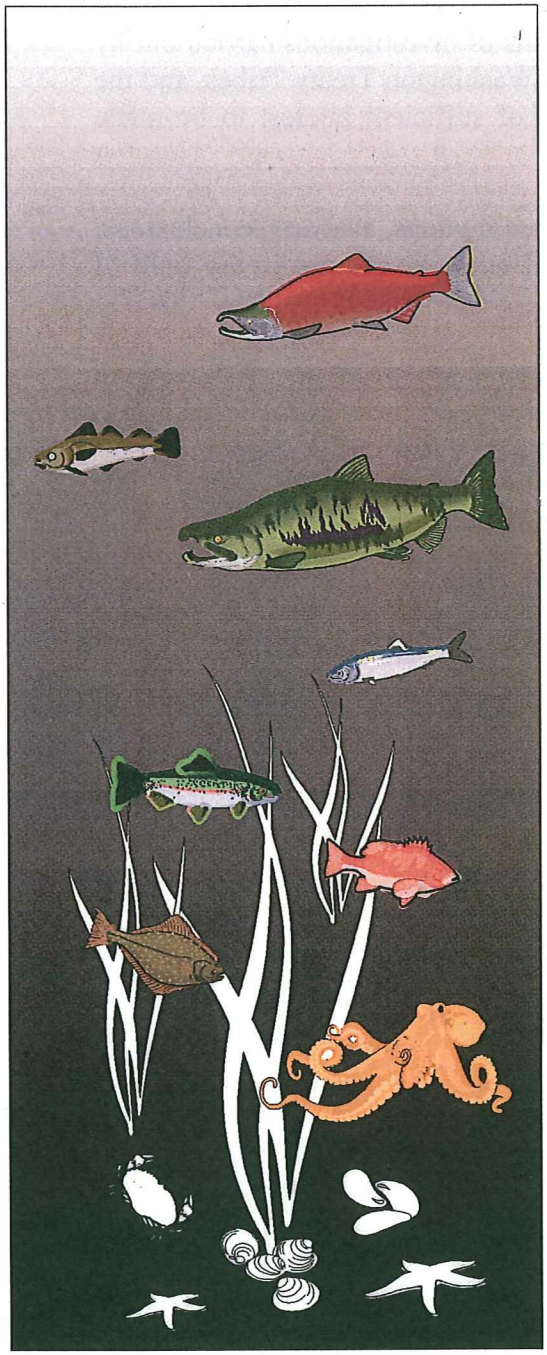
Northwest Fishery Resource Bulletin



Salmon Smolt Catch by a Rotary Screwtrap Operated in the Nooksack River: 1994-1999

by

Michael T. MacKay
Lummi Natural Resources Department

Data Report Series No. 1

Northwest Fishery Resource Bulletin

Manuscript Series

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Data Report Series No. 1

December 2000

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Abstract

The pending listing of chinook salmon stocks in the Nooksack River under the Endangered Species Act prompted the Lummi Natural Resources Department to investigate methods of assessing the status of these populations. Presently, habitat restoration projects are being implemented in the Nooksack Watershed with uncertain benefits to these stocks. This project provides one potential means of assessing the success of these and other changes in land use practices deemed necessary to recover native chinook salmon populations in the Nooksack River.

This report summarizes six years of data collection, from 1994 to 1999, by the Lummi Natural Resources Department during the operation of a salmon smolt trap located in the lower Nooksack River mainstem. Out-migrant smolt sampling typically occurred between 1 April and 31 July each year. Operation of the screwtrap has followed a random sampling design since 1996. Since 1997 sampling has been scheduled to occur every other day during the period of trap operation. Each sample period was about 6-hours in duration with a randomly selected start time of either 0000, 0600, 1200, or 1800 hours.

A detailed description of the study methods is presented in Use of a Rotary Screwtrap to Monitor the Out-migration of Chinook Salmon Smolts from the Nooksack River: 1994-1998 (Conrad and MacKay, 2000). This report includes information on trap efficiency experiments using zero-age chinook salmon that may be useful in interpreting the catch data presented here for the other salmon species.

This report includes a brief analysis of the screwtrap catch and effort data. Supporting information on river discharges and upriver hatchery releases is provided. A subset of the available salmonid fork length data is also included.

Future development of smolt production estimates using this data may be possible provided trap calibration studies are performed for the species in question.

A determination of the contribution of hatchery-reared salmon to trap catches must be made in order to develop smolt production estimates for native chinook and coho salmon. This is problematic for species where there are hatchery releases without adipose fin clips on 100% of those released. Unfortunately, only hatchery steelhead salmon have received adipose fin clips on all fish released.

Non-lethal DNA tissue samples were taken from a sub-sample of chinook salmon beginning in 1997 to investigate the feasibility of estimating stock contributions using DNA analysis. Production estimates for individual Nooksack River chinook salmon stocks will be provided when the DNA analysis is completed.

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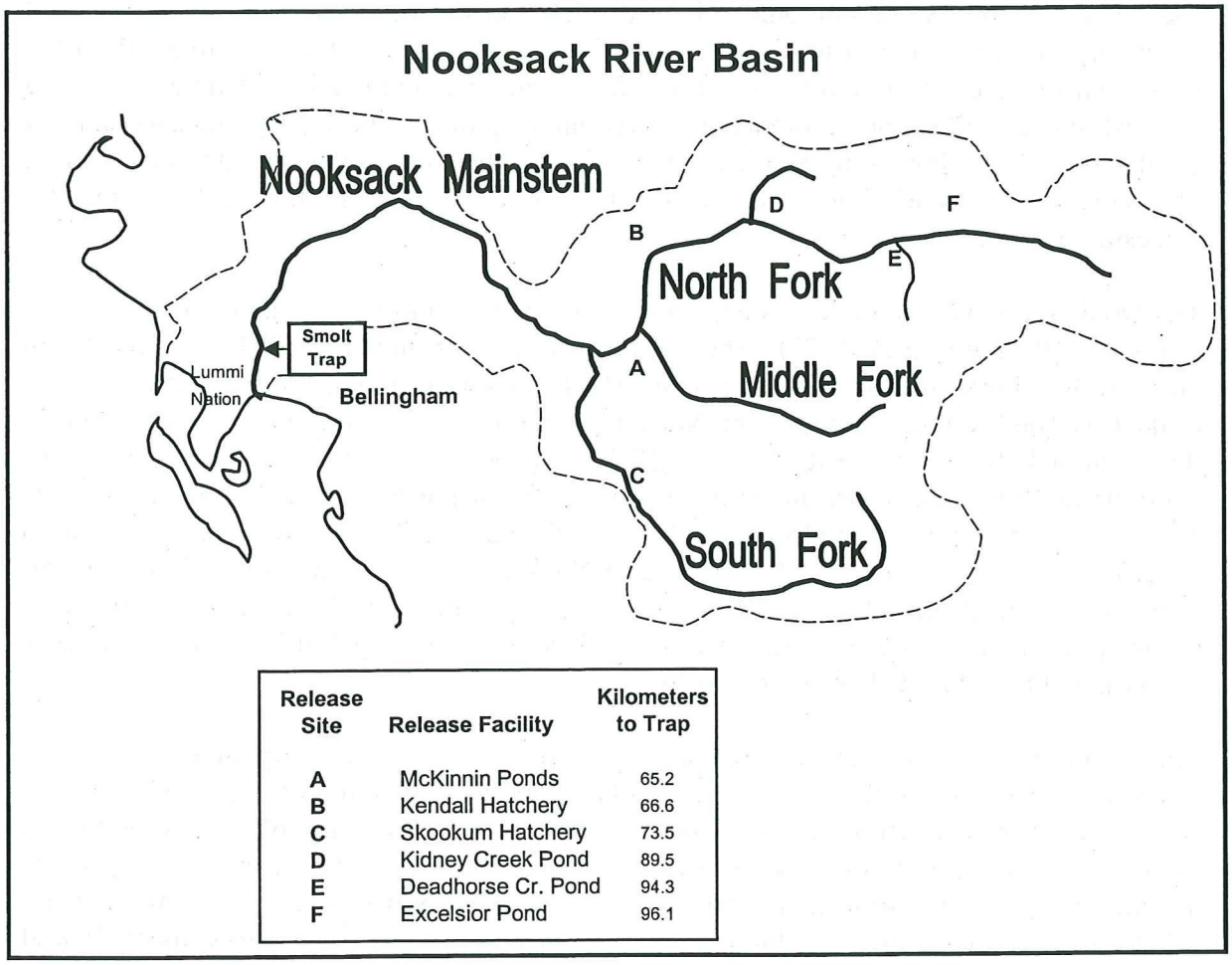
Introduction

The Lummi Natural Resources Department has a long-range goal of estimating the freshwater production of native chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), and pink (*O. gorbuscha*) salmon and steelhead trout (*O. mykiss*) originating from the Nooksack River. The level of smolt production from the river reflects the quantity and quality of freshwater salmonid habitat available in the watershed. Future analysis of basin spawner/recruitment estimates may provide an indication of the overall health of the watershed relative to salmonid production. Smolt out-migration estimates may be used to forecast future adult salmon returns to the river and help determine appropriate harvest rates for these stocks. Monitoring smolt out-migration in the lower river also provides insight into hatchery/wild stock interactions that impact weak populations limited by freshwater and estuary habitats.

The Nooksack River basin covers approximately 2,046,100 km^2, of which 126,651 km^2 is in Canada (Williams et al. 1975). The Nooksack River has three principal forks, the North Fork, Middle Fork, and South Fork (Figure 1). Each fork originates in the western slopes of the Cascade Mountain Range. The North Fork and the South Fork enter the mainstem of the Nooksack River at about river km 58.9. The Middle Fork enters the North Fork approximately 6.2 km upstream from the confluence of the North and South Forks. The North and Middle Forks are glacially fed. More than 500 km of the river are accessible to anadromous fish (Williams et al. 1975). The Nooksack River supports populations of all five species of Pacific Salmon (*Oncorhynchus spp.*) plus anadromous populations of steelhead trout (*O. mykiss*), cutthroat trout (*Salmo clarki*), Dolly Varden trout (*Salvelinus malma*), and Bull Trout (*Salvelinus confluentus*).

This report summarizes six years of sampling with a rotary screwtrap in the Nooksack River mainstem, 1994 through 1999. Included in this data report are catches of all salmonids by the screwtrap, hours of trap operation, and a discussion of factors thought to affect the screwtrap catches. The location of the screwtrap in the lower mainstem captures stream flow from all sources in the basin except from Silver Creek, a small lowland tributary below the screwtrap which drains an area of 40,922 km^2 or approximately 2% of the basin.

This investigation began as a feasibility study in 1994 and gradually expanded in operation and design. Currently, a primary objective of this study is to provide baseline abundance data useful for detecting changes in Nooksack River salmon production, especially for native chinook, coho, and chum salmon stocks.



Release Site	Release Facility	Kilometers to Trap
A	McKinnin Ponds	65.2
B	Kendall Hatchery	66.6
C	Skookum Hatchery	73.5
D	Kidney Creek Pond	89.5
E	Deadhorse Cr. Pond	94.3
F	Excelsior Pond	96.1

Figure 1. Map of the Nooksack River watershed showing the Nooksack Basin, location of the screwtrap, hatcheries, and off-station hatchery release sites (map not to scale).

A long-range objective is to develop smolt out-migration estimates for specific stocks of chinook, coho, chum, and pink salmon. A separate report (Conrad and MacKay 2000), presents summaries and analyses for the chinook salmon smolt out-migration data from 1994 through 1998. This report also discusses an index of relative abundance for chinook salmon smolts in 1996, 1997, and 1998. This document provides additional details on the sampling methods used in the collection of the data presented here.

Statistical weeks used in this report are defined by the mid-week date (on Wednesday) for the years indicated (Appendix A). Summaries of catch data by set and statistical week are provided in Appendices C and D. Average daily discharge for the Nooksack River is reported in Appendix B for each day during the screwtrap sampling season.

As this is a data report, data analysis is limited. We encourage others to utilize this information to provide an assessment of abundance for species other than chinook. Future calibration experiments using coho, chum, and pink salmon may provide information that will allow production estimates to be made for these species using the screwtrap catch and effort data provided here.

Methods

Screwtrap Description

The rotary screwtrap used in this study is a modification of the original designed by E. G. Solutions[1]. A more detailed description of the screwtrap can be found in Conrad and MacKay (2000). Figure 2 shows the trap in both the raised and operating configurations. The opening of the screwtrap is 2.43 m in diameter which gives it an effective sampling depth of 1.2 m. The area of the screwtrap opening is 4.68 m^2 and the trap has an effective sampling area of 2.34 m^2.

The cone and livebox assembly are unmodified from the manufacturer. They are attached to a steel frame that can be raised and lowered as shown in Figure 2. The frame is attached to overhead supports which are mounted on pontoons which are 7.3 m long and 4.6 m wide. The pontoons and overhead supports are fabricated from aluminum and are of our own design. The pontoons are assembled from four smaller sections and two crosswalk members allowing them to be more easily transported to remote locations. Plans for the floats are available from the author on request.[2]

The trap is positioned near the thalweg as shown in Figure 3 using three, 9.5 mm (3/8″) low stretch synthetic "Spectron 12"[3] cables. Two of the cables are attached to hand winches mounted on each pontoon. The winches are rated for two tons and have a 22:1 mechanical advantage. The winch-lines run through a snatch block mounted on a stanchion attached to the pontoons which raises the lines crossing the river to avoid interfering with boat traffic. A third cable spans the river overhead slightly upstream of the trap. A snatch block attached to the trap with a bow bridle runs free on the cable crossing the river. All lines are secured to large trees on each bank approximately 3-4 m above ground level. The "Spectron" cable used in this rigging system has a working load similar to 3/8″ galvanized steel cable. This synthetic cable has a great advantage over steel cable as it is lightweight which reduces cable sag and is much easier to handle and store. A 12′ aluminum skiff with a 6-horsepower motor is used to transport the crew between the trap and the stream bank.

An emergency quick-release fitting is installed on the right bank (facing downstream) so that both cables can be released from the shore in an emergency. This allows the trap to swing to the sand bar side of the channel where the river is less swift and river debris is less abundant. When not operating, the screwtrap is always winched to the sand-bar side of the channel and secured to protect it from river debris.

The screwtrap site is located 7.6 km upstream (≈ 4.8 river miles) from the mouth of the Nooksack River. This section of river is constrained by flood control levees on both banks. The distance between the levees at this location is approximately 101 m. The channel depth at the sampling site is approximately 3.3 m at a low flow river discharge of 2,850 cfs[4].

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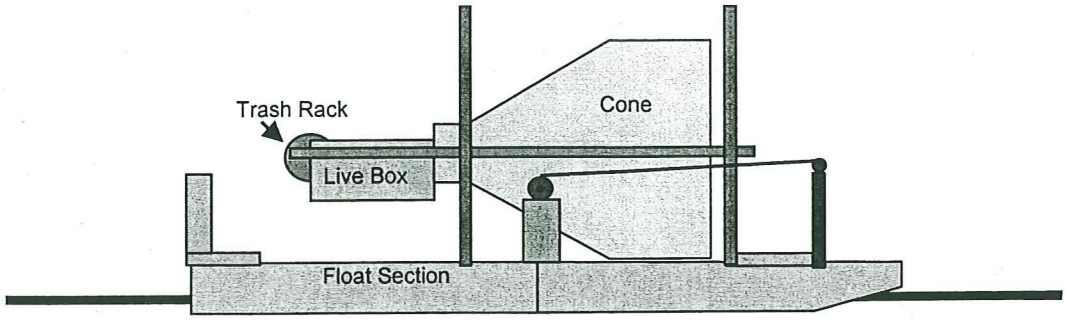
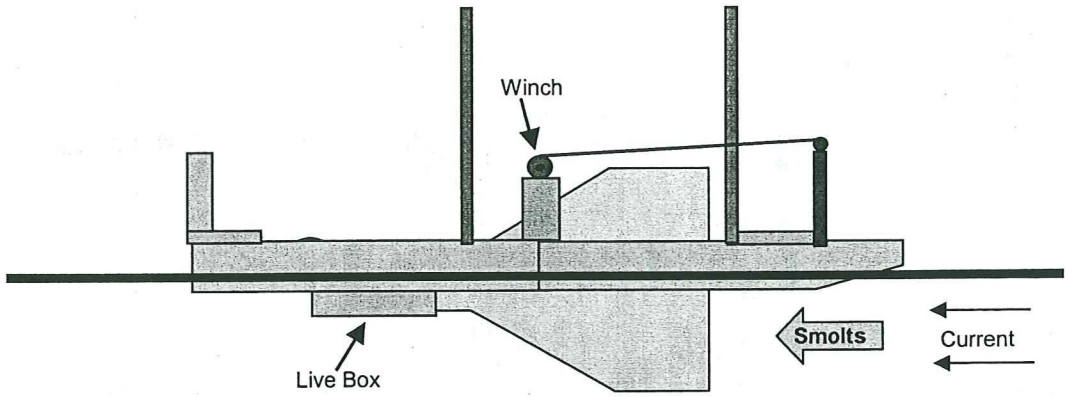
[1] E. G. Solutions, Inc. PO Box 2437, Corvallis, OR 97339. Phone: (541) 752-7810.
[2] Lummi Natural Resources Department, 2616 Kwina Road, Bellingham, WA 98226. Phone: (360) 384-1489
[3] Samson Ocean Systems, Inc., 2090 Thornton St., Ferndale, WA 98248 Phone: (360) 384-4669
[4] Cubic feet per second.



Screwtrap Not Fishing



Screwtrap Fishing

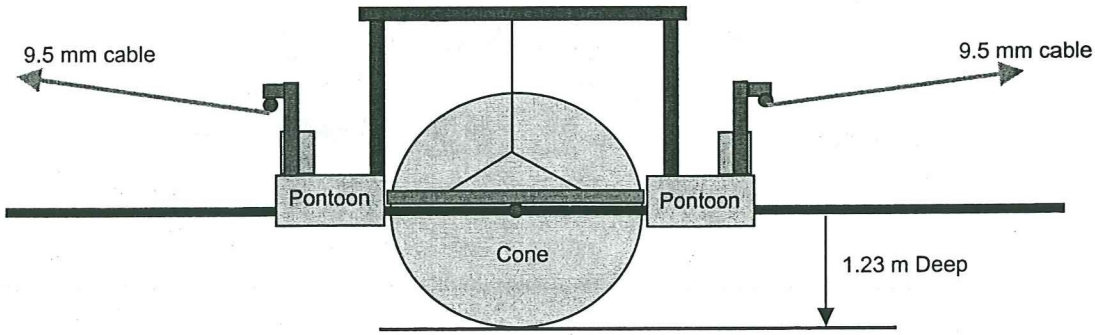


Figure 2. Schematic diagrams of the modified rotary screwtrap, designed by E.G. Solutions Inc., which was operated in the lower Nooksack River during the smolt out-migration study.

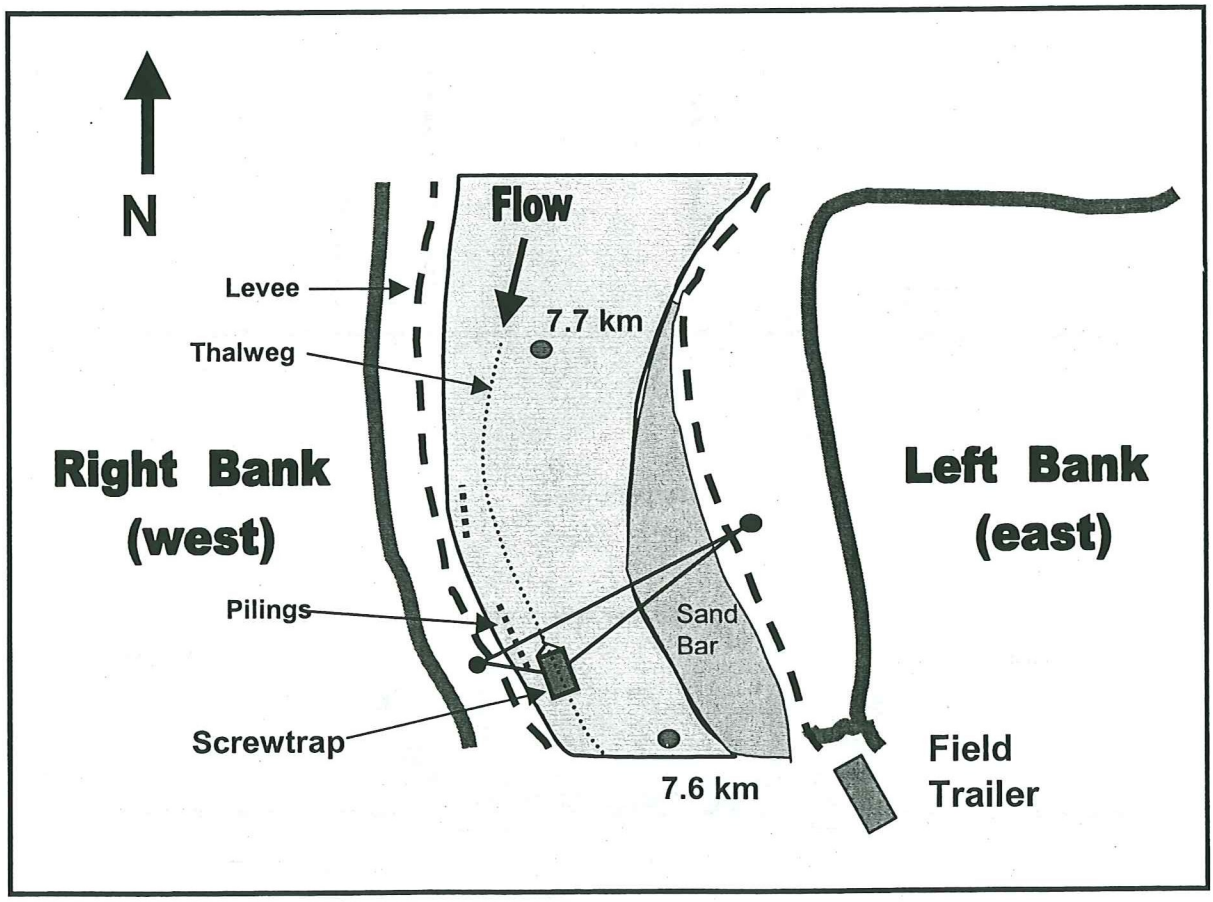


Figure 3. Schematic of the site in the mainstem of the lower Nooksack River where the screwtrap was operated, 1994-1999 (not drawn to scale). Distances are km from the river mouth.

The channel cross-section of the river at this site was measured in 1994, 1996, 1997, and 1998. In 1997, we calculated the cross-sectional areas for a low flow condition of 3,000 cfs, a medium flow of 5,000 cfs, and high flow of 8,000 cfs. The percent of this channel cross-section covered by the screwtrap opening is approximately 3.4%, 2.0%, and 0.8% for low, medium, and high flow conditions, respectively. Generally, the trap is not operational during flows which exceed 8,000 cfs due to the large amount of debris in the river which threatens the safety of the trap and crew.

Screwtrap Effort

Details of the sampling effort by the trap during each year are presented in Conrad and MacKay (2000). In 1996, 1997, 1998, and 1999 we used a randomized schedule to select a start time for each set. We define a set as the period of time when the screwtrap is sampling (i.e., that time during which the cone is submerged up to its central axis and the cone is rotating). In 1997, 1998, and 1999 we attempted to operate the trap for a standard six-hour set every other day. Starting times each day were randomly selected from 0000, 0600, 1200, or 1800 hours. In 1996 we used a four-hour set length starting at 0000, 0400, 0800, 1200, 1600, or 2000 hours as determined by a randomized schedule. In 1994 and 1995, we generally fished a six-hour period during daylight hours on three of four consecutive weekdays between 0900 and 1500 hours.

Deviation from the schedule occurred when river debris and flows were too high (the most frequent cause) or when we experience damage to the gear as a result of debris encounters. Infrequently a set is canceled or delayed due to human factors. We never experienced down time as a result of mechanical breakdown that was not caused by debris damage.

Screwtrap Data Collection

To begin a set, the screwtrap is first positioned over the thalweg using the hand-winches. The distance to nearby pilings provides a reference to determine when the trap is in the sampling position, which is approximately 4 m west of the thalweg. This position has the highest surface water velocity; at a discharge of 5,000 cfs (medium flow) the surface velocity at this location is approximately 1 m per second.

Once in position, the frame securing the cone and live-box assembly is lowered using small hand winches. The exact time is noted when the shaft contacts the surface of the water. This is recorded as the "start time" of the set. A sample of our data form is in Appendix H.

At the start of each set, we record the shaft rotational speed and the secchi depth of the water. The secchi depth is a measure of vertical water transparency. This measurement is taken by lowering a 21 cm diameter limnological secchi disk attached to a pole into the water until it is not visible. The distance from the water's surface to the disk is then recorded. The secchi depth has become a primary indicator of trap capture efficiency as discussed later and reported in Conrad and MacKay (2000).

Other information recorded at the start of each set includes water color, water temperature, type and amount of river debris, wind and sky conditions.

When river debris and/or catches are abundant, the crew remains on the trap for the duration of the set to continuously process the catch and to remove sticks, logs, etc. from the cone and live-box as needed. Occasionally, when a stick or log gets stuck in the trap opening, the cone end is raised temporarily to remove the obstruction while leaving the live-box in the river. The time is noted so that this temporary interruption in sampling can be subtracted from the overall set time.

Prior to the end of each set, another secchi depth measurement is taken. The frame, cone, and live-box assembly is raised at an angle so that the water depth in the live-box is approximately 0.5 m. The time is then noted to mark the end of the set.

The catch is processed by first removing all accumulated debris in the live-box. Salmon are dipped out of the live-box and either (1) individually identified to species, examined for the presence of an adipose fin clip[5], and tallied or (2) placed immediately in an anesthetic solution to facilitate the collection of fork length measurements, tissue, and scale samples. Occasionally chinook salmon smolts were tallied without determining their adipose fin status to prevent handling mortalities when catches were high (for example, following a hatchery release upriver of the screwtrap) or due to problems caused by debris entering the trap and live box.

Normally every 5th chinook and the first 20 of other species are placed in the anesthetic solution. When the anesthetic takes effect, a fork length measurement is taken. A scale sample and a DNA tissue sample were taken from all chinook salmon in this sub-sample in 1997, 1998, and 1999. The DNA tissue sample is taken by removing the posterior margin of the upper caudal fin lobe with surgical scissors.

The anesthetic solution used was a 100 mg/l concentration of "Tricaine-S" brand tricaine methanesulfonate commonly known as "MS-222". This is the dosage recommended by the manufacturer (Western Chemicals, Inc.). Anesthetized fish were immediately placed in a recovery tank after processing and allowed to fully recover prior to release back into the river.

