



WASHINGTON
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FISHERIES

**METHODOLOGY FOR DETERMINING PUGET SOUND COHO
ESCAPEMENT GOALS, ESCAPEMENT ESTIMATES, 1977 PRE-
SEASON RUN SIZE PREDICTION AND IN-SEASON RUN AS-
SESSMENT**

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State of Washington
DEPARTMENT OF FISHERIES

TECHNICAL REPORT NO. 28

METHODOLOGY FOR DETERMINING PUGET SOUND COHO ESCAPEMENT GOALS,
ESCAPEMENT ESTIMATES, 1977 PRE-SEASON RUN SIZE
PREDICITON AND IN-SEASON RUN ASSESSMENT

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INTRODUCTION

The objective of this report is to explain Washington Department of Fisheries (WDF) procedures for determining Puget Sound coho escapement goals, escapement estimates, pre-season run prediction, and in-season run prediction updates. The details of this report have already been presented to the Management Plan Development Team appointed by the Fisheries Advisory Board that was established by Judge Boldt of the U.S. District Court for Western Washington at Tacoma as a result of United States vs. Washington Civil No. 9313. Tribal representatives of the team are Phil Mundy, Lars Moberg, Michael Grayum, and Larry Gilbertson. Some of the results of this report differ from previously released figures. The data contained herein should be considered most current and accurate.

There are a variety of possible sources of error in the various methods. In each case, however, methods and assumptions used are supported by the weight of present technical evidence and will stand until shown to be in error.

ESCAPEMENT GOALS

Definition

As defined by the Management Plan Development Team, the escapement goal for a naturally spawning salmon stock is the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions. The consensus of the management team was that escapement should occur throughout the course of a run, and not be overly represented by a particular segment (early, middle or late) of the run. It was assumed that the amount of rearing area was the chief limiting factor of coho production.

Methodology for Escapement Goals

Stream numbers (WDF, 1975a), names, accessible lengths, average summer widths and accessible square yards or linear yards are presented in Appendix I, Table 1-16. Accessible lengths are measurements to known blockages or estimates of accessible or used distances. Average creek widths are based on actual measurements, estimates derived from actual observations and estimates based on consideration of drainage area involved. Available area in tributaries was derived by multiplying accessible length in miles X 1,760 X average width in yards. Available length of rivers or large tributaries (generally those greater than 6-yd average width) was calculated by multiplying accessible length in miles X 1,760.

The rearing potential in numbers of smolts for most streams less than 6-yd average width was calculated by multiplying yd^2 of available area X .42 (Chapman, 1965). Chapman's average production for three study streams was .35 smolts per yd^2 . The average value for the larger stream (.42) was used in this report because of the relatively small size of his study streams; because he states his production estimates are conservative due to measurements of stream widths being made in only 1 year; and because population studies by WDF in Puget Sound streams indicate relatively high smolt densities.

The smolt production potential of rivers and most streams larger than 6-yd average width was calculated by multiplying the accessible length in linear yards X 2.5 (Lister and Walker, 1966). This value was derived by dividing the mean number of smolts produced each year of a 5-year study at Big Qualicum by the accessible river length (11,440 yd). Rearing potential for a few streams with an average width of more than 6-yd was calculated using yd^2 (Chapman) instead of the linear yard method. These streams are of exceptional rearing quality with more of a small stream character.

Number of females necessary to produce the potential smolts was calculated by dividing number of smolts by 100. This number of smolts per female was obtained by dividing the average rearing potential of Minter Creek (30,000 smolts) by the estimated optimum escapement (300 females) (Salo and Bayliff, 1958). Total desired escapement is the necessary number of females X 2 for natural areas and number of females X 2.5 for areas above hatchery racks.

Exceptions to General Methodology

Potential production in the Nooksack (except South Fork), Suiattle, Puyallup, and Carbon Rivers was calculated at 1/2 the Big Qualicum rate of 2.5 smolts per linear yard. This was done because of the glacial nature of these rivers and known lower productivity.

Potential production for the White River and its tributaries above the dam near Buckley was assumed to be equal to the production from the average measured escapement level for the 1943-1975 period. The lowest and highest escapement counts (10% of total number of counts) were not included in the average.

Production in the Dewatto, Tahuya, Big Mission, and Union systems was calculated at twice the usual rate to compensate for beaver dam and marsh areas and high productivity.

Because of poor coho rearing environment and fluctuating water levels, productivity of tributaries in the Nisqually drainage was calculated using .10 smolt per yd² instead of .42.

Production for Lakes Washington, Sammamish, Baker, and Samish was calculated by multiplying the miles of shoreline X 1,760 X 1.25 (equal to number of smolts per linear yard for each bank of a river). University of Washington Cooperative Fishery Unit studies document the existence of rearing coho in Lake Washington; however, actual rearing density data are not available. WDF data indicate coho rear in Baker Lake, but actual densities are not known.

Production for streams with hatchery racks is presented in separate tables. Escapements to these streams are controlled by hatcheries and are additive to the goals listed for natural areas.

Goals

Calculated escapement goals for natural areas are rounded to the nearest 1,000 except for the Samish goal which is rounded to the nearest 100. Natural goals are listed by drainage or geographical area in Appendix I, Table 17. Goals for areas above hatchery racks are listed by hatchery in Appendix I, Table 18. Goals for areas above racks are rounded to the nearest 100, except for goals at George Adams and Hood Canal, which are rounded to the nearest 10. In some drainages, estimated actual escapement consistently differs from the escapement goal. These areas should be carefully reviewed and monitored to determine if goals are reasonable or if past fishing rates have been improper.

The escapement goals assume that proper distribution to individual streams and areas within streams is attained. An increase in goals may be necessary if proper distribution is not achieved.

ESCAPEMENT ESTIMATES

Background

The WDF established spawning ground survey areas in 1951 (WDF, 1974a). Survey counts were used as an index to compare escapement levels on a year-to-year basis. Initial total escapement estimates were calculated for the Comprehensive Puget Sound and Adjacent Waters Study, Appendix XI, Fish & Wildlife Report (Fish & Wildlife Technical Committee, 1970). The WDF has made total Puget Sound escape-

ment estimates for all years since 1965. Each year's estimate was derived through use of data and formulas developed for Adjacent Waters Study. Historic spawning ground counts are tabulated in the Salmon Spawning Ground Data Report (Egan, 1977).

Definition

Index areas

An index area is a section of stream which provides accurate counts of spawning fish without requiring extensive adjustments. These areas are usually easily accessible, have good visibility throughout most of the spawning season, and are considered representative of total escapement to the stream. An attempt is made to survey index areas at least once every 2 weeks throughout the spawning season.

Supplemental survey areas

A supplemental survey area is a section of stream which can provide valuable spawning ground data under certain conditions, but cannot be relied upon for consistency and quality required of an index area. Many of these streams have visibility or access problems which limit their usefulness. An attempt is made to survey as many supplemental areas as possible throughout the spawning season. Supplemental survey data are used to support and complement index area data.

Other counts

A number of dam and trap counts are available each year in Puget Sound. These counts are used in combination with the stream survey data to aid in estimating total escapement.

Methodology for Escapement Estimates

Base year

The first step in making total escapement estimates was to establish a base year to which other years could be compared; 1965 was chosen because of the relatively average escapement levels achieved that year (WDF, 1971). The base year escapement estimate was calculated by adding up the escapement estimates for each individual stream. These estimates for individual streams were calculated by using all stream survey data, fish counts, and individual expertise available at that time.

Base year index value

The base year index value is the quotient obtained when the total base year escapement estimate for a drainage is divided by the mean peak fish per mile count of the index areas within the drainage. For example; escapement estimates for Drainage A in base year = 1,000 fish. Peak fish per mile counts in base year for the four index areas in Drainage A totaled 100. Thus, the mean peak fish per mile count is 25 ($100 \div 4$). The base year index value for Drainage A equals 40 ($1,000 \div 25$).

Non-base year calculations

For each non-base year, mean peak fish per mile counts were calculated for each drainage and multiplied by the appropriate base year index value. In many cases the resultant number is the actual escapement estimate for the particular drainage for that non-base year. Specific index area streams and formulas used for each drainage area are presented in Appendix II, Table 2.

Exceptions to General Methodology

In some cases, adjustments are made to the mean peak fish per mile counts to compensate for hatchery plants in index streams, poor visibility during the spawning season or lack of survey data for the peak spawning period. When adjustments to index counts were necessary, supplemental survey counts were often utilized.

Base year index values were never calculated for the Strait of Juan de Fuca, Samish River, East Kitsap Peninsula, or Deschutes River. Escapement estimates for these areas are calculated by using escapement surveys made in the areas, by using escapement surveys made in adjacent drainages, and/or by using rack estimates and other data.

Samish River escapements are assumed equal to 36% of the Nooksack escapements. East Kitsap escapements (north of the Tacoma Narrows Bridge) are assumed equal to 35% of the South Sound estimates. Deschutes River estimates are calculated by adding 33% to the rack count. Strait of Juan de Fuca escapements were estimated to be about 1/2 of the escapement goal for most years. In the 2 years of lowest Puget Sound escapement estimates, the Strait escapement was calculated to be 40% of average.

Supportive Data - Adjustments

The 1971- and 1972- brood hatchery evaluation tagging data were used to check the accuracy of escapement estimates. Total hatchery catch was calculated for 1974 and 1975 using the tag groups. Total wild catch was calculated by subtracting hatchery catch from total Puget Sound-origin catch. Hatchery escapement was calculated by adding rack counts. Wild escapement was then calculated using the formula:

$$\frac{\text{hatchery catch}}{\text{hatchery escapement}} = \frac{\text{wild catch}}{\text{wild escapement}}$$

The formula assumes equal harvest rates. In 1974 and 1975, according to this method, escapement estimates based on stream surveys were 8% and 19% low, respectively. All escapement estimates were adjusted upwards by 14% to compensate for the difference in estimates.

PRE-SEASON RUN SIZE PREDICTIONS

General

The basis for the Puget Sound prediction of wild coho is a relationship between stream flow in year (X) and the return in year (X + 2). For hatchery returns, the basic method is a relationship between hatchery releases and adult returns. Past effort at predicting wild coho runs was discussed in the 1974 prediction report (Zillges, 1974). While the basic methodology used in predicting the 1977 run is the same as that used for the 1974 run, some changes have been made. For example, much more information has been made available in recent years in the form of hatchery evaluation studies. These studies have given a relatively accurate estimate of numbers of hatchery coho contributing to Puget Sound and other fisheries. This information, when combined with refined use of flow information, should provide more accurate and reliable prediction of wild and hatchery runs.

Base Data

Hatchery escapements

Total hatchery escapement for a given year was calculated by adding hatchery rack counts and estimated returns of off-station releases (Appendix III, Table 1).

Hatchery rack counts include those coho which returned to hatcheries of Puget Sound, plus estimates of coho passing hatchery racks during high water. Off-station returns are estimates of the number of fish returning to rivers and other areas where hatchery fish have been released. These estimates are based on the number of pounds released, return rates expected for each release, and adjustments made on the basis of stream surveys.

Wild escapement

Wild coho escapement estimates, based on foot surveys and rack counts, are available for all years since 1965 as previously described (Appendix II, Table 2).

Catches of Puget Sound origin

An estimate of the catch of coho which originated from waters outside of Puget Sound has been subtracted from total Puget Sound catches. Catches of non-Puget Sound fish were assumed equal to percentages of the catch by area as established in U.S.- Canada salmon interception negotiations (Joint Technical Committee, 1969-1973). Net catches from the Strait of Juan de Fuca were assumed to be 65% Puget Sound origin; catches from Point Roberts 10% Puget Sound origin; catches from the San Juan Islands 20% Puget Sound origin; and catches from West Beach 75% Puget Sound origin. Sport catches from Punch Card Area 7 were assumed to be 20% Puget Sound origin; those from Areas 5 and 6 were assumed 65% Puget Sound origin.

Catches of hatchery and wild fish

Total catches for each fishing area were apportioned into hatchery and wild segments in the same ratio as escapement of wild and hatchery fish in areas contributing to the catch. An estimate of the number of "resident fish" occurring in the sport catch was calculated for each year since 1974. These "resident fish" were assumed to be hatchery fish. Once assumption of the methodology used to separate catches into wild and hatchery portions is that hatchery and wild stocks are harvested at equal rates.

Total hatchery and wild runs

Total hatchery or wild run for a given year was determined by adding estimated escapement and catches for that year (Appendix III, Table 1). Total run estimates

are actually estimates of the total number of coho of Puget Sound origin which are available as "resident stocks" and those entering Puget Sound as "ocean stocks". All catches and escapements (other than hatchery rack counts of jacks) are assumed to be 3-year-old fish.

Stream flows

An extensive study was undertaken to determine the time of year during which low flows are most critical to coho survival. This was accomplished by computer analysis specifying all reasonable time periods to be included in the data base. For a given stream, for example, total mean daily flows for a given consecutive number of days were selected from June through September flow data, the July through September flow data, June through May flow data; etc. (U.S.G.S., 1950-60; 1961-74; 1975). Total yearly run sizes of natural coho were regressed with each of these mean flow calculations for different time periods and correlation coefficients obtained. The time period correlating best for the majority of streams was June through September.

