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Supplemental Tolt River Instream Flow Analysis

by

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Final Report

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and
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1.0 ABSTRACT

A habitat optimization technique was used to derive monthly instream flow recommendations for the South Fork, North Fork and mainstem Tolt River. Flow recommendations were based on a synthesis of the hydraulic and hydrologic characteristics of individual study reaches with biological information in the form of habitat suitability criteria, periodicity, and relative abundance estimates for four species of salmon and trout known to occur within the Tolt River system.

2.0 ACKNOWLEDGMENTS

This supplemental report presents the results of a reanalysis of the instream flow data obtained on the Tolt River. The initial results were presented in a report entitled "Tolt River Fisheries and Instream Flow Analysis" by Stober et al. 1983. Mathematical errors were found to occur in the original analysis of the data which required correction. In the process of reanalysis it was found necessary to recalibrate the IFG-4 model. The results of this effort are presented in this supplement.

The person deserving our strongest commendation is Katie Swanson of FRI, whose exquisite computer programming skills made this project possible. Our colleague Steve Crumley also provided valuable advice and assistance at several stages of the investigation. We would like to extend our appreciation to Mr. Wayne Wright and Mr. Keith Kurko of Seattle City Light for the help they provided.

3.0 EXECUTIVE SUMMARY

Following the development of a new methodology for deriving streamflow recommendations to protect fisheries resource values, the Fisheries Research Institute conducted a re-analysis of instream flow field data collected in 1981-82 at seven study reaches on the Tolt River system. The methodology, referred to as an optimization technique, combines hydraulic, hydrologic and biological information to calculate monthly streamflows which maximize the physical habitat available for several species/life stages considered simultaneously. The salmonid species used in the analysis were coho and chinook salmon, and cutthroat and steelhead trout. Steelhead are the most abundant salmonid species found in the Tolt River and the final instream flow recommendations are weighted heavily to provide for steelhead habitat.

Two interpretations of physical habitat availability were used to identify alternative sets of flow recommendations to aid in future negotiations of final instream flow requirements. Both interpretations derive from an index of habitat availability, termed weighted usable area (WUA), which was calculated for a range of discharges for each species/life stage. The first interpretation expresses the WUA available at each discharge as a percentage of the maximum WUA determined from the range of simulated flows. The resulting values are referred to as habitat indices. The second interpretation results in efficiency indices, which proportionally relate habitat index values to the total stream surface area estimates obtained for the different streamflows.

The habitat and efficiency indices are synthesized into composite values which reflect the periodicity, relative abundance, and ecological sensitivity of individual life stages on a month by month basis. Peak combined habitat

and efficiency index values are compared with stochastic projections of normal and dry water year mean monthly flows to determine separate instream flow recommendations for the South Fork, North Fork, and mainstem Tolt River.

4.0 INTRODUCTION

This report presents results and conclusions based on a re-analysis of the physical data collected in an instream flow investigation of the Tolt River, Washington, by the Fisheries Research Institute (FRI) of the University of Washington in 1981-82. The research described herein supersedes all information pertaining to instream flows which appeared in an earlier FRI report entitled "Tolt River Fisheries and Instream Flow Analysis" (Stober et al. 1983). The major issue addressed in this report is the allocation of water within the Tolt River system to protect instream salmonid habitat within the South Fork Tolt River.

The primary stimulus for a reassessment of the instream flow data was the development by FRI of an opimization technique which represented an improvement (in terms of theoretical adequacy) over the original method. Instead of calculating a recommended instream flow based on a combination of optimum flows, the newer method, which will be discussed in detail below, selects a discharge which maximizes the amount of habitat for all species/life stages considered simultaneously. By optimizing the potential habitat for all life stages a streamflow may be determined which affords the greatest degree of fisheries resource protection.

Changes in the quality and availability of instream habitat for salmonids may occur following the proposed development of a hydroelectric project on the South Fork Tolt River. The project would utilize water from the existing Seattle Water Department Tolt River Reservoir which is presently used to store and divert water from the South Fork for municipal and industrial (M & I) water supply. The primary purpose of the reservoir will continue to be for M & I water supply, and electrical energy will be generated from existing

operating procedures.

The preferred design includes a 69 inch diameter, five mile long diversion pipeline from the reservoir to the powerhouse located southeast of an existing water supply regulating basin. A water return conduit from the powerhouse will be designed so that water will flow to the regulating basin for M & I water supply or during periods of reduced demand be returned to the South Fork (RM 2.5). The maximum hydraulic capacity of the turbine is 245 cfs. Excess water for power generation will occur primarily during the winter from November to March, while M & I water supply will be the predominant requirement during the summer months.

The construction and operation of a hydroelectric facility on the South Fork will result in alteration of the flow regime both upstream and downstream of the proposed discharge site. Average and peak daily discharges in the diversion reach can be expected to decline, resulting in reduced but more stable streamflows. The segment of the South Fork below the discharge site will experience greater fluctuations in discharge on a daily basis when compared to existing conditions. The overall volume of water delivered to the mainstem Tolt River by the South Fork may decrease if water diverted for M & I water supply is increased from present levels (approximately 46 MGD) to the maximum permitted (60 MGD). Therefore, post-project streamflows may be expected to be affected both by future water supply requirements and water diverted for hydroelectric generation.

5.0 METHODS

5.1 Recalibration of IFG-4 Models

A discussion of study site selection, the collection of field data, and the basic assessment procedures used in the application of the Instream Flow Incremental Methodology (IFIM) to the Tolt River may be found in Stober et al. (1983). Figure 1 indicates the location of the seven instream flow study reaches within the Tolt River watershed. The general approach to determining the relationship between stream discharge and habitat availability for the target species/life stages remained unchanged, as shown in Figure 2. However, recent revisions to the computer programs used in the IFIM analysis by the U.S. Fish and Wildlife Service, Instream Flow Group, and the opportunity to recalibrate the IFG-4 models resulted in modified WUA versus discharge functions. The recalibration step was undertaken to minimize the number of adjustments made of the original data without impairing the reliability of the models. In some cases alterations to the data were justified by the necessity of selecting a single value from a range of measured data. An example is the required specification of a single water surface elevation for a transect when surface elevations measured at opposite ends of the transect did not agree. As long as the discrepancy is not severe, the modeller is free to test a model's performance using various estimates from this range, choosing the water surface elevation which gives the best agreement between observed and predicted values.

The hydraulic simulation program calculates a regression equation for each vertical within a study reach using the logarithmic transform of three or more sets of velocity and discharge measurements. The equations are used to predict velocities at each vertical at unmeasured discharges. In calibrating

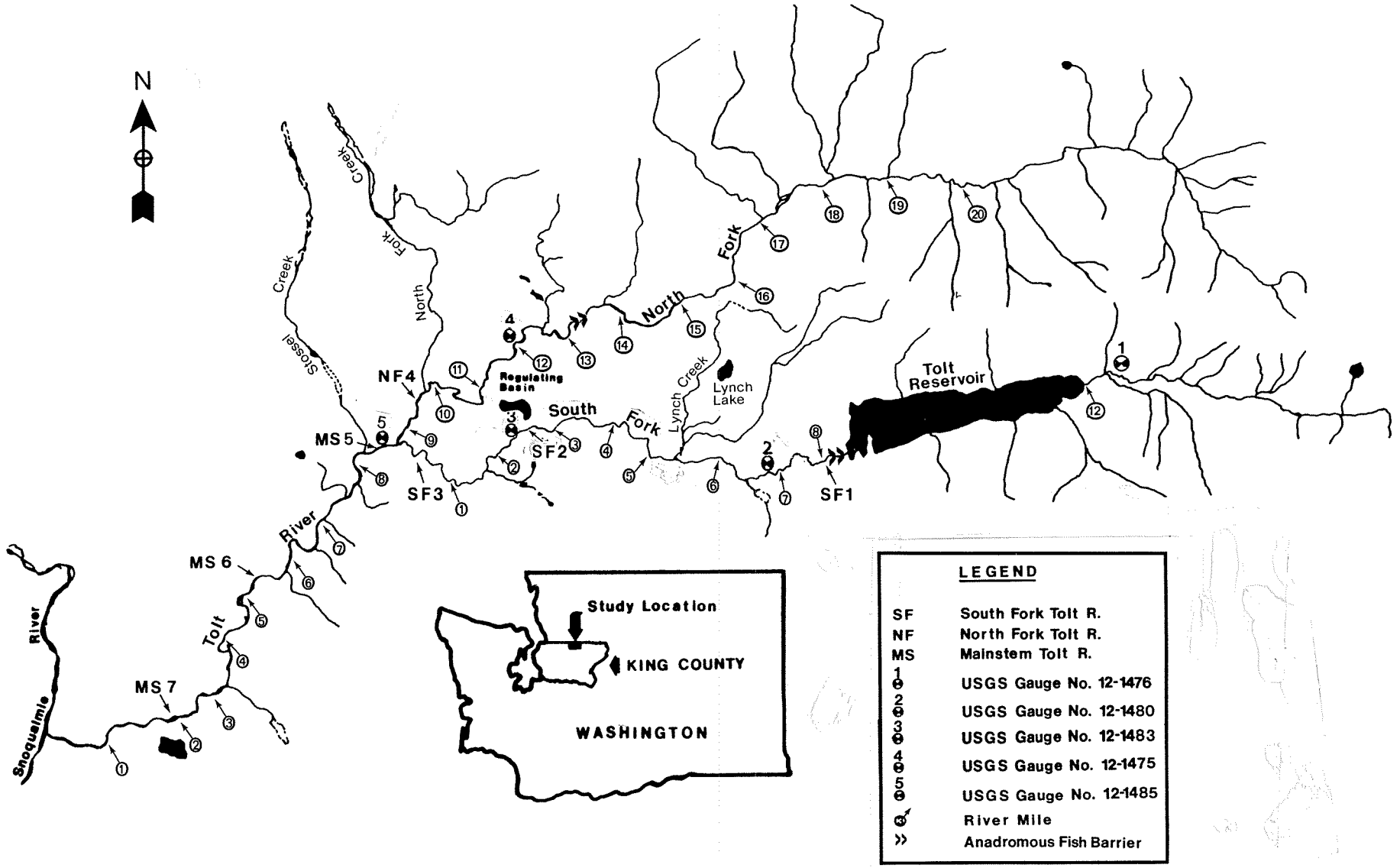

Figure 1. Tolt River study area showing sampling stations, river mile locations, and USGS gages.

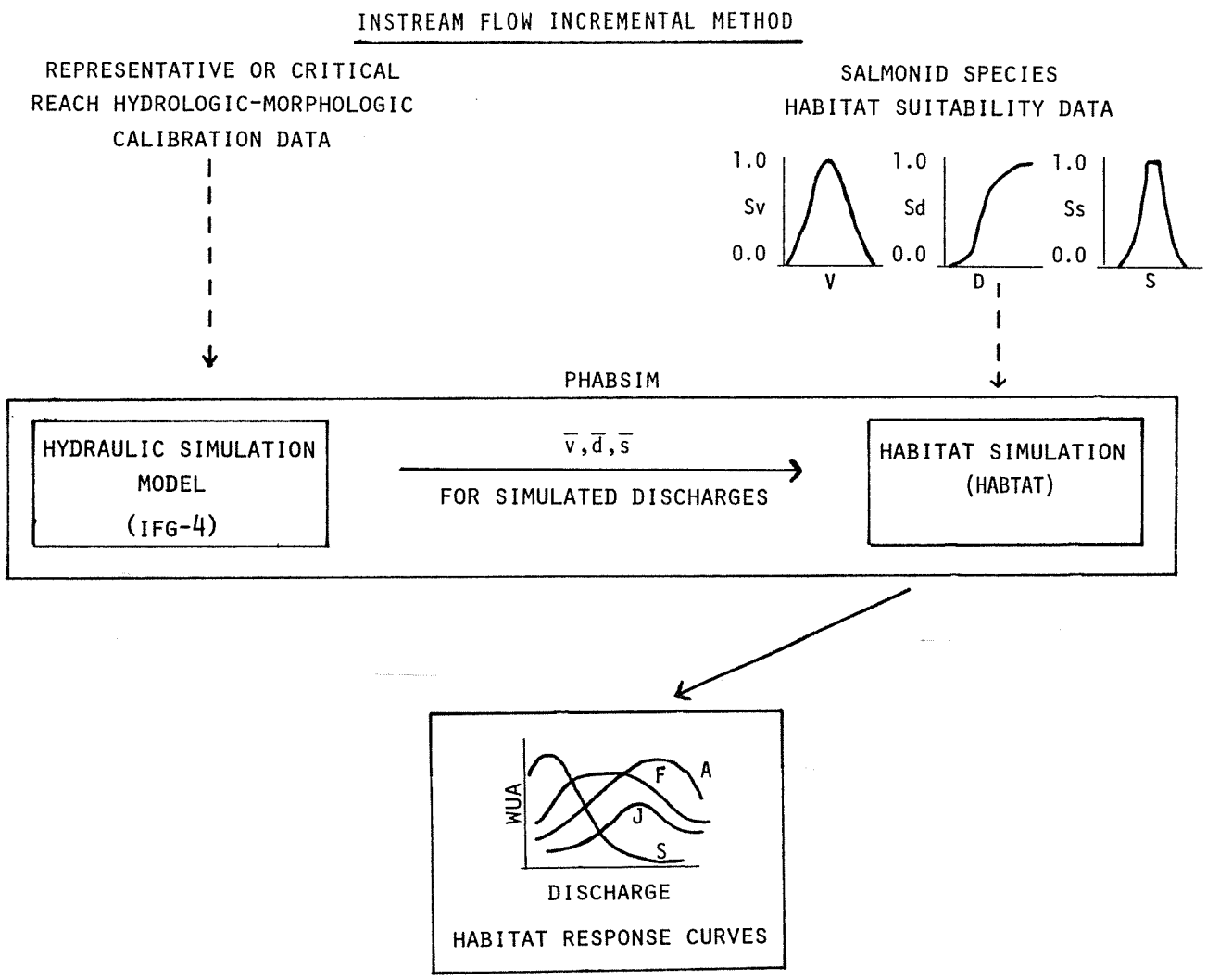

Figure 2. Flow diagram depicting the hydraulic and physical habitat simulations involved in the Instream Flow Incremental Method (modified from Loar and Sale (1981)).

an IFG-4 model the regression slope, intercept, and velocity prediction errors are evaluated for each vertical. Where regression slopes are less than or equal to zero, or where large velocity prediction errors occur, the modeller must decide whether the data may be altered slightly to describe a more reasonable velocity-flow relationship. The occurrence of regression equations characterized by negative slopes or large prediction errors is generally attributable to the small sample size used in the calculations, the magnitude and frequency of field measurement errors, and the physical and hydraulic complexity of the modelled stream. The modeller is obligated to evaluate all changes to the original data in light of these potential sources of error and, secondarily, their effect on the overall performance of the simulation model. In most cases this requires several iterative adjustments until an acceptably calibrated model is attained with the fewest possible number of alterations of the original data. This was the procedure used to calibrate the Tolt River hydraulic simulation models.

Another factor contributing to modifications of the original WUA versus discharge relationships is the recent revision of the IFG-4 hydraulic simulation program by the Instream Flow Group of the United States Fish and Wildlife Service. The updated version of the IFG-4 program calculates roughness coefficient (Manning's n) values for each of the cells within the study reach where previously default values of 0.06 were assigned to all cells except those for which two or fewer velocity measurements were obtained. While this modification presumably enhances the predictive capability of a calibrated IFG-4 model, it may lead to significantly different results in model output and interpretation.

5.2 Habitat Suitability Functions

Given a sufficient number of observations and measurements, suitability

functions (curves) may be constructed which describe the relative probability that a species/life stage will utilize some increment of a physical habitat parameter, such as water depth, within a preferred range of that parameter (Figure 2). Any combination of suitability functions may be applied to the physical characteristics of a study reach cell, including the water velocity and depth predicted by an IFG-4 model, in order to calculate the composite habitat suitability of the associated cell. The composite habitat suitability may then be multiplied by the total surface area of the cell to obtain the weighted usable area (WUA) for that cell. This calculation is performed for all cells within the study reach and the individual products are summed to give the WUA for the entire study reach, expressed in units of square feet per 1,000 linear feet of stream. The calculation of WUA essentially equates the area of suboptimal fish habitat within a study reach to an equivalent area of optimal habitat. It should be emphasized that WUA is an index of available habitat and should not be construed as a direct measure of the biological carrying capacity of a stream.

With the exception of incubation criteria, the habitat suitability functions used in this study are identical to those identified in Appendices I and J of the report by Stober et al. (1983). The revised steelhead trout (Salmo gairdneri) juvenile and spawning depth suitability functions and the criteria developed by Phillip Wampler (USFWS) for pink (Oncorhynchus gorbuscha) and chum (O. keta) salmon spawning were retained in the present analysis. All other non-incubation habitat suitability functions were accessed from a binary file of species criteria which is maintained and supported by the Instream Flow Group (Bovee 1978).

Due to the unavailability of acceptable incubation criteria at the time of the initial study, spawning habitat suitability functions were used in

their place. The effective spawning habitat program recently developed by the IFG offers a less conservative, yet more realistic alternative to modelling incubation habitat within a study reach. For each species, the amount of effective spawning, or incubation, habitat present at a particular flow is determined in a three-step process. In the first step, spawning habitat suitability curves are used to calculate the WUA within the individual cells of the study reach at a streamflow of interest, typically the discharge which provides the maximum amount of spawning WUA over the range of simulated flows. The second step involves the computation of WUA for a different, usually lower, "incubation" discharge using modified depth and velocity suitability functions. The substrate (and cover, if used) criteria applied in this step are the same as those accessed in step 1. The modified depth and velocity suitability function coordinates used for the four salmonid species were:

Velocity		Depth	
x (ft/sec)	y (probability)	x (ft)	y (probability)
0.0	0.0	0.0	0.0
0.1	1.0	0.1	1.0
100.0	1.00	100.0	1.0

These criteria, which were used interchangably for all species, are thought to provide adequate intragravel incubation conditions and allow sufficient depth for emergence.

In the final step of the effective spawning habitat analysis the WUA values obtained in steps 1 and 2 are compared on a cell-by-cell basis. For each cell, the lesser of the two WUA values is retained. The cell WUA's are then summed to give the unadjusted study reach WUA for the discharge at which the modified criteria were applied. When adjusted for reach length, the WUA

is an index of the amount of incubation habitat present within the study reach relative to the spawning habitat which exists at a pre-determined spawning flow. In this study the effective spawning, or incubation, habitat available at various streamflows was referenced to the discharge at which spawning habitat was maximized for each species of interest.

Caution should be exercised when evaluating effective spawning habitat results produced by the existing IFG program. Slightly inflated incubation habitat values may be obtained for any cell that is fully watered at the reference spawning flow but is only partially watered at the incubation flow of interest. When the WUA predicted for the spawning flow is less than the WUA for the incubation flow, the former value is used in the summation of effective spawning habitat for the study reach. This occurs in spite of an actual reduction in cell area and, hence, spawning WUA at the lower incubation flow. This problem could be remedied by calculating spawning flow WUA's using cell areas predicted for the incubation flows in the first step of the effective spawning habitat analysis. Due to time and cost restraints the effective spawning habitat program was not modified to correct this problem. However, the net effect of slightly overestimating WUA's for cells at the margins of the stream study reaches should not significantly alter the results of subsequent analyses.

5.3 Procedures to Derive Instream Flow Recommendations

The objective of the optimization technique used in the re-analysis of the Tolt River data was to calculate a range of acceptable monthly flow recommendations from which normal and critical water year minimum instream flow rule curves may be negotiated. An envelope of flow recommendations is provided by two divergent interpretations of the output from a standard IFIM analysis.

Figure 3 is a flow diagram depicting the steps required to arrive at final instream flow recommendations using the habitat optimization method. In Step 1 WUA values determined for a given species/life stage at all study reaches within a river segment are synthesized into an aggregate habitat response curve describing the relationship between habitat and flow for the entire river segment. In order to calculate combined WUA values it was necessary to estimate the proportion of the South Fork, North Fork, and mainstem Tolt River represented by each of the study reaches. The South Fork and mainstem river, each defined by three study reaches, were partitioned into three segments of varying length based on habitat inventory surveys and aerial photograph analysis. The total length of the North Fork accessible to anadromous fish was similarly determined, assuming that the single study reach on the North Fork is representative of the general habitat features of the accessible portion of stream. The length of the river segments represented by each study reach and their gross habitat characteristics are described in Table 1. The total distance in feet of each segment was divided by 1000 (WUA is expressed in units of ft^2/1000 lineal feet of stream) to obtain an extrapolation factor for each study reach. For all simulated discharges determined for South Fork stations 1-3, North Fork station 4, and mainstem stations 5-7, the WUA predicted for each study reach was multiplied by the associated river segment extrapolation factor. The summation of these products yielded combined WUA values for each life stage for the South Fork, North Fork, and mainstem Tolt River.

The second step of the optimization analysis identifies the two divergent interpretations of WUA values mentioned earlier, each resulting in a unique set of monthly instream flow recommendations. It is important that the branching which occurs at this stage of the analysis is clearly understood.

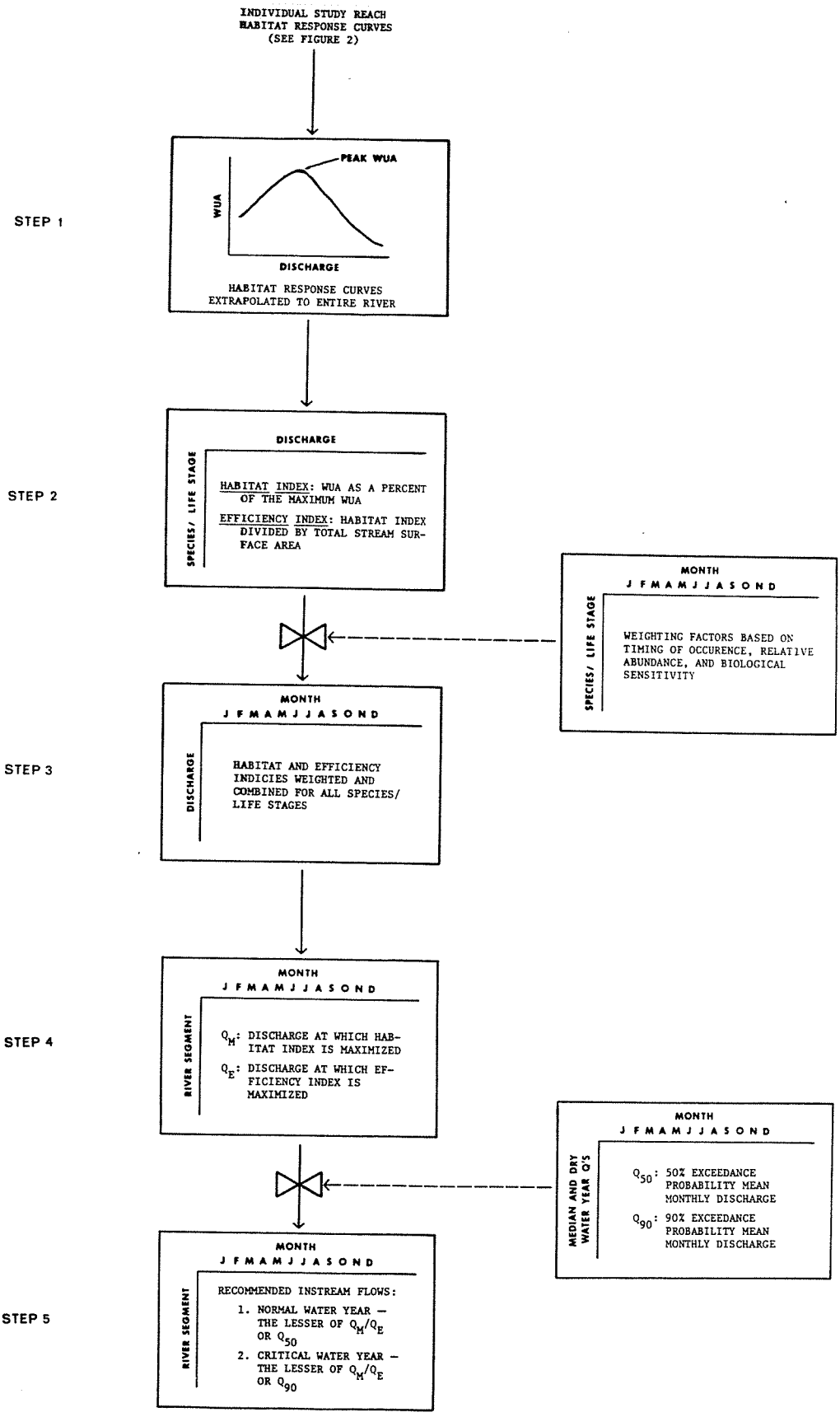

Figure 3. Steps required in the optimization procedure used to derive minimum instream flow recommendations.

Table 1. Reach characteristics used to partition the South Fork, North Fork, and mainstem Tolt River for study area representation.

Study area	Length of reach represented (miles)	Extrapolation factor	Reach description
SF1	3.8 (RM 4.1 - RM 7.9)	20.328	Reach boundaries are large, impassable falls located 0.1 mile above SF1 and ravine/canyon terrain below. Moderate to steep gradient; large rock and cobble substrate with fair amount of patch gravel. Good pool: riffle ratio. Banks unstable, particularly in vicinity of a large landslide at RM 7.4. Lynch Creek, a major tributary, enters at lower end of reach.
SF2	1.8 (RM 2.4 - RM 4.1)	9.240	Precipitous terrain; bedrock canyon walls. Moderately steep to steep gradient with deep pools, cascades, and fast riffles. 1:1 pool to riffle ratio. Heavily shaded. Good spawning gravels at tail end of pools, but subject to displacement at high flows.
SF3	2.4 (RM 0.0 - RM 2.4)	12.408	Valley broadens slightly. Moderate to steep stream gradient. Cobble and boulder substrate predominate with patch strips of gravel. Banks stable except in lower 0.5 mile of reach, where clearcutting has occurred. Fallen trees and debris dams common. Some channel braiding in lower reach.
NF4	4.6 (RM 8.8 - RM 13.4)	24.816	Steep gradient in upper canyon section; moderate to steep gradient over lower two miles. Large falls at RM 13.4 denies fish passage; smaller falls at RM 10.8 restricts access. Deep pools and cascades prevail in reach above bridge and in lower 0.25 mile. Mid-reach contains good pool:riffle ratio and fair to good spawning habitat. Some natural bank instability occurs. North Creek enters at RM 9.7, 0.1 mile below NF4.

Table 1. Reach characteristics used to partition the South Fork, North Fork, and mainstem Tolt River for study area representation (continued).

Study area	Length of reach represented (miles)	Extrapolation factor	Reach description
MS5	1.3 (RM 7.5 - RM 8.8)	6.336	Deep pool at confluence but fast riffles and rapids predominate in reach. Localized spawning gravels near USGS gage and mouth of Stossel Creek (RM 8.6); patch gravels elsewhere. Moderate gradient with large rock and cobble substrate. Riparian vegetation changes from second-growth conifer/deciduous mix to mostly deciduous below. Banks stable.
MS6	3.2 (RM 4.3 - RM 7.5)	16.632	Similar to MS 5 reach but larger river characteristics prevail with increased tributary inflow. Moderate gradient; cobble and boulder substrate; gravels suitable for spawning along stream margins and at tails of three large pools in mid to lower section. Minor slide activity and channel splitting in localized areas. Single-family residential land use from RM 6.0 downstream; land development increasing.
MS7	4.3 RM 0.0 - 4.3)	22.968	River channel broadens; gradient and prevailing substrate size are reduced relative to MS6 reach. Cobble and gravel areas provide widely distributed areas suitable for spawning. Rapids confined to shorter sections, deep glides are common, pool habitat is less defined. Channel braiding and overflow channels are common, as are riprap and earthen levees in the lower reach. Land development includes residential, pasture land, and rural farming.

For all simulated discharges, the following indices are calculated for each species/life stage:

1. Habitat index - The WUA available at a given discharge divided by the maximum WUA determined from the range of simulated flows. Maximum WUA values may be readily identified from the peaks in the habitat response curves.
2. Efficiency index - The ratio of WUA at a given discharge to the maximum WUA, divided by the gross stream surface area.

Use of the term "efficiency" is meant to suggest that the availability of habitat may be more economical or productive with regard to the stream surface area present at different streamflows. Both habitat and efficiency indices are expressed as percentages. Since these values are standardized and unitless, they are better suited than WUA units for comparisons of different species or life stages.