Data Analysis

Preliminary analysis of the data was conducted. Catches of chinook, coho, and steelhead salmon smolts with and without adipose fins were compiled separately. This was done because all adclipped fish are of hatchery origin while fish with adipose fins are often a mixture of both hatchery and native ("wild") fish. Because fish were sometimes tallied, and the adipose fin status of tallied fish was not determined, it was necessary to allocate tallied fish to one of the adipose fin status groups. This was done by allocating the tallied fish to each group in proportion to their abundance in the sampled fish (whose adipose fin status was

[5] Fish with an adipose fin clip are referred to as adclipped fish.

determined) from the same set. If there were no fish sampled from the set, samples from the set closest in time to the set being allocated were used. All allocations to each group were rounded to the nearest whole fish. This allocation to an adipose fin status group was necessary only for chinook salmon.

Catch per unit effort (CPUE) was calculated as the catch of a species per hour of trap operation. CPUE was calculated for each set, and by day and statistical week. CPUE for a day or statistical week was calculated as the sum of all catches from the appropriate sets divided by the sum of the screwtrap effort for those sets.

Conrad and MacKay (2000) found a strong relationship between the clarity of the water (as measured by secchi disk depth) and the efficiency of the trap in capturing chinook salmon out-migrants. As the clarity of the water increases (secchi depth gets deeper), the efficiency of the trap in catching out-migrating chinook salmon juveniles decreases. This relationship was estimated using capture-efficiency trials conducted by releasing a known number of marked, hatchery-reared chinook salmon smolts upstream of the trap site and then enumerating the number of these marked smolts recaptured at the trap (see Conrad and MacKay 2000 for details). A linear regression model using the inverse of secchi depth as the independent (explanatory) variable best explained the variability in capture efficiency. Two additional capture-efficiency trials were conducted in 1999 which were not included in the analysis by Conrad and MacKay (2000). The results from these two trials were used to update their model for estimating trap capture efficiency for out-migrating chinook salmon smolts from secchi disk depth. Refer to Conrad and MacKay (2000) for more details on the analytical procedures used to estimate this relationship.

Results

Screwtrap Effort

Screwtrap effort in number of hours sampled during each statistical week is shown for all years in Table 1. The shaded area of the table indicates the years where a random sampling plan was used. Also shown is the mid-week date (Wednesday's date in 1995) and the statistical week number. Appendix A shows the actual date of each mid-week day for each year sampled.

Table 1. Summary of the number of hours of screwtrap sampling effort during each statistical week for the years 1994 through 1999.

Statistical Week #	Mid-week Date (1995)	YEAR[a] 1994	1995	1996	1997	1998	1999
12	3/22				4.82		15.66
13	3/29		3.60	20.23	0.00		17.38
14	4/5		16.22	32.00	23.77	5.75	18.05
15	4/12		18.22	33.66	18.00	23.34	23.18
16	4/19		30.57	43.08	14.52	18.46	29.29
17	4/26	22.42	19.01	8.00	16.85	23.33	36.75
18	5/3	28.65	28.43	40.23	11.92	12.47	17.60
19	5/10	21.75	6.98	36.30	18.79	19.87	23.98
20	5/17	22.23	21.06	17.92	13.73	17.17	12.47
21	5/24	16.62	27.16	12.10	24.38	24.57	15.05
22	5/31	0.00	20.37	40.88	17.33	24.25	9.58
23	6/7	26.18	31.70	35.42	18.00	29.21	12.25
24	6/14	22.38	25.92	28.07	18.33	24.47	17.22
25	6/21	25.70	34.71	26.17	16.33	27.02	16.67
26	6/28	35.03	18.53	20.75	24.33	19.10	11.05
27	7/5	20.68	20.76	0.00	24.25	24.85	22.72
28	7/12	14.20	31.99	4.17	5.98	19.17	16.98
29	7/19	2.25	5.95	16.34	18.17	22.84	23.84
30	7/26		10.20	16.25	18.25	18.50	16.50
31	8/2			12.20	12.25		
32	8/9			16.20			
33	8/16			16.55			
	Totals	**258.09**	**371.38**	**476.52**	**320.00**	**354.37**	**356.22**

[a] Shaded area indicates a random sampling design was used to allocate effort during the season.

Annual screwtrap effort ranged from 258.1 hours in 1994 to 476.5 hours in 1996 (Table 2). The average number of hours the screwtrap was fished each sample day was fairly consistent from year to year ranging from 5.9 to 6.8 hours.

Table 2. Summary of the annual sampling effort by the screwtrap operated in the Nooksack River, 1994 through 1999.

YEAR:	1994	1995	1996	1997	1998	1999
Total hours of effort	258.1	371.4	476.5	320.0	354.4	356.2
Number of sets	70	131	129	61	60	71
Days sampled	41	55	76	54	59	61
Mean effort per set (hrs)	3.7	2.8	3.7	5.2	5.9	5.0
Mean daily effort (hrs)	6.3	6.8	6.3	5.9	6.0	5.9
First day of sampling	25-Apr	31-Mar	25-Mar	17-Mar	3-Apr	23-Mar
Last day of sampling	18-Jul	27-Jul	14-Aug	30-Jul	24-Jul	30-Jul

River Discharge

Figures 4A and 4B illustrate the average daily discharge of the Nooksack River measured at the USGS stream gage located at Ferndale, WA, approximately 1.7 km upstream of the screwtrap. Also shown are the days when the trap was in operation. Note the large differences in flow regimes among years and the occasional loss of sampling time due to high flow events. The average daily river discharge values measured by the USGS station are presented in Appendix B.

Logs and debris on sandbars and stream channel margins often re-mobilize during major flow events. This water-borne debris can damage trap components and expose personnel working on the trap to dangerous conditions. We found it is prudent to interrupt sampling during a rapid rise in the river to avoid the long down time which can result from equipment damage.

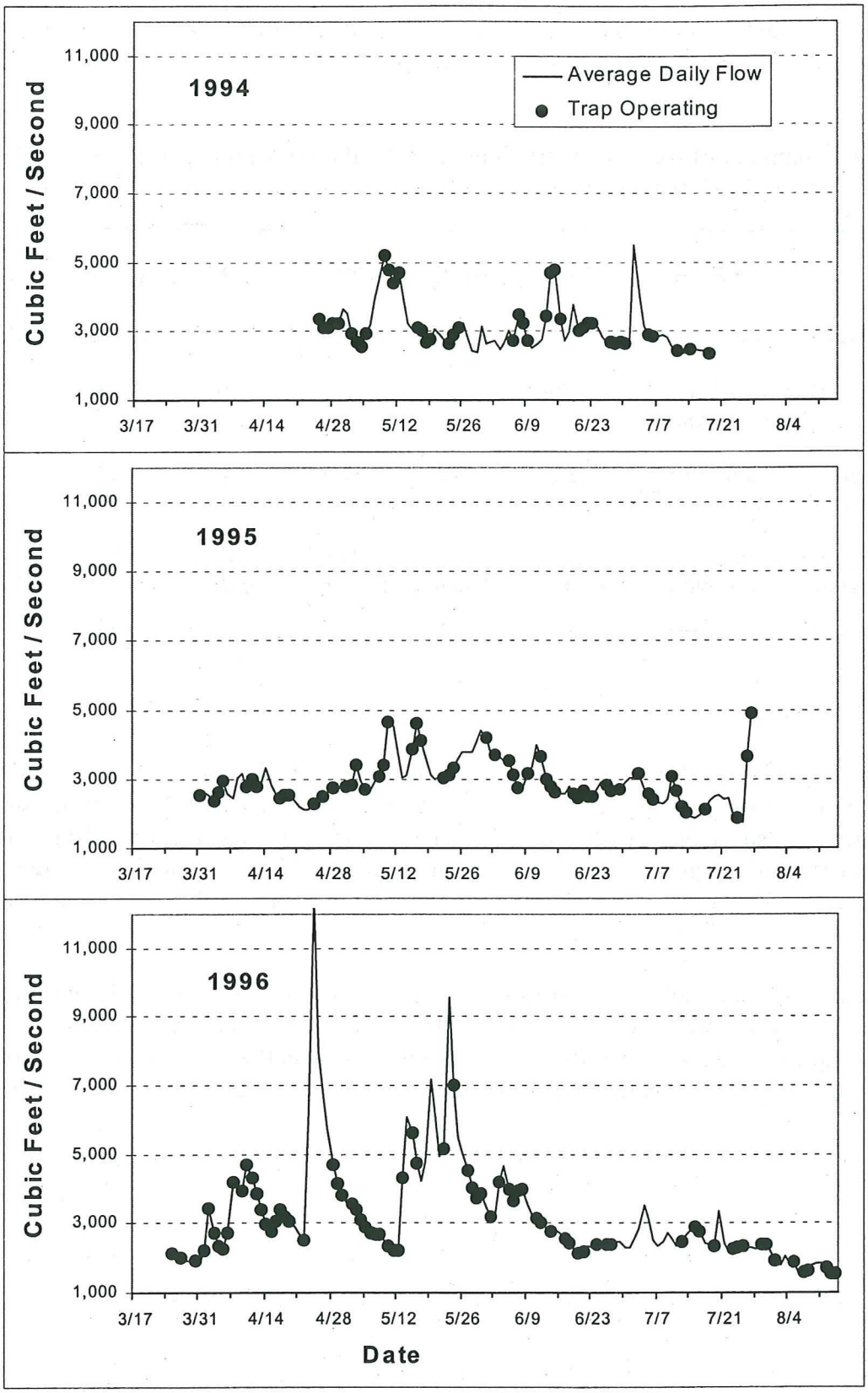


Figure 4A. Average daily discharge of the Nooksack River as measured near Ferndale with days of trap operation indicated (continued next page).

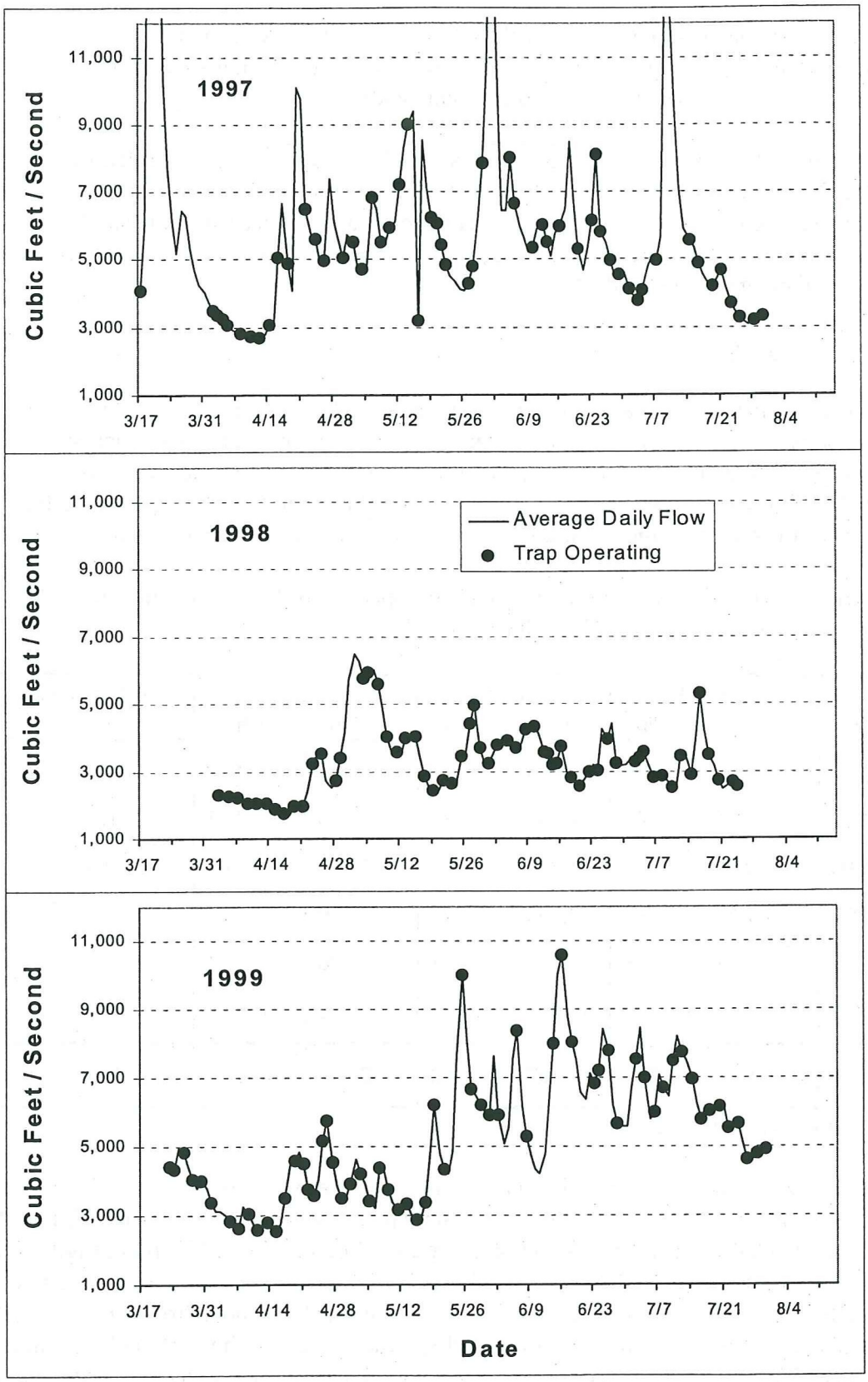


Figure 4B. Average daily discharge of the Nooksack River as measured near Ferndale with days of trap operation indicated.

In 1994, we avoided a major rise in flows on 24 April but were put out of operation for a period of four days during a lesser peak flow event when a log entered the trap opening, stopped the cone rotation, and severed the main shaft.

In 1997 high flow events caused us to miss 16 of the 68 (23.5%) scheduled sampling days. During the six years the trap was operated, 1997 was the worst year for high-flow events. An unusual high flow event late in the season on 9 July increased the river stage to a level that allowed a branch from a floating log to snag and break a towline which caused structural damage to one of the trap floats.

Screwtrap Catches

Appendix C lists screwtrap effort and the catch of all salmonid species of the genus *Oncorhynchus* by set for each year of sampling. Total annual catches of each species by the screwtrap, and the numbers of adclipped chinook, coho, and steelhead captured, are shown in Table 3. Chinook, coho, and chum salmon were the most common species in the catches each year. Pink salmon and steelhead were captured in relatively small numbers.

Table 3. Summary of the annual catch by species by the screwtrap operated in the Nooksack River, 1994 through 1999.

	Chinook		Coho				Steelhead	
Year	Total	Clip.[a]	Total	Clip.[a]	Pink	Chum	Total	Clip.[a]
1994	3,860	908	1,133	37	798	858	59	0
1995	3,163	363	2,698	35	0	21,585	171	39
1996	4,765	246	1,209	28	1,215	11,981	194	63
1997	2,742	382	3,300	29	0	607	213	86
1998	2,329	95	3,313	137	276	1,234	47	0
1999	4,049	259	11,509	76	0	17,287	194	42
Total	20,908	2,253	23,162	342	2,289	53,552	878	230

[a] Fish with an adipose fin clip.

Appendix D summarizes trap effort, catch, and catch per hour for each species by statistical week for each year. Figure 5 compares the annual trends in statistical week CPUE (catch per hour) for each species (Figure 5A chinook; Figure 5B coho; Figure 5C chum; Figure 5D pink; and Figure 5E steelhead). Chinook salmon have the most extended period of abundance in the catches with CPUE values commonly exceeding 5 fish per hour from April through July. The other species have a smaller period of abundance in the catches with coho salmon CPUE exceeding 5 fish per hour from May into mid-June, chum salmon CPUE exceeding 5 fish per hour from April into early June, pink salmon CPUE exceeding 5 fish per hour from March into early May, and steelhead CPUE exceeding 2 fish per hour from late April through May.

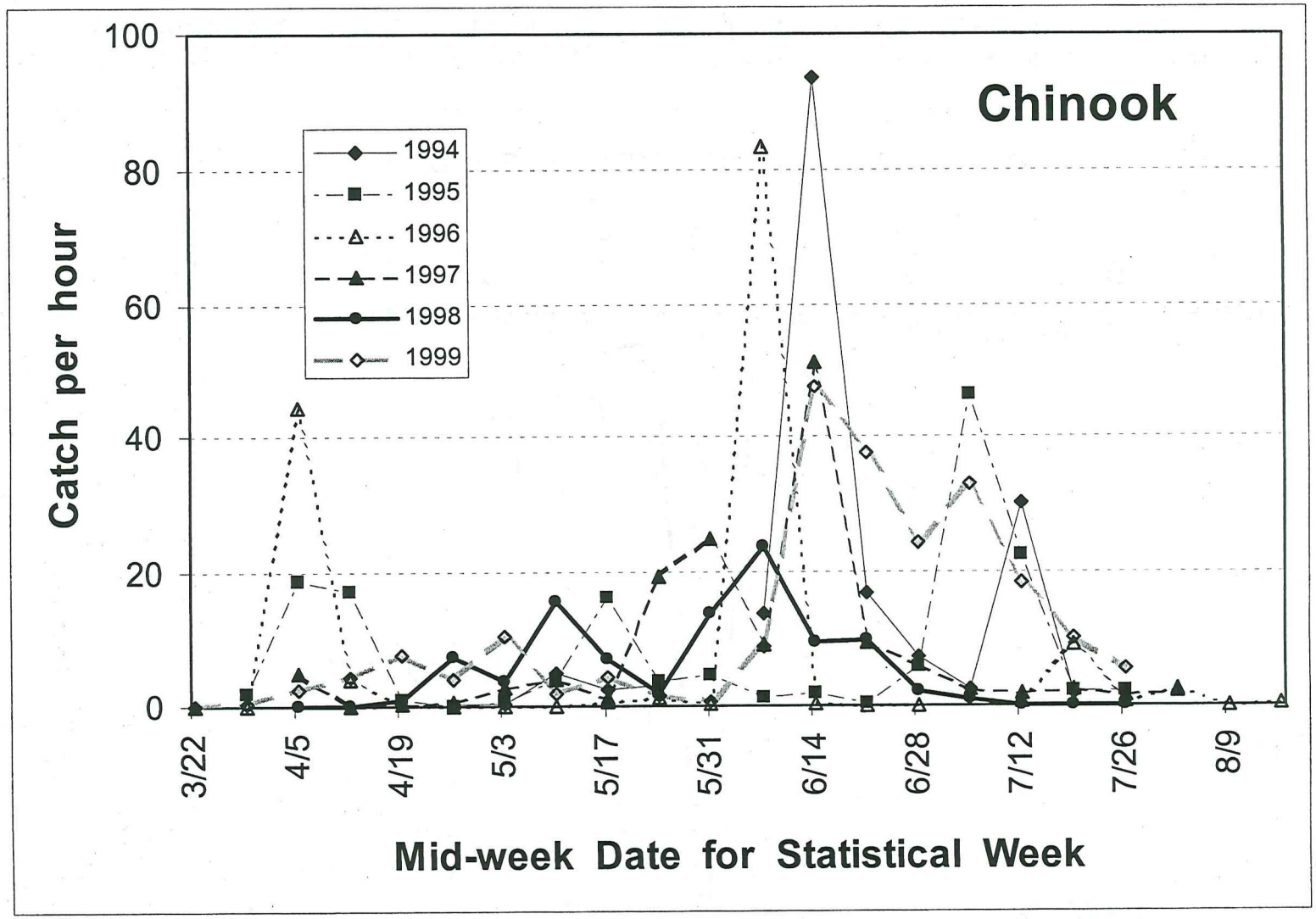


Figure 5A. Catch per hour of chinook salmon smolts by the screwtrap operated in the Nooksack River summarized by statistical week, 1994-1999. Statistical weeks labeled by mid-week date (Wednesday) for 1995.

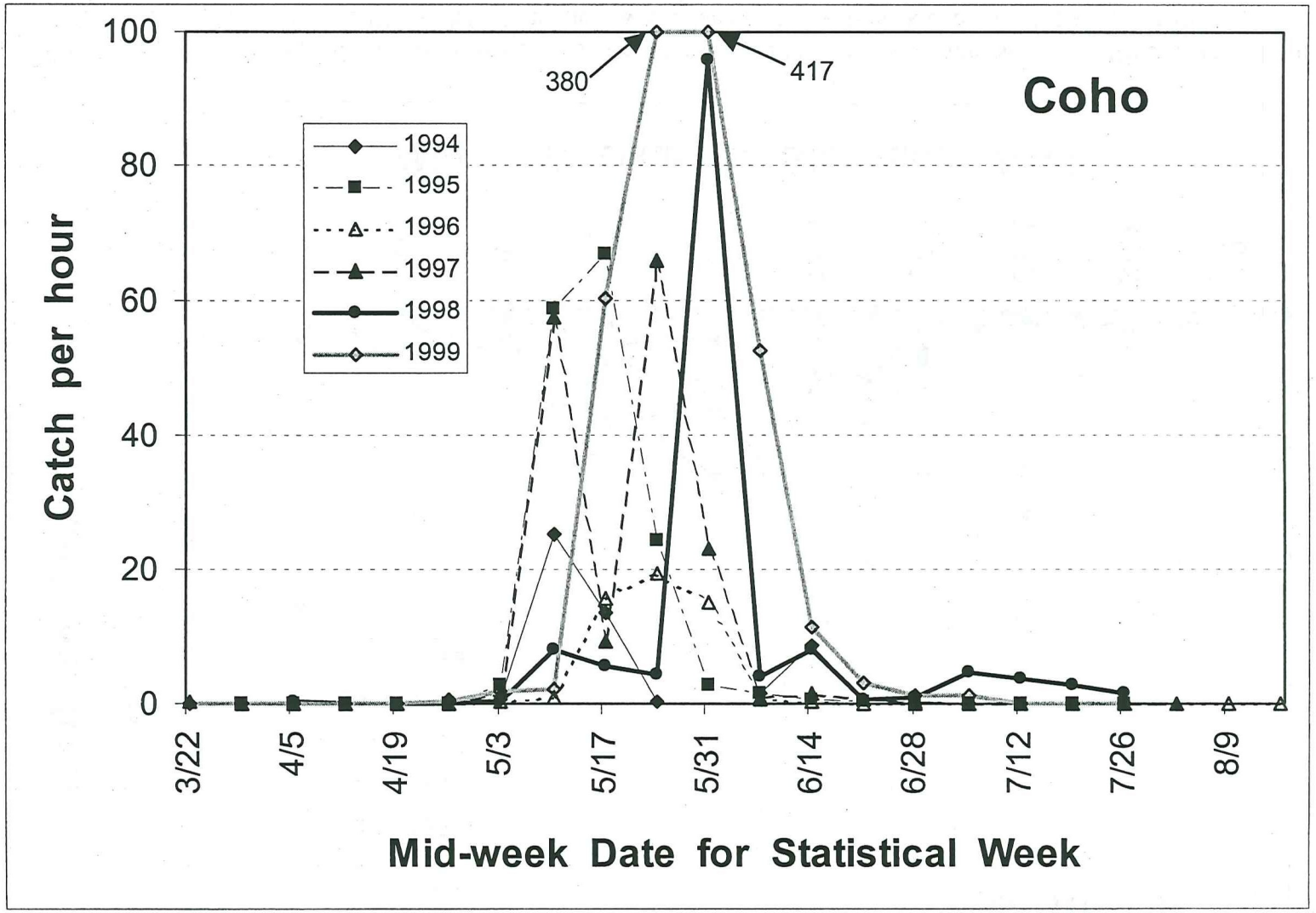


Figure 5B. Catch per hour of coho salmon smolts by the screwtrap operated in the Nooksack River summarized by statistical week, 1994-1999. Statistical weeks labeled by mid-week date (Wednesday) for 1995.

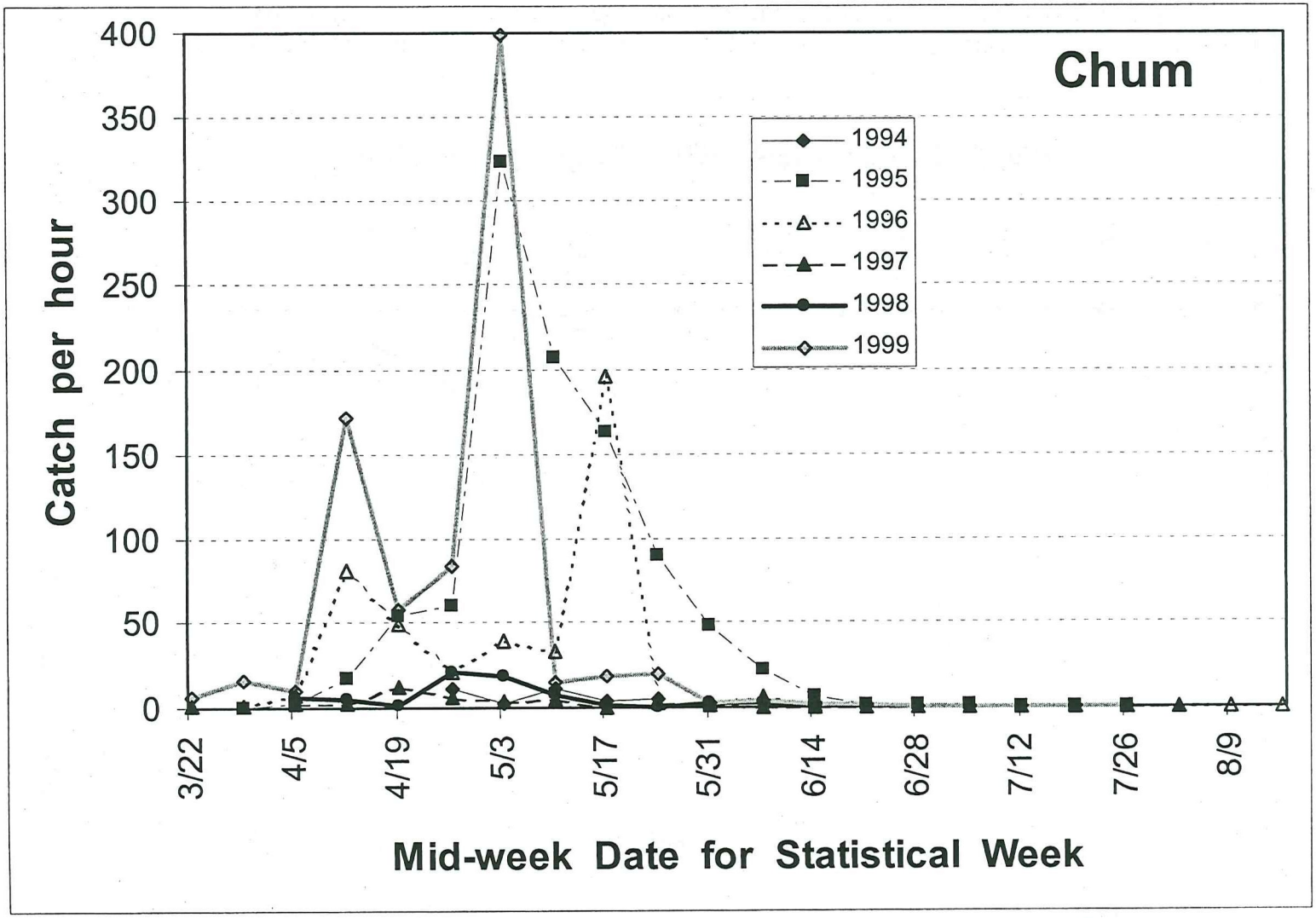


Figure 5C. Catch per hour of chum salmon smolts by the screwtrap operated in the Nooksack River summarized by statistical week, 1994-1999. Statistical weeks labeled by mid-week date (Wednesday) for 1995.