Critical duration

Another study was conducted to determine how many consecutive days of low flows were necessary to influence coho survival. To do this, the lowest average daily mean flows for given numbers of consecutive days was calculated for each stream for each year. For each stream, the lowest average flow for each year for a given period was regressed with corresponding yearly run sizes. This was repeated for each consecutive-day period. A correlation coefficient was then available for each stream for each consecutive-day period. The period resulting in the best correlation coefficients for the majority of streams was the 60-consecutive-day period.

Streams used

At least one stream was chosen from each major drainage area in Puget Sound for the prediction formula (Appendix III, Table 2). Those streams having the best correlation coefficients between flow and natural coho return were selected if they were indicative of coho streams in the drainage.

Flows used

For the prediction formula, the lowest average daily flows for 60-consecutive-day period during June through September were used (Appendix III, Table 3). The average flows of a stream were expressed as a percentage of the 12-year average low flows for the particular stream (Appendix III, Table 4). The percentages of the 11 streams for a given year were added and the totals used in the regression analysis.

1977 Wild Coho Run Prediction

Regression analysis

Regression analysis based on the correlation between summer stream flows and wild run sizes was used to predict 1977 wild coho returns from 1975 observed flows. Confidence intervals were calculated in a similar manner as in 1974 (Zillges, 1974).

Area breakdown

The total wild run prediction was apportioned to individual drainage areas in proportion to the actual returns to the drainages in a year which had a similar size wild run. The most recent year which had a run similar in size to that forecast for 1977 was the brood year 1974.

1977 Hatchery Coho Run Prediction

Methodology

The 1977 hatchery run forecast is based on observed contribution rates of micro-tagged coho. Each 1974-brood hatchery release was matched as closely as possible with a 1970-, 1971-, 1972-, or 1973-brood experimental group of tagged coho (WDF, 1974b, 1975b, and 1976). The contribution rates of these tagged coho were then used to forecast the return from similar 1974-brood releases. In some cases, releases were made which did not match exactly any micro-tagged release. These releases were matched with tagged hatchery releases from nearby area, with tagged releases that were liberated on or near the same date, or with tagged releases that consisted of fish of similar size at time of release. In a few cases it was not possible to match the releases with any past releases. In these cases, hatchery personnel were consulted and their advice followed on calculating expected rates of return.

Prediction

Individual release forecasts were added to obtain total forecasts for drainage areas. These drainage area forecasts were added to obtain a total Puget Sound forecast. The total forecast includes returns from all known Washington Department of Fisheries releases, U.S. Fish & Wildlife releases, tribal releases, and University of Washington releases.

Discussion

Much of the discussion presented in the 1974 forecast report applies equally to the 1977 wild run (Zillges, 1974). The 1977 hatchery run forecast is based on much more reliable methodology than any previous forecast. Actual numbers forecast for 1977 will be presented in 1977 status report detailing the prediction and management recommendations.

IN-SEASON RUN ASSESSMENT

General

The need for a method to update or confirm pre-season run size predictions by in-season information is obvious. Any departure from average ocean natural or fishing mortality rates results in changes in the size of the returning runs and changes the accuracy of the pre-season prediction. This aspect of management of Puget Sound coho salmon stocks is currently being analyzed. This report represents results of those studies to-date. Further results and recommendations will be formalized by the Management Plan Development Team and included in the 1977 status report.

As the season progresses, different fisheries take part of the returning coho runs. In the case of Puget Sound coho, initial catches are made off the west coast of Vancouver Island by the Canadian troll fishery and off the northern Washington coast by Washington troll and sport fisheries. If these catches of Puget Sound fish can be isolated they should relate to Puget Sound returns.

The next major harvest of Puget Sound fish occurs in the Canadian Strait of Juan de Fuca fishery (Area 20). At various times in the fall, it is likely that substantial portions of the Canadian catch in Area 20 consist of Puget Sound fish. Again, if these catches of Puget Sound fish can be isolated they should relate to inside runs.

The final harvester of Puget Sound fish are the fisheries in Puget Sound. Catches at various times and places in Puget Sound may relate to total run size.

Canadian Troll Fisheries

Puget Sound wild and total run sizes were regressed on Canadian troll catches and catch per unit effort for Areas 21 through 27 for various time periods. No significant or useful relationships were found.

Washington Troll Fisheries

Puget Sound wild and total run size were regressed on Washington troll catches and catch per unit of effort for Areas 5 through 12 (WDF, 1975), all combinations of Areas 5 through 12, the Puget Sound district, the Grays Harbor district, the Willapa district, and combinations of the three districts. Wild and total runs were also regressed on average weights of fish from the catches of the above areas.

Washington troll catches and CPUE seem to correlate with Puget Sound total and wild run sizes in many cases (Appendix IV, Table 1). Good relationships also exist between catches in calculated Areas 9 and 5-10 and Puget Sound total runs, and between catches from calculated Areas 9, 10, and 5-10 and Puget Sound wild runs. Catches were also calculated both through July and through August in the above mentioned areas, and catches for both time periods seem to correlate.

Canadian Strait (Area 20) Catches

Puget Sound wild and total run size were regressed on Canadian Strait catches and catch per unit of effort. Catches were calculated by time period (weekly and bi-weekly) and gear type or combination of gear types. Significant and/or useful correlations were found for the September 9-15, September 16-22, and September 9-22 periods (Appendix IV, Table 1).

Puget Sound Catches

Puget Sound wild and total runs were regressed on Admiralty Inlet catches through September 30 and October 7. No significant relationships were found; however, further refinement of the data could prove otherwise.

Catches in other areas of Puget Sound may be correlated significantly with run size and these relationships will be analyzed. First-day catches will be studied in detail. Additionally, some members of the Management Plan Development Team are addressing the subject.

Conclusions

Catches from a number of areas seem to correlate quite well with Puget Sound wild and/or total runs. One or more of these relationships may be adequate to accurately confirm or adjust the pre-season prediction. However, it is more likely that a number of these indicators should be looked at before any conclusions are drawn.

Because of the variability in timing of coho runs into Puget Sound, great care should be taken before changes are made in the pre-season prediction. All indicators should be carefully analyzed before conclusions are drawn.

LITERATURE CITED

- Chapman, D. W.
1965. Net production of juvenile coho salmon in three Oregon streams. Trans. Am. Fish. Soc. Vol. 94, No. 1. pp 40-52.
- Egan, R. P.
1977. Salmon spawning ground data report. Wash. Dept. Fish. 346 p.
- Fish & Wildlife Technical Committee
1970. Comprehensive study of water and related land resources in Puget Sound and Adjacent Waters. Appendix XI. Fish & Wildlife.
- Joint Technical Committee
1969-1973. Reports of the Technical Committee on Salmon Interceptions. Canada-U.S. (Unpubl.).
- Lister, D. B. and C. E. Walker
1966. The effect of flow control on freshwater survival of chum, coho, and chinook salmon in the Big Qualicum River. Canadian Fish. Cult. Vol. 37, pp 3-25.
- Salo, E. and W. H. Bayliff
1958. Artificial and natural production of silver salmon (Oncorhynchus kisutch), at Minter Creek, Washington. Wash. Dept. Fish., Res. Bull. No. 4, 76 pp.
- Washington Department of Fisheries
1965-1975. Washington troll salmon catches. Internatl. Papers. Wash. Dept. Fish. (Unpubl.).
1971. Salmon escapement and desired escapement to certain Puget Sound streams. Wash. Dept. Fish. (Unpubl.) ms. 21 p.
- 1974a. Report on the salmon escapement in the State of Washington, 1971. Wash. Dept. Fish. (Unpubl.)
- 1974b. 1974 estimated catch of marked salmon in various Washington fisheries. Wash. Dept. Fish. 321 p.
- 1975a. A stream catalog of Washington streams and salmon utilization. Wash. Dept. Fish. Vol 1., Puget Sound Region.
- 1975b. 1975 estimated catch of marked salmon in various Washington fisheries. Wash. Dept. Fish. (Unpubl.).
1976. 1976 estimated catch of marked salmon in various Washington fisheries. Wash. Dept. Fish. (Unpubl.).

U.S.G.S.

1950-1960. Surface water supply of the United States. U.S. Dept. of Interior, Geological Survey.

1961-1974. Water resources data for Washington. Part 1. Surface Water Records. U.S. Dept. of Interior, Geological Survey.

1975. Water resources data for Washington. Water year 1975. U.S. Dept. of Interior, Geological Survey.

Zillges, G. F.

1974. 1974 Puget Sound coho run size forecast. Wash. Dept. Fish. (Unpubl.) ms. 25 p.

APPENDIX I
(Escapement Goals)

Table 1. Nooksack River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
120	Nooksack River	65.0	--	--
124	Silver	7.5	2.0	26,400
141	Unnamed	2.9	1.0	5,104
163	Ten-Mile	13.6	2.0	47,872
165	Deer	8.0	1.0	14,080
172	Unnamed	1.6	1.0	2,816
181	Four-Mile	3.9	1.0	6,864
187	Unnamed	2.1	1.0	3,696
194	Wiser Lake Creek	5.1	2.0	17,952
201	Bertrand	9.8	2.0	34,496
206	Unnamed	4.1	1.0	7,216
210	Fishtrap	10.1	2.0	35,552
228	Anderson	4.7	3.0	24,816
234	Smith (dry)	4.2	1.0	7,392
235	McCavley	1.4	1.0	2,464
236	Unnamed	1.0	1.0	1,760
242	Unnamed	2.2	1.0	3,872
246	South Fork	25.0	--	--
247	Toss	2.2	2.2	7,744
250	Black Slough	2.5	2.0	8,800
252	Unnamed	2.6	1.0	4,576
253	Unnamed	1.2	1.0	2,112
254	Unnamed	0.9	1.0	1,584
255	Unnamed	0.8	1.0	1,408
257	Unnamed	0.4	1.0	704
259	Unnamed	0.3	1.0	528
260	McCarty Creek	0.8	2.0	2,812
261	Unnamed	1.6	1.0	2,816
262	Jones	0.7	2.0	2,464
263	Unnamed	1.7	1.0	2,992
264	Hutchinson	5.6	4.0	39,424
265	Unnamed	0.7	1.0	1,232
270	Saxon (dry)	0.2	1.0	352
273	Skookum	0.6	3.0	3,168
283	Edfro	0.4	2.0	1,408
284	Unnamed	0.2	1.0	352
285	Cavanaugh	0.5	2.0	1,760
290	Unnamed	0.3	1.0	528
292	Plumbago	0.2	2.0	704
294	Roaring	0.3	2.0	1,056
295	Deer	0.1	1.0	176
339	Middle Fork	7.2	--	--
340	Canyon	2.2	2.0	7,744
341	Unnamed	0.6	1.0	1,056

(Continued)

Table 1. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
347	Unnamed	1.7	1.0	2,992
348	Unnamed	0.6	1.0	1,056
349	Unnamed	0.8	1.0	1,408
352	Unnamed	0.9	1.0	1,584
354	Heislars	0.8	2.0	2,816
390	Bell (dry)	1.0	2.0	3,520
392	Kenny	0.8	2.0	2,816
394	Racehorse	1.5	4.0	10,560
402	Coal	0.8	2.0	2,816
410	Unnamed	1.1	1.0	1,936
411	Unnamed	0.8	1.0	1,408
412	Unnamed	0.5	1.0	880
414	Unnamed	0.5	1.0	880
415	Maple	1.2	4.0	8,448
422	Unnamed	0.6	1.0	1,056
423	Unnamed	0.7	1.0	1,232
424	Boulder	0.8	2.0	2,816
425	Unnamed	0.7	1.0	1,232
434	Unnamed	0.5	1.0	880
435	Unnamed	0.6	1.0	1,056
436	Wildcat	0.5	1.0	880
437	Canyon Creek	1.3	--	--
463	Hedrick	0.8	1.0	1,408
464	Cornell	1.2	2.0	4,224
465	West Cornell	0.9	1.0	1,584
468	Gallop	0.9	2.0	3,168
469	Glacier Creek	3.7	--	--
470	Little	0.2	2.0	704
471	Davis	0.2	2.0	707
472	Thompson	1.6	0.2	563
490	Unnamed	0.2	1.0	352
491	Lookout	0.3	2.0	1,056
492	Unnamed	0.3	1.0	528
493	Cascade	0.25	2.0	880
495	Deadhorse	0.25	2.0	880
TOTAL				408,178
Tributaries	408,178 sq. yds. X .42		=	171,435
Nooksack River	65.0 X 1,760 = 114,400 X 1.25		=	143,000
S. Fork Nooksack	25.0 X 1,760 = 44,000 X 2.50		=	110,000
Canyon Creek	1.3 X 1,760 = 2,288 X 1.25		=	2,860
Glacier Creek	3.7 X 1,760 = 6,512 X 1.25		=	8,140
Middle Fork Nooksack	7.2 X 1,760 = 12,672 X 1.25		=	15,840
TOTAL SMOLTS				451,275

Table 2. Strait of Georgia - independent drainages.