Throughout the remainder of the analysis, the same calculations are performed separately for values derived from habitat indices and those derived from efficiency indices. In Step 3 of the analysis habitat and efficiency indices are weighted and combined based on the periodicity and relative biological importance of the species/life stages present. The seasonal timing or periodicity of salmonid life stages which occur in the Tolt River system is shown in Figure 4. The periodicity chart was compiled from information presented by the Pacific Northwest River Basins Commission (1970), as modified by electrofishing and spawner survey data collected in 1981-82 (Stober et al. 1983). An assessment of the relative importance of each species/life stage was made on the basis of quantitative population estimates and a subjective appraisal of the ecological sensitivity of the various life stages (in the sense of being critical or limiting to the population) to habitat

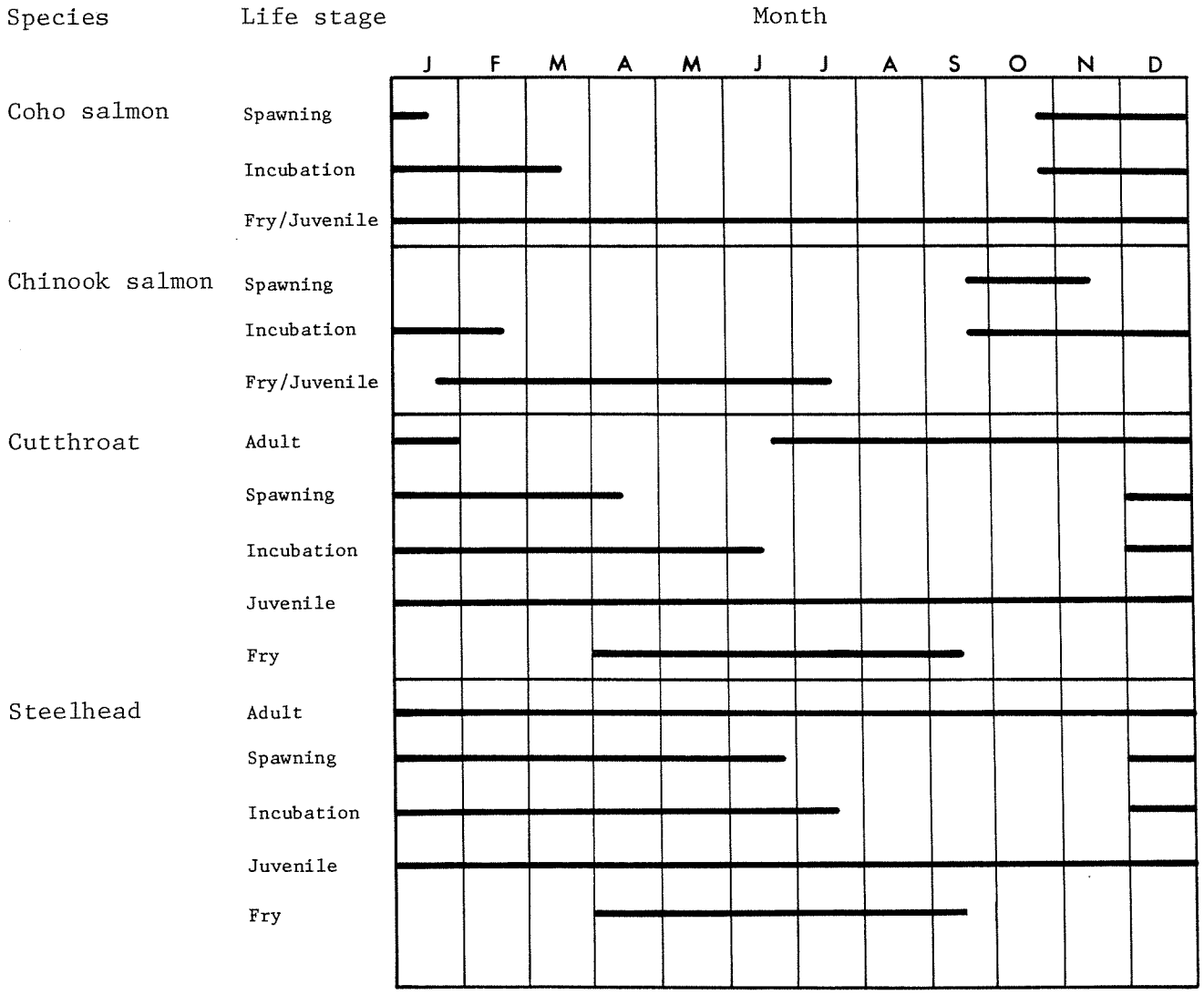

Figure 4. Periodicity chart for salmonid species/life stages utilizing the Tolt River.

perturbation. An explanation of how this information was assembled may be found in Stober et al. (1983). The monthly weighting factors tabulated for each species/life stage in Table 2 represents a synthesis of the timing, abundance, and sensitivity information presented in the original report (see Tables 24 and 27 in Stober et al. (1983)). Steelhead trout, which respectively comprised 94%, 92% and 88% of the salmonids sampled in the South Fork, North Fork and mainstem Tolt River, are weighted more heavily than the other species. Chinook salmon were not captured in electrofishing sessions in the two forks, hence the weighting factor of 0.0 for life stages of this species. Note that the sum of the weighting factors for any given month equals 1.0.

Figure 5 is a hypothetical example of the computations involved in Step 3. Three species/life stages and five discharges are used to illustrate the calculation of weighted and combined habitat index values for the months of January through May. The same procedure would be followed for both indices for the remaining months of the year.

The results of Step 3 are habitat and efficiency index tables indicating the weighted and combined values for all species/life stages considered simultaneously, arranged by discharge and month. Step 4 involves the selection of the discharges associated with the highest combined habitat and efficiency indices for each month. The Q_M discharge for a given month is the flow at which the habitat index value is highest. Similarly, the Q_E discharge identifies the streamflow having the maximum efficiency index value.

Under regulated flow conditions, the provision for monthly Q_M or Q_E streamflows would optimize the amount of habitat available relative to either the maximum habitat attainable (i.e., the peak WUA values) or the gross stream surface area, respectively, for the seasonally varying mix of species/life

Table 2. Month specific weighting factors based on periodicity and relative biological importance. F = fry, J = juvenile, A = adult, S = spawning, I = incubation.

SOUTH FORK

MONTH	COHO SALMON			CHINOOK SALMON			CUTTHROAT TROUT					STEELHEAD TROUT				
	F	S	I	J	S	I	F	J	A	S	I	F	J	A	S	I
JANUARY	.0065	.0180	.0245	.0000	.0000	.0000	.0000	.0016	.0012	.0030	.0012	.0000	.2200	.2200	.4088	.0944
FEBRUARY	.0163	.0000	.0327	.0000	.0000	.0000	.0000	.0014	.0000	.0042	.0014	.0000	.1256	.1888	.4720	.1576
MARCH	.0180	.0000	.0310	.0000	.0000	.0000	.0000	.0012	.0000	.0035	.0023	.0000	.1256	.1256	.5032	.1888
APRIL	.0310	.0000	.0180	.0000	.0000	.0000	.0012	.0014	.0000	.0016	.0028	.1576	.0944	.0944	.3776	.2200
MAY	.0490	.0000	.0000	.0000	.0000	.0000	.0021	.0019	.0000	.0000	.0030	.1888	.0944	.0944	.2520	.3144
JUNE	.0490	.0000	.0000	.0000	.0000	.0000	.0023	.0023	.0007	.0000	.0016	.3144	.2832	.0944	.0944	.1576
JULY	.0490	.0000	.0000	.0000	.0000	.0000	.0035	.0028	.0007	.0000	.0000	.3776	.3776	.0944	.0000	.0944
AUGUST	.0490	.0000	.0000	.0000	.0000	.0000	.0037	.0026	.0007	.0000	.0000	.4408	.3776	.1256	.0000	.0000
SEPTEMBER	.0490	.0000	.0000	.0000	.0000	.0000	.0026	.0035	.0009	.0000	.0000	.2832	.5032	.1576	.0000	.0000
OCTOBER	.0147	.0278	.0065	.0000	.0000	.0000	.0000	.0047	.0023	.0000	.0000	.0000	.6608	.2832	.0000	.0000
NOVEMBER	.0065	.0343	.0082	.0000	.0000	.0000	.0000	.0037	.0033	.0000	.0000	.0000	.6391	.3144	.0000	.0000
DECEMBER	.0049	.0310	.0131	.0000	.0000	.0000	.0000	.0021	.0023	.0019	.0007	.0000	.2832	.3144	.2520	.0944

NORTH FORK

	F	S	I	J	S	I	F	J	A	S	I	F	J	A	S	I
JANUARY	.0110	.0305	.0415	.0000	.0000	.0000	.0000	.0002	.0002	.0004	.0002	.0000	.2134	.2134	.3966	.0916
FEBRUARY	.0276	.0000	.0554	.0000	.0000	.0000	.0000	.0002	.0000	.0006	.0002	.0000	.1218	.1832	.4580	.1530
MARCH	.0305	.0000	.0525	.0000	.0000	.0000	.0000	.0002	.0000	.0005	.0003	.0000	.1218	.1218	.4882	.1832
APRIL	.0525	.0000	.0305	.0000	.0000	.0000	.0002	.0002	.0000	.0002	.0004	.1530	.0916	.0916	.3664	.2134
MAY	.0830	.0000	.0000	.0000	.0000	.0000	.0003	.0003	.0000	.0000	.0004	.1832	.0916	.0916	.2446	.3050
JUNE	.0830	.0000	.0000	.0000	.0000	.0000	.0003	.0003	.0001	.0000	.0002	.3050	.2748	.0916	.0916	.1530
JULY	.0830	.0000	.0000	.0000	.0000	.0000	.0005	.0004	.0001	.0000	.0000	.3664	.3664	.0916	.0000	.0916
AUGUST	.0830	.0000	.0000	.0000	.0000	.0000	.0005	.0004	.0001	.0000	.0000	.4278	.3664	.1218	.0000	.0000
SEPTEMBER	.0830	.0000	.0000	.0000	.0000	.0000	.0004	.0005	.0001	.0000	.0000	.2748	.4882	.1530	.0000	.0000
OCTOBER	.0249	.0471	.0110	.0000	.0000	.0000	.0000	.0007	.0003	.0000	.0000	.0000	.6412	.2748	.0000	.0000
NOVEMBER	.0110	.0581	.0139	.0000	.0000	.0000	.0000	.0005	.0005	.0000	.0000	.0000	.6110	.3050	.0000	.0000
DECEMBER	.0083	.0525	.0222	.0000	.0000	.0000	.0000	.0003	.0003	.0003	.0001	.0000	.2748	.3050	.2446	.0916

MAINSTEM TOLT RIVER

	F	S	I	J	S	I	F	J	A	S	I	F	J	A	S	I
JANUARY	.0160	.0440	.0600	.0017	.0000	.0033	.0000	.0002	.0002	.0004	.0002	.0000	.2036	.2036	.3784	.0874
FEBRUARY	.0400	.0000	.0800	.0025	.0000	.0025	.0000	.0002	.0000	.0006	.0002	.0000	.1162	.1748	.4370	.1460
MARCH	.0440	.0000	.0760	.0050	.0000	.0000	.0000	.0002	.0000	.0005	.0003	.0000	.1162	.1162	.4658	.1748
APRIL	.0760	.0000	.0440	.0050	.0000	.0000	.0002	.0002	.0000	.0002	.0004	.1460	.0874	.0874	.3496	.2036
MAY	.1200	.0000	.0000	.0050	.0000	.0000	.0003	.0003	.0000	.0000	.0004	.1748	.0874	.0874	.2334	.2910
JUNE	.1200	.0000	.0000	.0050	.0000	.0000	.0003	.0003	.0001	.0000	.0002	.2910	.2622	.0874	.0874	.1460
JULY	.1200	.0000	.0000	.0050	.0000	.0000	.0005	.0004	.0001	.0000	.0000	.3496	.3496	.0874	.0000	.0874
AUGUST	.1200	.0000	.0000	.0000	.0000	.0000	.0005	.0004	.0001	.0000	.0000	.4082	.3496	.1162	.0000	.0000
SEPTEMBER	.1200	.0000	.0000	.0000	.0042	.0008	.0004	.0005	.0001	.0000	.0000	.2622	.4658	.1460	.0000	.0000
OCTOBER	.0360	.0680	.0160	.0000	.0038	.0012	.0000	.0007	.0003	.0000	.0000	.0000	.6118	.2622	.0000	.0000
NOVEMBER	.0160	.0840	.0200	.0000	.0023	.0027	.0000	.0005	.0005	.0000	.0000	.0000	.5830	.2910	.0000	.0000
DECEMBER	.0120	.0760	.0320	.0000	.0000	.0050	.0000	.0003	.0003	.0003	.0001	.0000	.2622	.2910	.2334	.0874

HABITAT INDICES (%)

Species/ life stage	Discharge (cfs) 50	100	150	200	250 →
Sp 1	100	93	84	72	60
Sp 2	87	94	100	95	90
Sp 3	96	100	95	91	86

WEIGHTING FACTORS

Species/ life stage	Month Jan	Feb	Mar	Apr	May →
Sp 1	.3	.2	.1	-	-
Sp 2	.2	.4	.6	.5	.4
Sp 3	.5	.4	.3	.5	.6

COMBINED AND WEIGHTED HABITAT INDICES

Discharge (cfs)	Month Jan	Feb	Mar	Apr	May →
50	95.4[1]	93.2	91.0	91.5	92.4
100	96.7	96.2	95.7	97.0	97.6
150	92.7	94.8	96.9	97.5	97.0[3]
200	86.1	88.8	91.5[2]	93.0	92.6
250	79.0	82.4	85.8	88.0	87.6

Sample Calculations

1. January/50 cfs: (100 x .3) + (87 x .2) + (96 x .5) = 95.4
2. March/200 cfs: (72 x .1) + (95 x .6) + (91 x .3) = 91.5
3. May/150 cfs: (100 x .4) + (95 x .6) = 97.0

Figure 5. Hypothetical example of the computations involved in Step 3 of the habitat optimization procedure. The same calculations are applied to efficiency index values.

stages which utilize the stream. Monthly Q_M and Q_E flows were determined for the South Fork, North Fork, and mainstem Tolt River. In some months, however, discharges during median (normal) or critical (drought) water years may be less than the associated monthly Q_M or Q_E discharge. Step 5 imposes a hydrologic cap on the optimum flows using stochastic projections of monthly mean discharges derived from USGS records of historical unregulated streamflows. The median monthly flow (Q_{50}), identified as the 50th percentile discharge from the appropriate flow duration curve, corresponds to the expected monthly mean streamflow in 1 out of 2 water years. Table 3 indicates median monthly discharges or, equivalently, normal water year flows, for the three Tolt River segments. Critical water year discharges, also listed in Table 3, are characterized by the occurrence of 90th percentile monthly flows. A critical monthly mean flow (Q_{90}) may be expected approximately once every 10 years based on statistical analysis of USGS discharge records.

Based on a habitat index interpretation of WUA versus discharge relationships, the monthly instream flow recommended for a normal water year is the lesser of Q_M or Q_{50} for the month in question. A critical water year monthly instream flow recommendation is the lesser of Q_M and Q_{90}. Similar comparisons are made between Q_E and Q_{50} or Q_{90} discharges to obtain normal and critical water year monthly instream flow recommendations which are derived from efficiency index values.

Table 3. Normal and critical water year mean monthly pre-dam natural discharges for the South Fork, North Fork, and mainstem Tolt River (data from USGS).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
South Fork												
Normal	223	224	145	243	237	172	97	52	69	180	302	304
Critical	101	122	82	110	156	86	40	23	38	51	100	165
North Fork												
Normal	515	422	322	421	449	354	192	122	146	250	489	538
Critical	294	242	231	303	309	210	112	68	81	95	211	326
Mainstem												
Normal	795	719	570	693	700	542	274	164	212	471	785	880
Critical	420	371	398	451	474	304	148	94	100	215	348	526

6.0 RESULTS

All information necessary to verify calculations involved in the habitat simulation and optimization procedures are contained within the body of this report. WUA values used in the impact analysis are not included, however approximate values may be obtained by reference to WUA versus discharge tables for South Fork stations 1 and 2 presented below.

6.1 Performance of IFG-4 Models

Several corrections and minor adjustments to the water velocity and stage data were necessary to calibrate the seven Tolt River IFG-4 models. The modifications required were not excessive yet considerably enhanced the accuracy and reliability of the hydraulic simulation model. All changes in the original data are documented in Appendix Tables A1 through A7.

One measure of model performance is the correspondence between discharges predicted by the model for each transect (Q_{CALC}) and the input discharges (Q_{QARD}). The ratio of Q_{QARD} to Q_{CALC} is termed the Velocity Adjustment Factor (VAF) and is applied to each cell velocity to calculate the predicted velocities at any given discharge (Milhous et al. 1981). VAF's calculated using the revised data sets are presented in Table 5. The VAF's resulting from the calibrated model runs vary between 0.71 and 1.13, indicating that the IFG-4 models are suitable for predictive purposes for the range of flows simulated.

6.2 Habitat Response Curves

WUA indices of the physical habitat available at different flows for all non-incubation life stages used in the optimization analyses are listed by study reach in Tables 6 through 12. Maximum WUA values have been underlined. The gross stream surface area simulated for each discharge may be found in the

Table 4. Velocity adjustment factors used in calibrated IFG-4 models of the Tolt River study reaches.

Discharge (cfs)	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7
			South Fork Station 1				
20	1.06	.82	.91	1.00	.81	.92	.96
50	1.03	.92	.95	1.04	.94	1.09	1.03
100	1.01	.98	1.01	1.04	.97	1.01	1.05
200	.97	1.01	1.03	.98	.97	1.02	1.03
500	.87	.95	.86	.81	.92	.95	.86
			South Fork Station 2				
20	.88	.94	.71	.84	.86	1.13	
50	.93	1.00	.84	.94	.94	.98	
100	.96	1.00	.90	.96	.97	.98	
200	1.01	.99	.89	.97	.98	.99	
500	.99	.99	.76	.89	.93	.99	
			South Fork Station 3				
20	.86	1.02	.93	.92	.99	.94	
50	.97	1.00	.92	.98	.99	.98	
100	1.01	1.01	.94	1.00	1.01	1.00	
200	.99	.99	.93	.99	.98	.99	
500	.89	.82	.82	.89	.85	.96	
			North Fork Station 4				
20	.92	.87	.94	.82	.82		
50	.92	.93	.97	.93	.91		
100	.98	.99	1.00	.99	.98		
200	1.03	1.00	1.00	1.02	1.02		
500	.96	.89	.99	.98	.99		
			Mainstem Station 5				
50	.92	.81	.95	.89	.94		
100	.94	.89	.98	.96	.96		
200	.98	.96	1.01	1.02	.98		
500	1.02	1.00	1.01	1.01	1.00		
1000	.93	.99	.95	.96	.98		
			Mainstem Station 6				
50	.90	.85	.95	.96	.75		
100	.98	.90	.99	.99	.88		
200	.99	.97	1.00	1.00	.98		
500	1.01	1.01	1.01	1.00	1.01		
1000	.92	.87	.93	.98	.90		

Table 4 (continued).

Discharge (cfs)	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7
			Mainstem Station 7				
50	.92	.87	.91	.91	.98		
100	.97	.95	.97	.97	.99		
200	1.01	1.01	1.00	1.02	1.00		
500	1.03	1.04	1.01	1.02	1.01		
1000	.96	.94	.97	.94	.97		

Table 5. WUA (ft^2) as a function of discharge (cfs) simulated for South Fork Station 1 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
20	3628	1143	9802	883	4447	4709	5247	944	13165	16588	513	502	34887
25	3719	1162	10437	1478	4579	5469	5656	1093	12861	18419	763	810	36316
30	3811	1164	10919	1542	4676	6016	6109	1157	12455	19598	1058	939	37253
35	3670	1189	11071	1570	4666	6606	7008	1225	11872	20560	1455	1223	38183
40	3602	1212	11156	1552	4602	7166	7560	1176	11328	21112	1859	1514	38901
45	3472	1250	11265	1559	4514	7616	8024	1161	11234	21536	2265	1771	39663
50	3290	1309	11230	1644	4402	7935	8574	1177	10889	21760	2460	2085	40621
55	3113	1384	11224	1758	4281	8202	8869	1187	10515	21907	2596	2411	41953
60	3017	1354	11110	1901	4162	8369	9336	1209	10280	22079	2686	2723	43261
65	2939	1293	11057	2045	4045	8520	9589	1195	10036	22248	2861	3051	44306
70	2832	1238	11018	2128	3954	8647	9820	1195	9857	22364	3043	3382	45228
75	2677	1191	10997	2086	3875	8847	10290	1163	9624	22378	3287	3634	45983
80	2573	970	10980	1935	3798	8910	10752	1105	9233	22196	3538	3981	46456
85	2481	923	10825	1887	3707	8908	11398	1116	9197	22018	3896	4257	46867
90	2409	896	10700	1839	3617	8913	11754	1136	9170	21842	4149	4495	47259
95	2343	886	10595	1764	3508	8930	11857	1167	9036	21715	4290	4681	47661
100	2292	918	10506	1623	3420	8888	11976	1192	8897	21634	4512	4869	48122
105	2250	950	10424	1447	3346	8788	12191	1197	8734	21533	4721	5045	48568
110	2209	964	10342	1282	3297	8656	12679	1207	8588	21401	4826	5179	49022
115	2149	952	10244	1166	3259	8517	13101	1223	8459	21241	4866	5264	49468
120	2089	928	10135	1095	3221	8407	13260	1246	8320	21066	5011	5324	49900
125	2020	952	10064	1044	3194	8324	13345	1281	8189	20899	5197	5369	50316
130	1959	972	9983	1023	3158	8242	13235	1344	8064	20769	5347	5381	50718
135	1894	1003	9845	1014	3125	8169	13253	1405	7939	20630	5414	5398	51109
140	1836	1028	9691	1026	3100	8105	13249	1456	7814	20536	5437	5429	51484
145	1790	1053	9549	1029	3068	8069	13176	1511	7658	20483	5423	5465	51853
150	1751	1075	9422	1027	3036	8048	13016	1562	7516	20455	5472	5490	52290
155	1716	1110	9301	1032	3003	8004	12888	1620	7385	20427	5516	5515	52673
160	1686	1129	9167	1040	2969	7952	12833	1675	7292	20381	5498	5527	53124
165	1662	1133	9072	1051	2933	7884	12767	1721	7214	20328	5471	5525	53538
170	1638	1125	8991	1071	2889	7803	12676	1753	7141	20261	5471	5519	53943
175	1614	1117	8893	1088	2849	7701	12582	1758	7076	20178	5514	5514	54339
180	1593	1107	8783	1104	2813	7606	12530	1761	7016	20114	5573	5516	54721
185	1570	1095	8677	1111	2776	7526	12482	1752	6956	20040	5648	5524	55113
190	1540	1083	8588	1114	2740	7454	12395	1737	6895	19961	5696	5538	55491
195	1510	1069	8501	1116	2700	7376	12360	1691	6834	19869	5693	5562	55862
200	1484	1056	8412	1119	2661	7289	12321	1608	6780	19788	5670	5596	56226
205	1459	1042	8320	1121	2622	7202	12262	1523	6756	19716	5642	5622	56584
210	1440	1024	8227	1124	2584	7123	12193	1442	6723	19639	5605	5661	56837
215	1421	1007	8137	1127	2549	7035	12116	1360	6698	19558	5556	5700	57036
220	1397	990	8049	1131	2510	6934	12031	1284	6657	19493	5519	5728	57268
225	1369	971	7963	1136	2465	6761	11735	1202	6567	19344	5485	5732	57513
230	1346	954	7884	1137	2431	6677	11626	1102	6514	19282	5333	5769	57750
235	1325	938	7819	1137	2399	6589	11532	1008	6452	19205	5184	5813	57985
240	1303	918	7746	1132	2365	6504	11443	929	6352	19127	5120	5856	58213
245	1283	898	7672	1127	2330	6441	11358	860	6196	19040	5113	5904	58450
250	1263	875	7609	1126	2299	6381	11269	795	6082	18939	5088	5958	58682
255	1244	844	7536	1125	2267	6336	11210	742	5892	18811	5031	6000	58947
260	1228	811	7508	1121	2238	6283	11156	696	5708	18675	4969	6053	59229
265	1211	782	7479	1115	2205	6249	11102	655	5552	18464	4935	6121	59475
270	1196	754	7439	1108	2177	6218	11044	621	5422	18292	4915	6187	59717
275	1181	726	7381	1100	2149	6190	11023	593	5327	18144	4901	6248	59957
280	1163	696	7316	1088	2122	6158	11034	566	5259	18042	4906	6304	60147
285	1143	676	7258	1074	2097	6127	11044	544	5195	17924	4920	6358	60326

Table 5. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
290	1124	671	7195	1044	2074	6103	11084	525	5150	17798	4937	6413	60484
295	1107	666	7131	1016	2049	6085	11108	507	5108	17688	4955	6463	61523
300	1089	660	7068	988	2025	6069	11180	492	5045	17589	4975	6507	61682
305	1072	659	7001	964	2003	6055	11317	478	4984	17503	5001	6546	61839
310	1055	662	6934	942	1981	6044	11422	466	4927	17396	5035	6584	61994
315	1041	666	6871	921	1959	6032	11491	457	4872	17276	5062	6630	62148
320	1029	672	6809	899	1937	6023	11510	449	4822	17161	5074	6676	62300
325	1017	670	6753	888	1915	6019	11474	447	4774	17031	5093	6723	62451
330	1005	660	6700	883	1893	6013	11412	452	4720	16897	5113	6767	62600
335	993	653	6651	878	1872	5999	11324	460	4674	16761	5146	6799	62747
340	981	648	6605	876	1850	5973	11224	467	4638	16626	5179	6831	62893
345	971	645	6565	879	1829	5944	11142	474	4596	16488	5177	6863	63036
350	963	644	6520	896	1809	5914	11083	483	4558	16368	5186	6889	63177
355	954	643	6478	913	1790	5881	11032	490	4522	16245	5205	6913	63317
360	946	644	6441	931	1770	5841	10988	496	4487	16123	5200	6935	63456
365	938	646	6407	950	1752	5789	10932	500	4458	16007	5195	6953	63569
370	931	652	6372	992	1736	5744	10833	506	4435	15907	5198	6971	63676
375	924	658	6338	1055	1720	5699	10745	516	4419	15811	5203	6995	63749
380	917	666	6303	1119	1705	5655	10679	524	4400	15715	5195	7017	63821
385	910	684	6267	1131	1688	5607	10617	532	4376	15622	5156	7037	63892
390	904	709	6246	1128	1674	5562	10569	544	4351	15534	5114	7055	63962
395	898	737	6240	1127	1662	5527	10492	559	4322	15445	5084	7070	64031
400	892	763	6236	1125	1650	5484	10401	577	4298	15354	5031	7081	64101
405	886	790	6234	1129	1638	5443	10309	599	4275	15262	4965	7093	64169
410	879	819	6233	1136	1628	5403	10215	620	4254	15173	4907	7103	64236
415	873	853	6223	1144	1618	5360	10148	641	4236	15085	4855	7110	64303
420	867	909	6183	1147	1606	5320	10136	667	4221	14994	4826	7115	64370
425	861	961	6146	1155	1596	5279	10124	694	4201	14898	4792	7117	64435
430	856	1015	6106	1168	1588	5243	10138	721	4183	14804	4772	7116	64501
435	852	1077	6066	1181	1579	5205	10152	747	4164	14706	4752	7111	64565
440	848	1125	6026	1187	1570	5167	10165	773	4146	14613	4748	7102	64630
445	846	1176	5985	1200	1564	5134	10146	798	4132	14522	4747	7089	64693
450	844	1223	5949	1217	1557	5101	10092	822	4121	14426	4740	7073	64756
455	842	1268	5915	1236	1551	5071	10026	845	4112	14330	4733	7057	64819
460	840	1315	5883	1254	1545	5039	9953	868	4105	14230	4729	7040	64881
465	838	1371	5855	1277	1539	5008	9874	891	4100	14128	4723	7021	64943