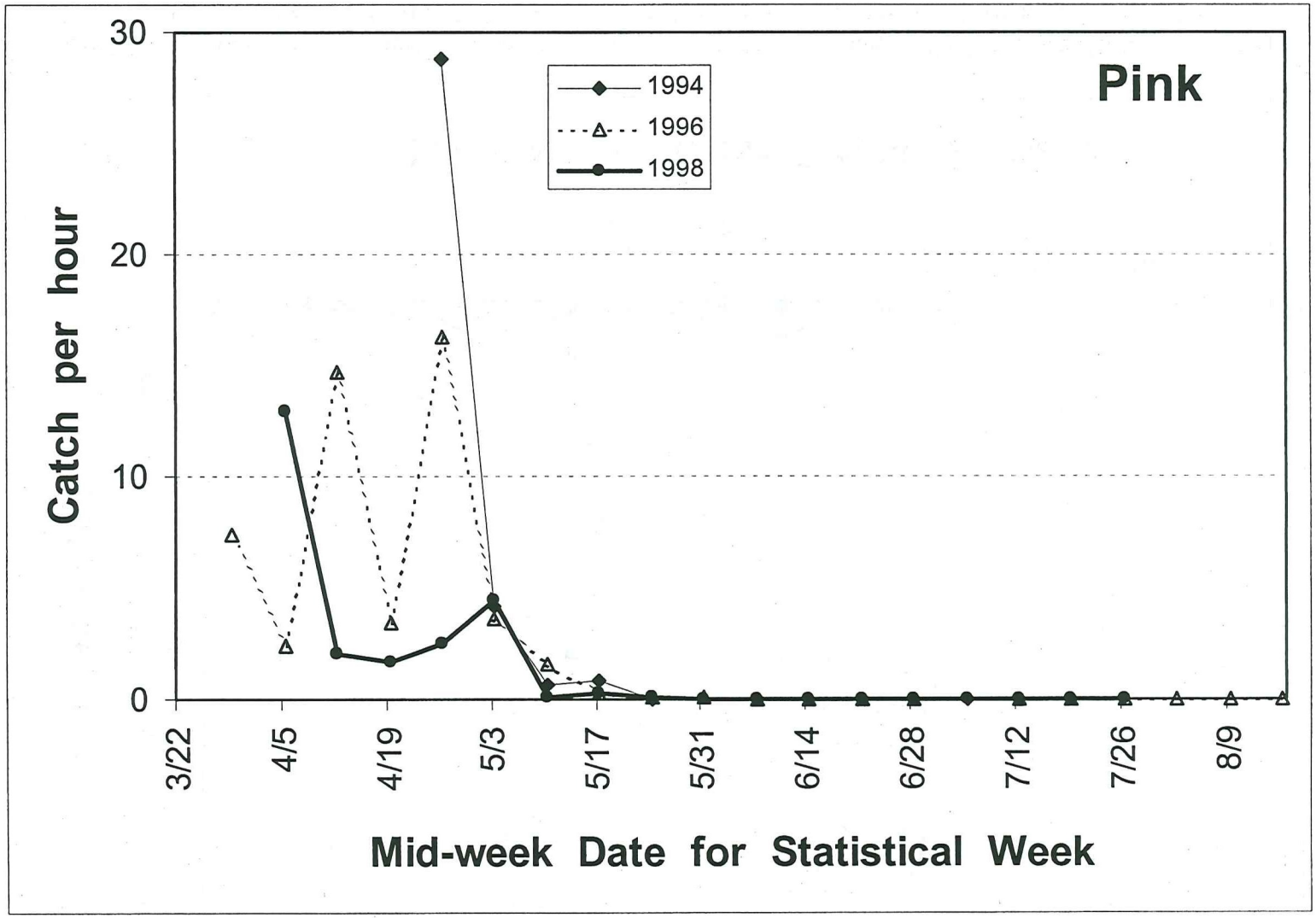


Figure 5D. Catch per hour of pink salmon smolts by the screwtrap operated in the Nooksack River summarized by statistical week, 1994-1999. Statistical weeks labeled by mid-week date (Wednesday) for 1995.

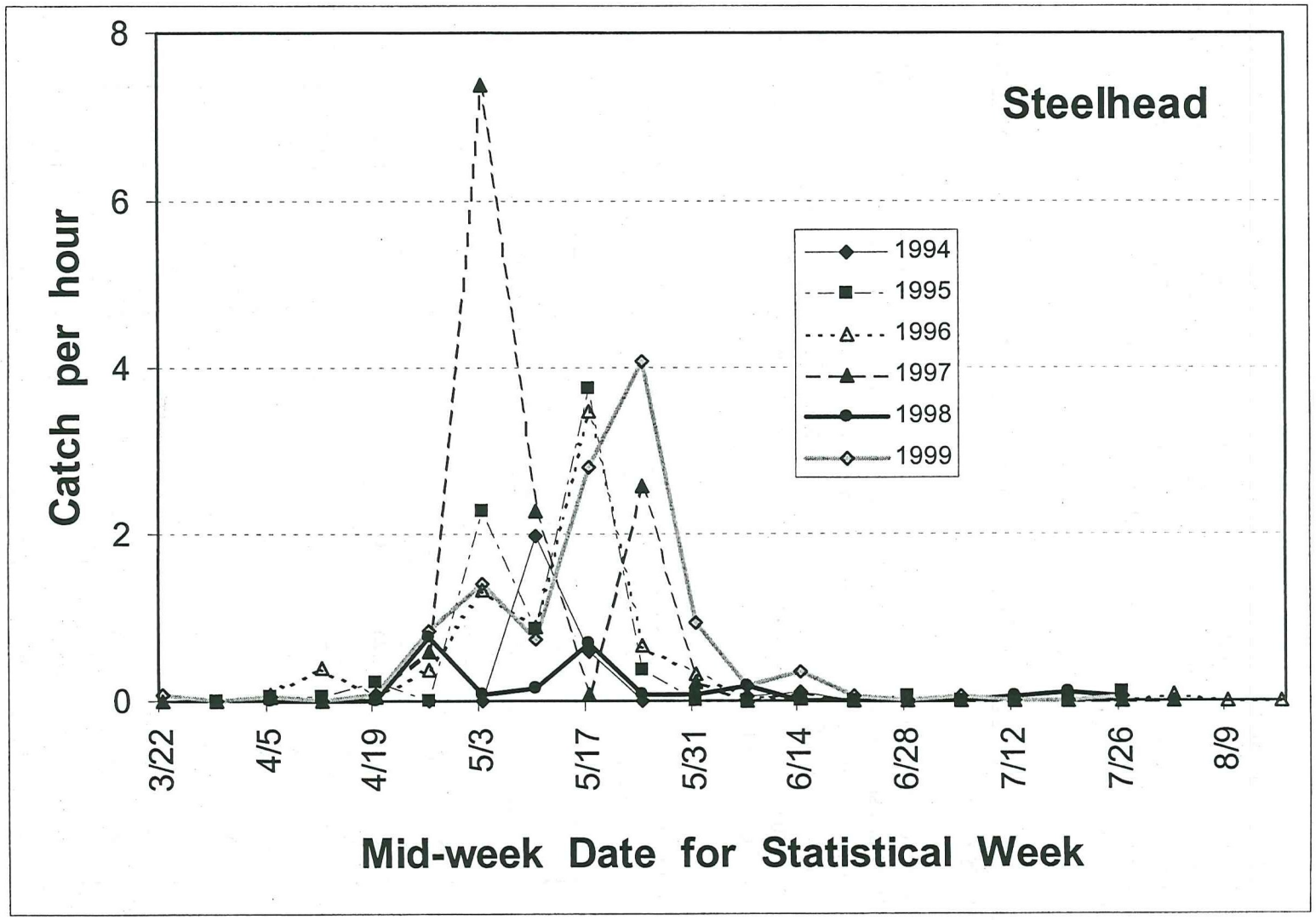


Figure 5E. Catch per hour of steelhead smolts by the screwtrap operated in the Nooksack River summarized by statistical week, 1994-1999. Statistical weeks labeled by mid-week date (Wednesday) for 1995.

Hatchery Salmon Releases

Appendix E lists all known releases of hatchery salmon upstream of the screwtrap for the years 1994 through 1999, by release date[6]. These release data are compared with catch per hour for each species by statistical week in Figure 6. Note the large apparent influence of the release of hatchery fish above the trap on screwtrap catches up to four weeks later. A similar relationship between screwtrap catch per hour and hatchery releases is likely for coho and steelhead salmon.

Updated Relationship Between Trap Capture Efficiency for Chinook Salmon Smolts and Secchi Disk Depth

The results for the two capture-efficiency trials conducted using chinook salmon smolts during 1999 are shown in Table 4. Table 5 compares parameter estimates for the regression equation relating capture efficiency to the inverse of the secchi disk depth with the 1999 data added to those from Conrad and MacKay (2000). Although the regression parameter estimates changed slightly, the changes were not significant. The fit of the updated model to the observed data is shown in Figure 7.

Table 4. Screwtrap capture efficiency estimates and secchi disk depths for chinook salmon smolt trials conducted from 1995 through 1999.

Year	Trial Number	Trial Code	Number Released	Number Recaptured	Capture Efficiency	Secchi Depth
95	1	95(1)	1,993	19	0.953%	2.425
95	2	95(2)	1,970	41	2.081%	2.275
95	3	95(3)	1,192	67	5.621%	0.900
95	4	95(4)	1,933	29	1.500%	2.100
95	5	95(5)	936	40	4.274%	1.200
95	6	95(6)	732	10	1.366%	2.500
96	7	96(1)	1,599	7	0.438%	1.650
96	8	96(2)	1,574	10	0.635%	1.900
96	9	96(3)	1,486	2	0.135%	3.500
96	10	96(4)	1,546	3	0.194%	2.650
96	11	96(5)	1,569	7	0.446%	3.200
97	12	97	1,645	72	4.377%	0.967
98	13	98(1)	1,798	38	2.113%	1.633
98	14	98(2)	1,789	8	0.447%	2.300
99	15	99(1)	2,001	47	2.349%	1.850
99	16	99(2)	2,004	59	2.944%	1.200

[6] Hatchery release data were supplied and verified by the following hatchery managers between April and October, 2000: Linda Delgado (Lummi Skookum Creek Hatchery and Lummi Sea Pond Hatchery Manager) and Ed Argenio (WDFW Nooksack Kendall Creek Hatchery Manager).

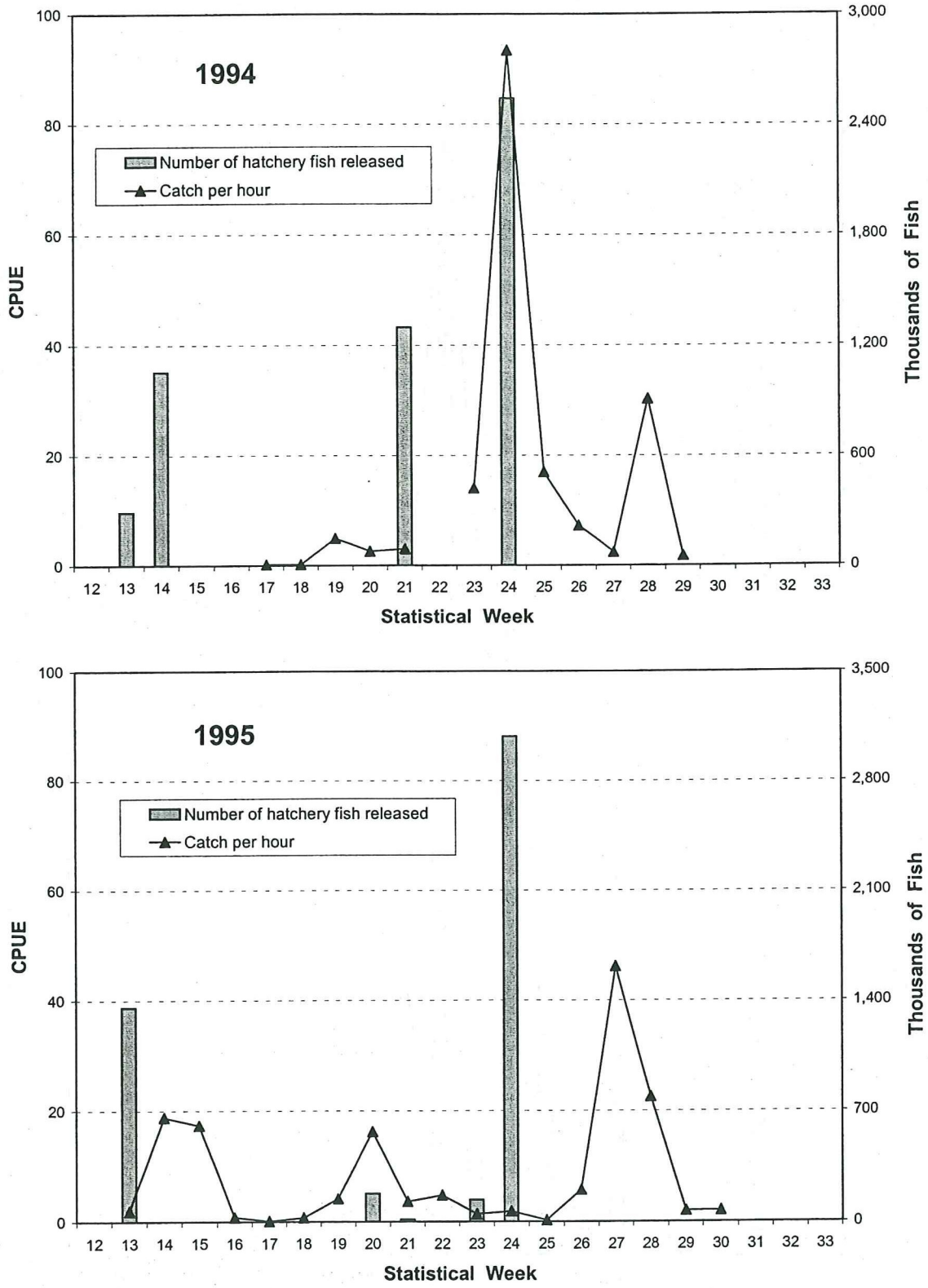


Figure 6. Catch per hour (CPUE) by statistical week of out-migrating chinook salmon by the screwtrap operated in the Nooksack River, 1994-1999. Releases of hatchery chinook salmon above the trap are summarized by statistical week, also.

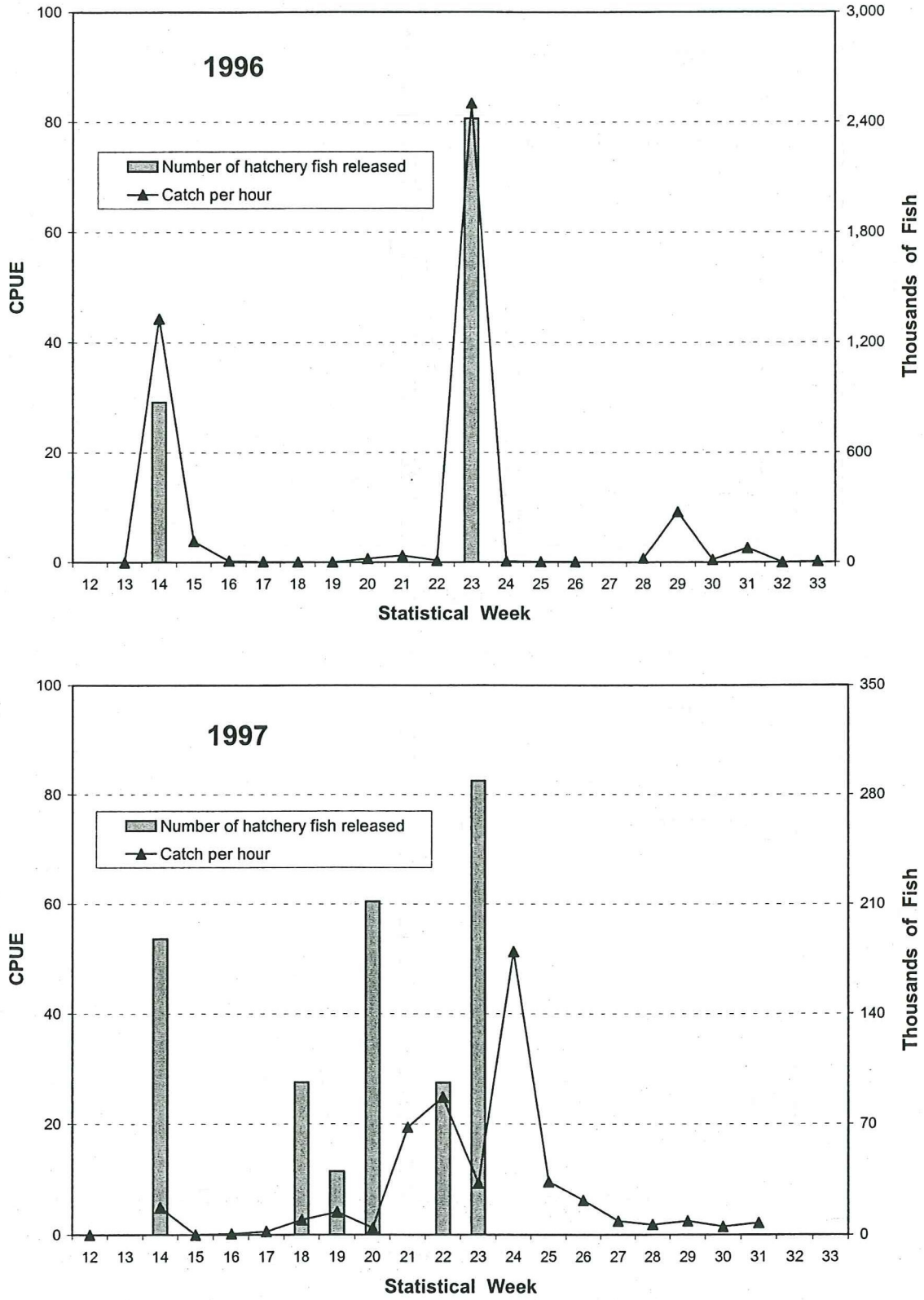


Figure 6. Catch per hour (CPUE) by statistical week of out-migrating chinook salmon by the screwtrap operated in the Nooksack River, 1994-1999 (continued).

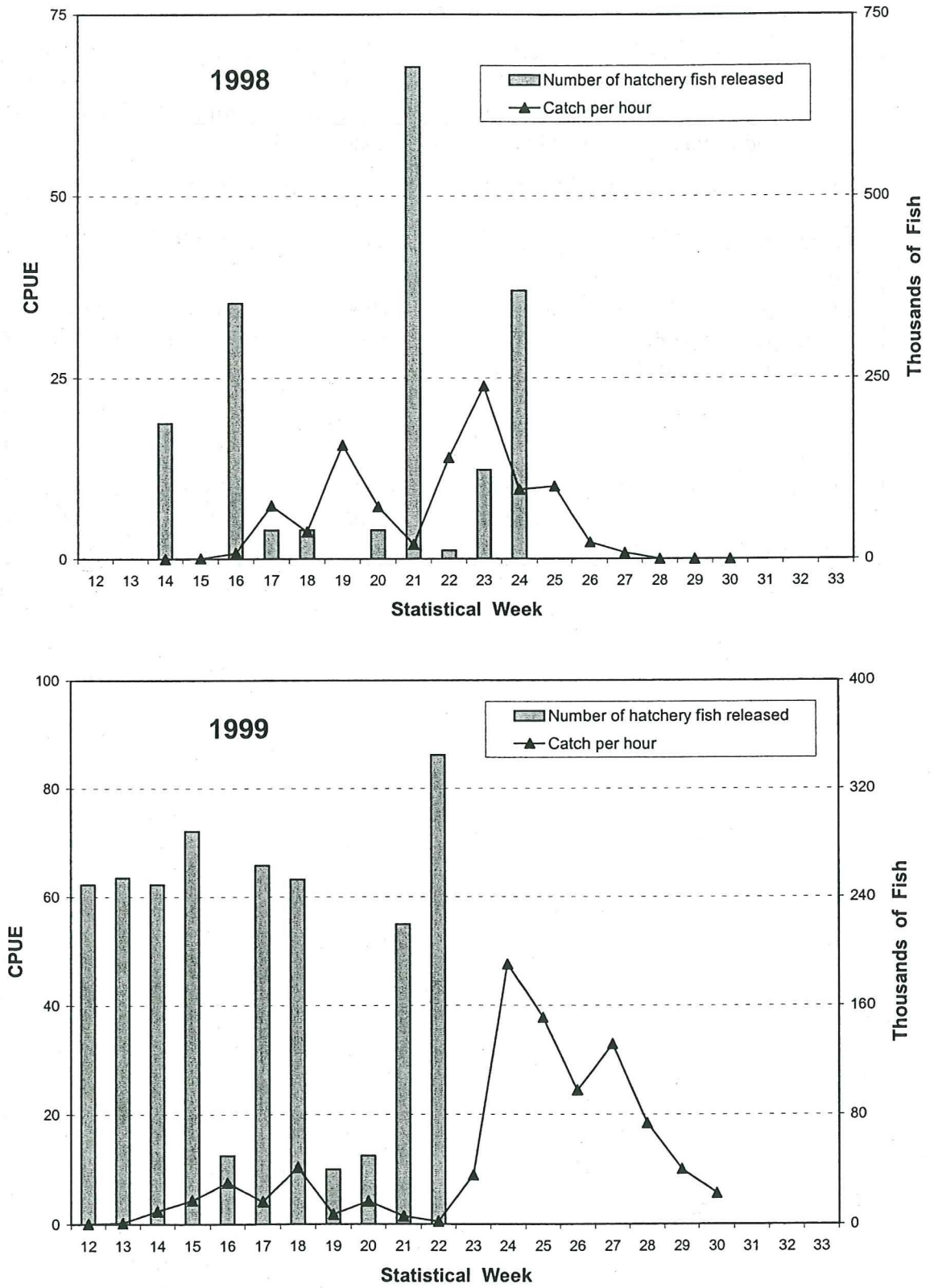


Figure 6. Catch per hour (CPUE) by statistical week of out-migrating chinook salmon by the screwtrap operated in the Nooksack River, 1994-1999 (continued).

Table 5. Parameter estimates, their standard errors, significance of the parameters, and 95% confidence interval for the linear regression model of inverse secchi depth (*X*) and capture efficiency (*Y*) using 1995 through 1998 data (Conrad and MacKay 2000) and with the 1999 data added.

Model Parameter	Estimated Coefficient	Standard Error	Significance	95% Confidence Interval		
1995-1998 Data						
Intercept	-0.01780	0.00486	0.003	-0.02839	-	-0.00721
Slope	0.06296	0.00792	0.000	0.04572	-	0.08021
Adjusted r^2	0.827					
1995-1999 Data						
Intercept	-0.01668	0.00466	0.003	-0.02668	-	-0.00668
Slope	0.06124	0.00745	0.000	0.04526	-	0.07723
Adjusted r^2	0.816					

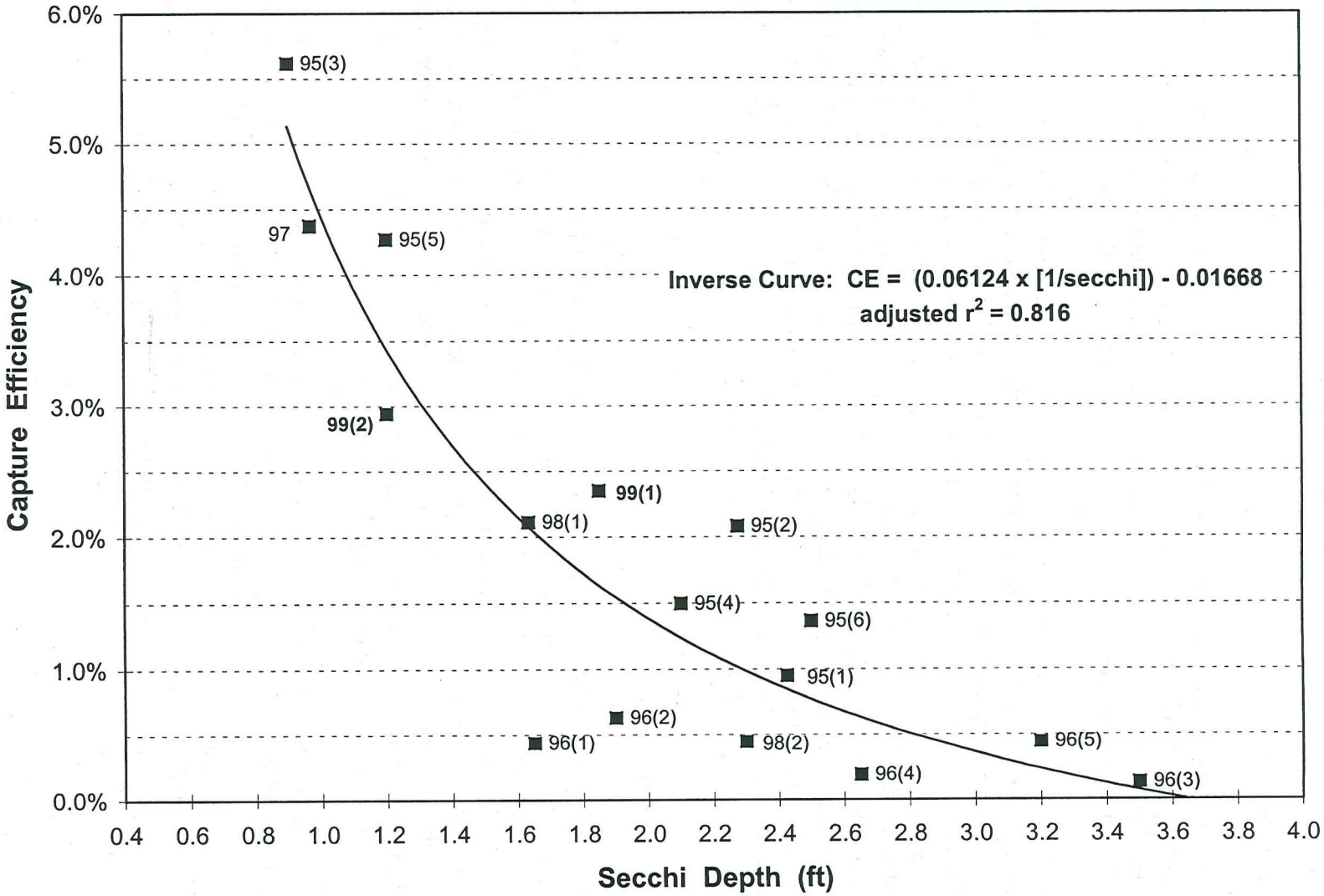


Figure 7. Plot of secchi depth at the screwtrap versus estimated capture efficiency (CE), and the fit of the curve for the inverse secchi model, for the capture-efficiency trials conducted using hatchery-reared chinook salmon smolts, 1995-1999. Data points labeled by year and trial number (Table 4).