Stream number	Stream name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
2(01)	Dakota Creek	1.5	--	--
		7.0	2.0	24,640
8	Unnamed	3.0	1.0	5,280
21	Unnamed	3.5	1.0	6,160
30	N. Fk. Dakota	5.0	1.0	8,800
45	California	1.0	--	--
		6.0	1.0	10,560
89	Terrell	8.8	1.0	15,488
97	Fingalson	2.4	1.0	4,224
622	Padden	2.2	2.0	744
626	Chuckanut	4.0	2.0	14,080
630	Unnamed	0.5	1.0	880
638	Oyster	0.3	2.0	1,056
648	Colony	2.7	1.0	4,752
650	Whitehall	0.3	1.0	528
TOTAL				97,192
Tributaries 97,192 sq. yd x .42 = 40,821				
Dakota Creek 1.5 mi x 1,760 = 2,640 x 2.5 = 6,600				
California 1.0 mi x 1,760 = 1,760 x 2.5 = <u>4,400</u>				
TOTAL SMOLTS 51,821				

Table 3. Samish River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
3	Samish River	10.5	--	--
9	Unnamed	3.1	.5	2,128
10	Thomas	5.9	2.0	20,768
11	Unnamed	1.1	.5	968
12	Wollord	3.3	.5	2,904
15	Bob Smith	1.0	.5	880
16	Unnamed	.3	.5	264
TOTAL				27,912
Tributaries 27,912 sq. yds. X .42 = 11,723				
Samish River 10.5 X 1,760 = 18,480 X 2.5 = <u>46,200</u>				
TOTAL SMOLTS				57,923

Table 4. Skagit River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
176	Skagit River	94.2	--	--
179	Carpenter	6.2	2.0	21,824
181	Unnamed	3.0	1.0	5,280
182	Unnamed	4.0	1.0	7,040
183	Unnamed	2.3	1.0	4,048
215	North Fork	7.3	--	--
227	Nookachamps	10.7	--	--
230	E. Fork Nooksack	6.6	3.0	34,848
231	Turner	3.3	1.0	5,804
235	Mundt	2.0	2.0	7,040
239	Walker	4.6	1.0	8,096
240	Unnamed	2.8	1.0	4,928
241	Unnamed	1.8	1.0	3,168
258	Lake Creek	3.6	2.0	12,672
259	Unnamed	2.4	1.0	4,224
260	Unnamed	2.0	1.0	3,520
261	Unnamed	2.1	1.0	3,696
264	Unnamed	0.8	1.0	1,406
267	Hansen	8.3	1.5	21,912
275	Unnamed	0.9	1.0	1,584
278	Skiyou Slough	2.2	--	--
279	Coal	3.0	2.0	10,560
280	Wiseman	4.3	3.0	22,704
281	Gilligan (dry)	1.0	1.0	1,760
286	Unnamed	5.1	1.0	8,976
287	Anderson	1.9	3.0	10,032
291	Sorenson	1.2	1.0	2,112
292	Parker	0.9	2.0	3,168
293	Morgan	2.7	2.0	9,504
294	Childs	2.0	1.0	3,520
298	Day Creek Slough	1.5	--	--
299	Day Creek	5.0	--	--
		0.4	3.0	2,112
332	Jones (dry)	1.5	3.0	7,920
339	Mannser Creek	3.6	2.0	12,672
340	Unnamed	1.3	1.0	2,288
343	Etach Creek (Cont. as)	1.5	3.0	7,920
	Red Cabin Creek (dry)	1.8	2.0	6,336
350	Loretta	0.9	3.0	4,572
352	Muddy	3.2	1.0	5,632
359	Alder	4.4	2.5	19,360
365	O'Toole	0.4	3.0	2,112
372	Boyd	1.2	2.0	4,224
375	Mill	1.2	2.0	4,224

(Continued)

Table 4. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
377	Grandy	4.0	--	--
		3.6	3.0	19,008
378	Unnamed	0.6	1.0	1,056
384	Savage	2.1	1.0	3,696
385	Presentin	1.1	3.0	5,808
392	Finney	11.7	--	--
396	Quartz	0.5	1.0	880
397	Hatchery	0.25	1.0	440
626	Jackman	1.5	3.0	7,920
661	Miller	0.3	2.0	1,056
667	McCleod Slough	2.4	--	--
669	Unnamed	0.4	1.0	704
673	Sauk River	35.0	--	--
674	Unnamed	3.1	1.0	5,456
677	Unnamed	0.9	1.0	1,584
678	Hilt	0.7	2.0	3,696
683	Unnamed	2.4	1.0	4,224
684	Unnamed	2.2	1.0	3,872
686	Unnamed	2.0	1.0	3,520
691	White	0.7	2.0	2,464
701	Rinker	2.7	2.0	9,504
703	Unnamed	0.4	1.0	704
707	Unnamed	2.6	1.0	4,576
710	Suattle	45.0	--	--
723	Big Creek	.6	--	--
761	Tenas	1.6	4.0	11,264
797	Straight	1.9	2.0	6,688
813	Buck	1.5	--	--
892	Circle	0.1	2.0	352
897	Lime	1.0	4.0	7,040
910	Captain	0.4	2.0	1,408
919	Downey	1.2	--	--
973	Sulpher	1.2	--	--
1068	Unnamed	1.2	2.0	4,224
1073	Everett	1.6	1.0	2,816
1078	Unnamed	2.2	--	--
1079	Dan	3.4	4.0	23,936
1087	Unnamed	1.0	1.0	1,760
1089	Unnamed	0.3	1.0	528
1092	Unnamed	1.0	1.0	1,760
1094	Unnamed	0.5	1.0	880

(Continued)

Table 4. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
1096	Backman	0.3	1.0	528
1097	Clear	.4	--	--
1112	Murphy	0.5	1.0	1,760
1113	Goodman	0.8	2.0	2,812
1114	Dutch	0.8	2.0	2,812
1116	Whitechuck	19.8	--	--
1117	Black Oak	0.6	1.0	1,056
1118	Unnamed	0.3	1.0	528
1120	Unnamed	1.3	1.0	2,288
1121	Unnamed	0.7	1.0	1,232
1122	Unnamed	1.0	1.0	1,760
1123	Unnamed	0.8	1.0	1,406
1124	Stujack	0.4	1.0	704
1128	Unnamed	0.7	1.0	1,232
1129	Unnamed	0.9	1.0	1,584
1130	Unnamed	0.9	1.0	1,584
1131	Dead Duck	0.3	1.0	528
1132	Unnamed	1.3	1.0	2,288
1135	Unnamed	1.0	1.0	1,760
1136	Pugh	.08	1.0	1,406
1141	Unnamed	1.1	1.0	1,936
1142	Unnamed	0.9	1.0	1,584
1143	Owl	0.5	1.0	880
1148	Camp	0.5	1.0	880
1154	Fire	0.8	1.0	1,406
1155	Unnamed	1.0	1.0	1,760
1158	Fourteen-Mile	1.0	1.0	1,760
1176	Unnamed	0.7	1.0	1,232
1335	Unnamed	2.3	1.0	4,048
1336	Unnamed	1.1	1.0	1,936
1340	Unnamed	3.5	2.0	12,320
1346	Illabot	2.5	--	--
1347	Illabot Slough	1.0	--	--
1396	Rocky	0.6	2.0	2,112
1401	Corkin Dale (dry)	1.3	2.0	4,576
1404	O'Brian	1.8	2.0	6,336
1411	Cascade River	18.5	--	--
		2.5	4.0	17,600
1412	Jordan	0.5	3.0	2,640
1425	Boulder	0.3	2.0	1,056
1451	Marble	0.8	3.0	4,218
1481	Sibley	0.4	2.0	1,408
1747	Olson	1.2	2.0	4,224

(Continued)

Table 4. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
1750	Diobsud	1.7	4.0	11,968
1774	Bacon	6.0	--	--
		2.3	3.0	12,144
1774	Oakes	0.3	2.0	1,056
1780	Falls	0.3	3.0	1,574
1794	E. Fork Bacon	0.8	3.0	4,218
1844	Damnation	0.3	2.0	1,056
1855	Thornton	0.2	2.0	704
1859	Martin	0.3	2.0	1,056
1867	Goodell	1.8	--	--
1902	Newhalem	0.5	2.0	1,760
TOTAL				582,518
Tributaries		582,518 sq. yds X .42	=	224,658
Skagit River		94.2 X 1,760 = 165,792 X 2.5	=	414,480
North Fork		7.3 X 1,760 = 12,848 X 2.5	=	32,120
Nookachamps		10.7 X 1,760 = 18,832 X 2.5	=	47,080
Skiyou Slough		2.2 X 1,760 = 3,872 X 2.5	=	9,680
Day Creek Slough		1.5 X 1,760 = 2,640 X 2.5	=	6,600
Day Creek		5.0 X 1,760 = 8,800 X 2.5	=	22,000
Grandy		4.0 X 1,760 = 5,632 X 2.5	=	17,600
Finney		11.7 X 1,760 = 20,592 X 2.5	=	51,480
McCleod Slough		2.4 X 1,760 = 4,224 X 2.5	=	10,560
Sauk River		35.0 X 1,760 = 61,600 X 2.5	=	154,000
Big Creek		.6 X 1,760 = 1,056 X 2.5	=	2,640
Buck		1.5 X 1,760 = 2,640 X 2.5	=	6,600
Suiattle		45.0 X 1,760 = 79,200 X 1.25	=	99,000
Downey		1.2 X 1,760 = 2,112 X 1.25	=	2,640
Sulpher		1.2 X 1,760 = 2,112 X 1.25	=	2,640
Unnamed		2.2 X 1,760 = 3,872 X 2.5	=	9,680
Clear		.4 X 1,760 = 704 X 2.5	=	1,760
Whitechuck		19.8 X 1,760 = 34,848 X 2.5	=	87,120
Illabot		2.5 X 1,760 = 4,400 X 2.5	=	11,000
Illabot Slough		1.0 X 1,760 = 1,760 X 2.5	=	4,400
Cascade River		18.5 X 1,760 = 32,560 X 2.5	=	81,400
Bacon		6.0 X 1,760 = 10,560 X 2.5	=	26,400
Goodell		1.8 X 1,760 = 3,168 X 2.5	=	7,920
Baker Lake		8.0 X 1,760 = 14,080 X 1.25	=	17,600
TOTAL SMOLTS				1,371,058

Table 5. Stillaguamish River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
1	Stillaguamish River	69.0	--	--
18	Jorgenson Slough	2.0	--	--
34	S. Cook Slough	3.4	--	--
36	Portage	11.3	1.0	19,888
38	Fish	4.2	0.5	3,696
62	Pilchuck Creek	11.0	--	--
64	Unnamed	0.7	1.0	1,232
65	Unnamed	3.1	1.0	5,456
70	Unnamed	0.5	1.0	880
72	Unnamed	0.3	1.0	528
73	Unnamed	2.3	1.0	4,048
77	Unnamed	3.7	1.0	6,512
78	Unnamed	2.6	1.0	4,576
79	Unnamed	1.5	1.0	2,640
80	Unnamed	3.4	1.0	5,984
126	Armstrong	1.0	2.0	3,520
135	North Fork	37.3	--	--
149	Unnamed	0.6	1.0	1,056
156	Grant	1.2	2.0	4,224
166	Unnamed	1.4	1.0	2,464
171	Hell	0.6	2.0	2,112
173	Deer Creek	13.0	--	--
176	Unnamed	0.2	1.0	352
180	Unnamed	1.3	1.0	2,288
181	Rick	0.8	2.0	2,812
185	Unnamed	0.5	1.0	880
187	Little Deer	0.7	2.0	2,464
213	Unnamed	1.4	1.0	2,464
215	Brooks	3.4	2.0	11,968
217	Montague	2.0	1.0	3,520
221	Rollins	3.3	2.0	11,616
223	Dicks	1.7	2.0	5,984
226	Unnamed	1.7	1.0	2,992
229	Boulder	2.8	--	--
241	Unnamed	0.8	1.0	1,406
242	Unnamed	0.6	1.0	1,056
243	Unnamed	1.3	1.0	2,288
246	French	2.7	2.0	9,504
250	Unnamed	0.5	1.0	880
251	Unnamed	1.2	1.0	2,112
252	Unnamed	2.4	1.0	4,224
253	Little French (dry)	1.2	2.0	4,224

(Continued)

Table 5. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
255	Segelson	2.4	2.0	8,448
257	Moose (dry)	2.9	1.0	5,104
260	Squire	5.0	--	--
		2.7	2.5	11,880
261	Firland (dry)	1.9	1.0	3,344
262	Ashton (dry)	1.5	1.0	2,640
263	Snow Gulch	1.2	1.0	2,112
264	Unnamed	0.8	1.0	1,406
265	Browns	2.2	2.0	7,744
266	Buckeye	0.2	1.0	352
322	Jim	8.5	--	--
		5.0	2.7	23,760
323	Unnamed	1.3	1.0	2,288
324	Siberia	1.8	1.0	3,168
328	Unnamed	1.5	1.0	2,640
329	Bear	0.8	1.0	1,406
330	Porter	3.0	1.0	5,280
336	Unnamed	1.8	1.0	3,168
337	Unnamed	0.7	1.0	1,232
338	Lake Riley	2.5	2.0	8,800
340	Cub	4.2	1.0	7,392
350	Jordan	1.0	1.0	1,760
357	Unnamed	2.8	1.0	4,928
359	Canyon	11.5	--	--
		1.5	4.0	10,560
392	Rotary	0.7	2.0	2,464
393	Hawthorn	1.8	2.0	6,336
397	Turlo	1.6	2.0	5,632
399	Benson	1.4	2.0	4,928
408	Schweitzer	0.9	2.0	3,168
410	Boardman	4.3	3.0	22,704
417	Mallardy	1.3	2.0	4,576
420	Blackjack	0.9	2.0	3,168
423	Marten	0.5	2.0	1,760
428	Deer	2.1	2.0	7,392
430	Coal	0.9	2.0	3,168
436	Perry	2.2	2.0	7,744
443	Buck	0.8	2.0	2,816
444	Palmer (dry)	2.1	2.0	7,392
TOTAL				344,510

(Continued)

Table 5. (Continued)

Tributaries	344,510 sq. yds. X .42	= 144,694
Stillaguamish River	69.0 X 1,760 = 121,440 X 2.5	= 303,600
Jorgenson River	2.0 X 1,760 = 3,520 X 2.5	= 8,800
S. Cook Slough	3.4 X 1,760 = 5,984 X 2.5	= 14,960
Pilchuck Creek	11.0 X 1,760 = 19,360 X 2.5	= 48,400
North Fork	37.3 X 1,760 = 65,648 X 2.5	= 164,120
Deer Creek	13.0 X 1,760 = 22,880 X 2.5	= 57,200
Boulder	2.8 X 1,760 = 4,928 X 2.5	= 12,320
Squire	5.0 X 1,760 = 8,800 X 2.5	= 22,000
Jim	8.5 X 1,760 = 14,960 X 2.5	= 37,400
Canyon	11.5 X 1,760 = 20,240 X 2.5	= <u>50,600</u>
	TOTAL SMOLTS	864,094

Table 6. Snohomish River.