Table 6. WUA (ft^2) as a function of discharge (cfs) simulated for South Fork Station 2 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
20	2478	4267	9220	1751	3208	4814	6384	1503	5431	13111	995	475	28579
25	2502	6385	9360	3032	3397	5236	7315	1930	5385	14031	1114	752	30318
30	2421	7234	9166	4260	3447	5580	7753	2271	5276	14682	1437	1184	31136
35	2364	7035	8959	5168	3448	5683	8073	2350	5018	14813	1959	1661	31896
40	2370	6563	8718	6008	3344	5876	8329	2337	4817	15030	2512	2112	32694
45	2335	6133	8414	5846	3254	5976	8608	2206	4761	15130	3259	2475	33531
50	2301	5848	8137	5515	3143	5928	8570	1996	4727	15144	3816	2817	34331
55	2247	5585	7993	5024	3026	5752	8460	1733	4634	15129	3988	3171	34919
60	2152	5308	7788	4478	2937	5586	8503	1464	4524	15016	4038	3461	35446
65	2257	4875	8005	4177	3166	5706	8540	1246	4905	15481	4061	3744	35934
70	2215	4426	7748	4037	2999	5663	8526	1071	4577	15406	4104	4058	36375
75	2159	4033	7632	3879	2934	5621	8420	934	4462	15219	3874	4295	36786
80	2090	3594	7548	3725	2876	5549	8260	818	4340	14912	3721	4425	37211
85	2021	3137	7510	3652	2818	5452	8080	719	4184	14555	3425	4550	37604
90	1976	2690	7534	3526	2756	5352	7884	634	4021	14126	3186	4659	37980
95	1951	2351	7481	3326	2706	5259	7682	563	3850	13773	2936	4692	38343
100	1950	2052	7406	3154	2656	5200	8052	499	3663	13479	2742	4668	38661
105	1918	1824	7251	3013	2592	5168	8379	446	3592	13184	2609	4562	38948
110	1898	1645	7083	2766	2541	5135	8530	396	3552	12892	2622	4455	39181
115	1893	1455	6939	2538	2477	5125	8441	351	3544	12590	2641	4315	39434
120	1888	1307	6815	2314	2414	5118	8294	311	3574	12316	2682	4150	39645
125	1894	1197	6692	2107	2348	5088	8125	274	3608	12079	2738	3971	39851
130	1894	1107	6573	1940	2293	5037	8005	243	3579	11829	2815	3832	40051
135	1890	1032	6454	1800	2239	4953	7804	220	3508	11535	2924	3713	40246
140	1895	970	6338	1649	2196	4863	7549	208	3431	11226	3085	3585	40437
145	1934	911	6289	1521	2212	4803	7318	207	3432	11143	3172	3450	40595
150	1976	863	6227	1409	2197	4740	7088	210	3378	10959	3192	3342	40727
155	2018	834	6132	1327	2183	4678	6998	217	3325	10827	3218	3236	40856
160	2045	809	6029	1253	2178	4598	6981	225	3279	10703	3242	3144	40983
165	2060	856	5941	1197	2175	4504	6892	238	3229	10601	3185	3052	41107
170	2059	920	5851	1146	2173	4403	6815	252	3177	10510	2946	2967	41228
175	2034	988	5781	1096	2178	4304	6733	266	3156	10426	2692	2896	41322
180	2017	1063	5720	1052	2183	4227	6659	281	3104	10323	2459	2834	41419
185	2007	1148	5679	1010	2195	4156	6581	295	3034	10163	2329	2781	41577
190	1999	1156	5647	988	2197	4080	6496	316	2952	10035	2231	2739	41773
195	1994	1153	5585	971	2188	4017	6470	340	2885	9937	2189	2704	41962
200	1992	1158	5535	967	2172	3960	6447	367	2824	9821	2173	2666	42153
205	1991	1151	5489	994	2149	3913	6384	397	2779	9703	2158	2632	42337
210	1990	1144	5444	1023	2121	3883	6336	429	2736	9566	2161	2630	42518
215	1989	1136	5394	1117	2097	3861	6265	468	2686	9416	2174	2631	42655
220	1986	1126	5345	1261	2078	3850	6166	513	2640	9282	2228	2633	42784
225	1979	1124	5294	1263	2059	3833	6073	564	2600	9176	2245	2632	42912
230	1955	1131	5248	1240	2041	3807	5987	618	2583	9069	2221	2641	43162
235	1932	1143	5202	1221	2016	3768	5898	674	2571	8967	2206	2663	43366
240	1915	1158	5159	1205	1989	3720	5818	729	2554	8865	2160	2689	43566
245	1909	1174	5113	1185	1978	3668	5738	789	2550	8776	2063	2709	43764
250	1899	1193	5065	1165	1971	3620	5660	847	2550	8686	2053	2729	43958
255	1881	1214	5025	1146	1960	3564	5576	902	2543	8614	2048	2764	44125
260	1830	1224	4981	1131	1946	3514	5499	942	2521	8534	2079	2814	44292
265	1779	1231	4943	1118	1931	3468	5428	977	2485	8455	2073	2868	44446
270	1751	1239	4899	1107	1917	3416	5358	1009	2449	8374	2064	2917	44597
275	1723	1244	4857	1094	1903	3366	5288	1040	2418	8288	2060	2960	44746
280	1703	1247	4816	1082	1891	3313	5217	1072	2389	8193	2054	2981	44884
285	1684	1253	4783	1070	1880	3253	5140	1103	2379	8106	2050	3000	45019

Table 6. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
290	1668	1261	4753	1061	1869	3193	5062	1131	2364	8046	2028	3031	45148
295	1654	1269	4723	1053	1856	3135	5004	1154	2351	8004	1944	3052	45276
300	1642	1276	4696	1047	1846	3087	4981	1179	2337	7966	1860	3065	45401
305	1631	1285	4671	1047	1837	3038	4973	1203	2327	7926	1791	3070	45526
310	1619	1293	4650	1050	1831	2997	4962	1223	2325	7879	1786	3073	45649
315	1607	1301	4629	1055	1826	2958	4947	1243	2319	7833	1784	3076	45771
320	1597	1310	4607	1060	1822	2925	4945	1264	2303	7781	1794	3072	45891
325	1589	1325	4578	1067	1818	2892	4958	1284	2265	7731	1814	3066	46009
330	1582	1340	4556	1072	1812	2864	4954	1303	2226	7680	1843	3068	46096
335	1575	1354	4539	1077	1806	2841	4920	1322	2194	7631	1871	3069	46183
340	1570	1369	4528	1083	1802	2821	4864	1341	2169	7574	1887	3068	46268
345	1559	1380	4519	1088	1800	2806	4796	1338	2151	7533	1897	3067	46352
350	1551	1401	4525	1096	1803	2797	4735	1331	2136	7492	1907	3061	46434
355	1542	1423	4527	1105	1807	2788	4687	1325	2122	7452	1918	3054	46515
360	1533	1443	4517	1113	1808	2774	4649	1319	2105	7410	1931	3048	46593
365	1523	1445	4512	1120	1811	2763	4622	1310	2084	7364	1963	3028	46666
370	1514	1454	4487	1128	1812	2754	4624	1301	2072	7326	2001	3005	46736
375	1505	1462	4457	1135	1810	2744	4612	1292	2063	7296	2041	2982	46805
380	1498	1472	4430	1142	1807	2736	4585	1276	2062	7270	2092	2960	46874
385	1494	1495	4404	1148	1803	2726	4557	1244	2064	7242	2141	2938	46943
390	1492	1518	4377	1154	1796	2713	4525	1211	2067	7217	2196	2916	47010
395	1492	1510	4350	1163	1784	2700	4481	1175	2072	7197	2265	2895	47077
400	1493	1502	4332	1161	1775	2694	4440	1138	2077	7172	2347	2874	47143
405	1494	1505	4325	1138	1768	2696	4409	1099	2081	7149	2426	2856	47209
410	1496	1507	4327	1114	1762	2697	4382	1055	2086	7125	2452	2841	47274
415	1498	1509	4329	1090	1756	2697	4352	1011	2092	7102	2470	2827	47339
420	1501	1507	4324	1071	1750	2691	4341	965	2095	7079	2485	2813	47403
425	1505	1496	4302	1053	1744	2675	4405	917	2096	7050	2520	2797	47466
430	1510	1484	4281	1036	1738	2651	4470	863	2097	7023	2515	2784	47529
435	1513	1473	4261	1019	1731	2629	4532	811	2100	7001	2438	2775	47591
440	1517	1461	4244	1003	1724	2605	4583	758	2103	6979	2342	2766	47653
445	1522	1431	4230	1003	1714	2600	4570	724	2119	6960	2291	2754	47708
450	1526	1401	4213	1002	1704	2592	4558	688	2134	6942	2241	2742	47760
455	1527	1372	4195	1001	1694	2585	4549	654	2149	6922	2209	2727	47811
460	1517	1342	4178	1000	1686	2580	4541	620	2165	6901	2172	2710	47862
465	1508	1294	4170	1013	1677	2579	4516	591	2180	6879	2136	2694	47913

Table 7. WUA (ft^2) as a function of discharge (cfs) simulated for South Fork Station 3 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
20	3066	270	8457	211	3391	4754	4542	248	7567	11734	323	199	26524
25	2846	308	9252	227	3400	5328	5249	294	7569	13162	571	339	27767
30	2478	324	9294	233	3318	5851	6429	367	7191	14151	887	564	28751
35	2434	334	9211	239	3304	6345	7019	479	6982	14871	1019	838	29330
40	2521	325	9113	239	3356	6675	7556	473	6729	15431	1163	1066	29859
45	2564	309	8865	233	3464	7048	8177	395	6419	15857	1600	1155	30332
50	2455	297	8875	222	3591	7518	9023	396	6448	16284	2049	1280	31088
55	2402	298	8773	190	3618	7815	9898	419	6060	16418	2407	1480	31651
60	2374	318	8843	173	3654	8111	10559	491	5704	16504	2656	1705	32025
65	2396	357	8922	164	3688	8312	11446	601	5797	16805	2990	1899	32490
70	2414	415	8687	158	3583	8432	12571	755	5488	16657	3631	2104	32948
75	2266	491	8490	154	3449	8581	13000	982	5272	16551	4115	2334	33377
80	2042	568	8150	153	3284	8592	13297	1193	5046	16363	4544	2554	33779
85	1871	624	7792	168	3121	8466	13402	1291	4870	16146	4796	2738	34121
90	1707	684	7435	197	2954	8241	13287	1393	4668	15791	4664	2909	34407
95	1571	777	7125	238	2812	7990	13047	1473	4440	15368	4642	3055	34682
100	1469	897	6827	287	2676	7687	12837	1539	4194	14936	4649	3197	34947
105	1380	1021	6564	348	2555	7414	12633	1591	3969	14550	4500	3364	35203
110	1301	1057	6367	417	2440	7153	12375	1571	3800	14160	4486	3540	35449
115	1229	1083	6201	488	2333	6898	12072	1541	3696	13771	4400	3715	35688
120	1162	1110	6024	556	2237	6654	11818	1505	3629	13360	4393	3878	35919
125	1106	1171	5802	599	2135	6410	11606	1438	3612	12946	4198	4056	36127
130	1056	1256	5570	635	2042	6140	11322	1370	3634	12556	3993	4240	36316
135	1014	1343	5363	676	1951	5849	11062	1328	3612	12157	3599	4412	36497
140	946	1553	5117	745	1840	5602	10772	1349	3589	11799	3138	4545	36828
145	864	1592	4864	804	1755	5394	10512	1353	3602	11444	2859	4678	37115
150	810	1556	4641	872	1688	5182	10178	1374	3638	11124	2707	4792	37378
155	768	1519	4443	942	1639	5012	9785	1401	3625	10824	2660	4901	37624
160	743	1503	4267	1027	1601	4872	9291	1405	3614	10556	2671	4969	37864
165	726	1499	4109	1083	1569	4744	8837	1404	3622	10306	2754	5023	38098
170	711	1513	3966	1096	1548	4614	8416	1405	3636	10009	2933	5088	38325
175	693	1517	3847	1098	1534	4506	7983	1409	3666	9703	3074	5132	38552
180	680	1498	3734	1101	1523	4389	7604	1404	3727	9435	3078	5151	38748
185	671	1481	3607	1111	1512	4236	7333	1426	3801	9169	3049	5159	39072
190	664	1461	3493	1140	1502	4011	7125	1473	3888	8935	2950	5152	39343
195	657	1441	3376	1193	1494	3780	6958	1500	3974	8687	2644	5118	39610
200	654	1419	3269	1295	1488	3589	6785	1525	4048	8441	2423	5069	39896
205	654	1401	3175	1301	1488	3416	6612	1540	4130	8214	2318	5000	40171
210	660	1386	3106	1305	1493	3266	6394	1557	4178	8024	2194	4914	40310
215	669	1375	3049	1309	1501	3159	6179	1573	4224	7878	2046	4821	40447
220	680	1364	2989	1307	1512	3088	6064	1562	4197	7745	1949	4714	40574
225	689	1359	2944	1308	1521	3012	5942	1537	4260	7610	1874	4610	40699
230	698	1357	2906	1318	1528	2940	5773	1508	4327	7458	1814	4515	40822
235	708	1365	2869	1330	1536	2865	5530	1472	4401	7300	1769	4413	40942
240	719	1384	2847	1341	1553	2795	5259	1436	4462	7155	1636	4305	41091
245	734	1429	2839	1356	1575	2730	4977	1373	4532	7059	1518	4221	41242
250	749	1479	2831	1372	1598	2673	4775	1308	4609	6967	1411	4148	41389
255	765	1547	2800	1392	1620	2615	4678	1241	4644	6870	1301	4079	41533
260	781	1590	2772	1417	1641	2555	4571	1173	4670	6783	1332	4018	41675
265	800	1615	2749	1443	1657	2501	4449	1110	4697	6721	1312	3966	41815
270	816	1637	2728	1478	1675	2450	4346	1050	4733	6653	1338	3924	41946
275	834	1654	2712	1512	1698	2413	4256	997	4750	6598	1370	3884	42095
280	852	1676	2688	1546	1718	2398	4240	946	4769	6560	1385	3857	42234
285	871	1705	2671	1584	1736	2404	4243	899	4790	6529	1379	3826	42371

Table 7. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
290	891	1696	2652	1623	1747	2410	4216	865	4788	6532	1386	3795	42506
295	910	1679	2636	1663	1756	2403	4164	837	4781	6535	1385	3764	42700
300	930	1665	2621	1700	1768	2384	4130	810	4768	6538	1392	3736	42880
305	951	1632	2617	1721	1782	2361	4092	781	4747	6526	1349	3699	43058
310	975	1591	2624	1738	1797	2355	4051	760	4716	6506	1266	3653	43234
315	998	1554	2635	1751	1811	2355	4005	741	4686	6483	1181	3606	43407
320	1017	1518	2660	1753	1831	2360	3953	730	4663	6468	1150	3564	43571
325	1032	1482	2685	1757	1854	2362	3893	725	4639	6457	1118	3527	43728
330	1050	1443	2716	1755	1885	2362	3834	731	4623	6443	1097	3504	43884
335	1071	1398	2763	1720	1918	2365	3781	741	4608	6429	1080	3488	44038
340	1091	1361	2817	1657	1951	2373	3727	754	4604	6425	1067	3470	44190
345	1112	1326	2877	1584	1987	2383	3675	769	4606	6431	1031	3449	44341
350	1134	1301	2923	1515	2022	2401	3759	784	4624	6443	997	3421	44490
355	1154	1285	2954	1449	2054	2420	3952	799	4657	6457	966	3390	44638
360	1174	1270	2991	1383	2082	2441	4149	815	4697	6473	954	3356	44784
365	1194	1258	3008	1326	2102	2465	4321	837	4750	6475	924	3325	44929
370	1214	1246	3009	1279	2117	2493	4441	861	4814	6477	893	3298	45072
375	1234	1233	3011	1239	2131	2528	4497	885	4889	6473	865	3276	45214
380	1253	1221	3013	1203	2143	2554	4538	907	4962	6467	835	3260	45354
385	1273	1211	3017	1172	2148	2570	4542	930	5042	6477	809	3244	45493
390	1295	1203	3021	1144	2149	2586	4523	955	5130	6497	782	3229	45631
395	1316	1197	3025	1121	2149	2600	4498	983	5208	6516	757	3212	45768
400	1337	1192	3029	1096	2149	2606	4461	962	5273	6533	743	3189	45903
405	1358	1185	3035	1071	2148	2620	4423	962	5335	6548	731	3164	46037
410	1378	1177	3041	1048	2145	2634	4369	962	5400	6563	720	3140	46170
415	1398	1170	3046	1028	2142	2646	4316	955	5428	6583	711	3115	46271
420	1419	1162	3051	1011	2141	2652	4255	944	5450	6597	702	3087	46365
425	1440	1154	3056	996	2139	2657	4190	932	5481	6614	694	3057	46458
430	1461	1147	3064	984	2137	2655	4122	921	5509	6629	689	3027	46551
435	1481	1140	3074	976	2136	2655	4069	910	5538	6633	688	2998	46643
440	1501	1133	3084	969	2136	2660	4017	900	5568	6637	687	2972	46734
445	1520	1128	3095	962	2135	2666	3964	881	5594	6646	690	2952	46812
450	1542	1123	3107	958	2135	2672	3918	856	5612	6661	692	2928	46908
455	1563	1118	3118	952	2136	2675	3874	829	5630	6683	694	2902	46994
460	1585	1114	3129	943	2136	2679	3829	800	5651	6722	698	2877	47079
465	1605	1110	3139	934	2137	2686	3786	772	5673	6758	702	2851	47163

Table 8. WUA (ft^2) as a function of discharge (cfs) simulated for North Fork Station 4 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
20	5802	1112	13034	485	10148	7393	5671	1633	16680	17019	134	184	46463
25	6968	1208	16074	348	11372	9588	7625	1567	16720	19613	234	299	47844
30	7846	1236	17974	296	12053	11738	10290	1309	16848	21855	380	422	48829
35	8321	1105	19597	332	12495	13575	12098	1158	16315	23771	576	558	49697
40	8727	1008	21282	337	12728	14859	13876	1185	15724	25450	807	688	50326
45	9078	1184	22131	378	12714	16014	16675	1283	15018	26763	1141	866	50890
50	9098	1397	22600	434	12544	17199	18654	1451	14433	27837	1454	1101	51661
55	9038	1659	22918	536	12290	18181	19901	1692	13771	28577	1746	1395	52195
60	9016	1912	23005	688	12004	18754	21071	1851	13089	29141	2154	1739	52627
65	8993	2061	23027	775	11672	19111	22031	1932	12538	29629	2641	2191	53033
70	8818	2124	22869	866	11280	19340	23199	2010	12072	30019	3246	2691	53431
75	8721	2158	22643	990	10931	19441	24328	2046	11644	30443	3874	3345	53815
80	8630	2195	22397	1080	10608	19484	24881	2037	11240	30781	4550	3985	54272
85	8458	2294	22152	1177	10313	19510	25161	2007	10869	31098	5306	4671	54716
90	8309	2424	21965	1244	10049	19428	25619	1897	10432	31359	6178	5329	55239
95	8132	2560	21662	1323	9763	19246	26470	1754	10029	31471	7032	6020	55752
100	7931	2593	21317	1416	9485	18984	27069	1605	9665	31427	7662	6723	56459
105	7761	2608	21000	1503	9196	18700	27209	1437	9342	31320	8142	7437	57117
110	7627	2555	20773	1593	8929	18353	27087	1297	8994	31199	8531	8129	57736
115	7507	2441	20528	1664	8693	17967	27144	1178	8642	31030	8706	8728	58303
120	7369	2313	20346	1726	8461	17566	27119	1079	8412	30846	8679	9239	58796
125	7160	2171	20186	1779	8252	17202	27050	1022	8223	30616	8563	9731	59228
130	6910	2034	20021	1783	8062	16807	26984	987	8046	30360	8415	10207	59674
135	6723	1873	19734	1763	7877	16365	27057	967	7817	30114	8219	10682	60499
140	6584	1749	19406	1729	7695	15917	27252	962	7561	29870	7557	11126	61197
145	6487	1658	19095	1680	7490	15539	27188	981	7351	29607	7055	11501	61876
150	6414	1602	18832	1613	7290	15239	26916	986	7157	29366	6876	11851	62522
155	6380	1589	18778	1510	7224	15038	26526	974	7164	29707	6926	12131	62895
160	6347	1615	18605	1419	7071	14803	26145	957	6989	29479	6965	12335	63206
165	6325	1669	18417	1326	6926	14539	25797	939	6805	29208	6992	12511	63508
170	6252	1659	18208	1249	6791	14269	25409	912	6738	28951	6890	12672	64166
175	6107	1642	18021	1185	6659	14007	24889	893	6718	28669	6771	12845	64646
180	5945	1625	17836	1124	6537	13733	24291	887	6727	28417	6600	12994	64873
185	5830	1609	17658	1082	6424	13454	23659	882	6779	28136	6306	13114	65095
190	5720	1588	17536	1058	6330	13212	23003	888	6855	27789	6039	13190	65396
195	5625	1555	17440	1040	6240	12983	22347	906	6875	27371	5946	13226	65719
200	5549	1524	17330	1027	6152	12764	21743	928	6843	26999	5839	13241	66036
205	5467	1493	17168	1021	6058	12532	21210	945	6838	26706	5716	13216	66347
210	5382	1465	17025	1025	5965	12309	20733	959	6913	26468	5588	13162	67024
215	5304	1434	16895	1223	5871	12118	20335	970	6928	26231	5466	13095	67527
220	5232	1405	16777	1342	5771	11972	19932	959	6953	26003	5468	12998	68019
225	5179	1383	16688	1361	5680	11811	19575	932	6970	25812	5509	12892	68503
230	5125	1371	16572	1360	5584	11621	19338	877	7084	25639	5509	12761	68855
235	5067	1371	16444	1353	5479	11402	19121	805	7127	25442	5521	12630	69185
240	4996	1404	16257	1340	5373	11174	18972	753	7196	25232	5500	12492	69507
245	4927	1417	16086	1318	5256	10927	18718	724	7327	25024	5417	12357	69825
250	4861	1434	15921	1299	5142	10661	18476	701	7386	24843	5315	12232	70179
255	4799	1456	15755	1282	5039	10405	18212	677	7491	24684	5208	12097	70534
260	4742	1478	15589	1269	4949	10162	17913	658	7617	24538	5144	11950	70885
265	4662	1477	15421	1255	4867	9933	17630	643	7747	24408	5094	11790	71231
270	4579	1458	15250	1243	4791	9723	17377	631	7760	24288	5006	11629	71569
275	4512	1440	15104	1233	4713	9516	17102	621	7825	24159	4872	11479	71832
280	4473	1427	14975	1230	4647	9364	16859	618	7573	24071	4813	11332	72054
285	4395	1406	14818	1234	4579	9191	16594	602	7568	24003	4791	11221	73095

Table 8. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
290	4300	1389	14655	1238	4514	9024	16364	586	7602	23935	4775	11097	73235
295	4216	1371	14491	1252	4460	8859	16136	575	7631	23852	4805	10960	73374
300	4133	1352	14336	1275	4411	8703	15909	560	7668	23751	4859	10845	73510
305	4063	1338	14186	1280	4362	8549	15683	543	7684	23643	4935	10724	73645
310	4003	1327	14055	1266	4315	8405	15449	527	7699	23531	4986	10614	73779
315	3953	1314	13930	1249	4268	8269	15207	508	7734	23420	5012	10535	73911
320	3888	1312	13804	1233	4225	8137	14968	498	7811	23310	4884	10461	74042
325	3818	1317	13679	1203	4182	8010	14736	492	7890	23202	4763	10384	74172
330	3753	1319	13539	1173	4141	7888	14505	489	7979	23105	4649	10309	74300
335	3688	1330	13392	1145	4104	7766	14282	490	8031	23006	4542	10260	74412
340	3627	1354	13266	1123	4069	7657	14066	491	8108	22917	4505	10221	74525
345	3570	1378	13147	1102	4034	7547	13842	492	8173	22813	4458	10181	74633
350	3520	1390	13034	1085	4003	7433	13640	489	8198	22711	4419	10127	74740
355	3472	1382	12930	1078	3975	7316	13417	488	8199	22610	4376	10116	74846
360	3433	1370	12826	1078	3949	7204	13206	488	8205	22504	4325	10123	74950
365	3400	1357	12719	1086	3922	7090	13000	486	8200	22371	4314	10128	75054
370	3369	1338	12613	1105	3893	6987	12776	487	8189	22238	4329	10108	75157
375	3338	1309	12525	1120	3864	6891	12551	490	8160	22133	4366	10071	75258
380	3310	1277	12459	1136	3837	6808	12347	493	8130	22027	4450	10033	75359
385	3283	1252	12406	1143	3812	6737	12165	488	8102	21939	4482	10006	75457
390	3255	1228	12339	1156	3784	6671	12007	486	8089	21876	4520	9980	75555
395	3228	1202	12258	1181	3758	6604	11911	484	8075	21808	4567	9951	75651
400	3206	1177	12181	1198	3734	6539	11881	478	8054	21731	4611	9908	75746
405	3190	1155	12092	1193	3710	6474	11918	471	8029	21656	4630	9872	75840
410	3176	1136	11999	1194	3688	6413	11950	464	8011	21581	4655	9833	75931
415	3163	1118	11911	1198	3668	6363	11953	455	7994	21488	4768	9786	76114
420	3150	1102	11815	1193	3646	6319	11933	447	7978	21392	4831	9739	76250
425	3139	1086	11719	1183	3625	6276	11870	441	7961	21284	4804	9699	76636
430	3130	1067	11641	1163	3613	6238	11784	439	7933	21162	4668	9657	76772
435	3116	1049	11583	1142	3588	6202	11696	445	7905	21048	4530	9618	76853
440	3106	1036	11493	1120	3572	6165	11584	446	7808	20921	4456	9572	76930
445	3100	1025	11403	1102	3560	6128	11443	448	7760	20779	4392	9515	77004
450	3082	1013	11315	1087	3550	6088	11278	451	7690	20630	4292	9456	77078
455	3059	1002	11226	1071	3541	6043	11141	450	7615	20453	4064	9392	77151
460	3033	989	11137	1055	3534	5993	11002	452	7540	20249	3848	9331	77224
465	3005	972	11055	1039	3531	5940	10847	455	7463	20036	3737	9271	77296