Discussion

Production Estimates

In the future, we plan to examine the feasibility of using the screwtrap data to estimate the annual smolt out-migration from the Nooksack River. Abundance estimates based entirely on catch per unit effort analyses, however, do not take into account the large variability in capture efficiencies of the screwtrap due to ever-changing river conditions.

To illustrate this, Figure 8 shows two plots that model the abundance of out-migrating chinook salmon smolts in 1999. The upper figure is the estimated daily catch per hour for each day of the sampling season. For those dates not sampled by the screwtrap, the catch per hour was estimated by averaging the CPUE values of the days prior to and after the non-sampled date. The lower figure is a plot of daily production estimates. These were calculated using the CPUE for each day as estimated for the previous graph and expanding them to account for a 24-hour period. These 24-hour estimates were then divided by capture efficiency estimated using the daily average secchi disk reading for that day and the regression relationship in Figure 7. As can be seen, the dates of peak abundance are very different for each plot. We believe the approach using the capture efficiency adjustment to the data is more representative of actual daily abundance.

Hatchery Salmon Releases

As was discussed in the Results section, releases of hatchery-reared juvenile salmon above the trap greatly influence screwtrap catches for several days and up to two weeks later, depending upon the release location. We have been unable to clearly identify hatchery fish in our catches visually because of the overlap in external morphological characteristics between juvenile hatchery and naturally produced stocks. Some, but not all, hatchery releases receive an adipose fin clip. We record all adipose clipped chinook, coho, and steelhead salmon seen in our catches. But this information by itself does not provide us with an estimate of the contribution of hatchery-reared fish to the catch.

To estimate the production by individual native chinook salmon stocks, we have been gathering DNA tissue samples from a sub-sample of the chinook salmon captured by the trap since 1997. This is a non-lethal sample where a small tissue sample is taken by blunting the upper caudal fin lobe. DNA analysis of these samples, and comparison with previously collected baseline samples, should allow us to estimates the contribution of these stocks to the catches by the trap and, hopefully, estimate their contribution to the total out-migration.

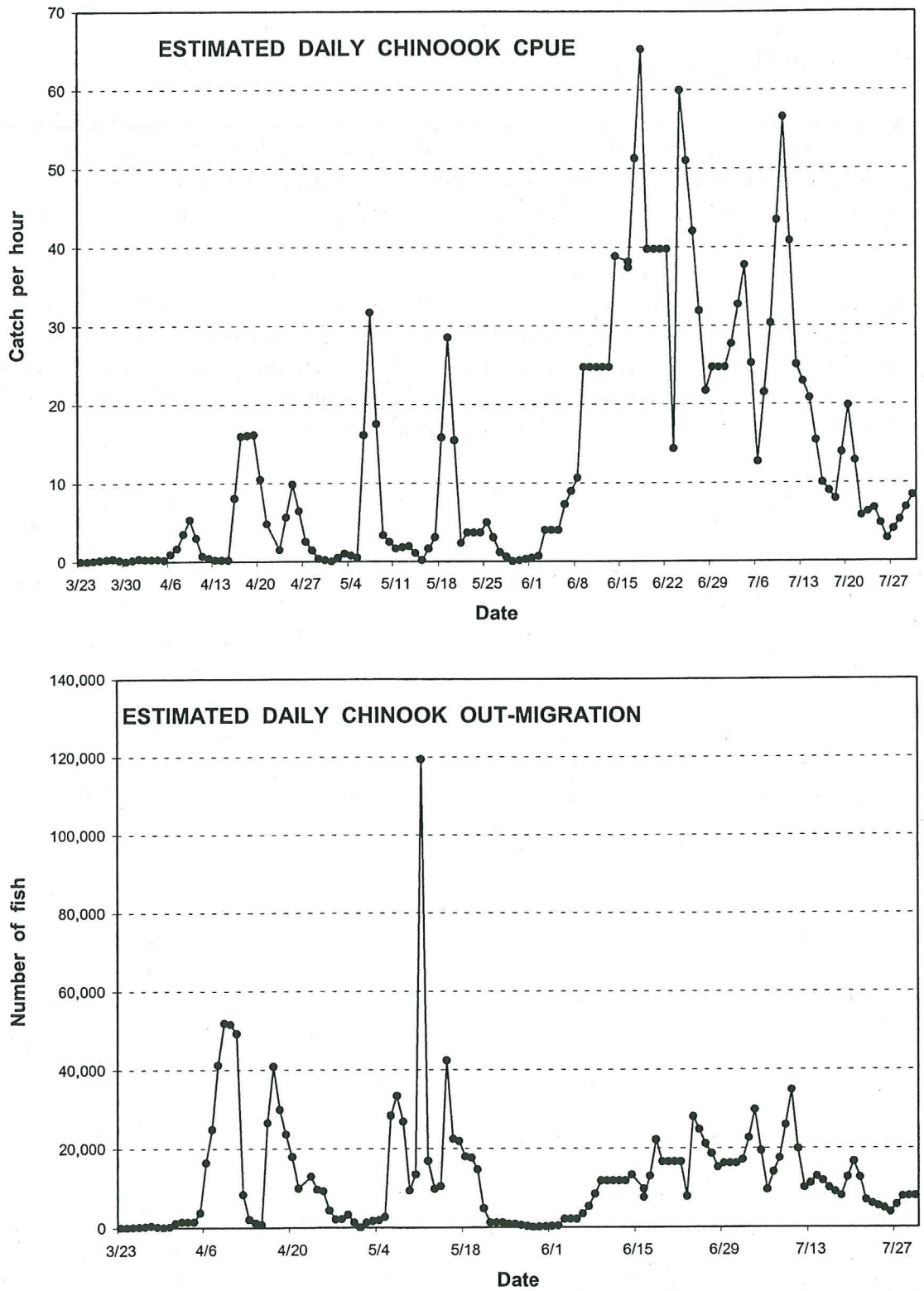


Figure 8. Comparison of plots of CPUE (catch per hour) of out-migrating chinook salmon and daily total out-migration estimates based on trap capture efficiency estimates for Nooksack River data collected in 1999.

Debris and Discharge Limitations

Accurate production estimates rely on sampling throughout the entire out-migration period. As stated earlier, crew safety and concerns about debris damage prevent us from operating the trap during flows greater than about 8,000 cfs. Unfortunately, the catch per hour often increases with river discharge. It is unlikely that we will perfect a sampling technique that will allow us to maintain a presence during all high flow events.

High flow and debris concerns have previously discouraged us from sampling prior to the third week in March. A similar smolt trap operated on the Skagit River by the Washington Department of Fish and Wildlife has caught chinook salmon smolts as early as January. Our sampling window probably includes the peak of pink salmon out-migration, but as with chinook, likely misses some portion of the early out-migration.

Conclusions and Recommendations

Six years of screwtrap operations have demonstrated the feasibility of sampling the out-migration of chinook and other species of juvenile salmon from the Nooksack River. We have demonstrated that salmonids can be non-lethally captured by the trap and released alive after enumeration and biological sampling (Table 6). Based upon our six years of experience with operating a screwtrap in the lower mainstem of the Nooksack River, we present the following conclusions and recommendations.

Conclusions

1. The catch of out-migrating juvenile salmonids by the trap can vary greatly from hour to hour due to changes in river conditions that affect the capture efficiency of the trap. A primary factor affecting capture efficiency is water turbidity. Turbidity can be quantified by collecting secchi depth measurements at the trap.

2. Catches are also influenced by major flow events originating upstream in rearing habitat that tend to flush out smaller individuals, especially those with a dominant zero-age life history pattern (pink and chum salmon smolts). Sampling during these periods should be attempted when debris conditions allow.

3. Large releases of hatchery-reared chinook and coho salmon and steelhead can greatly influence trap catches up to several weeks after the release, depending upon the release location. Assessment of the natural production of these species requires some method to estimate the contribution of hatchery-origin fish to the trap catches.

4. For species where there are multiple stocks present, such as chinook, DNA tissue analysis may provide estimates of stock contribution provided DNA baselines are available. We have demonstrated that non-lethal sampling of out-migrating smolts for DNA tissue samples is possible.

5. Mark and recapture calibration experiments that cover a relatively narrow window of time (several hours) can be used to develop trap capture efficiency relationships related to river conditions (turbidity, discharge, stage, etc.) and salmonid out-migration behaviors.

Recommendations

1. Conduct mark and recapture calibration experiments for pink, chum, and coho salmon out-migrants in order to develop a capture efficiency relationship with secchi depth.

2. Continue monitoring during the out-migration period for pink, chum, coho, and chinook salmon using a randomized sampling schedule, six hours of effort every other day, and increasing the sampling frequency to every day during the peak out-migration period for these species.

Table 6. Summary of the annual mortalities, by species, observed at the screwtrap operated in the lower Nooksack River, 1994-1999.

	Chinook Salmon			Coho Salmon			Chum Salmon			Pink Salmon		
Year	Number Mortalities	Total Catch	% Mortality	Number Mortalities	Total Catch	% Mortality	Number Mortalities	Total Catch	% Mortality	Number Mortalities	Total Catch	% Mortality
1994	674[a]	3,860	17.46%	39	1,133	3.44%	14	858	1.63%	2	798	0.25%
1995	22	3,163	0.70%	12	2,698	0.44%	224	21,585	1.04%	0	0	0.00%
1996	11	4,765	0.23%	0	1,209	0.00%	47	11,981	0.39%	24	1,215	1.98%
1997	12	2,742	0.44%	12	3,300	0.36%	24	607	3.95%	0	0	0.00%
1998	0	2,329	0.00%	2	3,313	0.06%	0	1,234	0.00%	0	276	0.00%
1999	5	4,049	0.12%	7	11,509	0.06%	30	17,287	0.17%	0	0	0.00%

[a] On 6/13/94 there were 669 mortalities due to very high debris in the trap causing cone blockage. Of the mortalities, 250 were adipose fin clipped and from a release on 5/23-25 of 1,299,035 chinook salmon from the Kendall Hatchery.

3. Collect DNA tissue samples from a representative sub-sample from the catch for chinook and coho to estimate the stock of origin. Secure funding and perform DNA analysis on these samples.

4. Investigate the feasibility of mass marking all hatchery-origin coho and chinook salmon with an exterior mark that can be detected at the trap to reduce DNA analysis costs. Perform a cost benefit analysis of mass marking versus DNA analysis to estimate which method is most cost effective.

5. Estimate the total production of out-migrating chinook salmon for 1997, 1998, and 1999 using trap capture efficiency and secchi depth data. Compare these results with index values of abundance estimated in Conrad and MacKay (2000).

6. Examine the feasibility of using PUD #1 water treatment plant turbidity measurements for more accurate assessment of nighttime secchi depths.

7. Continue to assess changes in the channel shape at the trap location by conducting annual cross-section measurements of the channel at the trap site.

8. Continue to conduct at least three annual mark and recapture trap calibration experiments to estimate if changes in channel conditions may cause year to year variation in trap capture efficiency.

9. Attempt to perform trap calibration experiments under very low and very high turbidity conditions to expand the coverage of the calibration curve (secchi depths greater than 3.5 feet and less than 0.8 feet).

10. Examine a representative sample of coho salmon out-migrants to determine stomach contents and their potential predation on other species.

Acknowledgments

I would like to thank the following dedicated individuals who operated the screwtrap in often difficult conditions at all hours of the day. Without their help, this project would not have been possible:

Lummi Natural Resources Dept.
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Gabe Jefferson
Frank Lorenz
Tom Morris Jr.
Adam Pfundt
Andre' Revey
Ernie Reynolds
Ward Simmonds Jr.

Nooksack Tribe
Ken Johnny
Kerry Roberts
Lauren Roberts

Northwest Indian Fish Commission
Grant Kirby

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The Washington Department of Fish and Wildlife's (WDF&W) Kendall Creek Hatchery staff were very helpful in providing chinook and coho salmon for our calibration experiments. Thanks also to Ted Thygessen for supporting this effort and for providing information on hatchery releases.

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I am indebted to Bob Conrad of the Northwest Indian Fish Commission in Olympia for his ongoing technical support including assistance in developing our study design, statistical analysis of catch and screwtrap calibration data, and his critical review of several documents related to this work.

We are grateful to tribal elder Lute Hillaire for blessing our screwtrap prior to our first set in 1994.

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APPENDICES

APPENDIX A

Mid-week dates for statistical weeks, 1994-1999.

Appendix Table A. Mid-week date (Wednesday) of the statistical weeks defined for the years 1994 through 1999. Statistical weeks begin on Sunday and end the following Saturday.

Statistical Week #	Year[a] 1994	1995	1996	1997	1998	1999
6	2/9	2/8	2/7	2/5	2/4	2/10
7	2/16	2/15	2/14	2/12	2/11	2/17
8	2/23	2/22	2/21	2/19	2/18	2/24
9	3/2	3/1	2/28	2/26	2/25	3/3
10	3/9	3/8	3/6	3/5	3/4	3/10
11	3/16	3/15	3/13	3/12	3/11	3/17
12	3/23	3/22	3/20	3/19	3/18	3/24
13	3/30	3/29	3/27	3/26	3/25	3/31
14	4/6	4/5	4/3	4/2	4/1	4/7
15	4/13	4/12	4/10	4/9	4/8	4/14
16	4/20	4/19	4/17	4/16	4/15	4/21
17	4/27	4/26	4/24	4/23	4/22	4/28
18	5/4	5/3	5/1	4/30	4/29	5/5
19	5/11	5/10	5/8	5/7	5/6	5/12
20	5/18	5/17	5/15	5/14	5/13	5/19
21	5/25	5/24	5/22	5/21	5/20	5/26
22	6/1	5/31	5/29	5/28	5/27	6/2
23	6/8	6/7	6/5	6/4	6/3	6/9
24	6/15	6/14	6/12	6/11	6/10	6/16
25	6/22	6/21	6/19	6/18	6/17	6/23
26	6/29	6/28	6/26	6/25	6/24	6/30
27	7/6	7/5	7/3	7/2	7/1	7/7
28	7/13	7/12	7/10	7/9	7/8	7/14
29	7/20	7/19	7/17	7/16	7/15	7/21
30	7/27	7/26	7/24	7/23	7/22	7/28
31	8/3	8/2	7/31	7/30	7/29	8/4
32	8/10	8/9	8/7	8/6	8/5	8/11
33	8/17	8/16	8/14	8/13	8/12	8/18
34	8/24	8/23	8/21	8/20	8/19	8/25

[a] Shaded areas indicate weeks that sampling was conducted.

APPENDIX B

Mean daily discharge values for the Nooksack River as measured at the Ferndale gage, 1994-1999.

Appendix Table B. Mean daily discharge (cubic feet per second) of the Nooksack River measured at the U. S. G. S. gage (#12213100) at Ferndale, WA. Bolded values indicates days of trap operation. Shaded areas indicates days that sampling was not possible due to high flows.

Date	1994	1995	1996	1997	1998	1999
3/17				**4,090**		
3/18				6,040		
3/19				19,000		
3/20				33,700		
3/21				19,600		
3/22				10,400		
3/23				7,700		**4,400**
3/24				6,170		**4,330**
3/25			**2,150**	5,180		4,970
3/26			2,070	6,450		**4,850**
3/27			**2,000**	6,280		4,400
3/28			1,920	5,310		**4,050**
3/29			1,910	4,660		3,800
3/30			**1,920**	4,240		**3,990**
3/31		**2,550**	1,870	4,030		3,790
4/1		2,620	**2,230**	3,750		**3,380**
4/2		2,530	**3,440**	**3,490**		3,140
4/3		**2,380**	**2,720**	**3,350**	**2,320**	3,110
4/4		**2,610**	**2,360**	**3,230**	2,230	2,990
4/5		**2,960**	**2,260**	**3,060**	**2,260**	**2,840**
4/6		2,560	**2,710**	2,950	2,340	2,680
4/7		2,440	**4,190**	2,880	**2,220**	**2,640**
4/8		3,020	4,150	**2,830**	2,190	3,260
4/9		3,160	**3,920**	2,790	**2,040**	**3,030**
4/10		**2,770**	**4,710**	**2,730**	2,010	2,760
4/11		**3,010**	**4,320**	2,680	**2,040**	**2,590**
4/12		**2,780**	**3,860**	**2,680**	2,180	2,610
4/13		2,920	**3,390**	2,780	**2,060**	**2,800**
4/14		3,330	**2,980**	**3,070**	1,950	2,640
4/15		2,840	**2,760**	2,940	**1,870**	**2,560**
4/16		2,590	**3,050**	**5,050**	1,820	2,750
4/17		**2,460**	**3,400**	6,670	**1,750**	**3,500**
4/18		**2,540**	**3,200**	**4,880**	1,720	4,550
4/19		**2,520**	**3,060**	4,070	**1,960**	**4,600**
4/20		2,370	2,900	10,100	1,920	4,850
4/21		2,220	2,680	9,770	**1,950**	**4,480**

- continued -

Appendix Table B. Mean daily discharge (cubic feet per second) of the Nooksack River measured at the U. S. G. S. gage (#12213100) at Ferndale, WA. Bolded values indicates days of trap operation. Shaded areas indicates days that sampling was not possible due to high flows (continued).

Date	1994	1995	1996	1997	1998	1999
4/22		2,120	**2,510**	**6,500**	2,330	**3,760**
4/23		2,120	5,960	5,750	**3,230**	**3,590**
4/24		**2,270**	12,500	**5,620**	3,530	4,040
4/25	**3,360**	2,410	7,960	4,920	**3,510**	**5,170**
4/26	**3,100**	**2,510**	6,820	**4,990**	2,740	**5,730**
4/27	**3,090**	2,610	5,750	7,380	2,500	**4,560**
4/28	**3,230**	**2,740**	**4,710**	6,140	**2,730**	3,850
4/29	**3,240**	2,760	**4,160**	5,560	**3,420**	**3,480**
4/30	3,650	2,740	**3,820**	**5,070**	4,100	3,490
5/1	3,500	**2,790**	3,620	5,720	5,730	**3,920**
5/2	**2,920**	**2,810**	**3,550**	**5,520**	6,500	4,610
5/3	**2,670**	**3,410**	**3,390**	4,770	6,280	**4,190**
5/4	**2,570**	2,960	**3,110**	**4,720**	**5,770**	3,900
5/5	**2,930**	**2,710**	**2,880**	4,660	**5,920**	**3,430**
5/6	3,170	2,690	**2,740**	**6,830**	6,030	3,190
5/7	3,940	2,960	**2,670**	6,500	**5,580**	**4,390**
5/8	4,710	**3,060**	**2,670**	**5,540**	4,870	4,350
5/9	**5,210**	**3,390**	2,500	5,450	**4,040**	**3,730**
5/10	**4,770**	**4,650**	**2,350**	**5,930**	3,620	3,370
5/11	**4,400**	4,540	**2,230**	6,110	**3,590**	**3,180**
5/12	**4,710**	3,750	**2,200**	**7,240**	3,510	3,320
5/13	3,930	3,040	**4,300**	8,280	**3,990**	**3,330**
5/14	3,210	3,130	6,080	**9,000**	4,040	3,050
5/15	3,060	**3,850**	**5,620**	9,360	**4,050**	**2,860**
5/16	**3,090**	**4,610**	**4,730**	**3,200**	3,400	2,950
5/17	**3,000**	**4,100**	4,230	8,530	**2,860**	**3,390**
5/18	**2,680**	3,670	4,820	7,090	2,570	4,680
5/19	**2,760**	3,130	7,160	**6,250**	**2,430**	**6,200**
5/20	3,070	2,990	6,110	**6,060**	2,440	4,800
5/21	2,890	3,070	4,930	**5,440**	**2,740**	**4,350**
5/22	2,740	**3,050**	**5,160**	**4,830**	2,740	4,200
5/23	**2,650**	**3,130**	9,570	4,500	**2,640**	4,850
5/24	**2,870**	**3,310**	**6,990**	4,380	2,540	7,620
5/25	**3,110**	3,560	5,500	4,120	**3,460**	**10,000**
5/26	3,220	3,770	5,010	4,100	3,590	8,120
5/27	2,810	3,770	**4,530**	**4,290**	**4,420**	**6,670**

- continued -

Appendix Table B. Mean daily discharge (cubic feet per second) of the Nooksack River measured at the U. S. G. S. gage (#12213100) at Ferndale, WA. Bolded values indicates days of trap operation. Shaded areas indicates days that sampling was not possible due to high flows (continued).

Date	1994	1995	1996	1997	1998	1999
5/28	2,420	3,790	**4,020**	**4,800**	4,960	6,520
5/29	2,370	4,090	**3,750**	6,320	**3,710**	**6,190**
5/30	3,160	4,420	**3,840**	**7,840**	3,290	5,990
5/31	2,630	**4,180**	3,430	10,900	**3,220**	**5,930**
6/1	2,670	3,750	**3,190**	17,700	3,490	7,630
6/2	2,710	**3,710**	3,210	12,400	**3,790**	**5,910**
6/3	2,460	3,640	**4,190**	6,460	3,830	5,100
6/4	2,670	3,530	4,670	6,450	**3,920**	5,560
6/5	3,030	**3,540**	**3,960**	**8,030**	3,850	7,560
6/6	**2,720**	**3,110**	**3,660**	**6,690**	**3,700**	**8,370**
6/7	**3,460**	**2,750**	**3,920**	5,980	3,830	6,180
6/8	**3,230**	2,710	**3,990**	5,640	**4,230**	**5,300**
6/9	**2,720**	**3,170**	3,520	5,210	4,420	4,750
6/10	2,530	3,350	3,230	**5,340**	**4,340**	4,350
6/11	2,640	4,000	**3,130**	5,900	4,130	4,200
6/12	2,780	**3,670**	**3,020**	**6,040**	**3,580**	4,800
6/13	**3,440**	**2,990**	2,850	**5,530**	**3,510**	6,400
6/14	**4,680**	**2,800**	**2,780**	5,110	**3,190**	**7,990**
6/15	**4,790**	**2,610**	2,790	5,770	**3,230**	9,980
6/16	**3,340**	2,580	2,720	**5,990**	**3,720**	**10,600**
6/17	2,730	2,580	**2,560**	6,520	2,990	8,800
6/18	2,990	2,780	**2,430**	8,490	**2,810**	**8,050**
6/19	3,770	**2,580**	2,260	6,650	2,690	7,510
6/20	**3,020**	**2,450**	**2,120**	**5,310**	**2,550**	6,580
6/21	**3,100**	**2,650**	**2,170**	4,670	2,790	6,360
6/22	**3,210**	**2,510**	2,360	5,300	**3,000**	7,120
6/23	**3,240**	**2,500**	2,320	**6,150**	3,180	**6,830**
6/24	3,120	2,690	**2,390**	**8,100**	**3,040**	**7,220**
6/25	2,830	2,920	2,430	**5,820**	4,230	8,430
6/26	2,670	**2,830**	**2,370**	5,480	**3,950**	**7,780**
6/27	**2,660**	**2,680**	**2,400**	**4,980**	4,400	6,200
6/28	**2,620**	2,580	2,460	4,530	**3,220**	**5,670**
6/29	**2,690**	**2,710**	2,460	**4,550**	3,160	5,590
6/30	**2,620**	2,890	2,300	4,540	3,190	5,580
7/1	2,670	3,030	2,300	**4,150**	3,340	6,750
7/2	5,480	3,040	2,550	3,900	**3,280**	**7,530**

- continued -

Appendix Table B. Mean daily discharge (cubic feet per second) of the Nooksack River measured at the U. S. G. S. gage (#12213100) at Ferndale, WA. Bolded values indicates days of trap operation. Shaded areas indicates days that sampling was not possible due to high flows (continued).

Date	1994	1995	1996	1997	1998	1999
7/3	4,030	**3,150**	2,860	**3,800**	**3,390**	8,450
7/4	3,140	2,700	3,530	**4,080**	**3,570**	**7,020**
7/5	**2,910**	**2,570**	3,100	4,780	3,100	5,780
7/6	**2,860**	**2,430**	2,520	5,110	**2,820**	**5,980**
7/7	2,840	2,310	2,350	**4,970**	2,800	7,080
7/8	2,910	2,300	2,460	5,650	**2,860**	**6,720**
7/9	2,810	2,420	2,740	15,300	2,670	6,440
7/10	2,560	**3,080**	2,550	12,200	**2,520**	**7,500**
7/11	**2,440**	**2,640**	2,350	9,410	2,460	8,190
7/12	2,360	**2,200**	**2,480**	7,100	**3,430**	**7,740**
7/13	2,390	**2,030**	2,670	5,900	3,500	7,520
7/14	**2,480**	1,930	2,820	**5,560**	**2,900**	**6,950**
7/15	2,460	1,880	**2,900**	5,340	3,930	6,240
7/16	2,420	1,960	**2,770**	**4,880**	**5,300**	**5,780**
7/17	2,430	**2,140**	2,430	4,560	4,200	6,150
7/18	**2,330**	2,350	2,390	4,340	**3,490**	**6,030**
7/19		2,500	**2,360**	**4,200**	3,160	6,040
7/20		2,540	3,360	4,420	**2,710**	**6,160**
7/21		2,400	2,440	**4,680**	2,470	6,160
7/22		2,460	2,170	4,200	2,570	**5,560**
7/23		1,990	**2,270**	**3,710**	**2,680**	5,540
7/24		**1,870**	**2,290**	3,440	**2,580**	**5,660**
7/25		1,760	**2,330**	**3,280**		5,130
7/26		**3,640**	2,320	3,150		**4,640**
7/27		**4,910**	2,320	3,070		4,600
7/28			2,270	**3,190**		**4,810**
7/29			**2,370**	3,380		5,020
7/30			**2,370**	**3,330**		**4,910**
7/31			2,170			
8/1			**1,910**			
8/2			1,800			
8/3			2,050			
8/4			1,840			
8/5			**1,900**			
8/6			1,600			
8/7			**1,600**			

- continued -

Appendix Table B. Mean daily discharge (cubic feet per second) of the Nooksack River measured at the U. S. G. S. gage (#12213100) at Ferndale, WA. Bolded values indicates days of trap operation. Shaded areas indicates days that sampling was not possible due to high flows (continued).

Date	1994	1995	1996	1997	1998	1999
8/8			**1,610**			
8/9			1,800			
8/10			1,840			
8/11			1,830			
8/12			**1,700**			
8/13			**1,550**			
8/14			**1,560**			

APPENDIX C

Summary by set of screwtrap effort and salmonid catch data, 1994-1999.