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd)
5	Mission	6.1	2.5	26,840
6-11	Tribs. to 5	5.0	1.0	8,800
12	Snohomish River	73.6	-	-
15	Steamboat Slough	6.2	-	-
16	Union Slough	4.7	-	-
17-22	Unnamed	4.0	5.0	35,200
23	Deadman Slough	1.0	2.0	3,520
24	Unnamed	.2	2.0	704
26	Deadwater Slough	1.7	5.0	14,960
28	East Fork	.9	2.0	3,168
36	Wood	1.5	2.0	5,280
43	Ebey Slough	12.4	-	-
44	Quilceda	9.1	3.0	48,048
46	Sturgeon	1.0	2.0	3,520
48	Trib. to 44	1.5	1.5	3,960
49	West Fork	3.1	3.0	16,368
52	Trib. to 49	2.7	1.5	7,128
55	Trib. to 49	.3	1.0	528
56-57	Tribs. to 44	1.0	1.0	1,760
58	Middle Fork	3.6	3.0	19,008
60	Trib. to 58	3.3	2.0	11,616
61-62	Tribs. to 58	.5	2.0	1,760
63-64	Tribs. to 58	2.7	1.5	7,128
66	Trib. to 44	1.2	1.5	3,168
67	Trib. to 44	.2	1.0	352
68	Allen	6.3	3.0	33,264
70	Trib. to 68	2.9	2.0	10,208
71-72	Tribs. to 68	1.0	1.0	1,760
73	Munson	2.8	2.0	9,856
74-81	Tribs. to 68	6.5	1.0	11,440
83-85	Unnamed	2.7	2.0	9,504
86	Unnamed	.3	2.0	1,056
90	Unnamed	.5	1.0	880
96	Unnamed	.3	2.0	1,056
98	Unnamed	.4	2.0	1,408
103	Swain Trail Slough	.9	2.0	3,168
107	Larimer	3.1	2.0	10,912
108	Thomas	1.0	1.0	1,760
117-119	Unnamed	1.3	1.0	2,288
120-122	Unnamed	2.4	1.5	6,336
125	Pilchuck River	39.7	-	-
126	Unnamed	2.7	3.0	14,256
127-129	Tribs. to 126	1.6	1.5	4,224
130	Unnamed	2.1	2.0	7,392
131-133	Tribs. to 130	.8	1.5	2,112

(Continued)

Table 6. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd.)
135	Unnamed	1.3	1.5	3,432
137	Unnamed	1.3	2.0	4,576
139	Dubuque	7.1	3.0	37,488
140	Panther	4.0	2.0	14,080
141-144	Tribs. to 150	2.8	1.5	7,392
145	Trib. to 139	2.2	2.0	7,744
146	Little Pilchuck	11.6	5.0	102,080
147	Stevens	5.8	2.0	20,416
148	Catherine	2.7	2.0	9,504
150	Trib. to 147	1.0	2.0	3,520
151	Trib. to 146	2.4	3.0	12,672
152	Trib. to 146	2.3	2.0	8,096
153	Star	5.1	3.0	26,928
154	Trib. to 153	.5	1.0	880
155-157	Tribs. to 146	2.0	1.5	5,280
158	Unnamed	.4	2.0	1,408
159	Unnamed	2.0	1.5	5,280
160	Trib. to 159	.5	1.0	880
161	Unnamed	2.1	2.0	7,392
162	Swartz Lake	3.1	3.0	16,368
163	Basworth Lake	1.4	3.0	7,392
164	Boyd Lake	2.4	3.0	12,672
165	Purdy	1.1	3.0	5,808
166	Worthy	4.2	5.0	36,960
167-168	Tribs. to 166	1.1	2.0	3,872
170	Kelly	.3	3.0	1,584
171-173	Tribs. to 170	.4	1.0	704
174	Boulder	.2	3.0	1,056
176	Wilson	.6	3.0	3,168
180	Miller	.5	3.0	2,640
181-182	Unnamed	.7	1.5	1,848
184	French	6.0	3.5	36,960
185-194	Tribs. to 184	5.0	2.0	17,600
209	Unnamed (side channel)	1.6	-	-
210	Evans	2.7	3.0	14,256
211	Trib. to 210	1.7	1.5	4,488
212	Anderson	2.3	2.5	10,120
213	Trib. to 212	.1	1.0	176
214	Elliot	1.7	2.0	5,984
219	Snoqualmie River	40.3	-	-
220	Ricci	.1	2.0	352
224	Unnamed	.3	1.5	792
225	Unnamed	.3	1.5	792
227	Unnamed	1.8	1.5	4,752
228	Pearson Eddy	2.2	1.0	3,872
236	Peoples	.9	2.5	3,960
238	Duval	.2	1.0	352

(Continued)

Table 6. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd.)
240	Cherry	6.9	6.0	72,864
243	North Fork Cherry	1.5	3.5	9,240
244	Trib. to 243	.5	2.5	2,200
245	Trib. to 240	.1	2.0	352
247	Trib. to 240	.5	2.5	2,200
248	Margaret	1.3	2.0	4,576
254	Trib. to 240	.1	2.0	352
256	Trib. to 240	.5	2.0	1,760
257	Hannan	.2	2.0	704
267	Tuck	2.1	3.0	11,088
276	Unnamed	.5	1.0	880
278	Ames	3.5	1.5	9,240
283	Harris	6.4	5.5	61,952
284	Stillwater	1.1	2.5	4,840
285 A,B, C,D	Tribs. to 283	1.5	1.5	3,960
286	Trib. to 283	1.1	4.0	7,744
286 A	Trib. to 283	.2	2.0	704
287-290	Tribs. to 283	.7	2.0	2,464
291	Tolt River	10.8	-	-
292	Langlois	2.0	3.0	10,560
292 B,D,E	Tribs to 291	1.7	5.0	14,960
295-299	Unnamed	.5	2.0	1,760
300	Stossel	4.5	5.0	39,600
300 A,B	Tribs. to 300	.3	2.0	1,056
301	Trib. to 300	.2	1.0	352
302	South Fork Tolt River	8.1	-	-
303-309	Unnamed	1.2	2.5	5,280
364	Griffin	11.4	6.5	130,416
369	Trib. to 364	1.0	3.0	5,280
371	East Fork	3.3	4.0	23,232
372	Trib. to 364	.1	2.0	352
373 A	Trib. to 364	.1	2.0	352
376	Patterson	8.0	5.0	70,400
377	Trib. to 376	1.7	2.0	5,984
378	Trib. to 376	.2	2.0	704
379	Trib. to 376	.2	1.0	352
381	Trib. to 376	.6	1.5	1,584
382	Canyon	2.1	4.0	14,784
382 A	Trib to 376	.1	1.5	264
383	Trib. to 376	.3	1.5	792
383 A	Trib. to 376	.2	1.0	352
384	Raging River	11.0	-	-
389	Unnamed	.5	2.0	1,760
390	Unnamed	.2	2.0	704
393	Lake	2.0	2.5	8,800
396	Deep	1.7	3.5	10,472
398	Trib. to 396	.4	2.0	1,408

Table 6. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd.)
434	Skunk	.8	2.0	2,816
435	Mud	.5	2.0	1,760
440	Tokul	1.1	4.0	7,744
814	Unnamed	1.1	2.0	3,872
815-816	Tribs. to 814	.3	1.0	528
818	Riley Slough	6.0	4.0	42,240
819	Foye	1.6	2.5	7,040
820	High Peak	1.5	2.0	5,280
821	Trib. to 818	.2	1.5	528
822	Trib. to 818	.7	3.0	3,696
825	Haskel Slough	2.2	4.0	15,488
826	Woods	7.3	6.0	77,088
828	Richardson	4.4	3.0	23,232
829-830	Tribs. to 828	.5	1.5	1,320
831	West Fork Woods	6.9	6.0	72,864
832-833	Tribs. to 831	3.0	2.0	10,560
835	Trib. to 831	1.0	2.0	3,520
836	Carpenter	7.4	4.0	52,096
837-839	Tribs. to 836	1.6	1.5	4,224
840	Trib. to 831	1.0	1.5	2,640
841-842	Tribs. to 826	.4	1.0	704
857	Unnamed	1.4	2.5	6,160
858	Barr	.7	2.0	2,464
859	Trib. to 858	.5	1.0	880
862	Unnamed	1.1	1.5	2,904
864	Unnamed	.5	1.5	1,320
865	Elwell	2.8	4.0	19,712
866	Trib. to 865	.4	1.0	704
869	Trib. to 865	.5	1.5	1,320
870	Youngs	1.0	4.0	7,040
876	McCoy	1.7	3.0	8,976
877	Trib. to 876	1.8	2.5	7,920
882	Winter	1.8	2.0	6,336
883	Ames	2.2	1.0	3,872
939	Wagleys	2.0	2.5	8,800
940	Wallace River	8.8	-	-
941	Unnamed	.2	2.0	704
942	Bear	1.5	3.0	7,920
946	Olney	.7	5.0	6,160
961	Skykomish Slough	1.6	10.0	28,160
963	Unnamed	2.6	3.0	13,728
964	Trib. to 963	.8	1.5	2,112
965	Duffy	.2	2.0	704
969	Crystal	.3	1.5	792
970	Proctor	1.2	3.0	6,336
972	Hogarty	.8	2.0	2,816
975	Anderson	.5	2.0	1,760
979	Deer	.4	2.0	1,408

Table 6. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd.)
982	North Fork Skykomish	18.9	-	-
983	Lewis	.5	2.0	1,760
984-1032	Tribs. to 982	1.9	2.0	6,688
1053	Silver	2.0	2.0	7,040
1054-1182	Tribs. to 982	3.9	2.0	13,728
1248	Bridal Veil	.2	4.0	1,408
1249	Philadelphia	.1	2.0	352
1250-1251	Unnamed	.3	2.0	1,056
1252	Barclay	.4	4.0	2,816
1263	Unnamed	.5	2.0	1,760
1264	Index	1.4	3.5	8,624
1265	Trib. to 1264	.3	2.0	1,056
1280	Unnamed	.6	2.0	2,112
1285	Unnamed	.6	2.0	2,112
1286	Unnamed	.4	2.0	1,408
1287	Unnamed	.4	2.0	1,408
1288	Lowe	.7	2.5	3,080
1296	Unnamed	2.0	2.5	8,800
1297	Side Channel	.8	-	-
1298	Unnamed	.6	2.5	2,640
1300	Money	4.4	3.0	23,232
1301	Kimall	.1	2.0	352
1307-1308	Tribs. to 1300	.5	1.0	880
1326	Unnamed	.3	1.5	792
1327	Unnamed	.2	1.5	528
1329	Miller River (East Fork)	6.1	-	-
1330-1334	Tribs. to 1329	1.3	2.0	4,576
1335	West Fork Miller River	.8	3.0	4,224
1336	Trib. to 1335	.2	2.0	704
1361-1368	Tribs. to 1329	1.8	2.0	6,336
1406	Unnamed	.5	1.5	1,320
1407	Maloney	.6	3.0	3,168
1413	Beckler River	12.0	-	-
1414	Bolt	.7	1.5	1,848
1415	Trib. to 1413	.4	1.0	704
1416	Eagle	.6	2.5	2,640
1427-1432	Tribs. to 1413	2.0	1.5	5,280
1435	Trib. to 1413	1.1	3.0	5,808
1436	Harlan	.3	2.0	1,056
1443	Trib. to 1413	.5	2.0	1,760
1445-1448	Tribs. to 1413	1.2	2.0	4,224
1449	Johnson	.6	3.0	3,168
1461	Rapid River	6.0	5.0	52,800
1462-1499	Tribs. to 1461	4.0	2.0	14,080
1531	Four of July	1.2	3.0	6,336
1539-1543	Tribs. to 1413	1.1	1.5	2,904
1548-1550	Tribs. to 1413	.4	2.0	1,408
1552	Evergreen	.8	3.0	4,224

