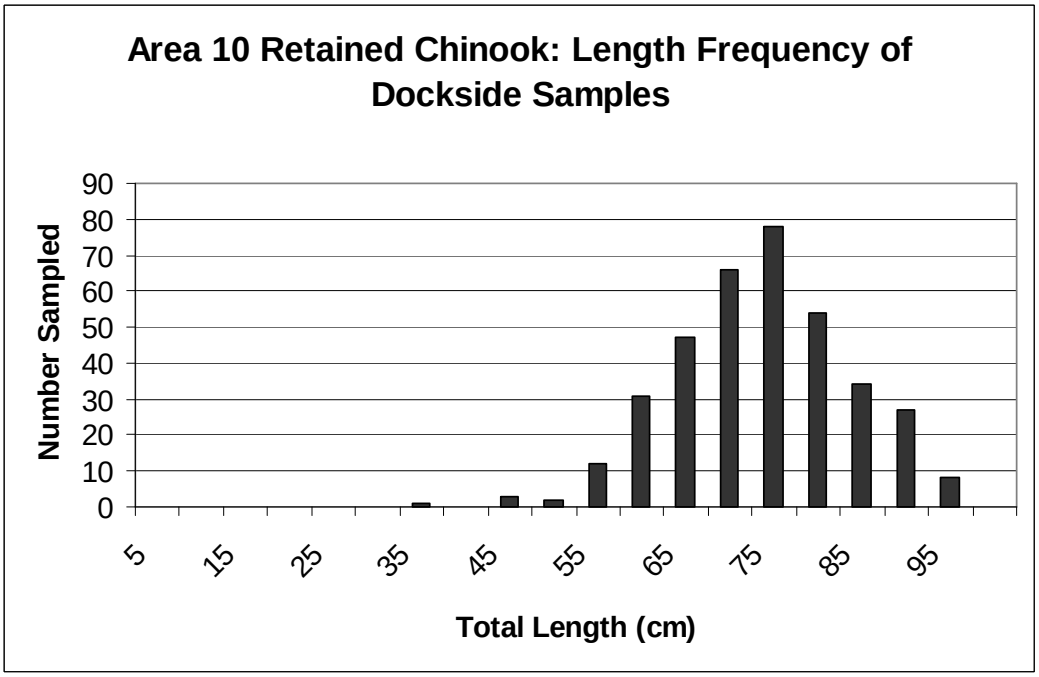


Figure 9. Length frequency distribution of retained Chinook sampled during dockside angler interviews in the Areas 9 and 10 summer selective Chinook fisheries.

Dockside Fishing Method Question

For the duration of the fishery, we recorded a total of 1,663 responses to the fishing method question for private boats that successfully encountered Chinook (1156 boats in Area 9 and 507 boats in Area 10). Of these, 1,663 boats (90.4%) used downriggers as the predominant fishing method (Table 10). In Area 9, 1,040 (91.3%) boats reported that downriggers were used as their predominant fishing method, while 65 (5.6%) boats employed the weight and bait method, 44 (2.5%) boats used the diver method, 6 (0.5%) used the jigging method and 1 (0.1%) boat used an "other" fishing method (trolling without downriggers). In Area 10, 436 (87.1%) boats reported that downriggers were used as their predominant fishing method, while 56 (10.7%) boats employed the weight and bait method, 13 (2.0%) boats used the diver method, 2 (0.3%) used the jigging method (Table 10).

Test Fishing

Gear Types and Fishing Time

The test boats in Areas 9 and 10 attempted to replicate the fishing methods that anglers used to encounter Chinook by employing fishing methods in the same proportions reported by anglers. Anglers predominantly used downriggers to encounter Chinook in both areas (91% of boats in Area 9 and 87% of boats in Area 10; Table 10); therefore, the test boats employed downriggers for over 94% of the test fishing time during the season (Table 11).

The Area 9 test boat fished with downriggers 88% of the time, totaling 66 hours and 26 minutes while the fishery was open (July 16-31) and 115 hours and 22 minutes total during their month-long sampling effort (July 16-August 15). In addition the Area 9 test boat fished the weight and bait method for 8 hours and 36 minutes while the fishery was open and 22 hours and 12 minutes over the one-month fishery (Table 12).

The Area 10 test boat fished with downriggers 95% of the time totaling 60 hours and 9 minutes while the fishery was open (July 16-28) and 119 hours and 18 minutes total during their month-long sampling effort (July 16-August 15). In addition, the Area 10 boat fished with the 'weight and bait' method for 4 hours and 51 minutes, and the 'jigging' method for 1 hour and 2 minutes (Table 12).

The Area 9 test boat averaged 27 hours and 30 minutes of fishing time per week and fished a total of 23 days out of a possible 23 days. The Area 10 test boat fished an average of 25 hours and 2 minutes per week and fished for 22 out of the possible 23 days (Table 12).

Chinook Encounters and Mark Rates

For the one-month duration of the fishery, the test boat in Area 9 encountered a total of 183 Chinook (141 legal and 42 sublegal), while the test boat in Area 10 encountered a total of 138 Chinook (39 legal and 99 sublegal). Test boat catches during the fishery showed that 77% of the Chinook encountered in Area 9 were legal-size, compared to 28% in Area 10 (Table 13). Based on the combined test fishing data, the adipose mark rate in Area 9 was 78% for legal-size

Chinook and 83% for sublegal-size Chinook. In Area 10, the adipose mark rate was 72% for legal-size Chinook and 85% for sublegal-size Chinook (Tables 13 through 15).

In Area 9, the season-total catch composition for the four size/mark-status categories was: 60.1% legal and marked; 16.9% legal and unmarked; 19.1% sublegal and marked; and 3.8% sublegal and unmarked (Table 14). In Area 10, the season-total rates in the four categories were: 20.3% legal and marked; 8.0% legal and unmarked; 60.9% sublegal and marked; and 10.9% sublegal and unmarked (Table 15).

Chinook Size and Age

Analysis of Chinook total lengths collected by the test boat samplers for the fishery indicated a higher frequency of sublegal-size Chinook in the Area 10 test fishery compared to that in Area 9 (Figures 11 and 12). The average size of Chinook in Area 9 was 66.6 cm total length, with a minimum of 33.1 cm and a maximum of 94.2 cm (n = 183). The mean size of Chinook in Area 10 was 14 cm lower, averaging 52.5 cm total length, with a minimum of 29.9 cm and a maximum of 89.0 cm (n = 138). A two-tailed t-test indicated that this difference was statistically significant ($P < 0.001$, $t_{0.05(2)} = -9.33$, d.f. = 319). Furthermore, the percent of fish caught by the test boats that were legal-size was higher in Area 9 (77%) compared to Area 10 (28%).

In both areas, unmarked Chinook tended to be slightly larger than marked Chinook on average (5 cm in Area 9 and 4 cm in Area 10) (Figures 11 and 12). This difference was statistically significant for Area 9 ($P = 0.0346$, $t_{0.05(2)} = -2.13$, d.f. = 181) but not Area 10 ($P = 0.183$, $t_{0.05(2)} = -1.34$, d.f. = 136). In general, however, marked Chinook constituted the majority of total encounters across all 5-cm size-classes examined.

Analysis of scale samples showed that the test boats in Areas 9 and 10 caught Chinook from brood years 2003, 2004, and 2005 (age 4, 3, and 2, respectively) (Figures 13 and 14). In Area 9, the average total length of the 2003-2005 brood samples was 82.6, 68.8, and 49.5 with sample sizes of n = 30, 91 and 47 respectively (Figure 13). In Area 10, the average total length of 2003-2005 brood samples was 81.8, 71.8, and 44.9 with sample sizes of n = 8, 27, and 100 respectively (Figure 14). The difference between total test-boat Chinook encounters and aged individuals was due to a limited number of unreadable scale samples (area 9: 15 samples not aged; area 10: 3 samples not aged).

Other Species

In addition to Chinook, the test boat in Area 9 caught and released 13 coho (*Oncorhynchus kisutch*), 2 pinks (*O. gorbuscha*), 1 chum (*O. keta*), 2 butter sole (*Isopsetta isolepsis*), 5 rock sole (*Lepidopsetta bilineata*),1 arrowtooth flounder (*Atheresthes stomias*),107 spiny dogfish (*Squalus acanthias*), and 18 Pacific sandab (*Citharichthys sordidus*). The test boat in Area 10 caught and released 37 coho, 1 pink, 2 lingcod (*Ophiodon elongatus*), 62 Pacific sandab, 22 spiny dogfish, 2 copper rockfish (*Sebastes caurinus*), 2 brown rockfish (*S. auriculatus*), and 1 red Irish lord (*Hemilepidotus hemilepidotus*) (Table 16).

Table 10. Predominate fishing method type used by private boats (percent of boat trips) to encounter Chinook (kept and released) during the Chinook Selective Fishery in Marine Areas 9 and 10, July 16 – 31, 2007.

Stratum Date	Area 9 Percent per Fishing Method					Area 10 Percent per Fishing Method					Total: Combined Areas 9 & 10 Percent per Fishing Method				
	Down-rigger	Weight and Bait	Diver	Jig	Other	Down-rigger	Weight and Bait	Diver	Jig	Other	Down-rigger	Weight and Bait	Diver	Jig	Other
7/16 - 7/19	81.6%	10.0%	7.9%	0.4%	0.0%	83.2%	16.8%	0.0%	0.0%	0.0%	82.4%	13.4%	4.0%	0.2%	0.0%
7/20	89.6%	4.4%	5.5%	0.5%	0.0%	92.5%	5.7%	1.9%	0.0%	0.0%	91.0%	5.0%	3.7%	0.3%	0.0%
7/21	92.3%	1.5%	3.1%	3.1%	0.0%	94.3%	4.3%	1.4%	0.0%	0.0%	93.3%	2.9%	2.3%	1.5%	0.0%
7/22	100.0%	0.0%	0.0%	0.0%	0.0%	86.0%	14.0%	0.0%	0.0%	0.0%	93.0%	7.0%	0.0%	0.0%	0.0%
7/23 - 7/26	98.0%	1.6%	0.4%	0.0%	0.0%	81.7%	13.6%	3.9%	0.9%	0.0%	89.8%	7.6%	2.2%	0.5%	0.0%
7/27	96.1%	2.6%	1.3%	0.0%	0.0%	92.9%	3.6%	3.6%	0.0%	0.0%	94.5%	3.1%	2.4%	0.0%	0.0%
7/28	97.7%	1.1%	1.1%	0.0%	0.0%	79.2%	16.8%	3.0%	1.0%	0.0%	88.5%	9.0%	2.1%	0.5%	0.0%
7/29	92.9%	2.8%	2.8%	0.7%	0.7%						46.5%	1.4%	1.4%	0.4%	0.4%
7/30 -7/31	73.5%	26.5%	0.0%	0.0%	0.0%						36.7%	13.3%	0.0%	0.0%	0.0%
Total	**91.3%**	**5.6%**	**2.5%**	**0.5%**	**0.1%**	**87.1%**	**10.7%**	**2.0%**	**0.3%**	**0.0%**	**90.4%**	**6.9%**	**2.4%**	**0.4%**	**0.0%**

Table 11. Percent of time that the test boats fished using different fishing methods during the Chinook Selective Fishery in Marine Areas 9 and 10, July 16 – 31, 2007. A '--' is listed for dates when test boats did not operate.

Stratum Date	Area 9 Percent per Fishing Method					Area 10 Percent per Fishing Method					Total: Combined Areas 9 & 10 Percent per Fishing Method				
	Down-rigger	Weight and Bait	Diver	Jig	Other	Down-rigger	Weight and Bait	Diver	Jig	Other	Down-rigger	Weight and Bait	Diver	Jig	Other
7/16 - 7/19	72.0%	28.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	86.0%	14.0%	0.0%	0.0%	0.0%
7/20	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
7/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/23 - 7/26	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
7/27	70.0%	30.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	85.0%	15.0%	0.0%	0.0%	0.0%
7/28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/30 -7/31	100.0%	0.0%	0.0%	0.0%	0.0%	--	--	--	--	--	100.0%	0.0%	0.0%	0.0%	0.0%
Total	**88.4%**	**11.6%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**94.2%**	**5.8%**	**0.0%**	**0.0%**	**0.0%**

Table 12. Total hours that the test boats fished, by month and gear type, in Marine Area 9 (top table), Marine Area 10 (middle table), and in the two areas combined (bottom table), during the Chinook selective fishery from July 16 – 31, 2007.

Total Hours Fished: Area 9 Test Boat						
	Week					
Gear Type	29	30	31	32	33	TOTAL Hours
Downrigger	22:51:00	33:10:00	21:20:00	30:08:00	7:53:00	115:22:00
Weight and Bait	6:51:00	1:45:00	8:06:00		5:30:00	22:12:00
Jig						0:00
Total	**29:42:00**	**34:55:00**	**29:26:00**	**30:08:00**	**13:23:00**	**137:34:00**
					Weekly average time fished	**27:30:48**

Total Hours Fished: Area 10 Test Boat						
	Week					
Gear Type	29	30	31	32	33	TOTAL Hours
Downrigger	34:42:00	25:27:00	23:21:00	24:56:00	10:52:00	119:18:00
Weight and Bait					4:51:00	4:51:00
Jig				1:02:00		1:02:00
Total	**34:42:00**	**25:27:00**	**23:21:00**	**25:58:00**	**15:43:00**	**125:11:00**
					Weekly average time fished	**25:02:12**

Total Hours Fished: Combined Areas 9 & 10 Test Boats						
	Week					
Gear Type	29	30	31	32	33	TOTAL Hours
Downrigger	57:33:00	58:37:00	44:41:00	55:04:00	18:45:00	234:40:00
Weight and Bait	6:51:00	1:45:00	8:06:00	0:00:00	10:21:00	27:03:00
Jig	0:00:00					0:00:00
Total	**64:24:00**	**60:22:00**	**52:47:00**	**55:04:00**	**29:06:00**	**261:43:00**
					Weekly average time fished	**26:10:18**

Table 13. Total weekly Chinook encounters and number of DNA samples collected in the Areas 9 and 10 test fishery from July 16 – August 15, 2007 (statistical weeks 29 through 33), by mark status (M=marked; UM=unmarked) and legal-size or sublegal-size.

Month	Statistical Week	AREA 9						AREA 10					
		Legal			Sub Legal			Legal			Sub Legal		
		M	UM	Total	M	UM	Total	M	UM	Total	M	UM	Total
Jul / Aug	29	15	4	19	6	2	8	5	2	7	17	1	18
	30	35	7	42	8	1	9	11	3	14	14	6	20
	21	30	3	33	5	1	6	5	1	6	23	5	28
	32	28	13	41	14	1	15	7	5	12	24	3	27
	33	2	4	6	2	2	4	0	0	0	6	0	6
Jul / Aug Total		110	31	141	35	7	42	28	11	39	84	15	99
Percent		78%	22%		83%	17%		72%	28%		85%	15%	

Table 14. Raw test-boat encounter composition data and associated weekly mark-rate estimates and standard errors (SE) for Chinook salmon caught during the Chinook selective fishery in Marine Area 9 and beyond, July 16-August 15, 2007 (*Note: the Area-9 fishery ran from July 16-31 only; corresponding statistical weeks are emphasized with gray fill*). The upper table shows the test boat catch of Chinook by statistical week whereas the lower table shows the rates (and standard errors, in parentheses) of marked and unmarked Chinook by month and class.