Appendix Table C1. Summary by set of screwtrap effort and salmonid catch data, 1994.

1994						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho				
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Steel-head
1	4/25	17	10:15	0.50		1		1		15	5	
2	4/25	17	11:00	4.25		2		1		190	50	
3	4/26	17	10:53	4.02	2.0	0		4		177	4	
4	4/27	17	8:50	5.92	2.0	0		5		91	9	
5	4/28	17	10:16	5.40	1.5	2	1	1		145	109	
6	4/29	17	9:10	2.33	1.5	0	0	0		28	57	
7	5/2	18	8:30	8.00	2.0	1	0	5		47	33	
8	5/3	18	8:44	6.98	2.5	3	1	5		6	2	
9	5/4	18	8:50	6.70	2.8	0	0	0		5	0	
10	5/5	18	8:44	6.97	2.8	2	1	8		61	45	
11	5/9	19	8:54	6.95	1.1	3	0	173		1	54	4
12	5/10	19	8:30	4.00	1.2	32	5	106		9	90	1
13	5/10	19	13:55	1.67	1.0	6	0	18		1	5	1
14	5/11	19	18:07	2.38	1.3	38	3	31		0	18	5
15	5/11	19	21:30	2.25	1.2	11	2	122	17	0	8	18
16	5/12	19	18:45	2.00	1.2	8	0	19	0	0	1	3
17	5/12	19	21:30	2.50	1.2	10	3	79	4	3	66	11
18	5/16	20	8:47	3.87		18	2	35	0	2	26	0
19	5/16	20	13:00	2.92	2.7	17	1	18	0	1	15	0
20	5/17	20	8:37	3.72	3.2	5	1	1	0	11	4	0
21	5/17	20	12:37	3.00	2.8	4	0	0	0	5	4	0
22	5/18	20	19:04	1.85	3.7	0	0	0	0		1	0
23	5/18	20	21:30	1.92		3	1	160	8		7	6
24	5/19	20	18:00	2.95	3.2	1	0	3	0		3	0
25	5/19	20	21:30	2.00		10	2	85	3		19	7
26	5/23	21	9:00	2.95	4.2	5	0	1	0		1	0
27	5/23	21	11:57	3.92		5	0	1	0		1	0
28	5/24	21	8:25	3.58	3.4	0	0	0	0		0	0
29	5/24	21	12:15	3.45		19	0	0	0		5	0
30	5/25	21	12:37	2.72	2.7	21	2	3	0		67	0
31	6/6	23	9:32	3.47	2.8	20	9	5	0		9	0
32	6/6	23	13:30	2.42		21	1	2	0		8	0
33	6/7	23	8:25	4.00	1.7	114	40	24	1		41	0
34	6/7	23	13:12	2.63		89	28	7	0		25	1
35	6/8	23	8:42	3.63	1.3	38	13	3	0		3	0
36	6/8	23	12:45	2.95		60	14	2	0		3	0
37	6/9	23	8:30	3.83	3.2	14	3	0	0		0	0
38	6/9	23	12:30	3.25		11	3	0	0		0	0
39	6/13	24	8:28	4.53	1.8	353	106	23	0		37	0
40	6/13	24	13:30	1.92		838	252	41	0		4	0
41	6/14	24	8:16	3.78	1.0	134	45	48	0		11	0
42	6/14	24	12:45	2.92		65	17	9	0		1	0

- continued -

Appendix Table C1. Summary by set of screwtrap effort and salmonid catch data, 1994 (continued).

1994						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho				
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Steel-head
43	6/15	24	8:30	2.75	1.0	491	116	36	0		1	0
44	6/15	24	12:16	2.65		149	20	31	0		0	2
45	6/16	24	8:30	3.83	1.7	60	22	2	0		0	
46	6/20	25	9:25	2.92	2.4	14	2	0	0		1	
47	6/20	25	12:05	3.40		17	4	1	0		1	
48	6/21	25	8:19	3.75	2.6	15	1	0	0		0	
49	6/21	25	12:23	2.87		48	12	3	3		0	
50	6/22	25	8:15	3.83	2.3	19	1	1	0		1	
51	6/22	25	12:20	2.78	2.4	98	18	3	0		2	
52	6/23	25	8:36	3.67	2.1	76	5	0	0		0	
53	6/23	25	12:40	2.48		150	34	5	0		0	
54	6/27	26	8:27	6.72	2.7	4	0	0	0		0	
55	6/28	26	8:26	3.98	3.4	1	0	0	0		0	
56	6/28	26	12:33	2.78		5	0	1	1		0	
57	6/29	26	15:28	3.78	1.8	23	5	0			0	
58	6/29	26	19:30	3.75		134	18	0			1	
59	6/30	26	23:55	5.05	1.9	65	6	0				
60	6/30	26	5:43	5.55	2.4	10	0	0				
61	6/30	26	11:30	3.42		13	2	1				
62	7/5	27	9:45	6.00	1.9	5	1					
63	7/6	27	8:23	5.18	2.2	10	0					
64	7/6	27	8:23	5.33	1.8	9	2					
65	7/6	27	19:20	4.17	1.7	26	3					
66	7/11	28	0:30	3.78	2.3	0	0					
67	7/11	28	8:23	3.25	2.0	5	0					
68	7/14	28	16:02	4.85	0.9	257	36					
69	7/14	28	21:43	2.32	1.1	168	42					
70	7/18	29	10:30	2.25	1.6	4	2					
TOTALS				258.09		3,860	908[c]	1,133	37	798	858	59

[a] Smolts captured with an adipose fin clip.

[b] No sockeye salmon smolts were captured during trapping. One cutthroat trout was captured. No steelhead trout smolts with a clipped adipose fin were captured.

[c] Total includes 344 tallied chinook salmon smolts assigned to the adipose fin clipped category based on a sample of chinook salmon smolts from the same set or neighboring sets.

Appendix Table C2. Summary by set of screwtrap effort and salmonid catch data, 1995.

1995						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
1	3/31	13	10:12	3.60	3.4	7				1		
2	4/3	14	11:05	2.73	3.2	3				10		
3	4/3	14	13:49	2.22		8				1		
4	4/4	14	10:21	2.98	3.1	2				1		
5	4/4	14	13:20	2.37		9				6		
6	4/5	14	9:50	3.37	1.6	81	7			14		
7	4/5	14	13:12	2.55		202	8			17	1	
8	4/10	15	9:31	3.00	2.5	51	0			39	0	
9	4/10	15	12:45	3.12		44	0			26	1	
10	4/11	15	9:40	3.50	1.9	147	0			120	0	
11	4/11	15	13:30	2.38		66	0			58	0	
12	4/12	15	9:12	2.55	2.1	6	0			40	0	
13	4/12	15	11:50	3.67		2	0			22	0	
14	4/17	16	9:35	2.43	3.3	1	0			0	0	
15	4/17	16	12:01	3.58		1	0			6	0	
16	4/18	16	22:20	2.17	2.1	2	0			44	3	
17	4/19	16	0:30	2.00	2.1	5	0			116	1	
18	4/19	16	2:30	2.00	1.9	2	0			292	0	
19	4/19	16	4:30	2.00	2.7	2	0			494	1	
20	4/19	16	6:30	2.00	2.5	3	0	2		82	0	
21	4/19	16	8:30	0.92	2.5	2	0	0		25	0	
22	4/19	16	10:32	1.97	3.0	3	0	0		134	0	
23	4/19	16	12:30	2.17	2.6	1	0	0		91	0	
24	4/19	16	14:40	1.83	2.6	2	0	0		100	0	
25	4/19	16	16:30	2.08	2.8	0	0	0		183	0	
26	4/19	16	18:35	2.00	2.3	0	0	0		37	0	
27	4/19	16	20:35	1.75	2.0	1	0	0		18	1	
28	4/19	16	22:20	1.67	2.0	0	0	1		47	1	
29	4/24	17	9:40	3.08	4.0+	0	0	0		2	0	
30	4/24	17	12:50	2.33	4.0+	0	0	0		8	0	
31	4/26	17	9:15	3.50	3.4	1	0	0		50	0	
32	4/26	17	12:45	3.97		0	0	0		190	0	
33	4/28	17	9:18	2.95	3.0	0	0	0		475	0	
34	4/28	17	12:34	3.18	2.9	1	0	0		407	0	
35	5/1	18	9:35	1.08	3.3	0	0	0		12	0	
36	5/1	18	11:55	1.88	3.2	0	0	0		31	0	
37	5/2	18	19:10	4.67	3.1	1	0	8	1	306	15	5
38	5/3	18	23:50	1.17	2.2	4	0	6	0	64	16	0
39	5/3	18	1:30	1.25	2.2	0	0	8	0	69	5	3
40	5/3	18	3:15	2.25	1.6	4	1	23	0	453	20	0
41	5/3	18	6:20	2.25	1.6	2	0	18	0	2,454	5	0
42	5/3	18	9:35	1.75	1.4	3	0	3	0	2,329	1	0
43	5/3	18	11:50	4.42	1.3	4	0	5	0	3,431	2	0

- continued -

Appendix Table C2. Summary by set of screwtrap effort and salmonid catch data, 1995 (continued).

1995						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
44	5/3	18	16:15	1.00	1.2	0	0	2	0	22	1	0
45	5/5	18	9:22	3.38	3.1	2	0	2	0	7	0	0
46	5/5	18	13:00	3.33	2.8	1	0	0	0	5	0	0
47	5/8	19	9:45	0.50	2.7	12	0	0	0	4	0	0
48	5/9	19	9:12	2.05	2.1	0	0	9	0	44	1	0
49	5/9	19	12:50	3.17	2.2	5	0	37	1	657	2	1
50	5/10	19	9:42	0.23		1	0	16	0	267	0	0
51	5/10	19	10:35	1.03	1.2	11	0	348	5	473	3	0
52	5/15	20	9:45	3.00	2.0	32	23	21	0	611	1	0
53	5/15	20	13:25	2.25	1.7	43	32	15	0	1,128	0	0
54	5/16	20	19:37	3.97	0.9	74	57	167	0	22	3	2
55	5/17	20	23:35	1.58	1.3	104	104	248	0	27	11	3
56	5/17	20	1:10	2.92	1.4	36	27	373	5	11	26	13
57	5/17	20	4:35	3.67	1.5	34	25	500	0	202	36	8
58	5/17	20	8:35	3.67	1.4	19	11	82	5	1,446	2	2
59	5/22	21	8:55	3.33	3.0	1	0	1	1	173	0	0
60	5/22	21	12:25	3.17	3.1	5	1	2	0	437	0	0
61	5/23	21	19:31	3.75	2.1	28	14	174	2	20	1	0
62	5/24	21	23:16	1.98	1.9	1	0	104	2	8	2	0
63	5/24	21	1:15	2.12		1	0	206	3	2	1	0
64	5/24	21	3:22	1.72	2.4	2	0	143	5	27	4	2
65	5/24	21	5:05	2.25	2.4	4	2	14	3	97	0	
66	5/24	21	7:20	3.92	2.4	8	5	2	0	163	1	
67	5/24	21	11:15	4.92	2.5	49	24	15	0	1,519	1	
68	5/31	22	7:48	1.00	1.2	0	0	0	0	0	0	
69	5/31	22	8:54	0.10		3	0	0	0	21	0	
70	5/31	22	9:00	0.27		3	0	0	0	73	0	
71	5/31	22	9:16	0.23		0	0	0	0	0	0	
72	5/31	22	9:30	5.55	1.1	12	0	14	1	126	0	
73	5/31	22	15:03	6.87	1.5	54	7	26	1	192	0	
74	6/2	22	9:12	4.25	1.8	13	0	14		356	0	
75	6/2	22	14:29	2.10	1.6	12	3	1		217	0	
76	6/5	23	9:30	3.83	1.8	6	0	19		176	0	
77	6/5	23	13:20	2.28	1.7	8	3	12		206	0	
78	6/6	23	9:08	3.37	2.3	2	1	9		54	0	
79	6/6	23	12:30	4.00	2.2	5	1	4		10	0	
80	6/7	23	8:45	1.17	2.5	3	0	0		13	0	
81	6/7	23	9:55	0.42		0	0	1		5	0	
82	6/7	23	10:20	0.50	2.5	0	0	0		2	0	
83	6/7	23	10:50	1.03		0	0	0		2	0	
84	6/7	23	11:52	1.67		0	0	1		3	0	
85	6/7	23	13:32	2.03	2.6	1	0	0		12	0	

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Appendix Table C2. Summary by set of screwtrap effort and salmonid catch data, 1995 (continued).

1995						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
86	6/7	23	15:34	2.60	2.8	0	0	1		3	0	
87	6/7	23	18:10	2.90		0	0	1		0	0	
88	6/9	23	9:08	3.28	2.1	2	1	2		60	0	
89	6/9	23	12:40	2.62	1.9	17	4	0		137	0	
90	6/12	24	9:05	2.72	1.7	26	0	6		60	0	
91	6/12	24	12:00	3.00	1.7	19	2	2		48	0	
92	6/13	24	9:08	3.37	2.5	1		2		5	0	
93	6/13	24	12:30	3.08	2.5	1		0		7	0	
94	6/14	24	8:35	3.50	2.5	0		3		6	0	
95	6/14	24	12:05	3.50	2.5	0		2		11	0	
96	6/15	24	8:53	3.62	3.1	0		0		6	0	
97	6/15	24	12:30	3.13	3.0	1		1		5	0	
98	6/19	25	8:58	3.37	2.5	1		5		12	0	
99	6/19	25	12:20	4.03	3.0	2		1		10	0	
100	6/20	25	12:20	4.13	3.6	0		1		1	0	
101	6/21	25	8:58	4.03	3.3	3		2		6	0	
102	6/21	25	13:00	3.35		1		1		2	0	
103	6/22	25	8:10	8.47	3.4	1		0		9	0	
104	6/23	25	9:00	2.75	3.0	0		0		1	0	
105	6/23	25	11:45	4.58	2.6	1		0		2	0	
106	6/26	26	8:31	5.02		27		1		7	1	
107	6/26	26	13:32	2.42		18		0		4	0	
108	6/27	26	8:45	2.92		2		0		0	0	
109	6/27	26	11:40	2.67		2		0		1	0	
110	6/29	26	9:40	3.17	2.0	25		0		3	0	
111	6/29	26	13:25	2.33	1.6	33		5		3	0	
112	7/3	27	8:15	3.92	1.1	631		3		6	0	
113	7/3	27	12:47	3.32	1.0	259		0		18	0	
114	7/5	27	8:20	3.63	1.7	17		0		0	0	
115	7/5	27	11:58	3.58	1.6	18		0		0	0	
116	7/6	27	9:26	2.78	1.9	10		0		0	0	
117	7/6	27	12:13	3.53	1.9	23		0		0	0	
118	7/10	28	7:36	4.68	1.2	242		0		1	0	
119	7/10	28	12:20	4.27	1.6	406		1		6	0	
120	7/11	28	8:24	5.85	1.1	57		2			0	
121	7/11	28	14:29	1.63	1.1	10					0	
122	7/12	28	8:25	3.62	1.7	4					0	
123	7/12	28	12:02	4.18	1.4	1					0	
124	7/13	28	8:34	6.43	1.5	1					0	
125	7/13	28	15:00	1.33		0					0	
126	7/17	29	9:08	5.12	1.7	7					0	
127	7/17	29	15:30	0.83	1.5	5					0	

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Appendix Table C2. Summary by set of screwtrap effort and salmonid catch data, 1995 (continued).

1995						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
128	7/24	30	10:45	4.87		1					0	
129	7/26	30	9:14	2.47	0.3	1					0	
130	7/26	30	12:02	2.68	0.4	17					1	
131	7/27	30	10:04	0.18	0.3	2						
TOTALS				371.38		3,163	363[c]	2,698	35	21,585	171	39

[a] Smolts captured with an adipose fin clip.

[b] No pink salmon or sockeye salmon smolts were captured during trapping. Three cutthroat trout were captured.

[c] Total includes 9 tallied chinook salmon smolts assigned to the adipose fin clipped category based on a sample of chinook salmon smolts from the same set or neighboring sets.

Appendix Table C3. Summary by set of screwtrap effort and salmonid catch data, 1996.

1996						CATCH BY SPECIES[b]							
					Secchi	Chinook		Coho				Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Total	Ad-Clip[a]
1	3/25	13	12:02	4.00	3.0					13			
2	3/27	13	7:46	4.18	3.3					12	7		
3	3/27	13	20:10	3.88	3.5					6	0		
4	3/30	13	4:10	4.00	3.5					101	7		
5	3/30	13	12:00	4.17	4.0					19	8		
6	4/1	14	4:14	3.78	2.9					31	9		
7	4/2	14	8:12	4.08	0.9	131	127			15	90		
8	4/2	14	12:27	4.08	0.8	20	20			11	95		
9	4/3	14	4:10	4.00	1.5	12	11			5	13		
10	4/4	14	15:59	4.00	3.2	158	21			1	1		
11	4/4	14	20:20	4.03		82	0			1	2		
12	4/5	14	8:00	4.03	3.5	206	0			9	0		
13	4/6	14	16:00	4.00	3.2	809	39			5	18	2	
14	4/7	15	23:57	4.67	1.1	43	0	2		33	279	6	4
15	4/7	15	12:07	4.02	0.9	9	0	0		30	83	0	0
16	4/7	15	16:10	4.03	0.7	14	2	0		8	66	1	0
17	4/9	15	12:00	4.02	1.6	10	0	0		173	202	0	0
18	4/10	15	4:27	3.70	1.2	25	1	1		56	385	3	0
19	4/10	15	8:43	1.22	1.1	5	1	0		151	973	0	0
20	4/11	15	4:00	4.00	0.9	8	1	0		30	345	3	0
21	4/12	15	16:00	4.00	1.6	14	2	0		14	307	0	0
22	4/13	15	20:00	4.00	2.4	2	0	0		0	76	0	0
23	4/14	16	4:03	4.00	2.1	2	1	0		5	57	0	0
24	4/14	16	20:00	4.08	2.2	1	0	0		0	8	0	0
25	4/15	16	0:16	4.07	3.1	1	0	0		5	21	0	0
26	4/15	16	16:15	3.53	3.3	0	0	0		1	5	0	0
27	4/15	16	20:04	3.85	3.3	1	0	0		0	6	0	0
28	4/16	16	0:05	3.82	3.1	0	0	0		3	7	0	0
29	4/16	16	4:14	3.70	2.9	1	0	0		49	58	0	0
30	4/17	16	4:10	4.03	1.3	1	1	0		28	1,046	1	0
31	4/18	16	4:15	4.00	1.7	2	0	0		5	527	0	0
32	4/18	16	12:00	4.00	1.6	2	0	0		35	261	0	0
33	4/19	16	16:40	4.00	1.7	1	1	0		19	114	1	0
34	4/22	17	0:03	4.00	2.8	1	0	0		0	5	2	1
35	4/22	17	4:03	4.00	3.3	0	0	0		130	166	1	0
36	4/28	18	12:10	4.00	1.2	0	0	0		60	83	1	1
37	4/28	18	16:17	4.00	1.5	1	0	0		1	34	3	2
38	4/28	18	20:23	4.05	1.5	0	0	0		1	52	13	8
39	4/29	18	4:30	4.00	1.4	0	0	0		10	231	2	2
40	4/30	18	0:30	4.08	1.9	0	0	3		0	3	15	5
41	4/30	18	16:00	4.00	1.9	0	0	1		7	49	4	3
42	5/2	18	11:59	4.00	2.0	0	0	1		56	648	1	0
43	5/3	18	8:05	4.13	1.8	0	0	1		7	455	0	0

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Appendix Table C3. Summary by set of screwtrap effort and salmonid catch data, 1996 (continued).

1996						CATCH BY SPECIES[b]							
					Secchi	Chinook		Coho				Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Total	Ad-Clip[a]
44	5/4	18	0:26	3.97	1.7	0	0	4		1	38	15	10
45	5/4	18	16:05	4.00	2.5	1	0	0		1	9	0	0
46	5/5	19	20:05	4.00	3.2	0	0	5		0	2	4	2
47	5/6	19	0:12	4.08	2.7	0	0	1		0	1	6	2
48	5/6	19	7:58	4.00	2.9	0	0	0		8	11	1	0
49	5/7	19	8:00	4.00	2.9	0	0	0		16	20	0	0
50	5/7	19	0:00	3.97	2.6	0	0	8		0	7	11	2
51	5/8	19	12:09	4.13	1.9	0	0	2		18	717	1	0
52	5/8	19	16:45	4.00	1.8	1	0	1		14	424	0	0
53	5/10	19	20:15	4.12	4.0	0	0	7		0	13	5	1
54	5/11	19	20:00	4.00	3.0	0	0	8		0	2	4	2
55	5/12	20	0:02	4.15	3.1	2	0	4		0	1	5	1
56	5/12	20	4:15	3.97	0.9	0	0	3		3	27	3	1
57	5/13	20	12:15	2.95	1.5	7	0	28		1	3,299	48	2
58	5/15	20	13:34	2.85	1.0	2	0	147		0	33	3	0
59	5/16	20	8:10	4.00	1.5	1	0	98		1	158	3	1
60	5/22	21	12:05	3.92	1.4	7	0	127	7	1	24	4	1
61	5/24	21	12:20	4.00	0.6	4	0	56	2	0	2	2	1
62	5/24	21	16:25	4.18	1.1	4	0	50	1	0	3	2	2
63	5/27	22	0:00	4.00	1.7	1	0	137	1	0	4	8	5
64	5/27	22	16:10	4.00	1.8	2	0	22	3	1	18	1	1
65	5/28	22	14:22	1.63	1.6	1	0	7	0	0	3	0	0
66	5/28	22	16:00	2.00	1.7	0	0	1	0	0	4	0	0
67	5/28	22	18:00	2.00	1.7	0	0	4	0	0	8	0	0
68	5/28	22	20:00	2.00	1.6	1	0	9	0	1	0	0	0
69	5/28	22	22:00	2.00	1.2	1	0	134	0	0	8	2	1
70	5/29	22	0:00	4.00	1.2	2	0	186	2	0	5	1	1
71	5/29	22	4:00	4.10	1.8	2	0	36	5	1	15	0	0
72	5/29	22	8:06	6.95	1.9	3	0	42	4	0	10	0	0
73	5/30	22	3:58	4.25	1.4	1	0	27	1	1	33	0	0
74	6/1	22	0:00	3.95	2.3	0	0	17	0	0	15	1	0
75	6/3	23	0:00	4.00	2.7	1	0	4	0	0	27	0	0
76	6/3	23	4:00	4.00	2.7	0	0	1	1	0	54	0	0
77	6/5	23	20:14	4.00	1.6	1,850	0	9	0	0	1	0	0
78	6/6	23	9:00	4.37	1.8	323	0	2	0	0	1	1	0
79	6/7	23	4:41	1.45	1.9	194	0	0	0	0	8	0	0
80	6/7	23	6:09	1.93	1.8	58	0	0	0	0	31	0	0
81	6/7	23	8:06	1.97	1.8	60	3	0	0	0	9	0	0
82	6/7	23	10:05	1.98	1.6	90	0	0	0	0	28	1	1
83	6/7	23	12:05	3.92	1.4	105	0	1	1	0	55	0	
84	6/7	23	16:08	4.02	1.4	137	0	2		0	4	0	
85	6/8	23	4:15	3.78	1.3	136	0	3		0	8	0	

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Appendix Table C3. Summary by set of screwtrap effort and salmonid catch data, 1996 (continued).

1996						CATCH BY SPECIES[b]							
					Secchi	Chinook		Coho				Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Total	Ad-Clip[a]
86	6/11	24	16:00	4.12	3.0	1	0	1		1	7	0	
87	6/11	24	20:07	4.03	2.5	2	0	4			6	0	
88	6/12	24	8:00	4.00	3.1	2	0	0			3	0	
89	6/12	24	12:05	4.00	2.8	1	0	0			8	0	
90	6/14	24	8:06	2.00	3.5	0	0	1			1	0	
91	6/14	24	10:06	1.90	3.4	0	0	0			0	1	
92	6/14	24	12:02	1.97	3.5	0	0	0			2	0	
93	6/14	24	14:00	2.05	3.2	0	0	0			1	0	
94	6/14	24	16:06	4.00	3.6	0	0	0			1	0	
95	6/17	25	20:00	2.00	3.3	0	0	0			1	0	
96	6/17	25	22:00	1.95	2.0	1	0	1			0	0	
97	6/18	25	23:57	2.22	2.5	1	0				0	0	
98	6/18	25	2:10	2.00	2.5	0	0				0	0	
99	6/18	25	4:10	4.00	2.5	0	0				1	0	
100	6/18	25	8:10	4.00	3.6	0	0				1	0	
101	6/20	25	16:07	5.83	3.7+	0	0				0	0	
102	6/21	25	8:30	4.17	3.7+	0	0				0	0	
103	6/24	26	20:00	4.00	3.7+	2	1				0	1	
104	6/26	26	8:13	4.33	3.7+	0	0				0	0	
105	6/27	26	4:07	2.22	3.2	0	0				5	0	
106	6/27	26	6:20	2.00	3.7+	0	0				1	0	
107	6/27	26	8:20	2.00	3.7+	0	0				0	0	
108	6/27	26	10:20	2.00	3.7+	0	0				0	0	
109	6/27	26	12:20	4.20	3.7+	0	0				1	0	
110	7/12	28	0:30	4.17	3.1	3	0					0	
111	7/15	29	4:00	4.17	1.5	19	1					0	
112	7/16	29	0:00	4.17	0.4	110	11					0	
113	7/16	29	16:05	4.00	0.8	20	0					0	
114	7/19	29	8:17	4.00	1.6	1	0					0	
115	7/23	30	20:00	4.25	1.5	3	0					0	
116	7/24	30	20:07	4.00	1.3	4	0					0	
117	7/25	30	8:12	4.00	1.6	0	0					0	
118	7/25	30	16:15	4.00	1.1	1	0					0	
119	7/29	31	12:04	4.00	1.0	6	2					0	
120	7/30	31	16:07	4.00	0.7	26						1	
121	8/1	31	8:15	4.20	1.4	0							
122	8/5	32	11:53	4.00	2.7	0							
123	8/5	32	15:53	4.00	2.2	0							
124	8/7	32	0:08	4.20	2.2	0							
125	8/8	32	20:05	4.00	1.8	0							
126	8/12	33	4:13	4.07	1.2	1							

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Appendix Table C3. Summary by set of screwtrap effort and salmonid catch data, 1996 (continued).

1996						CATCH BY SPECIES[b]							
					Secchi	Chinook		Coho				Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Total	Ad-Clip[a]
127	8/12	33	11:47	4.08	1.2	0							
128	8/13	33	19:45	4.25	1.3	1							
129	8/14	33	4:08	4.15	1.3	1							
TOTALS				476.52		4,765	246[c]	1,209	28	1,215	11,981	194	63

[a] Smolts captured with an adipose fin clip.

[b] No sockeye salmon smolts or cutthroat trout were captured during trapping.