Table 6. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd.)
1561	Anthracite	.3	2.0	1,056
1562	Foss River	5.2	-	-
1563-1564	Tribs. to 1562	.3	2.0	1,056
1568-1570	Tribs. to 1562	.4	2.0	1,408
1573	West Fork Foss River	2.1	4.0	14,784
1574-1579	Tribs. to 1573	.8	2.0	2,816
1621	Unnamed	.2	2.0	704
1622	Alpine	.6	2.5	2,640
1625-1628	Unnamed	.7	1.5	1,848
1631	Unnamed	.1	2.0	352
1632	Carroll	.1	2.0	352
1722-1730	Tribs. to Possession Sound	1.0	2.0	3,520
TOTAL				2,124,936
Tributaries		2,124,936 sq. yds. X .42	=	892,473
Snohomish River		= 73.6 X 1,760 = 129,536 X 2.5	=	323,840
Steamboat Slough		= 6.2 X 1,760 = 10,912 X 2.5	=	27,280
Union Slough		= 4.7 X 1,760 = 8,272 X 2.5	=	20,680
Ebey Slough		= 12.4 X 1,760 = 21,824 X 2.5	=	54,560
Pilchuck River		= 39.7 X 1,760 = 69,872 X 2.5	=	174,680
Unnamed S. Channel		= 1.6 X 1,760 = 70,928 X 2.5	=	7,040
Snoqualmie River		= 40.3 X 1,760 = 70,928 X 2.5	=	177,320
Tolt River		= 10.8 X 1,760 = 19,008 X 2.5	=	47,520
S.F. Tolt River		= 8.1 X 1,760 = 14,256 X 2.5	=	35,640
Raging River		= 11.0 X 1,760 = 19,360 X 2.5	=	48,400
Wallace River		= 8.8 X 1,760 = 15,488 X 2.5	=	38,720
N.F. Skykomish River		= 18.9 X 1,760 = 33,264 X 2.5	=	83,160
Side Channel		= .8 X 1,760 = 1,408 X 2.5	=	3,520
Miller River		= 6.1 X 1,760 = 10,736 X 2.5	=	26,840
Beckler River		= 12.0 X 1,760 = 21,120 X 2.5	=	52,800
Foss River		= 5.2 X 1,760 = 9,152 X 2.5	=	22,880
Lakes (5)			=	
TOTAL SMOLTS				<u>2,027,497</u>

Table 7. Lake Washington

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
28	Ship Canal	9.4	--	--
30	Thornton	3.6	3	19,008
33	Maple Leaf	1.9	1.5	5,016
34- 38	Tribs to 33	1.0	1.0	1,760
49	McAleer	3.5	3.5	21,560
49(A,B,C)	Tribs to 49	.5	1.0	880
52	Lyon	1.8	3.0	9,504
57	Sammamish River	13.8	--	--
59	Swamp	10.9	5.5	105,512
60(A,B)	Tribs to 59	1.6	1.0	2,816
61	Scriber Lake Cr.	3.1	4.5	24,552
62- 64	Tribs to 61	2.0	1.0	3,520
70	North	9.5	5.5	91,960
75- 76	Tribs to 70	3.3	2.0	11,616
77	Penny	4.0	2.0	14,080
79A	Tribs to 70	.5	1.0	880
80	Little Bear	8.3	4.5	65,736
81- 84	Tribs to 80	2.0	1.0	3,520
85-104	Tribs to 80	5.0	1.0	8,800
105	Big Bear	12.4	7.5	163,680
106	Evans	8.2	4.0	57,728
107,108, and 110	Tribs to 106	2.2	2.0	7,744
114	Unnamed	.5	1.0	880
115	Mackey	2.65	2.0	9,328
116-121	Tribs to 115 and 105	.5	2.0	1,760
122	Cottage Lake	3.7	2.5	16,280
123-126	Tribs to 122	.1	1.0	176
129	Seidel	1.2	2.0	4,224
131	Struve	1.8	2.0	6,336
132-134	Tribs to 131	2.0	2.0	7,040
135-139	Tribs to Beur	2.2	2.0	7,744
144-165	Tribs to Lk. Sammamish	4.0	1.0	7,040
166	Laughing Jacobs	.3	1.0	528
169	Tibbets	3.6	2.5	15,840
170-177	Tribs to 169	2.0	1.0	3,520
224-229	Unnamed	1.0	1.0	1,760
230	Juanita	2.1	2.5	9,240
231-241	Tribs to 230	1.0	1.0	1,760
242	Forbes	1.5	1.0	2,640
243-249	Unnamed	1.0	1.0	1,760
259	Mercer Slough	5.3	5.0	46,640
261	S.F. Kelsey	2.1	1.0	3,696

(Continued)

Table 7. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
264	Trib to 259	1.0	1.0	1,760
265-267	Tribs to 259	2.0	2.0	7,040
268	Coal	2.0	2.0	7,040
269	Trib to 268	1.5	1.0	2,640
282	May	8.0	3.0	42,240
283-297	Tribs to 282	7.0	1.0	12,320
299	Cedar River	21.0	--	--
302	Trib to 299	.3	1.0	528
304	Molasses	.4	1.5	1,056
305	Madson	2.0	2.0	7,040
320	Downs	3.5	2.0	18,480
320A	Trib to 320	.2	4.0	1,408
321	Unnamed	.1	1.5	264
328	Peterson	2.5	2.5	11,000
336	Unnamed	1.0	1.0	1,760
337	Trib to 336	.3	1.0	528
338	Rock	2.5	5.5	24,200
341	Walsh Lake Div.	.3	3.0	1,584
TOTAL				908,952
<p>Tributaries 908,952 sq. yds. X .42 = 381,760</p> <p>Ship Canal 9.4 X 1,760 = 16,544 X 2.5 = 41,360</p> <p>Sammamish River 13.8 X 1,760 = 24,288 X 2.5 = 60,720</p> <p>Cedar River 21.0 X 1,760 = 36,960 X 2.5 = 92,400</p> <p>Lk. Washington 71.5 mi X 1,760 = 125,840 X 1.25 = 157,300</p> <p>Lake Sammamish 16.0 mi X 1,760 = 28,160 X 1.25 = <u>35,200</u></p> <p style="text-align: right;">TOTAL SMOLTS 768,740</p>				

Table 8. Green River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
1	Green River	61	--	--
5	Springbrook	12	3	63,360
6-31	Tribs	1.0	2	3,520
45-49	Unnamed	4.2	2	14,784
51	Hill	6.7	4	47,168
53	Unnamed	1.7	2	5,984
98	Unnamed	2.3	1.5	6,072
105	Burns	2.1	4.0	14,784
107	Unnamed	1.2	2.0	4,224
108-110	Unnamed	1.5	1.5	3,960
111-112	Unnamed	.2	4.0	1,408
113	Crisp	1.1	4.0	7,744
114	Newaukum	13.0	6.0	137,280
115-117	Tribs to 114	.5	1.5	1,320
118	Unnamed	2.2	2	7,744
119	Spring	1.1	3	5,808
121	Watercress	2.6	2	9,152
122	N.F. Newaukum	1.5	3	7,920
123	Stonequarry	2.7	2	9,504
TOTAL				351,736
Tributaries		351,736 sq. yds. X .42	=	147,729
Green		61.0 X 1,760 = 107,360 X 2.5	=	<u>268,400</u>
		TOTAL SMOLTS		416,129

Table 9. Puyallup River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
6	Hylebos	9.0	3.0	47,520
7-15	Tribs to 6	6.8	2.0	23,936
21	Puyallup River	41.8	--	--
22	Clear	1.9	3.0	10,032
23	Swan	2.0	1.5	5,280
27	Clarks	3.7	3.0	19,536
28	Trib to 27	.4	1.0	704
31	White	68.0	--	--
32	Unnamed	4.7	4.0	33,088
33	Jovita	.7	1.5	1,848
35	Strawberry	1.6	3.0	8,448
42	Bowman	.6	2.0	2,112
43-44	Tribs to 42	.3	1.0	528
48-49	Unnamed	5.8	2.0	20,416
50	Unnamed	2.2	2.0	7,744
52-53	Unnamed	1.5	1.0	2,640
54-55	Unnamed	.8	1.0	1,408
56	Unnamed	1.2	2.0	4,224
57	Boise	4.5	4.0	31,680
59	Trib to 57	.8	1.0	1,408
398-405	Tribs to 21	3.0	2.0	10,560
406	Fennel	2.0	3.5	12,320
410	Canyon Falls	.7	5.0	6,160
413	Carbon River	27.0	--	--
429	South Prairie	15.7	--	--
430-431	Tribs to 429	1.0	2.0	3,520
432	Wilkeson	6.2	4.0	43,648
449-456	Tribs to 429	.7	2.0	2,464
460	Trib to 429	.1	1.0	176
461	Beaver	1.1	3.0	5,808
463-465	Tribs to 429	.2	1.0	352
479	Lilly	.2	3.0	1,056
482-483	Tribs to 413	.3	1.0	528
494-530	Tribs to 413	1.0	1.0	1,760
594-595	Tribs to 21	1.0	1.5	2,640
596	Fiske	1.0	2.0	3,520
600	Kapowsin	7.9	4.5	62,568
604	Trib to 600	1.0	2.0	3,520
608	Fox	.9	3.0	4,752
613	Kings	.1	4.0	704

(Continued)

Table 9. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
620	Le Dout	2.0	3.0	10,560
621	Unnamed	.4	2.0	1,408
622	Niesson	1.2	3.0	6,336
TOTAL				406,912
Tributaries 406,912 sq. yds. X .42 = 170,903				
Puyallup 41.8 X 1,760 = 73,568 X 1.25 = 91,960				
White (to dam) 24.0 X 1,760 = 42,240 X 1.25 = 52,800				
White (above dam) + Clearwater + Greenwater + West Fork White =				
2,242 adults ÷ 2 = 1,121 X 100 = 112,100				
Carbon 27.0 X 1,760 = 47,520 X 1.25 = 59,400				
S. Prairie 15.7 X 1,760 = 27,632 X 2.5 = <u>69,080</u>				
TOTAL SMOLTS				556,243

Table 10. Nisqually River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
8	Nisqually River	42.4	--	--
12	Side Channel	1.2	4.0	8,448
18	Muck Creek	7.0	4.0	49,280
22	Lacamas	3.0	2.0	10,560
27	Johnson	1.2	2.0	4,224
43	Yelm	9.1	3.0	48,048
44-49	Tribs to 43	1.8	1.5	4,752
50	Murray	12.2	3.0	64,416
51-54	Tribs to 50	1.5	1.0	2,640
55-57	Tribs to 8	1.8	2.0	6,336
59	Horn	1.0	2.0	3,520
60	Unnamed	1.2	3.0	6,336
63	Lackamas	3.0	2.0	10,560
64	Side Channel	.5	3.0	2,640
65	Taboton	4.0	2.0	14,080
67	Tanawax	11.2	3.0	59,136
68-72	Tribs to 67	3.7	1.0	6,512
76	Powell	1.2	3.0	6,336
86	Ohop	11.0	6.0	116,160
87	Trib to 86	1.5	2.0	5,280
88	Lynch	2.1	3.0	11,088
94	Trib to 86	2.3	2.0	8,096
95	25 mile	.7	3.5	4,312
98	Unnamed	2.4	2.0	8,448
101	Mashel	15.3	--	--
102	Little Mashel	.7	4.0	4,928
111	Beaver	.4	2.0	1,408
TOTAL				467,544
Tributaries		467,544 sq. yds. X .10	=	46,754
Nisqually River		42.4 X 1,760 = 74,624 X 1.25	=	93,280
Mashel River		13.7 X 1,760 = 24,112 X 2.5	=	<u>10,280</u>
TOTAL SMOLTS				200,314

Table 11. South Sound

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
5 (13)	Unnamed	.5	1.0	880
6	Woodland	5.5	3.0	29,040
7-10	Tribs to 6	2.5	1.0	4,400
12	Woodard	6.0	3.0	31,680
15 (13)	Unnamed	1.0	1.0	1,760
16-21 (13)	Unnamed	2.0	1.0	3,520
22-24	Ellis	1.5	1.5	3,960
25	Mission	1.0	1.0	1,760
29	Percival	3.3	3.0	17,424
30	Trib to 29	2.2	2.0	7,744
133 (13)	Unnamed	3.0	1.5	7,920
137 (13)	Unnamed	.7	1.5	1,848
138	McLane	5.0	2.5	22,000
139-143	Tribs to 138	5.0	1.0	8,800
1 (14)	Perry	1.0	1.0	1,760
9	Schneider	5.3	2.0	18,656
10-11	Tribs to 9	.7	1.0	1,232
12	Kennedy	2.3	6.0	24,288
20	Skookum	9.0	4.0	63,360
21-24	Tribs to 20	3.5	1.0	6,160
25-27	Unnamed	2.0	1.0	3,520
29	Mill	16.0	4.0	112,640
30-33	Tribs to 29	5.8	2.0	20,416
35	Goldsborough	11.2	7.0	137,984
36	Coffee	2.0	2.0	7,040
37	N.F. Goldsborough	4.0	2.5	17,600
38	Winter	4.0	1.0	7,040
41-43	Tribs to 35	.5	1.0	880
49	Johns	8.3	4.0	58,432
51	Cranberry	9.3	3.0	49,104
52-56	Tribs to 51	1.7	1.0	2,992
57	Deer	8.5	3.5	52,360
58-66	Tribs to 57	2.3	1.0	4,048
67	Malaney	2.9	2.5	12,760
68	Uncle John	1.5	1.0	2,640
69	Campbell	4.5	2.0	15,840
70-73	Tribs to 69	1.0	1.0	1,760
74-79	Unnamed	1.0	1.0	1,760
80	Jones	1.5	1.5	3,960
83-86	Unnamed	1.7	1.0	2,992
87-88	Unnamed	1.5	1.0	2,640
89-91	Unnamed	1.0	1.0	1,760