Chinook Catch

		Statistical week					
Size	Mark Status	29 Jul 16-22	30 Jul 23-29	31 Jul 30-Aug 5	32 Aug 6-12	33 Aug 13-15	Total
Legal	Marked	15	35	30	28	2	110
	Unmarked	4	7	3	13	4	31
Sub-legal	Marked	6	8	5	14	2	35
	Unmarked	2	1	1	1	2	7
Total		27	51	39	56	10	183

Weekly Chinook Mark Rate

	Statistical week					
Monthly Mark Rates	29 Jul 16-22	30 Jul 23-29	31 Jul 30-Aug 5	32 Aug 6-12	33 Aug 13-15	Overall
Legal Mark Rate	0.789	0.833	0.909	0.683	0.333	0.780
(SE)	(0.096)	(0.058)	(0.051)	(0.074)	(0.211)	(0.035)
Sublegal Mark Rate	0.750	0.889	0.833	0.933	0.500	0.833
(SE)	(0.164)	(0.111)	(0.167)	(0.067)	(0.289)	(0.058)
Combined Mark Rate	0.778	0.843	0.897	0.750	0.400	0.792
(SE)	(0.082)	(0.051)	(0.049)	(0.058)	(0.163)	(0.030)
Proportion Legal & Marked	0.556	0.686	0.769	0.500	0.200	0.601
(SE)	(0.097)	(0.066)	(0.068)	(0.067)	(0.133)	(0.036)
Proportion Legal & UnMarked	0.148	0.137	0.077	0.232	0.400	0.169
(SE)	(0.070)	(0.049)	(0.043)	(0.057)	(0.163)	(0.028)
Proportion Sub & Marked	0.222	0.157	0.128	0.250	0.200	0.191
(SE)	(0.082)	(0.051)	(0.054)	(0.058)	(0.133)	(0.029)
Proportion Sub & UnMarked	0.074	0.020	0.026	0.018	0.200	0.038
(SE)	(0.051)	(0.020)	(0.026)	(0.018)	(0.133)	(0.014)

Table 15. Raw test-boat encounter composition data and associated weekly mark-rate estimates and standard errors (SE) for Chinook salmon caught during the Chinook selective fishery in Marine Area 10 and beyond, July 16-August 15, 2007 *(Note: the Area-9 fishery ran from July 16-31 only; corresponding statistical weeks are emphasized with gray fill*). The upper table shows the test boat catch of Chinook by statistical week whereas the lower table shows the rates (and standard errors, in parentheses) of marked and unmarked Chinook by month and class.

Chinook Catch

		Statistical week					
Size	Mark Status	29 Jul 16-22	30 Jul 23-29	31 Jul 30-Aug 5	32 Aug 6-12	33 Aug 13-15	Total
Legal	Marked	5	11	5	7		28
	Unmarked	2	3	1	5		11
Sub-legal	Marked	17	14	23	24	6	84
	Unmarked	1	6	5	3		15
Total		25	34	34	39	6	138

Weekly Chinook Mark Rate

	Statistical week					
Monthly Mark Rates	29 Jul 16-22	30 Jul 23-29	31 Jul 30-Aug 5	32 Aug 6-12	33 Aug 13-15	Overall
Legal Mark Rate	0.714	0.786	0.833	0.583	0.000	0.718
(SE)	(0.184)	(0.114)	(0.167)	(0.149)	(0.000)	(0.073)
Sublegal Mark Rate	0.944	0.700	0.821	0.889	1.000	0.848
(SE)	(0.056)	(0.105)	(0.074)	(0.062)	(0.000)	(0.036)
Combined Mark Rate	0.880	0.735	0.824	0.795	1.000	0.812
(SE)	(0.066)	(0.077)	(0.066)	(0.066)	(0.000)	(0.033)
Proportion Legal & Marked	0.200	0.324	0.147	0.179	0.000	0.203
(SE)	(0.082)	(0.081)	(0.062)	(0.062)	(0.000)	(0.034)
Proportion Legal & UnMarked	0.080	0.088	0.029	0.128	0.000	0.080
(SE)	(0.055)	(0.049)	(0.029)	(0.054)	(0.000)	(0.023)
Proportion Sub & Marked	0.680	0.412	0.676	0.615	1.000	0.609
(SE)	(0.095)	(0.086)	(0.081)	(0.079)	(0.000)	(0.042)
Proportion Sub & UnMarked	0.040	0.176	0.147	0.077	0.000	0.109
(SE)	(0.040)	(0.066)	(0.062)	(0.043)	(0.000)	(0.027)

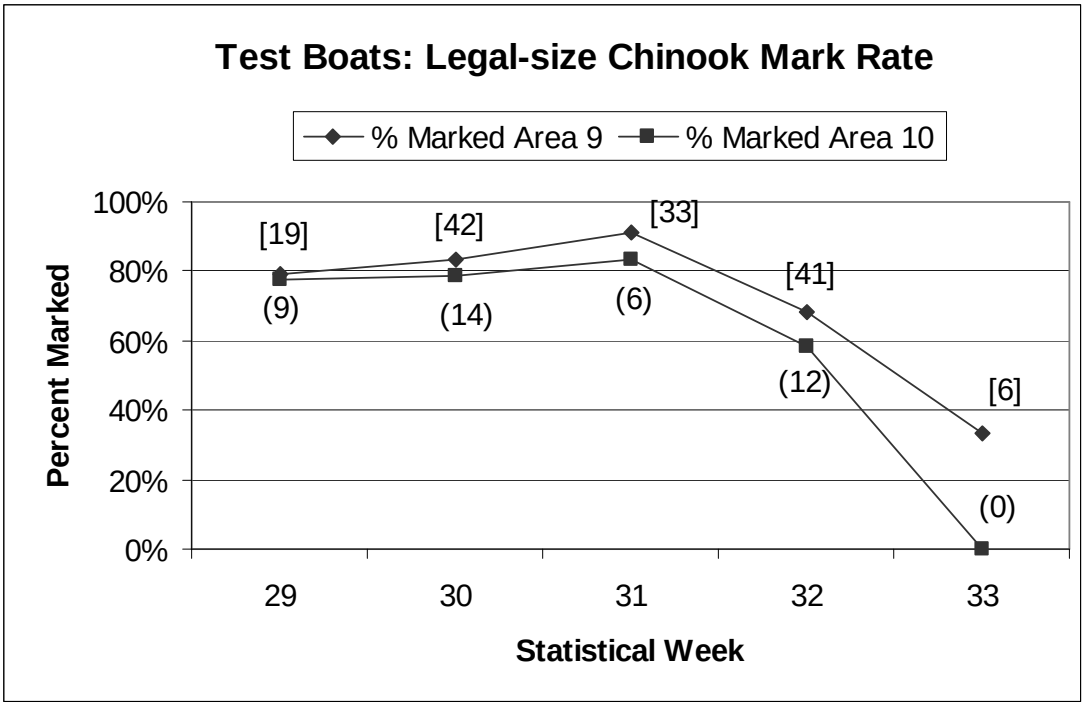
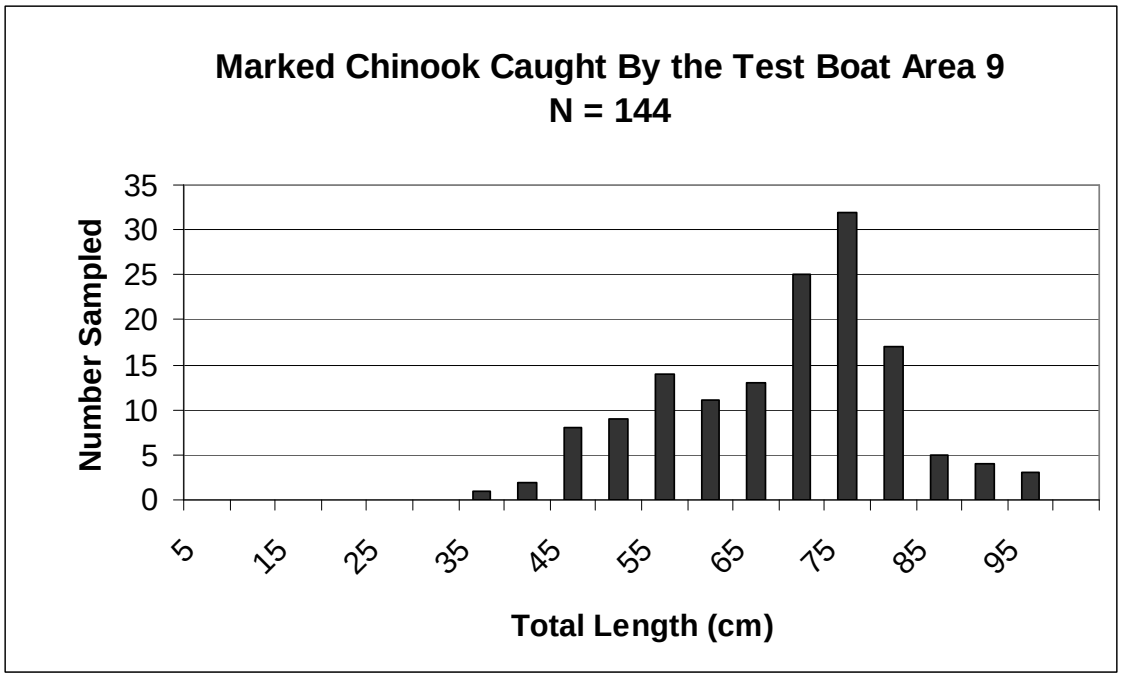
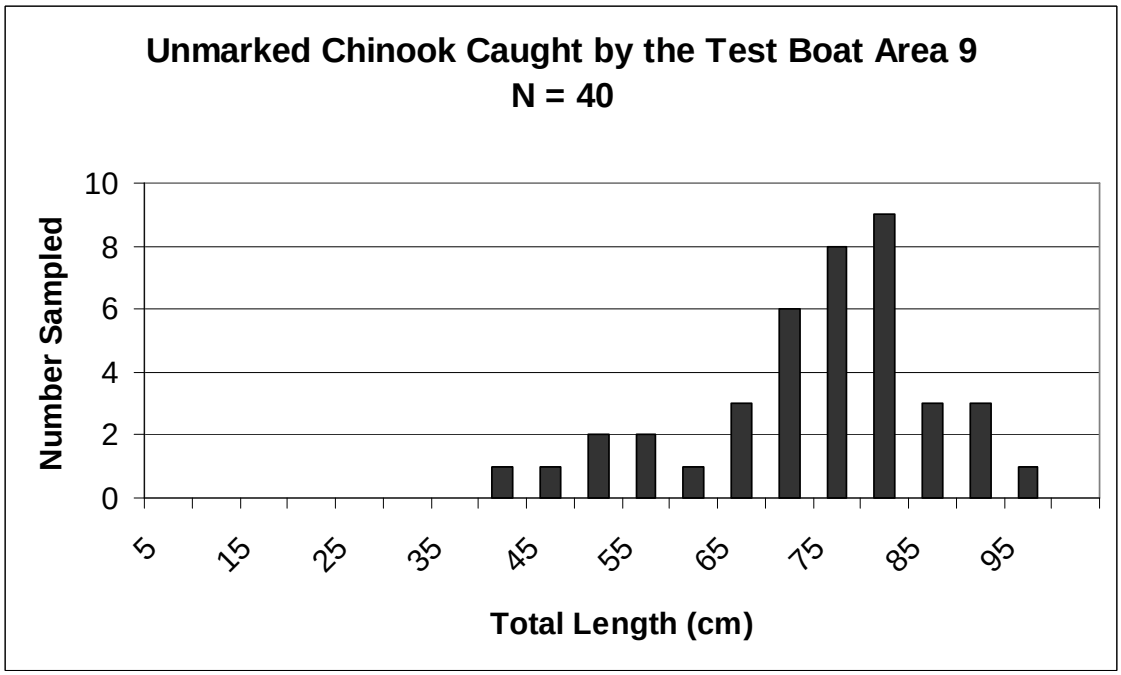
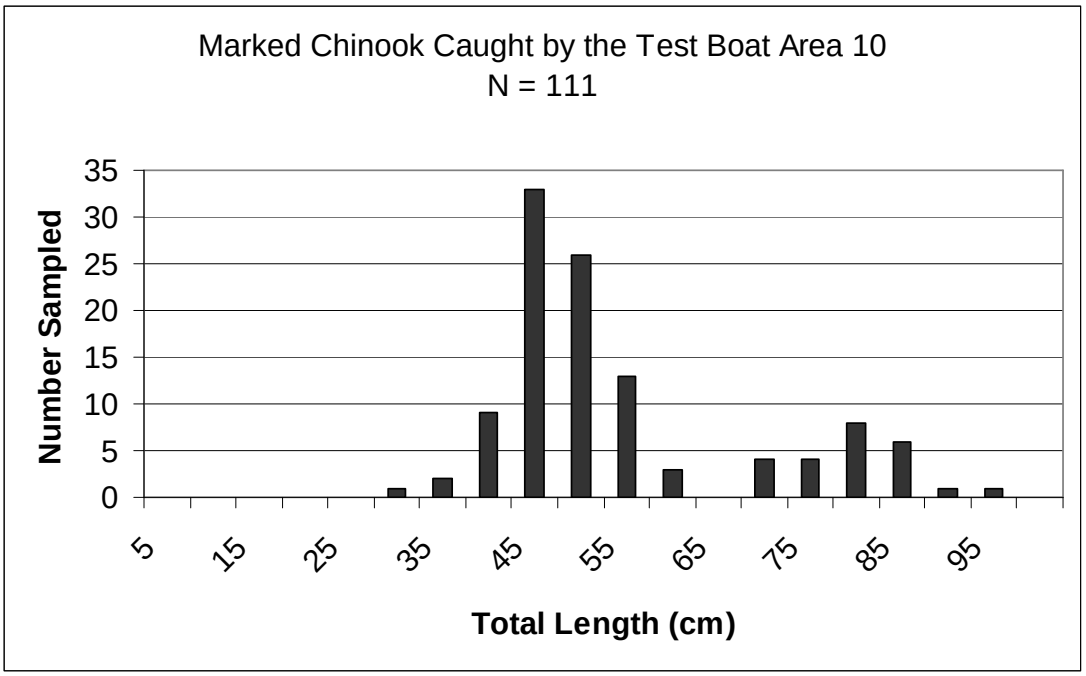


Figure 10. Monthly mark rate (% adipose fin clipped) of legal-size Chinook caught by the WDFW test boats in Marine Areas 9 and 10 during the Chinook selective fishery from July 16 – August 15, 2007. Sample sizes for Marine Area 9 are in brackets [ ], while sample sizes for Marine Area 10 are in parentheses ( ).

Figure 11. Length frequency distribution of marked and unmarked Chinook salmon caught by the Area 9 test boat from July 16 – August 15, 2007.







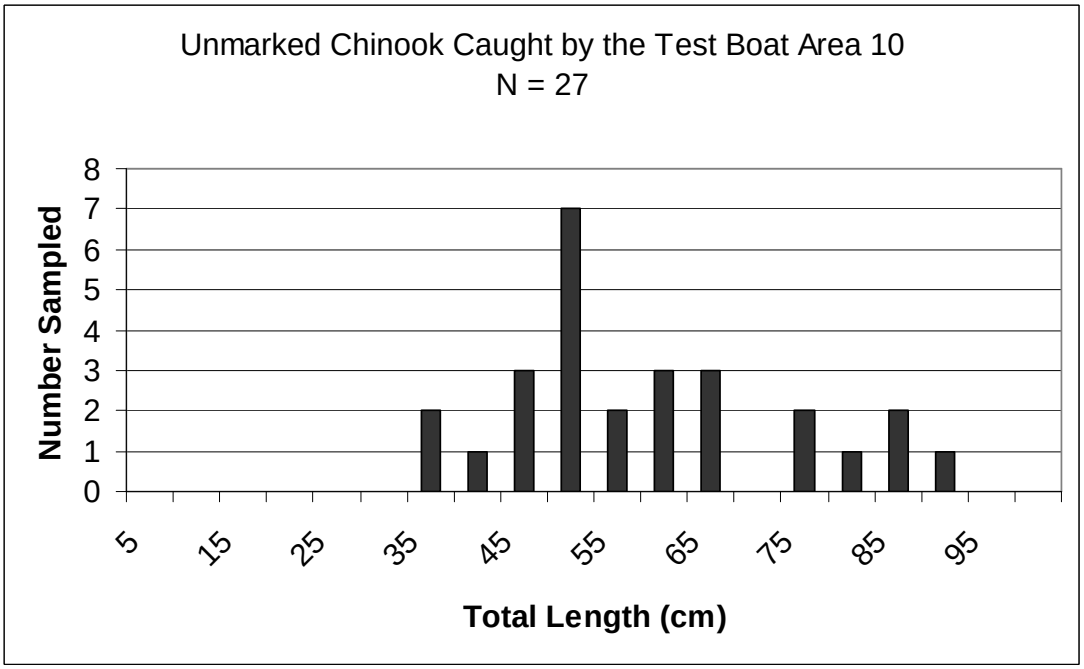


Figure 12. Length frequency distribution of marked and unmarked Chinook salmon caught by the Area 10 test boat from July 16 – August 15, 2007.