Table 9. WUA (ft^2) as a function of discharge (cfs) simulated for Mainstem Station 5 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
50	4807	1826	21512	821	10851	13178	11708	2244	24283	29257	914	181	63597
60	5099	2152	22539	1350	11055	15338	15048	2429	23366	31424	1652	702	64985
70	5333	2507	23115	1741	10924	17194	17959	2409	22888	33382	2615	1577	66189
80	5169	2854	23069	1870	10669	18710	20703	2160	21949	35002	3488	2758	67251
90	5061	3087	22722	2024	10269	19853	22696	1954	21118	36174	4333	4210	68052
100	4983	3135	22389	2249	9869	20653	24084	1824	20384	36869	5107	5758	68835
110	4887	3200	22206	2465	9528	21070	25264	1750	19729	37390	5748	7170	69591
120	4783	3021	21735	2658	9181	21054	26759	1654	19177	37746	6145	8540	70298
130	4726	2812	21357	2762	8855	20834	27469	1582	18905	38168	6324	9860	70987
140	4517	2640	20827	2788	8579	20493	28316	1500	18841	38600	6399	11094	71552
150	4318	2491	20327	2707	8351	20133	28827	1392	18742	38822	6389	12197	72774
160	4186	2357	19883	2577	8144	19753	28897	1252	18657	38826	6491	13151	73583
170	4060	2235	19515	2464	7945	19349	28716	1140	18343	38505	6713	13999	74117
180	3873	2107	19380	2354	7766	18945	28247	1067	17993	38086	7042	14777	74535
190	3703	1992	19092	2263	7571	18449	28126	1013	17738	37523	7173	15427	74943
200	3566	1877	18731	2193	7385	18008	28077	976	17715	36942	7410	15914	75332
210	3379	1768	18371	2135	7187	17629	27551	945	17587	36279	7501	16284	75760
220	3246	1657	18046	2086	6991	17177	26720	923	17410	35618	7417	16485	76317
230	3152	1570	17812	2030	6775	16639	25702	916	17123	35022	7285	16590	76899
240	3060	1501	17641	1958	6566	16082	24907	916	16779	34414	7070	16614	77480
250	2977	1429	17447	1871	6377	15446	24147	931	16445	33861	6759	16620	78052
260	2852	1386	17076	1765	6144	14931	23720	939	15710	33396	6610	16602	78578
270	2672	1322	16802	1659	5977	14367	23356	989	15363	32872	6359	16449	78957
280	2528	1257	16568	1573	5809	13976	23089	1014	15195	32642	6297	16239	79306
290	2427	1205	16161	1499	5647	13596	22909	1021	15224	32233	6254	15924	79610
300	2328	1166	15747	1423	5492	13272	22612	1027	14970	31847	6178	15537	79890
310	2237	1138	15353	1367	5360	12983	22016	1045	14750	31469	6121	15137	80133
320	2177	1125	14926	1324	5251	12751	21386	1087	14556	31063	6013	14754	80389
330	2114	1124	14465	1285	5155	12553	20764	1124	14379	30686	5864	14359	80622
340	2032	1135	14041	1255	5064	12367	20042	1144	14086	30338	5790	13948	80849
350	1959	1160	13620	1234	4974	12207	19400	1151	13763	30003	5951	13529	81070
360	1903	1198	13207	1216	4891	12058	18879	1156	13494	29688	6182	13115	81261
370	1852	1207	12803	1204	4800	11939	18377	1156	13223	29325	6430	12696	81447
380	1810	1186	12460	1207	4721	11829	17852	1149	12954	28918	6696	12263	81629
390	1780	1160	12217	1244	4650	11752	17228	1141	12670	28522	6971	11821	81802
400	1745	1151	12011	1273	4570	11704	16648	1132	12389	28102	7177	11406	81979
410	1709	1155	11679	1308	4490	11643	16255	1125	12125	27707	7360	11023	82264
420	1677	1176	11337	1351	4406	11553	15987	1125	11830	27342	7503	10677	82469
430	1648	1199	10978	1376	4323	11460	15945	1128	11590	26975	7661	10339	82641
440	1638	1178	10740	1397	4266	11388	15877	1129	11391	26725	7750	10028	82813
450	1613	1154	10418	1420	4170	11261	15811	1135	11185	26304	7570	9727	82970
460	1589	1147	10160	1441	4082	11144	15651	1149	11002	25875	7266	9450	83120
470	1564	1146	9894	1459	3994	11060	15527	1169	10859	25445	7181	9167	83266
480	1542	1158	9652	1483	3903	10962	15419	1193	10726	25009	7158	8910	83410
490	1512	1166	9411	1508	3807	10826	15357	1216	10599	24585	7022	8674	83663
500	1466	1180	9195	1513	3736	10692	15397	1226	10666	24542	6846	8482	84415
510	1409	1190	8956	1503	3659	10505	15364	1234	10549	24200	6590	8275	84552
520	1366	1174	8737	1480	3584	10277	15350	1237	10427	23853	6211	8095	84681
530	1325	1161	8480	1444	3512	10076	15337	1239	9838	23427	5899	7921	84786
540	1290	1149	8291	1419	3446	9882	15144	1244	9689	23063	5752	7760	84887
550	1251	1137	8075	1400	3376	9718	14965	1253	9489	22663	5582	7606	84985
560	1213	1128	7870	1390	3309	9542	14822	1263	9290	22210	5444	7446	85083
570	1176	1121	7685	1379	3245	9372	14652	1262	9110	21721	5208	7287	85162
580	1146	1127	7504	1385	3190	9210	14387	1240	8955	21264	4964	7140	85255

Table 9. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
590	1118	1136	7369	1388	3137	9029	14141	1220	8816	20815	4769	6994	85337
600	1093	1145	7258	1391	3088	8837	13881	1203	8672	20354	4521	6869	85417
610	1069	1154	7158	1388	3041	8614	13591	1187	8524	19913	4253	6768	85497
620	1047	1162	7044	1367	2992	8391	13316	1168	8374	19461	3940	6672	85576
630	1024	1167	6909	1337	2944	8199	13052	1152	8258	18980	3672	6567	85653
640	1003	1174	6779	1302	2900	8024	12771	1138	8167	18518	3441	6463	85758
650	988	1181	6656	1275	2855	7871	12498	1122	8082	18103	3275	6346	85866
660	975	1183	6539	1246	2806	7724	12156	1101	8011	17723	3137	6238	85997
670	963	1185	6433	1223	2753	7596	11807	1077	7943	17391	3039	6150	86126
680	954	1187	6335	1204	2699	7490	11475	1052	7870	17089	2882	6068	86252
690	946	1180	6238	1183	2651	7367	11150	1030	7806	16778	2723	5974	86376
700	939	1168	6136	1160	2608	7242	10808	1014	7724	16464	2574	5891	86498
710	933	1155	6040	1137	2569	7132	10471	1001	7600	16136	2449	5815	86620
720	921	1144	5961	1115	2533	7034	10119	992	7480	15804	2364	5748	86740
730	902	1131	5867	1093	2491	6921	9737	988	7314	15514	2289	5694	86858
740	878	1117	5792	1067	2458	6791	9388	986	7191	15237	2223	5628	86973
750	854	1103	5716	1043	2425	6679	9094	984	7072	14978	2117	5567	87087
760	837	1082	5647	1021	2392	6570	8851	982	6959	14723	1996	5491	87200
770	824	1062	5555	1003	2363	6457	8633	982	6848	14507	1888	5412	87312
780	815	1041	5469	989	2331	6350	8470	984	6727	14283	1806	5314	87422
790	806	1022	5380	974	2298	6261	8345	985	6598	14078	1789	5222	87532
800	797	1003	5290	960	2263	6172	8256	989	6476	13879	1774	5156	87641
810	787	985	5211	945	2234	6088	8171	994	6356	13684	1752	5101	87748
820	778	969	5148	929	2206	6010	8070	1001	6240	13492	1742	5038	87855
830	772	959	5098	908	2182	5947	7928	1008	6140	13325	1757	4968	87960
840	766	948	5055	885	2157	5887	7824	1020	6040	13155	1772	4903	88065
850	762	938	5029	851	2131	5826	7713	1036	5926	12971	1772	4829	88168
860	757	929	5011	817	2105	5770	7573	1053	5817	12803	1761	4756	88271
870	752	924	4985	772	2081	5720	7441	1071	5715	12624	1750	4682	88373
880	746	920	4933	728	2057	5674	7372	1096	5609	12420	1735	4617	88471
890	742	918	4877	691	2030	5629	7320	1125	5515	12265	1720	4558	88569
900	738	919	4827	659	2004	5560	7294	1145	5425	12121	1708	4496	88666
910	731	919	4781	636	1980	5487	7270	1161	5334	11973	1671	4430	88762
920	722	920	4736	614	1958	5409	7246	1175	5250	11811	1617	4361	88858
930	711	923	4695	594	1939	5335	7270	1187	5166	11640	1554	4287	88952
940	702	926	4675	574	1919	5298	7251	1191	5089	11468	1527	4216	89046
950	696	930	4660	560	1896	5272	7207	1190	5020	11319	1499	4144	89139
960	690	935	4645	546	1872	5241	7170	1190	4956	11167	1471	4074	89231
970	685	939	4630	534	1848	5209	7139	1186	4884	11015	1454	4007	89323
980	681	946	4607	522	1825	5171	7110	1180	4811	10866	1437	3941	89414
990	677	953	4567	512	1802	5133	7113	1173	4747	10737	1435	3870	89504
1000	673	963	4533	504	1780	5094	7119	1166	4686	10609	1448	3800	89594

Table 10. WUA (ft^2) as a function of discharge (cfs) simulated for Mainstem Station 6 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
50	7365	2724	15301	2224	7547	9501	9587	2480	21873	22508	938	3826	61357
60	6870	3155	16051	2620	7477	9984	10189	2658	21574	23967	972	4924	64586
70	5600	3498	15942	3193	7256	10366	11253	2736	20698	24859	1044	5961	68465
80	4749	3764	15492	3687	6947	10742	11831	2750	20461	25549	1184	6882	70813
90	4356	3985	14895	3977	6617	10982	12191	2618	19940	26099	1396	7694	72458
100	4039	4015	14317	4232	6314	11120	12022	2570	19446	26379	1627	8424	74061
110	3592	3978	13664	4573	5983	11159	12059	2555	18868	26620	1888	9169	75491
120	3314	4051	13193	4713	5666	11210	12270	2574	19289	27298	2372	10053	77574
130	3036	3967	12654	4495	5483	11140	12523	2551	19255	27578	2925	10919	79007
140	2705	3899	12054	4296	5318	11170	12526	2551	18601	27630	3542	11876	80938
150	2489	3901	11477	4217	5180	11113	12441	2555	17928	27395	4512	12923	81964
160	2329	3831	10985	4107	5048	11083	12494	2560	17265	27116	5406	13949	82913
170	2205	3748	10585	3996	4916	10981	12677	2602	16689	26749	5826	14895	84326
180	2156	3688	10170	3853	4783	10741	12867	2659	16226	26277	6091	15777	85310
190	2126	3719	9813	3746	4671	10455	13051	2764	15832	25675	5684	16549	86299
200	2040	3784	9540	3732	4619	10200	12994	2881	15427	24975	5236	17176	87964
210	1974	3910	9268	3700	4565	9878	12888	2968	15018	24336	4874	17681	88477
220	1891	3993	9009	3645	4463	9587	12946	2977	14640	23774	4673	18122	88915
230	1839	4078	8759	3623	4382	9241	12995	2995	14340	23239	4511	18502	89332
240	1816	4126	8550	3641	4305	8935	12778	2970	14148	22748	4212	18797	90001
250	1812	4218	8384	3688	4253	8763	12401	2932	13603	22199	3842	18960	91113
260	1847	4393	8282	3801	4204	8636	11949	2921	13458	21612	3585	19030	91957
270	1885	4545	8182	3901	4185	8505	11396	2912	13588	21041	3471	19009	92767
280	1931	4752	8124	3980	4196	8376	10728	2880	13474	20573	3424	18900	93670
290	1945	4950	8025	4103	4226	8275	10260	2830	12858	20149	3421	18765	94470
300	1979	5146	7952	4215	4256	8182	10008	2832	12687	19852	3291	18593	94995
310	2020	5388	7871	4304	4299	8061	9944	2857	12587	19547	3113	18363	95334
320	1961	5553	7760	4424	4357	7938	9971	2901	12508	19281	3067	18117	95795
330	1901	5703	7618	4582	4449	7813	9946	2963	12426	18968	3052	17847	96258
340	1872	5776	7466	4827	4551	7688	9788	3017	12365	18708	3054	17515	96710
350	1868	5882	7342	5115	4651	7590	9579	3098	12294	18418	2975	17201	97360
360	1871	5975	7211	5303	4734	7500	9342	3181	12160	18194	2786	16957	98098
370	1886	6063	7094	5465	4807	7397	9159	3289	11940	17972	2616	16691	98884
380	1922	6096	6994	5661	4877	7267	9070	3386	11754	17771	2514	16432	99810
390	1965	6143	6919	5875	4920	7167	9011	3468	11614	17599	2358	16143	100668
400	2023	6169	6884	6007	4939	7079	8949	3528	11496	17455	2121	15841	101276
410	2046	6126	6846	6065	4946	7018	8991	3580	11417	17303	1929	15508	101879
420	2065	6108	6839	6087	4929	6978	9010	3625	11492	17177	1850	15187	102417
430	2054	6100	6866	6104	4878	6930	8960	3693	11661	17035	1783	14894	104176
440	2007	6032	6889	6191	4808	6880	8857	3798	11855	16864	1732	14663	105147
450	1995	5946	6948	6205	4736	6852	8813	3924	12061	16734	1678	14440	106061
460	1915	5860	6980	6153	4650	6798	8841	4086	12300	16611	1620	14223	106587
470	1829	5770	7006	6126	4561	6746	8835	4206	12526	16485	1534	14027	107098
480	1754	5689	6952	6102	4460	6702	8835	4295	12684	16362	1464	13849	107601
490	1666	5591	6888	6040	4364	6649	8747	4260	12825	16248	1424	13675	108007
500	1575	5484	6811	5988	4266	6593	8682	4167	13015	16141	1408	13525	110440
510	1518	5423	6739	5932	4158	6526	8510	4015	13180	15982	1385	13384	110860
520	1466	5380	6659	5864	4053	6448	8290	3886	13272	15812	1374	13298	111229
530	1420	5353	6584	5786	3950	6373	8030	3748	13388	15653	1371	13234	111561
540	1328	5364	6502	5703	3856	6298	7822	3611	13475	15488	1364	13178	111884
550	1260	5424	6405	5614	3767	6213	7610	3482	13528	15373	1374	13136	112202
560	1213	5515	6317	5552	3684	6164	7420	3366	13716	15274	1399	13112	112494
570	1175	5597	6233	5521	3604	6105	7292	3283	13908	15154	1422	13098	114555
580	1141	5667	6136	5548	3518	6034	7154	3218	14086	15044	1447	13092	114820

Table 10. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
590	1113	5668	6038	5620	3432	5951	7002	3153	14155	14917	1454	13090	115060
600	1087	5705	5960	5707	3347	5860	6871	3087	14204	14771	1450	13110	115297
610	1062	5735	5887	5811	3273	5767	6726	3019	14180	14624	1428	13123	115531
620	1039	5815	5810	5926	3211	5674	6565	2945	14133	14502	1395	13131	115761
630	1018	5850	5711	6026	3148	5581	6484	2870	14006	14407	1372	13138	115982
640	996	5887	5572	6110	3082	5488	6519	2796	13945	14325	1347	13159	116405
650	978	5881	5441	6222	3022	5398	6581	2712	13805	14249	1329	13200	119556
660	953	5873	5301	6285	2961	5318	6650	2613	13550	14204	1342	13263	120365
670	918	5902	5161	6238	2911	5258	6650	2484	13327	14139	1369	13332	120902
680	890	5958	5044	6185	2862	5198	6582	2366	13139	14052	1395	13410	121417
690	869	5950	4958	6154	2820	5147	6488	2279	13007	13952	1411	13461	121926
700	850	5920	4856	6120	2789	5094	6352	2187	12862	13851	1438	13496	122089
710	825	5896	4750	6082	2757	5025	6240	2108	12704	13737	1448	13572	122208
720	799	5868	4657	6061	2720	4916	6152	2035	12476	13602	1432	13672	122325
730	769	5812	4558	6122	2687	4807	6050	1979	12258	13454	1418	13734	122441
740	741	5741	4474	6173	2661	4725	5903	1940	12046	13311	1369	13760	122556
750	717	5622	4408	6118	2628	4638	5774	1921	11864	13185	1328	13771	122670
760	703	5491	4365	6007	2594	4533	5668	1907	11713	13046	1270	13727	122782
770	696	5356	4327	5923	2560	4436	5573	1896	11517	12877	1096	13649	122894
780	689	5226	4280	5872	2520	4370	5495	1885	11317	12708	1003	13540	123003
790	684	5091	4233	5853	2483	4269	5438	1878	11117	12576	952	13382	123107
800	679	4961	4194	5765	2446	4143	5374	1871	10898	12455	894	13191	123210
810	667	4840	4172	5682	2415	4028	5301	1871	10702	12312	825	12974	123312
820	653	4732	4169	5597	2390	3951	5173	1876	10519	12162	769	12733	123414
830	644	4633	4167	5544	2363	3894	5010	1886	10339	11992	723	12478	123514
840	640	4534	4151	5520	2329	3849	4828	1910	10144	11835	686	12212	123614
850	639	4439	4105	5513	2292	3821	4779	1930	9960	11675	663	11934	123712
860	640	4356	4059	5439	2254	3797	4772	1947	9789	11536	656	11649	123810
870	641	4286	4016	5346	2214	3785	4777	1965	9646	11415	653	11346	123907
880	622	4224	3964	5265	2171	3774	4732	1984	9521	11289	651	11017	124003
890	597	4167	3909	5194	2127	3762	4691	2004	9403	11142	648	10676	124098
900	584	4121	3854	5126	2101	3740	4623	2018	9299	10968	646	10313	124192
910	574	4074	3798	5068	2072	3725	4511	2033	9204	10795	646	9958	124286
920	566	4027	3747	5010	2044	3722	4324	2049	9106	10651	654	9626	124379
930	560	3985	3704	4952	2021	3719	4094	2066	9013	10530	679	9305	124471
940	555	3951	3658	4890	2000	3730	3863	2078	8929	10458	709	9016	124562
950	550	3924	3622	4822	1980	3746	3713	2068	8852	10416	714	8762	124645
960	547	3911	3586	4755	1960	3753	3630	2059	8795	10373	716	8514	124721
970	544	3924	3550	4691	1941	3753	3564	2047	8743	10324	716	8283	124808
980	542	3951	3524	4632	1918	3737	3506	2035	8695	10270	717	8062	124887
990	541	3978	3504	4578	1891	3702	3460	2020	8651	10214	694	7845	124966
1000	539	4004	3482	4526	1868	3657	3417	2002	8605	10156	643	7640	125039

Table 11. WUA (ft^2) as a function of discharge (cfs) simulated for Mainstem Station 7 for several salmonid species/life stages.

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
50	6739	1868	16730	1318	9120	12883	11680	1593	20699	27200	1158	1493	55060
60	5800	1966	16554	1510	8456	13500	12396	1401	19022	28114	1896	2566	57573
70	5253	2077	16226	1706	7831	13881	13169	1159	17650	28700	2667	3755	59602
80	4670	2096	15489	1875	7133	14046	13716	944	16726	28890	3112	5086	60459
90	4386	2036	14870	1909	6440	13846	13845	766	16375	28931	3781	6605	62251
100	3925	1870	14102	1863	6002	13607	14203	627	16100	28747	4110	8283	62947
110	3437	1691	13445	1810	5696	13285	14321	553	15840	28310	4696	9789	63588
120	3168	1532	12856	1763	5449	12970	14507	468	15447	27681	4958	11052	64280
130	2983	1385	12280	1654	5216	12539	14586	435	15236	26977	5442	12208	65039
140	2813	1289	11773	1558	5025	12174	14859	425	15418	26521	5777	13044	66691
150	2777	1223	11588	1489	5126	11967	15240	425	16232	26669	6036	13794	68400
160	2721	1151	11217	1421	5024	11654	15359	427	16031	26232	6352	14384	69239
170	2688	1078	10940	1353	4910	11207	15422	439	15923	25818	6664	14850	70015
180	2649	1013	10623	1278	4812	10703	15410	466	16050	25382	6763	15177	70595
190	2493	966	10297	1242	4735	10238	15014	499	16257	25069	6904	15347	71108
200	2350	929	10079	1181	4668	9767	14518	549	16144	24672	6928	15443	71512
210	2275	894	9968	1107	4620	9296	14027	602	16283	24190	6454	15424	71883
220	2210	850	9822	1043	4591	8913	13685	636	15990	23593	5940	15324	72208
230	2141	817	9768	987	4629	8637	13157	662	15791	23238	5728	15156	72633
240	2080	793	9690	945	4604	8424	12580	675	15431	22779	5531	14900	73067
250	2066	807	9725	907	4620	8272	11937	683	15114	22367	5407	14549	73488
260	2060	852	9657	878	4645	8165	11504	670	14791	22016	5135	14163	73898
270	2071	915	9612	848	4669	8149	11093	651	14474	21749	4594	13686	74360
280	2109	946	9513	818	4677	8165	10711	632	14209	21483	4210	13187	74900
290	2164	959	9454	801	4695	8166	10389	611	13901	21233	3814	12713	75476
300	2222	956	9436	795	4709	8185	10058	592	13521	20912	3407	12236	76022
310	2251	934	9378	806	4740	8229	9662	570	13217	20657	3037	11769	76523
320	2254	911	9282	818	4769	8289	9404	547	12978	20466	2752	11322	77028
330	2275	913	9217	834	4790	8342	9123	523	12828	20337	2630	10916	78123
340	2298	918	9126	839	4792	8417	8941	500	12787	20259	2511	10566	78777
350	2333	917	9059	839	4807	8499	8890	473	12829	20247	2393	10246	79924
360	2376	912	9024	837	4817	8594	8805	449	12870	20148	2268	10012	80900
370	2467	892	9038	829	5042	8819	8740	428	13365	20544	2236	9793	81355
380	2478	864	9030	820	5081	9067	8598	410	13389	20405	2325	9585	81676
390	2472	837	9062	809	5077	9298	8459	402	13283	20218	2468	9389	82040
400	2461	803	9157	804	5022	9415	8334	398	13179	20013	2566	9208	82388
410	2439	772	9244	793	4984	9497	8370	397	13017	19835	2647	9036	82729
420	2413	741	9283	788	4938	9531	8600	394	12908	19683	2728	8895	83064
430	2408	728	9319	762	4867	9549	8929	393	12846	19518	2889	8795	83394
440	2406	720	9266	713	4790	9587	9359	393	12736	19329	2924	8702	83718
450	2408	714	9162	662	4715	9622	9831	397	12623	19157	2849	8579	84037
460	2414	717	9042	624	4628	9655	10323	406	12535	18972	2944	8433	84355
470	2426	737	8912	595	4534	9672	10696	419	12531	18781	3072	8292	84659
480	2370	769	8794	568	4448	9680	10976	434	12698	18625	3244	8138	84951
490	2288	797	8700	544	4361	9648	11138	446	12883	18508	3211	7989	86242
500	2214	845	8620	531	4277	9591	11217	493	13053	18420	3189	7866	86567
510	2177	894	8539	518	4201	9519	11398	558	13154	18315	3207	7744	86884
520	2134	922	8442	507	4133	9403	11575	611	13200	18198	3206	7610	87196
530	2104	937	8308	496	4061	9260	11842	649	13171	18014	3265	7476	87564
540	2082	939	8182	484	4002	9120	11906	685	13085	17809	3229	7345	87942
550	2021	942	8069	471	3952	8989	11885	720	13005	17616	3165	7211	88315
560	1949	946	7956	473	3910	8875	11778	763	12986	17390	3186	7068	88683
570	1873	958	7822	483	3857	8770	11579	806	12856	17183	3281	6948	89108
580	1828	983	7667	514	3801	8651	11337	853	12623	16938	3381	6813	89515

Table 11. (continued).

Discharge (cfs)	Coho Salmon		Chinook Salmon		Cutthroat Trout				Steelhead Trout				Gross Stream Surface Area
	F	S	J	S	F	J	A	S	F	J	A	S	(ft^2)
590	1785	1024	7526	543	3748	8485	11085	897	12432	16698	3459	6663	89915
600	1745	1088	7426	560	3703	8306	10777	941	12271	16540	3440	6511	90307
610	1717	1113	7344	589	3668	8118	10522	979	12177	16369	3344	6377	90672
620	1688	1140	7274	634	3635	7948	10281	1012	12100	16207	3255	6246	91089
630	1662	1174	7190	680	3608	7773	10079	1028	12066	16057	3222	6111	91798
640	1641	1213	7101	701	3582	7559	9904	1039	12060	15886	3187	5970	92209
650	1621	1257	7013	720	3557	7341	9741	1050	12060	15705	2992	5862	92417
660	1607	1301	6922	745	3529	7129	9539	1069	12093	15530	2787	5761	92623
670	1600	1348	6869	776	3507	6939	9286	1091	12143	15364	2650	5672	92820
680	1597	1410	6843	797	3491	6792	9038	1116	12204	15196	2565	5577	93015
690	1589	1492	6813	819	3473	6651	8793	1145	12281	15062	2460	5504	93208
700	1585	1591	6742	839	3452	6519	8552	1182	12323	14971	2396	5450	93399
710	1586	1668	6643	853	3434	6398	8365	1212	12331	14901	2378	5403	93586
720	1588	1715	6557	876	3421	6279	8221	1237	12308	14838	2360	5404	93778
730	1585	1750	6474	907	3408	6160	8085	1259	12262	14759	2342	5437	93966
740	1589	1758	6396	945	3387	6060	7904	1282	12214	14673	2329	5476	94152
750	1593	1767	6318	989	3367	5974	7705	1302	12189	14585	2254	5516	94337
760	1599	1776	6240	1031	3346	5905	7480	1319	12154	14493	2186	5559	94520
770	1609	1782	6166	1077	3334	5845	7236	1340	12147	14378	2122	5624	94668
780	1620	1802	6095	1129	3325	5787	6971	1361	12242	14279	2062	5688	95358
790	1633	1828	6048	1175	3318	5751	6676	1393	12360	14195	2080	5754	95824
800	1648	1825	6013	1234	3316	5723	6410	1436	12404	14087	2110	5812	96028
810	1665	1823	5993	1286	3312	5697	6166	1480	12368	14014	2156	5914	96230
820	1682	1823	5967	1333	3305	5659	5961	1531	12302	13958	2214	6022	96431
830	1700	1825	5929	1385	3300	5597	5834	1582	12220	13882	2289	6128	96630
840	1719	1832	5879	1464	3291	5533	5854	1648	12134	13800	2372	6245	96827
850	1738	1842	5836	1526	3282	5476	5868	1722	12097	13739	2484	6357	97022
860	1755	1852	5787	1545	3275	5423	5876	1795	12100	13708	2606	6453	97216
870	1771	1861	5779	1541	3273	5392	5866	1858	12101	13671	2738	6550	97409
880	1776	1877	5788	1537	3272	5361	5839	1920	12079	13638	2845	6634	97600
890	1778	1894	5797	1529	3273	5324	5823	1974	12065	13605	2950	6694	97749
900	1780	1911	5783	1525	3274	5304	5846	2008	12038	13542	3067	6725	97895
910	1785	1931	5743	1529	3272	5289	5908	2025	12018	13461	3153	6739	98024
920	1791	1958	5708	1536	3271	5268	5974	2046	12004	13400	3222	6737	98152
930	1798	1982	5679	1541	3268	5243	6043	2072	11980	13359	3290	6725	98261
940	1807	1994	5649	1551	3264	5216	6047	2091	11969	13323	3236	6708	99244
950	1819	2009	5636	1554	3264	5174	6012	2110	11963	13277	3161	6675	99532
960	1830	2021	5634	1556	3278	5125	5989	2128	11940	13199	3095	6633	99742
970	1840	2038	5635	1568	3298	5090	5963	2142	11915	13115	3100	6585	100807
980	1853	2076	5640	1595	3326	5059	5882	2133	11883	13048	3015	6542	101469
990	1867	2119	5644	1623	3362	5044	5797	2124	11788	12998	2934	6494	101960
1000	1882	2169	5642	1659	3395	5031	5770	2111	11678	12951	2853	6425	102369

last column of the tables. Habitat simulation results for pink and chum salmon spawning are presented for all study reaches in Appendix Tables B1 through B7. WUA indices for these species were not incorporated into the optimization procedure used to derive instream flow recommendations, but are included for management considerations.

6.3 Habitat Optimization Results

Tables 13 through 19 summarize the incubation WUA available for each species by study reach. The spawning flows used in the effective spawning habitat simulations correspond to the discharges associated with the peak spawning WUA determined for the separate species.

Habitat indices calculated for each species/life stage for the South Fork, North Fork and mainstem Tolt River may be found in Tables 20, 21 and 22, respectively. Index values for the South Fork and mainstem are each based on WUA data synthesized from three study reaches. Peak incubation indices (100%) for salmonids in both river segments are attained at the highest discharges from the individual study reaches which provide the same amounts of incubation and peak spawning habitat, as identified by the effective spawning habitat analyses. For example, Table 20 indicates that an incubation habitat index value of 100% first occurs at 255 cfs for steelhead trout in the South Fork. This flow corresponds to the lowest discharge at South Fork station 1 at which incubation habitat is maximized (refer to Table 13). The equivalent discharges at stations 2 (Table 14) and 3 (Table 15) are both less than 255 cfs, yet still provide 100% steelhead incubation habitat at this flow. Thus, an incubation habitat index value of 100% is determined by the highest discharge for all three study reaches. Incubation habitat indices remain at this level as streamflows are increased.

Efficiency index values for the South Fork, North Fork and mainstem Tolt

Table 12. South Fork Station 1 effective spawning habitat values.

Species	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat ft^2/1000 ft)
Coho salmon	55	≥20	1383.65
Chinook salmon	70	≥20	2128.23
Cutthroat trout	180	20	403.76
		25	603.92
		30-45	928.41
		50	1189.73
		55	1749.40
		≥60	1760.80
Steelhead trout	425	20	5272.04
		25	5644.78
		30	6141.92
		35-45	6185.97
		50	6296.40
		55	6773.46
		60-70	6916.45
		75-105	6916.51
		110-250	7078.67
		≥255	7117.48

Table 13. South Fork Station 2 effective spawning habitat values.