(Continued)

Table 11. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
92-93	Unnamed	1.0	1.0	1,760
94	Sherwood	18.3	5.0	161,040
95-105	Tribs to 94	4.1	2.0	14,432
1 (15)	Unnamed	.3	2.0	1,056
2	Coulter	8.0	3.5	49,280
3-11	Tribs to 2	3.3	1.5	8,712
12-14	Unnamed	1.8	1.5	4,752
15	Rocky	3.4	3.5	20,944
16	Rock	4.0	2.0	1,760
22-23	Unnamed	.7	1.0	1,232
26-27	Dutcher	.7	2.0	2,464
29-35	Unnamed	1.2	1.5	3,168
36-38	Unnamed	.7	1.5	1,848
43-44	Unnamed	.5	1.0	880
46	Lacky	.5	2.0	1,760
56	Burley	3.0	5.0	26,400
57-59	Tribs to 56	2.7	2.5	11,880
60	Purdy	3.5	1.5	9,240
61	Trib to 60	.2	1.0	352
65	McCormick	1.6	1.5	4,224
66	Trib to 65	.4	1.0	704
68-69	Unnamed	.7	1.0	1,232
70-71	Unnamed	.3	1.0	528
72	Warren	.5	1.0	880
75	Artendale	1.7	2.5	7,480
76-78	Tribs to 75	1.0	1.0	1,760
80	Unnamed	1.4	2.0	4,928
81-86	Tribs to 80	2.7	1.0	4,752
87-88	Sullivan Gulch	1.2	1.5	3,168
324 (11)	McAllister	5.5	5.0	48,400
325-328	Tribs to 324	2.1	2.0	7,392
7 (12)	Chambers	4.1	--	--
8	Leach	1.8	2.5	7,920
9	Flett	3.1	2.0	10,912
19	Sequalitchew	9.6	2.0	33,792
TOTAL				1,253,472
Tributaries 1,253,472 sq yds. X .42 = 526,458 Chambers 4.1 X 1,760 = 7,216 X 2.5 = <u>18,040</u> TOTAL SMOLTS 544,498				

Table 12. East Kitsap - North of Narrows

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
97-98 (15)	North	1.1	2.5	4,840
99	Crescent	3.1	3.0	16,368
105-106	Unnamed	.5	1.0	880
107	Ollalla	2.5	3.5	15,400
108-113	Tribs to 107	1.4	1.0	2,464
129	Judd	2.9	2.0	10,208
130-135	Tribs to 129	.5	1.0	880
139	Unnamed	2.0	1.5	5,280
140-144	Tribs to 139	.3	1.0	528
159	Unnamed	2.8	2.5	12,320
182-184	Unnamed	.7	1.0	1,232
185	Curley	5.3	3.5	32,648
186-187	Tribs to 185	1.7	1.0	2,992
188	Salmonberry	4.0	1.5	10,560
192	Beaver	1.3	1.5	3,432
193-197	Unnamed	.5	1.0	880
201	Wilson	.3	1.0	528
202	Annapolis	.1	1.0	176
203	Blackjack	6.9	4.0	48,576
204-207	Tribs to 203	2.2	1.0	3,872
209-210	Ross	1.6	2.0	5,632
211	Anderson	.4	1.5	1,056
215	Unnamed	.2	1.0	352
216	Gorst	.6	5.0	5,280
217	Trib to 216	.2	1.0	352
226	Unnamed	.7	1.0	1,232
229	Chico	5.7	3.0	30,096
230	Kitsap	.6	1.5	1,584
231	Dickerson	.8	1.5	2,112
233	Unnamed	.2	1.0	352
234	Lost	1.7	2.0	5,984
245	Koch	.8	1.0	1,408
246	Strawberry	2.5	1.5	6,600
247	Trib to 246	1.1	1.0	1,936
249	Clear	3.2	4.0	22,528
250-254	Tribs to 249	2.0	1.0	3,520
255-256	Barker	3.0	3.0	15,840
257-262	Unnamed	.5	1.0	880
266	Illahee	1.4	2.0	4,928
268-272	Unnamed	.7	1.0	1,232
273	Steele	2.1	2.0	7,392
274-275	Tribs to 273	1.4	1.0	2,464

(Continued)

Table 12. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
276-278	Unnamed	.8	1.0	1,408
279	Little Scandia	1.0	1.0	1,760
280	Big Scandia	.4	2.0	1,408
281-284	Unnamed	1.0	1.0	1,760
285	Dogfish	3.5	3.0	18,480
286-287	Tribs to 255	2.5	1.0	4,400
290-291	Unnamed	1.7	1.0	2,992
295-297	Unnamed	1.0	1.0	1,760
299	Grovers	5.0	3.0	26,400
306-309	Unnamed	2.5	1.5	6,600
310	Unnamed	.6	1.0	1,056
311-312	Eglon	1.1	1.5	2,904
313-319	Unnamed	.7	1.0	1,232
TOTAL				368,984
Tributaries 368,984 sq. yds. X .42 = 154,973				
TOTAL SMOLTS 154,973				

Table 13. Deschutes River

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
28	Deschutes River	41.1	--	--
31-32	Tribs to Deschutes	1.0	1.0	1,760
33	Trib to Deschutes	4.0	1.5	10,560
34	Trib to 33	1.8	1.0	3,168
36	Trib to 28	0.6	1.5	1,584
37	Spurcron Creek	5.8	1.5	15,312
38	Trib to 37	0.4	1.0	704
39-41	Tribs to 28	1.8	1.5	4,752
42	Trib to 28	2.0	1.5	5,280
43-44	Tribs to 42	0.8	1.0	1,408
45-46	Tribs to 28	5.0	1.5	13,200
47-49	Tribs to 46	1.5	1.0	2,640
50	Trib to 28	0.5	2.0	1,760
51	Pipeline Creek	3.0	2.0	4,576
52-53	Tribs to 51	1.6	1.5	4,224
56	Trib to 28	0.6	1.0	1,056
57	Fall Creek	0.4	1.5	1,056
66	Trib to 28	0.6	1.5	1,584
67	Trib to 66	0.5	1.0	880
68	Trib to 28	0.7	1.5	1,848
69	Mitchell Creek	1.1	2.0	3,872
70-71	Tribs to 69	0.9	1.0	1,584
86	Huckleberry Creek	0.5	3.5	3,080
89	Johnson Creek	0.3	2.5	1,320
95	Thurston Creek	1.2	2.0	4,224
102	Trib to 28	0.3	1.0	528
104	Trib to 28	0.1	1.5	264
TOTAL				92,224
Tributaries		92,224 sq. yds. X .42	=	38,734
Deschutes River		41.1 X 1,760 = 72,336 X 2.5	=	<u>180,840</u>
TOTAL SMOLTS				219,574

Table 14. Hood Canal

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
347-354 (15)	Unnamed	2.5	1.0	4,400
356	Gambel	4.0	3.0	21,120
357-359	Tribs to 356	.7	1.0	1,232
370	Unnamed	.5	1.0	880
371-376	Unnamed	1.9	1.0	3,344
377	Little Anderson	1.1	2.0	3,872
378-386	Tribs to 377	4.7	1.0	8,272
389	Big Beef	10.0	4.0	70,400
390-398	Tribs to 389	6.0	2.0	21,472
399	Little Beef	.3	1.0	528
400	Seabeck	3.6	3.0	19,008
401-402	Tribs to 400	1.7	2.0	5,984
403	Unnamed	.2	1.0	352
404	Stavis	4.0	1.5	10,560
405-406	Tribs to 404	.8	1.0	1,408
407	Boyce	1.2	1.0	2,112
408	Unnamed	.6	1.5	1,584
412	Anderson	3.8	3.0	20,064
413-416	Tribs to 412	1.9	1.0	3,344
420	Dewatto	8.7	7.0	107,184
421-437	Tribs to 420	13.0	1.0	22,880
438	Unnamed	1.7	1.0	2,992
439	Rendsland	5.0	2.0	17,600
440-443	Tribs to 439	.6	1.0	1,056
444-445	Unnamed	.3	1.0	528
446	Tahuya	21.1	5.0	185,680
447-458	Tribs to 446	6.0	1.5	15,840
459-469	Tribs to 446	10.0	1.5	26,400
470	Trib to 446	1.9	1.5	5,016
471-476	Tribs to 446	4.0	1.0	7,040
478	Shoofly	.5	1.5	1,320
479-487	Unnamed	.5	1.0	880
488	Stimson	3.0	1.5	7,920
492	Unnamed	.3	1.0	528
493-494	Little Mission	.8	2.5	3,520
495	Big Mission	9.8	3.0	51,744
496-502	Tribs to 495	4.5	1.5	11,880
503	Union	6.4	4.5	50,688
504-509	Tribs to 503	2.4	1.5	6,336
510	Bear	.3	2.5	1,320
512-513	Tribs to 503	1.1	1.0	1,936
514	E.F. Union	2.2	1.5	5,808

(Continued)

Table 14. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
515	Trib to 503	1.2	1.5	3,168
516	Hazel	.3	1.5	792
1 (16)	Skokomish River	17.3	--	--
2	Unnamed	.8	2.0	2,816
4	Unnamed	1.4	2.0	4,928
7	Hunter	1.0	1.0	1,760
8-10	Unnamed	1.5	2.0	5,280
11	South Fork	23.0	--	--
12	Swift	.5	3.0	2,640
13	Vance	4.3	2.5	18,920
14-19	Tribs to 13	2.7	1.0	4,752
36	Dalby	.2	1.0	352
37	Flat	.1	1.0	176
44	Unnamed	.3	1.0	528
45	Harp	.2	1.0	352
47	Brown	2.4	2.0	8,448
53	LeBar	1.8	3.0	9,504
59-65	Unnamed	1.0	1.5	2,640
66	Cedar	2.9	2.0	10,208
68-70	Tribs to 66	2.3	1.0	4,048
75-76	Unnamed	.4	1.0	704
81-82	Unnamed	.2	1.5	528
105	McTaggart	.8	3.0	4,224
221	Hill	.6	1.5	1,584
224	Clark	.1	1.0	176
225	Miller	.3	1.0	528
226	Sund	.2	1.0	352
228-229	Unnamed	.5	1.5	1,320
230	Lilliwaup	.7	.5	616
243	Eagle	1.7	2.5	7,480
244-246	Tribs to 243	.7	1.0	1,232
248	Jorstad	.9	3.5	5,544
251	Hamma Hamma	2.4	--	--
253	John	1.9	3.5	11,704
318	Waketickah	.3	2.5	1,320
326	Schaerer	.2	2.0	704
332	Fulton	.8	5.0	7,040
349	McDonald	.2	2.0	704
351	Duckabush	7.0	--	--
352-359	Tribs to 351	1.0	2.0	3,520

(Continued)

Table 14. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
362	Unnamed	.2	1.5	528
438-439	Unnamed	.7	2.0	2,464
441	Walker	.8	1.5	2,112
442	Dosewallips	17.0	--	--
443-446	Tribs to 442	1.2	1.5	3,168
449	Rockybrook	.3	3.5	1,848
458-485	Tribs to 442	2.2	1.0	3,872
4 (17)	Spencer	.6	1.5	1,584
12	Big Quilcene River	7.6	--	--
76	Little Quilcene River	6.3	3.5	38,808
77	Leland	4.0	1.5	10,560
78-81	Tribs to 77	.5	1.0	880
82-85	Tribs to 76	.7	1.5	1,848
87-88	Tribs to 76	.5	1.0	880
89	Ripley	2.0	1.0	3,520
115	Donavan	2.5	2.0	8,800
116-120	Tribs to 115	1.6	1.0	2,816
121	Unnamed	.2	1.0	352
129	Tarboo	6.8	2.0	23,936
130	Tribs to 129	.5	2.0	1,760
133-136	Tribs to 129	.7	1.0	1,232
163-167	Unnamed	1.0	1.5	2,640
170	Thorndyke	5.0	1.5	13,200
180-181	Unnamed	2.6	2.0	9,152
189-193	Unnamed	.4	1.0	704
200	Unnamed	.7	1.0	1,232
203	Chimacum	12.0	3.5	73,920
205	E.F. Chimacum	6.5	2.0	22,880
206-207	Tribs to 205	.5	1.0	880
208-214	Tribs to 203	3.5	2.0	12,320
TOTAL				1,114,520
Tributaries		1,114,520 sq. yds. X .42	=	468,098
Extra for Dewatto, Tahuya, Big Mission and Union		= 503,712 sq. yds. X .42	=	211,559
Skokomish River		17.3 X 1,760 = 30,448 X 2.5	=	76,120
S.F. Skokomish River		23.0 X 1,760 = 40,480 X 2.5	=	101,200
Hamma Hamma River		2.4 X 1,760 = 4,224 X 2.5	=	10,560
Duckabush River		7.0 X 1,760 = 12,320 X 2.5	=	30,800
Dosewallips River		17.0 X 1,760 = 29,920 X 2.5	=	74,800
Big Quilcene River		7.6 X 1,760 = 13,376 X 2.5	=	33,440
TOTAL SMOLTS				1,006,577