[c] Total includes 67 tallied chinook salmon smolts assigned to the adipose fin clipped category based on a sample of chinook salmon smolts from the same set or neighboring sets.

Appendix Table C4. Summary by set of screwtrap effort and salmonid catch data, 1997.

1997						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
1	3/17	12	11:57	4.82	1.1			1		4		
2	4/2	14	12:05	6.03	1.9	39	35	0		7		
3	4/3	14	18:04	6.00	1.9	37	36	1		25		
4	4/4	14	0:06	6.07	1.4	38	37	0		8	1	
5	4/5	14	22:57	5.67	2.3	2	0	0		7	0	
6	4/8	15	11:52	6.00	2.8	0	0	0		5	0	
7	4/10	15	7:45	6.00	3.0	0	0	0		14	0	
8	4/12	15	10:50	6.00	3.6	0	0	0		32	0	
9	4/14	16	11:55	6.00	1.4	1	0	0		56	0	
10	4/16	16	6:20	2.85	1.7	0	0	1		108	1	
11	4/18	16	10:45	5.67	0.8	2	1	0		23	0	
12	4/22	17	12:00	6.00	0.6	4	0	0		49	8	7
13	4/24	17	17:44	4.77	0.9	2	0	0		2	1	1
14	4/26	17	11:55	6.08	1.2	4	0	1		48	1	0
15	4/30	18	0:05	5.95	1.1	22	0	7		7	79	41
16	5/2	18	6:02	5.97	1.1	10	0	12		34	9	5
17	5/4	19	11:52	6.17	1.5	16	3	3		34	1	0
18	5/6	19	5:57	0.88	0.9	22	1	94	4	20	6	4
19	5/8	19	12:05	5.92	1.0	23	0	42	0	27	5	0
20	5/10	19	23:56	5.82	1.1	16	0	945	17	5	31	2
21	5/12	20	18:06	2.07	0.7	7	0	34	0	2	0	0
22	5/14	20	12:25	5.58	0.4	1	0	61	0	4	0	0
23	5/16	20	10:05	6.08	0.4	9	0	31	0	1	1	0
24	5/19	21	11:07	3.95	0.8	11	0	177	0	9	6	0
25	5/20	21	12:04	2.05	0.8	15	0	64	2	9	2	0
26	5/20	21	14:12	2.05	0.8	1	0	47	0	6	0	0
27	5/20	21	16:15	2.25	1.2	15	0	61	0	5	2	0
28	5/20	21	18:30	1.92	0.9	10	0	240	6	3	17	3
29	5/20	21	20:25	2.00	1.2	8	0	59		3	2	0
30	5/21	21	22:25	4.00	0.9	80	0	350		3	17	14
31	5/21	21	2:25	3.08	0.8	217	0	476		2	16	9
32	5/22	21	12:10	3.08	1.2	116	0	134		21	1	
33	5/27	22	12:45	5.33	1.5	86	0	54		0	0	
34	5/28	22	12:00	6.00	1.1	188	0	183		7	2	
35	5/30	22	6:00	6.00	0.4	157	0	161		4	2	
36	6/5	23	14:00	6.00	0.4	48	8	9		0	0	
37	6/6	23	6:00	6.00	0.5	76	7	2		5	0	
38	6/6	23	12:00	6.00	0.5	43	14	4		1	0	
39	6/10	24	17:45	6.25	0.8	227	82	10		0	1	
40	6/12	24	0:00	6.00	0.5	537	50	8		1	0	
41	6/13	24	18:00	6.08	0.8	176	78	10		5	1	
42	6/16	25	6:35	4.33	0.8	122	0	5		0		
43	6/20	25	6:00	6.17	0.6	19	2	3		0		

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Appendix Table C4. Summary by set of screwtrap effort and salmonid catch data, 1997 (continued).

1997						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip[a]
44	6/20	25	12:10	5.83	0.7	15	1	2		0		
45	6/23	26	12:00	6.08	0.8	70	7	2		0		
46	6/24	26	11:45	6.25	0.4	33	9	1		1		
47	6/25	26	12:10	6.08	0.7	27	1	1				
48	6/27	26	0:05	5.92	0.9	21	0	0				
49	6/29	27	0:00	6.00	1.1	31	5	2				
50	7/1	27	12:00	6.00	1.2	10	1	1				
51	7/3	27	0:00	6.25	1.3	10	3	0				
52	7/4	27	12:00	6.00	1.3	9	0	0				
53	7/7	28	0:01	5.98	0.7	11	0	0				
54	7/14	29	18:00	6.17	0.5	14	0	1				
55	7/16	29	0:00	6.00	0.8	26	0					
56	7/19	29	18:00	6.00	0.5	5	0					
57	7/21	30	6:00	6.25	0.5	5	0					
58	7/23	30	0:00	6.00	0.8	6	0					
59	7/25	30	18:00	6.00	1.2	16	1					
60	7/28	31	10:00	6.00	1.7	22						
61	7/30	31	12:30	6.25	1.0	4						
			TOTALS	320.00		2,742	382[c]	3,300	29	607	213	86

[a] Smolts captured with an adipose fin clip.

[b] No pink salmon or sockeye salmon smolts were captured during trapping. Thirteen cutthroat trout were captured.

[c] Total includes 204 tallied chinook salmon smolts assigned to the adipose fin clipped category based on a sample of chinook salmon smolts from the same set or neighboring sets.

Appendix Table C5. Summary by set of screwtrap effort and salmonid catch data, 1998.

1998						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho				
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Steel-head
1	4/3	14	10:15	5.75	4.0			1		74	34	
2	4/5	15	12:05	5.92	4.5			1		13	8	
3	4/7	15	18:05	5.50	4.8	2		0		8	65	
4	4/9	15	0:05	5.92	4.0	0		0		18	35	
5	4/11	15	6:00	6.00	4.0	0		0		9	2	
6	4/13	16	18:23	6.10	4.0	0		0		7	7	
7	4/15	16	0:07	6.08	4.0	0		0		9	8	
8	4/17	16	6:00	6.28	4.0	15		0		15	4	
9	4/19	17	11:52	6.08	4.0	0		1		12	0	
10	4/21	17	0:02	6.17	4.0	9	1	0		12	25	
11	4/23	17	18:09	5.18	1.3	142	15	0		24	384	18
12	4/25	17	6:21	5.90	1.5	21	2	1		10	75	0
13	4/28	18	9:56	6.22	3.6	7	0	3	1	51	160	0
14	4/29	18	0:15	6.25	4.0	40	0	1	0	5	62	1
15	5/4	19	12:05	4.92	0.9	19	0	1	0	0	31	0
16	5/5	19	17:03	2.78	0.8	18	0	0	0	0	4	2
17	5/7	19	6:00	6.00	1.1	62	0	156	0	2	77	1
18	5/9	19	12:00	6.17	1.4	214	10	1	0	0	37	0
19	5/11	20	8:03	3.52	2.4	18	0	18	0	2	9	2
20	5/13	20	18:06	6.15	1.3	51	0	18	0	0	12	5
21	5/15	20	6:00	7.50	1.5	55	0	60	0	2	4	5
22	5/17	21	12:00	6.00	2.0	47	0	55	0	1	10	1
23	5/19	21	6:05	6.35	4.7	0	0	2	0	0	0	0
24	5/21	21	18:00	6.17	3.2	0	0	25	1	1	3	1
25	5/23	21	11:57	6.05	3.2	2	0	22	1	0	1	0
26	5/25	22	18:00	6.00	1.5	76	0	1,107	111	0	30	0
27	5/27	22	6:05	5.92	1.3	240	0	758	0	0	16	1
28	5/28	22	17:40	6.08	1.6	17	0	255	0	0	1	1
29	5/29	22	23:45	6.25	1.7	6	0	198	0	0	2	0
30	5/31	23	12:00	6.58	4.9	4	0	2	0	0	12	0
31	6/2	23	11:50	4.63	2.1	46	0	10	0	0	50	0
32	6/4	23	9:00	6.00	2.3	121	0	15	0	1	7	1
33	6/4	23	15:00	6.00	1.7	411	0	23	1		8	2
34	6/6	23	0:00	6.00	1.7	115	0	70	0		2	2
35	6/8	24	0:05	6.17	1.2	129	0	100	0		0	0
36	6/10	24	18:26	6.15	1.8	11	0	47	0		0	0
37	6/12	24	18:05	5.92	2.2	50	0	40	0		0	0
38	6/13	24	10:16	6.23	2.5	45	0	10	0		0	0
39	6/14	25	6:00	6.00	2.3	22	7	3	0		39	0
40	6/15	25	13:00	3.00	1.9	77	23	3	0		1	0
41	6/16	25	9:00	6.00	1.9	158	20	7	1		3	0
42	6/18	25	12:15	6.02	2.8	4	1	2	1		0	0
43	6/20	25	12:00	6.00	2.5	10	2	5	0		2	0

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Appendix Table C5. Summary by set of screwtrap effort and salmonid catch data, 1998 (continued).

1998						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho				
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Pink	Chum	Steel-head
44	6/22	26	0:09	7.10	2.1	8	2	6	0		2	0
45	6/24	26	17:55	6.08	2.3	13	3	3	0		0	0
46	6/26	26	6:05	5.92	1.5	23	6	11	0		0	0
47	6/28	27	11:55	6.08	1.8	21	3	6	0		0	0
48	7/2	27	12:00	6.00	1.2			53	0		1	0
49	7/3	27	6:05	6.42	0.5			15	0		1	0
50	7/4	27	12:04	6.35	0.4			37	6			0
51	7/6	28	18:00	6.00	1.1			43	6			1
52	7/8	28	0:00	6.00	1.1			16	1			0
53	7/10	28	0:05	7.17	0.9			10	2			0
54	7/12	29	6:15	6.27	1.1			11	0			0
55	7/14	29	12:00	6.00	1.5			12	0			0
56	7/16	29	14:56	3.07	0.4			27	1			2
57	7/18	29	10:15	7.50	0.9			16	1			0
58	7/20	30	18:00	6.00	1.2			4	2			0
59	7/23	30	18:00	6.00	0.8			8	0			0
60	7/24	30	12:00	6.50	0.9			14	1			1
TOTALS				354.37		2,329	95[c]	3,313	137	276	1,234	47

[a] Smolts captured with an adipose fin clip.

[b] Four sockeye salmon smolts were captured during trapping. Three cutthroat trout were captured. No steelhead trout smolts with a clipped adipose fin were captured.

[c] Total includes 36 tallied chinook salmon smolts assigned to the adipose fin clipped category based on a sample of chinook salmon smolts from the same set or neighboring sets.

Appendix Table C6. Summary by set of screwtrap effort and salmonid catch data, 1999.

1999						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip
1	3/23	12	10:45	4.22	1.9					28	1	
2	3/24	12	6:23	5.62	2.0					32	0	
3	3/26	12	18:11	5.82	1.6	1				43	0	
4	3/28	13	6:08	5.87	1.8	2				118	0	
5	3/30	13	18:01	5.73	1.2	0				46	0	
6	4/1	13	0:13	5.78	2.6	2				122	0	
7	4/5	14	0:00	6.00	3.5	1				45	0	
8	4/7	14	17:58	6.03	3.4	10				15	1	
9	4/9	14	12:00	6.02	3.2	32				128	0	
10	4/11	15	6:08	5.88	4.0	4				51	0	
11	4/13	15	0:40	5.35	3.3	1				75	0	
12	4/15	15	6:00	6.00	2.8	1				96	0	
13	4/17	15	11:59	5.95	2.4	95				3,753	0	
14	4/19	16	6:07	5.63	1.9	91				721	0	
15	4/21	16	17:42	2.15	1.8	10				57	0	
16	4/21	16	19:51	2.32	1.8	37				45	0	
17	4/21	16	22:10	1.70	1.9	18		2		83	1	
18	4/22	16	23:52	2.47	1.9	7		0		134	0	
19	4/22	16	2:20	4.17	2.1	20		1		195	0	
20	4/22	16	6:30	2.50	2.3	4		0		34	0	
21	4/22	16	9:00	2.97	2.4	27		0		39	1	
22	4/23	16	12:38	5.38	3.2	8		1		385	0	
23	4/25	17	12:03	5.70	1.5	56		3		2,355	8	
24	4/26	17	12:20	2.17	1.2	8		0		190	0	
25	4/26	17	14:30	2.00	1.1	14		0		99	1	
26	4/26	17	16:30	2.13	1.2	7		0		31	2	
27	4/26	17	18:38	2.75	1.2	30		0		10	5	
28	4/26	17	21:23	2.42	1.2	15		0		57	6	
29	4/27	17	23:48	2.70	1.3	7		6		36	5	
30	4/27	17	2:30	4.83	1.4	12		2		83	3	
31	4/29	17	6:00	6.00	3.2	2		0		46	1	
32	5/1	17	5:57	6.05	3.0	0		0		146	0	
33	5/3	18	0:03	6.03	2.0	6		10		82	7	
34	5/5	18	17:55	6.12	2.9	3		6		28	5	
35	5/7	18	12:26	5.45	1.6	173		19	2	6,908	13	4
36	5/9	19	12:00	6.00	2.4	20		0	0	244	0	0
37	5/11	19	18:01	6.07	3.8	10		17	0	19	10	4
38	5/13	19	17:57	6.13	2.9	12		37	15	71	8	0
39	5/15	19	6:13	5.78	3.7	1		1	0	12	0	0
40	5/17	20	12:14	5.82	3.1	18		24	0	43	1	0
41	5/19	20	0:20	0.70	1.1	20		301	33	174	17	5
42	5/21	20	18:00	5.95	2.2	14		427	5	11	17	0
43	5/25	21	17:53	3.02	0.4	15		1,508	0	48	2	2

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Appendix Table C6. Summary by set of screwtrap effort and salmonid catch data, 1999 (continued).

1999						CATCH BY SPECIES[b]						
					Secchi	Chinook		Coho			Steelhead	
Set	Date	Stat. Week	Start Time	Effort (hours)	Depth (feet)	Total	Ad-Clip[a]	Total	Ad-Clip[a]	Chum	Total	Ad-Clip
44	5/27	21	5:58	6.03	0.9	7		3,318	0	115	45	14
45	5/29	21	6:00	6.00	1.1	0		893	0	133	14	9
46	5/31	22	18:28	3.70	1.1	1		1,823	0	4	5	2
47	6/2	22	0:07	5.88	1.1	4		2,176	0	14	4	2
48	6/6	23	17:52	6.05	0.9	44	26	582	17	4	2	
49	6/8	23	5:56	6.20	1.3	66	12	61	0	41	0	
50	6/14	24	17:53	6.15	0.7	239	30	82	1	4	0	
51	6/16	24	11:57	5.10	0.5	191	26	67	0	3	4	
52	6/18	24	6:04	5.97	0.7	389	36	48	0	13	2	
53	6/23	25	18:21	5.78	1.0	83	4	7	1	1	1	
54	6/24	25	18:00	4.97	0.9	298	19	20	0	5	0	
55	6/26	25	12:02	5.92	1.0	249	18	22	0	5	0	
56	6/28	26	17:58	6.07	1.2	132	9	5	1	1	0	
57	7/2	26	11:57	4.98	1.1	138	5	9	0	0	0	
58	7/4	27	5:58	6.07	1.3	229	11	18	0	2	1	
59	7/6	27	11:55	6.13	1.3	78	14	4	0	1	0	
60	7/8	27	23:59	5.87	1.1	178	8	5	0	0	0	
61	7/10	27	5:59	4.65	1.1	263	22	1	0	1	0	
62	7/12	28	11:58	5.43	0.8	136	6	0	0	0	0	
63	7/14	28	0:08	5.67	1.1	118	2	1	1	1	0	
64	7/16	28	18:00	5.88	1.5	59	4	0		0	0	
65	7/18	29	6:00	6.02	1.5	48	2	2		1	0	
66	7/20	29	17:59	5.90	1.4	117	5				0	
67	7/22	29	6:01	6.00	1.7	35					0	
68	7/24	29	12:00	5.92	1.3	40					0	
69	7/26	30	6:32	5.50	1.8	16					0	
70	7/28	30	1:04	4.93	1.9	26					0	
71	7/30	30	17:58	6.07	1.5	51					1	
			TOTALS	356.22		4,049	259[c]	11,509	76	17,287	194	42

[a] Smolts captured with an adipose fin clip.

[b] No pink salmon were captured during trapping. Three sockeye salmon smolts and 12 cutthroat trout were captured.

[c] There were no tallied chinook salmon smolts in 1999; the adipose fin status of all captured smolts was determined by examination.

APPENDIX D

Summary, by species, of weekly screwtrap effort, salmonid catch, and catch per unit effort, 1994-1999.

Appendix Table D1. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of chinook salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date[a]	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		1				0.00		0.06
13	29-Mar		3.60	20.23	0.00		17.38		7	0			4		1.94	0.00			0.23
14	5-Apr		16.22	32.00	23.77	5.75	18.05		305	1,418	116	0	43		18.80	44.31	4.88	0.00	2.38
15	12-Apr		18.22	33.66	18.00	23.34	23.18		316	130	0	2	101		17.34	3.86	0.00	0.09	4.36
16	19-Apr		30.57	43.08	14.52	18.46	29.29		25	12	3	15	222		0.82	0.28	0.21	0.81	7.58
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	5	2	1	10	172	151	0.22	0.11	0.13	0.59	7.37	4.11
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	6	21	2	32	47	182	0.21	0.74	0.05	2.68	3.77	10.34
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	108	29	1	77	313	43	4.97	4.15	0.03	4.10	15.75	1.79
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	58	342	12	17	124	52	2.61	16.24	0.67	1.24	7.22	4.17
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	50	99	15	473	49	22	3.01	3.65	1.24	19.40	1.99	1.46
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		97	14	431	339	5		4.76	0.34	24.87	13.98	0.52
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	367	44	2,954	167	697	110	14.02	1.39	83.40	9.28	23.86	8.98
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	2,090	48	6	940	235	819	93.39	1.85	0.21	51.28	9.60	47.56
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	437	9	2	156	271	630	17.00	0.26	0.08	9.55	10.03	37.79
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	255	107	2	151	44	270	7.28	5.77	0.10	6.21	2.30	24.43
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	50	958		60	21	748	2.42	46.15		2.47	0.85	32.92
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	430	721	3	11	0	313	30.28	22.54	0.72	1.84	0.00	18.43
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	4	12	150	45	0	240	1.78	2.02	9.18	2.48	0.00	10.07
30	26-Jul		10.20	16.25	18.25	18.50	16.50		21	8	27	0	93		2.06	0.49	1.48	0.00	5.64
31	2-Aug			12.20	12.25					32	26					2.62	2.12		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						3						0.18			
		258.09	371.38	476.52	320.00	354.37	356.22	3,860	3,163	4,765	2,742	2,329	4,049						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D2. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of adclipped chinook salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		0				0.00		0.00
13	29-Mar		3.60	20.23	0.00		17.38		0	0			0		0.00	0.00			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		15	218	108	0	0		0.92	6.81	4.54	0.00	0.00
15	12-Apr		18.22	33.66	18.00	23.34	23.18		0	7	0	0	0		0.00	0.21	0.00	0.00	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		0	3	1	0	0		0.00	0.07	0.07	0.00	0.00
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	1	0	0	0	18	0	0.04	0.00	0.00	0.00	0.77	0.00
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	2	1	0	0	0	0	0.07	0.04	0.00	0.00	0.00	0.00
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	13	0	0	4	10	0	0.60	0.00	0.00	0.21	0.50	0.00
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	7	279	0	0	0	0	0.31	13.25	0.00	0.00	0.00	0.00
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	2	46	0	0	0	0	0.12	1.69	0.00	0.00	0.00	0.00
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		10	0	0	0	0		0.49	0.00	0.00	0.00	0.00
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	111	10	3	29	0	38	4.24	0.32	0.08	1.61	0.00	3.10
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	578	2	0	210	0	92	25.83	0.08	0.00	11.46	0.00	5.34
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	77	0	0	3	53	41	3.00	0.00	0.00	0.18	1.96	2.46
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	31	0	1	17	11	14	0.88	0.00	0.05	0.70	0.58	1.27
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	6	0		9	3	55	0.29	0.00		0.37	0.12	2.42
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	78	0	0	0	0	12	5.49	0.00	0.00	0.00	0.00	0.71
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	2	0	12	0	0	7	0.89	0.00	0.73	0.00	0.00	0.29
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	1	0	0		0.00	0.00	0.05	0.00	0.00
31	2-Aug			12.20	12.25					2	0					0.16	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	908	363	246	382	95	259						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D3. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of coho salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				1		0				0.21		0.00
13	29-Mar		3.60	20.23	0.00		17.38		0	0			0		0.00	0.00			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		0	0	1	1	0		0.00	0.00	0.04	0.17	0.00
15	12-Apr		18.22	33.66	18.00	23.34	23.18		0	3	0	1	0		0.00	0.09	0.00	0.04	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		3	0	1	0	4		0.10	0.00	0.07	0.00	0.14
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	12	0	0	1	2	11	0.54	0.00	0.00	0.06	0.09	0.30
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	18	75	10	19	4	35	0.63	2.64	0.25	1.59	0.32	1.99
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	548	410	32	1,084	158	55	25.20	58.74	0.88	57.69	7.95	2.29
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	302	1,406	280	126	96	752	13.59	66.76	15.63	9.18	5.59	60.30
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	5	661	233	1,608	104	5,719	0.30	24.34	19.26	65.96	4.23	380.00
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		55	622	398	2,318	3,999		2.70	15.22	22.97	95.59	417.43
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	43	50	22	15	120	643	1.64	1.58	0.62	0.83	4.11	52.49
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	190	16	6	28	197	197	8.49	0.62	0.21	1.53	8.05	11.44
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	13	10	1	10	20	49	0.51	0.29	0.04	0.61	0.74	2.94
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	2	6	0	4	20	14	0.06	0.32	0.00	0.16	1.05	1.27
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	3		3	111	28	0.00	0.14		0.12	4.47	1.23
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	3	0	0	69	1	0.00	0.09	0.00	0.00	3.60	0.06
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	1	66	2	0.00	0.00	0.00	0.06	2.89	0.08
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	0	26	0		0.00	0.00	0.00	1.41	0.00
31	2-Aug			12.20	12.25					0	0					0.00	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	1,133	2,698	1,209	3,300	3,313	11,509						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D4. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of adclipped coho salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		0				0.00		0.00
13	29-Mar		3.60	20.23	0.00		17.38		0	0			0		0.00	0.00			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
15	12-Apr		18.22	33.66	18.00	23.34	23.18		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	0	1	0	0	1	2	0.00	0.04	0.00	0.00	0.08	0.11
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	21	6	0	21	0	15	0.97	0.86	0.00	1.12	0.00	0.63
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	11	10	0	0	0	38	0.49	0.47	0.00	0.00	0.00	3.05
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	0	16	10	8	2	0	0.00	0.59	0.83	0.33	0.08	0.00
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		2	16	0	111	0		0.10	0.39	0.00	4.58	0.00
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	1	0	2	0	1	17	0.04	0.00	0.06	0.00	0.03	1.39
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	0	0	0	0	0	1	0.00	0.00	0.00	0.00	0.00	0.06
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	3	0	0	0	2	1	0.12	0.00	0.00	0.00	0.07	0.06
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	1	0	0	0	0	1	0.03	0.00	0.00	0.00	0.00	0.09
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	0		0	6	0	0.00	0.00		0.00	0.24	0.00
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	0	0	0	9	1	0.00	0.00	0.00	0.00	0.47	0.06
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	0	2	0	0.00	0.00	0.00	0.00	0.09	0.00
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	0	3	0		0.00	0.00	0.00	0.16	0.00
31	2-Aug			12.20	12.25					0	0					0.00	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	37	35	28	29	137	76						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D5. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of chum salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				4		103				0.83		6.58
13	29-Mar		3.60	20.23	0.00		17.38		1	22			286		0.28	1.09			16.46
14	5-Apr		16.22	32.00	23.77	5.75	18.05		49	228	47	34	188		3.02	7.13	1.98	5.91	10.42
15	12-Apr		18.22	33.66	18.00	23.34	23.18		305	2,716	51	110	3,975		16.74	80.69	2.83	4.71	171.48
16	19-Apr		30.57	43.08	14.52	18.46	29.29		1,669	2,110	187	19	1,693		54.60	48.98	12.88	1.03	57.80
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	234	1,132	171	99	484	3,053	10.44	59.55	21.38	5.88	20.75	83.07
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	80	9,183	1,602	41	222	7,018	2.79	323.00	39.82	3.44	17.80	398.75
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	242	1,445	1,197	86	149	346	11.13	207.02	32.98	4.58	7.50	14.43
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	79	3,447	3,518	7	25	228	3.55	163.68	196.32	0.51	1.46	18.28
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	74	2,446	29	61	14	296	4.45	90.06	2.40	2.50	0.57	19.67
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		985	123	11	49	18		48.36	3.01	0.63	2.02	1.88
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	89	683	226	6	79	45	3.40	21.55	6.38	0.33	2.70	3.67
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	54	148	29	6	0	20	2.41	5.71	1.03	0.33	0.00	1.16
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	5	43	3	0	45	11	0.19	1.24	0.11	0.00	1.67	0.66
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	1	18	7	1	2	1	0.03	0.97	0.34	0.04	0.10	0.09
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	24		0	2	4	0.00	1.16		0.00	0.08	0.18
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	7	0	0	0	1	0.00	0.22	0.00	0.00	0.00	0.06
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	0	0	1	0.00	0.00	0.00	0.00	0.00	0.04
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
31	2-Aug			12.20	12.25					0	0					0.00	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	858	21,585	11,981	607	1,234	17,287						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D6. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of pink salmon smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		0				0.00		0.00
13	29-Mar		3.60	20.23	0.00		17.38		0	151			0		0.00	7.46			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		0	78	0	74	0		0.00	2.44	0.00	12.87	0.00
15	12-Apr		18.22	33.66	18.00	23.34	23.18		0	495	0	48	0		0.00	14.71	0.00	2.06	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		0	150	0	31	0		0.00	3.48	0.00	1.68	0.00
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	646	0	130	0	58	0	28.81	0.00	16.25	0.00	2.49	0.00
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	119	0	144	0	56	0	4.15	0.00	3.58	0.00	4.49	0.00
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	14	0	56	0	2	0	0.64	0.00	1.54	0.00	0.10	0.00
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	19	0	5	0	4	0	0.85	0.00	0.28	0.00	0.23	0.00
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	0	0	1	0	2	0	0.00	0.00	0.08	0.00	0.08	0.00
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		0	4	0	0	0		0.00	0.10	0.00	0.00	0.00
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	0	0	0	0	1	0	0.00	0.00	0.00	0.00	0.03	0.00
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	0	0	1	0	0	0	0.00	0.00	0.04	0.00	0.00	0.00
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	0		0	0	0	0.00	0.00		0.00	0.00	0.00
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
31	2-Aug			12.20	12.25					0	0					0.00	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	798	0	1,215	0	276	0						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D7. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of steelhead smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		1				0.00		0.06
13	29-Mar		3.60	20.23	0.00		17.38		0	0			0		0.00	0.00			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		1	2	1	0	1		0.06	0.06	0.04	0.00	0.06
15	12-Apr		18.22	33.66	18.00	23.34	23.18		1	13	0	0	0		0.05	0.39	0.00	0.00	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		7	2	1	0	2		0.23	0.05	0.07	0.00	0.07
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	0	0	3	10	18	31	0.00	0.00	0.38	0.59	0.77	0.84
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	0	65	54	88	1	25	0.00	2.29	1.34	7.38	0.08	1.42
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	43	6	32	43	3	18	1.98	0.86	0.88	2.29	0.15	0.75
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	13	79	62	1	12	35	0.58	3.75	3.46	0.07	0.70	2.81
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	0	10	8	63	2	61	0.00	0.37	0.66	2.58	0.08	4.05
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		0	13	4	2	9		0.00	0.32	0.23	0.08	0.94
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	1	0	2	0	5	2	0.04	0.00	0.06	0.00	0.17	0.16
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	2	0	1	2	0	6	0.09	0.00	0.04	0.11	0.00	0.35
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	0	0	0	0	0	1	0.00	0.00	0.00	0.00	0.00	0.06
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	0	1	1	0	0	0	0.00	0.05	0.05	0.00	0.00	0.00
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	0		0	0	1	0.00	0.00		0.00	0.00	0.04
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	0	0	0	1	0	0.00	0.00	0.00	0.00	0.05	0.00
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	0	2	0	0.00	0.00	0.00	0.00	0.09	0.00
30	26-Jul		10.20	16.25	18.25	18.50	16.50		1	0	0	1	1		0.10	0.00	0.00	0.05	0.06
31	2-Aug			12.20	12.25					1	0					0.08	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	59	171	194	213	47	194						

[a] Mid-week date (Wednesday) for 1995.