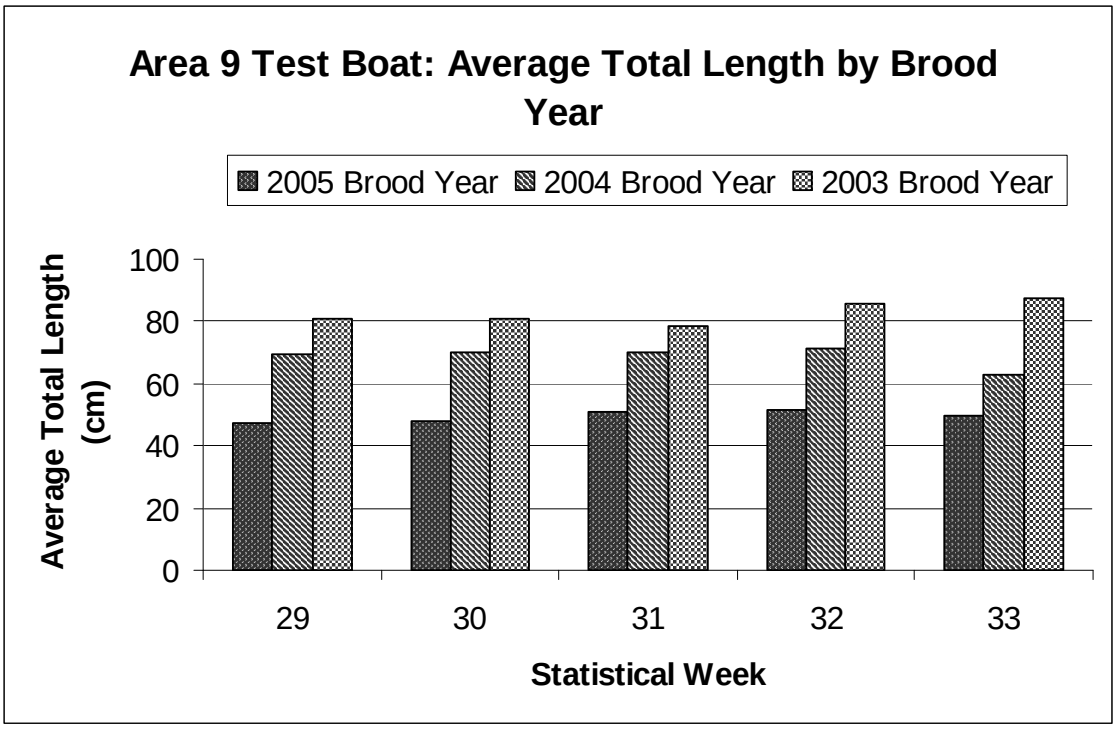


Figure13. Average total length (cm) of Chinook sampled in the Area 9 test fishery, by month and brood year, from July 16 – August 15, 2007.

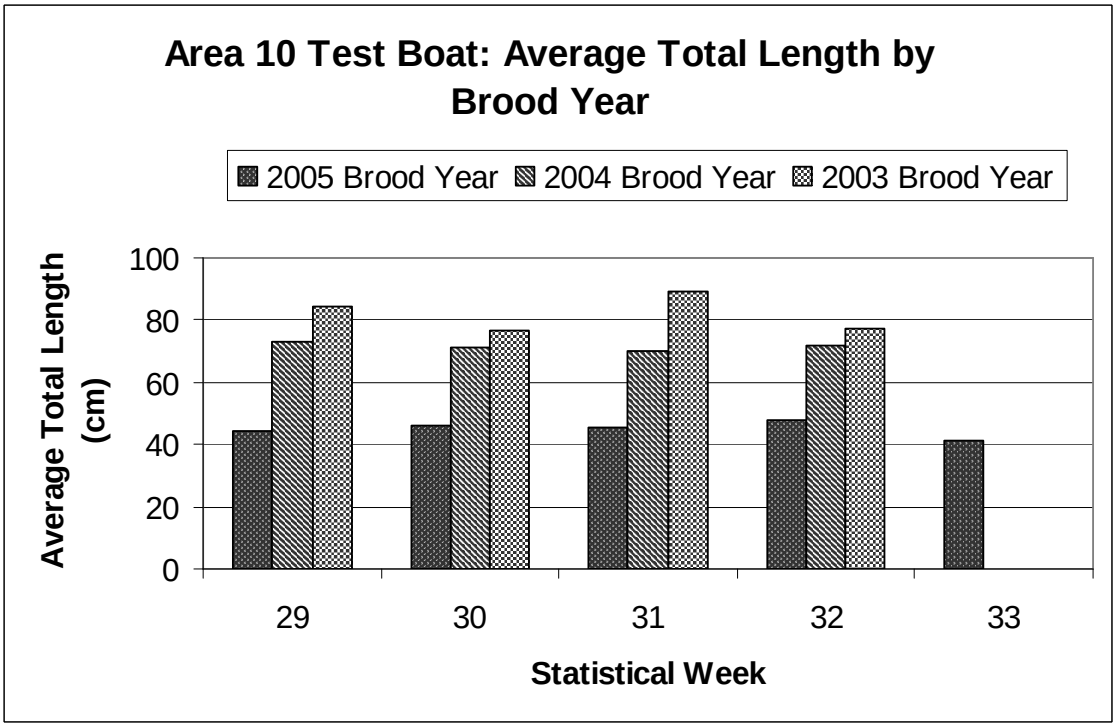


Figure14. Average total length (cm) of Chinook sampled in the Area 10 test fishery, by statistical week and brood year, from July 16 – August 15, 2007.

Table 16. Test boat catches of species other than Chinook in Areas 9 and 10 from July 16 – August 15, 2007

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TOTALS FOR OTHER SPECIES ENCOUNTERED Test Boats: Areas 9 and 10			
Area 9		Area 10	
Species	Total Catch	Species	Total Catch
Coho	13	Coho	37
Pink	2	Pink	1
Chum	1	Lingcod	2
Butter Sole	2	Pacific Sandab	62
Rock Sole	5	Brown Rockfish	2
Arrowtooth Flounder	1	Copper Rockfish	2
Pacific Sandab	18	Red Irish Lord	1
Dogfish Shark	107	Dogfish Shark	22
GRAND TOTAL	**149**		**129**

Voluntary Trip Reports (VTR's)

Anglers fishing from private vessels in Area 9 returned Voluntary Trip Reports (VTR's) at a moderate rate, with 39 VTR's returned over the 16 day fishery, while anglers in Area 10 returned a total of 13 VTR's. In Area 9, a total of 134 Chinook encounters were recorded on VTR's over the 16-day fishery (Table 17). There were 80 legal-size encounters recorded on VTR's for Area 9. Of those encounters 60 were marked, and 20 were unmarked (75% mark rate) Of the 54 sub-legal size encounters 31 were marked and 23 were unmarked (57% mark rate) (Table 19).

In Area 10, a total of 29 Chinook were recorded on VTR's (Table 18). Eleven of the Chinook (38%) recorded on VTR's in Area 10 were legal-size, and 73% of these fish were marked (Table 19). Of the 18 sublegal-size Chinook reported in Area 10, 16 were marked and 2 were unmarked (89% mark rate), resulting in an overall combined mark rate of 83% for the 29 Chinook reported on VTR's (Table 19).

Comparison of Mark Rates: Test Fishery vs VTR's

We calculated the mark rates of legal-size Chinook encountered in Area 9 from VTR's submitted by private-boat anglers and compared these results with equivalent data from the test boat in Area 9. The Area 9 VTR's showed variable mark rates for legal-size Chinook encounters compared to the mark rates for the test boat in Area 9 (Figure 15). This variability in the VTR mark rates, however, is likely the result of low sample sizes for legal Chinook reported on VTR's relative to those obtained by the test boat (Figure 15). Similarly, a comparison of VTR- and test boat-based mark rates between Areas 9 and 10 suggests the former was less variable than the latter. This difference, however, was also likely due to sampling error (i.e., small sample sizes were obtained in Area 10) (Figure 15). When comparing overall mark rates for the duration of the fishery, mark rates appear to be consistently above average. For statistical weeks 29 and 30 the legal-size mark rate for the test boat in Area 9 was 82% while the mark rate from VTR's was

75%. In Area 10 the legal-size mark rate for the test boat was 76% while the mark rate from VTR's was 72%.

Coded Wire Tags

Samplers recovered 255 (179 Area 9 and 76 Area 10) coded-wire tags from Chinook harvested during the 16-day Chinook selective fishery in Areas 9 and 10 (Table 20; Appendix D). Of these, 253 were Puget Sound stocks, and two were Canadian stocks. Fifty-four of these CWT recoveries were double index tags (Tables 20 and 21). Chinook from George Adams, Grovers Creek and Nisqually hatcheries contributed the highest number of double index tags. We estimated that anglers caught and released 290 (218 in Area 9 and 72 in Area 10) legal-size, unmarked double index tagged Chinook, and that the mortality of unmarked legal-size double index tagged Chinook due to this selective fishery was 29 fish (22 Area 9 and 7 Area 10) (Tables 21A and 21B).

Table 17. Total Chinook encounters (retained and released) reported by anglers on Voluntary Trip Reports (VTR's) during the Chinook Selective Fishery in Marine Area 9 by strata, July 16 – 31, 2007.

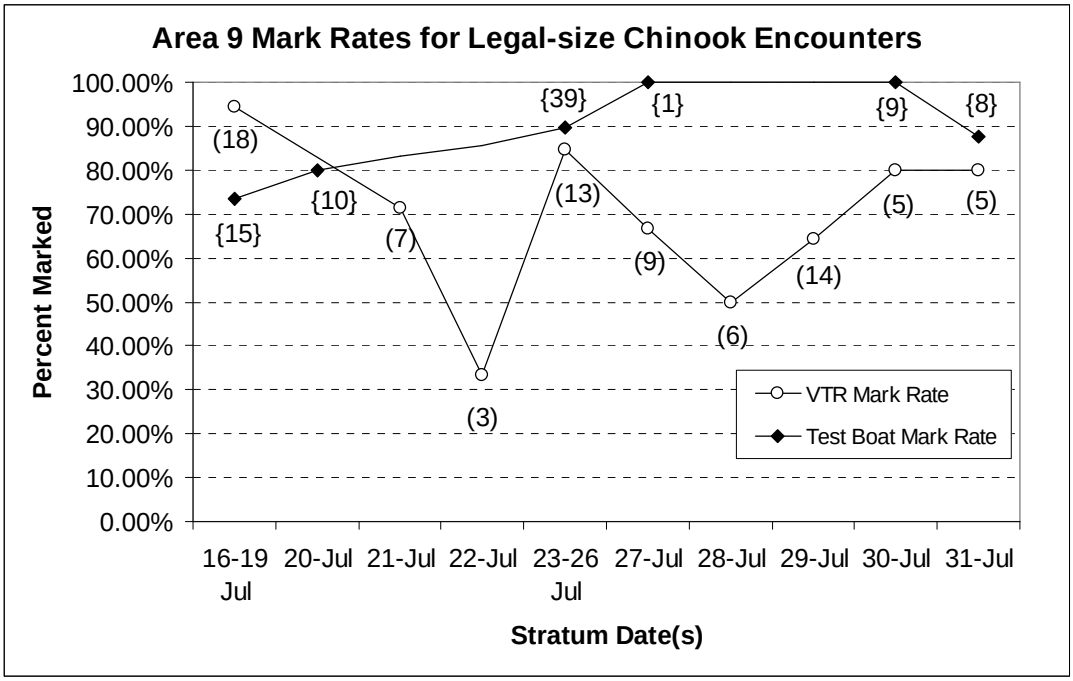
Area 9												
		Stratum Date										
Size	**Mark Status**	**7/16-7/19**	**7/20**	**7/21**	**7/22**	**7/23-7/26**	**7/27**	**7/28**	**7/29**	**7/30**	**7/31**	**Total**
Legal	**Marked**	17	0	5	1	11	6	3	9	4	4	**60**
	Unmarked	1	0	2	2	2	3	3	5	1	1	**20**
Sublegal	**Marked**	1	0	4	1	9	3	2	7	4	0	**31**
	Unmarked	9	0	7	0	4	0	2	0	1	0	**23**
Total		**28**	**0**	**18**	**4**	**26**	**12**	**10**	**21**	**10**	**5**	**134**

Table 18. Total Chinook encounters (retained and released) reported by anglers on Voluntary Trip Reports (VTR's) during the Chinook Selective Fishery in Marine Area 10 by strata, July 16 – 28, 2007.

Area 10									
		Stratum Date							
Size	**Mark Status**	**7/16-7/19**	**7/20**	**7/21**	**7/22**	**7/23-7/26**	**7/27**	**7/28**	**Total**
Legal	**Marked**	0	1	2	0	4	0	1	**8**
	Unmarked	0	1	1	0	1	0	0	**3**
Sublegal	**Marked**	0	0	4	0	5	3	4	**16**
	Unmarked	0	0	2	0	0	0	0	**2**
Total		**0**	**2**	**9**	**0**	**10**	**3**	**5**	**29**

Table 19. Summary of the number of marked and unmarked, legal-size and sublegal-size Chinook salmon encountered (retained and released) by volunteers reporting their catch on Voluntary Trip Reports (VTR's) during the Chinook Selective Fishery in Marine Areas 9 and 10, from July 16 – 31, 2007

Area	Legal-size			Sublegal-size			Total		
	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked
Area 9	60	20	75.00%	31	23	57.41%	91	43	67.91%
Area 10	8	3	72.73%	16	2	88.89%	24	5	82.76%
Total	68	23	74.73%	47	25	65.28%	115	48	70.55%



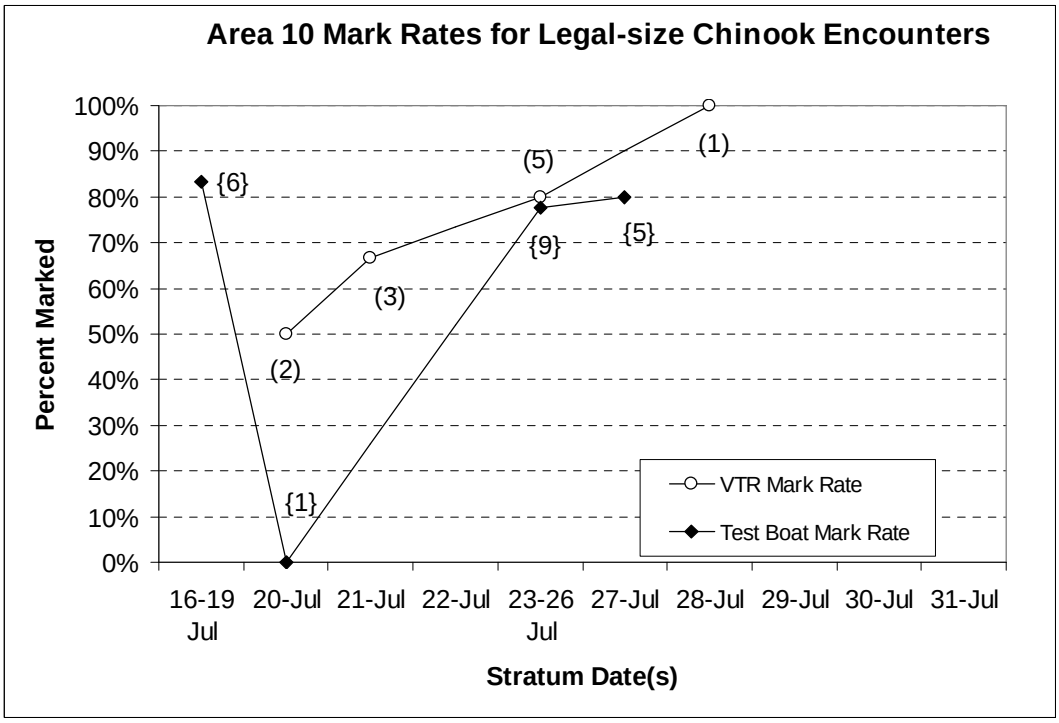


Figure 15. Fishery mark rate (% adipose fin-clipped) of legal-size Chinook salmon caught in Areas 9 and 10 by the test boat, compared with mark rates from private-boat anglers reporting their catch on Voluntary Trip Reports (VTR's), from July 16 – 31, 2007. Sample sizes for the test boat are in curved brackets {}, while sample sizes for VTR's from private boats are in parentheses ().

Table 20. Summary of total observed (in-sample) coded-wire tag recoveries from Chinook salmon harvested during the Chinook selective fishery in Areas 9 (July 16-31) and 10 (July 16-28).

AREA 9 CWT Recovery Data				
Rearing Hatchery	**Release Agency**	**# CWT's Recovered**	**% of Total**	**# DIT's**
HOODSPORT HATCHERY	WDFW	25	14%	
GARRISON HATCHERY	WDFW	18	10%	
WALLACE R HATCHERY	WDFW	11	6%	1
GROVERS CR HATCHERY	SUQ	11	6%	11
MINTER HATCHERY	WDFW	10	6%	
GEORGE ADAMS HATCHRY	WDFW	10	6%	10
CHAMBERS CR HATCHERY	WDFW	8	4%	
LAKEWOOD HATCHERY	WDFW	8	4%	
ICY CR HATCHERY	WDFW	8	4%	
GORST CR REARING PND	SUQ	8	4%	
NISQUALLY HATCHERY	NISQ	7	4%	7
ENDICOTT PD (LLTK)	WDFW	7	4%	
ISSAQUAH HATCHERY	WDFW	7	4%	
VOIGHTS CR HATCHERY	WDFW	6	3%	
TUMWATER FALLS HATCH	WDFW	6	3%	
SOOS CREEK HATCHERY	WDFW	5	3%	5
KALAMA CR HATCHERY	NISQ	5	3%	
WHITE RIVER HATCHERY	MUCK	3	2%	
BERNIE GOBIN HATCH	TULA	3	2%	
RFEG 6 HOOD CANAL	WDFW	3	2%	
MARBLEMOUNT HATCHERY	WDFW	2	1%	2
CLARKS CRK HATCHERY	PUYA	2	1%	
COWSKULL ACCLIM POND	PUYA	1	1%	
SAMISH HATCHERY	WDFW	1	1%	1
(BAKER R)	WDFW	1	1%	
(SKAGIT R)	WDFW	1	1%	
H-NANAIMO R	CDFO	1	1%	
H-CHILLIWACK R	CDFO	1	1%	1
Total CWT's Recovered		**179**	**100%**	**38**

AREA 10 CWT Recovery Summary				
Rearing Hatchery	**Release Agency**	**# CWT's Recovered**	**% of Total**	**# DIT's**
HOODSPORT HATCHERY	WDFW	12	16%	
VOIGHTS CR HATCHERY	WDFW	6	8%	
TUMWATER FALLS HATCH	WDFW	7	9%	
ICY CR HATCHERY	WDFW	7	9%	
NISQUALLY HATCHERY	NISQ	6	8%	6
LAKEWOOD HATCHERY	WDFW	6	8%	
GARRISON HATCHERY	WDFW	5	7%	
GROVERS CR HATCHERY	SUQ	5	7%	5
GORST CR REARING PND	SUQ	4	5%	
SOOS CREEK HATCHERY	WDFW	3	4%	3
ISSAQUAH HATCHERY	WDFW	3	4%	
MINTER HATCHERY	WDFW	3	4%	
WALLACE R HATCHERY	WDFW	2	3%	
CHAMBERS CR HATCHERY	WDFW	2	3%	
MARBLEMOUNT HATCHERY	WDFW	1	1%	1
GEORGE ADAMS HATCHRY	WDFW	1	1%	1
KALAMA CR HATCHERY	NISQ	1	1%	
COWSKULL ACCLIM POND	PUYA	1	1%	
BERNIE GOBIN HATCH	TULA	1	1%	
Total CWT's Recovered:		**76**	**100%**	**16**

Table 21A. Observed number of double index tagged (DIT) Chinook kept by anglers, and the estimated mortality of unmarked double index tagged Chinook due to catch and release mortality, during the Chinook selective fishery in Marine Area 9 from July 16 – 31, 2007.

Area 9 DIT Analysis

Hatchery	Brood Year	Observed DIT Tagged fish	Estimated Harvest of Marked DIT fish	Variance Estimated Harvest of Marked DIT fish	Estimated Unmarked DIT fish Encountered	Estimated Mortality of Unmarked DIT fish	Variance Estimated Mortality Unmarked DIT fish	Standard Error Estimated Mortality Unmarked DIT fish
George Adams Hatchery	2003	6	31.00	155.51	30.87	3.09	1.54	2.77
	2004	4	20.28	96.27	20.19	2.02	0.95	1.81
Grovers Creek Hatchery	2003	3	17.80	94.79	16.70	1.67	0.83	1.52
	2004	7	49.18	320.44	55.53	5.55	4.09	5.14
	2005	1	5.14	21.32	6.71	0.67	0.36	0.60
H-Chilliwack R. Hatchery	2005	1	3.39	8.11	3.44	0.34	0.08	0.29
Marblemount Hatchery	2004	2	8.35	28.41	8.23	0.82	0.28	0.72
Nisqually Hatchery	2003	2	12.66	73.47	12.47	1.25	0.71	1.14
	2004	4	21.87	124.96	22.12	2.21	1.28	2.00
	2005	1	3.21	7.09	3.61	0.36	0.09	0.30
Samish Hatchery	2005	1	3.39	8.11	3.08	0.31	0.07	0.26
Soos Creek Hatchery	2004	5	30.40	167.75	30.34	3.03	1.67	2.77
Wallace Hatchery	2004	1	4.59	16.48	4.57	0.46	0.16	0.40
TOTAL		**38**	**211.27**	**1122.70**	**217.87**	**21.79**	**12.12**	**19.72**

Table 21B. Observed number of double index tagged (DIT) Chinook kept by anglers, and the estimated mortality of unmarked double index tagged Chinook due to catch and release mortality, during the Chinook selective fishery in Marine Area 10, from July 16 – 28, 2007.

Area 10 DIT Analysis

Hatchery	Brood Year	Observed DIT Tagged fish	Estimated Harvest of Marked DIT fish	Variance Estimated Harvest of Marked DIT fish	Estimated Unmarked DIT fish Encountered	Estimated Mortality of Unmarked DIT fish	Variance Estimated Mortality Unmarked DIT fish	Standard Error Estimated Mortality Unmarked DIT fish
George Adams Hatchery	2004	1	4.26	13.89	4.24	0.42	0.14	0.37
Grovers Creek Hatchery	2003	2	6.68	17.31	6.26	0.63	0.15	0.52
	2004	3	17.38	84.26	19.62	1.96	1.07	1.78
Marblemount Hatchery	2004	1	4.98	19.78	4.90	0.49	0.19	0.44
Nisqually Hatchery	2003	2	9.24	33.67	9.10	0.91	0.33	0.81
	2004	4	14.73	43.50	14.90	1.49	0.44	1.27
Soos Creek Hatchery	2003	1	4.98	19.78	4.98	0.50	0.20	0.45
	2004	2	8.06	26.19	8.04	0.80	0.26	0.70
TOTAL		**16**	**70.29**	**258.38**	**72.04**	**7.20**	**2.79**	**6.33**

Encounters and Total Mortalities

Method 1 Results

Based on Method 1, we estimated a total of 24,045 Chinook encounters in Areas 9 and 10 (15,584 in Area 9 and 8,461 in Area 10). These Chinook encounters consisted of 6,582 retained legal-size fish (6,532 marked and 50 unmarked), 8,372 released legal-size fish (5,571 marked and 2,801 unmarked), 267 retained sublegal-size fish (246 marked and 21 unmarked), and 8,823 sublegal-size released fish (7,034 marked and 1,789 unmarked) (Table 22; Table 24).

The estimate of 5,571 released legal-size and marked Chinook (5,081 in Area 9 and 1,451 in Area 10) suggests that anglers released 46% of the legal-size and marked Chinook they could have kept. While we believe that some "high grading" of catch occurred during the course of the fishery given the moderate catch rates estimated for Areas 9 and 10 (CPUE: 0.27 and 0.18 Chinook kept per angler trip, respectively), we believe that anglers would have retained a higher proportion of encountered, legally harvestable fish than this suggests. Thus, we suspect the calculated release rate of 46% for legal-size marked fish (and by implication our "Method-1" estimate of total encounters) is probably biased high.

Based on the estimates of encounters produced using Method 1, we estimated the total Chinook mortality during this fishery at 9,870 fish (Table 22; Table 25) of which 91% were marked. Estimated mortalities for both areas combined consisted of 6,582 retained legal-size fish (6,532 marked and 50 unmarked), 1,256 released legal-size Chinook (836 marked and 420 unmarked), 267 retained sub-legal fish (246 marked, 21 unmarked), and 1,765 sublegal released fish (1,407 marked and 358 unmarked).

Method 2 Results

Using Method 2, we estimated that anglers encountered a total of 13,770 Chinook salmon in Areas 9 and 10 during their respective fisheries (Table 23). The 13,770 total encounters consisted of 6,582 retained legal-size fish (6,532 marked and 50 unmarked), 1,580 released unmarked legal-size Chinook, 267 retained sublegal-size fish (246 marked, 21 unmarked), and 5,341 sublegal-size released Chinook (4,281 marked and 1,060 unmarked) (Table 24).

Given Method-2 encounters, we estimated the total Chinook mortality during this fishery at 8,155 fish (Table 25), the majority of which (94%) were marked. These estimated mortalities were comprised of 6,582 retained legal-size fish (6,532 marked and 50 unmarked), 237 released unmarked legal-size Chinook, 267 retained sublegal-size fish (246 marked, 21 unmarked), and 1,068 sublegal-size released fish (856 marked and 212 unmarked) for both areas combined.

Comparison of Methods 1 and 2

Combined Areas 9 and 10 season-total encounter and mortality estimates differed appreciably between Methods 1 and 2. Method-2 encounters (13,770), based on expanded dockside observations of legal-marked Chinook (i.e., using the legal-marked proportion of

test-boat encounters), were 43% less than interview-based Method-1 encounters (24,045). In contrast to total encounters, estimated mortalities diverged less between methods; there was a 17% difference between Methods 2 and 1 (8,150 vs. 9, 870 mortalities, respectively) for this quantity.

Given the disparity in results from the two methods and the importance of encounter and mortality estimates to total fishery-impact assessment, we briefly consider the potential sources of the observed disparity in results here. Method 1 yielded estimates (retention + release) suggesting anglers released nearly half (46%) of the legal-marked Chinook salmon that they caught (i.e., they were "sorting" their catch at a high level). Considering the moderate catch rates estimated for Areas 9 and 10 fisheries (~1 fish retained per 4 and 6 angler trip, respectively) and the two-fish bag limit, we believe that sorting of this magnitude is unlikely and thus a result of anglers over-reporting releases during dockside interviews. Conversely, it is also unlikely that anglers kept *all* legal-size, marked fish encountered, as anglers do occasionally release fish that are marginally larger than the legal minimum with hopes of landing a larger fish. Even in low-success winter fisheries, charter-boat anglers are known to release ~10% of all legal-marked encounters (e.g., Areas 8-1/8-2; WDFW 2007a, 2007c). In combination, these considerations suggest the true number of Chinook encountered and impacted by the Areas 9 and 10 selective Chinook fisheries is between Method-1 and Method-2 estimates.

In sum, the true total number of Chinook encountered during the course of the 9 and 10 fisheries is likely between 13,770 (Method 2) and 24,045 (Method 1); the true number of fishery-related mortalities is likely between 8,155 (Method 2) and 9,870 (Method 1).

Table 22. Summary of season-wide (July 16-31 for Area 9 and 16-28 for Area 10) impact (encounters and total mortality) estimates for Marine Areas 9 and 10. *The values displayed were derived by summing stratum-specific encounters and mortalities (and variances) using the "Method-1" estimation approach* (See Appendix A for further detail). Method 1 uses the number of Chinook encounters obtained from dockside creel estimates for each stratum, combined with counts from charter boats and apportions total encounters to the four categories of legal marked, legal unmarked, sublegal marked, and sublegal unmarked, according to the stratum-specific proportions of those fish caught in the test fishery in each area. Values may not add exactly due to rounding error.

Area 9

Total Encounters (E): **15,584** (Creel estimates: 4,905 Marked Retained + 33 Unmarked Retained + 9,949 Released; Charters: 334 Marked Retained + 363 Released)

V(E): 531,212

The listed values are season totals based on the sum of monthly-computed estimates and variances (See Appendix A for further estimation detail).

Size/mark group	Encounters	# Retained	Mortality Rate	Ret. Mortality	Num Released	Release Mortality Rate	Release Mortality	Total Mortality	Variance	SE	95% CI	CV (%)
% legal marked	9,727	5,081	100%	5,081	4,645	15%	697	5,778	189,826	436	[4924-6632]	8
% legal Unmarked	2,138	16	100%	16	2,121	15%	318	335	4,553	67	[202-467]	20
% sub-legal marked	2,939	158	100%	158	2,781	20%	556	714	11,608	108	[503-925]	15
% sub-legal unmarked	780	16	100%	16	763	20%	153	169	3,916	63	[47-292]	37
All groups combined:	**15,584**	**5,272**		**5,272**	**10,311**		**1,724**	**6,996**	**209,902**	**458**	**[6098-7894]**	**7**

Area 10

Total Encounters (E): **8,461** (Creel estimates: 1,469 Marked Retained + 38 Unmarked Retained + 6,777 Released; Charters: 70 Marked Retained + 107 Released)

V(E): 263,693

The listed values are season totals based on the sum of monthly-computed estimates and variances (See Appendix A for further estimation detail).

Size/mark group	Encounters	# Retained	Mortality Rate	Ret. Mortality	Num Released	Release Mortality Rate	Release Mortality	Total Mortality	Variance	SE	95% CI	CV (%)
% legal marked	2,377	1,451	100%	1,451	926	15%	139	1,590	22,203	149	[1298-1882]	9
% legal Unmarked	713	33	100%	33	680	15%	102	135	874	30	[77-193]	22
% sub-legal marked	4,341	88	100%	88	4,253	20%	851	939	6,931	83	[776-1102]	9
% sub-legal unmarked	1,030	5	100%	5	1,025	20%	205	210	2,133	46	[119-300]	22
All groups combined:	**8,461**	**1,577**		**1,577**	**6,884**		**1,297**	**2,874**	**32,140**	**179**	**[2522-3225]**	**6**

Table 23. Estimated encounters of Chinook in areas 9 (July 16-31, 2007) and 10 (July 16-28, 2007) Chinook selective fisheries based on "Method 2", which assumes that anglers retained all legal-size marked Chinook. Total encounters were estimated by dividing the number of legal-size marked Chinook that anglers retained by the weighted proportion of legal-size marked fish from the test boats. The number of encounters in the remaining three categories was then obtained by multiplying the total encounters by the proportions for each corresponding category. Values may not add exactly due to rounding error.

Area		Legal		Sublegal		TOTAL
		Marked	Unmarked	Marked	Unmarked	
9	Est. Encounters	5,081	1,182	1,676	485	**8,424**
	Proportion	0.603	0.140	0.199	0.058	
10	Est. Encounters	1,451	447	2,851	597	**5,346**
	Proportion	0.271	0.084	0.533	0.112	
Total Encounters: Areas 9 & 10		**6,532**	**1,629**	**4,527**	**1,082**	**13,770**
Combined Proportion		0.474	0.118	0.329	0.079	

Table 24. Comparison of methods used to estimate encounters of Chinook in the Areas 9 and 10 Chinook selective fisheries during July 2007. Method 1 applies the size/mark-status proportions from test fishing data to the number of encounters estimated from creel surveys (combined with counts of encounters reported from charter boats). Method 2 assumes that anglers did not release any legal-size marked fish, and total encounters are estimated by dividing the number of legal-size marked Chinook retained by the proportion of legal-size marked fish observed by the test fishery during each stratum, and then summed across the whole season; the number of encounters in the remaining three categories was then obtained by multiplying the total encounters by the proportions for each corresponding category. See Appendix A for more details on Method-1 versus Method-2 estimation. Values may not add exactly due to rounding error.

Method	Area	Legal				Sublegal				Total Encounters
		Marked		Unmarked		Marked		Unmarked		
		Kept	Released	Kept	Released	Kept	Released	Kept	Released	
(1) Total encounters from creel surveys	**9**	5,081	4,645	16	2,121	158	2,781	16	763	15,584
	10	1,451	926	33	680	88	4,253	5	1,025	8,461
	Total	**6,532**	**5,571**	**50**	**2,801**	**246**	**7,034**	**21**	**1,789**	**24,045**
(2) Total encounters from legal-size marked fish retained	**9**	5,081	0	16	1,165	158	1,518	16	468	8,424
	10	1,451	0	33	414	88	2,762	5	592	5,346
	Total	**6,532**	**0**	**50**	**1,580**	**246**	**4,281**	**21**	**1,060**	**13,770**

Table 25. Comparison of methods used to estimate mortalities of Chinook in the Areas 9 and 10 Chinook selective fisheries during July 2007. Method 1 applies the size/mark-status proportions from test fishing data to the number of encounters estimated from creel surveys (combined with counts of encounters reported from charter boats). Method 2 assumes that anglers did not release any legal-size marked fish, and total encounters are estimated by dividing the number of legal-size marked Chinook retained by the proportion of legal-size marked fish logged by test boats during each stratum, and then summed across the whole season; the number of encounters in the remaining three categories was then obtained by multiplying the total encounters by the proportions for each corresponding category. See Appendix A for more details on Method-1 vs. Method-2 estimation. Values may not add exactly due to rounding error.

Method	Area	Legal				Sublegal				Total Mortalities
		Marked		Unmarked		Marked		Unmarked		
		Kept	Released	Kept	Released	Kept	Released	Kept	Released	
(1) Mortalities based on total encounters from creel surveys	**9**	5,081	697	16	318	158	556	16	153	6,996
	10	1,451	139	33	102	88	851	5	205	2,874
	Total	**6,532**	**836**	**50**	**420**	**246**	**1,407**	**21**	**358**	**9,870**
(2) Mortalities based on total encounters from legal-size marked fish retained	**9**	5,081	0	16	175	158	304	16	94	5,845
	10	1,451	0	33	62	88	552	5	118	2,310
	Total	**6,532**	**0**	**50**	**237**	**246**	**856**	**21**	**212**	**8,155**

Observed versus Predicted Encounters and Mortalities

To place the estimated impact of the Areas 9 and 10 Chinook selective fisheries into context, we contrasted post-season estimates of total encounters and mortalities generated using Method 1 with pre-season management expectations generated using the Fishery Regulation Assessment Model (FRAM; Model 3907). Pre-season FRAM predictions suggested the areas 9 and 10 fisheries would result in a total of 20,680 total Chinook encounters (10,075 legal and 10,605 sublegal Chinook), 7,000 of which would be landed (all legal, 230 unmarked, 6,770 marked; Table 26); we estimated that anglers actually encountered 24,045 Chinook (14,954 legal and 9,091sublegal) of which 6,850 were landed (71 unmarked, 6,779 marked). With the exception of legal-marked encounters (observed encounters exceeded modeled values by 48%), observed encounters were similar to FRAM-modeled impacts. Further, observed unmarked-Chinook encounter estimates (i.e., legal, sublegal, and landed-only, by area and overall) were generally less than and within 5% of modeled values (Table 26).

Similar to our modeled versus observed encounters comparison, differences between pre-season modeled mortalities and actual (estimated) values were minimal overall and within marine-area and size/mark-status classes (Table 27). Pre-season predictions suggested 9,932 Chinook mortalities would occur (7,000 retention and 2,932 post-release mortalities) as a result of the 9 and 10 fisheries. We estimated that 9,870 Chinook (6,850 retention and 3,020 post-release mortalities) mortalities actually occurred due to the fishing activity that occurred in the two marine areas. Similar to total encounters, post-release mortality observations for legal-size Chinook (especially marked fish) exceeded pre-season predictions by 55%. More importantly, observed unmarked-Chinook mortalities were either comparable to (<10% divergent) or less than FRAM predictions in all cases.

In combination, our observed-versus-predicted encounters/mortalities comparison suggests that the Areas 9 and 10 fisheries operated within the conservation constraints defined by managers during pre-season fishery planning.

Table 26. Comparison of observed Chinook encounters based on estimates from creel surveys, versus Chinook encounters predicted from the FRAM model (final model run 3907), for Areas 9 and 10 combined from July 16-31 (Area 9) and July 16-28 (Area 10), 2007.

Areas 9 & 10	FRAM Chinook Encounters				Estimated Chinook Encounters (Method 1: Creel Surveys)[a]			
Chinook Encounters	**Unmarked**	**Marked**	**Total**	**Mark Rate**	**Unmarked**	**Marked**	**Total**	**Mark Rate**
Area 9 Total Encounters (Landed+Released)	3,790	10,832	**14,622**	74.08%	2,918	12,666	**15,584**	81.28%
Legal	2,070	5,462	7,532	72.52%	2,138	9,727	11,864	81.98%
Sublegal	1,720	5,370	7,090	75.74%	780	2,939	3,719	79.03%
Landed encounters only	166	5,134	5,300	96.87%	33	5,239	5,272	99.37%
Area 10 Total Encounters (Landed+Released)	1,798	4,260	**6,058**	70.32%	1,743	6,718	**8,461**	79.40%
Legal	803	1,740	2,543	68.42%	713	2,377	3,090	76.92%
Sublegal	995	2,520	3,515	71.69%	1,030	4,341	5,371	80.82%
Landed encounters only	64	1,636	1,700	96.24%	38	1,539	1,577	97.59%
Combined 9 & 10 Total Encounters (Landed+Released)	5,588	15,092	**20,680**	72.98%	4,661	19,384	**24,045**	80.62%
Legal	2,873	7,202	10,075	71.48%	2,851	12,103	14,954	80.94%
Sublegal	2,715	7,890	10,605	74.40%	1,810	7,281	9,091	80.09%
Landed encounters only	230	6,770	7,000	96.71%	71	6,779	6,850	98.96%

a. We used the number of Chinook encounters obtained from dockside creel estimates and apportioned these total encounters into the four categories of legal marked, legal unmarked, sublegal marked, and sublegal unmarked, according to the proportions of those fish caught in the test fishery in Areas 9 and 10 ("Method 1"). The total encounters also include counts of Chinook encounters from charter vessels (sizes and mark status of these Chinook were known).

Table 27. Comparison of observed Chinook mortalities based on estimates from creel surveys, versus Chinook mortalities predicted from the FRAM model (final model run 3907), for Areas 9 and 10 combined from July 16-31 (Area 9) and July 16-28 (Area 10), 2007.

Chinook Mortalities	FRAM Chinook Mortalities			Estimated Chinook Mortalities[a]		
	Unmarked	Marked	Total	Unmarked	Marked	Total
Area 9 Total (Landed+Released)	804	6,514	**7,318**	504	6,492	**6,996**
Released Legal	294	306	600	318	697	1,015
Released Sublegal	344	1,074	1,418	153	556	709
Landed Only	166	5,134	5,300	33	5,239	5,272
Area 10 Total (Landed+Released)	377	2,237	**2,614**	345	2,529	**2,874**
Released Legal	114	97	211	102	139	241
Released Sublegal	199	504	703	205	851	1,056
Landed Only	64	1,636	1,700	38	1,539	1,577
Combined 9 & 10 Total (Landed+Released)	1,181	8,751	**9,932**	849	9,021	**9,870**
Released Legal	408	403	811	420	836	1,256
Released Sublegal	543	1,578	2,121	358	1,407	1,765
Landed Only	230	6,770	7,000	71	6,779	6,850

a. Mortalities were calculated based on the number of Chinook encounters obtained from dockside creel estimates, which we apportioned into the four categories of legal marked, legal unmarked, sublegal marked, and sublegal unmarked, according to the proportions of those fish caught in the test fishery in Areas 9 and 10 ("Method 1").

SUMMARY

During July of 2007, anglers were allowed to fish for and retain Chinook in Marine Areas 9 and 10, an angling opportunity which has not existed for more than a decade. Our sampling results for this pilot selective Chinook fishery suggest that it was highly successful with respect to the goal of increasing recreational fishing opportunity without compromising conservation goals for ESA-listed Puget Sound Chinook salmon.

Based on both test-fishing and VTR data collected during the course of the Areas 9 and 10 fisheries, we estimated that roughly two thirds to three quarters of all legal-size Chinook salmon encountered by anglers in the two areas were marked and could therefore be retained by anglers. Thus, mark rates were sufficiently high to provide acceptable harvest probabilities. Additionally, the measured impacts of the fishery were either less than or comparable to pre-season expectations for unmarked Chinook salmon and the estimated number of mortalities of unmarked CWT fish (i.e., DIT groups) was negligible. Thus, the pilot fishery resulted in acceptable levels of impact on wild Chinook salmon and did not compromise the integrity of the coast-wide coded wire tag program. Finally, in terms of implementation, the Areas 9 and 10 fisheries were successful in terms of monitoring and management; total landings closely approached but remained within the established harvest quotas.

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LITERATURE CITED

Cochran, W.G. 1977. Sampling Techniques. John Wiley and Sons. New York.

International North Pacific Fisheries Commission. 1963. International North Pacific Fisheries Commission Annual Report, 1961.

Joint Coho DIT Analysis Workgroup. (Northwest Indian Fisheries Commission, Western Washington Treaty Tribes, and Washington Department of Fish and Wildlife). 2003. Analysis of coho salmon double index tag (DIT) data for the brood years 1995-1997. Northwest Fishery Resource Bulletin No. 12. Olympia, WA. 160 pp.

Murthy, M.N. 1957. Ordered and unordered estimators in sampling without replacement. Sankhya 18:379-390.

SFEC-AWG. 2002. Pacific Salmon Commission, Joint Selective Fisheries Evaluation Committee Report, *Investigation of methods to estimate mortalities of unmarked salmon in mark-selective fisheries through the use of double index tag groups.* TCSFEC (02)-1, February 2002.

Thiesfeld, S.L., and A. Hagen-Breaux. 2005a. 2003 Chinook Selective Fishery, Marine Areas 5 and 6. January 12, 2005. Washington Department of Fish and Wildlife. Olympia, Washington.

Thiesfeld, S.L., and A. Hagen-Breaux. 2005b. 2004 Chinook Selective Fishery, marine areas 5 and 6. January 12, 2005. Washington Department of Fish and Wildlife. Olympia, Washington.

Washington Department of Fisheries and Northwest Indian Fisheries Commission. 1992. Puget Sound salmon sport catch estimation study-1990. Joint report prepared by: Washington Department of Fisheries, Puget Sound Treaty Indian Tribes, and Northwest Indian Fisheries Commission, May 1992.

Washington Department of Fish and Wildlife (WDFW). 2002. Methods for projecting impacts on the CWT system of conducting both the Skykomish River and Areas 5/6 Marine Selective Fisheries in Years 2003-2006. Olympia, Washington. 19 pp.

Washington Department of Fish and Wildlife. 2005. Evaluation of the 2003 and 2004 Chinook Mark-Selective Fishery, marine areas 5 and 6. Final Draft. January 14, 2005. Washington Department of Fish and Wildlife. Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW). 2006. 2005 Chinook Selective Fishery, Marine Areas 5 and 6. Final Report: March 21, 2006. Washington Department of Fish and Wildlife. Olympia, Washington. 43 pp.

Washington Department of Fish and Wildlife (WDFW). 2007a. 2005-2006 Chinook Selective Fishery, Marine Areas 8-1 and 8-2. Final Report Draft: February 28, 2007. Washington Department of Fish and Wildlife. Olympia, Washington. 74 pp.

Washington Department of Fish and Wildlife (WDFW). 2007b. 2006 Chinook Selective Fishery, Marine Areas 5 and 6. Final Report: August 15, 2007. Washington Department of Fish and Wildlife. Olympia, Washington. 44 pp.

Washington Department of Fish and Wildlife (WDFW). 2007c. 2006-2007 Chinook Selective Fishery, Marine Areas 8-1 and 8-2. Final Report Draft: September 29, 2007. Washington Department of Fish and Wildlife. Olympia, Washington. 87 pp.

Appendix A. Estimating strata-specific and overall selective-fishery impacts in Areas 9 and 10

List A1. Variable definitions and equations associated with Figure A1.

Below are definitions and equations for all quantities used in estimating total mark-selective fishery impacts under "Method 1" (defined in the main report on p. 16). The sequence in the list builds from stratum estimators (and variances) of encounters-by-class (i.e., size/mark-status groups) to season-wide fishery-impact estimates. Where appropriate, the inclusion/treatment of charter-based encounters [kept plus released Chinook; assumed the result of a complete census (i.e., with zero variance)] in estimating particular quantities of interest is also provided (see p. 13 in the main report body for background on this topic); those instances are denoted by the symbol †. Further, estimation differences leading to "Method-2" estimates of fishery impacts are also identified where appropriate and are denoted by ‡. *Regarding notation*: i) symbols follow those in Figure A1; ii) estimated quantities appear in *italics*; and iii) constants (with an assumed variance of zero) are depicted in ***bold-faced, italicized*** font.

A. Total and class-specific encounters estimation:

The first step towards quantifying mark-selective fishery impacts by size/mark-status class is the apportioning of Murthy-based estimates of total Chinook encounters (the sum of retained and released fish; *Stratum Encounters*) in a given stratum i to the appropriate group using encounter-composition data collected in the WDFW test fishery (*Test-fishery Encounter Composition*).

Stratum Encounters

E_i = Estimated total Chinook encounters for stratum i, inclusive of retained and released individuals from all mark-status groups (N_{MKi} = marked-retained, N_{UKi} = unmarked-retained, N_{MRi} = marked-released, and N_{URi} = unmarked-released), released Chinook of unknown mark status (N_{unkRi}), and apportioned unidentified salmon [N_{AUSi}, i.e., unidentified (to species) released salmonids that may have been Chinook; apportioned by identified-released proportions] derived using the Murthy estimator. E_i and its variance are estimated as:

$$(1) \quad E_i = N_{MKi} + N_{UKi} + N_{MKi} + N_{UKi} + N_{unkKi} + N_{AUSi}$$

$$(2) \quad var(E_i) = var(N_{MKi}) + var(N_{UKi}) + var(N_{MRi}) + var(N_{URi}) + var(N_{unkRi}) + var(N_{AUSi})$$ [1]

† If E_i is being estimated for the sake of characterizing encounters in stratum i (regardless of size-mark status) alone, all charter encounters $\boldsymbol{E_{charti}}$ (retained + released) should be incorporated into 1 above; otherwise, $\boldsymbol{E_{charti}}$ is incorporated into class specific estimates (i.e., if class-specific encounters or mortalities are of interest).

‡ For Method-2, the total stratum encounter estimate, E_i, is obtained by: 1) combining the marked-legal retention estimate (K_{LMi}) and the test-fishery-based estimate of the proportion of at-large Chinook that are marked and of legal size (p_{LMi}; defined in 3 and 9 below) and 2) assuming that anglers retain all legal-size,

[1] Variances for all quantities contributing to E_i under Method-1 are defined in the Methods section of the main body of the report.

marked Chinook [i.e., $E_i = K_{LMi} / p_{LMi}$, with $var(E_i) = (K_{LMi}^2 / p_{LMi}^2)*(var(K_{LMi}) / p_{LMi}^2 + var(p_{LMi}) / K_{LMi}^2)$]. This estimate is used in all subsequent Method-2 computations in a manner identical to Method-1 E_is unless specified otherwise.

Test-fishery Encounter Composition

p_{LMi} = the test-fishery estimate of Chinook catch proportion comprised of legal (L), marked (M) individuals during stratum *i*,

p_{LUi} = the test-fishery estimate of Chinook catch proportion comprised of legal (L), unmarked (U) individuals during stratum *i*

p_{SMi} = the test-fishery estimate of Chinook catch proportion comprised of sublegal (S), marked (M) individuals during stratum *i*

p_{SUi} = the test-fishery estimate of Chinook catch proportion comprised of sublegal (S), unmarked (U) individuals during stratum *i*

For each *XY* combination (*X* = L and S and *Y* = M or U), test-fishery p_{XYi}s and their variances are estimated as:

(3) $p_{XYi} = N_{XYi} / \Sigma N_{XYi}$, and

(4) $var(p_{XYi}) = [p_{XYi}*(1- p_{XYi})] / (n_i-1)$,

where n_i = the total number of fish encountered by test boats during stratum *i*.

Note: to increase the sample size used to quantify test-fishery catch composition, p_{XYi} estimates were generated for statistical weeks rather than for individual 1-4 day strata; these estimates, however, were used in the same manner as described above.

Encounters by Size/Mark-status Class

E_{LMi} = estimated legal (L), marked (M) encounters during stratum *i*

E_{LUi} = estimated legal (L), unmarked (U) encounters during stratum *i*

E_{SMi} = estimated sublegal (S), marked (M) encounters during stratum *i*

E_{SUi} = estimated sublegal (S), marked (U) encounters during stratum *i*

For each *XY* combination (*X* = L and S and *Y* = M or U), apportioned encounters E_{XYi} and a conservative estimate of its variance (*assuming* p_{XYi} *and* E_{XYi} *are independent estimates*) are obtained from:

(5) $E_{XYi} = E_i*p_{XYi}$

(6) $var(E_{XYi}) = var(E_i)* p_{XYi}^2 + E_i^2*var(p_{XYi})$

† If E_{XYi} is being estimated for the purpose of characterizing class-specific encounters during stratum *i* alone, charter encounters broken down by class [i.e., $\boldsymbol{E}_{\mathbf{chart}XYi}$ (retained + released)] should be incorporated into 5 above; otherwise, $\boldsymbol{E}_{\mathbf{chart}XYi}$s are incorporated into estimators below (i.e., if class-specific mortalities are of interest).

‡ $var(E_{XYi})$ (i.e., equation 6) includes an additional covariance component [i.e., $var(E_i)*var(p_{XYi})$] for Method-2 estimates of apportioned encounters given that E_i is derived from test-fishery data.

B. Estimating Retained and Released Numbers by Size/Mark-status Class:

Before mortality can be estimated for each class, the number of fish retained and released must be estimated. Class-specific retention estimates are obtained by apportioning Murthy estimates of marked and unmarked Chinook retained in each stratum *i* to size classes (*Apportioned Estimates of Retention to Size Classes*); this is achieved using proportions estimated during dockside creel surveys (*Dockside Observations for Apportioning Retained Catch to Class*). Releases are then estimated as the difference between class-specific total encounters and retention (*Estimating Release Numbers by Class*).

Dockside Observations for Apportioning Retained Catch to Class

d_{LMK} = the estimated proportion of retained (kept, K), marked (M) Chinook salmon that were legal (L); based on *season-wide* dockside observations of marked Chinook (as is d_{SMK})

d_{SMK} = the estimated proportion of retained (kept, K), marked (M) Chinook salmon that were sublegal (S)

The proportion of retained, marked fish in size class X (X = L or S) and its variance are estimated as:

(7) $d_{XMK} = n_{XMK} / \Sigma\, n_{XMK}$

(8) $var(d_{XMK}) = [d_{XMK}*(1- d_{XMK})] / (\Sigma n_{XMK}-1)$,

where $\Sigma\, n_{XMK}$ and n_{XMK} are *season-wide* total dockside counts of marked fish and the subset of marked fish in size-class X, respectively.

d_{LUK} = the estimated proportion of retained (kept, K), unmarked (U) Chinook salmon that are legal (L) ; estimated from *season-wide* dockside observations of unmarked Chinook (as is p_{SUK})

d_{SUK} = the estimated proportion of retained (kept, K), unmarked (U) Chinook salmon that are sublegal (S)

The proportions of retained, unmarked fish belonging to legal and sublegal size classes are estimated as above (7 and 8) but using *season-wide* dockside observations on unmarked (U), not marked Chinook salmon.

Apportioned Estimates of Retention to Size Classes

K_{LMi} = estimated number of legal (L), marked (M) Chinook kept in stratum i

K_{LUi} = estimated number of legal (L), unmarked (U) Chinook kept in stratum i

The number of kept, marked encounters, marked fish in size class X (legal or sublegal) and its variance is estimated as:

(9) $K_{XMi} = d_{XMK}*N_{MKi}$

(10) $var(K_{XMi}) = var(N_{MKi})* d_{XMK}^{\,2} + N_{KMi}^{\,2}*var(d_{XMK}) + var(N_{MKi})* var(d_{XMK})$

where $d_{X\text{MK}}$ and its variance are from 7 and 8 above and $N_{\text{MK}i}$ is the Murthy estimate of retained marked fish for stratum *i* defined for 1 above.

$K_{\text{SM}i}$ = estimated number of sublegal (S), marked (M) Chinook kept in stratum *i*
$K_{\text{SU}i}$ = estimated number of sublegal (S), unmarked (U) Chinook kept in stratum *i*

The number of retained, unmarked fish belonging to legal and sublegal size classes is estimated as above (9 and 10) using unmarked fish proportions and stratum-specific Murthy-based retention estimates (and variances).

Estimating Release Numbers by Class
$R_{\text{LM}i}$ = estimated number of legal (L), marked (M) Chinook released in stratum *i*
$R_{\text{LU}i}$ = estimated number of legal (L), unmarked (U) Chinook released in stratum *i*
$R_{\text{SM}i}$ = estimated number of sublegal (S), marked (M) Chinook released in stratum *i*
$R_{\text{SU}i}$ = estimated number of sublegal (S), unmarked (U) Chinook released in stratum *i*

For each size/mark-status class *XY* combination (*X* = L and S and *Y* = M or U), the number fish encountered and released is estimated as the difference of total size/mark-status class encounters (E_{XYi}) and retention (K_{XYi}) during stratum *i*. The estimator and its variance are:

(11) $R_{XYi} = E_{XYi} - K_{XYi}$
(12) $var(R_{XYi}) = var(E_{XYi}) + var(K_{XYi})$

† Charter-reported $\boldsymbol{R_{XYi}}$s are incorporated into equation 11 for complete R_{XYi} estimation.
‡‡ For Method-2, $R_{\text{LM}i}$ is assumed to be zero with zero variance (i.e., anglers retain all legal-size, marked fish); all other R_{XYi}s are estimated using equations 11 and 12, but with Method-2-specific E_{XYi}s.

C. Estimating Total (and Class-specific) Stratum-specific and Season-wide Mortality:

The final step towards quantifying mark-selective fishery impacts is the application of assumed mortality rates (*Assumed Mortality Rates for Retained and Released Chinook*) to class-specific retention and release estimates.

Assumed Mortality Rates for Retained and Released Chinook
$\boldsymbol{m_{\text{K}}}$ = retention mortality rate, 100% for all retained Chinook
$\boldsymbol{sfm_{\text{L}}}$ = release mortality rate for legal (L) Chinook, assumed to be a constant 15%
$\boldsymbol{sfm_{\text{S}}}$ = release mortality rate for sublegal (S) Chinook, assumed to be a constant 20%

Retention-mortality Estimates
$M_{\text{LMK}i}$ = estimated number of mortalities due to direct harvest of legal (*L*), marked (*M*) Chinook in stratum *i*; the point estimate and variance are equivalent to $K_{\text{LM}i}$ given that $m_{\text{K}} = 1.00$ (i.e., $M_{\text{LMK}i} = K_{\text{LM}i} * \boldsymbol{m_{\text{K}}}$).

M_{LUKi} = estimated number of mortalities due to direct harvest of legal (*L*), unmarked (*U*) Chinook in stratum *i*; the point estimate and variance are equivalent to K_{LUi} given that m_K = 1.00 (i.e., $M_{LUKi} = K_{LUi}*\boldsymbol{m_K}$).

M_{SMKi} = estimated number of mortalities due to direct harvest of sublegal (*S*), marked (*M*) Chinook in stratum *i*; the point estimate and variance are equivalent to K_{SMi} given that m_K = 1.00 (i.e., $M_{SMKi} = K_{SMi}*\boldsymbol{m_K}$).

M_{SUKi} = estimated number of mortalities due to direct harvest of sublegal (*S*), unmarked (*U*) Chinook in stratum *i*; the point estimate and variance are equivalent to K_{SUi} given that m_K = 1.00 (i.e., $M_{SUKi} = K_{SUi}*\boldsymbol{m_K}$).

† Charter-reported $\boldsymbol{K_{XYi}}$s are added to the appropriate M_{XYi} for complete retention-mortality estimation.

Release-mortality Estimates

M_{LMRi} = estimated number of post-release, fishery-related mortalities of encountered legal (*L*), marked (*M*) Chinook in stratum *i*

M_{LURi} = estimated number of post-release, fishery-related mortalities of encountered legal (*L*), unmarked (*U*) Chinook in stratum *i*

M_{SMRi} = estimated number of post-release, fishery-related mortalities of encountered sublegal (*S*), marked (*M*) Chinook in stratum *i*

M_{SURi} = estimated number of post-release, fishery-related mortalities of encountered sublegal (*S*), unmarked (*U*) Chinook in stratum *i*

An estimate of release mortality for size/mark-status class *XY* (*X* = L or S, *Y* = M or U) in stratum *i* and its variance is obtained from:

(13) $M_{XYRi} = R_{XYi}*\boldsymbol{sfm_Y}$

(14) $var(M_{XYRi}) = \text{var}(R_{XYi})*\boldsymbol{sfm_Y}^2$

Season-wide Total and Class-specific Mortality Estimation

M_{total} = season-wide Chinook mortality due to the selective fishery; this parameter and its variance [$var(M_{total})$] are computed as the sum of all strata-specific retention (M_{XYKi}) and release mortality (M_{XYRi}) estimates and variances, respectively, for the *XY* (*X* = L or S, *Y* = M or U) size/mark-status groups; similarly, mortality estimates and variances for subgroups of interest (*e.g.*, unmarked, sublegal Chinook, $M_{SU\text{-}total}$) are estimated by summing estimates/variances across strata for the season for that class.

The standard error (SE), coefficient of variation (CV), and 95% confidence interval about M_{total} (and all other parameters θ defined herein) are obtained from:

(15) $SE(\theta) = (\theta)^{1/2}$

(16) $CV(\theta) = [SE(\theta) / \theta]*100$

(17) 95% CI = $\theta \pm 1.96*SE(\theta)$

Figure A1. Graphical representation of the estimation approach used to quantify stratum-specific encounters and mortalities by size/mark-status category for the Areas 9 and 10 selective Chinook fishery during July 2007. Boxes depict abundance estimates (encounters, mortalities) whereas the mathematical operations depicted on intermediate connector lines are estimator formulae for subsequent boxes (moving from left to right). Gray ovals represent points in the total encounter and mortality estimation sequence where Methods 1 and 2 diverge. Variable and parameter names, complete formulae, and variances (where appropriate) are defined in List A1. Bold-faced, italicized symbols are constants, all others are estimated quantities. Total stratum mortality is the sum of M_{Ki} and M_{Ri}; the season-wide estimate is the sum of all strata estimates.

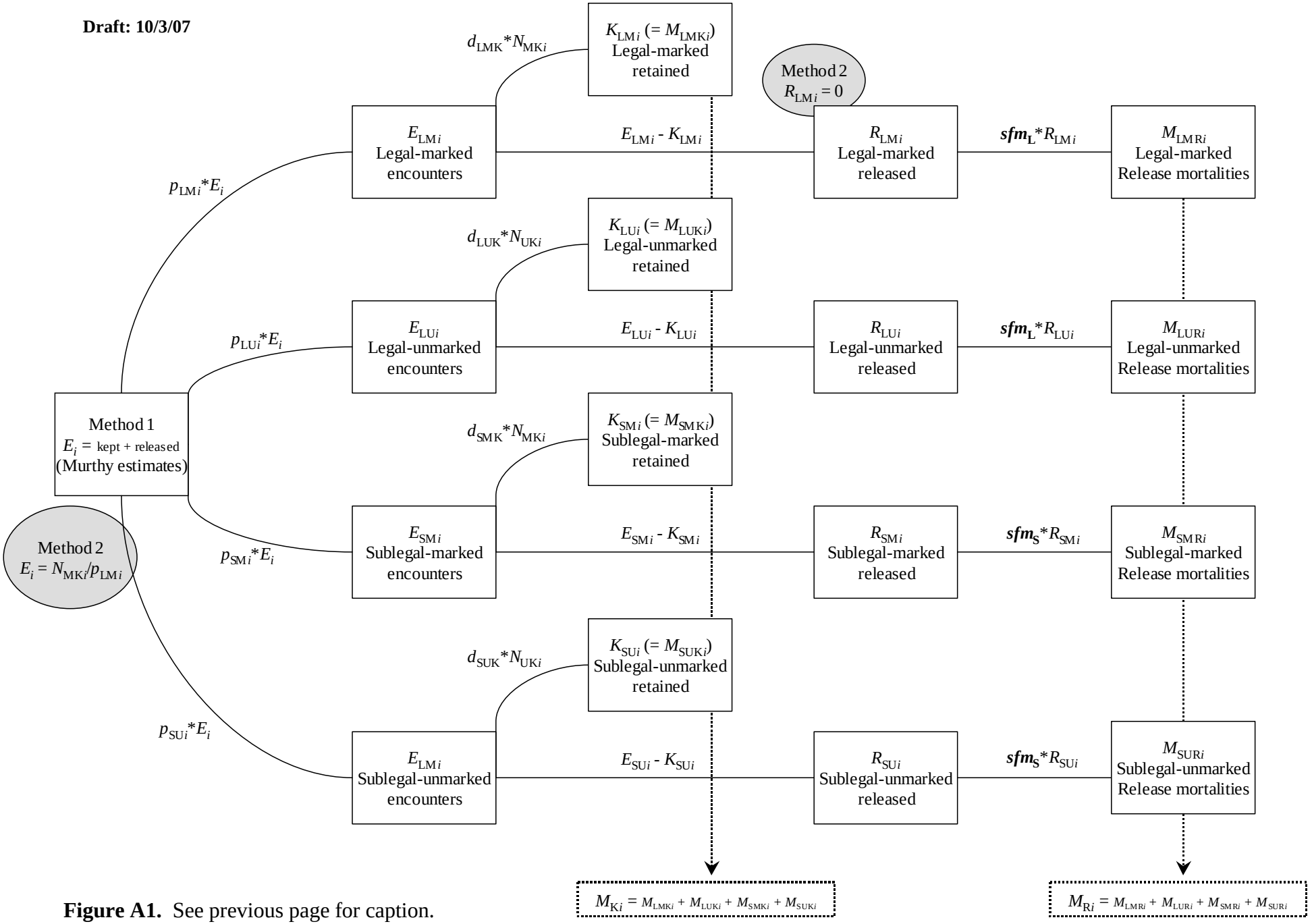

Figure A1. See previous page for caption.

Appendix B. 2007 statistical weeks used by Washington Department of Fish and Wildlife.

2007 Statistical Week Calendar (Monday-Sunday)

STAT MONTH	WEEK NO.	START DATE	END DATE	STAT MONTH	WEEK NO.	START DATE	END DATE
1	1	1-Jan	7-Jan	7	27	2-Jul	8-Jul
	2	8-Jan	14-Jan		28	9-Jul	15-Jul
	3	15-Jan	21-Jan		29	16-Jul	22-Jul
	4	22-Jan	28-Jan		30	23-Jul	29-Jul
	5	29-Jan	4-Feb		31	30-Jul	5-Aug
2	6	5-Feb	11-Feb	8	32	6-Aug	12-Aug
	7	12-Feb	18-Feb		33	13-Aug	19-Aug
	8	19-Feb	25-Feb		34	20-Aug	26-Aug
	9	26-Feb	4-Mar		35	27-Aug	2-Sep
3	10	5-Mar	11-Mar	9	36	3-Sep	9-Sep
	11	12-Mar	18-Mar		37	10-Sep	16-Sep
	12	19-Mar	25-Mar		38	17-Sep	23-Sep
	13	26-Mar	1-Apr		39	24-Sep	30-Sep
4	14	2-Apr	8-Apr	10	40	1-Oct	7-Oct
	15	9-Apr	15-Apr		41	8-Oct	14-Oct
	16	16-Apr	22-Apr		42	15-Oct	21-Oct
	17	23-Apr	29-Apr		43	22-Oct	28-Oct
	18	30-Apr	6-May		44	29-Oct	4-Nov
5	19	7-May	13-May	11	45	5-Nov	11-Nov
	20	14-May	20-May		46	12-Nov	18-Nov
	21	21-May	27-May		47	19-Nov	25-Nov
	22	28-May	3-Jun		48	26-Nov	2-Dec
6	23	4-Jun	10-Jun	12	49	3-Dec	9-Dec
	24	11-Jun	17-Jun		50	10-Dec	16-Dec
	25	18-Jun	24-Jun		51	17-Dec	23-Dec
	26	25-Jun	1-Jul		52	24-Dec	30-Dec
					53	31-Dec	31-Dec

Appendix C. Sample rates in the Areas 9 and 10 selective Chinook fishery from July 16 through July 31, 2007.

Stratum	Area 9			Area 10		
	Number of Chinook Sampled	Estimated Chinook Retained	Sample Rate	Number of Chinook Sampled	Estimated Chinook Retained	Sample Rate
7/16 - 7/19	291	2347	12.4%	45	279	16.1%
7/20	109	366	29.8%	12	37	32.4%
7/21	116	368	31.5%	21	77	27.3%
7/22	45	165	27.3%	33	133	24.8%
7/23 - 7/26	130	597	21.8%	110	469	23.5%
7/27	67	345	19.4%	58	140	41.4%
7/28	83	210	39.5%	75	373	20.1%
7/29	53	251	21.1%			
7/30	14	71	19.7%			
7/31	25	216	35.2%			
Total	**933**	**4936**	**18.9%**	**354**	**1508**	**23.5%**

Appendix D. Observed sampling data from creel surveys conducted during the Areas 9 and 10.

Area 9 In-sample Data	**Stratum**										
Statistic	7/16-19	7/20	7/21	7/22	7/23-26	7/27	7/28	7/29	7/30	7/31	**Total**
Kept Chinook Sampled	291	109	116	45	130	67	83	53	14	25	**933**
Kept Chinook Marked	289	108	114	45	129	66	81	52	14	25	**923**
Total Released Chinook	450	194	287	109	346	236	298	199	36	53	**2208**
Released Chinook Unmarked	109	29	74	25	89	58	74	67	8	22	**555**
Released Chinook Marked	182	78	90	36	118	76	93	51	21	11	**756**
Released Chinook Unknown Mark Status	159	87	123	48	139	102	131	81	7	20	**897**
Mark Rate [= Marked Encounters/(Marked+Unmarked Encounters)]	81%	86%	73%	76%	73%	71%	70%	60%	81%	62%	**75%**

Area 10 In-sample Data	**Stratum**							
Statistic	7/16-19	7/20	7/21	7/22	7/23-26	7/27	7/28	**Total**
Kept Chinook Sampled	45	12	21	33	110	58	75	**354**
Kept Chinook Marked	44	12	21	32	105	58	73	**345**
Total Released Chinook	128	74	131	116	269	159	238	**1115**
Released Chinook Unmarked	43	8	41	20	48	22	50	**232**
Released Chinook Marked	31	8	26	22	90	35	48	**260**
Released Chinook Unknown Mark Status	54	58	64	74	131	102	140	**623**
Mark Rate	63%	71%	53%	72%	79%	81%	70%	**72%**
[= Marked Encounters/(Marked+Unmarked Encounters)]								

Appendix E1. Recoveries of coded wire tags from Chinook salmon during the Chinook Selective Fishery in Marine Areas 9 , July 1 through July 31, 2007.

Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	09	Jul 16 2007	Decoded Tag	210519	2003	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		75		AD Fin Clp	AD+OTOLITH	50103
Chin	09	Jul 16 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	74		AD Fin Clp	AD Fin Clp	32881
Chin	09	Jul 16 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	71		AD Fin Clp	AD Fin Clp	49038
Chin	09	Jul 16 2007	Decoded Tag	210598	2004	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		73		AD Fin Clp	AD Fin Clp	49041
Chin	09	Jul 16 2007	Decoded Tag	210598	2004	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		66		AD Fin Clp	AD Fin Clp	50332
Chin	09	Jul 16 2007	Decoded Tag	210598	2004	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		74		AD Fin Clp	AD Fin Clp	50393
Chin	09	Jul 16 2007	Decoded Tag	631777	2002	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		77		AD Fin Clp	AD Fin Clp	50336
Chin	09	Jul 16 2007	Decoded Tag	631880	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		80		AD Fin Clp	AD Fin Clp	32580
Chin	09	Jul 16 2007	Decoded Tag	631880	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		82		AD Fin Clp	AD Fin Clp	45121
Chin	09	Jul 16 2007	Decoded Tag	632282	2003	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		75		AD Fin Clp	AD Fin Clp	45124
Chin	09	Jul 16 2007	Decoded Tag	632283	2003	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	76		AD Fin Clp	AD Fin Clp	32880
Chin	09	Jul 16 2007	Decoded Tag	632375	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	92		AD Fin Clp	AD Fin Clp	50334
Chin	09	Jul 16 2007	Decoded Tag	632389	2003	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		73		AD Fin Clp	AD Fin Clp	49037
Chin	09	Jul 16 2007	Decoded Tag	632468	2003	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		74		AD Fin Clp	AD Fin Clp	50333
Chin	09	Jul 16 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	65		AD Fin Clp	AD Fin Clp	40415
Chin	09	Jul 16 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		59		AD Fin Clp	AD Fin Clp	50331
Chin	09	Jul 16 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	50394
Chin	09	Jul 16 2007	Decoded Tag	632873	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		58		AD Fin Clp	AD Fin Clp	50362
Chin	09	Jul 16 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		57		AD Fin Clp	AD Fin Clp	50102
Chin	09	Jul 16 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		77		AD Fin Clp	AD Fin Clp	40288
Chin	09	Jul 16 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50395
Chin	09	Jul 16 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	45123
Chin	09	Jul 16 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	50363
Chin	09	Jul 16 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		63		AD Fin Clp	AD Fin Clp	50104
Chin	09	Jul 16 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	32581
Chin	09	Jul 16 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	68		AD Fin Clp	AD Fin Clp	50335
Chin	09	Jul 16 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	49039
Chin	09	Jul 17 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	77		AD Fin Clp	AD Fin Clp	50365
Chin	09	Jul 17 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	60		AD Fin Clp	AD Fin Clp	50397
Chin	09	Jul 17 2007	Decoded Tag	632472	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		73		AD Fin Clp	AD Fin Clp	50368
Chin	09	Jul 17 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	70		AD Fin Clp	AD Fin Clp	50366
Chin	09	Jul 17 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		68		AD Fin Clp	AD Fin Clp	50369
Chin	09	Jul 17 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50337
Chin	09	Jul 17 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		71		AD Fin Clp	AD Fin Clp	50364
Chin	09	Jul 17 2007	Decoded Tag	632897	2004	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	60		AD Fin Clp	AD Fin Clp	50105
Chin	09	Jul 17 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		72		AD Fin Clp	AD Fin Clp	50106
Chin	09	Jul 17 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		68		AD Fin Clp	AD Fin Clp	50367
Chin	09	Jul 17 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50396
Chin	09	Jul 18 2007	Decoded Tag	210548	2003	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	77		AD Fin Clp	AD Fin Clp	32882
Chin	09	Jul 18 2007	Decoded Tag	210559	2003	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		75		AD Fin Clp	AD Fin Clp	32887
Chin	09	Jul 18 2007	Decoded Tag	210601	2004	COWSKULL ACCLIM POND	COWSKULL ACCLIM POND	PUYA		65		AD Fin Clp	AD Fin Clp	50338
Chin	09	Jul 18 2007	Decoded Tag	632284	2003	MINTER CR 15.0048	MINTER HATCHERY	WDFW		80		AD Fin Clp	AD Fin Clp	50372
Chin	09	Jul 18 2007	Decoded Tag	632375	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	69		AD Fin Clp	AD Fin Clp	32886
Chin	09	Jul 18 2007	Decoded Tag	632471	2003	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		85		AD Fin Clp	AD Fin Clp	50373
Chin	09	Jul 18 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	50251
Chin	09	Jul 18 2007	Decoded Tag	632873	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		58		AD Fin Clp	AD Fin Clp	50370
Chin	09	Jul 18 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		67		AD Fin Clp	AD Fin Clp	50398
Chin	09	Jul 18 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	50421

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Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	09	Jul 18 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	50339
Chin	09	Jul 18 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		65		AD Fin Clp	AD Fin Clp	50400
Chin	09	Jul 18 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		70		AD Fin Clp	AD Fin Clp	32883
Chin	09	Jul 18 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		68		AD Fin Clp	AD Fin Clp	49042
Chin	09	Jul 18 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	61		AD Fin Clp	AD Fin Clp	50340
Chin	09	Jul 18 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	49050
Chin	09	Jul 18 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	50371
Chin	09	Jul 18 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		70		AD Fin Clp	AD Fin Clp	50374
Chin	09	Jul 20 2007	Decoded Tag	185238	2005	R-CHILLIWACK R	H-CHILLIWACK R	CDFO	DIT	51		AD Fin Clp	AD Fin Clp	50425
Chin	09	Jul 20 2007	Decoded Tag	210520	2003	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		75		AD Fin Clp	AD+OTOLITH	50344
Chin	09	Jul 20 2007	Decoded Tag	632374	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	86		Undetmd AD	Unmarked	50343
Chin	09	Jul 20 2007	Decoded Tag	632464	2003	GREEN R 09.0001	ICY CR HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	50342
Chin	09	Jul 20 2007	Decoded Tag	632471	2003	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		83		AD Fin Clp	AD Fin Clp	50402
Chin	09	Jul 20 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		73		AD Fin Clp	AD Fin Clp	50341
Chin	09	Jul 20 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		67		AD Fin Clp	AD Fin Clp	50422
Chin	09	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		57		AD Fin Clp	AD Fin Clp	50160
Chin	09	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50345
Chin	09	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50401
Chin	09	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	50405
Chin	09	Jul 20 2007	Decoded Tag	632890	2004	HAMMA HAMMA 16.0251	RFEG 6 HOOD CANAL	WDFW		64		AD Fin Clp	AD Fin Clp	50346
Chin	09	Jul 20 2007	Decoded Tag	632897	2004	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	75		AD Fin Clp	AD Fin Clp	49048
Chin	09	Jul 20 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		58		AD Fin Clp	AD Fin Clp	50287
Chin	09	Jul 20 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		53		AD Fin Clp	AD Fin Clp	50403
Chin	09	Jul 20 2007	Decoded Tag	633369	2005	FRIDAY CR 03.0017	SAMISH HATCHERY	WDFW	DIT	53		AD Fin Clp	AD Fin Clp	49046
Chin	09	Jul 21 2007	Decoded Tag	210519	2003	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		76		AD Fin Clp	AD+OTOLITH	50427
Chin	09	Jul 21 2007	Decoded Tag	210594	2004	WHITE R 10.0031	WHITE RIVER HATCHERY	MUCK		56		Unmarked	Unmarked	50257
Chin	09	Jul 21 2007	Decoded Tag	210599	2004	BAKER R 03.0435		WDFW		60		AD Fin Clp	AD Fin Clp	50349
Chin	09	Jul 21 2007	Decoded Tag	631880	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		71		AD Fin Clp	AD Fin Clp	32890
Chin	09	Jul 21 2007	Decoded Tag	632375	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	75		AD Fin Clp	AD Fin Clp	50350
Chin	09	Jul 21 2007	Decoded Tag	632385	2003	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	32889
Chin	09	Jul 21 2007	Decoded Tag	632472	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		76		AD Fin Clp	AD Fin Clp	40418
Chin	09	Jul 21 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	57		AD Fin Clp	AD Fin Clp	50376
Chin	09	Jul 21 2007	Decoded Tag	632870	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50348
Chin	09	Jul 21 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		59		AD Fin Clp	AD Fin Clp	50408
Chin	09	Jul 21 2007	Decoded Tag	632874	2004	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		67		AD Fin Clp	AD Fin Clp	40417
Chin	09	Jul 21 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		69		AD Fin Clp	AD Fin Clp	50377
Chin	09	Jul 21 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66	F	AD Fin Clp	AD Fin Clp	01199
Chin	09	Jul 21 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		55		AD Fin Clp	AD Fin Clp	50347
Chin	09	Jul 21 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW			M	AD Fin Clp	AD Fin Clp	50375
Chin	09	Jul 21 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50410
Chin	09	Jul 21 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		56		AD Fin Clp	AD Fin Clp	32891
Chin	09	Jul 21 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		65		AD Fin Clp	AD Fin Clp	50409
Chin	09	Jul 21 2007	Decoded Tag	632889	2004	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW	DIT	54		AD Fin Clp	AD Fin Clp	50378
Chin	09	Jul 21 2007	Decoded Tag	632890	2004	HAMMA HAMMA 16.0251	RFEG 6 HOOD CANAL	WDFW		69		AD Fin Clp	AD Fin Clp	50256
Chin	09	Jul 21 2007	Decoded Tag	633286	2005	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	49		AD Fin Clp	AD Fin Clp	50407
Chin	09	Jul 22 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	66		AD Fin Clp	AD Fin Clp	50379
Chin	09	Jul 22 2007	Decoded Tag	632375	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	79		AD Fin Clp	AD Fin Clp	42119
Chin	09	Jul 22 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		58		AD Fin Clp	AD Fin Clp	50351
Chin	09	Jul 22 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		59		AD Fin Clp	AD Fin Clp	50353
Chin	09	Jul 22 2007	Decoded Tag	632890	2004	HAMMA HAMMA 16.0251	RFEG 6 HOOD CANAL	WDFW		61		AD Fin Clp	AD Fin Clp	32892

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Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	09	Jul 22 2007	Decoded Tag	632897	2004	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	73		AD Fin Clp	AD Fin Clp	50412
Chin	09	Jul 22 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		67		AD Fin Clp	AD Fin Clp	32893
Chin	09	Jul 22 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		72		AD Fin Clp	AD Fin Clp	50429
Chin	09	Jul 23 2007	Decoded Tag	631879	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		76		AD Fin Clp	AD Fin Clp	50414
Chin	09	Jul 23 2007	Decoded Tag	632283	2003	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	78		AD Fin Clp	AD Fin Clp	50356
Chin	09	Jul 23 2007	Decoded Tag	632375	2003	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	79		AD Fin Clp	AD Fin Clp	40419
Chin	09	Jul 23 2007	Decoded Tag	632790	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	77		AD Fin Clp	Unmarked	50355
Chin	09	Jul 23 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	50382
Chin	09	Jul 23 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		54		AD Fin Clp	AD Fin Clp	50423
Chin	09	Jul 23 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		52		AD Fin Clp	AD Fin Clp	50354
Chin	09	Jul 23 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	50381
Chin	09	Jul 23 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		72		AD Fin Clp	AD Fin Clp	50380
Chin	09	Jul 23 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	69		AD Fin Clp	AD Fin Clp	50413
Chin	09	Jul 23 2007	Decoded Tag	633089	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		54		AD Fin Clp	AD Fin Clp	50424
Chin	09	Jul 24 2007	Decoded Tag	210548	2003	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	83		AD Fin Clp	AD Fin Clp	50430
Chin	09	Jul 24 2007	Decoded Tag	632278	2003	GORST CR 15.0216	GORST CR REARING PND	SUQ		74		AD Fin Clp	AD Fin Clp	50259
Chin	09	Jul 24 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50258
Chin	09	Jul 24 2007	Decoded Tag	632874	2004	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		64		AD Fin Clp	AD Fin Clp	50357
Chin	09	Jul 24 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	57		AD Fin Clp	AD Fin Clp	50383
Chin	09	Jul 25 2007	Decoded Tag	210546	2003	CLARKS CRK HATCHERY	CLARKS CRK HATCHERY	PUYA		79		AD Fin Clp	AD Fin Clp	28786
Chin	09	Jul 25 2007	Decoded Tag	210546	2003	CLARKS CRK HATCHERY	CLARKS CRK HATCHERY	PUYA		71		AD Fin Clp	AD Fin Clp	50417
Chin	09	Jul 25 2007	Decoded Tag	210595	2004	WHITE R 10.0031	WHITE RIVER HATCHERY	MUCK		55		Unmarked	Unmarked	50432
Chin	09	Jul 25 2007	Decoded Tag	210598	2004	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		64		AD Fin Clp	AD Fin Clp	50358
Chin	09	Jul 25 2007	Decoded Tag	632789	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW	DIT	57		AD Fin Clp	AD Fin Clp	50384
Chin	09	Jul 25 2007	Decoded Tag	632870	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50416
Chin	09	Jul 25 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		59		AD Fin Clp	AD Fin Clp	50359
Chin	09	Jul 27 2007	Decoded Tag	185802	2004	R-NANAIMO R	H-NANAIMO R	CDFO		75		AD Fin Clp	AD Fin Clp	50436
Chin	09	Jul 27 2007	Decoded Tag	632283	2003	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	84		AD Fin Clp	AD Fin Clp	50434
Chin	09	Jul 27 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	51023
Chin	09	Jul 27 2007	Decoded Tag	632874	2004	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		59		AD Fin Clp	AD Fin Clp	49049
Chin	09	Jul 27 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50260
Chin	09	Jul 27 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	49045
Chin	09	Jul 27 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		54		AD Fin Clp	AD Fin Clp	50435
Chin	09	Jul 27 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		70		AD Fin Clp	AD Fin Clp	50311
Chin	09	Jul 27 2007	Decoded Tag	632889	2004	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW	DIT	57		AD Fin Clp	AD Fin Clp	50360
Chin	09	Jul 27 2007	Decoded Tag	632897	2004	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	57		AD Fin Clp	AD Fin Clp	40420
Chin	09	Jul 27 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	51024
Chin	09	Jul 27 2007	Decoded Tag	633285	2005	GROVERS CR 15.0299	GROVERS CR HATCHERY	SUQ	DIT	58		AD Fin Clp	AD Fin Clp	50261
Chin	09	Jul 28 2007	Decoded Tag	210595	2004	WHITE R 10.0031	WHITE RIVER HATCHERY	MUCK		51		Unmarked	Unmarked	40421
Chin	09	Jul 28 2007	Decoded Tag	632388	2003	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW				Unkn Marks	AD Fin Clp	50388
Chin	09	Jul 28 2007	Decoded Tag	632468	2003	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		49		AD Fin Clp	AD Fin Clp	50418
Chin	09	Jul 28 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	62		AD Fin Clp	AD Fin Clp	50386
Chin	09	Jul 28 2007	Decoded Tag	632870	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		59		AD Fin Clp	AD Fin Clp	50262
Chin	09	Jul 28 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50263
Chin	09	Jul 28 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	51025
Chin	09	Jul 28 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	51029
Chin	09	Jul 28 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	50387
Chin	09	Jul 28 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		58		AD Fin Clp	AD Fin Clp	51026
Chin	09	Jul 28 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		53		AD Fin Clp	AD Fin Clp	50419
Chin	09	Jul 28 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		82		AD Fin Clp	AD Fin Clp	50385

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Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	09	Jul 29 2007	Decoded Tag	632282	2003	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		94		AD Fin Clp	AD Fin Clp	50439
Chin	09	Jul 29 2007	Decoded Tag	632284	2003	MINTER CR 15.0048	MINTER HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	50229
Chin	09	Jul 29 2007	Decoded Tag	632284	2003	MINTER CR 15.0048	MINTER HATCHERY	WDFW		87		AD Fin Clp	AD Fin Clp	51083
Chin	09	Jul 29 2007	Decoded Tag	632372	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		56		Unmarked	Unmarked	51033
Chin	09	Jul 29 2007	Decoded Tag	632389	2003	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		74		AD Fin Clp	AD Fin Clp	51081
Chin	09	Jul 29 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	50440
Chin	09	Jul 29 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	50230
Chin	09	Jul 29 2007	Decoded Tag	632873	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		70		AD Fin Clp	AD Fin Clp	50438
Chin	09	Jul 29 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		55		AD Fin Clp	AD Fin Clp	51062
Chin	09	Jul 29 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	39616
Chin	09	Jul 29 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69		AD Fin Clp	AD Fin Clp	51031
Chin	09	Jul 29 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		76		AD Fin Clp	AD Fin Clp	51030
Chin	09	Jul 29 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		57		AD Fin Clp	AD Fin Clp	50420
Chin	09	Jul 30 2007	Decoded Tag	210591	2004	SKAGIT R 03.0176		WDFW		67		AD Fin Clp	AD Fin Clp	51063
Chin	09	Jul 30 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	50318
Chin	09	Jul 30 2007	Decoded Tag	632874	2004	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		67		AD Fin Clp	AD Fin Clp	50445
Chin	09	Jul 30 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	50319
Chin	09	Jul 30 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		54		AD Fin Clp	AD Fin Clp	51034
Chin	09	Jul 30 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50441
Chin	09	Jul 30 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	50442
Chin	09	Jul 30 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		58		AD Fin Clp	AD Fin Clp	50321
Chin	09	Jul 30 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50330
Chin	09	Jul 30 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	50317
Chin	09	Jul 30 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	71		AD Fin Clp	AD Fin Clp	49020
Chin	09	Jul 30 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	17938
Chin	09	Jul 30 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50443
Chin	09	Jul 30 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	50444
Chin	09	Jul 30 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50446
Chin	09	Jul 31 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	69		AD Fin Clp	AD Fin Clp	40425
Chin	09	Jul 31 2007	Decoded Tag	632874	2004	SKOKOMISH R 16.0001	ENDICOTT PD (LLTK)	WDFW		60		AD Fin Clp	AD Fin Clp	51035
Chin	09	Jul 31 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		69		AD Fin Clp	AD Fin Clp	50448

Appendix E2. Recoveries of coded wire tags from Chinook salmon during the Chinook Selective Fishery in Marine Areas 10, July 1 through July 28, 2007.

Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	10	Jul 16 2007	Decoded Tag	632282	2003	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		72		AD Fin Clp	AD Fin Clp	50201
Chin	10	Jul 16 2007	Decoded Tag	632471	2003	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50361
Chin	10	Jul 16 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	50203
Chin	10	Jul 16 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		53		AD Fin Clp	AD Fin Clp	40384
Chin	10	Jul 16 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		70		AD Fin Clp	AD Fin Clp	50202
Chin	10	Jul 16 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		53		AD Fin Clp	AD Fin Clp	50204
Chin	10	Jul 16 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		50		AD Fin Clp	AD Fin Clp	50282
Chin	10	Jul 17 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		67		AD Fin Clp	AD Fin Clp	50283
Chin	10	Jul 18 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	73		AD Fin Clp	AD Fin Clp	50284
Chin	10	Jul 18 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	65		AD Fin Clp	AD Fin Clp	50302
Chin	10	Jul 18 2007	Decoded Tag	632870	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		71		AD Fin Clp	AD Fin Clp	50205
Chin	10	Jul 18 2007	Decoded Tag	632873	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		62		AD Fin Clp	AD Fin Clp	50206
Chin	10	Jul 18 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	40385
Chin	10	Jul 18 2007	Decoded Tag	632965	2004	MINTER CR 15.0048	MINTER HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	50207
Chin	10	Jul 18 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		54		AD Fin Clp	AD Fin Clp	50208
Chin	10	Jul 20 2007	Decoded Tag	631879	2003	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		83	F	AD Fin Clp	AD Fin Clp	50305
Chin	10	Jul 20 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	62		AD Fin Clp	AD Fin Clp	50209
Chin	10	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	40387
Chin	10	Jul 20 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50286
Chin	10	Jul 20 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	40386
Chin	10	Jul 20 2007	Decoded Tag	632966	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	73		Unmarked	Unmarked	50159
Chin	10	Jul 20 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		52		AD Fin Clp	AD Fin Clp	50285
Chin	10	Jul 21 2007	Decoded Tag	210520	2003	TULALIP CR 07.0001	BERNIE GOBIN HATCH	TULA		77		AD Fin Clp	AD+OTOLITH	50213
Chin	10	Jul 21 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50210
Chin	10	Jul 21 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50211
Chin	10	Jul 21 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		77		AD Fin Clp	AD Fin Clp	50288
Chin	10	Jul 21 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		51		AD Fin Clp	AD Fin Clp	50154
Chin	10	Jul 22 2007	Decoded Tag	210598	2004	KALAMA CR 11.0017	KALAMA CR HATCHERY	NISQ		68		AD Fin Clp	AD Fin Clp	50214
Chin	10	Jul 23 2007	Decoded Tag	631896	2003	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	80		Unmarked	Unmarked	42484
Chin	10	Jul 23 2007	Decoded Tag	632279	2003	GORST CR 15.0216	GORST CR REARING PND	SUQ		74		AD Fin Clp	AD Fin Clp	32894
Chin	10	Jul 23 2007	Decoded Tag	632279	2003	GORST CR 15.0216	GORST CR REARING PND	SUQ		79		AD Fin Clp	AD Fin Clp	40388
Chin	10	Jul 23 2007	Decoded Tag	632282	2003	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		65		AD Fin Clp	AD Fin Clp	32895
Chin	10	Jul 23 2007	Decoded Tag	633089	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		58		AD Fin Clp	AD Fin Clp	50215
Chin	10	Jul 24 2007	Decoded Tag	632385	2003	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		75		AD Fin Clp	AD Fin Clp	32896
Chin	10	Jul 24 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	70		AD Fin Clp	AD Fin Clp	50307
Chin	10	Jul 24 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50415
Chin	10	Jul 24 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		69		AD Fin Clp	AD Fin Clp	32899
Chin	10	Jul 24 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		67		AD Fin Clp	AD Fin Clp	32897
Chin	10	Jul 24 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		62		AD Fin Clp	AD Fin Clp	32898
Chin	10	Jul 24 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		58		AD Fin Clp	AD Fin Clp	50289
Chin	10	Jul 25 2007	Decoded Tag	632283	2003	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	89		AD Fin Clp	AD Fin Clp	50306
Chin	10	Jul 25 2007	Decoded Tag	632464	2003	GREEN R 09.0001	ICY CR HATCHERY	WDFW		81		AD Fin Clp	AD Fin Clp	32568
Chin	10	Jul 25 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50290
Chin	10	Jul 25 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		61		AD Fin Clp	AD Fin Clp	50295
Chin	10	Jul 25 2007	Decoded Tag	632880	2004	GORST CR 15.0216	GORST CR REARING PND	SUQ		61		AD Fin Clp	AD Fin Clp	50216
Chin	10	Jul 25 2007	Decoded Tag	632897	2004	PURDY CR 16.0005	GEORGE ADAMS HATCHRY	WDFW	DIT	70		AD Fin Clp	AD Fin Clp	32900
Chin	10	Jul 25 2007	Decoded Tag	632972	2004	ISSAQUAH CR 08.0178	ISSAQUAH HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	32569
Chin	10	Jul 27 2007	Decoded Tag	210589	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	74		Unmarked	Unmarked	50161
Chin	10	Jul 27 2007	Decoded Tag	210601	2004	COWSKULL ACCLIM POND	COWSKULL ACCLIM POND	PUYA		69		AD Fin Clp	AD Fin Clp	50291
Chin	10	Jul 27 2007	Decoded Tag	632283	2003	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	79		AD Fin Clp	AD Fin Clp	50310
Chin	10	Jul 27 2007	Decoded Tag	632284	2003	MINTER CR 15.0048	MINTER HATCHERY	WDFW		76		AD Fin Clp	AD Fin Clp	50162
Chin	10	Jul 27 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	50217
Chin	10	Jul 27 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		69		AD Fin Clp	AD Fin Clp	40389
Chin	10	Jul 27 2007	Decoded Tag	632879	2004	FINCH CR 16.0222	HOODSPORT HATCHERY	WDFW		66		AD Fin Clp	AD Fin Clp	50309
Chin	10	Jul 28 2007	Decoded Tag	210592	2004	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	DIT	83		AD Fin Clp	AD Fin Clp	50312

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Species	Area	RecovDate	TagResult	TagCode	BroodYr	ReleaseSite	RearingHatchery	ReleaseAgency	DIT	FKLcm	Sex	RecovMark	ReleaseMark	Label
Chin	10	Jul 28 2007	Decoded Tag	631896	2003	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	91		AD Fin Clp	Unmarked	50293
Chin	10	Jul 28 2007	Decoded Tag	632282	2003	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		78		AD Fin Clp	AD Fin Clp	49003
Chin	10	Jul 28 2007	Decoded Tag	632284	2003	MINTER CR 15.0048	MINTER HATCHERY	WDFW		70		AD Fin Clp	AD Fin Clp	40392
Chin	10	Jul 28 2007	Decoded Tag	632378	2003	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	81		AD Fin Clp	AD Fin Clp	50167
Chin	10	Jul 28 2007	Decoded Tag	632385	2003	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		76		AD Fin Clp	AD Fin Clp	50226
Chin	10	Jul 28 2007	Decoded Tag	632583	2003	GORST CR 15.0216	GORST CR REARING PND	SUQ		74		Unmarked	AD Fin Clp	50165
Chin	10	Jul 28 2007	Decoded Tag	632783	2004	CLEAR CR 11.0013C	NISQUALLY HATCHERY	NISQ	DIT	61		AD Fin Clp	AD Fin Clp	50225
Chin	10	Jul 28 2007	Decoded Tag	632786	2004	CHAMBERS CR 12.0007	CHAMBERS CR HATCHERY	WDFW		68		AD Fin Clp	AD Fin Clp	50164
Chin	10	Jul 28 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		63		AD Fin Clp	AD Fin Clp	50224
Chin	10	Jul 28 2007	Decoded Tag	632871	2004	CHAMBERS CR 12.0007	GARRISON HATCHERY	WDFW		72		AD Fin Clp	AD Fin Clp	50316
Chin	10	Jul 28 2007	Decoded Tag	632873	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		56		AD Fin Clp	AD Fin Clp	40390
Chin	10	Jul 28 2007	Decoded Tag	632876	2004	WALLACE R 07.0940	WALLACE R HATCHERY	WDFW		65		AD Fin Clp	AD Fin Clp	50222
Chin	10	Jul 28 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		64		AD Fin Clp	AD Fin Clp	40423
Chin	10	Jul 28 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		70		AD Fin Clp	AD Fin Clp	50294
Chin	10	Jul 28 2007	Decoded Tag	632877	2004	GREEN R 09.0001	ICY CR HATCHERY	WDFW		55		AD Fin Clp	AD Fin Clp	50313
Chin	10	Jul 28 2007	Decoded Tag	632889	2004	CASCADE R 03.1411	MARBLEMOUNT HATCHERY	WDFW	DIT	62		AD Fin Clp	AD Fin Clp	50219
Chin	10	Jul 28 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	40422
Chin	10	Jul 28 2007	Decoded Tag	632964	2004	VOIGHT CR 10.0414	VOIGHTS CR HATCHERY	WDFW		60		AD Fin Clp	AD Fin Clp	50223
Chin	10	Jul 28 2007	Decoded Tag	632967	2004	BIG SOOS CR 09.0072	SOOS CREEK HATCHERY	WDFW	DIT	67		AD Fin Clp	AD Fin Clp	50314
Chin	10	Jul 28 2007	Decoded Tag	632978	2004	CHAMBERS CR 12.0007	LAKEWOOD HATCHERY	WDFW		56		AD Fin Clp	AD Fin Clp	50292
Chin	10	Jul 28 2007	Decoded Tag	633089	2004	DESCHUTES R 13.0028	TUMWATER FALLS HATCH	WDFW		61		AD Fin Clp	AD Fin Clp	50166

Appendix F. Sites sampled for the creel survey estimate in Areas 9 and 10 by sample date. Sites-size measures calculated from boat-survey data during the July 2007 selective Chinook fisheries are provided for all sampled sites.

Sample Date	Area 9 Sampled Sites and Size Measures					
	Fort Worden Ramp	Kingston Public Ramp	Mukilteo State Park Public Ramp	Norton Street (Everett) Ramp	Port Townsend Boat Haven Ramp	Salsbury County Park Ramp
7/16/07				0.455	0.141	
7/18/07				0.455	0.141	
7/20/07				0.455	0.141	
7/21/07				0.473	0.091	
7/22/07				0.473	0.091	
7/23/07		0.046		0.485		
7/24/07		0.046		0.485		
7/25/07		0.046		0.485		
7/27/07				0.485	0.054	
7/28/07		0.059		0.473		
7/29/07				0.473		0.032
7/30/07			0.291		0.198	
7/31/07	0.047			0.372		

Sample Date	Area 10 Sites & Size Measures		
	Armeni Public Ramp	Kingston Public Ramp	Shilshole Public Ramp
7/16/07	0.149		0.298
7/18/07	0.149		0.298
7/20/07	0.149		0.298
7/21/07	0.145		0.366
7/22/07	0.145		0.366
7/23/07	0.194		0.418
7/24/07		0.127	0.418
7/25/07		0.127	0.418
7/27/07	0.194		0.418
7/28/07	0.118		0.306