Table 15. Strait of Juan de Fuca

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
215-218 (17)	Unnamed	1.1	1.5	2,904
219	Snow	4.9	4.0	34,496
220	Trib to 219	.6	1.5	1,584
221	Andrews	2.4	2.5	10,560
222-223	Tribs to 219	.2	1.0	352
232	Trib to 219	.5	1.0	880
245	Salmon	5.7	3.5	35,112
246-266	Tribs to 245	6.5	1.0	11,440
270	Contractors	2.5	2.0	8,800
271	Trib to 270	.5	1.0	880
272	Eagle	2.9	2.0	10,208
273-277	Unnamed	1.0	1.0	1,760
278	Unnamed	1.0	1.0	1,760
280-283	Tribs to 278	.7	1.0	1,232
284	Unnamed	.3	1.5	792
285	Jimmycomlately	1.9	2.5	8,360
293	Dean	.4	1.5	1,056
301	Johnson	.3	1.0	528
1 (18)	Bell	2.7	2.0	9,504
2	Trib to 1	.6	1.0	1,056
4	Gierin	.3	1.5	702
15	Cassalery	.2	1.5	528
18	Dungeness River	18.8	--	--
19	Slough to 18	.7	3.0	3,696
20	Meadowbrook	1.9	1.5	5,016
21	Matriotti	2.0	2.0	7,040
22-26	Tribs to 21	2.0	1.0	3,520
28	Unnamed (Hurd)	2.9	2.0	10,208
30	Bear	2.0	2.0	7,392
34	Trib to 30	.9	1.0	1,584
38	Canyon	1.7	3.0	8,976
45-47	Unnamed	.5	1.0	880
48	Gray Wolf River	9.6	--	--
49	Cat	.3	1.0	528
69	Cameron	.9	4.0	6,336
70	Grand	.4	3.0	2,112
119	Eddy	.1	2.0	352
120	Unnamed	1.0	1.5	2,640
121	Gold	.1	1.5	264
160	MacDonald	5.2	3.0	27,456
161 and 163	Tribs to 160	2.5	1.0	4,400
173	Siebert	8.5	3.0	44,880
174-178	Tribs to 173	2.0	1.0	3,520
183	Bagley	1.2	2.5	5,280

(Continued)

Table 15. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
185	Morse	3.9	---	---
186	Mining	.1	1.0	176
232	Lees	2.0	1.5	5,280
233	E.F. Lees	.7	1.0	1,232
234	Ennis	.3	2.0	1,056
245	Peabody	2.0	2.0	7,040
249	Valley	1.7	2.0	5,984
250-251	Tribs to 249	.9	1.0	1,584
256	Tumwater	2.5	2.0	8,800
257-264	Tribs to 256	.5	1.0	880
265	Dry	3.0	2.0	10,560
266-271	Tribs to 265	3.0	1.0	5,280
272	Elwha River	4.9	--	--
273-278	Tribs to 272	1.7	1.0	2,992
7 (19)	Salt	6.5	4.0	45,760
8-16	Tribs to 7	6.3	2.0	22,176
20	Whiskey	4.3	4.0	30,272
21-25	Tribs to 20	4.0	2.0	14,080
31	Lyre	2.8	--	--
32-41	Tribs to 31	4.0	2.0	14,080
81	Unnamed	1.0	2.0	3,520
82	East Twin	3.7	5.0	32,560
83	Sadie	3.5	3.0	18,480
84-86	Tribs to 83	4.9	2.0	17,248
87	Trib to 82	.5	1.0	880
93	West Twin	4.2	5.0	36,960
94	Trib to 93	1.1	3.0	5,808
95-100	Tribs to 93	3.0	2.0	10,560
103	Deep	7.9	3.0	41,712
104	E.F. Deep	2.2	2.0	7,744
106-108	Tribs to 103	2.0	1.0	3,520
109	Joe	1.6	2.0	5,632
110	Jim	3.6	2.0	12,672
111	Trib to 110	.7	1.0	1,232
113	Pysht River	7.2	--	--
		9.1	4.0	64,064
114	Reed	3.1	2.0	10,912
115	S.F. Pysht	8.4	3.0	44,352
116-117	Tribs to 115	3.5	1.5	9,240
118	Middle	1.6	1.5	4,224
119	Trib to 115	1.0	1.0	1,760
120	Green	1.8	2.0	6,336
121	Trib to 120	1.0	1.5	2,640
122	Needham	2.4	2.0	8,448

(Continued)

Table 15. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
123	Trib to 122	.6	1.0	1,056
124-125	Tribs to 113	1.6	1.0	2,816
129	Clallam River	11.0	--	--
130	Pearson	4.5	2.0	15,840
131-132	Tribs to 130	1.0	1.0	1,760
133	Last	5.4	3.0	28,512
134	Charley	4.5	3.0	23,760
135-138	Tribs to 134	2.1	1.0	3,696
139	Blowder	.2	2.0	704
140-144	Tribs to 129	2.5	1.0	4,400
148	Hoko River	23.4	--	--
149	Little Hoko	3.6	4.0	25,344
150-157	Tribs to 149	3.5	2.0	12,320
163	Ossert	1.1	2.0	3,872
164-169	Tribs to 148	5.2	1.0	9,152
170	Brownes	.6	2.0	2,112
171	Trib to 170	.5	1.0	880
174	Trib to 148	1.1	2.0	3,872
175	Johnson	3.0	2.0	10,560
176-178	Tribs to 175	3.8	1.0	6,688
179-180	Tribs to 148	.5	1.0	880
182	Herman	1.7	3.0	8,976
183	N. Branch Herman	.2	1.0	352
188-191	Tribs to 148	3.0	1.5	7,920
192	Ellis	3.7	2.5	16,280
195	Trib to 148	.3	1.0	528
196	Bear	1.6	3.0	8,448
197	Cub	3.2	1.5	8,448
199-202	Tribs to 148	4.3	1.5	11,352
203	Sekiu River	5.0	--	--
		3.8	4.0	26,752
204	Trib to 203	1.1	2.0	3,872
205	Corpenters	2.2	3.0	11,616
206	Trib to 205	2.7	1.5	7,128
208	No Name	.8	1.5	2,112
209-210	Tribs to 203	.3	1.0	528
212	S.F. Sekiu	3.2	3.0	16,896
213-218	Tribs to 212	4.7	1.5	12,408
221-222	Tribs to 203	.4	2.0	1,408
223	Sonnybrook	.1	2.0	352
227	Olsen	1.0	2.5	4,400
228	Jansen	.2	2.5	880
230	Rasmussen	2.5	2.0	8,800
231	Bullman	3.3	3.0	17,424

(Continued)

Table 15. (Continued)

Stream Number	Stream Name	Accessible Length (mi)	Average Width (yd)	Area (sq. yd)
232-233	Tribs to 231	1.7	1.5	4,488
234	Snow	1.9	2.5	8,360
235	Sail River	5.0	3.0	26,400
TOTAL				1,202,752
<p>Tributaries 1,202,752 sq. yds. X .21 = 252,578</p> <p>Dungeness River 18.8 X 1,760 = 33,088 X 1.25 = 41,360</p> <p>Gray Wolf 9.6 X 1,760 = 16,896 X 1.25 = 21,120</p> <p>Morse 3.9 X 1,760 = 6,864 X 1.25 = 8,580</p> <p>Elwha River 4.9 X 1,760 = 8,624 X 1.25 = 10,780</p> <p>Lyre 2.8 X 1,760 = 4,928 X 1.25 = 6,160</p> <p>Pysht 7.2 X 1,760 = 12,672 X 1.25 = 15,840</p> <p>Clallam 11.0 X 1,760 = 19,360 X 1.25 = 24,200</p> <p>Hoko 23.4 X 1,760 = 41,184 X 1.25 = 51,480</p> <p>Sekiu 5.0 X 1,760 = 8,800 X 1.25 = <u>11,000</u></p> <p style="text-align: right;">TOTAL SMOLTS 443,098</p>				

Table 16. Smolt potentials above hatchery racks.

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd)
<u>Nooksack</u>				
406	Fendall Creek	4.1	2.0	14,432
407	Unnamed	3.3	1.0	5,808
409	Unnamed	0.2	1.0	352
TOTAL				20,592
Tributaries 20,592 sq. yd. x .42 = 8,649				
TOTAL SMOLTS 8,649				
<u>Samish</u>				
5	Samish River	10.2	--	--
17	Friday	9.6	3.5	59,136
18	Wildes	1.1	0.5	968
19	Butler	2.6	0.5	2,288
20	Unnamed	1.5	0.5	1,320
23	Silver	2.6	1.5	6,864
24	Unnamed	1.5	0.5	1,320
25	Unnamed	0.8	0.5	704
30	Unnamed	1.2	0.5	1,056
33	Bear	2.3	2	8,096
42	Lake Creek	1.2	1	2,112
50	Swede	3.4	2	11,968
54	Parson	2.2	1	3,872
55	Dry	5.0	0.5	4,400
56	Unnamed	1.7	0.5	1,496
61	Unnamed	1.2	0.5	1,056
62	Vernon	2.8	0.5	2,464
64	Thunder	1.6	0.5	1,408
67	Unnamed	0.4	0.5	352
69	Unnamed	0.3	0.5	264
70	Mills	2.1	0.5	1,848
73	Unnamed	0.3	0.5	264
75	Unnamed	0.4	0.5	352
78	Unnamed	0.4	0.5	352
81	Ennis	3.1	0.5	2,728
84	Unnamed	1.4	0.5	1,232
TOTAL				117,920
Tributaries 117,920 sq. yd. x .42 = 49,526				
Samish River 10.2 mi x 1,760 = 17,952 yd. x 2.50 = 44,880				
Samish Lake approx. 7.8 mi x 1,760 = 13,728 yd. x 1.25 = 17,160				
TOTAL SMOLTS				111,566
<u>Skykomish</u>				
943	May Creek	4.8	3.0	25,344
TOTAL				25,344
Tributaries 25,344 sq. yd. x .42 = 10,644				
TOTAL SMOLTS 10,644				

(Continued)

Table 16. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd)
<u>Issaquah</u>				
178	Issaquah Creek	13.5	4.0	95,040
181	N.F. Issaquah	1.3	2.5	5,720
183	E.F. Issaquah	5.7	3.0	30,096
184-193	Tribs to 183	0.7	1.0	1,232
194-198	Tribs to 178	0.5	1.0	880
199-202	Tribs to 178	1.4	1.5	3,696
203-205	Tribs to 178	.4	1.5	1,056
206	Trib to 178	.7	1.0	1,232
207	15-Mile	2.4	2.0	8,448
208	Trib to 207	1.1	1.0	1,936
212	McDonald	2.5	2.0	8,800
213-214	Tribs to 178	.2	1.0	352
215-217	Tribs to 178	1.0	1.0	1,760
218	Carey	4.2	2.0	14,784
TOTAL				175,032

Tributaries 175,032 sq. yd. x .42 = 73,513
 TOTAL SMOLTS 73,513

<u>Green</u>				
72	Big Soos Creek	14.2	5.0	124,960
73	Soosette	5.2	3.0	27,456
74-82	Tribs to 73	2.0	2.0	7,040
83	Covington	8.0	3.0	42,240
84	Unnamed	1.8	2.0	6,336
85	Rock	1.7	2.0	5,984
87	Jenkins	6.5	3.0	34,320
88-90	Tribs to 87	5.4	1.5	14,256
91	Unnamed	4.4	2.0	15,488
92	Little Soos	4.8	2.0	16,896
93	Unnamed	1.1	1.5	2,904
TOTAL				297,880

Tributaries 297,880 sq. yd. x .42 = 125,110
 TOTAL SMOLTS 125,110

<u>Puyallup</u>				
414	Voight Creek	4.1	5.0	36,080
415-417	Tribs to 414	2.8	2.0	9,856
TOTAL				45,936

Tributaries 45,936 sq. yd. x .42 = 19,293
 TOTAL SMOLTS 19,293

(Continued)

Table 16. (Continued)

Stream number	Stream name	Accessible length (mi)	Average width (yd)	Area (sq. yd)
<u>Minter Creek</u>				
48	Minter Creek	6.3	4.0	44,352
49-52	Tribs to 48	7.2	2.0	25,344
TOTAL				69,696
Tributaries 69,696 sq. yd. x .42 = 29,272				
TOTAL SMOLTS 29,272				
<u>George Adams</u>				
5	Purdy Creek	1.7	2.0	3,520
6	Weaver Creek	1.3	1.0	2,288
TOTAL				5,808
Tributaries 5,808 sq. yd. x .42 = 2,439				
TOTAL SMOLTS 2,439				
<u>Hood Canal</u>				
222	Finch Creek	1.1	1.0	2,112
TOTAL				2,112
Tributaries 2,112 sq. yd. x .42 = 887				
TOTAL SMOLTS 887				

Table 17. Coho salmon escapement goals for Puget Sound and the Strait of Juan de Fuca.