Appendix Table D8. Summary of hours of trap effort, total catch, and catch per hour, by statistical week, for the catch of adclipped steelhead smolts by the Nooksack screwtrap, 1994-1999.

Stat.		Effort in hours						Total catch						Catch per hour					
Week	Date	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
12	22-Mar				4.82		15.66				0		0				0.00		0.00
13	29-Mar		3.60	20.23	0.00		17.38		0	0			0		0.00	0.00			0.00
14	5-Apr		16.22	32.00	23.77	5.75	18.05		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
15	12-Apr		18.22	33.66	18.00	23.34	23.18		0	4	0	0	0		0.00	0.12	0.00	0.00	0.00
16	19-Apr		30.57	43.08	14.52	18.46	29.29		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
17	26-Apr	22.42	19.01	8.00	16.85	23.33	36.75	0	0	1	8	0	0	0.00	0.00	0.13	0.47	0.00	0.00
18	3-May	28.65	28.43	40.23	11.92	12.47	17.60	0	8	31	46	0	4	0.00	0.28	0.77	3.86	0.00	0.23
19	10-May	21.75	6.98	36.30	18.79	19.87	23.98	0	1	9	6	0	4	0.00	0.14	0.25	0.32	0.00	0.17
20	17-May	22.23	21.06	17.92	13.73	17.17	12.47	0	28	5	0	0	5	0.00	1.33	0.28	0.00	0.00	0.40
21	24-May	16.62	27.16	12.10	24.38	24.57	15.05	0	2	4	26	0	25	0.00	0.07	0.33	1.07	0.00	1.66
22	31-May	0.00	20.37	40.88	17.33	24.25	9.58		0	8	0	0	4		0.00	0.20	0.00	0.00	0.42
23	7-Jun	26.18	31.70	35.42	18.00	29.21	12.25	0	0	1	0	0	0	0.00	0.00	0.03	0.00	0.00	0.00
24	14-Jun	22.38	25.92	28.07	18.33	24.47	17.22	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
25	21-Jun	25.70	34.71	26.17	16.33	27.02	16.67	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
26	28-Jun	35.03	18.53	20.75	24.33	19.10	11.05	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
27	5-Jul	20.68	20.76	0.00	24.25	24.85	22.72	0	0		0	0	0	0.00	0.00		0.00	0.00	0.00
28	12-Jul	14.20	31.99	4.17	5.98	19.17	16.98	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
29	19-Jul	2.25	5.95	16.34	18.17	22.84	23.84	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
30	26-Jul		10.20	16.25	18.25	18.50	16.50		0	0	0	0	0		0.00	0.00	0.00	0.00	0.00
31	2-Aug			12.20	12.25					0	0					0.00	0.00		
32	9-Aug			16.20						0						0.00			
33	16-Aug			16.55						0						0.00			
		258.09	371.38	476.52	320.00	354.37	356.22	0	39	63	86	0	42						

[a] Mid-week date (Wednesday) for 1995.

APPENDIX E

Summary of the releases of hatchery-origin salmon into the Nooksack River, 1994-1999.

Appendix Table E1. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1994.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
4/1	Chinook	N. F. Nooksack Spring	Yearlings	Kendall Hatchery	139,738	292,300
4/4	Chinook	Green River Falls	Zero-age	Nooksack River (RM 30.9)	0	1,056,000
5/23	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	231,395
5/24	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Side Channel	0	188,370
5/24	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	180,208	221,209
5/25	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	202,507	225,117
5/25	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	199,593	432,944
5/25	Chinook	Green River Falls	Zero-age	Mamoya Ponds (RM 0.2)	0	2,000,000
6/15	Chinook	Green River Falls	Zero-age	Kendall Hatchery	0	1,552,902
6/15	Chinook	Green River Falls	Zero-age	Kendall Hatchery	0	987,800
					722,046	**7,188,037**
5/12	Chum	Nooksack	Zero-age	Kendall Hatchery	**0**	**195,400**
3/21	Coho	Various	Yearlings	Various Lowland Tribs.		1,033,550
5/6	Coho	Various	Fry	Nooksack River (RM ?)	0	10,000
5/6	Coho	Various	Fry	Racehorse Creek	0	54,000
5/6	Coho	Various	Fry	Kendall Creek	0	30,000
5/6	Coho	Various	Fry	Maple Creek	0	2,500
5/6	Coho	Various	Fry	Gallup Creek	0	2,000
5/6	Coho	Various	Fry	Unnamed #0434	0	2,500
5/15	Coho	Various	Yearlings	Skookum Hatchery	53,830	1,900,000
6/1	Coho	Various	Yearlings	Kendall Creek	1,148,994	1,148,994
					1,202,824	**4,183,544**
	Steelhead		Yearlings	McKinnin Pond	unknown	unknown

Appendix Table E2. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1995.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
3/30	Chinook	Green River Falls	Zero-age	Nooksack River (RM 30.9)	0	1,008,090
4/1	Chinook	N. F. Nooksack Spring	Yearlings	Kendall Hatchery	135,500	347,500
5/15	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	178,000	178,000
5/24	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	15,000	15,000
5/26	Chinook	Green River Falls	Zero-age	Mamoya Ponds (RM 0.2)	0	3,093,162
6/7	Chinook	Green River Falls	Zero-age	Kendall Hatchery	0	138,400
6/14	Chinook	Green River Falls	Zero-age	Kendall Hatchery	0	3,082,800
					328,500	**7,862,952**
5/10	Chum	Nooksack	Zero-age	Kendall Hatchery	**0**	**391,800**
3/27	Coho	Various	Fry	Various Tributaries	0	483,300
4/5	Coho	Various	Fry	Various Tributaries	0	188,500
3/29	Coho	Various	Fry	Nooksack River (RM 30.9)	0	208,500
4/4	Coho	Various	Fry	North Fork Tributaries	0	500,000
5/11	Coho	Various	Yearlings	Skookum Hatchery	50,539	1,750,000
5/18	Coho	Various	Yearlings	Kendall Hatchery	41,600	1,190,000
					92,139	**4,320,300**
5/1	Steelhead	Tokul Creek	Yearlings	McKinnin Pond	**50,000**	**50,000**

Appendix Table E3. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1996.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
4/1	Chinook	N. F. Nooksack Spring	Yearlings	Kendall Hatchery	185,900	185,900
4/4	Chinook	Green River Falls	Fry	Nooksack River (RM 5.7)	0	689,700
5/23	Chinook	Green River Falls	Zero-age	Mamoya Pond (RM 0.2)	0	2,500,000
6/3	Chinook	Green River Falls	Zero-age	Nooksack River (RM 5.7)	0	2,418,800
6/21	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	2,600	2,600
					188,500	**5,797,000**
5/10	Chum	Nooksack	Zero-age	Kendall Hatchery	**0**	**402,000**
3/20	Coho	Various	Fry	Various Tributaries	0	889,000
4/3	Coho	Various	Fry	Various Tributaries	0	175,000
5/7	Coho	Various	Yearlings	Skookum Hatchery	51,190	950,000
5/13	Coho	Various	Yearlings	Kendall Hatchery	45,000	1,089,200
					96,190	**3,103,200**
5/1	Steelhead	Tokul Creek	Yearlings	McKinnin Pond	**50,000**	**50,000**

Appendix Table E4. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1997.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
4/1	Chinook	N. F. Nooksack Spring	Yearlings	Kendall Hatchery	187,700	187,700
5/1	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	96,500
5/8	Chinook	Green River Falls	Zero-age	Mamoya Pond (RM 0.2)	0	2,527,000
5/15	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
5/19	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	211,800
5/29	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	96,400
6/1	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	180,000	248,800
6/6	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
6/12	Chinook	Green River Falls	Zero-age	Nooksack River (RM 1.3)	0	1,143,200
					367,700	**4,591,400**
5/18	Chum	Nooksack	Zero-age	Kendall Hatchery	0	22,800
6/4	Chum	Nooksack	Zero-age	Kendall Hatchery	0	9,000
					0	**31,800**
4/30	Coho	Various	Yearlings	Skookum Hatchery	49,173	1,050,125
5/20	Coho	Various	Yearlings	Kendall Hatchery	55,000	1,050,000
					104,173	**2,100,125**
5/1	Steelhead	Tokul Creek	Yearlings	McKinnin Pond	**55,000**	**55,000**

Appendix Table E5. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1998.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
4/1	Chinook	N. F. Nooksack Spring	Yearlings	Kendall Hatchery	151,500	187,600
4/15	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	0	352,600
4/22	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
5/1	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
5/7	Chinook	Green River Falls	Zero-age	Mamoya Pond (RM 0.2)	0	1,500,000
5/11	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
5/17	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Side Channel	0	100,000
5/20	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	339,000
5/20	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	198,200
5/20	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	40,000
5/30	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	12,000
5/31	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Side Channel	0	122,900
6/1	Chinook	Green River Falls	Zero-age	Nooksack River (RM 1.3)	0	124,000
6/12	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	202,500	369,800
					354,000	**3,466,100**
4/22	Chum	Nooksack	Zero-age	Kendall Hatchery	0	115,100
4/29	Chum	Nooksack	Zero-age	Kendall Hatchery	0	110,300
					0	**225,400**
5/14	Coho	Various	Yearlings	Skookum Hatchery	51,477	2,371,537
5/20	Coho	Various	Yearlings	Kendall Hatchery	253,100	298,200
					304,577	**2,669,737**
4/26	Steelhead	Skagit	Yearlings	McKinnin Pond	**55,000**	**55,000**

Appendix Table E6. Summary of the releases of hatchery-origin salmon into the Nooksack River, 1999.

Release Date	Species	Stock	Age	Release Location	Number of Ad-clips	Total Release
3/21	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	249,300
3/28	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	254,200
4/4	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	249,100
4/11	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	103,700
4/15	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	0	184,800
4/23	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	50,000
4/30	Chinook	N. F. Nooksack Spring	Zero-age	Deadhorse Creek Pond	0	164,600
4/30	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Side Channel	0	98,600
5/6	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	50,000
5/8	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	203,000
5/13	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Side Channel	0	39,900
5/13	Chinook	Green River Falls	Zero-age	Mamoya Pond (RM 0.2)	0	1,295,244
5/16	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	50,000
5/23	Chinook	N. F. Nooksack Spring	Zero-age	Kidney Creek Pond	0	180,000
5/25	Chinook	N. F. Nooksack Spring	Zero-age	Excelsior Tributary	0	39,900
6/3	Chinook	N. F. Nooksack Spring	Zero-age	Kendall Hatchery	172,000	344,700
					172,000	**3,557,044**
5/2	Chum	Nooksack	Zero-age	Kendall Hatchery	**0**	**350,000**
5/6	Coho	Various	Yearlings	Kendall Hatchery	270,000	320,000
5/22	Coho	Various	Yearlings	Skookum Hatchery	50,465	1,650,000
					320,465	**1,970,000**
4/26	Steelhead	Skagit	Yearlings	Kendall Hatchery	33,900	33,900
5/1	Steelhead	Skagit	Yearlings	McKinnin Pond	29,000	29,000
					62,900	**62,900**

APPENDIX F

Fork length data, reported by statistical week, for juvenile chinook salmon, coho salmon, chum salmon, pink salmon, and steelhead captured by the screwtrap operated on the Nooksack River, 1994-1999.

Appendix Table F1. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1994.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
17	64	33	36	46				
17	60	34	36	73				
17	70	34	38	91				
17	95	35	39	109				
17		35	36	124				
17		34	40	132				
17		35	39	53				
17		33	38					
17		34	40					
17		34	38					
17		35	40					
17		37	41					
17		34	39					
17		37	41					
17		35	41					
17		34	39					
17		33	39					
17		34	37					
17		35	41					
17		35	41					
18	62	35	38	116				
18	65	36	36	116				
18	70	36	37	109				
18	81	39	37	110				
18	110	36	39	115				
18		37	39	115				
18		36	41	120				
18		34	37	118				
18		34	36	106				
18		34	40	115				
18		35	46	116				
18		35	37	116				
18		35	42	120				
18		39	45	105				
18		32	39	105				
18		36	39	130				
18		35	34	105				
18		35	41	103				
18		34	40					
18		35	38					
19	55	37	45	136	200		102	124
19	57	40	47	122	167		118	175
19	58		49	115	189			233
19	59		49	133	160			195
19	61		52	112	220			199
19	62		53	107	235			225
19	64		51	99	182			186
19	65		46	103	185			119
19	67		46	123	159			
19	67		46	132	170			
19	69		40	122	161			
19	70		45	112	200			
19	72		46	103	183			
19	74		47	98	231			
19	75		47	115	215			
19	76		45	123	151			
19	80		58	108	162			
19	82		38	89	175			
19	103		38	119	155			
19	110		39	149	145			

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
20	55	57	50	134	193		115	
20	59	28	44	122	173		120	
20	62	22	34	108	153			
20	63	17	40	115	149			
20	64	19	41	101	183			
20	65	17	54	141	154			
20	66		40	131	174			
20	66		43	146	180			
20	67		41	130	180			
20	68		47	120	185			
20	71		38	112	183			
20	73		36	102	175			
20	75		45	93	170			
20	75		36	112				
20	77		41	121				
20	81		35	142				
20	85		44	130				
20	98		32	112				
20	110		31	118				
20	77		37	135				
21	63		34	137				
21	65		40	97				
21	66		44	66				
21	67		45	160				
21	68		43	123				
21	69		35					
21	70		42					
21	71		38					
21	72		40					
21	73		44					
21	75		45					
21	77		41					
21	77		50					
21	80		38					
21	81		41					
21	83		34					
21	85		38					
21	86		44					
21	87		45					
21	89		44					
23	56		41	127	130		113	
23	60		45	136				
23	62		44	135				
23	64		47	73				
23	67		43	72				
23	69		52	106				
23	70		48	66				
23	72		44	139				
23	73		41	141				
23	74		61	125				
23	74		41	129				
23	76		49	161				
23	77		49	95				
23	79		48	139				
23	82		56	105				
23	85		47	139				
23	87		39	105				
23	89		49	105				
23	92		42	101				
23	110		52	122				

Appendix Table F1. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1994 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
24	60		51	149				
24	62		54	155				
24	67			121				
24	69			106				
24	73			135				
24	75			128				
24	76			137				
24	76			131				
24	77			126				
24	80			132				
24	82			129				
24	85			120				
24	87			131				
24	87			124				
24	89			139				
24	90			126				
24	98			87				
24	105			139				
24	105			132				
24	110			112				
25	61		60	135				
25	65		66	95				
25	68		49	80				
25	70		56	81				
25	73		56	105				
25	75			96				
25	76			130				
25	78			143				
25	79			155				
25	80			97				
25	80			107				
25	83			105				
25	85			117				
25	87							
25	87							
25	90							
25	93							
25	95							
25	100							
25	105							
26	71		59	96				
26	76			98				
26	78							
26	79							
26	80							
26	81							
26	83							
26	83							
26	85							
26	85							
26	86							
26	88							
26	89							
26	90							
26	92							
26	94							
26	95							
26	98							
26	100							
26	101							

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
27	73							
27	77							
27	78							
27	79							
27	80							
27	81							
27	82							
27	83							
27	83							
27	84							
27	86							
27	88							
27	89							
27	89							
27	90							
27	91							
27	92							
27	93							
27	95							
27	97							
28	73							
28	74							
28	77							
28	79							
28	80							
28	80							
28	82							
28	85							
28	86							
28	87							
28	90							
28	90							
28	92							
28	94							
28	96							
28	97							
28	100							
28	101							
28	105							
28	110							
29	85							
29	90							
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Appendix Table F2. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1995.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
13	44		37					
13	46		33					
13	52							
13	53							
13	54							
13	55							
13								
13								
13								
13								
13								
13								
13								
13								
13								
13								
13								
13								
13								
13								
14	40		37			99		
14	41		38			110		
14	43		38					
14	45		41					
14	47		36					
14	48		37					
14	49		38					
14	50		36					
14	51		39					
14	52		40					
14	53		38					
14	54		36					
14	55		36					
14	79		38					
14	89		35					
14	90		39					
14	108		36					
14			38					
14			38					
14			41					
15	40		37		158			
15	43		41					
15	44		39					
15	45		38					
15	46		39					
15	47		40					
15	48		38					
15	49		37					
15	51		42					
15	52		38					
15	53		39					
15	54		39					
15	56		36					
15	58		39					
15	59		41					
15	61		40					
15	88		39					
15	98		42					
15	103		40					
15	110		39					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
16	50		37	123	144	44		
16	54		40	108	187	46		
16	56		42	99	147	48		
16	82		37		295	50		
16	110		38		185	52		
16			34		130	54		
16			43		228	55		
16			38			57		
16			39			59		
16			41			61		
16			37			62		
16			37					
16			36					
16			39					
16			39					
16			39					
16			39					
16			38					
16			39					
16			41					
17	42		37					
17	72		39					
17			37					
17			37					
17			37					
17			38					
17			39					
17			39					
17			37					
17			39					
17			37					
17			39					
17			37					
17			37					
17			37					
17			37					
17			35					
17			38					
17			37					
17			37					
18	44		32	120	165	63	123	165
18	45		37	105	165		107	190
18	55		37	125	200			175
18	57		43	123	200			243
18	59		40	120	195			120
18	63		37	100	157			210
18	65		37	123	118			245
18	67		37	127	168			210
18	97		41	125	148			220
18	110		39	107	210			215
18	63		37	121	187			210
18			39	116	185			193
18			40	100	215			
18			37	120	209			
18			32	105	180			
18			37	105	157			
18			36	110	184			
18			38	104	210			
18			40	113	193			
18			34	110	78			

Appendix Table F2. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1995 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
19	40		32	115	88			194
19	46		38	109	198			
19	49		38	120	165			
19	51		40	128				
19	52		36	102				
19	53		45	84				
19	54		37	116				
19	58		37	109				
19	59		38	114				
19	60		45	134				
19	63		44	116				
19	64		36	109				
19	68		37	116				
19	69		36	118				
19	70		35	122				
19	72		35	128				
19	73		36	112				
19	74		34	119				
19			36	125				
19			37	110				
20	58		36	105	144			193
20	65		36	110	137			224
20	68		39	129				183
20	70		37	125				185
20	71		40	116				
20	76		37	130				
20	80		39	107				
20	65		36	124				
20	69		37	115				
20	70		36	122				
20	71		41	101				
20	72		37	130				
20	74		37	119				
20	75		40	119				
20	77		37	125				
20	79		37	124				
20	82		41	109				
20	83		36	123				
20	85		35	124				
20	92		38	129				
21	63		44	165	149		112	
21	67		50	118	179			
21	68		35	114				
21	71		32	126				
21	74		44	120				
21	78		36	115				
21	80		44	138				
21	87		34	99				
21	70		41	98				
21	74		40	122				
21	75		36	142				
21	77		44	124				
21	78		34	118				
21	79		35	133				
21	80		36	133				
21	80		36	101				
21	82		34	110				
21	85		39	112				
21	86		36	103				
21	100		45	112				

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
22	65		35	129			90	
22	69		36	123			110	
22	71		35	132			115	
22	72		37	135				
22	74		38	85				
22	75		35	104				
22	77		34	120				
22	78		34	110				
22	79		36	84				
22	80		36	94				
22	82		37	121				
22	83		39	119				
22	85		36	83				
22	90		36	131				
22	73		37	101				
22	76		35	112				
22	80		41	91				
22	82		35	82				
22	84		35	91				
22	89		34	120				
23	67		34	156			117	
23	70		35	114				
23	74		52	127				
23	75		39	127				
23	78		36	127				
23	79		35	129				
23	80		36	128				
23	81		36	140				
23	82		35	142				
23	84		42	145				
23	88		36	91				
23	90		37	140				
23	91		38	138				
23	109		38	136				
23	75		39	134				
23	83		39	136				
23	85		36	132				
23	87		35	137				
23	89		39	140				
23	93		40	128				
24	73		36	117			120	
24	75		42	90				
24	77		38	96				
24	79		42	94				
24	80		39	86				
24	81		47	83				
24	83		38	130				
24	84		37	112				
24	85		36	140				
24	86		46	102				
24	87		36	138				
24	89		43	104				
24	90		52	105				
24	77		40	94				
24	80		44	120				
24			44					
24			43					
24			38					
24			38					
24			37					

Appendix Table F2. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1995 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
25	70		46	87				
25	71		46	90				
25	75		59	91				
25	76		44	96				
25	78		53	125				
25	80		54	124				
25	81		55	89				
25	93		42	93				
25			51	135				
25			40					
25			44					
25			40					
25			48					
25			56					
25			57					
25			49					
25			40					
25			57					
25			47					
25			38					
26	73		48	92	165			
26	76		52	89				
26	77		41	81				
26	78		52	85				
26	79		46	85				
26	80		46					
26	81		39					
26	82		39					
26	84		70					
26	85		38					
26	85		39					
26	87		40					
26	89		44					
26	91		39					
26	92		46					
26	93		41					
26	94		39					
26	98							
26	100							
26	104							
27	65		53	99				
27	66		49	97				
27	74		39	95				
27	75		53					
27	76		46					
27	77		53					
27	79		43					
27	80		51					
27	81		47					
27	83		42					
27	84		54					
27	85		60					
27	86		35					
27	87		35					
27	88		48					
27	89		44					
27	90		45					
27	92		49					
27	93		46					
27	95		48					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
28	61		54	110				
28	75		37	90				
28	76		47	109				
28	78		56					
28	80		50					
28	81		47					
28	82		48					
28	84							
28	87							
28	88							
28	89							
28	90							
28	92							
28	93							
28	94							
28	96							
28	97							
28	99							
28	100							
28	101							
29	82							
29	83							
29	84							
29	87							
29	89							
29	90							
29	91							
29	93							
29	95							
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29								
30	74				43			
30	83							
30	84							
30	89							
30	90							
30	91							
30	93							
30	94							
30	95							
30	102							
30								
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Appendix Table F3. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1996.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
13		35	41					
13		33	37					
13		32	39					
13		33	40					
13		33	34					
13		33	38					
13		32	40					
13		35	39					
13		35	39					
13		32	37					
13		34	36					
13		34	43					
13		35	38					
13		33	36					
13		32	38					
13		32	39					
13		33	35					
13		31	34					
13		30	34					
13		34	32					
14	54	34	39		262	222		
14	59	33	39		312	202		
14	57	34	40			165		
14	57	34	39			215		
14	54	35	37			203		
14	45	33	40			148		
14	69	34	40			190		
14	49	32	39			250		
14	53	35	40			179		
14	45	32	38			194		
14	56	36	41			215		
14	59	34	40			171		
14	56	35	41			160		
14	52	34	41			184		
14	60	32	37			187		
14	54	34	44			192		
14	57	39	39			212		
14	51	34	38			193		
14	65	34	43			216		
14	38	35	34			162		
15	62	38	41	101	123	115		214
15	50	35	40	173	128	99		195
15	53	38	37		700	130		157
15	56	39	39		125	119		123
15	55	39	40		185	146		
15	47	38	40		173	151		
15	60	37	33		265	188		
15	53	28	37		185			
15	63	32	42		197			
15	58	32	35					
15	131	32	38					
15	51	31	38					
15	57	31	33					
15	68	33	37					
15	56	32	39					
15	64	31	39					
15	54	31	37					
15	59	30	37					
15	62	34	39					
15	206	31	45					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
16	58	36	32		233	110		
16	52	32	40		187	109		
16	64	31	37			134		
16	63	30	36					
16	123	30	39					
16	104	29	40					
16	60	31	37					
16	99	30	38					
16	63	32	37					
16		33	36					
16		38	39					
16		38	38					
16		34	38					
16		33	38					
16		33	36					
16		36	39					
16		35	41					
16		36	39					
16		31	36					
16		34	36					
17	73	34	39		190			176
17		32	39		181			
17		27	37					
17		32	40					
17		32	39					
17		34	37					
17		32	36					
17		32	39					
17		30	41					
17		32	36					
17		33	38					
17		33	39					
17		32	36					
17		32	45					
17		31	36					
17		32	38					
17		31	37					
17		33	37					
17		33	34					
17		33	37					
18	117	31	36	122	206			205
18	62	31	38	87	182			186
18		31	39	166	165			187
18		30	39	110	215			175
18		31	37	142	190			186
18		29	36	116	163			178
18		34	37	102	203			179
18		32	36	126	172			221
18		32	35	127	183			211
18		32	39		158			182
18		30	37		173			233
18		29	36		188			174
18		31	40		199			201
18		32	38		177			185
18		35	39		164			184
18		31	37		159			175
18		32	38		180			234
18		29	38		160			164
18		32	36		158			235
18		33	37		198			307

Appendix Table F3. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1996 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
19	73	34	38	99	161			161
19		35	37	130	183			177
19		34	37	112	187			222
19		32	37	104	126			231
19		36	39	127	137			225
19		34	40	105	116			204
19		35	39	88	172			216
19		32	39	137	156			
19		34	41	134	184			
19		34	46	101	171			
19		35	39	146	125			
19		32	40	128	172			
19		34	39	114	150			
19		32	39	126	187			
19		33	40	113	175			
19		34	37	138	208			
19		32	40	105	150			
19		33	39	136	193			
19		32	39	99	203			
19		32	37	126	201			
20	75	33	36	110	182			193
20	95	34	38	110	198			165
20	83	34	39	98	178			223
20	60	34	61	117	192			170
20	70		43	108	163			190
20	80		39	82	212			240
20	76		42	127	147			224
20	71		40	114	157			
20	71		40	123	183			
20	80		41	110	187			
20	75		56	103	187			
20	70		40	147	194			
20			41	133	194			
20			45	114	154			
20			45	93	170			
20			43	67	164			
20			63	94	185			
20			39	110	167			
20			56	105	150			
20			48	111	111			
21	82		38	130	165		111	220
21	58		45	110	163		117	204
21	83		38	134	170		119	210
21	50		40	128	177			215
21	69		40	124				
21	60		38	120				
21	79		49	128				
21	67		40	134				
21	75		37	128				
21	80		39	125				
21	80		37	131				
21	60		38	130				
21	72		42	98				
21	73		37	117				
21	81		36	101				
21			40					
21			38					
21			37					
21			38					
21			37					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
22	74	31	40	101	140		121	208
22	75	32	37	120	165		134	175
22	79	34	39	130	176		129	197
22	74	33	38	122	154		94	203
22	83		38	103	163		114	230
22	77		39	103			112	222
22	60		37	134			103	209
22	80		40	90			115	233
22	75		38	135			128	
22	69		38	136				
22	83		39	115				
22	74		35	112				
22	72		39	143				
22	69		37	116				
22			39	123				
22			38	110				
22			35	95				
22			37	124				
22			39	122				
22			44	115				
23	73		39	115	189	116	103	209
23	90		40	89			118	
23	55		37	85				
23	78		37	94				
23	74		38	132				
23	49		37	125				
23	45		49	100				
23	48		44	95				
23	75		37	111				
23	65		39	105				
23	60		36	124				
23	62		40	105				
23	91		35	146				
23	58		38	104				
23	81		41	120				
23	73		40	115				
23	69		38	123				
23	86		43	128				
23	81		41	114				
23	74		49	138				
24	75	34	59	94	146			
24	85		49	130				
24	88		38	84				
24	90		40	86				
24	76		49	132				
24	87		43	101				
24			41					
24			56					
24			42					
24			33					
24			33					
24			38					
24			33					
24			37					
24			53					
24			43					
24			44					
24			40					
24			36					
24			48					

Appendix Table F3. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1996 (continued).