Species	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	30	≥20	7233.54
Chinook salmon	40	20	5997.11
		≥25	6007.88
Cutthroat trout	35	≥20	2350.10
Steelhead trout	95	20	4272.70
		≥25	4692.18

Table 14. South Fork Station 3 effective spawning habitat values.

Species	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	285	20-25	102.57
		30-35	103.82
		40-45	529.01
		50-80	1084.77
		85-130	1463.23
		≥135	1704.54
Chinook salmon	325	20-25	83.77
		30-35	84.70
		40-45	611.56
		50-80	1144.01
		85-130	1682.03
		≥135	1756.96
Cutthroat trout	215*	20-25	301.57
		30-35	307.16
		40-45	781.58
		50	1287.24
		55-80	1308.66
		85-130	1560.33
		≥135	1573.07
Steelhead trout	185	20-25	4845.28
		30-45	5123.32
		50-80	5146.08
		≥85	5159.36

*Incorrectly read as 215 cfs, correct value is 105 cfs. This error was discovered during final editing and not corrected because the low weighting given cutthroat trout was not expected to significantly affect the final results.

Table 15. North Fork Station 4 effective spawning habitat values.

Spawning	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	105	20	2525.98
		25-40	2602.24
		≥45	2608.37
Chinook salmon	130	20	1752.43
		25-40	1780.95
		45	1783.09
Cutthroat trout	75	20	2041.72
		≥25	2046.30
Steelhead trout	200	20	12736.07
		25-35	13204.09
		40	13204.73
		45-75	13214.93
		≥80	13240.97

Table 16. Mainstem Station 5 effective spawning habitat values.

Spawning	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	110	50	3199.80
		≥60	3200.35
Chinook salmon	140	50	2787.88
		≥60	2788.17
Cutthroat trout	60	≥50	2429.32
Steelhead trout	250	50	16581.32
		60	16613.10
		70	16620.05

Table 17. Mainstem Station 6 effective spawning habitat values.

Spawning	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	680	50	1501.21
		60-70	1694.60
		80	1899.82
		90-100	1994.12
		110-120	2255.44
		130	2331.81
		140	2509.67
		150-160	2760.14
		170	2908.41
		180-190	3366.71
		200	3476.19
		210-230	3519.59
		240	3818.57
		250	3843.51
		260	4158.40
		270-310	4158.61
		320-340	4177.48
		350-360	5580.86
		370-420	5585.09
		$\geq$ 430	5958.50
Chinook salmon	660	50	1924.78
		60	2272.61
		70	2273.45
		80	2752.27
		90	2982.90
		100	3006.39
		110	3428.89
		120	3518.62
		130	3833.32
		140	4191.83
		150-160	4591.51
		170	4887.85
		180-190	5056.66
		200	5243.48
		210-230	5250.50
		240	5320.95
		250	5324.02
		260-340	5924.31
		350-360	6249.83
		370-420	6254.87
		$\geq$430	6285.15

Table 17. (continued).

Spawning	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Cutthroat trout	480	50	1835.24
		60-70	2220.46
		80	2542.73
		90	2654.96
		100	2667.06
		110	3136.40
		120	3148.51
		130	3235.68
		140	3630.18
		150-160	3831.64
		170	3944.22
		180	4027.91
		190	4088.09
		200	4185.13
		210-230	4185.82
		240-50	4223.27
		260-310	4289.06
		320-340	4289.19
		$\geq$350	4294.53
Steelhead trout	260	50	18233.97
		60	18408.95
		70-80	18853.92
		90	18960.09
		110-120	19025.73
		$\geq$130	19029.36

Table 18. Mainstem Station 7 effective spawning habitat values.

Species	Spawning Q (cfs)	Incubation Q (cfs)	Effective Spawning Habitat (ft^2/1000 ft)
Coho salmon	1000	50-110	17.40
		120-130	44.30
		140	53.17
		150-160	68.09
		170-190	104.65
		200-260	175.23
		270	215.65
		280-290	271.60
		300-310	622.55
		320-330	670.21
		340	865.29
		350	951.10
		360-370	969.35
		380-450	1161.50
		460-480	1195.22
		490-520	1787.99
		530-590	1821.59
		600	2096.73
		610-760	2135.48
		$\geq$770	2169.35
Chinook salmon	90	$\geq$50	1909.24
Cutthroat trout	970	50-110	0.0
		120-140	12.76
		150-160	13.34
		170-190	23.47
		200-220	57.95
		230-260	60.00
		270	66.54
		280-290	78.69
		300-310	533.70
		320-330	559.66
		340	676.56
		350	707.03
		360-370	709.16
		380-450	765.56
		460-480	768.29
		490-520	1876.65
		530-590	1880.34
		600	1936.86
		610-620	1985.15
		630-760	2106.43
		$\geq$770	2141.73
Steelhead trout	200	50	15337.55
		$\geq$60	15442.60

Table 19. Habitat index values for several species/life stages in the South Fork Tolt River.

	DISCHARGE (CFS)														
SPECIES/LIFE STAGE	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
COHO/FRY	100.00	99.51	96.95	94.03	93.85	92.04	88.06	84.53	82.17	81.91	80.18	76.09	71.98	68.54	65.64
COHO/SPAWNING	69.84	91.45	100.00	98.72	94.49	90.89	89.22	88.27	85.18	80.15	75.34	71.48	63.45	58.71	54.54
COHO/INCUBATION	82.89	82.89	82.90	82.90	87.44	87.44	93.39	93.39	93.39	93.39	93.39	93.39	93.39	97.43	97.43
CHINOOK/JUVENILE	92.24	97.95	99.97	100.00	99.59	98.72	97.98	97.33	96.54	96.99	95.55	94.62	93.35	91.47	89.87
CHINOOK/SPAWNING	40.82	67.62	81.75	91.78	100.00	98.41	96.78	93.88	91.27	91.31	91.66	89.03	84.03	82.40	80.43
CHINOOK/INCUBATION	82.70	82.78	82.79	82.79	88.22	88.22	93.69	93.69	93.69	93.69	93.69	93.69	93.69	99.23	99.23
CUTTHROAT/FRY	96.46	99.16	100.00	99.78	98.82	98.06	97.03	95.12	93.46	93.56	90.76	88.46	85.99	83.37	80.70
CUTTHROAT/JUVENILE	58.76	66.57	72.70	78.33	83.42	87.75	91.26	93.46	95.10	97.06	98.15	99.78	100.00	99.26	98.20
CUTTHROAT/ADULT	44.93	50.13	55.78	61.56	65.65	69.64	73.96	77.16	80.83	84.16	87.91	90.73	93.07	95.66	96.47
CUTTHROAT/SPAWNING	63.98	77.34	86.82	93.01	90.91	86.51	83.68	80.24	78.21	76.56	77.08	78.67	79.32	80.25	81.82
CUTTHROAT/INCUBATION	43.72	48.99	57.62	57.62	65.27	65.27	80.32	95.43	95.75	95.75	95.75	95.75	95.75	99.81	99.81
STEELHEAD/FRY	100.00	98.40	95.01	90.93	87.03	85.50	83.81	80.58	78.10	78.03	75.48	73.42	70.54	69.48	68.37
STEELHEAD/JUVENILE	75.13	83.03	88.28	91.98	94.49	96.33	97.57	98.14	98.57	100.00	99.98	99.64	98.53	97.34	95.85
STEELHEAD/ADULT	12.82	17.85	24.85	32.74	40.94	52.11	60.08	64.85	67.77	72.07	78.61	83.40	88.30	92.46	93.16
STEELHEAD/SPAWNING	8.09	13.10	17.56	24.01	30.13	34.72	39.99	45.86	51.46	57.01	62.78	67.61	72.82	77.11	80.89
STEELHEAD/INCUBATION	82.04	86.58	91.96	92.31	92.31	92.31	93.31	97.16	98.31	98.31	98.31	98.32	98.32	98.39	98.39

SPECIES/LIFE STAGE	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
COHO/FRY	63.22	61.50	59.83	58.35	56.74	55.18	53.67	52.29	50.89	49.42	48.24	47.44	46.82	46.32	45.90
COHO/SPAWNING	52.24	51.58	51.66	50.69	48.91	47.30	47.55	48.21	49.29	51.98	52.45	51.98	51.96	51.92	52.41
COHO/INCUBATION	97.43	97.43	97.43	97.43	97.43	97.43	97.43	97.43	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	88.34	86.87	85.36	84.02	82.75	81.43	80.17	78.84	77.30	75.58	74.05	72.65	71.27	69.89	68.77
CHINOOK/SPAWNING	77.25	72.97	68.39	63.08	59.10	56.14	53.45	51.76	50.69	50.36	49.93	49.67	49.90	50.50	50.94
CHINOOK/INCUBATION	99.23	99.23	99.23	99.23	99.23	99.23	99.23	99.23	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	78.06	75.72	73.58	71.86	70.26	68.74	67.30	65.88	64.51	63.15	62.22	61.26	60.42	59.70	59.01
CUTTHROAT/JUVENILE	97.13	95.60	93.92	92.08	90.29	88.72	87.24	85.62	83.89	82.36	81.22	80.15	79.09	78.05	76.92
CUTTHROAT/ADULT	96.29	96.57	97.55	99.19	100.00	99.74	99.24	97.85	96.90	95.68	94.29	92.36	90.68	89.18	87.61
CUTTHROAT/SPAWNING	83.53	84.84	85.29	84.39	83.57	82.96	82.14	82.41	83.30	85.40	87.45	89.80	92.59	94.79	96.63
CUTTHROAT/INCUBATION	99.81	99.81	99.81	99.81	99.81	99.81	99.81	99.81	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	66.64	64.79	63.15	61.83	60.86	60.04	59.42	58.80	57.96	57.10	56.37	55.66	54.85	54.26	53.78
STEELHEAD/JUVENILE	94.47	93.26	92.07	90.80	89.45	88.05	86.72	85.50	84.20	83.05	82.27	81.50	80.81	80.14	79.50
STEELHEAD/ADULT	93.32	94.84	95.47	96.60	96.56	98.32	99.34	100.00	98.63	96.59	94.99	94.61	94.91	94.90	94.88
STEELHEAD/SPAWNING	83.68	86.23	88.44	90.30	91.54	92.35	93.05	93.64	94.30	94.82	95.35	95.79	96.21	96.32	96.22
STEELHEAD/INCUBATION	98.39	98.39	98.39	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69

Table 19. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
COHO/FRY	45.40	44.70	44.14	43.65	43.07	42.52	42.09	41.70	41.46	41.25	40.97	40.59	40.16	39.77	39.43
COHO/SPAWNING	53.05	53.59	53.86	54.21	53.77	53.18	52.66	52.05	51.40	50.81	50.20	49.71	49.39	49.26	49.23
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	67.76	66.79	65.79	64.82	63.99	63.09	62.23	61.41	60.66	59.95	59.25	58.59	58.00	57.47	56.96
CHINOOK/SPAWNING	51.05	50.95	50.90	50.76	51.00	51.61	53.04	53.45	53.86	54.95	56.49	56.64	56.57	56.54	56.41
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	58.32	57.76	57.27	56.80	56.31	55.71	55.11	54.51	53.94	53.44	52.94	52.36	51.90	51.44	51.00
CUTTHROAT/JUVENILE	75.68	74.40	73.19	71.96	70.50	69.01	67.64	66.35	65.25	64.27	63.37	62.01	61.18	60.27	59.37
CUTTHROAT/ADULT	86.03	84.40	83.10	82.07	81.04	80.42	79.79	78.99	78.07	77.08	76.26	74.56	73.52	72.36	71.16
CUTTHROAT/SPAWNING	98.03	98.53	98.78	99.16	100.00	99.33	97.33	95.10	93.08	91.12	88.88	86.21	82.86	79.61	76.87
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	53.35	53.07	52.84	52.61	52.39	52.20	52.02	52.04	51.93	51.83	51.44	51.10	51.00	50.89	50.54
STEELHEAD/JUVENILE	78.77	77.99	77.30	76.52	75.81	75.08	74.36	73.69	73.05	72.45	71.92	71.21	70.70	70.14	69.61
STEELHEAD/ADULT	94.89	95.04	94.55	94.53	93.90	91.59	89.77	88.68	87.45	85.98	85.19	84.39	82.19	80.17	78.34
STEELHEAD/SPAWNING	96.17	96.07	95.93	95.82	95.73	95.61	95.48	95.18	95.04	94.87	94.52	93.94	93.78	93.70	93.59
STEELHEAD/INCUBATION	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69	99.69

SPECIES/LIFE STAGE	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
COHO/FRY	39.22	38.99	38.73	38.28	37.85	37.58	37.33	37.08	36.83	36.62	36.44	36.27	36.13	36.01	35.93
COHO/SPAWNING	49.55	49.89	50.32	50.28	50.05	49.81	49.49	49.16	49.17	49.02	48.77	48.52	48.16	47.76	47.44
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	56.48	56.05	55.52	55.21	54.92	54.57	54.15	53.67	53.27	52.85	52.43	52.02	51.63	51.28	50.97
CHINOOK/SPAWNING	56.30	56.29	56.35	56.45	56.54	56.75	56.90	56.98	57.06	56.83	56.67	56.48	56.23	56.00	55.76
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	50.68	50.44	50.15	49.88	49.52	49.23	48.99	48.74	48.51	48.26	47.95	47.69	47.48	47.29	47.10
CUTTHROAT/JUVENILE	58.61	57.91	57.28	56.60	56.08	55.56	55.12	54.73	54.41	54.12	53.83	53.53	53.23	53.03	52.85
CUTTHROAT/ADULT	69.96	68.94	68.29	67.66	67.00	66.37	65.93	65.80	65.70	65.65	65.51	65.68	66.14	66.44	66.58
CUTTHROAT/SPAWNING	73.99	71.17	68.69	66.20	63.91	61.89	60.23	58.66	57.35	56.37	55.49	54.76	54.02	53.45	53.04
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	49.98	49.65	48.80	47.92	47.15	46.53	46.05	45.70	45.43	45.17	44.91	44.53	44.14	43.76	43.38
STEELHEAD/JUVENILE	69.14	68.63	68.08	67.51	66.79	66.16	65.60	65.17	64.72	64.34	64.02	63.73	63.45	63.09	62.70
STEELHEAD/ADULT	76.98	75.93	74.94	74.22	73.68	73.59	73.63	73.75	73.85	73.97	73.74	73.59	73.24	73.03	72.75
STEELHEAD/SPAWNING	93.65	93.83	93.98	94.35	94.94	95.54	96.08	96.56	96.98	97.46	97.85	98.17	98.35	98.46	98.64
STEELHEAD/INCUBATION	99.69	99.69	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 19. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
COHO/FRY	35.85	35.76	35.69	35.66	35.63	35.59	35.62	35.61	35.61	35.60	35.62	35.64	35.66	35.71	35.81
COHO/SPAWNING	47.18	46.82	46.23	45.63	45.18	44.77	44.62	44.61	44.63	44.53	44.59	44.63	44.74	45.22	45.88
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	50.69	50.43	50.22	50.09	50.00	49.96	49.90	49.79	49.70	49.57	49.35	49.13	48.91	48.69	48.54
CHINOOK/SPAWNING	55.34	55.22	55.13	54.58	53.73	52.84	52.36	51.93	51.50	51.22	51.60	52.55	53.57	53.47	53.08
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	46.96	46.84	46.77	46.73	46.68	46.69	46.72	46.75	46.72	46.66	46.59	46.48	46.38	46.19	45.99
CUTTHROAT/JUVENILE	52.73	52.62	52.51	52.37	52.19	52.01	51.87	51.72	51.52	51.27	51.07	50.91	50.71	50.46	50.21
CUTTHROAT/ADULT	66.53	66.25	65.84	65.28	64.63	64.04	63.89	64.08	64.32	64.47	64.37	64.12	63.91	63.61	63.30
CUTTHROAT/SPAWNING	52.85	53.00	53.62	54.44	55.29	55.82	56.35	56.84	57.31	57.79	58.38	59.12	59.63	59.90	60.34
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	43.03	42.64	42.24	41.89	41.65	41.40	41.24	41.13	41.04	41.01	41.06	41.18	41.31	41.44	41.58
STEELHEAD/JUVENILE	62.33	61.92	61.51	61.08	60.67	60.28	59.95	59.62	59.28	58.94	58.65	58.36	58.08	57.83	57.61
STEELHEAD/ADULT	72.72	72.82	73.04	73.43	73.79	73.57	73.49	73.55	73.48	73.38	73.40	73.46	73.43	73.07	72.70
STEELHEAD/SPAWNING	98.82	99.03	99.32	99.54	99.74	99.92	99.98	100.00	99.99	99.89	99.80	99.80	99.83	99.83	99.82
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
COHO/FRY	35.91	36.02	36.13	36.22	36.33	36.45	36.58	36.74	36.88	37.03	37.21	37.41	37.58	37.69	37.78
COHO/SPAWNING	46.32	46.74	47.26	47.80	48.45	49.53	50.44	51.39	52.53	53.35	54.09	54.74	55.36	56.02	56.71
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	48.46	48.42	48.41	48.43	48.40	48.21	48.00	47.78	47.57	47.37	47.18	47.00	46.83	46.67	46.55
CHINOOK/SPAWNING	52.83	52.42	51.93	51.53	51.19	50.82	50.61	50.57	50.58	50.45	50.65	50.97	51.30	51.57	52.10
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	45.77	45.58	45.39	45.21	45.04	44.85	44.68	44.54	44.38	44.24	44.10	43.96	43.84	43.72	43.61
CUTTHROAT/JUVENILE	50.02	49.77	49.58	49.39	49.18	48.94	48.67	48.38	48.09	47.82	47.63	47.43	47.24	47.05	46.89
CUTTHROAT/ADULT	62.84	62.30	61.76	61.19	60.73	60.50	60.41	60.42	60.46	60.48	60.24	59.88	59.48	59.06	58.58
CUTTHROAT/SPAWNING	60.47	60.49	60.64	60.68	60.56	60.50	60.43	60.27	60.12	59.97	59.89	59.62	59.30	58.93	58.67
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	41.69	41.78	41.86	41.96	41.97	41.97	41.97	41.96	41.96	41.97	42.02	42.05	42.10	42.16	42.24
STEELHEAD/JUVENILE	57.39	57.16	56.92	56.69	56.47	56.24	55.99	55.74	55.48	55.22	54.98	54.74	54.51	54.30	54.07
STEELHEAD/ADULT	72.55	72.28	71.87	71.28	70.74	70.43	70.18	69.90	69.29	68.75	68.51	68.19	67.97	67.77	67.55
STEELHEAD/SPAWNING	99.77	99.65	99.54	99.43	99.29	99.11	98.88	98.64	98.38	98.10	97.80	97.46	97.08	96.70	96.29
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 20. Habitat index values for several species/life stages in the North Fork Tolt River.

DISCHARGE (CFS)

SPECIES/LIFE STAGE	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
COHO/FRY	63.77	76.59	86.24	91.46	95.92	99.78	100.00	99.34	99.10	98.85	96.92	95.86	94.86	92.97	91.33
COHO/SPAWNING	42.64	46.32	47.39	42.37	38.65	45.40	53.57	63.61	73.31	79.03	81.44	82.75	84.16	87.96	92.94
COHO/INCUBATION	96.86	99.77	99.77	99.77	99.77	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	56.60	69.80	78.06	85.10	92.42	96.11	98.15	99.53	99.90	100.00	99.31	98.33	97.26	96.20	95.39
CHINOOK/SPAWNING	27.20	19.52	16.60	18.62	18.90	21.20	24.34	30.06	38.59	43.47	48.57	55.52	60.57	66.01	69.77
CHINOOK/INCUBATION	98.26	99.89	99.89	99.89	99.89	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	79.73	89.35	94.70	98.17	100.00	99.89	98.55	96.56	94.31	91.70	88.62	85.88	83.34	81.03	78.95
CUTTHROAT/JUVENILE	37.89	49.14	60.16	69.58	76.16	82.08	88.15	93.19	96.13	97.96	99.13	99.65	99.87	100.00	99.58
CUTTHROAT/ADULT	20.81	27.98	37.76	44.39	50.92	61.19	68.45	73.03	77.32	80.84	85.13	89.27	91.30	92.33	94.01
CUTTHROAT/SPAWNING	79.81	76.59	63.98	56.60	57.92	62.71	70.92	82.70	90.47	94.43	98.24	100.00	99.56	98.09	92.72
CUTTHROAT/INCUBATION	99.80	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	99.00	99.24	100.00	96.84	93.33	89.14	85.67	81.74	77.69	74.42	71.65	69.11	66.71	64.51	61.92
STEELHEAD/JUVENILE	54.08	62.32	69.44	75.53	80.87	85.04	88.45	90.80	92.60	94.15	95.39	96.73	97.81	98.81	99.64
STEELHEAD/ADULT	1.54	2.69	4.36	6.62	9.96	13.11	16.70	20.06	24.74	30.34	37.28	44.50	52.26	60.95	70.96
STEELHEAD/SPAWNING	1.39	2.26	3.19	4.21	5.20	6.54	8.31	10.54	13.13	16.55	20.32	25.26	30.10	35.28	40.25
STEELHEAD/INCUBATION	96.19	99.72	99.72	99.72	99.73	99.80	99.80	99.80	99.80	99.80	99.80	99.80	100.00	100.00	100.00

SPECIES/LIFE STAGE	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
COHO/FRY	89.38	87.17	85.30	83.83	82.51	81.00	78.70	75.95	73.90	72.37	71.30	70.50	70.13	69.76	69.52
COHO/SPAWNING	98.16	99.43	100.00	97.97	93.60	88.69	83.24	77.99	71.82	67.06	63.57	61.43	60.93	61.93	64.00
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	94.07	92.57	91.20	90.21	89.15	88.36	87.66	86.95	85.70	84.27	82.92	81.78	81.55	80.80	79.98
CHINOOK/SPAWNING	74.20	79.42	84.29	89.34	93.33	96.80	99.78	100.00	98.88	96.97	94.22	90.46	84.69	79.59	74.37
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	76.71	74.52	72.25	70.15	68.30	66.48	64.83	63.34	61.89	60.46	58.85	57.28	56.76	55.55	54.42
CUTTHROAT/JUVENILE	98.65	97.30	95.85	94.07	92.09	90.04	88.17	86.15	83.88	81.58	79.65	78.11	77.08	75.87	74.52
CUTTHROAT/ADULT	97.13	99.33	99.84	99.39	99.60	99.51	99.26	99.02	99.28	100.00	99.77	98.77	97.34	95.94	94.66
CUTTHROAT/SPAWNING	85.73	78.45	70.23	63.39	57.57	52.74	49.95	48.24	47.26	47.02	47.95	48.19	47.61	46.77	45.89
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	59.53	57.37	55.45	53.38	51.29	49.93	48.81	47.76	46.40	44.88	43.63	42.48	42.52	41.48	40.39
STEELHEAD/JUVENILE	100.00	99.86	99.52	99.14	98.60	98.01	97.28	96.47	95.69	94.91	94.08	93.31	94.39	93.67	92.81
STEELHEAD/ADULT	80.77	88.01	93.52	97.99	100.00	99.69	98.36	96.66	94.41	86.80	81.04	78.98	79.55	80.00	80.31
STEELHEAD/SPAWNING	45.46	50.77	56.17	61.39	65.92	69.78	73.49	77.09	80.67	84.03	86.86	89.50	91.62	93.16	94.49
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 20. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
COHO/FRY	42.73	41.97	41.25	40.54	39.87	39.24	38.69	38.16	37.73	37.37	37.03	36.69	36.38	36.08	35.78
COHO/SPAWNING	50.31	50.50	50.57	51.00	51.92	52.84	53.30	52.99	52.53	52.03	51.30	50.19	48.96	48.01	47.09
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	59.95	59.40	58.80	58.16	57.61	57.09	56.60	56.15	55.70	55.24	54.77	54.39	54.11	53.88	53.58
CHINOOK/SPAWNING	69.15	67.47	65.79	64.22	62.98	61.81	60.85	60.46	60.46	60.91	61.97	62.82	63.71	64.11	64.83
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	33.19	32.86	32.53	32.24	31.97	31.69	31.45	31.23	31.03	30.81	30.59	30.36	30.15	29.95	29.73
CUTTHROAT/JUVENILE	41.71	41.06	40.43	39.81	39.25	38.68	38.10	37.50	36.92	36.34	35.81	35.32	34.89	34.53	34.19
CUTTHROAT/ADULT	54.92	54.07	53.23	52.41	51.61	50.79	50.05	49.23	48.46	47.70	46.88	46.06	45.31	44.64	44.06
CUTTHROAT/SPAWNING	24.34	24.05	23.90	23.95	24.00	24.05	23.90	23.85	23.85	23.75	23.80	23.95	24.10	23.85	23.75
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	46.36	46.83	47.36	47.67	48.12	48.51	48.66	48.66	48.70	48.67	48.61	48.43	48.25	48.09	48.01
STEELHEAD/JUVENILE	74.07	73.73	73.42	73.10	72.82	72.49	72.16	71.84	71.51	71.08	70.66	70.33	69.99	69.71	69.51
STEELHEAD/ADULT	56.10	54.71	53.40	52.17	51.75	51.21	50.76	50.26	49.68	49.55	49.72	50.15	51.11	51.48	51.92
STEELHEAD/SPAWNING	79.00	78.42	77.86	77.49	77.19	76.89	76.48	76.40	76.45	76.49	76.34	76.06	75.77	75.57	75.37
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
COHO/FRY	35.48	35.24	35.06	34.91	34.77	34.62	34.50	34.40	34.25	34.14	34.07	33.88	33.62	33.34	33.03
COHO/SPAWNING	46.09	45.13	44.29	43.56	42.87	42.25	41.64	40.91	40.22	39.72	39.30	38.84	38.42	37.92	37.27
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	53.23	52.90	52.51	52.11	51.73	51.31	50.89	50.55	50.30	49.91	49.52	49.14	48.75	48.37	48.01
CHINOOK/SPAWNING	66.24	67.19	66.91	66.96	67.19	66.91	66.35	65.23	64.05	62.82	61.81	60.96	60.07	59.17	58.27
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	29.53	29.34	29.15	28.98	28.82	28.65	28.48	28.39	28.19	28.06	27.97	27.89	27.82	27.77	27.74
CUTTHROAT/JUVENILE	33.85	33.52	33.18	32.87	32.61	32.39	32.17	31.97	31.79	31.60	31.41	31.20	30.97	30.72	30.45
CUTTHROAT/ADULT	43.71	43.60	43.73	43.85	43.86	43.79	43.56	43.24	42.92	42.51	41.99	41.38	40.88	40.37	39.80
CUTTHROAT/SPAWNING	23.66	23.36	23.02	22.68	22.24	21.85	21.55	21.46	21.75	21.80	21.90	22.04	21.99	22.09	22.24
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	47.93	47.80	47.66	47.55	47.45	47.35	47.25	47.09	46.92	46.34	46.06	45.64	45.20	44.75	44.30
STEELHEAD/JUVENILE	69.30	69.05	68.81	68.57	68.28	67.97	67.63	67.24	66.88	66.48	66.03	65.55	64.99	64.34	63.66
STEELHEAD/ADULT	52.46	52.96	53.18	53.47	54.77	55.49	55.18	53.62	52.03	51.18	50.45	49.30	46.68	44.20	42.92
STEELHEAD/SPAWNING	75.15	74.83	74.56	74.26	73.91	73.55	73.25	72.93	72.64	72.29	71.86	71.41	70.93	70.47	70.02
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 20. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
COHO/FRY	68.72	67.12	65.34	64.08	62.87	61.83	60.99	60.09	59.16	58.30	57.51	56.92	56.33	55.69	54.91
COHO/SPAWNING	63.61	62.96	62.31	61.69	60.89	59.62	58.44	57.25	56.17	54.98	53.87	53.03	52.57	52.57	53.83
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	79.07	78.26	77.46	76.68	76.15	75.74	75.26	74.56	73.93	73.37	72.86	72.47	71.97	71.41	70.60
CHINOOK/SPAWNING	70.05	66.46	63.04	60.68	59.34	58.33	57.60	57.26	57.49	68.59	75.27	76.33	76.28	75.88	75.15
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	53.35	52.32	51.36	50.47	49.73	49.03	48.33	47.60	46.87	46.13	45.34	44.63	43.87	43.05	42.21
CUTTHROAT/JUVENILE	73.14	71.79	70.39	68.96	67.72	66.55	65.42	64.23	63.09	62.11	61.36	60.54	59.56	58.44	57.27
CUTTHROAT/ADULT	93.24	91.33	89.13	86.82	84.41	82.00	79.78	77.83	76.08	74.62	73.14	71.83	70.96	70.16	69.62
CUTTHROAT/SPAWNING	44.57	43.65	43.35	43.11	43.40	44.28	45.36	46.19	46.87	47.41	46.87	45.55	42.86	39.34	36.80
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	39.99	39.87	39.93	40.24	40.69	40.81	40.62	40.59	41.03	41.12	41.27	41.37	42.05	42.30	42.71
STEELHEAD/JUVENILE	91.99	91.10	90.30	89.40	88.30	86.97	85.79	84.86	84.10	83.35	82.63	82.02	81.47	80.84	80.18
STEELHEAD/ADULT	79.14	77.77	75.81	72.43	69.37	68.30	67.07	65.66	64.19	62.78	62.81	63.28	63.28	63.42	63.17
STEELHEAD/SPAWNING	95.70	97.01	98.13	99.04	99.61	99.89	100.00	99.81	99.40	98.90	98.16	97.36	96.37	95.39	94.34
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
COHO/FRY	54.15	53.43	52.75	52.12	51.24	50.33	49.59	49.16	48.31	47.26	46.34	45.43	44.66	44.00	43.45
COHO/SPAWNING	54.33	54.98	55.83	56.67	56.63	55.91	55.21	54.72	53.91	53.26	52.57	51.84	51.30	50.88	50.38
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	69.86	69.14	68.42	67.70	66.97	66.23	65.59	65.03	64.35	63.64	62.93	62.26	61.61	61.04	60.49
CHINOOK/SPAWNING	73.92	72.85	71.90	71.17	70.39	69.71	69.15	68.99	69.21	69.43	70.22	71.51	71.79	71.00	70.05
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	41.29	40.40	39.59	38.88	38.24	37.64	37.03	36.51	35.98	35.46	35.04	34.66	34.27	33.90	33.53
CUTTHROAT/JUVENILE	56.01	54.64	53.33	52.09	50.91	49.84	48.77	48.00	47.11	46.25	45.41	44.61	43.82	43.08	42.38
CUTTHROAT/ADULT	68.68	67.80	66.83	65.73	64.69	63.76	62.75	61.86	60.89	60.05	59.21	58.38	57.55	56.69	55.80
CUTTHROAT/SPAWNING	35.39	34.26	33.09	32.16	31.43	30.84	30.35	30.20	29.42	28.64	28.10	27.37	26.54	25.76	24.83
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	43.49	43.84	44.46	45.21	45.98	46.06	46.44	44.95	44.92	45.12	45.29	45.51	45.61	45.70	45.90
STEELHEAD/JUVENILE	79.51	78.94	78.43	77.97	77.56	77.18	76.77	76.49	76.27	76.05	75.79	75.47	75.13	74.77	74.42
STEELHEAD/ADULT	62.22	61.05	59.82	59.09	58.51	57.50	55.96	55.28	55.03	54.85	55.19	55.81	56.69	57.27	57.57
STEELHEAD/SPAWNING	93.32	92.38	91.36	90.25	89.04	87.83	86.69	85.58	84.74	83.81	82.77	81.90	80.99	80.16	79.56
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 21. Habitat index values for several species/life stages in the Mainstem Tolt River.

DISCHARGE (CFS)

SPECIES/LIFE STAGE	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
COHO/FRY	100.00	90.92	80.45	71.16	66.70	61.38	55.13	51.40	48.40	44.92	43.07	41.51	40.34	39.40	37.72
COHO/SPAWNING	69.18	77.14	84.42	89.32	91.93	89.85	86.86	84.38	80.15	77.08	75.40	72.86	70.20	67.91	67.02
COHO/INCUBATION	26.97	28.87	28.87	30.89	31.81	31.81	34.38	34.75	35.50	37.37	40.04	40.04	41.99	46.50	46.50
CHINOOK/JUVENILE	98.11	100.00	99.28	96.15	92.82	89.10	85.67	82.59	79.47	76.31	74.16	71.69	69.74	67.84	65.91
CHINOOK/SPAWNING	53.39	63.96	76.13	85.64	90.49	93.89	98.18	100.00	95.97	92.03	89.51	86.41	83.37	79.83	77.49
CHINOOK/INCUBATION	56.33	59.81	59.81	64.61	66.92	67.16	71.39	72.29	75.44	79.03	83.04	83.04	86.01	87.70	87.70
CUTTHROAT/FRY	100.00	96.25	91.58	85.94	80.01	75.64	72.00	68.75	66.16	63.96	63.60	62.16	60.65	59.27	58.06
CUTTHROAT/JUVENILE	85.53	91.24	95.52	98.64	99.70	100.00	99.35	98.31	96.33	94.73	93.46	91.86	89.54	86.66	83.70
CUTTHROAT/ADULT	67.19	73.56	80.78	86.07	88.96	90.86	92.31	94.62	96.03	97.59	99.01	99.55	100.00	99.99	99.08
CUTTHROAT/SPAWNING	100.00	99.70	94.93	88.11	79.86	74.63	72.01	69.57	67.83	67.02	66.35	65.53	65.81	67.01	69.36
CUTTHROAT/INCUBATION	33.75	38.46	38.46	42.41	43.78	43.93	49.66	50.04	51.10	55.92	58.39	58.39	59.93	60.96	61.69
STEELHEAD/FRY	100.00	95.04	90.09	86.96	84.74	82.81	80.82	80.27	79.55	78.83	79.53	77.90	76.48	75.78	75.43
STEELHEAD/JUVENILE	88.88	93.31	96.36	98.32	99.64	100.00	99.80	99.73	99.06	98.55	98.62	97.52	96.19	94.65	93.09
STEELHEAD/ADULT	15.93	23.30	31.60	37.60	45.65	51.06	58.31	63.82	70.94	77.06	84.37	91.93	97.09	100.00	99.10
STEELHEAD/SPAWNING	13.02	19.09	25.68	32.69	40.26	48.21	55.56	62.44	68.92	74.57	80.04	84.85	89.04	92.60	95.34
STEELHEAD/INCUBATION	97.95	98.66	99.62	99.62	99.85	99.99	99.99	99.99	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
COHO/FRY	35.91	34.61	33.40	32.41	31.64	31.34	31.23	31.15	31.38	31.66	32.07	32.32	31.90	31.61	31.45
COHO/SPAWNING	66.67	67.09	66.86	66.93	66.80	67.77	70.31	72.79	75.38	77.64	79.68	82.00	83.48	85.24	86.21
COHO/INCUBATION	48.53	48.96	48.96	48.96	51.90	52.14	55.23	55.80	56.56	56.56	61.32	61.32	62.14	62.14	64.78
CHINOOK/JUVENILE	64.41	63.23	62.00	61.13	60.32	59.92	59.21	58.65	58.05	57.34	56.81	56.15	55.30	54.44	53.51
CHINOOK/SPAWNING	75.96	74.04	72.06	70.58	69.75	69.28	69.68	69.90	69.96	70.83	71.75	72.76	74.24	76.26	79.21
CHINOOK/INCUBATION	89.56	89.64	89.64	89.64	90.34	90.37	96.38	96.38	96.38	96.38	96.38	96.38	96.38	96.38	96.38
CUTTHROAT/FRY	57.17	56.37	55.47	55.02	54.23	53.81	53.38	53.18	53.01	52.98	52.94	53.09	53.32	53.67	53.96
CUTTHROAT/JUVENILE	80.86	77.90	75.28	72.81	70.66	69.01	67.76	66.79	66.11	65.46	64.96	64.51	64.17	63.83	63.59
CUTTHROAT/ADULT	97.38	95.19	93.57	91.19	88.26	84.79	82.09	79.29	76.40	74.22	72.39	70.52	69.25	67.81	66.28
CUTTHROAT/SPAWNING	72.47	75.15	76.01	76.94	76.81	76.42	75.96	75.66	74.78	73.40	73.01	73.04	73.54	74.32	74.86
CUTTHROAT/INCUBATION	63.47	63.48	63.48	63.51	63.96	63.96	64.77	64.89	65.09	65.09	72.78	72.78	73.21	73.21	75.19
STEELHEAD/FRY	74.48	74.03	72.61	71.46	70.09	68.23	66.77	66.04	65.12	63.40	62.07	61.06	60.25	59.65	59.27
STEELHEAD/JUVENILE	91.26	89.32	87.27	85.71	84.01	82.36	80.80	79.38	78.22	77.07	75.96	74.96	74.11	73.32	72.69
STEELHEAD/ADULT	97.31	91.89	86.69	83.90	80.29	76.65	72.84	67.56	64.24	61.12	57.14	53.21	50.56	49.23	48.18
STEELHEAD/SPAWNING	97.41	98.76	99.59	100.00	99.89	99.19	98.17	96.55	94.63	92.65	90.51	88.26	86.06	83.91	81.79
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 21. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
COHO/FRY	31.54	31.76	32.42	32.61	32.74	32.89	32.78	32.62	32.47	32.18	32.08	31.64	31.21	30.34	29.19
COHO/SPAWNING	87.52	88.68	89.42	89.26	89.26	88.98	88.01	87.40	87.20	86.20	85.00	84.03	83.31	82.93	82.28
COHO/INCUBATION	79.75	80.00	80.03	82.65	82.65	82.65	82.65	82.65	86.33	86.33	86.33	86.78	86.78	86.78	94.83
CHINOOK/JUVENILE	52.72	52.01	51.48	50.97	50.71	50.75	50.66	50.48	50.35	50.06	49.62	49.13	48.60	47.95	47.34
CHINOOK/SPAWNING	82.64	84.83	86.62	88.89	91.49	93.16	93.85	94.24	94.12	94.46	93.87	92.69	91.95	91.31	90.26
CHINOOK/INCUBATION	99.65	99.65	99.70	99.70	99.70	99.70	99.70	99.70	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	54.31	54.58	56.02	56.40	56.45	56.09	55.77	55.31	54.57	53.75	52.88	51.89	50.85	49.80	48.76
CUTTHROAT/JUVENILE	63.47	63.43	63.86	64.31	64.81	64.96	65.03	64.96	64.81	64.74	64.66	64.52	64.36	64.18	63.78
CUTTHROAT/ADULT	65.12	63.89	62.85	61.77	60.68	59.67	59.54	60.06	60.93	61.96	63.26	64.70	65.73	66.50	66.75
CUTTHROAT/SPAWNING	75.70	76.63	78.06	79.32	80.54	81.47	82.33	83.07	84.29	86.20	88.62	91.86	94.49	96.64	96.47
CUTTHROAT/INCUBATION	75.77	75.80	75.80	76.77	76.77	76.77	76.77	76.77	76.77	76.77	76.77	76.80	76.80	76.80	95.53
STEELHEAD/FRY	59.04	58.74	59.35	58.92	58.26	57.64	56.96	56.65	56.64	56.58	56.53	56.61	56.89	57.46	58.04
STEELHEAD/JUVENILE	72.15	71.55	71.78	71.10	70.37	69.64	68.96	68.36	67.73	67.07	66.41	65.73	65.04	64.41	63.87
STEELHEAD/ADULT	47.18	45.67	45.01	45.69	46.50	46.37	46.31	46.79	47.98	48.15	46.91	46.67	46.99	47.87	47.11
STEELHEAD/SPAWNING	79.79	78.20	76.61	75.06	73.47	71.91	70.35	68.93	67.71	66.66	65.56	64.41	63.32	62.25	61.23
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
COHO/FRY	28.06	27.35	26.66	26.11	25.37	24.47	23.60	22.75	22.17	21.64	21.15	20.76	20.37	20.01	19.70
COHO/SPAWNING	81.88	82.00	81.88	81.75	81.83	82.54	83.61	84.72	85.95	86.66	88.14	88.92	90.31	91.28	92.36
COHO/INCUBATION	94.83	94.83	94.83	95.29	95.29	95.29	95.29	95.29	95.29	95.29	95.97	99.02	99.02	99.54	99.54
CHINOOK/JUVENILE	46.78	46.20	45.57	44.82	44.13	43.42	42.74	42.03	41.23	40.50	39.96	39.49	39.03	38.47	37.81
CHINOOK/SPAWNING	89.43	88.48	87.35	86.04	84.70	83.30	82.53	82.27	83.15	84.54	85.91	87.66	89.73	91.59	92.82
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	47.77	46.77	45.83	44.89	44.06	43.30	42.61	41.88	41.12	40.38	39.70	39.12	38.60	38.11	37.62
CUTTHROAT/JUVENILE	63.29	62.66	61.80	60.88	59.97	59.10	58.38	57.67	56.88	55.87	54.78	53.63	52.53	51.45	50.25
CUTTHROAT/ADULT	66.88	67.02	67.07	67.30	66.87	66.18	65.31	64.27	62.99	61.67	60.21	58.86	57.52	56.50	55.80
CUTTHROAT/SPAWNING	96.03	94.96	93.97	92.44	90.90	89.63	88.55	88.11	87.96	87.75	87.53	87.14	86.50	85.43	84.27
CUTTHROAT/INCUBATION	95.53	95.53	95.53	95.58	95.58	95.58	95.58	95.58	95.58	95.58	96.54	97.35	97.35	99.39	99.39
STEELHEAD/FRY	58.79	59.23	59.41	59.16	59.01	58.79	58.93	58.84	58.50	58.09	57.70	57.35	57.00	56.63	56.46
STEELHEAD/JUVENILE	63.56	63.02	62.44	61.72	60.99	60.32	59.60	58.86	58.08	57.29	56.62	55.93	55.29	54.68	54.06
STEELHEAD/ADULT	46.48	45.96	45.09	44.87	44.25	43.46	43.46	43.82	44.21	44.43	43.74	42.32	40.80	39.86	38.97
STEELHEAD/SPAWNING	60.37	59.52	58.78	58.09	57.43	56.81	56.19	55.67	55.12	54.55	54.03	53.57	53.11	52.63	52.16
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 21. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
COHO/FRY	19.42	19.15	18.89	18.69	18.50	18.36	18.22	18.07	17.84	17.67	17.52	17.46	17.47	17.49	17.54
COHO/SPAWNING	93.02	93.64	94.73	96.37	97.55	98.73	99.62	100.00	99.85	99.10	97.81	96.35	94.80	93.53	92.30
COHO/INCUBATION	99.54	99.54	99.54	99.54	99.54	99.54	99.54	99.54	99.54	99.54	99.54	99.54	100.00	100.00	100.00
CHINOOK/JUVENILE	37.18	36.53	36.00	35.60	35.25	34.75	34.16	33.65	33.12	32.66	32.23	31.86	31.49	31.12	30.81
CHINOOK/SPAWNING	94.38	95.44	95.29	94.90	94.80	94.61	94.28	94.31	95.47	96.62	96.58	95.83	95.49	95.68	96.16
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	37.16	36.68	36.26	35.89	35.53	35.22	34.92	34.64	34.37	34.09	33.79	33.47	33.22	32.95	32.71
CUTTHROAT/JUVENILE	49.06	47.92	46.94	46.14	45.36	44.62	43.88	43.06	42.22	41.51	40.85	40.21	39.62	39.12	38.64
CUTTHROAT/ADULT	55.20	54.45	53.37	52.18	50.94	49.60	48.49	47.56	46.59	45.41	44.26	43.13	41.98	40.85	39.71
CUTTHROAT/SPAWNING	82.92	81.46	79.52	77.83	76.83	75.99	75.22	74.46	73.97	73.82	73.97	74.12	74.45	74.79	75.47
CUTTHROAT/INCUBATION	99.39	99.39	99.39	99.39	99.39	99.39	99.39	99.39	99.39	99.39	99.39	99.39	100.00	100.00	100.00
STEELHEAD/FRY	56.17	55.77	55.47	55.25	55.17	55.00	54.65	54.13	53.56	53.01	52.57	52.17	51.75	51.56	51.42
STEELHEAD/JUVENILE	53.46	52.92	52.40	51.85	51.35	50.92	50.50	50.06	49.61	49.15	48.72	48.26	47.75	47.26	46.86
STEELHEAD/ADULT	37.04	35.25	34.15	33.32	32.27	31.62	31.27	30.87	30.50	29.99	28.97	27.88	26.20	25.06	24.88
STEELHEAD/SPAWNING	51.83	51.57	51.38	51.20	51.01	50.85	50.81	50.98	51.17	51.29	51.38	51.35	51.31	51.19	50.96
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SPECIES/LIFE STAGE	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
COHO/FRY	17.61	17.65	17.68	17.76	17.87	17.99	18.12	18.23	18.15	18.02	17.96	17.93	17.91	17.91	17.93
COHO/SPAWNING	90.67	89.17	87.85	86.70	85.62	84.64	83.80	83.12	82.64	82.24	81.99	81.76	81.66	81.57	81.38
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	30.56	30.39	30.25	30.10	29.89	29.64	29.39	29.26	29.13	29.00	28.80	28.53	28.28	28.08	27.88
CHINOOK/SPAWNING	96.01	95.81	95.48	95.62	96.55	97.36	96.61	95.20	93.93	92.75	91.70	90.95	90.26	89.54	88.85
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	32.49	32.30	32.11	31.93	31.70	31.46	31.22	31.01	30.79	30.57	30.42	30.26	30.10	29.96	29.82
CUTTHROAT/JUVENILE	38.11	37.63	37.20	36.76	36.35	36.01	35.69	35.50	35.31	35.10	34.89	34.73	34.56	34.39	34.28
CUTTHROAT/ADULT	38.68	37.69	36.69	35.82	35.39	35.22	35.12	34.98	34.74	34.56	34.45	34.38	34.14	33.86	33.34
CUTTHROAT/SPAWNING	76.44	77.57	78.98	80.49	82.65	84.97	87.21	89.23	91.30	93.21	94.44	95.25	96.16	97.20	97.91
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	51.07	50.58	50.05	49.50	48.91	48.44	48.09	47.79	47.46	47.17	46.88	46.61	46.36	46.10	45.88
STEELHEAD/JUVENILE	46.42	46.03	45.65	45.23	44.81	44.42	44.11	43.81	43.50	43.19	42.79	42.37	42.00	41.70	41.47
STEELHEAD/ADULT	24.75	24.68	24.79	25.14	25.60	26.33	27.19	28.16	28.93	29.69	30.54	31.12	31.58	32.10	31.80
STEELHEAD/SPAWNING	50.67	50.46	50.20	49.91	49.62	49.29	48.90	48.47	47.95	47.33	46.58	45.79	45.01	44.21	43.46
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 21. (continued).

SPECIES/LIFE STAGE	DISCHARGE (CFS) 950	960	970	980	990	1000
COHO/FRY	17.98	18.04	18.08	18.16	18.25	18.35
COHO/SPAWNING	81.32	81.39	81.83	82.77	83.80	84.94
COHO/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00
CHINOOK/JUVENILE	27.75	27.66	27.57	27.51	27.45	27.37
CHINOOK/SPAWNING	88.00	87.15	86.51	86.19	85.96	85.89
CHINOOK/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00
CUTTHROAT/FRY	29.70	29.66	29.66	29.69	29.74	29.80
CUTTHROAT/JUVENILE	34.14	33.95	33.79	33.60	33.41	33.21
CUTTHROAT/ADULT	32.87	32.58	32.32	31.92	31.56	31.39
CUTTHROAT/SPAWNING	98.20	98.49	98.59	98.11	97.57	96.87
CUTTHROAT/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00
STEELHEAD/FRY	45.70	45.51	45.32	45.12	44.78	44.41
STEELHEAD/JUVENILE	41.27	41.01	40.73	40.47	40.26	40.04
STEELHEAD/ADULT	31.19	30.64	30.65	29.97	29.22	28.35
STEELHEAD/SPAWNING	42.75	42.02	41.32	40.65	39.97	39.26
STEELHEAD/INCUBATION	100.00	100.00	100.00	100.00	100.00	100.00

River are given in Tables 23, 24, and 25. Since efficiency indices attain variable maxima, peak values are underlined for each species/life stage.

Tables 26 and 27 summarize the combined WUA values and associated discharges identified by peak habitat and efficiency indices for each species/life stage in the three river segments. From an inspection of Table 26 it can be seen that steelhead adult, spawning and incubation discharges dominated the optimum flows determined for the South and North Forks. Whereas steelhead adult and spawning discharges remain relatively high in the mainstem Tolt River, the optimum flows providing maximal incubation habitat for the other species are notably higher. Nevertheless, the amount of WUA predicted for steelhead trout life stages in all river segments tends to be greater than the physical habitat available for other species.

A comparison of discharges and WUA values related to peak efficiency indices in Table 27 with those values in Table 26 indicate life stages which have relatively flat or double peaked habitat response curves. The most conspicuous examples include the comparatively slow rates of change in incubation habitat with increasing discharge for all species. Disproportionately larger increases in gross stream surface areas at successively higher discharges result in maximum efficiency index values at discharges which are frequently lower than the flows identified by peak WUA estimates.

The result of weighting and combining all species/life stage habitat index values according to their timing of occurrence, relative abundances and biological importance are summarized by month in Table 28 for the South Fork. The percentages marked with a box identify the optimum discharge (Q_M) which provides the maximum amount of habitat for all species/life stages considered simultaneously. Tables 29 and 30 present combined habitat indices for the

Table 22. Efficiency index values for several species/life stages in the South Fork Tolt River.

DISCHARGE (CFS)

SPECIES/LIFE STAGE	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
COHO/FRY	.7678	.7301	.6917	.6553	.6413	.6167	.5760	.5390	.5122	.5007	.4817	.4506	.4216	.3977	.3775
COHO/SPAWNING	.5362	.6710	.7134	.6880	.6457	.6090	.5836	.5629	.5310	.4900	.4527	.4233	.3716	.3406	.3137
COHO/INCUBATION	.6365	.6082	.5914	.5778	.5976	.5859	.6109	.5955	.5821	.5709	.5611	.5530	.5470	.5653	.5604
CHINOOK/JUVENILE	.7083	.7187	.7132	.6969	.6806	.6615	.6409	.6207	.6018	.5929	.5741	.5603	.5468	.5307	.5170
CHINOOK/SPAWNING	.3134	.4962	.5832	.6397	.6834	.6594	.6331	.5986	.5689	.5582	.5507	.5272	.4922	.4781	.4626
CHINOOK/INCUBATION	.6350	.6074	.5907	.5770	.6028	.5911	.6129	.5974	.5840	.5728	.5629	.5548	.5488	.5757	.5708
CUTTHROAT/FRY	.7405	.7275	.7134	.6954	.6753	.6570	.6347	.6066	.5826	.5719	.5453	.5238	.5037	.4837	.4642
CUTTHROAT/JUVENILE	.4512	.4884	.5186	.5459	.5700	.5880	.5969	.5960	.5928	.5934	.5897	.5908	.5857	.5759	.5648
CUTTHROAT/ADULT	.3450	.3678	.3979	.4290	.4486	.4666	.4838	.4921	.5038	.5145	.5282	.5372	.5451	.5550	.5549
CUTTHROAT/SPAWNING	.4913	.5674	.6194	.6483	.6212	.5797	.5474	.5117	.4875	.4680	.4631	.4659	.4646	.4656	.4706
CUTTHROAT/INCUBATION	.3357	.3595	.4111	.4016	.4461	.4374	.5254	.6085	.5968	.5853	.5753	.5670	.5608	.5791	.5741
STEELHEAD/FRY	.7678	.7220	.6778	.6337	.5947	.5729	.5482	.5139	.4868	.4770	.4535	.4348	.4132	.4031	.3933
STEELHEAD/JUVENILE	.5769	.6092	.6298	.6410	.6457	.6455	.6383	.6258	.6144	.6113	.6007	.5900	.5771	.5647	.5513
STEELHEAD/ADULT	.0985	.1310	.1773	.2282	.2798	.3491	.3930	.4135	.4224	.4406	.4723	.4939	.5172	.5364	.5359
STEELHEAD/SPAWNING	.0621	.0961	.1253	.1673	.2059	.2327	.2616	.2924	.3208	.3485	.3772	.4003	.4265	.4474	.4653
STEELHEAD/INCUBATION	.6299	.6353	.6560	.6434	.6308	.6185	.6104	.6196	.6128	.6010	.5907	.5822	.5759	.5708	.5659

SPECIES/LIFE STAGE	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
COHO/FRY	.3605	.3477	.3354	.3244	.3130	.3022	.2918	.2824	.2731	.2633	.2553	.2493	.2445	.2402	.2365
COHO/SPAWNING	.2979	.2915	.2896	.2818	.2698	.2590	.2585	.2604	.2645	.2769	.2776	.2731	.2713	.2692	.2700
COHO/INCUBATION	.5556	.5507	.5461	.5417	.5374	.5334	.5297	.5261	.5366	.5327	.5292	.5255	.5222	.5186	.5152
CHINOOK/JUVENILE	.5038	.4911	.4785	.4672	.4565	.4459	.4359	.4258	.4148	.4026	.3919	.3817	.3722	.3624	.3543
CHINOOK/SPAWNING	.4405	.4125	.3834	.3508	.3260	.3074	.2906	.2795	.2720	.2683	.2642	.2610	.2606	.2619	.2625
CHINOOK/INCUBATION	.5659	.5609	.5562	.5518	.5474	.5433	.5395	.5359	.5366	.5327	.5292	.5255	.5222	.5186	.5152
CUTTHROAT/FRY	.4452	.4280	.4125	.3996	.3876	.3764	.3659	.3558	.3461	.3364	.3293	.3219	.3155	.3096	.3041
CUTTHROAT/JUVENILE	.5539	.5404	.5265	.5120	.4981	.4857	.4743	.4624	.4501	.4387	.4298	.4211	.4130	.4047	.3963
CUTTHROAT/ADULT	.5491	.5459	.5468	.5516	.5516	.5461	.5396	.5285	.5199	.5097	.4990	.4853	.4735	.4625	.4514
CUTTHROAT/SPAWNING	.4764	.4795	.4781	.4693	.4610	.4542	.4466	.4450	.4470	.4550	.4628	.4719	.4835	.4915	.4979
CUTTHROAT/INCUBATION	.5692	.5642	.5595	.5550	.5506	.5465	.5426	.5390	.5366	.5327	.5292	.5255	.5222	.5186	.5152
STEELHEAD/FRY	.3800	.3662	.3540	.3438	.3357	.3287	.3230	.3176	.3110	.3042	.2983	.2925	.2864	.2814	.2771
STEELHEAD/JUVENILE	.5388	.5272	.5161	.5049	.4934	.4821	.4715	.4618	.4518	.4424	.4354	.4282	.4220	.4156	.4096
STEELHEAD/ADULT	.5322	.5361	.5352	.5372	.5327	.5383	.5401	.5401	.5292	.5145	.5027	.4971	.4956	.4921	.4888
STEELHEAD/SPAWNING	.4773	.4874	.4958	.5021	.5050	.5057	.5059	.5057	.5060	.5051	.5046	.5034	.5024	.4995	.4957
STEELHEAD/INCUBATION	.5611	.5562	.5515	.5543	.5500	.5459	.5420	.5384	.5349	.5311	.5276	.5239	.5206	.5170	.5137

Table 22. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
COHO/FRY	.2324	.2275	.2234	.2194	.2151	.2110	.2076	.2044	.2024	.2007	.1986	.1960	.1931	.1905	.1881
COHO/SPAWNING	.2716	.2728	.2726	.2725	.2686	.2639	.2597	.2552	.2509	.2472	.2434	.2401	.2375	.2360	.2349
COHO/INCUBATION	.5120	.5090	.5061	.5027	.4995	.4963	.4932	.4902	.4882	.4865	.4848	.4829	.4809	.4791	.4772
CHINOOK/JUVENILE	.3470	.3399	.3330	.3258	.3196	.3131	.3070	.3011	.2962	.2917	.2872	.2830	.2789	.2753	.2718
CHINOOK/SPAWNING	.2614	.2593	.2576	.2552	.2547	.2561	.2616	.2620	.2630	.2674	.2739	.2735	.2720	.2708	.2692
CHINOOK/INCUBATION	.5120	.5090	.5061	.5027	.4995	.4963	.4932	.4902	.4882	.4865	.4848	.4829	.4809	.4791	.4772
CUTTHROAT/FRY	.2986	.2940	.2898	.2855	.2812	.2765	.2718	.2672	.2633	.2600	.2566	.2529	.2496	.2464	.2434
CUTTHROAT/JUVENILE	.3875	.3787	.3704	.3617	.3521	.3425	.3336	.3253	.3185	.3127	.3072	.2995	.2942	.2887	.2833
CUTTHROAT/ADULT	.4405	.4296	.4206	.4126	.4047	.3992	.3935	.3872	.3811	.3750	.3697	.3601	.3536	.3467	.3396
CUTTHROAT/SPAWNING	.5020	.5015	.4999	.4985	.4995	.4930	.4801	.4662	.4544	.4433	.4308	.4164	.3985	.3814	.3668
CUTTHROAT/INCUBATION	.5120	.5090	.5061	.5027	.4995	.4963	.4932	.4902	.4882	.4865	.4848	.4829	.4809	.4791	.4772
STEELHEAD/FRY	.2732	.2701	.2674	.2645	.2617	.2591	.2566	.2551	.2535	.2522	.2494	.2468	.2453	.2438	.2412
STEELHEAD/JUVENILE	.4033	.3969	.3912	.3846	.3786	.3726	.3668	.3613	.3566	.3525	.3486	.3439	.3400	.3360	.3321
STEELHEAD/ADULT	.4858	.4837	.4785	.4752	.4690	.4546	.4428	.4347	.4269	.4183	.4130	.4076	.3953	.3841	.3738
STEELHEAD/SPAWNING	.4924	.4890	.4855	.4817	.4781	.4745	.4709	.4666	.4640	.4616	.4582	.4537	.4510	.4489	.4466
STEELHEAD/INCUBATION	.5105	.5074	.5046	.5011	.4979	.4948	.4917	.4887	.4867	.4850	.4833	.4815	.4795	.4776	.4757

SPECIES/LIFE STAGE	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
COHO/FRY	.1864	.1846	.1826	.1797	.1770	.1751	.1732	.1716	.1699	.1684	.1657	.1644	.1633	.1623	.1615
COHO/SPAWNING	.2355	.2352	.2372	.2360	.2340	.2321	.2297	.2274	.2268	.2255	.2218	.2200	.2177	.2153	.2132
COHO/INCUBATION	.4752	.4733	.4714	.4694	.4676	.4659	.4641	.4627	.4612	.4600	.4548	.4534	.4521	.4508	.4495
CHINOOK/JUVENILE	.2684	.2653	.2617	.2591	.2568	.2542	.2513	.2483	.2457	.2431	.2384	.2359	.2334	.2312	.2291
CHINOOK/SPAWNING	.2675	.2665	.2656	.2650	.2644	.2644	.2641	.2636	.2632	.2614	.2577	.2561	.2542	.2524	.2506
CHINOOK/INCUBATION	.4752	.4733	.4714	.4694	.4676	.4659	.4641	.4627	.4612	.4600	.4548	.4534	.4521	.4508	.4495
CUTTHROAT/FRY	.2409	.2387	.2364	.2341	.2315	.2294	.2274	.2255	.2238	.2220	.2181	.2162	.2146	.2132	.2117
CUTTHROAT/JUVENILE	.2785	.2741	.2700	.2657	.2622	.2589	.2558	.2532	.2509	.2489	.2448	.2427	.2406	.2390	.2376
CUTTHROAT/ADULT	.3325	.3263	.3219	.3176	.3133	.3092	.3060	.3044	.3031	.3020	.2980	.2978	.2990	.2995	.2993
CUTTHROAT/SPAWNING	.3516	.3369	.3238	.3107	.2989	.2884	.2796	.2714	.2645	.2593	.2523	.2483	.2442	.2409	.2384
CUTTHROAT/INCUBATION	.4752	.4733	.4714	.4694	.4676	.4659	.4641	.4627	.4612	.4600	.4548	.4534	.4521	.4508	.4495
STEELHEAD/FRY	.2375	.2350	.2300	.2249	.2205	.2168	.2137	.2114	.2095	.2077	.2042	.2019	.1995	.1973	.1950
STEELHEAD/JUVENILE	.3285	.3249	.3209	.3169	.3123	.3082	.3045	.3015	.2985	.2959	.2912	.2890	.2868	.2844	.2818
STEELHEAD/ADULT	.3658	.3594	.3533	.3484	.3445	.3428	.3417	.3412	.3406	.3402	.3354	.3337	.3311	.3292	.3270
STEELHEAD/SPAWNING	.4450	.4441	.4430	.4429	.4439	.4451	.4459	.4467	.4473	.4483	.4450	.4451	.4446	.4438	.4433
STEELHEAD/INCUBATION	.4738	.4719	.4714	.4694	.4676	.4659	.4641	.4627	.4612	.4600	.4548	.4534	.4521	.4508	.4495

Table 22. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
COHO/FRY	.1607	.1598	.1591	.1586	.1580	.1575	.1572	.1568	.1564	.1561	.1559	.1557	.1555	.1555	.1556
COHO/SPAWNING	.2115	.2093	.2061	.2029	.2004	.1981	.1970	.1964	.1961	.1952	.1951	.1949	.1951	.1969	.1994
COHO/INCUBATION	.4482	.4470	.4458	.4447	.4436	.4425	.4414	.4404	.4393	.4384	.4375	.4368	.4361	.4353	.4346
CHINOOK/JUVENILE	.2272	.2254	.2239	.2227	.2218	.2211	.2203	.2193	.2183	.2173	.2159	.2146	.2133	.2120	.2110
CHINOOK/SPAWNING	.2480	.2468	.2458	.2427	.2383	.2338	.2311	.2287	.2263	.2246	.2258	.2295	.2336	.2328	.2307
CHINOOK/INCUBATION	.4482	.4470	.4458	.4447	.4436	.4425	.4414	.4404	.4393	.4384	.4375	.4368	.4361	.4353	.4346
CUTTHROAT/FRY	.2105	.2094	.2085	.2078	.2071	.2066	.2062	.2059	.2052	.2046	.2038	.2030	.2022	.2011	.1999
CUTTHROAT/JUVENILE	.2363	.2352	.2341	.2329	.2315	.2302	.2290	.2278	.2263	.2248	.2235	.2224	.2212	.2197	.2182
CUTTHROAT/ADULT	.2982	.2961	.2936	.2903	.2867	.2834	.2820	.2822	.2826	.2827	.2816	.2801	.2787	.2769	.2751
CUTTHROAT/SPAWNING	.2369	.2369	.2390	.2421	.2452	.2470	.2488	.2503	.2518	.2533	.2554	.2582	.2600	.2608	.2623
CUTTHROAT/INCUBATION	.4482	.4470	.4458	.4447	.4436	.4425	.4414	.4404	.4393	.4384	.4375	.4368	.4361	.4353	.4346
STEELHEAD/FRY	.1929	.1906	.1883	.1863	.1847	.1832	.1820	.1811	.1803	.1798	.1796	.1799	.1801	.1804	.1807
STEELHEAD/JUVENILE	.2794	.2768	.2742	.2716	.2691	.2668	.2646	.2625	.2605	.2584	.2566	.2549	.2533	.2518	.2504
STEELHEAD/ADULT	.3259	.3255	.3256	.3266	.3273	.3256	.3244	.3239	.3228	.3217	.3211	.3209	.3202	.3181	.3160
STEELHEAD/SPAWNING	.4429	.4426	.4428	.4427	.4424	.4422	.4414	.4404	.4393	.4379	.4367	.4359	.4353	.4346	.4338
STEELHEAD/INCUBATION	.4482	.4470	.4458	.4447	.4436	.4425	.4414	.4404	.4393	.4384	.4375	.4368	.4361	.4353	.4346

SPECIES/LIFE STAGE	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
COHO/FRY	.1558	.1561	.1563	.1564	.1567	.1570	.1574	.1578	.1582	.1587	.1592	.1599	.1604	.1607	.1609
COHO/SPAWNING	.2010	.2025	.2044	.2064	.2090	.2133	.2170	.2208	.2253	.2286	.2315	.2340	.2363	.2389	.2415
COHO/INCUBATION	.4339	.4332	.4326	.4319	.4313	.4307	.4301	.4296	.4290	.4285	.4279	.4274	.4269	.4264	.4259
CHINOOK/JUVENILE	.2103	.2098	.2094	.2091	.2087	.2076	.2064	.2053	.2041	.2030	.2019	.2009	.1999	.1990	.1982
CHINOOK/SPAWNING	.2293	.2271	.2246	.2225	.2208	.2189	.2177	.2172	.2170	.2162	.2167	.2178	.2190	.2199	.2219
CHINOOK/INCUBATION	.4339	.4332	.4326	.4319	.4313	.4307	.4301	.4296	.4290	.4285	.4279	.4274	.4269	.4264	.4259
CUTTHROAT/FRY	.1986	.1975	.1963	.1953	.1942	.1932	.1922	.1913	.1904	.1895	.1887	.1879	.1872	.1864	.1857
CUTTHROAT/JUVENILE	.2170	.2156	.2144	.2133	.2121	.2108	.2093	.2078	.2063	.2049	.2038	.2027	.2017	.2006	.1997
CUTTHROAT/ADULT	.2727	.2699	.2672	.2643	.2619	.2606	.2598	.2595	.2594	.2591	.2578	.2559	.2539	.2518	.2495
CUTTHROAT/SPAWNING	.2624	.2621	.2623	.2621	.2612	.2606	.2599	.2589	.2579	.2569	.2563	.2548	.2531	.2513	.2499
CUTTHROAT/INCUBATION	.4339	.4332	.4326	.4319	.4313	.4307	.4301	.4296	.4290	.4285	.4279	.4274	.4269	.4264	.4259
STEELHEAD/FRY	.1809	.1810	.1811	.1812	.1810	.1808	.1805	.1803	.1800	.1798	.1798	.1797	.1797	.1798	.1799
STEELHEAD/JUVENILE	.2490	.2476	.2462	.2448	.2436	.2422	.2408	.2395	.2380	.2366	.2353	.2340	.2327	.2315	.2303
STEELHEAD/ADULT	.3148	.3131	.3109	.3079	.3051	.3034	.3019	.3003	.2973	.2946	.2932	.2915	.2902	.2889	.2877
STEELHEAD/SPAWNING	.4329	.4317	.4306	.4294	.4282	.4269	.4253	.4237	.4221	.4203	.4185	.4165	.4144	.4123	.4101
STEELHEAD/INCUBATION	.4339	.4332	.4326	.4319	.4313	.4307	.4301	.4296	.4290	.4285	.4279	.4274	.4269	.4264	.4259

Table 23. Efficiency index values for several species/life stages in the North Fork Tolt River.

DISCHARGE (CFS)

SPECIES/LIFE STAGE	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
COHO/FRY	.5531	.6451	.7117	.7416	.7681	.7901	.7800	.7669	.7588	.7511	.7310	.7178	.7043	.6847	.6662
COHO/SPAWNING	.3698	.3901	.3911	.3436	.3095	.3595	.4178	.4911	.5614	.6005	.6142	.6196	.6249	.6478	.6780
COHO/INCUBATION	.8400	.8403	.8234	.8090	.7989	.7918	.7800	.7720	.7657	.7598	.7542	.7488	.7425	.7365	.7295
CHINOOK/JUVENILE	.4909	.5879	.6442	.6901	.7400	.7610	.7656	.7684	.7650	.7598	.7490	.7363	.7222	.7085	.6959
CHINOOK/SPAWNING	.2359	.1644	.1370	.1510	.1513	.1679	.1899	.2321	.2955	.3303	.3663	.4158	.4497	.4862	.5090
CHINOOK/INCUBATION	.8522	.8413	.8243	.8099	.7998	.7918	.7800	.7720	.7657	.7598	.7542	.7488	.7425	.7365	.7295
CUTTHROAT/FRY	.6915	.7525	.7815	.7960	.8007	.7910	.7687	.7455	.7221	.6968	.6684	.6431	.6188	.5967	.5760
CUTTHROAT/JUVENILE	.3286	.4139	.4965	.5642	.6098	.6499	.6876	.7194	.7360	.7443	.7476	.7462	.7415	.7365	.7264
CUTTHROAT/ADULT	.1805	.2357	.3116	.3600	.4077	.4845	.5339	.5638	.5920	.6143	.6420	.6685	.6779	.6800	.6858
CUTTHROAT/SPAWNING	.6922	.6451	.5280	.4589	.4638	.4965	.5532	.6385	.6927	.7175	.7409	.7488	.7392	.7224	.6764
CUTTHROAT/INCUBATION	.8656	.8422	.8253	.8108	.8007	.7918	.7800	.7720	.7657	.7598	.7542	.7488	.7425	.7365	.7295
STEELHEAD/FRY	.8586	.8359	.8253	.7852	.7473	.7058	.6682	.6310	.5949	.5655	.5404	.5175	.4953	.4751	.4517
STEELHEAD/JUVENILE	.4690	.5249	.5731	.6125	.6475	.6734	.6899	.7010	.7090	.7154	.7194	.7243	.7262	.7277	.7269
STEELHEAD/ADULT	.0133	.0226	.0360	.0536	.0797	.1038	.1303	.1548	.1894	.2305	.2812	.3332	.3880	.4489	.5177
STEELHEAD/SPAWNING	.0121	.0190	.0263	.0342	.0416	.0518	.0649	.0813	.1006	.1257	.1533	.1892	.2235	.2598	.2936
STEELHEAD/INCUBATION	.8342	.8399	.8230	.8086	.7985	.7903	.7785	.7705	.7642	.7583	.7527	.7473	.7425	.7365	.7295

SPECIES/LIFE STAGE	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
COHO/FRY	.6460	.6222	.6018	.5851	.5703	.5551	.5354	.5129	.4922	.4765	.4643	.4544	.4493	.4448	.4411
COHO/SPAWNING	.7095	.7096	.7055	.6838	.6469	.6078	.5664	.5267	.4784	.4416	.4140	.3959	.3904	.3948	.4061
COHO/INCUBATION	.7228	.7137	.7055	.6979	.6912	.6854	.6804	.6753	.6661	.6585	.6512	.6445	.6407	.6375	.6345
CHINOOK/JUVENILE	.6799	.6607	.6434	.6296	.6162	.6056	.5964	.5871	.5708	.5549	.5400	.5271	.5225	.5151	.5075
CHINOOK/SPAWNING	.5353	.5668	.5947	.6236	.6450	.6634	.6788	.6753	.6586	.6385	.6136	.5831	.5426	.5074	.4719
CHINOOK/INCUBATION	.7228	.7137	.7055	.6979	.6912	.6854	.6804	.6753	.6661	.6585	.6512	.6445	.6407	.6375	.6345
CUTTHROAT/FRY	.5544	.5319	.5097	.4896	.4720	.4556	.4411	.4277	.4122	.3981	.3832	.3692	.3636	.3542	.3453
CUTTHROAT/JUVENILE	.7130	.6945	.6762	.6566	.6365	.6171	.5999	.5817	.5587	.5372	.5187	.5034	.4938	.4837	.4728
CUTTHROAT/ADULT	.7020	.7089	.7044	.6937	.6884	.6820	.6753	.6686	.6613	.6585	.6497	.6366	.6236	.6116	.6006
CUTTHROAT/SPAWNING	.6196	.5599	.4955	.4424	.3979	.3614	.3398	.3257	.3148	.3096	.3122	.3106	.3050	.2982	.2912
CUTTHROAT/INCUBATION	.7228	.7137	.7055	.6979	.6912	.6854	.6804	.6753	.6661	.6585	.6512	.6445	.6407	.6375	.6345
STEELHEAD/FRY	.4302	.4094	.3912	.3726	.3545	.3422	.3321	.3225	.3090	.2955	.2841	.2738	.2724	.2645	.2563
STEELHEAD/JUVENILE	.7228	.7127	.7021	.6919	.6815	.6718	.6619	.6514	.6374	.6250	.6127	.6014	.6048	.5972	.5889
STEELHEAD/ADULT	.5838	.6281	.6598	.6839	.6912	.6832	.6692	.6527	.6288	.5716	.5277	.5090	.5097	.5100	.5096
STEELHEAD/SPAWNING	.3286	.3624	.3963	.4285	.4556	.4782	.5000	.5205	.5373	.5533	.5657	.5769	.5870	.5939	.5995
STEELHEAD/INCUBATION	.7228	.7137	.7055	.6979	.6912	.6854	.6804	.6753	.6661	.6585	.6512	.6445	.6407	.6375	.6345

Table 23. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
COHO/FRY	.4316	.4184	.4059	.3967	.3874	.3791	.3722	.3650	.3557	.3479	.3407	.3349	.3297	.3244	.3184
COHO/SPAWNING	.3995	.3925	.3870	.3819	.3752	.3656	.3566	.3477	.3377	.3281	.3192	.3119	.3077	.3062	.3121
COHO/INCUBATION	.6280	.6233	.6212	.6190	.6162	.6132	.6102	.6074	.6012	.5967	.5924	.5882	.5852	.5824	.5797
CHINOOK/JUVENILE	.4966	.4878	.4811	.4747	.4693	.4644	.4592	.4528	.4445	.4378	.4316	.4263	.4212	.4159	.4093
CHINOOK/SPAWNING	.4399	.4143	.3916	.3757	.3656	.3577	.3515	.3478	.3456	.4093	.4459	.4490	.4464	.4420	.4357
CHINOOK/INCUBATION	.6280	.6233	.6212	.6190	.6162	.6132	.6102	.6074	.6012	.5967	.5924	.5882	.5852	.5824	.5797
CUTTHROAT/FRY	.3351	.3261	.3190	.3124	.3065	.3006	.2949	.2891	.2818	.2753	.2686	.2625	.2568	.2507	.2447
CUTTHROAT/JUVENILE	.4593	.4475	.4372	.4269	.4173	.4080	.3992	.3901	.3793	.3707	.3635	.3561	.3486	.3404	.3320
CUTTHROAT/ADULT	.5855	.5693	.5537	.5374	.5201	.5028	.4869	.4727	.4574	.4453	.4333	.4225	.4153	.4087	.4036
CUTTHROAT/SPAWNING	.2799	.2721	.2693	.2669	.2674	.2715	.2768	.2805	.2818	.2829	.2777	.2680	.2509	.2292	.2134
CUTTHROAT/INCUBATION	.6280	.6233	.6212	.6190	.6162	.6132	.6102	.6074	.6012	.5967	.5924	.5882	.5852	.5824	.5797
STEELHEAD/FRY	.2512	.2486	.2480	.2491	.2507	.2502	.2478	.2465	.2467	.2454	.2445	.2434	.2461	.2464	.2476
STEELHEAD/JUVENILE	.5777	.5678	.5609	.5534	.5441	.5333	.5235	.5154	.5056	.4974	.4895	.4825	.4768	.4709	.4648
STEELHEAD/ADULT	.4970	.4848	.4709	.4484	.4274	.4188	.4093	.3988	.3859	.3747	.3721	.3722	.3703	.3694	.3663
STEELHEAD/SPAWNING	.6010	.6047	.6096	.6131	.6138	.6125	.6102	.6062	.5976	.5902	.5816	.5727	.5640	.5556	.5470
STEELHEAD/INCUBATION	.6280	.6233	.6212	.6190	.6162	.6132	.6102	.6074	.6012	.5967	.5924	.5882	.5852	.5824	.5797

SPECIES/LIFE STAGE	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
COHO/FRY	.3125	.3068	.3014	.2963	.2899	.2834	.2782	.2750	.2663	.2601	.2545	.2490	.2444	.2403	.2369
COHO/SPAWNING	.3136	.3157	.3190	.3222	.3204	.3148	.3097	.3060	.2972	.2930	.2887	.2842	.2807	.2779	.2747
COHO/INCUBATION	.5771	.5742	.5713	.5685	.5657	.5630	.5610	.5593	.5513	.5502	.5492	.5482	.5472	.5462	.5452
CHINOOK/JUVENILE	.4032	.3970	.3909	.3849	.3789	.3729	.3680	.3637	.3548	.3502	.3456	.3413	.3371	.3334	.3298
CHINOOK/SPAWNING	.4266	.4183	.4108	.4046	.3982	.3925	.3879	.3858	.3815	.3820	.3856	.3920	.3928	.3878	.3819
CHINOOK/INCUBATION	.5771	.5742	.5713	.5685	.5657	.5630	.5610	.5593	.5513	.5502	.5492	.5482	.5472	.5462	.5452
CUTTHROAT/FRY	.2383	.2320	.2262	.2210	.2163	.2119	.2077	.2042	.1983	.1951	.1924	.1900	.1875	.1852	.1828
CUTTHROAT/JUVENILE	.3232	.3138	.3047	.2961	.2880	.2806	.2736	.2684	.2597	.2545	.2494	.2445	.2398	.2353	.2311
CUTTHROAT/ADULT	.3964	.3893	.3818	.3737	.3660	.3590	.3520	.3460	.3357	.3304	.3252	.3200	.3149	.3096	.3042
CUTTHROAT/SPAWNING	.2042	.1967	.1890	.1828	.1778	.1736	.1703	.1689	.1622	.1576	.1543	.1500	.1452	.1407	.1354
CUTTHROAT/INCUBATION	.5771	.5742	.5713	.5685	.5657	.5630	.5610	.5593	.5513	.5502	.5492	.5482	.5472	.5462	.5452
STEELHEAD/FRY	.2510	.2517	.2540	.2570	.2601	.2593	.2605	.2514	.2476	.2483	.2487	.2495	.2496	.2496	.2503
STEELHEAD/JUVENILE	.4589	.4533	.4481	.4432	.4388	.4345	.4306	.4278	.4205	.4185	.4162	.4137	.4111	.4084	.4057
STEELHEAD/ADULT	.3591	.3505	.3418	.3359	.3310	.3238	.3139	.3092	.3034	.3018	.3031	.3060	.3102	.3128	.3139
STEELHEAD/SPAWNING	.5386	.5304	.5219	.5131	.5037	.4945	.4863	.4786	.4672	.4611	.4546	.4490	.4432	.4378	.4338
STEELHEAD/INCUBATION	.5771	.5742	.5713	.5685	.5657	.5630	.5610	.5593	.5513	.5502	.5492	.5482	.5472	.5462	.5452

Table 23. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
COHO/FRY	.2326	.2280	.2237	.2195	.2156	.2119	.2086	.2055	.2029	.2006	.1985	.1965	.1945	.1927	.1908
COHO/SPAWNING	.2738	.2744	.2743	.2762	.2807	.2853	.2874	.2853	.2824	.2794	.2751	.2687	.2618	.2564	.2511
COHO/INCUBATION	.5442	.5433	.5423	.5415	.5407	.5399	.5392	.5384	.5376	.5369	.5362	.5354	.5347	.5340	.5333
CHINOOK/JUVENILE	.3263	.3227	.3189	.3149	.3115	.3083	.3052	.3023	.2995	.2966	.2937	.2912	.2893	.2877	.2858
CHINOOK/SPAWNING	.3764	.3666	.3568	.3478	.3406	.3337	.3281	.3255	.3251	.3270	.3323	.3363	.3407	.3423	.3458
CHINOOK/INCUBATION	.5442	.5433	.5423	.5415	.5407	.5399	.5392	.5384	.5376	.5369	.5362	.5354	.5347	.5340	.5333
CUTTHROAT/FRY	.1807	.1785	.1765	.1746	.1729	.1711	.1696	.1681	.1668	.1654	.1640	.1626	.1612	.1599	.1586
CUTTHROAT/JUVENILE	.2270	.2231	.2193	.2156	.2122	.2089	.2054	.2019	.1985	.1951	.1920	.1891	.1866	.1844	.1824
CUTTHROAT/ADULT	.2989	.2938	.2887	.2838	.2791	.2742	.2699	.2651	.2605	.2561	.2514	.2466	.2423	.2384	.2350
CUTTHROAT/SPAWNING	.1325	.1306	.1296	.1297	.1298	.1298	.1289	.1284	.1282	.1275	.1276	.1282	.1288	.1274	.1267
CUTTHROAT/INCUBATION	.5442	.5433	.5423	.5415	.5407	.5399	.5392	.5384	.5376	.5369	.5362	.5354	.5347	.5340	.5333
STEELHEAD/FRY	.2523	.2544	.2569	.2581	.2602	.2619	.2623	.2620	.2618	.2613	.2606	.2593	.2580	.2568	.2561
STEELHEAD/JUVENILE	.4031	.4005	.3982	.3959	.3937	.3914	.3891	.3868	.3845	.3817	.3789	.3766	.3743	.3723	.3707
STEELHEAD/ADULT	.3053	.2972	.2896	.2825	.2798	.2765	.2737	.2706	.2671	.2660	.2666	.2685	.2733	.2749	.2769
STEELHEAD/SPAWNING	.4300	.4261	.4223	.4196	.4174	.4152	.4124	.4113	.4110	.4107	.4093	.4073	.4052	.4036	.4020
STEELHEAD/INCUBATION	.5442	.5433	.5423	.5415	.5407	.5399	.5392	.5384	.5376	.5369	.5362	.5354	.5347	.5340	.5333

SPECIES/LIFE STAGE	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
COHO/FRY	.1890	.1875	.1863	.1853	.1841	.1830	.1814	.1806	.1796	.1788	.1783	.1771	.1756	.1740	.1722
COHO/SPAWNING	.2455	.2401	.2353	.2312	.2270	.2233	.2190	.2147	.2109	.2081	.2057	.2031	.2007	.1979	.1943
COHO/INCUBATION	.5327	.5320	.5313	.5307	.5294	.5285	.5258	.5249	.5243	.5238	.5233	.5228	.5223	.5218	.5213
CHINOOK/JUVENILE	.2836	.2814	.2790	.2765	.2739	.2712	.2676	.2653	.2637	.2614	.2591	.2569	.2546	.2524	.2503
CHINOOK/SPAWNING	.3528	.3575	.3555	.3554	.3557	.3536	.3489	.3424	.3358	.3290	.3234	.3187	.3137	.3088	.3038
CHINOOK/INCUBATION	.5327	.5320	.5313	.5307	.5294	.5285	.5258	.5249	.5243	.5238	.5233	.5228	.5223	.5218	.5213
CUTTHROAT/FRY	.1573	.1561	.1549	.1538	.1526	.1514	.1498	.1490	.1478	.1470	.1464	.1458	.1453	.1449	.1446
CUTTHROAT/JUVENILE	.1803	.1783	.1763	.1744	.1727	.1712	.1691	.1678	.1667	.1655	.1644	.1631	.1618	.1603	.1587
CUTTHROAT/ADULT	.2328	.2319	.2324	.2327	.2322	.2314	.2290	.2270	.2250	.2227	.2197	.2164	.2135	.2107	.2075
CUTTHROAT/SPAWNING	.1260	.1243	.1223	.1204	.1177	.1155	.1133	.1126	.1140	.1142	.1146	.1152	.1149	.1153	.1159
CUTTHROAT/INCUBATION	.5327	.5320	.5313	.5307	.5294	.5285	.5258	.5249	.5243	.5238	.5233	.5228	.5223	.5218	.5213
STEELHEAD/FRY	.2553	.2543	.2532	.2523	.2512	.2502	.2485	.2471	.2460	.2428	.2410	.2386	.2361	.2335	.2309
STEELHEAD/JUVENILE	.3691	.3673	.3656	.3639	.3615	.3592	.3556	.3529	.3507	.3482	.3455	.3427	.3394	.3357	.3319
STEELHEAD/ADULT	.2794	.2818	.2826	.2838	.2899	.2933	.2901	.2814	.2728	.2681	.2640	.2577	.2438	.2306	.2238
STEELHEAD/SPAWNING	.4003	.3981	.3961	.3941	.3913	.3887	.3852	.3828	.3809	.3787	.3760	.3734	.3705	.3677	.3650
STEELHEAD/INCUBATION	.5327	.5320	.5313	.5307	.5294	.5285	.5258	.5249	.5243	.5238	.5233	.5228	.5223	.5218	.5213

Table 24. Efficiency index values for several species/life stages in the Mainstem Tolt River.