Area	Smolt ^{1/} Potential	Number of Females	Desired Escapement
Nooksack	451,275	4,500	9,000
Strait of Georgia Ind.	51,821	500	1,000
Samish	57,923	600	1,200
Skagit	1,371,058	13,500	27,000
Stillaguamish	864,094	8,500	17,000
Snohomish	2,027,497	20,500	41,000
Lake Washington	768,740	7,500	15,000
Green	416,129	4,000	8,000
Puyallup	556,243	5,500	11,000
Nisqually	200,314	2,000	4,000
South Sound and East Kitsap	699,471	7,000	14,000
Deschutes	219,574	2,000	4,000
Hood Canal	1,006,577	10,000	20,000
Strait of Juan de Fuca	443,098	4,500	9,000
TOTAL	9,081,993	90,600	181,200

^{1/}From Tables 1-15.

Table 18. Coho salmon escapement goals for stream areas above hatchery racks.

Hatchery	Smolt ^{1/} Potential	Number of Females	Desired Escapement ^{2/}
Nooksack	8,649	173	400
Samish	111,566	1,116	2,800
Skagit	<u>3/</u>	--	--
Skykomish	10,644	106	300
Issaquah	73,513	735	1,800
Green	125,110	1,251	3,100
Puyallup	19,293	193	500
Minter Creek	29,272	293	700
George Adams	2,439	24	60
Hood Canal	887	9	20
Dungeness	<u>4/</u>	--	--

^{1/} From Table 16.

^{2/} Assumes 60:40 male to female ratio.

^{3/} No salmon use above rack.

^{4/} Rack is going to be removed.

APPENDIX II
(Escapement Estimates)

Table 1. Index Area Creeks and Corresponding Base Year Index Values for Puget Sound Drainages.

Area (Drainage)	Index Areas	Base Year Index Value	Other Comments or Procedures
Nooksack	Cornell Hutchinson Maple Potter Saxon	139	
Skagit	Savage Alder Grandy Illibot Jones Mundt Wiseman Baker River/100	319	Add total Baker count to total
Stillaguamish	Browns Lake Riley Naval Base Ashton	86	
Snohomish	Carpenter Harris Howard (Barr) Raging (Deep) Stossel (E.F.) Wallace Worthy	150	Add Sunset Falls count to total
Lake Washington	Big Bear Little Bear North	111	
Green	Burns Newaukum Spaight (Crisp)	53	
Puyallup	Clear (Canyon Falls) Kelley (Fennel) Kings (Fiske)	126	
Nisqually	25-Mile Creek	49	
South Puget Sound (South of Tacoma Narrows-excluding Deschutes River)	Burley Coulter Woodland Kennedy Schumacher	182	
Hood Canal (East)	Dewatto Stimson Union	463	
Hood Canal (West)	Eagle Fulton Johns (Hamma Hamma) Little Quilcene River	396	

Table 2. Puget Sound coho escapement estimates - natural only^{1/}.

Area	Year											
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Nooksack	10,000	6,000	5,000	1,000	2,000	6,000	4,000	2,000	4,000	6,000	4,000	3,000
Samish	4,000	2,000	2,000	500	1,000	2,000	1,000	1,000	1,000	2,000	1,000	1,000
Skagit	24,000	20,000	13,000	18,000	9,000	18,000	12,000	12,000	13,000	22,000	10,000	5,000
Stilly	9,000	6,000	3,000	3,000	6,000	12,000	7,000	6,000	8,000	12,000	4,000	4,000
Snohomish	33,000	42,000	29,000	60,000	21,000	64,000	44,000	20,000	36,000	44,000	43,000	39,000
Lake Washington	6,000	21,000	5,000	9,000	6,000	27,000	15,000	6,000	7,000	14,000	5,000	13,000
Green	4,000	7,000	4,000	11,000	3,000	8,000	5,000	2,000	1,000	3,000	2,000	3,000
Puyallup	14,000	10,000	17,000	9,000	2,000	4,000	10,000	3,000	3,000	5,000	2,000	4,000
Nisqually	3,000	6,000	3,000	2,000	2,000	4,000	500	2,000	2,000	1,000	2,000	1,000
South Sound and East Kitsap	9,000	15,000	9,000	5,000	7,000	13,000	12,000	1,000	4,000	14,000	5,000	7,000
Deschutes	1,000	4,000	1,000	500	500	2,000	2,000	500	1,000	2,000	3,000	2,000
Hood Canal	27,000	71,000	32,000	37,000	14,000	71,000	16,000	7,000	25,000	40,000	12,000	27,000
Strait	5,000	5,000	5,000	5,000	2,000	5,000	5,000	2,000	5,000	5,000	2,000	5,000
TOTAL	149,000	216,000	128,000	161,000	75,000	236,000	133,500	64,500	110,000	170,000	95,000	114,000

^{1/} Adjusted by .86 for 1971 and 1972 hatchery evaluation. Rounded to nearest 1,000 fish for estimates greater than 1,000. To nearest 500 fish for estimates less than 1,000

APPENDIX III
(Pre-Season Run Size Prediction)

Table 1. Coho prediction base data

Year	Rack counts	Estimates of off-station hatchery returns	Wild escapement estimates	Net catches total	Net catch Puget Sound origin	5-12 Sport catch Puget Sound origin	Net catch hatchery fish	Net catch wild fish	Sport catch hatchery fish	Sport catch wild fish	Sport catch resident fish	Total wild run	Total hatchery run
1965	76,066	36,000	149,000	405,060	304,623	91,096	117,117	187,506	39,639	51,457	-	387,963	268,822
1966	97,740	45,000	215,000	634,450	432,683	84,089	168,260	264,423	33,957	50,132	-	529,555	344,957
1967	66,334	41,000	128,000	287,849	185,721	89,174	73,829	111,892	38,618	50,556	-	290,448	219,781
1968	142,589	7,000	161,000	450,197	301,888	88,635	158,077	143,811	42,249	46,386	-	351,197	349,915
1969	165,623	1,000	75,500	360,185	206,981	76,553	144,265	62,716	52,540	24,013	-	162,229	363,428
1970	265,741	8,000	236,000	850,029	560,868	48,174	345,975	214,893	26,374	21,800	-	472,693	646,090
1971	157,520	4,000	133,500	556,318	385,041	83,481	253,648	131,393	48,091	35,390	-	300,283	463,259
1972	105,503	31,000	64,500	550,892	382,688	73,900	285,933	96,755	53,266	20,636	-	181,891	475,702
1973	105,725	20,000	110,000	806,241	522,349	62,938	336,459	185,890	35,987	26,951	-	499,171	321,841
1974	209,611	18,000	170,000	873,283	542,710	155,971	370,028	172,682	44,485	24,300	87,186	366,982	729,310
1975	158,203	12,000	95,000	961,607	660,334	195,210	517,023	143,311	53,593	16,871	124,746	255,182	865,565
1976	140,058	8,000	114,000	705,004	411,439	182,497	309,634	101,805	49,922	25,566	107,009	241,371	614,623

Table 2. Streams Used for Coho Prediction Formula.

Area	Stream Number	Stream Name
Nooksack - Samish	2090	S.F. Nooksack near Wickersham
Skagit	1781	Newhalem Creek near Newhalem
Stillaguamish	1685	Pilchuck Creek near Bryant
Snohomish	1350	Wallace River at Gold Bar
Lake Washington	1155	Rex River near Cedar Falls
Green	1085	Newaukum Creek near Black Diamond
Puyallup	975	Greenwater River at Greenwater
Nisqually	830	Mineral Creek near Mineral
South Sound	790	Deschutes River near Rainier
East Kitsap	911	Flett Creek at Tacoma
Hood Canal	615	Skokomish River near Potlatch

Table 3. 60-day mean low flows for June through September, 1963-1975

Year	Stream Number										
	2090	1781	1685	1350	1155	1085	975	830	790	911	615
1963	158	104	26	42	16	22	54	53	43	1.9	202
1964	450	186	52	120	66	28	81	74	45	2.2	297
1965	172	98	11	37	14	19	67	35	35	1.3	175
1966	174	84	14	28	13	18	53	34	34	1.1	182
1967	163	94	5	18	7	14	54	26	34	.74	192
1968	245	128	35	68	27	23	69	63	53	1.9	310
1969	165	77	23	31	14	22	56	45	40	.54	227
1970	180	74	16	40	12	16	50	28	33	.57	187
1971	282	109	38	42	23	18	71	53	48	1.1	378
1972	319	198	29	59	23	22	86	45	42	1.7	325
1973	117	97	9	22	9	16	39	35	32	.67	196
1974	285	155	13	53	20	19	77	41	46	1.5	302
1975	265	100	42	57	30	22	75	63	46	1.2	290
TOTAL	2,710	1,404	271	560	244	237	757	532	485	15.22	2,973
12-yr. mean (1963-74)	226	117	23	47	20	20	63	44	40	1.27	248

Table 4. Average low flows as a percent of the 12 year average - June-September

Year	Stream Number												TOTAL
	2090	1781	1685	1350	1155	1085	975	830	790	911	615		
1963	.70	.89	1.13	.89	.80	1.10	.86	1.20	1.08	1.50	.81	10.96	
1964	1.99	1.59	2.26	2.55	3.30	1.40	1.29	1.68	1.13	1.73	1.20	20.12	
1965	.76	.84	.48	.79	.70	.95	1.06	.80	.88	1.02	.71	8.99	
1966	.77	.72	.61	.60	.65	.90	.84	.77	.85	.87	.73	8.31	
1967	.72	.80	.22	.38	.35	.70	.86	.59	.85	.58	.77	6.82	
1968	1.08	1.09	1.52	1.45	1.35	1.15	1.10	1.43	1.33	1.50	1.25	14.25	
1969	.73	.66	1.00	.66	.70	1.10	.89	1.02	1.00	.43	.92	9.11	
1970	.80	.63	.70	.85	.60	.80	.79	.64	.83	.45	.75	7.84	
1971	1.25	.93	1.65	.89	1.15	.90	1.13	1.20	1.20	.87	1.52	12.69	
1972	1.41	1.69	1.26	1.26	1.15	1.10	1.37	1.02	1.05	1.34	1.31	13.96	
1973	.52	.83	.39	.47	.45	.80	.62	.80	.80	.53	.79	7.00	
1974	1.26	1.32	.57	1.13	1.0	.95	1.22	.93	1.15	1.18	1.22	11.93	
1975	1.17	.85	1.83	1.21	1.50	1.10	1.19	1.43	1.15	.94	1.17	13.54	

APPENDIX IV
(In-Season Run Assessments)

Table 1. A partial list of correlation coefficients obtained for in-season run assessment.

Geographical Area	Type of Fishery	Specific Fishing Area	Dates Included	Independent Variable	Wild Run	Total Run	r value	
Washington Coastal	troll	Puget Sound & Grays Harbor & Willapa	June thru August	catch	.659	.675		
	troll	Puget Sound & Grays Harbor & Willapa	June thru August	CPUE	.845	.608		
	troll	Puget Sound	June	Avg. wt.	.439	.186		
	troll	Grays Harbor	June thru August	Avg. wt.	.054	.494		
	troll	Area 9	thru July	catch	.771	.756		
	troll	Area 9	thru August	catch	.669	.631		
	troll	Area 10	thru July	catch	.763	.360		
	troll	Area 10	thru August	catch	.712	.281		
	troll	Area 11	thru July	catch	.367	.525		
	troll	Area 11	thru August	catch	.302	.485		
	troll	Areas 5-10	thru July	catch	.622	.749		
	troll	Areas 5-10	thru August	catch	.634	.656		
	troll	Areas 5-11	thru July	catch	.560	.721		
	troll	Areas 5-11	thru August	catch	.521	.631		
	troll	Areas 5-12	thru July	catch	.589	.628		
	troll	Areas 5-12	thru August	catch	.451	.458		
	Canada Strait	gill net	Area 20	September 9-15	catch	.423	.144	
		gill net	Area 20	September 9-15	CPUE	.334	.605	
gill net		Area 20	September 16-22	catch	.640	.139		
gill net		Area 20	September 16-22	CPUE	.551	.174		
gill net		Area 20	September 9-22	catch	.616	.159		
gill net		Area 20	September 9-22	CPUE	.439	.559		
purse seine		Area 20	September 9-15	catch	.198	.515		
purse seine		Area 20	September 9-15	CPUE	.437	.819		
purse seine		Area 20	September 16-22	catch	.501	.438		
purse seine		Area 20	September 16-22	CPUE	.477	.118		
purse seine		Area 20	September 9-22	catch	.315	.600		
purse seine		Area 20	September 9-22	CPUE	.615	.776		
gill net plus purse seine		Area 20	September 9-15	catch	.267	.467		
gill net plus purse seine		Area 20	September 16-22	catch	.718	.324		
gill net plus purse seine		Area 20	September 9-22	catch	.506	.529		