Stat						Adipose-fin Clips		
Week	Chin	Pink	Chum	Coho	Sthd	Chin	Coho	Sthd
25	85		38	132		89		
25	90		43					
25			50					
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
25								
26	88		43		145	113		
26			42					
26			58					
26			40					
26			47					
26			43					
26			50					
28	84							
28	95							
28	92							
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								
28								

Stat						Adipose-fin Clips		
Week	Chin	Pink	Chum	Coho	Sthd	Chin	Pink	Chum
29	96					83		
29	87					100		
29	73					89		
29	93							
29	104							
29	90							
29	89							
29	100							
29	84							
29	95							
29	75							
29	86							
29	91							
29	94							
29	70							
29	88							
29	82							
29	84							
29	75							
29	88							
30	83							
30	90							
30	97							
30	85							
30	94							
30	97							
30	86							
31	81				272	95		
31	109					93		
31	86							
31	90							
31	93							
31	81							
31	88							
31	82							
31	79							
31	97							
31	81							
31	83							
31	80							
31	100							
31	96							
31	86							
31	73							
31	85							
31	93							
31	82							
33	95							
33	95							
33	100							

Appendix Table F4. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1997.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
12			37	100				
12			39					
12			37					
12			40					
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
12								
14	146		42	99	320	139		
14	187		33			146		
14	95		38			124		
14	104		38			115		
14	109		39			198		
14	117		39			110		
14	85		34			176		
14	117		48			99		
14			40			147		
14			38			148		
14			43			209		
14			37			107		
14			36			209		
14			43			192		
14			42			172		
14			37			115		
14			36			136		
14			38			117		
14			42			118		
14			40			135		
15			53					
15			43					
15			56					
15			43					
15			44					
15			52					
15			36					
15			38					
15			37					
15			38					
15			39					
15			38					
15			40					
15			39					
15			40					
15			38					
15			37					
15			36					
15			40					
15			41					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
16	63		41	108	144	89		
16	53		35					
16			38					
16			41					
16			39					
16			40					
16			39					
16			38					
16			41					
16			43					
16			36					
16			36					
16			38					
16			39					
16			36					
16			38					
16			36					
16			38					
16			36					
16			39					
17	60		55	97	190			210
17	65		50		190			196
17	55		40		190			
17	57		39		120			
17	50		37		140			
17	65		39		210			
17	58		38		192			
17	63		38		193			
17	55		41		174			
17			37					
17			37					
17			36					
17			38					
17			36					
17			34					
17			36					
17			38					
17			43					
17			38					
17			35					
18	130		35	140	160			200
18	160		35	110	190			210
18	110		38	100	220			190
18	115		30	130	160			200
18	108		57	120	180			190
18	65		35	115	190			200
18	63		33	100	160			200
18	60		40	95	180			200
18	55		40	100	200			210
18	65		35	110	180			190
18	65		39	90	200			220
18	100		38	125	210			195
18	125		40	134	200			190
18	100		43	128	160			220
18	114		37	131	281			200
18	145		37	134	180			210
18	130		39	114	175			189
18	115		38	109	210			175
18	105		38	128	190			180
18	170		64	87	185			

Appendix Table F4. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1997 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
19	54		35	77	184	99		210
19	59		35	83	165	117		
19	63			93	210	115		
19	64			85	190	100		
19	84			95	155			
19	90			138	200			
19	71			130	190			
19	77			120	175			
19	80			133	160			
19	60			130	155			
19	55			125	155			
19	130			115	168			
19	125			100	157			
19	73			60	190			
19	65			125	143			
19	140			120	110			
19	43			125				
19	100			95				
19	75			115				
19	61			120				
20	142		35	110	190			
20	122		35	130	85			
20	65		35	110	135			
20	60		40	110				
20	53			130				
20	80			110				
20	138			120				
20	130			70				
20	132			85				
20	137			80				
20	84			130				
20	55			110				
20	118			110				
20	115			125				
20	135			130				
20	85			100				
20	60			125				
20				55				
20				130				
20				130				
21	71		40	126	222		127	
21	90		45	109	221			
21	76		38	129	177			
21	91		40	125	168			
21	60		35	122				
21	58		40	91				
21	92		62	129				
21	80		54	127				
21	83		58	141				
21	85		57	130				
21	81		38	91				
21	63		38	65				
21	92		56	122				
21	170		38	90				
21	76		34	107				
21	105		32	89				
21	78		62	63				
21	86		39	130				
21	89			128				
21	125			127				

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
22	80		31	122	169			
22	85		37	124	190			
22	90		39	119				
22	91		60	100				
22	75		61	90				
22	80		40	120				
22	58		37	130				
22	76		36	118				
22	117		38	129				
22	135		39	121				
22	162			132				
22	94			100				
22	140			90				
22	90			120				
22	76			115				
22	79			127				
22	137			109				
22	110			118				
22	84			135				
22	120			138				
23	56		52	114		81		
23	73		49	80		85		
23	64		55	58		89		
23	84		55	90		90		
23	80		35	91		80		
23	90		60	125		78		
23	84			113		86		
23	88			90		86		
23	85			100		83		
23	87			122		82		
23	91			130				
23	99			110				
23	100			139				
23	86			131				
23	73			80				
23	79							
23	82							
23	81							
23	89							
23	71							
24	64		49	130	227	94		
24	80		55	121		84		
24	81		57	129		80		
24	85		57	110		80		
24	79		36	129		84		
24	72		37	110		85		
24	90			130		78		
24	83			138		93		
24	66			129		85		
24	74			125		90		
24	86			136		86		
24	79			129		84		
24	70			130		91		
24	86			135		78		
24	84			136		79		
24	90			131		76		
24	83			112		79		
24	80			125				
24	91			106				
24	76			100				

Appendix Table F4. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1997 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
25	85			132		105		
25	90			127		80		
25	83			125		83		
25	87			116				
25	85			127				
25	83			113				
25	74			127				
25	91			110				
25	85			117				
25	89							
25	82							
25	90							
25	60							
25	65							
25								
25								
25								
25								
25								
25								
26	84		49	125		90		
26	92			120		78		
26	96			116		80		
26	78			127		84		
26	87					85		
26	104					82		
26	83					93		
26	80					91		
26	90					91		
26	94							
26	70							
26	89							
26	76							
26	99							
26	91							
26	88							
26	85							
26	86							
26	67							
26	89							
27	75			125		91		
27	92			132		77		
27	61			107		81		
27	78					83		
27	70							
27	90							
27	97							
27	87							
27	91							
27	87							
27	97							
27	93							
27	78							
27	93							
27	99							
27	96							
27	89							
27	87							
27	92							
27	90							

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
28	88							
28	86							
28	89							
28	90							
28	91							
28	86							
28	97							
28	92							
28	96							
28	86							
28	86							
28								
28								
28								
28								
28								
28								
28								
28								
28								
29	91			132				
29	95							
29	87							
29	92							
29	108							
29	72							
29	95							
29	69							
29	99							
29	77							
29	72							
29	93							
29	84							
29	79							
29	95							
29	93							
29	90							
29	86							
29	84							
29	70							
30	82					101		
30	80							
30	77							
30	98							
30	74							
30	89							
30	85							
30	94							
30	86							
30	100							
30	90							
30	74							
30	80							
30	87							
30	93							
30	94							
30	83							
30	84							
30	97							
30	86							

Appendix Table F4. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1997 (continued).

Stat						Adipose-fin Clips		
Week	Chin	Pink	Chum	Coho	Sthd	Chin	Coho	Sthd
31	72							
31	91							
31	95							
31	120							
31	90							
31	83							
31	81							
31	84							
31	94							
31	82							
31	103							
31	78							
31	73							
31	94							
31	92							
31	81							
31	86							
31	84							
31	87							
31	97							

Appendix Table F5. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1998.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
14		35	40	57				
14		36	39					
14		35	41					
14		35	38					
14		35	40					
14		35	38					
14		36	39					
14		35	38					
14		34	38					
14		35	39					
14		35	41					
14		35	39					
14		39	39					
14		38	39					
14		35	37					
14		33	39					
14		30	40					
14		31	40					
14		33	38					
14		31	38					
15	95	34	40					
15	105	34	39					
15		35	38					
15		29	39					
15		29	40					
15		35	31					
15		32	41					
15		34	40					
15		32	47					
15		29	41					
15		35	40					
15		31	33					
15		34	37					
15		34	39					
15		32	38					
15		31	43					
15		29	41					
15		32	41					
15		30	39					
15		29	43					
16	74	32	40					
16	72	32	43					
16	73	35	43					
16	70	33	41					
16	80	21	38					
16	73	32	42					
16	70	32	38					
16	69	31	36					
16	71	33	33					
16	75	35	40					
16	75	35	38					
16	76	33	42					
16	61	32	36					
16		33	41					
16		35	38					
16		33	34					
16		34	33					
16		36	39					
16		34	40					
16		32						

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
17	80	31	40	65	118	114		
17	63	34	37	57	100	79		
17	59	33	40		162	75		
17	57	32	37		187	70		
17	61	32	41		180	74		
17	67	33	38		148	67		
17	60	33	35		150	57		
17	76	35	40		160	75		
17	83	31	38		158	80		
17	77	35	36		190			
17	98	31	38		333			
17	120	32	38		340			
17	130	34	36		250			
17	71	30	40		240			
17	57	32	39		119			
17	47	32	41		190			
17	79	31	39		190			
17	69	31	34					
17	79	26	38					
17		26	45					
18	80	30	38	40	150		50	
18	62	31	42	50				
18	127	29	39	107				
18	66	30	41					
18	116	30	42					
18	72	31	44					
18	74	30	39					
18	65	31	39					
18	69	32	40					
18	90	30	40					
18	75	31	39					
18	75	29	40					
18	71	29	40					
18	52	28	37					
18	69	32	41					
18	89	31	41					
18	55	28	36					
18	57	30	36					
18	52	31	41					
18	64	28						
19	59	39	54	111	170	120		
19	55	37	55	60	168			
19	120		56	65	190			
19	62		36	71				
19	68		41	75				
19	54		39	65				
19	80		38	58				
19	60		52	63				
19	104		53	60				
19	85		49	70				
19	67		60	59				
19	95		37	65				
19	70		41	50				
19	103		39	65				
19	72		35	92				
19	58		60	90				
19	50		40	101				
19	77		50	76				
19	80		55	75				
19	111		50	103				

Appendix Table F5. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1998 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
20	73	32	39	110	150			
20	67	39	37	101	160			
20	71	39	36	107	175			
20	69	36	35	99	159			
20	85		35	114	200			
20	65		36	104	139			
20	58		40	105	168			
20	69		39	123	150			
20	70		39	121	210			
20	59		40	99	220			
20	80		50	109	100			
20	60		51	119	160			
20	70		40	124				
20	90		55	89				
20	66		55	115				
20	61		55	108				
20	75		41	114				
20	64		39	90				
20	59		41	87				
20	56		39	95				
21	71	38	39	91	125		110	
21	80	35	30	95	160			
21	56		35	120				
21	60		39	130				
21	59		30	91				
21	68		30	97				
21	59		33	58				
21	69		37	91				
21	75		38	110				
21	75		32	120				
21	59			95				
21	62			92				
21	60			120				
21	70			95				
21	80			97				
21	75			120				
21	76			100				
21	81							
21	84							
21	90							
22	70		51	130	158		130	
22	82		55	120	158		110	
22	59		45	135	182			
22	65		48	110				
22	90		55	120				
22	75		45	120				
22	85		55	130				
22	60		37	130				
22	80		51	122				
22	70		55	133				
22	90		45	100				
22	83		48	140				
22	78		40	120				
22	64		55	91				
22	79		40	81				
22	65		40	85				
22	64		40	110				
22	84		40	95				
22	85		38	90				
22	79		55	140				

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
23	75		42	139	228		113	
23	70		35	115	169		140	
23	81		36	95	190			
23	90		42	115	140			
23	69		40	126	150			
23	74		38	115				
23	67		38	98				
23	82		36	92				
23	75		44	112				
23	100		38	110				
23	87		34	160				
23	91		32	117				
23	66		50	101				
23	85		56	132				
23	84		43	133				
23	133		54	104				
23	71		55	85				
23	89		40	80				
23	65		41	120				
23	60		45	122				
24	90			95				
24	75			120				
24	85			97				
24	61			85				
24	70			95				
24	95			125				
24	80			80				
24	89			88				
24	66			100				
24	84			95				
24	70			90				
24	90			130				
24	89			135				
24	66			100				
24	75			135				
24	60			140				
24	70			125				
24	74			120				
24	65			90				
24	80							
25	91		39	100		90	130	
25	85		47	70		77	75	
25	85		39	75		91		
25	77		46	100		85		
25	85		40	89		85		
25	91		55	80		82		
25	65		60	87		89		
25	66			102		78		
25	82			100		80		
25	80			135		90		
25	75			132		80		
25	87			120		86		
25	80			80		80		
25	70			90		87		
25	60			90		80		
25	75			85		80		
25	70			95		80		
25	81			100		85		
25	69					80		
25	65							

Appendix Table F5. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1998 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
26	85		63	101		81		
26	80		59	85		80		
26	95			90		95		
26	79			91		85		
26	83			95		90		
26	100			135		85		
26	85			75		84		
26	87			72				
26	72			90				
26	92			77				
26	75			76				
26	94			90				
26	90			70				
26	91			81				
26	87			80				
26	85			90				
26	76			90				
26	80			70				
26	85			89				
26	90			95				
27	82		32	80		94		
27	86		57	80		90		
27	82			71				
27	82			65				
27	81			85				
27	92			75				
27	90			95				
27	95			80				
27	92			90				
27	63			98				
27	85			92				
27	90			90				
27	65			85				
27	84			80				
27	87			85				
27	87			89				
27	90			90				
27				78				
27				80				
27				72				
28				105	145		92	
28				93			75	
28				72			85	
28				76			87	
28				85			80	
28				84			87	
28				90				
28				80				
28				92				
28				90				
28				89				
28				105				
28				82				
28				100				
28				72				
28				76				
28				70				
28				75				
28				72				
28				80				

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
29				90			100	
29				75			101	
29				69				
29				101				
29				100				
29				87				
29				97				
29				87				
29				98				
29				90				
29				83				
29				95				
29				80				
29				85				
29				84				
29				86				
29				100				
29				91				
29				98				
29				80				
30				100			82	
30				85			81	
30				87			100	
30				101				
30				89				
30				96				
30				100				
30				95				
30				88				
30				91				
30				75				
30				100				
30				75				
30				90				
30				85				
30				80				
30				90				
30				90				
30				84				
30				83				
31								
31								
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Appendix Table F6. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1999.

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
12	64		38		~300			
12			38					
12			39					
12			38					
12			38					
12			35					
12			37					
12			39					
12			36					
12			39					
12			33					
12			35					
12			41					
12			36					
12			40					
12			37					
12			36					
12			38					
12			30					
12			33					
13	64		38					
13	68		38					
13	103		38					
13	76		37					
13			39					
13			36					
13			38					
13			39					
13			38					
13			38					
13			36					
13			40					
13			35					
13			39					
13			39					
13			37					
13			41					
13			36					
13			38					
13			39					
14	72		37		192			
14	60		36					
14	67		38					
14	72		39					
14	68		38					
14	61		40					
14	63		40					
14	66		37					
14	69		36					
14	89		37					
14	67		39					
14	96		38					
14	70		36					
14	69		36					
14	66		40					
14	71		38					
14	71		36					
14	65		39					
14	70		36					
14	64		37					

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
15	74		38					
15	68		36					
15	65		38					
15	68		37					
15	74		36					
15	73		39					
15	117		38					
15	75		37					
15	78		36					
15	80		37					
15	69		37					
15	74		36					
15	70		38					
15	56		37					
15	74		38					
15	58		41					
15	64		37					
15	56		37					
15	79		38					
15	76		38					
16	66		37	102	201			
16	66		41	113	198			
16	76		36	117				
16	55		37	121				
16	75		37					
16	76		39					
16	76		37					
16	104		39					
16	75		40					
16	74		39					
16	81		39					
16	67		39					
16	70		38					
16	64		37					
16	75		37					
16	69		37					
16	58		38					
16	73		39					
16	69		37					
16	79		37					
17	63		36	101	162			
17	79		50	115	145			
17	55		39	103	157			
17	72		35	126	161			
17	70		38	87	156			
17	78		39	111	146			
17	58		41	106	195			
17	64		39	75	170			
17	73		40	114	285			
17	76		41	88	132			
17	60		46	91	184			
17	73		37		276			
17	83		39		223			
17	68		38		160			
17	63		38		153			
17	69		39		190			
17	68		37		167			
17	79		39		183			
17	61		38		285			
17	85		43		225			

Appendix Table F6. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1999 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
18	69		37	125	181		132	149
18	80		39	79	186		129	200
18	77		39	78	159			137
18	80		39	88	165			146
18	61		49	98	143			
18	85		36	95	199			
18	83		37	83	159			
18	79		39	94	204			
18	78		43	100	186			
18			37	123	165			
18			38	100	242			
18			38	98	155			
18			38	82	210			
18			38	89	210			
18			35	103	130			
18			39	110	171			
18			39	130	171			
18			37	126	122			
18			36	129	205			
18			38	124	165			
19	76		36	122	128		127	143
19	79		40	138	116		143	147
19	98		38	118	144		133	131
19	73		40	114	132		124	140
19	72		40	111	83		120	
19	68		36	104	109		121	
19	77		40	101	179		127	
19	81		38	109	192		144	
19	55		37	131	163		132	
19	96		36	118	161		123	
19	66		36	125	178			
19	89		38	117	168			
19	73		33	118	152			
19	64		37	113	202			
19	68		39	125				
19	88		35	122				
19	85		37	111				
20	80		43	122	174		131	209
20	75		40	72	~600		130	197
20	76		40	112	173		144	201
20	75		38	72	164		138	210
20	57		42	76	216		135	197
20	75		38	76	153		125	
20	73		36	83	144		120	
20	85		37	121	190			
20	87		41	81	185			
20	67		40	83	169			
20	60		40	106	187			
20	83		49	75	141			
20	63		40	76	174			
20	79		37	83	173			
20	73		41	87	192			
20	71		38	79	184			
20	68		37	85	193			
20	74		36	83	205			
20	83		40	74	192			
20	80		39	118	219			

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
21	62		58	127	167			180
21	81		44	120	165			224
21	80		35	114	147			227
21	69		41	133	158			188
21	82		38	125	162			213
21	72		43	127	174			217
21	61		32	121	179			205
21	71		40	116	128			221
21	59		38	124	148			204
21	70		37	123	70			210
21	80		34	92	191			203
21	78		36	79				189
21	73		35	75				226
21	82		39	129				225
21	76		39	132				194
21	88		46	121				218
21	63		36	126				206
21	76		35	120				178
21	86		42	121				225
21	77		45	126				204
22	62		56	121	174	85	90	208
22	82		52	123	190	81		198
22	79		45	125	147	86		210
22	74		36	100	156	85		
22	85		37	133	204	90		
22	77		49	110	65	82		
22	79		38	133	153	85		
22	84		55	81		78		
22	78		52	123		92		
22	81		49	120		90		
22	86		36	121				
22	83		39	75				
22	86		40	134				
22	84		41	119				
22	90		37	64				
22			38	83				
22			42	81				
23	90		44	65		84		
23	80		39	132		87		
23	87		39	61		92		
23	87		40	92		93		
23	76		52	93		88		
23	81		38	105		72		
23	85		37	59		85		
23	82		38	52				
23	84		41	97				
23	76		44	117				
23	74		35	119				
23	80		39	130				
23	79		39	83				
23	97		37	73				
23	86		35	89				
23	80		36	66				
23	113		37	96				
23			39	95				
23			35	56				
23			37	112				

Appendix Table F6. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1999 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
24	82		40	89	~600	71		
24	81		45	119	~700	94		
24	86		64	65	89	81		
24	86		40	61	103	85		
24	81		45	85	162	89		
24	89		47	96	92			
24	83		51	82				
24	82		39	89				
24	96		38	110				
24	88		37	91				
24	91		36	67				
24	76		38	84				
24	94		37	70				
24	90		38	65				
24	84		37	64				
24	85		47	53				
24	86		38	66				
24	99		38	115				
24	90		46	117				
24	91		38	125				
25	80		44	92	~450	94	96	
25	82		55	74		92		
25	86		60	64		86		
25	87		57	68		88		
25	94		59	125		82		
25	88		60	121		88		
25	85		60	66				
25	70		37	122				
25	93		53	119				
25	86		50	126				
25	82		37	121				
25	81			133				
25	93			103				
25	83			125				
25	87			128				
25	84			75				
25	81			63				
25	97			72				
25	100			62				
25	96			64				
26	84		37	69	138	98	94	
26	88		52	69		104		
26	78		36	74		98		
26	87			113				
26	89			84				
26	89			103				
26	86			66				
26	90			59				
26	75			62				
26	97			68				
26	92			66				
26	88			61				
26	89			64				
26	93			85				
26	85			59				
26	80			63				
26	91			64				
26	102			59				
26	96			66				
26	95			82				

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Pink	Chum
27	84		36	66		95		
27	91		37	69		94		
27	90			67		87		
27	89			74		92		
27	99			133		102		
27	88			93		85		
27	89			100				
27	90			99				
27	94			111				
27	85			69				
27	85							
27	90							
27	96							
27	80							
27	82							
27	77							
27	90							
27	98							
27	79							
27	98							
28	87		61	94		99	109	
28	79		36	92		94		
28	86					103		
28	84							
28	72							
28	88							
28	87							
28	75							
28	79							
28	78							
28	75							
28	91							
28	80							
28	94							
28	89							
28	88							
28	77							
28	87							
28	84							
28	94							
29	87					86		
29	84					105		
29	79							
29	78							
29	78							
29	90							
29	75							
29	84							
29	66							
29	76							
29	90							
29	88							
29	94							
29	78							
29	72							
29	81							
29	82							
29	95							
29	99							
29	68							

Appendix Table F6. Fork length data (in mm), reported by statistical week, for juvenile chinook (Chin), pink, chum, coho, and steelhead (Sthd) captured by the screwtrap operated on the Nooksack River, 1999 (continued).

Stat Week	Chin	Pink	Chum	Coho	Sthd	Adipose-fin Clips Chin	Coho	Sthd
30	72				106			
30	90							
30	83							
30	83							
30	82							
30	72							
30	87							
30	78							
30	75							
30	96							
30	78							
30	89							
30	89							
30	84							
30	83							
30	79							

APPENDIX G

Data form used for the smolt trapping project on the Nooksack River.

SMOLT TRAP DATA - 1999

Hovander Trap

SET # _____

WK # _____

DATE _____

CREW _____ ROTATION _____ . ___ s/r

START _____ _____ SECCHI ___ . ___ ft. GUAGE ____ . ____ ft.

END _____ _____ SECCHI ___ . ___ ft. GUAGE ____ . ____ ft.

Chinook	DNA#	FL	DNA#	FL	DNA#	FL	Clip	No Clip	
Tally									FLs
									TALLY
									Morts
Tally -Clip									
									FLs
									TALLY
									Morts
						Total =			
									FLs
									TALLY
									Morts
						Total =			
									FLs
									TALLY
									Morts
						Total =			
									FLs
									TALLY
									Morts
						Total =			

CHIN	PINK	CHUM	COHO	STHD	CUT		lampr	bass	polyw	

SMOLT TRAP DATA - 1999

Hovander Trap

Page 2

DATE _____

SET # _____

WK # _____

	Start of Set	End of Set
Sky	☐ Clear ☐ Ptly Cldy ☐ Overcast ☐ Rain ☐ _____	☐ Clear ☐ Ptly Cldy ☐ Overcast ☐ Rain ☐ _____
Wind	☐ Calm ☐ 5-10 kts. ☐ 10 -15 ☐ 15+ ☐ SE ☐ W ☐ NE ☐ _____ ___ ___	☐ Calm ☐ 5-10 kts. ☐ 10 -15 ☐ 15+ ☐ SE ☐ W ☐ NE ☐ _____ ___ ___

Air Temperature _____ C

Water Temperature _____ C

	Start of Set	End of Set
Water Color	☐ Chocolate ☐ Light Brown ☐ Grey / Brown ☐ Grey / Green ☐ Green ☐ Clear	☐ Chocolate ☐ Light Brown ☐ Grey / Brown ☐ Grey / Green ☐ Green ☐ Clear

	None	Medium	High	
	☐	☐	☐	Logs
River	☐	☐	☐	Sticks
Debris	☐	☐	☐	_____

	None	Medium	High	
Livebox	☐	☐	☐	Leaves
Debris	☐	☐	☐	Sticks
	☐	☐	☐	Bark

Notes: