2003 Chinook Selective Fishery, Marine Areas 5 and 6

By

Steven L. Thiesfeld
Angelika Hagen-Breaux

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Washington Department of Fish and Wildlife
Fish Program
600 Capitol Way North
Olympia, Washington 98501

EXECUTIVE SUMMARY

During the summer of 2003, a pilot recreational Chinook salmon ("Chinook") fishery that was limited to retention of marked (adipose clipped) hatchery Chinook salmon occurred in Marine Area 5 and the western portion of Marine Area 6. Marine Areas 5 and 6 are located in Washington waters of the Strait of Juan de Fuca. The Chinook Selective Fishery was scheduled to begin on July 5, 2003 and continue for 41 days or until a quota of 3,500 Chinook was kept, whichever occurred first. The fishery started on July 5, 2003 and ran continuously for 30 days through August 3. We estimated total effort, catch per angler trip, number of fish kept, the percentage of marked Chinook salmon (mark rate), and the percentage of fish greater than the 22" minimum size encountered.

We estimated fishing effort at 24,593 angler trips during the Chinook Selective Fishery. Those anglers retained an estimated 3,493 Chinook and released 14,841. In addition, an estimated 5,364 coho and 5,608 pink salmon were kept during this fishery. The majority of the fishing effort (79%) and Chinook kept (72%) occurred in Area 5. In Area 5, the number of Chinook kept per angler trip was 0.13. An estimated 5,195 anglers participated in the Chinook Selective Fishery in Area 6. In Area 6, the number of Chinook kept per angler trip was 0.19. The estimated mark rate for legal-size Chinook (greater than or equal to 22") based on test fishing during the Chinook Selective Fishery was 43% in Area 5 and 45% in Area 6. Angler effort during the Chinook Selective Fishery in 2003 was approximately double the effort compared to the same time and area fished in 2002, when a combination of 'non-selective' and 'release all' regulations applied to Chinook.

Since the Chinook Selective Fishery in Areas 5 and 6 was a pilot fishery and included a new regulation requiring anglers to release salmon without bringing the fish on board their vessel, we initiated a program to educate anglers about proper methods of releasing fish and fish identification. Anglers were offered a "dehooker" and a pamphlet describing selective fisheries, how to identify salmon species and how to use the dehooker. Anglers were also asked to avoid netting fish they were going to release if possible. Compliance with existing regulations, and the new regulation prohibiting bringing salmon on board a vessel if they were going to be released, was good. Officers contacted 846 anglers during the selective fishery, issuing seven warnings and three citations for retaining wild Chinook salmon, and no citations and two warnings for bringing fish to be released on board a vessel.

INTRODUCTION

In recent years, abundant runs of hatchery salmon have been mixed with depressed runs of wild salmon in both marine and freshwater environments. Providing opportunities to harvest those 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 fin clipped ("marked") hatchery fish and are required to release unclipped ("unmarked") fish. These unmarked fish are typically wild fish, but may include certain 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.

During the summer of 2003, a selective Chinook recreational fishery was implemented in waters of the Strait of Juan de Fuca with the objective of increasing meaningful recreational opportunity while meeting conservation goals for Puget Sound Chinook salmon defined by the Puget Sound Chinook Harvest Management Plan. The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife reached agreement to consider selective Chinook sport fishing in this area for the 2003 and 2004 seasons 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. It was thought that a pilot fishery limited in time and area, as described below, would allow managers to determine the success of monitoring and sampling programs for collection of essential information.

The Chinook Selective Fishery started on July 5, 2003 and ran continuously through August 3, 2003 in Marine Area 5 and the western portion of Marine Area 6. Marine Areas 5 and 6 (hereafter: Areas 5 and 6) are located in Washington waters of the Strait of Juan de Fuca, running from the Sekiu River easterly to Low Point, and from Low Point to approximately Whidbey Island, respectively (Figure 1). Chinook selective fishing in Area 6 was open only from Low Point easterly to Ediz Hook, because the eastern portion of Area 6 has many more boat ramps and other access points, and would have required substantially more sampling effort to obtain accurate estimates of harvest and effort. Additional closures to help achieve fishery objectives were established: 1) in the eastern half of Marine Area 4; 2) near the mouths of the Sekiu and Hoko rivers; 3) near the mouth of the Elwha River; and 4) in Port Angeles Harbor.

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 a new regulation that, "Any salmon to be released may not be brought on board a vessel". Education efforts were undertaken to provide anglers with alternative methods for proper release of fish, other than netting the fish and bringing them into the boat. During the Chinook Selective Fishery anglers were also allowed to retain pink *O. gorbuscha* ("pink"), sockeye *O. nerka*, and marked hatchery coho salmon.

The season was scheduled to run from July 5, 2003 through August 14, 2003 (41 days), or until 3,500 hatchery Chinook salmon were caught and retained by anglers. The fishery was closed by emergency regulation effective at 11:59 p.m., August 3, 2003 because the quota was expected to be reached.

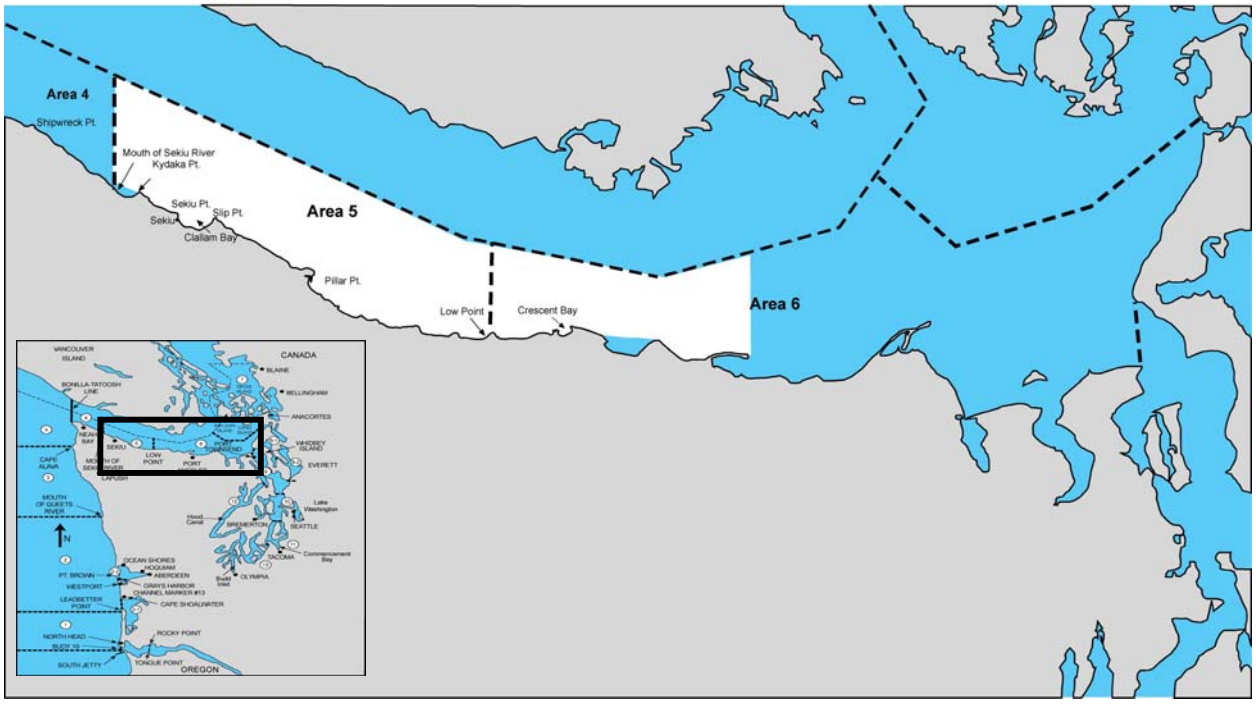

Figure 1. Location of the 2003 Chinook Selective Fishery (shown in white) in Marine Areas 5 and 6.

METHODS

We estimated total effort, catch per angler trip, number of fish harvested, the percentage of adipose fin clipped Chinook (mark rate), the total number of Chinook released and the proportion 22" or longer (legal-size). Coded wire tags and biological samples were collected from harvested fish and lengths were collected from Chinook caught on test boats. Tissue samples were collected from all Chinook caught on test fishing boats for possible future genetic analysis of stock composition.

Effort and Catch

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. Four boat surveys were conducted between July 5 and August 3 in Area 5, and 11 in Area 6, to determine the proportion of effort (or "size") for each access site. While on the water, boats were approached and the skipper was asked where they would tie up at or exit the fishery that day. All boats were surveyed or counted from a selected set of docks or access points during a day. Harvest and effort observed at the two sampled sites were then expanded to all access sites based on their

"size" to estimate total harvest for the day. Sample data were combined and expanded to create stratum estimates of harvest. The formula for expanding effort and harvest was:

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

where:

DE = daily estimator (e.g. catch)
P = proportion of effort at site *1* and *2*, and
E = sampled estimator at site *1* and *2*.

For example, if 18 fish are censused at Van Ripers and the Van Ripers proportion of effort (size) is 20% of the Area 5 effort, while 31 fish are censused at Olson's and the Olson's proportion of effort is 50%, then the total Area 5 catch for one day is calculated as follows:

$$\text{Estimated catch} = \frac{\left[(1-0.50)*(18/0.20)+(1-0.20)*(31/0.50)\right]}{(2-0.20-0.50)} = 73$$

Therefore the total estimated catch for all of Area 5 would be 73 fish. Effort would be expanded in a similar manner.

Weeks were divided into three strata: Monday through Thursday, Friday, and Saturday and Sunday. Each week, two days from the Monday though Thursday stratum were randomly selected for sampling. Every Friday, Saturday, and Sunday were sampled. For each sampling day an AM and a PM period were sampled. Morning shifts started at 7 AM and ended at 2 PM. Afternoon shifts started at 2 PM and ended at 9 PM, except that sampling shifts were adjusted earlier or later if boats were returning before or after normal shift times, such that all boats returning to a selected access site were sampled or counted. For each sampling day, two access sites (ramps or docks) in each Area were selected by computer program for sampling. The computer program selects sampling sites based on their "size" or effort (i.e. the proportion of angler effort that on average uses the site; Murthy 1957, Cochran 1977). Thus a total of four shifts were sampled per selected day in each Area. Access sites in Area 5 were divided into sampled and non-sampled sites. Access sites with low effort were excluded in the sample. All anglers and fish exiting the fishery through the sampled sites were counted. If any boats were not sampled, they were counted, and catch and effort estimates were expanded appropriately.

Harvest and effort estimates are 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 the fishery at a sampled site are accounted for and that anglers accurately report their harvest; and 4) Catch per unit effort (c/f) 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 shoreside interviews of anglers, as part of the catch and effort sampling program. Anglers were asked to report numbers of fish released by species. These survey data

were expanded to represent total fishery estimates of released salmon using the same methods as previously described for estimating total fishery estimates of catch and effort. For the Chinook released that the angler did not know the mark status, we used the mark rates from the test fishery for sublegal (< 22") Chinook to apportion those unknown Chinook into marked and unmarked categories.

Samplers collected coded wire tags from harvested Chinook. Fish bearing coded wire tags were also measured for fork length and scales were collected.

Test Fishing

Two "test" fishing boats were used to determine the species composition, percent of fish encountered that were adipose clipped (mark rate), the percentage of fish that were legal-size, and to collect scales, tissue samples, coded wire tags and fork lengths. We converted fork lengths to total lengths for analysis using the recommended equations presented in Conrad and Gutmann (1996). A 1 cm^2 tissue sample was collected from the dorsal fin or the caudal fin, and placed in a solution of ethanol. Tissue samples were collected for possible future genetic analysis of stock composition. Scales were collected following procedures outlined by the International North Pacific Fisheries Commission (1963). We used a simple season-long average to estimate mark rates of legal-size and sublegal-size Chinook. We calculated a rate weighted by weekly catch to determine the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

Two samplers, utilizing one rod each, fished from each boat. One test boat fished out of Sekiu (Area 5) from July 3 through August 14, and one boat fished out of Port Angeles (Area 6) from July 3 through August 14. The Sekiu boat fished 28 of the 30 open days during the Chinook Selective Fishery and the Port Angeles boat fished 27 days during the same time period. In addition, the Sekiu test boat fished 1 day in July prior to the Chinook Selective Fishery, and 8 days during the period of August 4 – 14, immediately following the Chinook Selective Fishery, during which they continued to target Chinook. The Port Angeles boat fished 1 day prior to the Chinook Selective Fishery and an additional 11 days (August 4 – 14) immediately following the Chinook Selective Fishery, during which they continued to target Chinook.

Samplers fishing from the test boats attempted to capture Chinook from July 3 through August 14 through their choice of area to fish, depth, gear type and fishing methods. Samplers fished predominately with downriggers and only with artificial lures, which was the predominate gear used by anglers. However, other fishing methods including weight and bait, trolling with divers, and jigging were not represented by the test boats.

Additional test fishing directed at coho was conducted in Area 5 in late August and into September. Few Chinook were encountered compared to test fishing directed at Chinook during July and early August.

Voluntary Trip Reports

Additional information on mark rates and the percentage of fish that were legal-size was obtained from Voluntary Trip Reports (VTR's). Volunteer trip report forms were issued to interested anglers prior to and during the fishing season. Anglers were asked to record date, number of anglers, target species, which Area they were fishing in, each fish hooked, whether the fish was kept or released, the species of fish if they could positively identify it, approximate total length, and whether the fish was adipose fin clipped or not. Volunteers also collected a few tissue samples for possible future genetic analysis. We used a simple season-long average to estimate mark rates of legal-size and sublegal-size Chinook. We calculated a rate weighted by weekly catch to determine the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

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 utilized 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 to estimate the number of mortalities. Because the fishery 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(*U*) = variance of estimator *U*.

RESULTS AND DISCUSSION

Effort and Catch

We estimated that anglers made 24,593 trips during the Chinook Selective Fishery (July 5 – August 3). Those anglers kept an estimated 3,493 Chinook, 5,364 hatchery coho and 5,608 pink (Table 1). Area 5 accounted for 79% of the effort (19,398 angler trips) and 72% of the kept Chinook (2,529) for a rate of 0.13 Chinook kept per angler trip. Area 6 accounted for 5,195 angler trips and 964 kept Chinook for a higher catch rate of 0.19 Chinook kept per angler trip. Based on angler interviews, Area 5 anglers released an estimated 13,118 Chinook, 22,447 coho, 3,148 pink and 894 unidentified or other salmon. Area 6 anglers released an estimated 1,723 Chinook, 455 coho, 194 pink and 36 unidentified or other salmon. Additional catch and sampling statistics are presented in Appendices A and B.

The Chinook Selective Fishery appears to have doubled the amount of effort in Areas 5 and 6, and greatly increased the number of days anglers could fish for Chinook, versus 2002. In 2002, anglers were only allowed to harvest Chinook (marked and unmarked) during five days of the summer season (July 8, 9, 10, 11 and 22) in Area 5. For comparison with 2003, from July 1 through August 3, 2002, an estimated 10,905 anglers participated in the Area 5 fishery, and kept 1,790 Chinook and 1,988 coho, while releasing 2,922 Chinook and 5,006 coho. There is no directly comparable information for Area 6 in 2002 since Chinook retention was not allowed and the entire area was open. However, observations from Washington Department of Fish and Wildlife (WDFW) samplers suggest that effort was at least double in the portion of Area 6 that was open during the Chinook Selective Fishery compared to the same time period in 2002 (Larry Bennett, WDFW, Personal Communication).

Effort was initially high in Area 5, declined precipitously during week 29, and then rose during the last week of the Chinook Selective Fishery (Figure 2). In Area 6, effort mostly increased modestly throughout the fishery (Figure 3). Chinook harvest in Area 5 was fairly static during the fishery (Figure 4), but in Area 6 essentially increased throughout the duration of the fishery (Figure 5). Consequently, the number of Chinook kept per angler increased throughout the duration of the fishery in Area 5 (Figure 6), while the number of Chinook kept per angler was higher during the last two weeks of the fishery in Area 6 than during the first three weeks (Figure 7).

Table 1. Recreational salmon catch estimate during the Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3, 2003. The released numbers are based on angler interviews. Values may not add exactly due to rounding error.

	Trips		Harvested			Released			
Fishery	Boats	Anglers	Chinook	Coho	Pink	Unidentified or other	Chinook	Coho	Pink
Area 5	8,008	19,398	2,529	5,258	5,147	894	13,118	22,447	3,148
Area 6	2,657	5,195	964	107	461	36	1,723	455	194
Total	10,665	24,593	3,493	5,364	5,608	930	14,841	22,902	3,342

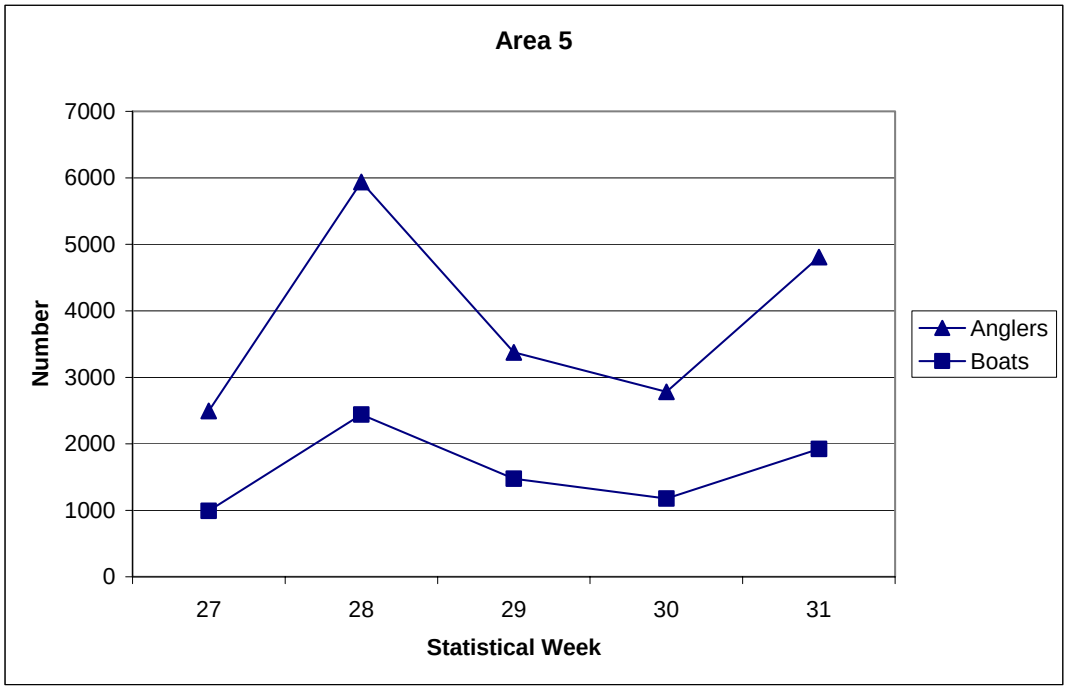

Figure 2. Angler effort in Marine Area 5, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

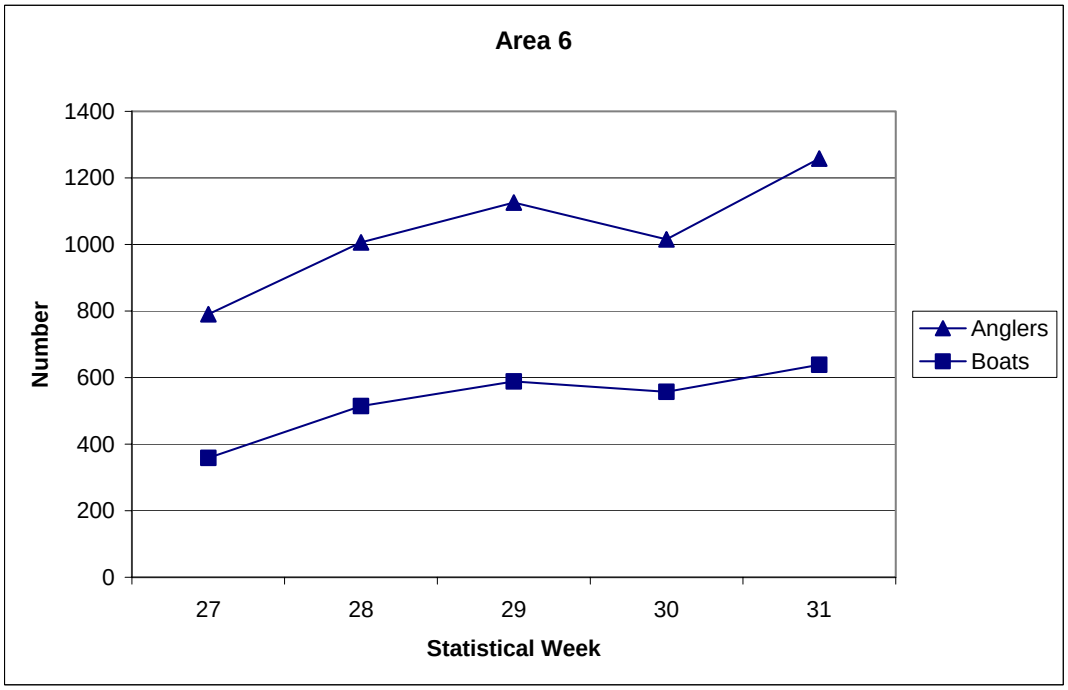

Figure 3. Angler effort in Marine Area 6, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

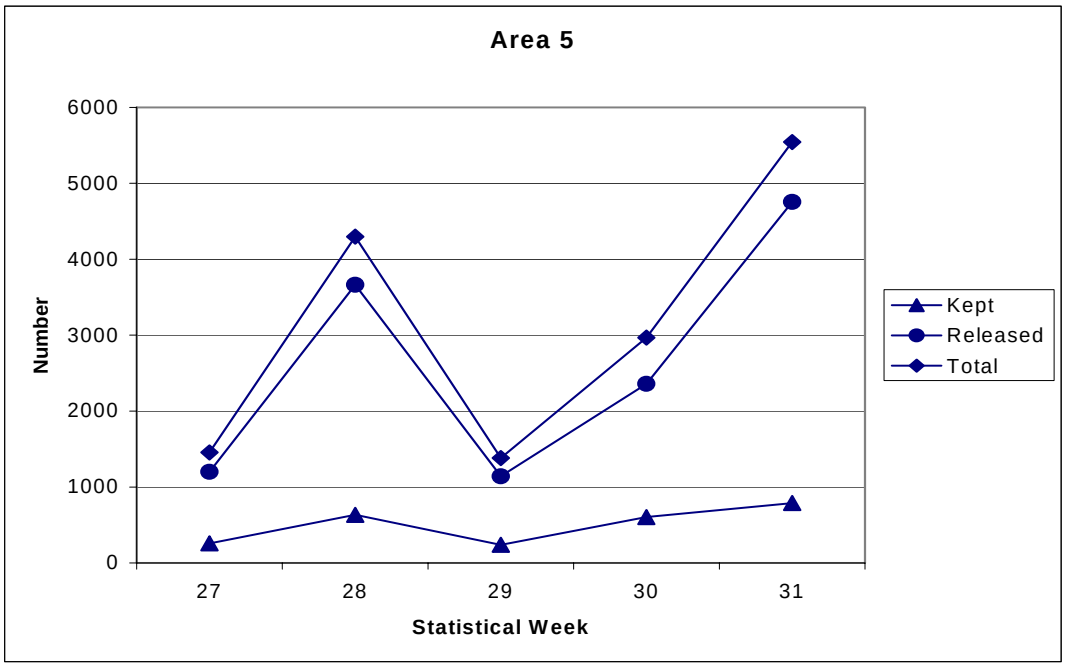

Figure 4. Catch of Chinook salmon in Marine Area 5, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

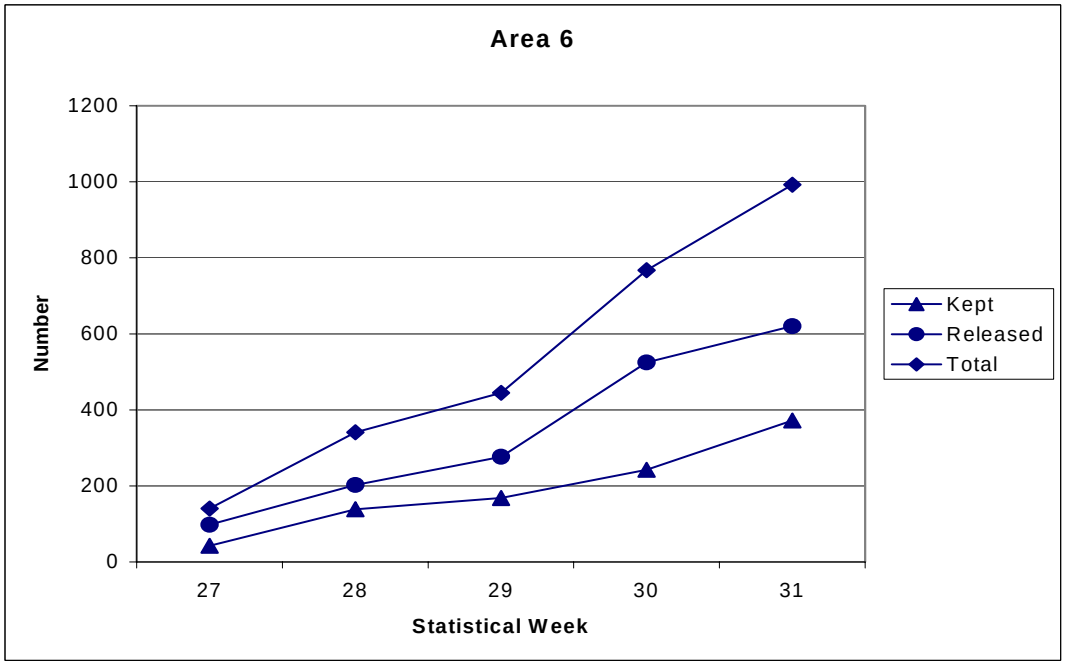

Figure 5. Catch of Chinook salmon in Marine Area 6, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

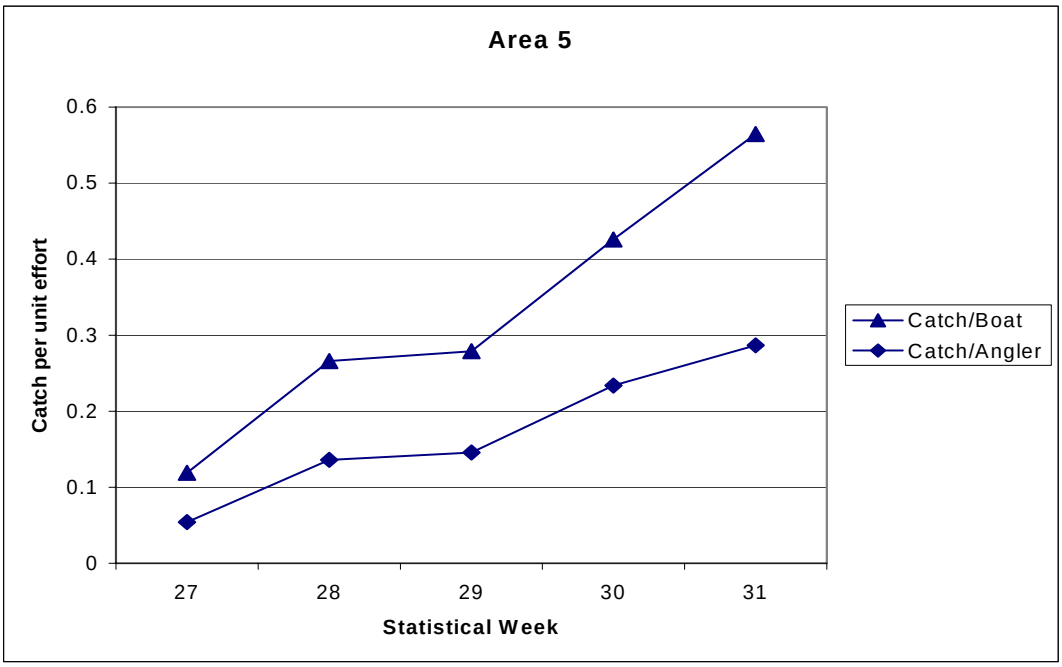

Figure 6. Catch per unit effort (C/f) for kept Chinook salmon in Marine Area 5, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

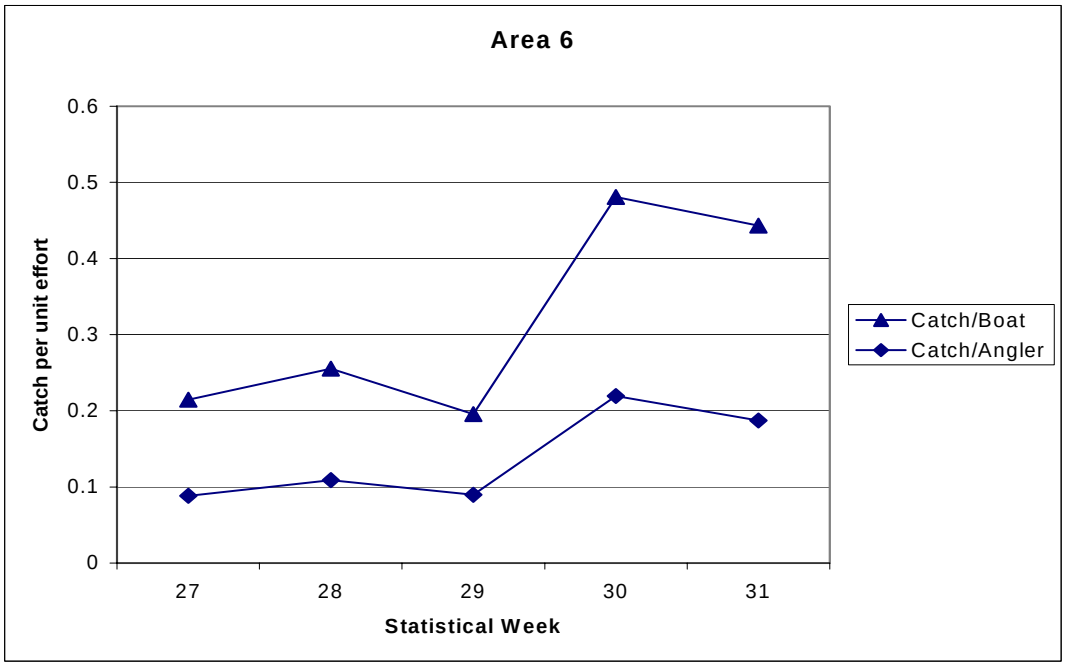

Figure 7. Catch per unit effort (C/f) for kept Chinook salmon in Marine Area 6, by week, for the 2003 Chinook Selective Fishery, July 5 through August 3, 2003. Note the first week includes only two days.

Mark Rate and Percent Legal

Test Fisheries

During the Chinook Selective Fishery (July 5-August 3), samplers fishing from the test boats caught 335 Chinook in Area 5 and 148 Chinook in Area 6 (Table 2). Most of the fish caught in Area 5 were between 40 and 75 cm (16 and 30"), whereas most of the fish caught in Area 6 were between 70 and 100 cm (28 and 39") (Figures 8 and 9). A significantly ($X^2 = 99.8$, $p < 0.0001$) higher percentage of legal-size Chinook were caught in Area 6 (94%) versus Area 5 (46%). During the Chinook Selective Fishery time period, 43% of the legal-size fish were marked in Area 5 and 45% of the legal-size Chinook were marked in Area 6 (Table 2). Based on these data, anglers could retain nearly one of every two legal-size Chinook they encountered during the fishery. The mark rate for legal-size Chinook in Area 5 generally declined from early July through mid-August while the mark rate of legal-size Chinook in Area 6 generally increased during the same time period (Figure 10). The mark rate on sublegal Chinook was 27% (n = 180) for Area 5, but only nine sublegal-size Chinook were encountered in Area 6 (Table 2). Weekly test fishing data are presented in Appendices C and D.

Based on the continued test fishing in Area 5 directed at coho, the mark rate on Chinook immediately following the closure of the Chinook Selective Fishery was not dissimilar from that observed during the fishery (Figure 10).

Voluntary Trip Reports (VTR's)

Anglers returned Voluntary Trip Reports (VTRs) from 139 boat trips in Areas 5 and 6 between July 5 and September 25. Of those, 53 (38%) were from one charter boat fishing out of Sekiu, and another 25 (18%) were from WDFW biologists fishing during their own time. The North Olympic Peninsula Chapter of Puget Sound Anglers contributed 36 (26%) of the reports. Based on the timing of the trips taken, and the size and species of the fish noted, most of the Chinook data appear to be from reliable sources.

Table 2. Summary of the number of marked and unmarked, legal-size and sublegal-size Chinook salmon caught by test boats during the Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3, 2003.

	Legal-size			Sublegal-size			Total		
	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked
Area 5	67	88	43	48	132	27	115	220	34
Area 6	63	76	45	3	6	33	66	82	45

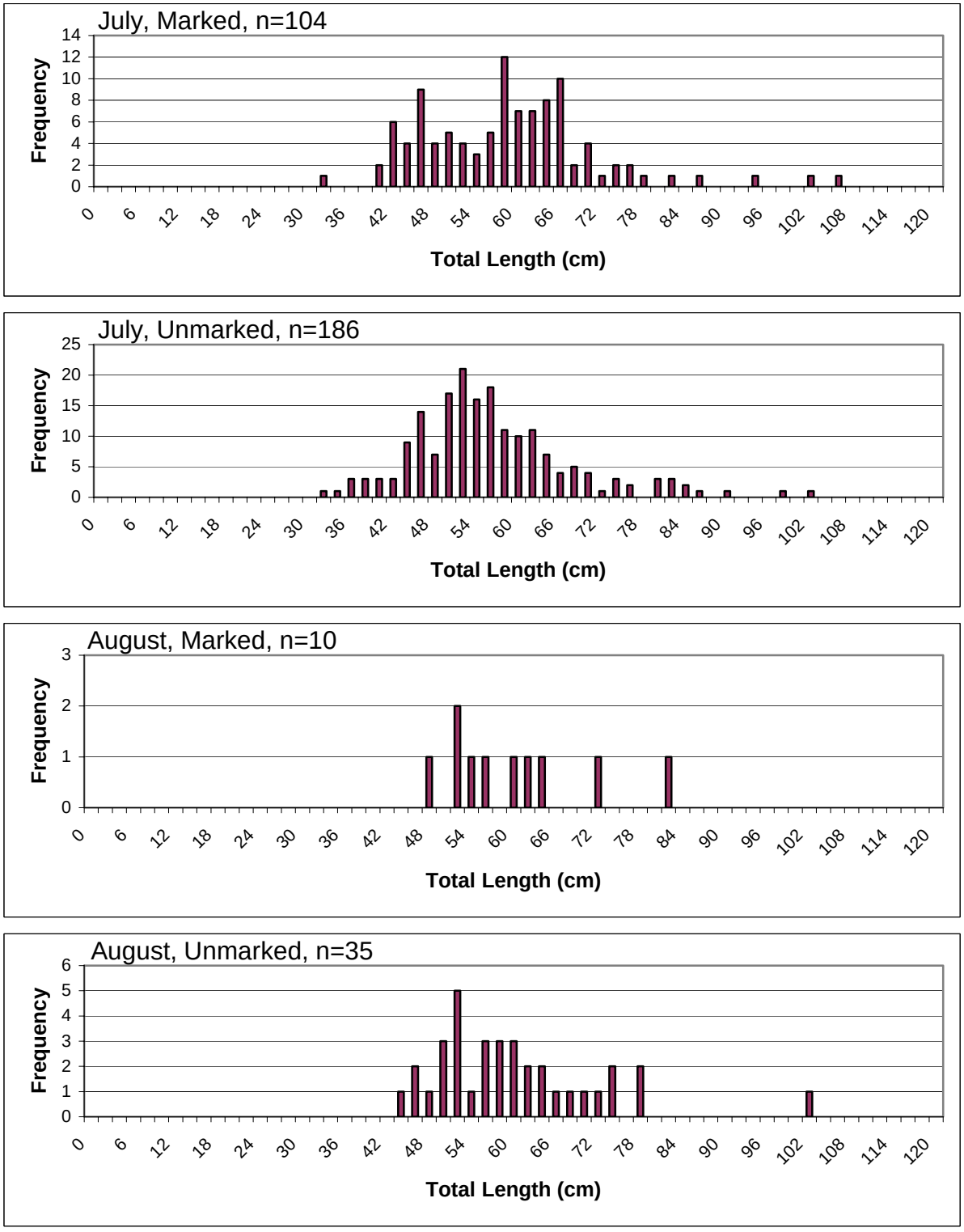

Figure 8. Length frequency histograms of Chinook salmon caught by test fishing boats sampling from July 5 through August 3, 2003, in Marine Area 5.

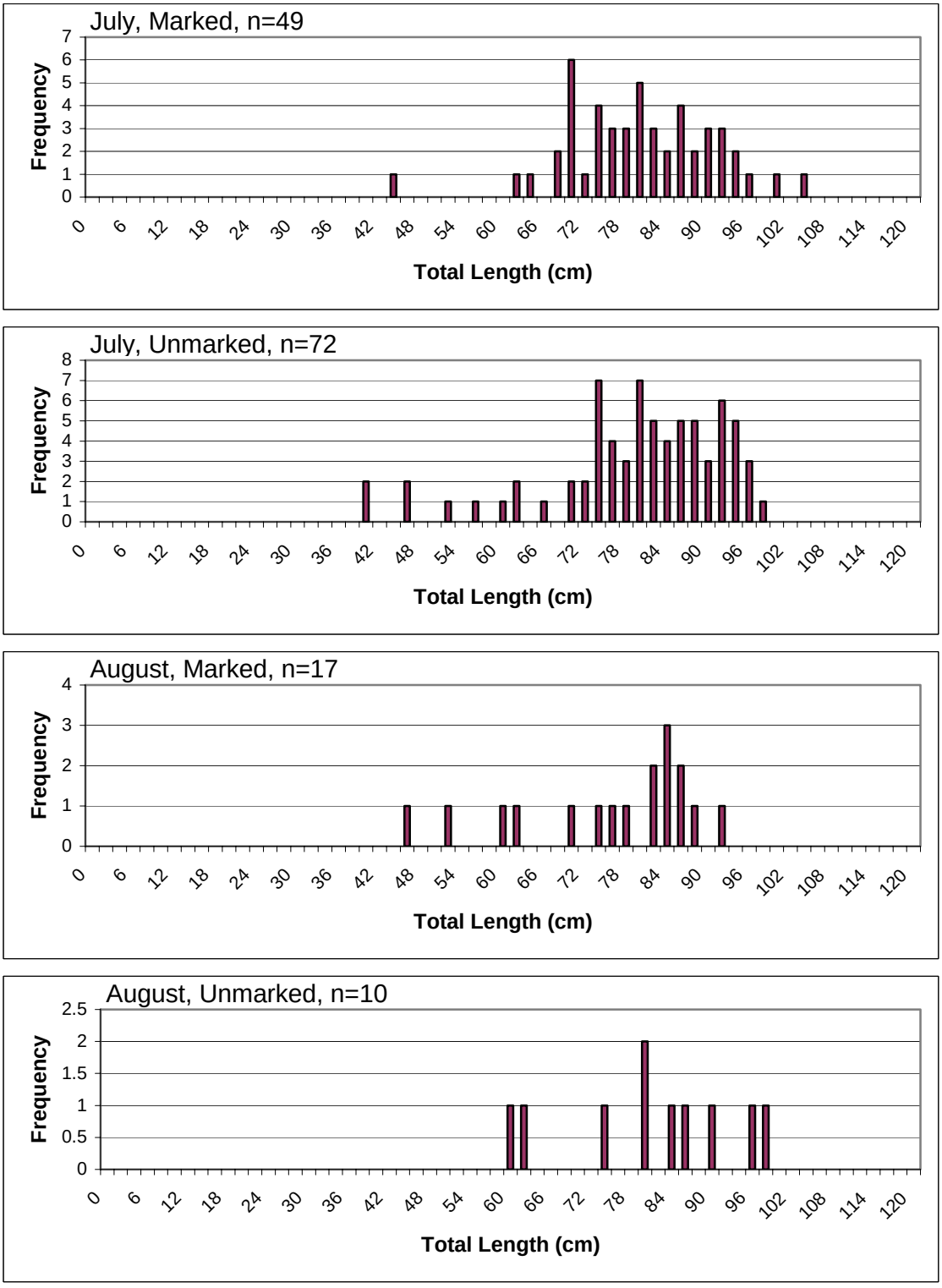

Figure 9. Length frequency histograms of Chinook salmon caught by test fishing boats sampling from July 5 through August 3, 2003, in Marine Area 6.

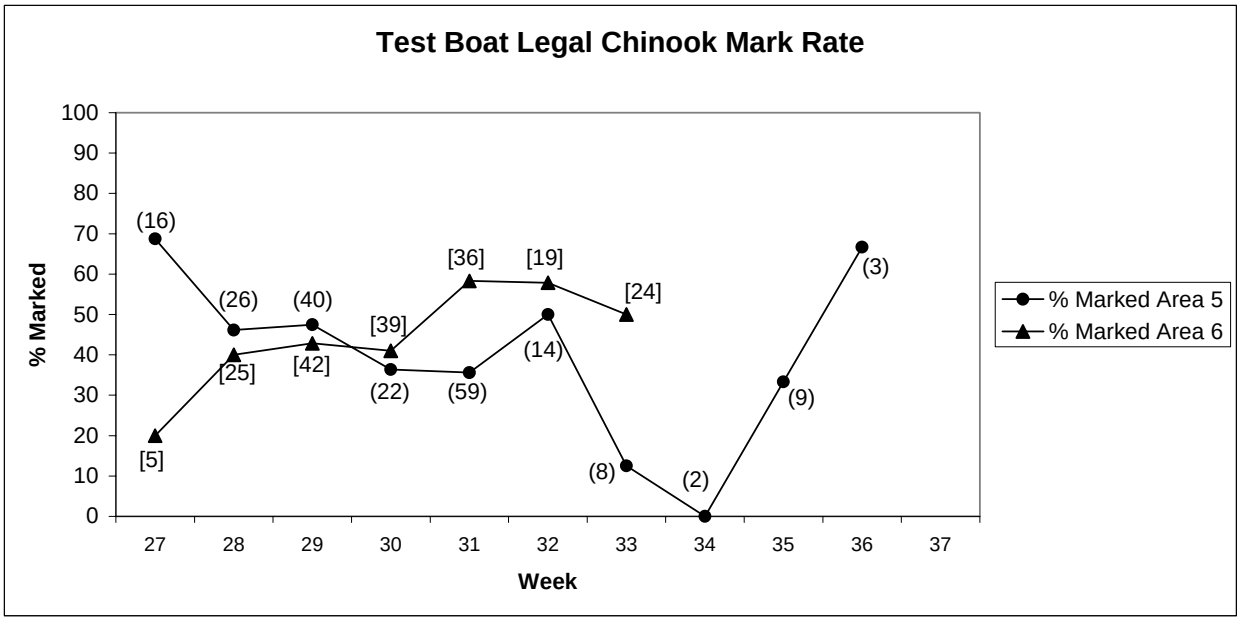

Figure 10. Mark rate (% adipose fin clipped) of legal-size Chinook caught by WDFW test boats in Marine Areas 5 and 6 during 2003. Sample sizes for Marine Area 5 are in ( ), while sample sizes for Marine Area 6 are in [ ]. The Chinook Selective Fishery was from July 5 through August 3 or statistical weeks 27 through 31. Note that statistical week 27 includes only 2 days of the Selective Fishery.

During the Chinook Selective Fishery, VTR's showed 179 Chinook encountered in Area 5 and 80 Chinook encountered in Area 6 (Table 3). In Area 5, 47% of the Chinook were legal-size compared to 46% from the test fishing. In Area 6, 84% of the Chinook encountered were legal-size compared to 94% from test fishing. The VTR information showed 44% of the legal-size fish were marked in Area 5 which was nearly identical to the 43% mark rate observed in the test fishery. In Area 6 the VTR results showed that 43% of the legal-size fish were marked which compared favorably with 45% observed in the test fishery. The mark rate on sublegal Chinook for Area 5 was 32% (n = 94), but only 13 sublegal-size Chinook were encountered in Area 6 (Table 3). The mark rates of legal-size Chinook were lower for VTR's versus test boat fishing during the first three weeks of the fishery in Area 5 (Figure 11), but otherwise were generally similar in both Areas (Figures 11 and 12). Weekly VTR data are presented in Appendices E and F.

Overall, the information on legal-size vs. sublegal-size Chinook and mark rates was very similar to the test fishery results. This was likely due to the reports being filled out by anglers who were both experienced and conscientious.

Table 3. Summary of the number of marked and unmarked, legal-size and sublegal-size Chinook salmon caught by volunteers reporting their catches on Voluntary Trip Reports (VTR'S) during the Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3, 2003.

	Legal-size			Sublegal-size			Total		
	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked	Marked	Unmarked	% Marked
Area 5	37	48	44	30	64	32	67	112	37
Area 6	29	38	43	5	8	38	34	46	43

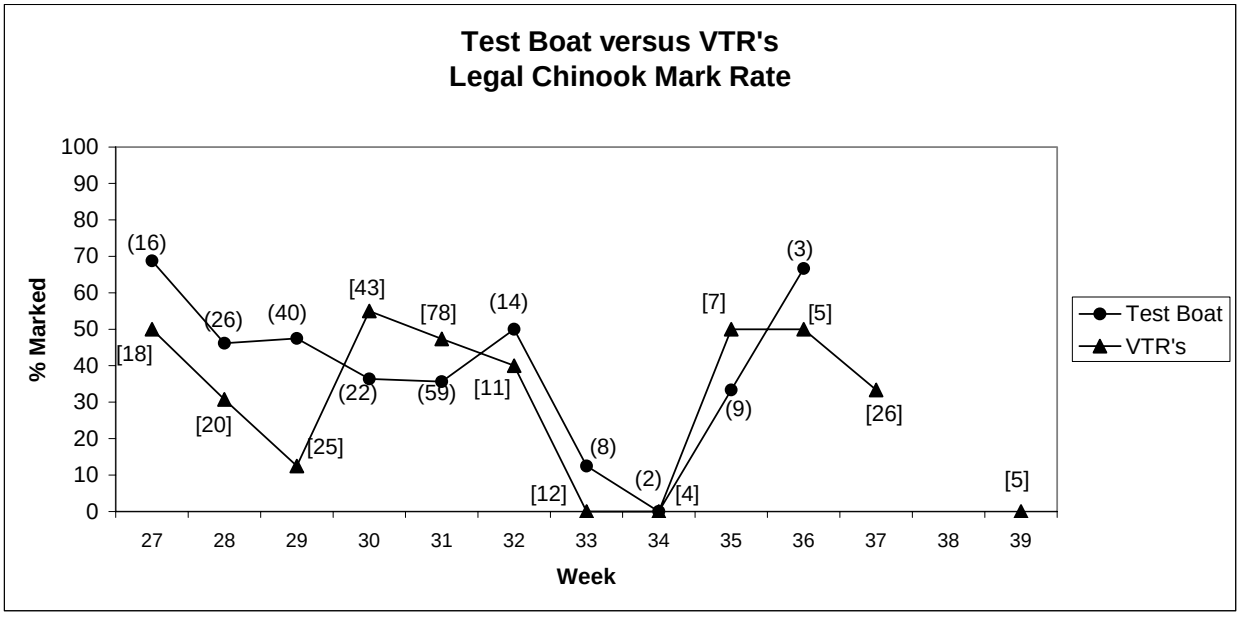

Figure 11. Mark rate (% adipose fin clipped) of legal-size Chinook salmon caught by WDFW test boats and anglers recording their catch on Voluntary Trip Reports (VTR's) in Marine Area 5 during 2003. Sample sizes for test boat are in ( ), while sample sizes for VTR's are in [ ]. The Chinook Selective Fishery was from July 5 through August 3 or statistical weeks 27 through 31. Note that statistical week 27 includes only 2 days of the selective fishery.

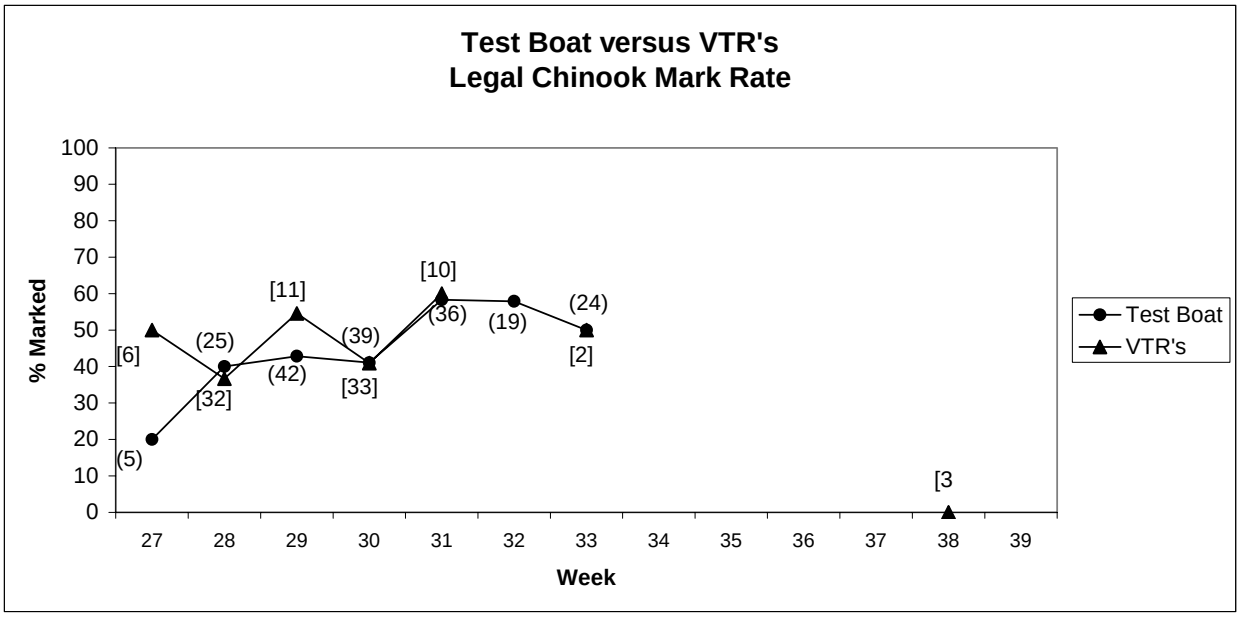

Figure 12. Mark rate (% adipose fin clipped) of legal-size Chinook salmon caught by WDFW test boats and anglers recording their catch on Voluntary Trip Reports (VTR's) in Marine Area 6 during 2003. Sample sizes for test boat are in ( ), while sample sizes for VTR's are in [ ]. The Chinook Selective Fishery was from July 5 through August 3 or statistical weeks 27 through 31. Note that statistical week 27 includes only 2 days of the selective fishery.

Summary of Chinook kept and released during the Chinook Selective Fishery.

A total of 3,493 Chinook were kept during the Chinook Selective Fishery. Of this total, 3,417 were marked and 76 were unmarked (Table 4 and Appendix G). A total of 14,841 Chinook were released during the Fishery based on angler interviews and the appropriate expansions. Of the total number of Chinook released, we estimated that 3,247 were marked and 11,593 were unmarked. This summary table uses the total Chinook encounters estimated from the creel surveys, with encounters apportioned by the percentage of Chinook in each category as measured during the test fishery.

Coded Wire Tagged Chinook Impacts

Samplers recovered 102 coded wire tags from Chinook during the Selective Fishery (Appendix H). Of these, 54 percent were Puget Sound stocks, 35 percent were Columbia River stocks, 8 percent were Canadian stocks, and the remainder from elsewhere. Only one tag was recovered from Strait of Juan de Fuca stocks in Washington. Thirty-eight double index tags were recovered in Areas 5 and 6 from July 5 through August 3 (Appendix I-1). We estimated the selective fishing mortality on unmarked double index tagged Chinook at 14 fish (Appendix I-2).

Table 4. Estimates of Chinook caught and released, by mark status, during the Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3, 2003. Values may not add exactly due to rounding error.

	Total Kept	Marked Kept	Unmarked Kept	Total Released	Marked Released	Unmarked Released	Total Encounters	% Marked of Total Chinook Encounters
Area 5	2,529	2,476	53	13,118	2,936	10,182	15,647	21%
Area 6	964	941	22	1,723	311	1,412	2,686	36%
Total	3,493	3,417	75	14,841	3,247	11,593	18,333	

SALMON HANDLING REGULATION AND EDUCATION

Since anglers were required to release salmon without bringing the fish on board their vessel, we initiated a program to educate anglers about the new regulation, alternative methods of releasing fish, and fish identification. A WDFW biologist contacted anglers 3 or 4 days each week starting at first light and working until an 8 or 10 hour shift was completed. The intent was to contact anglers before they started fishing, although some anglers were contacted after their fishing trip. Shifts alternated between Sekiu and Port Angeles, and sites were selected where creel surveys were not being conducted to avoid confusing anglers with multiple Washington Department of Fish and Wildlife (WDFW) employees or "bothering" them multiple times. After identifying himself as a WDFW employee, anglers were queried as to their knowledge of techniques for releasing salmon. Receptive anglers were given a pamphlet describing selective fisheries and how to identify salmon species, and a "dehooker". The dehooker was designed to release recreational caught salmon without handling the fish or putting them in a net, and as a tool for easily determining whether Chinook salmon exceeded the 22" minimum length. The dehooker is constructed from a 22" long, ½" diameter, wood dowel with a teacup hook in the end (Figure 13). Anglers unfamiliar with the dehooker were given a demonstration and instructed in the proper use of the dehooker. Anglers were also asked to avoid netting fish they were going to release.

Response to the new regulation and education efforts was mixed. Many of the experienced anglers had already developed their own methods to minimize handling stress and maximizing survival of released fish, including not using nets. These anglers were generally appreciative of the education effort, even though they gained little from the effort. Some experienced anglers liked the dehooker and preferred it to potentially dropping their own tools in the water. For some anglers, any attempt to limit their ability to handle fish was poorly received. Many of these anglers felt that it was unreasonable to handle fish without bringing them into the boat, while others felt that not using a net was impossible. They generally cited the following reasons: they didn't want to lose a fish (maybe their only Chinook caught during the day) while trying to identify whether it was legal to keep or not; the fish were too wild and active to handle unless they were in a net; and/or the conditions were too rough to safely handle fish over the side of the boat without a net. Some of the anglers who had not used a dehooker in the past were pleased with how well it worked, and a few asked for additional dehookers to share with friends.

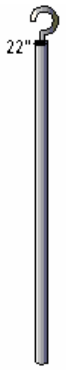

Figure 13. Schematic of "dehooker" given to anglers participating in the 2003 Chinook Selective Fishery in Marine Areas 5 and 6.

COMPLIANCE WITH REGULATIONS

Compliance with fishing regulations, including the new regulation prohibiting bringing salmon on board a vessel if they were going to be released, was considered an integral part of a successful fishery. Compared with 2002, WDFW enforcement division staff conducted additional patrols and emphasis patrols to monitor compliance. Between July 5 and August 3, officers contacted 620 anglers in Area 5 and 226 anglers in Area 6. From those contacts, officers issued 5 citations and 3 warnings in Area 5, and 2 citations in Area 6, for retention of unmarked Chinook. Two warnings were issued in Area 5 for bringing a salmon to be released on board a vessel, while no warnings or citations were issued for this regulation in Area 6. The enforcement data for Chinook compliance matches well with the rate that unmarked Chinook were observed in the dockside creel survey during the Chinook Selective Fishery. Out of 937 Chinook sampled by creel surveyors in Areas 5 and 6, only 20 (2.1%) were unmarked. Although this study was not designed to obtain an unbiased estimate of compliance, these data suggest a very high level of compliance in the fishery.

SUMMARY

The first year of the pilot marine Chinook selective sport fishery was successful with respect to the stated management objective of increasing meaningful recreational opportunity within conservation constraints for Puget Sound Chinook. Anglers were allowed to fish for and retain Chinook for 30 days in Areas 5 and 6, compared with only 10 days and 5 days in Area 5 in 2001 and 2002, respectively. Angler effort in Area 5 during 2003 was double the effort in 2002 during the same time frame, and likely was also double in Area 6. Using data from the test fishery sampling during the Chinook Selective Fishery nearly half, or one in two of the legal-size Chinook encountered were marked and could be retained by anglers. Compliance with fishing regulations was good during the fishery, and in general, programs aimed at public education to increase the awareness of proper fish release techniques were successful.

The pilot fishery was also successful with respect to the management objective of implementing monitoring and sampling programs to obtain information of management importance for evaluation and planning of potential future selective Chinook fisheries.

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Appendix A1. Summary of creel survey estimates of marked and unmarked Chinook catch and variances (in parentheses) during the Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3, 2003.

	Chinook Kept			Chinook Released			
Area	Marked	Unmarked	Total	Marked	Unmarked	Unknown	Total
5	2,476	53	2,529	485	10,572	2,061	13,118
	(7,643)	(236)	(63,566)	(7,643)	(1,443,225)	(192,139)	(1,643,007)
6	941	22	964	39	1,604	79	1,723
	(8,320)	(103)	(8,423)	(102)	(24,380)	(843)	(25,325)
5 and 6 Combined	3,417	75	3,493	524	12,176	2,141	14,841
	(71,650)	(338)	(71,988)	(7,745)	(1,467,605)	(192,982)	(1,668,332)

Appendix A2. Weekly creel survey estimates of marked and unmarked Chinook catch and variances (in parentheses) during the Chinook Selective Fishery in Marine Area 5, July 5 through August 3, 2003. Note there were only two days in week 27.

Statistical Week	Chinook Kept			Chinook Released			
	Marked	Unmarked	Total	Marked	Unmarked	Unknown	Total
27	247 (3,801)	11 (51)	258 (3,852)	62 (851)	906 (31,068)	232 (3,764)	1,200 (35,682)
28	618 (16,793)	17 (13)	635 (16,806)	233 (4,883)	2,711 (606,316)	718 (43,096)	3,662 (654,294)
29	240 (2,630)	0 (0)	240 (2,630)	23 (308)	1,002 (43,633)	116 (3,088)	1,142 (47,028)
30	595 (20,077)	11 (117)	606 (20,193)	73 (1,165)	2,132 (422,807)	156 (8,084)	2,361 (432,057)
31	776 (20,030)	14 (55)	790 (20,086)	94 (437)	3,821 (339,402)	839 (134,108)	4,754 (432,056)
Total	2,476 (63,330)	53 (236)	2,529 (63,566)	485 (7,643)	10,572 (1,443,225)	2,061 (192,139)	13,118 (1,643,007)

Appendix A3. Weekly creel survey estimates of marked and unmarked Chinook catch and variances (in parentheses) during the Chinook Selective Fishery in Marine Area 6, July 5 through August 3, 2003. Note there were only two days in week 27.

Statistical Week	Chinook Kept			Chinook Released			
	Marked	Unmarked	Total	Marked	Unmarked	Unknown	Total
27	43	0	43	1	96	0	98
	(14)	(0)	(14)	(1)	(2,323)	(0)	(2,324)
28	137	2	139	7	190	6	202
	(375)	(1)	(376))	(6)	(166)	(8)	(179)
29	164	4	168	0	266	11	277
	(258)	(6)	(264)	(0)	(2,188)	(12)	(2,200)
30	237	5	242	19	488	18	525
	(1,208)	(10)	(1,219)	(62)	(6,149)	(34)	(6,245)
31	360	11	372	12	564	44	620
	(6,464)	(86)	(6,550)	(34)	(13,554)	(789)	(14,377)
Total	941	22	964	39	1,604	79	1,723
	(8,320)	(103)	(8,423)	(7,643)	(24,380)	(843)	(25,325)

Appendix B1. Sample rates for the 2003 Area 5 and 6 Chinook Mark-Selective fisheries, July 5 – August 3, 2003.

	Area 5			Area 6		
Week	Number of Chinook Sampled	Estimated Chinook Retained	Sample Rate	Number of Chinook Sampled	Estimated Chinook Retained	Sample Rate
27	69	258	0.268	23	43	0.539
28	111	635	0.175	72	139	0.520
29	55	240	0.229	68	168	0.404
30	149	606	0.246	81	242	0.334
31	189	790	0.239	120	372	0.323
Total	573	2,529	0.227	364	964	0.378

Appendix B2. Weekly sampling data from creel surveys conducted during the Chinook Selective Fishery in Marine Area 5, July 5 through August 3, 2003; and statistics used to calculated a season-long weighted mark rate. Note there were only two days in week 27.

	Week					
Statistic	27	28	29	30	31	Total
Kept Chinook Sampled	69	111	55	149	189	573
Kept Chinook Marked	67	107	55	148	185	562
Released Chinook	357	653	271	648	1,230	3,159
Released Chinook Unmarked	265	487	238	580	1,028	2,598
Released Chinook Marked	23	48	6	19	32	128
Released Chinook Unknown Mark Status	69	118	27	49	170	433
Weekly Mark Rate (%)	25	24	20	22	17	21
Percent of Catch[a]	10.2	25.1	9.5	24.0	31.2	
Proportion of Total Catch Marked[b] (%)	2.6	6.0	1.9	5.4	5.4	21[c]
Variance						9

a. The weekly estimated harvest of Chinook divided by the estimated season total Chinook harvest (see Appendix D).
b. Weekly mark rate multiplied by the percent of catch.
c. Season-long weighted mark rate which equals the sum of the weekly proportions.

Appendix B3. Weekly sampling data from creel surveys conducted during the Chinook Selective Fishery in Marine Area 6, July 5 through August 3, 2003. Note there were only two days in week 27.

	Week					
Statistic	27	28	29	30	31	Total
Kept Chinook Sampled	23	72	68	81	120	364
Kept Chinook Marked	23	71	66	79	116	355
Released Chinook	32	106	121	214	248	721
Released Chinook Unmarked	31	99	116	191	225	662
Released Chinook Marked	1	4	0	11	5	21
Released Chinook Unknown Mark Status	0	3	5	12	18	38
Mark Rate (%)	44	43	36	32	35	36
Percent of Catch[a]	4.4	14.4	17.5	25.1	38.6	
Proportion of Total Catch Marked[b] (%)	1.9	6.2	6.2	8.0	13.3	36[c]
Variance						14

a. The weekly estimated harvest of Chinook divided by the estimated season total Chinook harvest (see Appendix D).
b. Weekly mark rate multiplied by the percent of catch.
c. Season-long weighted mark rate which equals the sum of the weekly proportions.

Appendix C.

Area 5 Chinook Mark Rates from Test Fishery

Chinook Encounters from Test Boats by Legal/Sublegal and Marked/Unmarked

Week		27	28	29	30	31	Grand Total
Legal-size	Marked	6	12	19	8	22	**67**
	Unmarked	2	14	21	14	37	**88**
Sublegal-size	Marked	5	10	13	7	13	**48**
	Unmarked	5	34	29	20	44	**132**

Rates	27	28	29	30	31
Legal-size Mark Rate	75%	46%	48%	36%	37%
Sublegal-size Mark Rate	50%	23%	31%	26%	23%
Combined Mark Rate	61%	31%	39%	31%	30%
Proportion Legal & Marked	33%	17%	23%	16%	19%
Proportion Legal & Unmarked	11%	20%	26%	29%	32%
Proportion Sub & Marked	28%	14%	16%	14%	11%
Proportion Sub & Unmarked	28%	49%	35%	41%	38%

Weekly Weighted Rates	27	28	29	30	31	Season-long Weighted Rate	Variance
% Catch	0.102	0.251	0.095	0.240	0.312		
Legal-size Mark Rate	0.0764	0.1159	0.0450	0.0872	0.1165	**0.4411**	0.0128
Sublegal-size Mark Rate	0.0510	0.0571	0.0293	0.0622	0.0712	**0.2708**	0.0066
Combined Mark Rate	0.0623	0.0789	0.0370	0.0734	0.0943	**0.3459**	0.0086
Proportion Legal & Marked	0.0340	0.0431	0.0220	0.0392	0.0592	**0.1974**	0.0025
Proportion Legal & Unmarked	0.0113	0.0502	0.0243	0.0685	0.0996	**0.2540**	0.0044
Proportion Sublegal & Marked	0.0283	0.0359	0.0150	0.0343	0.0350	**0.1485**	0.0021
Proportion Sublegal & Unmarked	0.0283	0.1220	0.0335	0.0979	0.1185	**0.4002**	0.0037

Appendix D.

Area 6 Chinook Mark Rates from Test Fishery

Chinook Encounters from Test Boats by Legal/Sublegal and Marked/Unmarked

Week		27	28	29	30	31	Grand Total
Legal-size	Marked		10	18	16	19	**63**
	Unmarked		15	24	23	14	**76**
Sublegal-size	Marked		0	0	1	2	**3**
	Unmarked		0	1	2	3	**6**

Rates	27	28	29	30	31
Legal-size Mark Rate		40%	43%	41%	58%
Sublegal-size Mark Rate			0%	33%	40%
Combined Mark Rate		40%	42%	40%	55%
Proportion Legal & Marked		40%	42%	38%	50%
Proportion Legal & Unmarked		60%	56%	55%	37%
Proportion Sub & Marked		0%	0%	2%	5%
Proportion Sub & Unmarked		0%	2%	5%	8%

Weekly Weighted Rates	27	28	29	30	31	Season-long Weighted Rate	Variance
% Catch	0.000	0.150	0.183	0.263	0.404		
Legal-size Mark Rate	0.0000	0.0602	0.0783	0.1079	0.2325	**0.4789**	0.0064
Sublegal-size Mark Rate	na	na	na	na	na	**na**	na
Combined Mark Rate	0.0000	0.0602	0.0765	0.1065	0.2232	**0.4663**	0.0051
Proportion Legal & Marked	0.0000	0.0602	0.0765	0.1002	0.2019	**0.4388**	0.0027
Proportion Legal & Unmarked	0.0000	0.0902	0.1019	0.1441	0.1488	**0.4851**	0.0095
Proportion Sublegal & Marked	0.0000	0.0000	0.0000	0.0063	0.0213	**0.0275**	0.0003
Proportion Sublegal & Unmarked	0.0000	0.0000	0.0042	0.0125	0.0319	**0.0487**	0.0005

Appendix E.

Area 5 Chinook Mark Rates from Voluntary Trip Reports (VTR)

Chinook Encounters from Test Boats by Legal/Sublegal and Marked/Unmarked

Week		27	28	29	30	31	Grand Total
Legal-size	Marked	4	4	1	10	18	**37**
	Unmarked	4	8	7	9	20	**48**
Sublegal-size	Marked	2	6	9	3	10	**30**
	Unmarked	8	1	8	17	30	**64**

Rates	27	28	29	30	31
Legal-size Mark Rate	50%	33%	13%	53%	47%
Sublegal-size Mark Rate	20%	86%	53%	15%	25%
Combined Mark Rate	33%	53%	40%	33%	36%
Proportion Legal & Marked	22%	21%	4%	26%	23%
Proportion Legal & Unmarked	22%	42%	28%	23%	26%
Proportion Sub & Marked	11%	32%	36%	8%	13%
Proportion Sub & Unmarked	44%	5%	32%	44%	38%

Weekly Weighted Rates	27	28	29	30	31	Season-long Weighted Rate	Variance
% Catch	0.102	0.251	0.095	0.240	0.312		
Legal-size Mark Rate	0.0510	0.0837	0.0119	0.1262	0.1480	**0.421**	0.0144
Sublegal-size Mark Rate	0.0204	0.2153	0.0502	0.0360	0.0781	**0.400**	0.0802
Combined Mark Rate	0.0340	0.1322	0.0379	0.0799	0.1121	**0.396**	0.0060
Proportion Legal & Marked	0.0226	0.0529	0.0038	0.0615	0.0721	**0.213**	0.0034
Proportion Legal & Unmarked	0.0226	0.1058	0.0265	0.0553	0.0801	**0.290**	0.0060
Proportion Sublegal & Marked	0.0113	0.0793	0.0341	0.0184	0.0401	**0.183**	0.0116
Proportion Sublegal & Unmarked	0.0453	0.0132	0.0303	0.1045	0.1202	**0.314**	0.0240

Appendix F.

Area 6 Chinook Mark Rates from Voluntary Trip Reports (VTR)

Chinook Encounters from Test Boats by Legal/Sublegal and Marked/Unmarked

Week		**27**	**28**	**29**	**30**	**31**	**Grand Total**
Legal-size	Marked	3	6	4	10	6	**29**
	Unmarked	3	13	5	13	4	**38**
Sublegal-size	Marked	0	0	0	5	0	**5**
	Unmarked	0	2	0	6	0	**8**

Rates	**27**	**28**	**29**	**30**	**31**
Legal-size Mark Rate	50%	32%	44%	43%	60%
Sublegal-size Mark Rate		0%		45%	
Combined Mark Rate	50%	29%	44%	44%	60%
Proportion Legal & Marked	50%	29%	44%	29%	60%
Proportion Legal & Unmarked	50%	62%	56%	38%	40%
Proportion Sub & Marked	0%	0%	0%	15%	0%
Proportion Sub & Unmarked	0%	10%	0%	18%	0%

Weekly Weighted Rates	27	28	29	30	31	Season-long Weighted Rate	Variance
% Catch	0.044	0.144	0.175	0.252	0.386		
Legal-size Mark Rate	0.0222	0.0454	0.0776	0.1093	0.2315	**0.486**	0.0102
Sublegal-size Mark Rate	na	na	na	na	na	**na**	na
Combined Mark Rate	0.0222	0.0411	0.0776	0.1110	0.2315	**0.483**	0.0116
Proportion Legal & Marked	0.0222	0.0411	0.0776	0.0740	0.2315	**0.446**	0.0188
Proportion Legal & Unmarked	0.0222	0.0890	0.0970	0.0962	0.1544	**0.459**	0.0082
Proportion Sublegal & Marked	0.0000	0.0000	0.0000	0.0370	0.0000	**0.037**	0.0041
Proportion Sublegal & Unmarked	0.0000	0.0137	0.0000	0.0444	0.0000	**0.058**	0.0058

Appendix G.

Chinook Mortalities in the Recreational Chinook Selective Fisheries in Areas 5 and 6

July 5 - August 3, 2003

Area 5

Total Encounters (E) **15647** (2529 Retained + 13118 Released from Creel Estimate)

V(E) 1706572

Test fishing proportions are used to split total encounters into legal marked/legal un-marked/sub-legal marked/sub-legal unmarked

	Test Fishery	V(TF)	Encounters	Retained	V(Ret)	Mort Rate	Mortality	Released	sfm	Mortality	Total Mort	VAR	StErr	LCI	UCI	%SE
% legal marked	0.197	0.0025	3089	2476	64195	100%	2476	613	15%	92	2568	61628	248	2081	3054	0.097
% legal Unmarked	0.254	0.0044	3974	53	131572	100%	53	3921	15%	588	641	121797	349	-43	1325	0.544
% sub-legal marked	0.148	0.0022	2323					2323	20%	465	465	22801	151	169	761	0.325
% sub-legal unmarked	0.400	0.0037	6260					6260	20%	1252	1252	47490	218	825	1679	0.174
	Total		**15647**				**2529**	**13118**		**2397**	**4926**					

Area 6

Total Encounters (E) **2686** (964 Retained + 1723 Released from Creel Estimate)

V(E) 33748

Test fishing proportions are used to split total encounters into legal marked/legal un-marked/sub-legal marked/sub-legal unmarked

	Test Fishery	V(TF)	Encounters	Retained	V(Ret)	Mort Rate	Mortality	Released	sfm	Mortality	Total Mort	VAR	StErr	LCI	UCI	%SE
% legal marked	0.439	0.0027	1179	941	8386	100%	941	238	15%	36	977	6643	82	817	1136	0.083
% legal Unmarked	0.485	0.0095	1303	22	17822	100%	22	1281	15%	192	214	14597	121	-23	451	0.564
% sub-legal marked	0.028	na	74					74	20%	15	15	na	na	na	na	na
% sub-legal unmarked	0.049	na	131					131	20%	26	26	na	na	na	na	na
	Total		**2686**				**963**	**1723**		**269**	**1232**					

Computation of Variance on Total Mortality

E = Encounters

PPN Test = Proportions legal marked or legal unmarked or sub-legal marked or sub-legal unmarked from test fishery

sfm = Selective Fishery Mortality Rate

Variance = (1-sfm)^2 * V(Ret) + (E^2 * V(TF) + V(Tot Enc) * PPN Test^2) * sfm^2

Appendix H. Observed recoveries of coded wire tags from Chinook salmon during the Chinook Mark-Selective Fisheries in Marine Areas 5 and 6, July 5 through August 3, 2003.

Area	RecovDate	Tagcode	RcvMark	FKLcm	BroodYr	RearingHatchery	ReleaseSite	ReleaseAgency
05	Aug 1 2003	050182	AD Fin Clp	80	1999	MAKAH NFH ON SOOES R	SOOES R 20.0015	FWS
05	Jul 14 2003	054421	AD Fin Clp	87	1999	SPRING CR NFH	SPRING CR 29.0159	FWS
05	Jul 20 2003	054523	AD Fin Clp	84	2000	SPRING CR NFH	SPRING CR 29.0159	FWS
05	Aug 2 2003	060270	AD Fin Clp	61	2000	MOKELUMNE R FISH INS	JERSEY PT,SAN JOAQ.R	EBMD
05	Jul 27 2003	065459	AD Fin Clp	57	2000	NIMBUS FISH HATCHERY	WICKLAND OIL NET PEN	CDFG
05	Aug 2 2003	093250	AD Fin Clp	65	2000	BIG CR HATCHERY	BIG CR (LWR COL R)	ODFW
05	Jul 8 2003	093250	AD Fin Clp	63	2000	BIG CR HATCHERY	BIG CR (LWR COL R)	ODFW
05	Jul 27 2003	093250	AD Fin Clp	67	2000	BIG CR HATCHERY	BIG CR (LWR COL R)	ODFW
05	Jul 8 2003	182811	AD Fin Clp	62	2000	H-COWICHAN R	R-COWICHAN BAY	CDFO
05	Jul 21 2003	184124	AD Fin Clp	81	1999	H-CHILLIWACK R	R-CHILLIWACK R	CDFO
05	Jul 19 2003	184336	AD Fin Clp	92	1999	H-NANAIMO R	R-NANAIMO R	CDFO
05	Aug 3 2003	184539	AD Fin Clp	72	2000	H-COWICHAN R	R-COWICHAN R	CDFO
05	Aug 1 2003	184551	AD Fin Clp	65	2000	H-CHEHALIS R	R-CHEHALIS R	CDFO
05	Jul 6 2003	184552	AD Fin Clp	58	2000	H-NANAIMO R	R-NANAIMO R	CDFO
05	Jul 26 2003	184614	AD Fin Clp	53	2000	H-CHILLIWACK R	R-CHILLIWACK R	CDFO
05	Aug 1 2003	184916	AD Fin Clp	56	2001	H-CHILLIWACK R	R-CHILLIWACK R	CDFO
05	Aug 1 2003	210135	AD Fin Clp	78	1998	KALAMA CR HATCHERY	KALAMA CR 11.0017	NISQ
05	Jul 21 2003	210151	Unmarked	92	1998	MARBLEMOUNT HATCHERY	SKAGIT R 03.0176	WDFW
05	Aug 1 2003	210153	AD Fin Clp	68	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Aug 3 2003	210153	AD Fin Clp	78	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 6 2003	210153	AD Fin Clp	75	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 13 2003	210153	AD Fin Clp	57	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 25 2003	210153	AD Fin Clp	54	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 25 2003	210153	AD Fin Clp	88	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 26 2003	210153	AD Fin Clp	78	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 27 2003	210153	AD Fin Clp	83	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 30 2003	210153	AD Fin Clp	97	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 30 2003	210153	AD Fin Clp		1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 12 2003	210166	AD Fin Clp	70	1999	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
05	Jul 27 2003	210166	AD Fin Clp	72	1999	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
05	Jul 7 2003	210221	AD Fin Clp	67	1999	BERNIE GOBIN HATCH	TULALIP CR 07.0001	TULA
05	Jul 11 2003	210269	AD Fin Clp	64	2000	KALAMA CR HATCHERY	KALAMA CR 11.0017	NISQ
05	Jul 19 2003	210269	AD Fin Clp	57	2000	KALAMA CR HATCHERY	KALAMA CR 11.0017	NISQ
05	Jul 30 2003	210269	AD Fin Clp	56	2000	KALAMA CR HATCHERY	KALAMA CR 11.0017	NISQ
05	Jul 31 2003	210269	AD Fin Clp	68	2000	KALAMA CR HATCHERY	KALAMA CR 11.0017	NISQ
05	Aug 2 2003	210272	AD Fin Clp	70	2000	BERNIE GOBIN HATCH	TULALIP CR 07.0001	TULA
05	Jul 11 2003	210272	AD Fin Clp	65	2000	BERNIE GOBIN HATCH	TULALIP CR 07.0001	TULA
05	Jul 13 2003	210273	AD Fin Clp	56	2000	BERNIE GOBIN HATCH	TULALIP CR 07.0001	TULA
05	Aug 2 2003	210279	AD Fin Clp	55	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Aug 3 2003	210279	AD Fin Clp	81	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 20 2003	210279	AD Fin Clp	65	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 26 2003	210279	AD Fin Clp	62	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Jul 26 2003	210279	AD Fin Clp	75	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ
05	Aug 2 2003	210294	AD Fin Clp	54	2000	PUYALLUP TRIBAL HATC	DIRU CR 10.0029	PUYA
05	Jul 27 2003	630164	AD Fin Clp	70	1999	MARBLEMOUNT HATCHERY	CASCADE R 03.1411	WDFW
05	Aug 1 2003	630171	AD Fin Clp	87	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Aug 3 2003	630171	AD Fin Clp	79	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 8 2003	630171	AD Fin Clp	56	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 26 2003	630171	AD Fin Clp	77	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 30 2003	630171	AD Fin Clp	73	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 18 2003	630173	AD Fin Clp	77	1999	SAMISH HATCHERY	FRIDAY CR + SAMISH R	WDFW
05	Jul 16 2003	630186	AD Fin Clp	71	1999	COWLITZ SALMON HATCH	TOUTLE R-NF 26.0314	WDFW
05	Aug 3 2003	630189	AD Fin Clp	73	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
05	Jul 6 2003	630189	AD Fin Clp	67	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
05	Jul 13 2003	630196	AD Fin Clp	58	2000	ELOCHOMAN HATCHERY	ELOCHOMAN R 25.0236	WDFW
05	Jul 18 2003	630197	AD Fin Clp	76	1999	MARBLEMOUNT HATCHERY	CASCADE R 03.1411	WDFW
05	Jul 27 2003	630197	AD Fin Clp	84	1999	MARBLEMOUNT HATCHERY	CASCADE R 03.1411	WDFW
05	Jul 21 2003	630279	AD Fin Clp	66	2000	KALAMA FALLS HATCHRY	KALAMA R 27.0002	WDFW
05	Jul 8 2003	630282	AD Fin Clp	61	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 8 2003	630282	AD Fin Clp	68	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 13 2003	630282	AD Fin Clp	62	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 25 2003	630282	AD Fin Clp	65	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 27 2003	630282	AD Fin Clp	69	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Aug 1 2003	630398	AD Fin Clp	64	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 31 2003	630399	AD Fin Clp	70	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 31 2003	630399	AD Fin Clp	70	2000	PORTAGE BAY HATCHERY	PORTAGE BAY/SHIP CNL	UW
05	Jul 26 2003	630469	AD Fin Clp	58	1999	SIMILKAMEEN HATCHERY	SIMILKAMEEN R 490325	WDFW

Appendix H. Continued.

Area	RecovDate	Tagcode	RcvMark	FKLcm	BroodYr	RearingHatchery	ReleaseSite	ReleaseAgency
05	Jul 5 2003	630476	AD Fin Clp	62	1999	LYONS FERRY HATCHERY	SNAKE R-LOWR 33.0002	WDFW
05	Jul 13 2003	630476	AD Fin Clp	58	1999	LYONS FERRY HATCHERY	SNAKE R-LOWR 33.0002	WDFW
05	Jul 7 2003	630668	AD Fin Clp	57	2000	WALLACE R HATCHERY	WALLACE R 07.0940	WDFW
05	Jul 13 2003	630669	AD Fin Clp	55	2000	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 27 2003	630669	AD Fin Clp	53	2000	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW
05	Jul 26 2003	630677	AD Fin Clp	56	2000	LYONS FERRY HATCHERY	BIG CANYON ACCL POND	NEZP
06	Aug 2 2003	630683	AD Fin Clp	69	2000	GEORGE ADAMS HATCHRY	PURDY CR 16.0005	WDFW
06	Jul 24 2003	630683	AD Fin Clp	60	2000	GEORGE ADAMS HATCHRY	PURDY CR 16.0005	WDFW
06	Jul 27 2003	630683	AD Fin Clp	58	2000	GEORGE ADAMS HATCHRY	PURDY CR 16.0005	WDFW
06	Aug 1 2003	630687	AD Fin Clp	53	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
06	Jul 11 2003	630687	AD Fin Clp	56	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ
06	Jul 16 2003	630697	AD Fin Clp	70	1999	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Aug 1 2003	630789	AD Fin Clp	55	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 19 2003	630789	AD Fin Clp	71	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Aug 2 2003	630790	AD Fin Clp	55	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 8 2003	630790	AD Fin Clp	52	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 26 2003	630790	AD Fin Clp	55	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 30 2003	630793	AD Fin Clp	56	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 27 2003	630794	AD Fin Clp	51	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 26 2003	630795	AD Fin Clp	50	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 11 2003	630867	AD Fin Clp	56	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 11 2003	630867	AD Fin Clp	63	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 27 2003	630867	AD Fin Clp	58	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Aug 2 2003	630868	AD Fin Clp	56	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Aug 1 2003	630872	AD Fin Clp	55	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 26 2003	630872	AD Fin Clp	59	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 27 2003	630872	AD Fin Clp	54	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 5 2003	630877	AD Fin Clp	55	2000	WASHOUGAL HATCHERY	WASHOUGAL R 28.0159	WDFW
06	Jul 24 2003	630989	AD Fin Clp	58	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Aug 2 2003	630990	AD Fin Clp	53	2000	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW
06	Jul 26 2003	630995	AD Fin Clp	50	2000	WELLS HATCHERY	COLUMBIA NEAR WELLS	WDFW
06	Jul 27 2003	631272	AD Fin Clp	53	2000	EASTBANK + DRYDEN	WENATCHEE R 45.0030	WDFW
06	Aug 2 2003	631273	AD Fin Clp	48	2000	LYONS FERRY HATCHERY	SNAKE R-LOWR 33.0002	WDFW
06	Jul 27 2003	631273	AD Fin Clp	49	2000	LYONS FERRY HATCHERY	SNAKE R-LOWR 33.0002	WDFW
06	Jul 21 2003	631312	AD Fin Clp	83	1999	COWLITZ SALMON HATCH	COWLITZ R 26.0002	WDFW

Appendix I-1. Observed harvested Chinook salmon with Double Index Tag (DIT) coded wire tags during the 2003 Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3.

Area	Recovery Date	Tag Code	Brood Year	Rearing Hatchery	Release Site	Release Agency	Fork Length (CM)
05	Jul 21 2003	184124	1999	H-CHILLIWACK R	R-CHILLIWACK R	CDFO	81
05	Jul 26 2003	184614	2000	H-CHILLIWACK R	R-CHILLIWACK R	CDFO	53
05	Aug 1 2003	184916	2001	H-CHILLIWACK R	R-CHILLIWACK R	CDFO	56
05	Aug 1 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	68
06	Aug 3 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	78
06	Jul 6 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	75
05	Jul 13 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	57
05	Jul 25 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	88
06	Jul 25 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	54
06	Jul 26 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	78
05	Jul 27 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	83
06	Jul 30 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	
06	Jul 30 2003	210153	1999	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	97
06	Jul 12 2003	210166	1999	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ	70
05	Jul 27 2003	210166	1999	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ	72
05	Aug 2 2003	210279	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	55
06	Aug 3 2003	210279	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	81
05	Jul 20 2003	210279	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	65
05	Jul 26 2003	210279	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	75
05	Jul 26 2003	210279	2000	GROVERS CR HATCHERY	GROVERS CR HATCHERY	SUQ	62
05	Aug 1 2003	630171	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	87
06	Aug 3 2003	630171	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	79
05	Jul 8 2003	630171	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	56
06	Jul 26 2003	630171	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	77
06	Jul 30 2003	630171	1999	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	73
06	Jul 18 2003	630173	1999	SAMISH HATCHERY	FRIDAY CR + SAMISH R	WDFW	77
06	Aug 3 2003	630189	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ	73
06	Jul 6 2003	630189	2000	NISQUALLY HATCHERY	CLEAR CR 11.0013C	NISQ	67
06	Jul 18 2003	630197	1999	MARBLEMOUNT HATCHERY	CASCADE R 03.1411	WDFW	76
05	Jul 27 2003	630197	1999	MARBLEMOUNT HATCHERY	CASCADE R 03.1411	WDFW	84
05	Jul 7 2003	630668	2000	WALLACE R HATCHERY	WALLACE R 07.0940	WDFW	57
05	Jul 13 2003	630669	2000	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	55
05	Jul 27 2003	630669	2000	SOOS CREEK HATCHERY	BIG SOOS CR 09.0072	WDFW	53
05	Aug 2 2003	630683	2000	GEORGE ADAMS HATCHRY	PURDY CR 16.0005	WDFW	69

Appendix I-1. Continued.

Area	Recovery Date	Tag Code	Brood Year	Rearing Hatchery	Release Site		Release Agency	Fork Length (CM)
06	Jul 24 2003	630683	2000	GEORGE ADAMS HATCHRY	PURDY CR	16.0005	WDFW	60
05	Jul 27 2003	630683	2000	GEORGE ADAMS HATCHRY	PURDY CR	16.0005	WDFW	58
05	Aug 1 2003	630687	2000	NISQUALLY HATCHERY	CLEAR CR	11.0013C	NISQ	53
05	Jul 11 2003	630687	2000	NISQUALLY HATCHERY	CLEAR CR	11.0013C	NISQ	56

Appendix I-2. Observed number of Double Index Tagged (DIT) Chinook kept by anglers, and the estimated mortality of unmarked DIT Chinook due to catch and release mortality, during the 2003 Chinook Selective Fishery in Marine Areas 5 and 6, July 5 through August 3.

Hatchery	Brood Year	DIT Tagged fish Observed	Estimated Harvest of Marked DIT fish	Estimated Angler Releases of UnMarked DIT fish	Estimated Mortality of Unmarked DIT fish	Variance of Estimated Mortality of DIT Fish	Standard Error of Estimated Mortality of DIT Fish
George Adams	2000	3	11.42	11.34	1.13	0.32	0.57
Grovers Creek	1999	10	35.16	35.05	3.51	0.98	0.99
Grovers Creek	2000	5	19.78	20.05	2.01	0.61	0.78
Chilliwack	1999	1	4.07	4.00	0.40	0.12	0.35
Chilliwack	2000	1	4.07	4.08	0.41	0.13	0.35
Chilliwack	2001	1	4.18	4.10	0.41	0.13	0.36
Marblemount	1999	2	6.54	6.66	0.67	0.17	0.41
Nisqually	1999	2	7.47	7.32	0.73	0.14	0.37
Nisqually - A	2000	2	4.95	5.36	0.54	0.09	0.31
Nisqually - B	2000	2	9.90	9.78	0.98	0.39	0.63
Samish	1999	1	2.48	2.54	0.25	0.04	0.20
Soos Creek	1999	5	19.08	19.52	1.95	0.62	0.79
Soos Creek	2000	2	8.71	9.08	0.91	0.36	0.60
Wallace	2000	1	5.71	5.84	0.58	0.28	0.53
Total		38			14.47		