	DISCHARGE (CFS)														
SPECIES/LIFE STAGE	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
COHO/FRY	.3720	.3237	.2749	.2378	.2175	.1971	.1746	.1600	.1486	.1348	.1268	.1208	.1159	.1122	.1065
COHO/SPAWNING	.2574	.2747	.2884	.2985	.2998	.2886	.2751	.2627	.2460	.2314	.2221	.2121	.2017	.1933	.1891
COHO/INCUBATION	.1003	.1028	.0986	.1032	.1038	.1022	.1089	.1082	.1090	.1122	.1179	.1165	.1207	.1324	.1312
CHINOOK/JUVENILE	.3650	.3561	.3392	.3213	.3027	.2862	.2714	.2571	.2440	.2291	.2184	.2087	.2004	.1931	.1860
CHINOOK/SPAWNING	.1986	.2278	.2601	.2862	.2951	.3015	.3110	.3113	.2946	.2763	.2636	.2515	.2396	.2273	.2187
CHINOOK/INCUBATION	.2095	.2130	.2043	.2159	.2183	.2157	.2261	.2251	.2316	.2373	.2446	.2417	.2471	.2497	.2475
CUTTHROAT/FRY	.3720	.3428	.3129	.2872	.2610	.2429	.2281	.2140	.2031	.1920	.1873	.1809	.1743	.1687	.1639
CUTTHROAT/JUVENILE	.3182	.3249	.3263	.3296	.3252	.3212	.3147	.3061	.2957	.2844	.2753	.2674	.2573	.2467	.2362
CUTTHROAT/ADULT	.2500	.2620	.2760	.2876	.2902	.2918	.2924	.2946	.2948	.2930	.2916	.2898	.2873	.2847	.2796
CUTTHROAT/SPAWNING	.3720	.3550	.3243	.2944	.2605	.2397	.2281	.2166	.2082	.2012	.1954	.1907	.1891	.1908	.1958
CUTTHROAT/INCUBATION	.1256	.1370	.1314	.1417	.1428	.1411	.1573	.1558	.1569	.1679	.1720	.1700	.1722	.1735	.1741
STEELHEAD/FRY	.3720	.3384	.3078	.2906	.2764	.2660	.2560	.2499	.2442	.2366	.2342	.2267	.2198	.2157	.2129
STEELHEAD/JUVENILE	.3307	.3323	.3292	.3286	.3250	.3212	.3161	.3105	.3041	.2958	.2904	.2838	.2764	.2695	.2627
STEELHEAD/ADULT	.0593	.0830	.1080	.1256	.1489	.1640	.1847	.1987	.2178	.2313	.2485	.2676	.2790	.2847	.2797
STEELHEAD/SPAWNING	.0484	.0680	.0877	.1092	.1313	.1548	.1760	.1944	.2116	.2238	.2357	.2470	.2558	.2636	.2691
STEELHEAD/INCUBATION	.3644	.3513	.3404	.3329	.3257	.3211	.3167	.3113	.3070	.3002	.2945	.2911	.2873	.2847	.2822

SPECIES/LIFE STAGE	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
COHO/FRY	.1002	.0961	.0922	.0890	.0863	.0848	.0838	.0830	.0830	.0831	.0837	.0839	.0824	.0809	.0800
COHO/SPAWNING	.1861	.1862	.1846	.1838	.1822	.1833	.1888	.1940	.1994	.2038	.2079	.2129	.2156	.2182	.2194
COHO/INCUBATION	.1354	.1359	.1352	.1345	.1416	.1410	.1483	.1487	.1496	.1485	.1600	.1592	.1605	.1591	.1648
CHINOOK/JUVENILE	.1798	.1755	.1712	.1679	.1645	.1620	.1590	.1564	.1535	.1505	.1482	.1458	.1428	.1394	.1362
CHINOOK/SPAWNING	.2120	.2055	.1990	.1938	.1903	.1874	.1871	.1863	.1850	.1860	.1872	.1890	.1917	.1952	.2015
CHINOOK/INCUBATION	.2500	.2488	.2476	.2462	.2464	.2444	.2588	.2570	.2549	.2530	.2515	.2503	.2489	.2468	.2452
CUTTHROAT/FRY	.1596	.1565	.1532	.1511	.1479	.1455	.1433	.1418	.1402	.1391	.1381	.1379	.1377	.1374	.1373
CUTTHROAT/JUVENILE	.2257	.2162	.2079	.2000	.1927	.1866	.1819	.1781	.1749	.1719	.1695	.1675	.1657	.1634	.1618
CUTTHROAT/ADULT	.2718	.2642	.2584	.2504	.2407	.2293	.2204	.2114	.2021	.1948	.1889	.1831	.1789	.1736	.1687
CUTTHROAT/SPAWNING	.2023	.2086	.2099	.2113	.2095	.2067	.2039	.2017	.1978	.1927	.1905	.1897	.1899	.1903	.1905
CUTTHROAT/INCUBATION	.1771	.1762	.1753	.1744	.1745	.1730	.1739	.1730	.1722	.1709	.1899	.1890	.1891	.1874	.1913
STEELHEAD/FRY	.2079	.2055	.2005	.1963	.1912	.1845	.1793	.1760	.1723	.1664	.1620	.1586	.1556	.1527	.1508
STEELHEAD/JUVENILE	.2547	.2479	.2410	.2354	.2292	.2227	.2169	.2116	.2069	.2023	.1982	.1947	.1914	.1877	.1850
STEELHEAD/ADULT	.2716	.2551	.2394	.2304	.2190	.2073	.1956	.1801	.1699	.1605	.1491	.1382	.1306	.1260	.1226
STEELHEAD/SPAWNING	.2719	.2741	.2750	.2746	.2725	.2683	.2636	.2574	.2503	.2432	.2362	.2292	.2223	.2148	.2081
STEELHEAD/INCUBATION	.2791	.2776	.2762	.2746	.2728	.2704	.2685	.2666	.2645	.2625	.2609	.2597	.2583	.2560	.2544

Table 24. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
COHO/FRY	.0795	.0793	.0805	.0805	.0803	.0803	.0796	.0789	.0778	.0767	.0760	.0747	.0734	.0711	.0678
COHO/SPAWNING	.2205	.2215	.2219	.2202	.2189	.2172	.2138	.2114	.2090	.2054	.2014	.1983	.1959	.1943	.1910
COHO/INCUBATION	.2010	.1998	.1986	.2039	.2027	.2018	.2008	.2000	.2069	.2057	.2046	.2048	.2040	.2033	.2202
CHINOOK/JUVENILE	.1328	.1299	.1278	.1258	.1244	.1239	.1231	.1221	.1207	.1193	.1176	.1160	.1143	.1123	.1099
CHINOOK/SPAWNING	.2082	.2118	.2150	.2193	.2244	.2274	.2280	.2280	.2256	.2251	.2225	.2188	.2162	.2139	.2096
CHINOOK/INCUBATION	.2511	.2488	.2474	.2460	.2445	.2434	.2422	.2412	.2397	.2383	.2370	.2360	.2351	.2342	.2322
CUTTHROAT/FRY	.1369	.1363	.1390	.1392	.1385	.1369	.1355	.1338	.1308	.1281	.1253	.1225	.1196	.1167	.1132
CUTTHROAT/JUVENILE	.1599	.1584	.1585	.1587	.1590	.1586	.1580	.1571	.1553	.1543	.1532	.1523	.1513	.1503	.1481
CUTTHROAT/ADULT	.1641	.1595	.1560	.1524	.1488	.1457	.1447	.1453	.1461	.1477	.1499	.1527	.1545	.1558	.1550
CUTTHROAT/SPAWNING	.1907	.1914	.1937	.1957	.1976	.1989	.2000	.2010	.2021	.2054	.2100	.2168	.2222	.2264	.2240
CUTTHROAT/INCUBATION	.1909	.1893	.1881	.1894	.1883	.1874	.1865	.1857	.1840	.1829	.1819	.1813	.1806	.1799	.2218
STEELHEAD/FRY	.1488	.1467	.1473	.1454	.1429	.1407	.1384	.1370	.1358	.1348	.1340	.1336	.1338	.1346	.1347
STEELHEAD/JUVENILE	.1818	.1787	.1782	.1754	.1726	.1700	.1675	.1654	.1624	.1598	.1574	.1551	.1529	.1509	.1483
STEELHEAD/ADULT	.1189	.1141	.1117	.1127	.1140	.1132	.1125	.1132	.1150	.1148	.1112	.1102	.1105	.1121	.1094
STEELHEAD/SPAWNING	.2010	.1953	.1901	.1852	.1802	.1756	.1709	.1668	.1623	.1589	.1553	.1520	.1489	.1458	.1421
STEELHEAD/INCUBATION	.2520	.2497	.2482	.2467	.2453	.2441	.2430	.2419	.2397	.2383	.2370	.2360	.2351	.2342	.2322

SPECIES/LIFE STAGE	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
COHO/FRY	.0643	.0625	.0607	.0593	.0574	.0552	.0531	.0507	.0492	.0479	.0467	.0457	.0447	.0437	.0428
COHO/SPAWNING	.1878	.1874	.1865	.1856	.1852	.1862	.1880	.1886	.1908	.1917	.1944	.1956	.1981	.1993	.2009
COHO/INCUBATION	.2175	.2167	.2160	.2164	.2157	.2150	.2143	.2122	.2115	.2108	.2117	.2178	.2172	.2173	.2165
CHINOOK/JUVENILE	.1073	.1056	.1038	.1018	.0999	.0979	.0961	.0936	.0915	.0896	.0882	.0869	.0856	.0840	.0823
CHINOOK/SPAWNING	.2051	.2022	.1990	.1954	.1917	.1879	.1856	.1832	.1845	.1871	.1895	.1928	.1968	.2000	.2019
CHINOOK/INCUBATION	.2294	.2286	.2278	.2271	.2263	.2256	.2249	.2226	.2219	.2213	.2206	.2200	.2193	.2183	.2175
CUTTHROAT/FRY	.1096	.1069	.1044	.1019	.0997	.0977	.0958	.0932	.0913	.0894	.0876	.0861	.0847	.0832	.0818
CUTTHROAT/JUVENILE	.1452	.1432	.1408	.1382	.1357	.1333	.1313	.1284	.1262	.1236	.1209	.1180	.1152	.1123	.1093
CUTTHROAT/ADULT	.1534	.1532	.1528	.1528	.1513	.1493	.1469	.1431	.1398	.1364	.1328	.1295	.1262	.1234	.1214
CUTTHROAT/SPAWNING	.2203	.2170	.2141	.2099	.2057	.2022	.1991	.1962	.1952	.1941	.1931	.1917	.1897	.1865	.1833
CUTTHROAT/INCUBATION	.2191	.2183	.2176	.2170	.2163	.2156	.2149	.2128	.2121	.2115	.2130	.2142	.2135	.2170	.2162
STEELHEAD/FRY	.1348	.1354	.1354	.1343	.1336	.1326	.1325	.1310	.1298	.1285	.1273	.1262	.1250	.1236	.1228
STEELHEAD/JUVENILE	.1458	.1440	.1423	.1402	.1380	.1361	.1340	.1310	.1289	.1268	.1249	.1230	.1213	.1194	.1176
STEELHEAD/ADULT	.1066	.1050	.1027	.1019	.1001	.0980	.0977	.0976	.0981	.0983	.0965	.0931	.0895	.0870	.0848
STEELHEAD/SPAWNING	.1385	.1360	.1339	.1319	.1300	.1282	.1264	.1239	.1223	.1207	.1192	.1178	.1165	.1149	.1135
STEELHEAD/INCUBATION	.2294	.2286	.2278	.2271	.2263	.2256	.2249	.2226	.2219	.2213	.2206	.2200	.2193	.2183	.2175

Table 24. (continued).

DISCHARGE (CFS)

SPECIES/LIFE STAGE	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
COHO/FRY	.0417	.0410	.0403	.0398	.0392	.0389	.0385	.0381	.0376	.0372	.0368	.0366	.0366	.0365	.0365
COHO/SPAWNING	.1998	.2003	.2020	.2049	.2069	.2090	.2106	.2111	.2104	.2086	.2055	.2022	.1987	.1953	.1922
COHO/INCUBATION	.2138	.2130	.2123	.2117	.2111	.2107	.2104	.2101	.2098	.2095	.2092	.2089	.2096	.2088	.2082
CHINOOK/JUVENILE	.0799	.0782	.0768	.0757	.0747	.0736	.0722	.0710	.0698	.0687	.0677	.0669	.0660	.0650	.0641
CHINOOK/SPAWNING	.2028	.2042	.2032	.2018	.2010	.2003	.1993	.1990	.2012	.2033	.2029	.2011	.2001	.1998	.2002
CHINOOK/INCUBATION	.2148	.2139	.2133	.2127	.2120	.2117	.2114	.2111	.2107	.2104	.2101	.2098	.2096	.2088	.2082
CUTTHROAT/FRY	.0798	.0785	.0773	.0763	.0753	.0746	.0738	.0731	.0724	.0717	.0710	.0702	.0696	.0688	.0681
CUTTHROAT/JUVENILE	.1054	.1025	.1001	.0981	.0962	.0944	.0928	.0909	.0890	.0873	.0858	.0844	.0830	.0817	.0804
CUTTHROAT/ADULT	.1186	.1165	.1138	.1110	.1080	.1050	.1025	.1004	.0982	.0956	.0930	.0905	.0880	.0853	.0827
CUTTHROAT/SPAWNING	.1781	.1743	.1696	.1655	.1629	.1609	.1590	.1572	.1559	.1554	.1554	.1555	.1560	.1561	.1571
CUTTHROAT/INCUBATION	.2135	.2126	.2120	.2114	.2108	.2104	.2101	.2098	.2095	.2092	.2089	.2086	.2096	.2088	.2082
STEELHEAD/FRY	.1207	.1193	.1183	.1175	.1170	.1164	.1155	.1143	.1129	.1116	.1105	.1095	.1085	.1076	.1070
STEELHEAD/JUVENILE	.1148	.1132	.1118	.1103	.1089	.1078	.1067	.1057	.1045	.1034	.1024	.1013	.1001	.0987	.0976
STEELHEAD/ADULT	.0796	.0754	.0728	.0709	.0684	.0669	.0661	.0652	.0643	.0631	.0609	.0585	.0549	.0523	.0518
STEELHEAD/SPAWNING	.1113	.1103	.1096	.1089	.1082	.1077	.1074	.1076	.1078	.1079	.1080	.1078	.1075	.1069	.1061
STEELHEAD/INCUBATION	.2148	.2139	.2133	.2127	.2120	.2117	.2114	.2111	.2107	.2104	.2101	.2098	.2096	.2088	.2082

SPECIES/LIFE STAGE	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
COHO/FRY	.0366	.0366	.0367	.0368	.0369	.0371	.0373	.0375	.0373	.0370	.0368	.0367	.0367	.0366	.0365
COHO/SPAWNING	.1885	.1851	.1821	.1795	.1770	.1747	.1727	.1711	.1699	.1689	.1682	.1675	.1671	.1668	.1656
COHO/INCUBATION	.2079	.2076	.2073	.2070	.2067	.2064	.2061	.2058	.2056	.2053	.2051	.2049	.2047	.2045	.2034
CHINOOK/JUVENILE	.0635	.0631	.0627	.0623	.0618	.0612	.0606	.0602	.0599	.0595	.0591	.0584	.0579	.0574	.0567
CHINOOK/SPAWNING	.1996	.1989	.1979	.1979	.1996	.2010	.1991	.1960	.1931	.1904	.1881	.1863	.1847	.1831	.1808
CHINOOK/INCUBATION	.2079	.2076	.2073	.2070	.2067	.2064	.2061	.2058	.2056	.2053	.2051	.2049	.2047	.2045	.2034
CUTTHROAT/FRY	.0675	.0670	.0666	.0661	.0655	.0649	.0644	.0638	.0633	.0628	.0624	.0620	.0616	.0613	.0607
CUTTHROAT/JUVENILE	.0792	.0781	.0771	.0761	.0751	.0743	.0736	.0731	.0726	.0721	.0716	.0711	.0707	.0703	.0697
CUTTHROAT/ADULT	.0804	.0782	.0761	.0741	.0731	.0727	.0724	.0720	.0714	.0710	.0707	.0704	.0699	.0692	.0678
CUTTHROAT/SPAWNING	.1589	.1610	.1637	.1666	.1708	.1754	.1798	.1837	.1877	.1914	.1937	.1951	.1966	.1987	.1992
CUTTHROAT/INCUBATION	.2079	.2076	.2073	.2070	.2067	.2064	.2061	.2058	.2056	.2053	.2051	.2049	.2047	.2045	.2034
STEELHEAD/FRY	.1062	.1050	.1038	.1025	.1011	.1000	.0991	.0984	.0976	.0969	.0961	.0955	.0949	.0943	.0933
STEELHEAD/JUVENILE	.0965	.0955	.0946	.0936	.0926	.0917	.0909	.0902	.0894	.0887	.0878	.0868	.0860	.0853	.0844
STEELHEAD/ADULT	.0515	.0512	.0514	.0520	.0529	.0543	.0561	.0580	.0595	.0610	.0626	.0638	.0646	.0656	.0647
STEELHEAD/SPAWNING	.1053	.1047	.1041	.1033	.1026	.1017	.1008	.0998	.0986	.0972	.0955	.0938	.0921	.0904	.0884
STEELHEAD/INCUBATION	.2079	.2076	.2073	.2070	.2067	.2064	.2061	.2058	.2056	.2053	.2051	.2049	.2047	.2045	.2034

Table 24. (continued).

SPECIES/LIFE STAGE	DISCHARGE (CFS) 950	960	970	980	990	1000
COHO/FRY	.0365	.0366	.0365	.0365	.0366	.0367
COHO/SPAWNING	.1652	.1651	.1651	.1664	.1680	.1699
COHO/INCUBATION	.2031	.2028	.2017	.2010	.2005	.2001
CHINOOK/JUVENILE	.0564	.0561	.0556	.0553	.0550	.0548
CHINOOK/SPAWNING	.1787	.1768	.1745	.1733	.1724	.1718
CHINOOK/INCUBATION	.2031	.2028	.2017	.2010	.2005	.2001
CUTTHROAT/FRY	.0603	.0602	.0598	.0597	.0596	.0596
CUTTHROAT/JUVENILE	.0693	.0689	.0682	.0675	.0670	.0664
CUTTHROAT/ADULT	.0667	.0661	.0652	.0642	.0633	.0628
CUTTHROAT/SPAWNING	.1994	.1997	.1989	.1972	.1956	.1938
CUTTHROAT/INCUBATION	.2031	.2028	.2017	.2010	.2005	.2001
STEELHEAD/FRY	.0928	.0923	.0914	.0907	.0898	.0888
STEELHEAD/JUVENILE	.0838	.0832	.0822	.0814	.0807	.0801
STEELHEAD/ADULT	.0634	.0621	.0618	.0602	.0586	.0567
STEELHEAD/SPAWNING	.0868	.0852	.0833	.0817	.0801	.0785
STEELHEAD/INCUBATION	.2031	.2028	.2017	.2010	.2005	.2001

Table 25. Stream discharges and WUA's associated with peak habitat indices for different species/life stages in the South Fork, North Fork, and mainstem Tolt River. Q = cfs; WUA = $ft^2 \times 10^5$ per total length of stream represented (SF = 7.95 mi., NF = 4.70 mi., MS = 8.7 mi.).

		South Fork		North Fork		Mainstem	
		Q	WUA	Q	WUA	Q	WUA
Coho							
	Fry	20	1.35	50	2.26	50	3.08
	Spawning	30	0.95	105	0.65	720	1.44
	Incubation	135	1.16	45	0.65	770	1.69
Chinook							
	Juveniles	35	4.22	65	5.71	60	7.90
	Spawning	40	0.90	130	0.44	120	1.36
	Incubation	135	1.21	45	0.44	430	1.66
Cutthroat							
	Fry	30	1.68	40	3.16	50	4.04
	Juveniles	80	3.39	85	4.84	100	6.28
	Adults	115	4.94	140	6.76	170	7.47
	Spawning	190	0.57	75	0.51	50	0.92
	Incubation	135	0.77	25	0.51	770	1.36
Steelhead (winter)							
	Fry	20	4.12	30	4.18	50	9.93
	Juveniles	65	8.04	95	7.81	100	13.33
	Adults	130	1.84	115	2.16	180	3.01
	Spawning	355	2.11	200	3.29	230	7.61
	Incubation	255	2.52	80	3.29	130	7.76

Table 26. Stream discharges and WUA's associated with peak efficiency indices for different species/life stages in the South Fork, North Fork, and mainstem Tolt River. Q = cfs; WUA = ft^2 x 10^5 per total length of stream represented (SF = 7.95 mi., NF = 4.70 mi., MS = 8.7 mi.).

		South Fork		North Fork		Mainstem	
		Q	WUA	Q	WUA	Q	WUA
Coho							
	Fry	20	1.35	45	2.25	50	3.08
	Spawning	30	0.95	100	0.64	90	1.33
	Incubation	20	0.96	25	0.63	490	1.60
Chinook							
	Juveniles	25	4.13	55	5.69	50	7.75
	Spawning	40	0.90	125	0.44	120	1.36
	Incubation	20	1.00	20	0.43	260	1.60
Cutthroat							
	Fry	20	1.62	40	3.16	50	4.04
	Juveniles	50	3.09	70	4.80	80	6.20
	Adults	85	4.73	100	6.72	130	7.17
	Spawning	35	0.53	75	0.51	50	0.92
	Incubation	55	0.74	20	0.51	490	1.30
Steelhead (winter)							
	Fry	20	4.12	20	4.14	50	9.93
	Juveniles	40	7.60	85	7.72	60	12.43
	Adults	125	1.84	115	2.16	180	3.01
	Spawning	135	1.99	190	3.27	220	7.58
	Incubation	30	2.32	25	3.28	50	7.61

Table 27. Combined and weighted monthly habitat indices for the South Fork Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	34.731	40.503	45.722	50.934	55.842	60.503	64.888	68.801	71.866	75.306	79.009	81.878	84.675	87.090	88.372

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	89.190	90.279	91.050	91.871	92.026	92.392	92.599	[92.717]	92.472	92.024	91.720	91.636	91.723	91.617	91.439

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	91.269	91.092	90.773	90.554	90.209	89.472	88.839	88.306	87.815	87.270	86.814	86.221	85.539	84.921	84.343

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	83.958	83.682	83.431	83.285	83.234	83.307	83.400	83.515	83.603	83.735	83.764	83.790	83.716	83.626	83.544

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	83.524	83.534	83.601	83.673	83.737	83.669	83.602	83.552	83.459	83.321	83.227	83.179	83.127	83.001	82.881

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	82.787	82.635	82.457	82.241	82.027	81.854	81.667	81.469	81.192	80.917	80.702	80.451	80.208	79.973	79.717

FEBRUARY

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	33.357	38.446	43.399	48.439	53.346	57.810	62.260	66.562	69.947	73.550	77.481	80.566	83.747	86.503	88.190

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	89.330	90.644	91.629	92.735	93.111	93.620	93.946	[94.172]	94.124	93.823	93.661	93.695	93.864	93.829	93.697

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	93.580	93.452	93.197	93.035	92.777	92.178	91.665	91.216	90.824	90.378	89.981	89.448	88.871	88.360	87.878

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	87.574	87.380	87.228	87.176	87.245	87.419	87.599	87.783	87.934	88.127	88.221	88.301	88.279	88.241	88.221

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	88.251	88.317	88.445	88.571	88.685	88.681	88.655	88.636	88.577	88.470	88.397	88.375	88.351	88.253	88.154

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	88.076	87.941	87.784	87.593	87.399	87.228	87.042	86.846	86.577	86.311	86.097	85.847	85.599	85.355	85.091

Table 27. (continued).

MARCH

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
35.371	40.433	45.246	49.989	54.568	58.469	62.608	66.921	70.330	73.834	77.529	80.454	83.480	86.100	87.855
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
89.067	90.361	91.372	92.504	92.919	93.340	93.621	93.822	93.875	93.715	93.667	93.737	**93.897**	93.864	93.728
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
93.607	93.465	93.236	93.071	92.848	92.392	91.991	91.603	91.285	90.927	90.572	90.072	89.631	89.247	88.879
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
88.664	88.544	88.470	88.477	88.599	88.798	88.994	89.186	89.344	89.545	89.666	89.765	89.771	89.751	89.754
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
89.792	89.858	89.980	90.088	90.185	90.200	90.181	90.158	90.103	89.999	89.922	89.895	89.874	89.798	89.722
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
89.653	89.531	89.397	89.240	89.075	88.918	88.742	88.556	88.318	88.078	87.870	87.631	87.385	87.143	86.880

APRIL

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
50.181	54.075	57.535	60.425	63.233	65.895	68.733	71.720	73.937	76.555	78.893	80.690	82.432	84.155	85.241
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
85.830	86.474	86.941	87.656	87.785	87.942	88.027	**88.053**	87.919	87.633	87.457	87.379	87.356	87.226	87.038
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
86.867	86.703	86.483	86.313	86.098	85.715	85.379	85.084	84.825	84.538	84.205	83.771	83.419	83.109	82.773
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
82.522	82.377	82.210	82.070	82.034	82.082	82.150	82.236	82.308	82.415	82.462	82.474	82.415	82.338	82.279
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
82.251	82.236	82.264	82.288	82.321	82.291	82.252	82.217	82.160	82.076	82.026	82.025	82.028	81.993	81.958
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
81.925	81.849	81.762	81.661	81.541	81.425	81.294	81.156	80.980	80.804	80.658	80.487	80.313	80.143	79.960

Table 27. (continued).

MAY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
60.360	63.981	67.226	69.153	70.991	73.005	75.053	77.509	79.015	80.932	82.432	83.481	84.402	85.422	85.941
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
86.076	86.306	86.411	86.947	86.859	86.860	86.810	86.715	86.397	85.986	85.695	85.520	85.402	85.227	85.024
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
84.834	84.659	84.438	84.264	84.041	83.657	83.325	83.065	82.817	82.547	82.244	81.868	81.530	81.223	80.888
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
80.612	80.435	80.249	80.031	79.892	79.844	79.826	79.839	79.847	79.883	79.870	79.828	79.733	79.628	79.534
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
79.471	79.416	79.392	79.376	79.374	79.312	79.260	79.218	79.159	79.086	79.048	79.049	79.052	79.021	78.993
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
78.970	78.914	78.845	78.762	78.662	78.571	78.471	78.365	78.224	78.086	77.983	77.859	77.738	77.620	77.493

JUNE

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
72.979	76.388	78.647	79.695	80.547	81.997	83.062	83.673	83.888	85.196	85.464	85.430	84.960	84.930	84.432
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
83.648	83.015	82.341	81.974	81.314	80.818	80.328	79.830	79.055	78.235	77.621	77.140	76.722	76.326	75.957
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
75.581	75.237	74.878	74.544	74.172	73.644	73.173	72.834	72.473	72.103	71.705	71.242	70.819	70.404	69.940
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
69.495	69.150	68.682	68.186	67.721	67.380	67.111	66.922	66.746	66.601	66.434	66.239	66.013	65.776	65.532
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
65.326	65.112	64.914	64.737	64.596	64.401	64.256	64.135	64.003	63.877	63.804	63.766	63.727	63.665	63.614
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
63.571	63.501	63.414	63.317	63.198	63.091	62.980	62.864	62.714	62.573	62.478	62.365	62.267	62.176	62.080

Table 27. (continued).

JULY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
80.517	83.811	85.580	86.091	86.345	87.440	87.931	87.569	87.065	**87.980**	87.538	86.883	85.631	85.003	83.933

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
82.643	81.534	80.432	79.601	78.632	77.874	77.150	76.439	75.423	74.390	73.603	72.962	72.386	71.878	71.426

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
70.958	70.531	70.104	69.690	69.245	68.646	68.107	67.733	67.316	66.898	66.457	65.959	65.496	65.028	64.501

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
63.970	63.539	62.930	62.289	61.651	61.154	60.751	60.453	60.177	59.935	59.683	59.406	59.112	58.806	58.483

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
58.204	57.906	57.617	57.356	57.142	56.877	56.686	56.525	56.355	56.205	56.116	56.057	55.998	55.919	55.858

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
55.805	55.730	55.635	55.533	55.407	55.295	55.182	55.064	54.914	54.774	54.688	54.587	54.505	54.434	54.360

AUGUST

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
79.500	82.420	83.685	84.149	84.411	85.757	**86.295**	85.513	84.834	85.879	85.479	84.841	83.560	82.987	81.869

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
80.474	79.296	78.110	77.108	76.076	75.321	74.590	73.861	72.749	71.597	70.715	70.017	69.399	68.854	68.371

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
67.876	67.436	66.979	66.551	66.072	65.389	64.782	64.374	63.914	63.443	62.953	62.409	61.871	61.333	60.727

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
60.118	59.633	58.911	58.192	57.488	56.950	56.517	56.201	55.911	55.656	55.381	55.075	54.745	54.409	54.054

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
53.751	53.432	53.124	52.854	52.636	52.348	52.144	51.978	51.800	51.645	51.560	51.511	51.459	51.377	51.313

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
51.263	51.185	51.082	50.968	50.826	50.704	50.583	50.456	50.287	50.131	50.040	49.931	49.846	49.772	49.696

Table 27. (continued).

SEPTEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
73.543	77.873	80.561	82.392	83.853	86.034	87.254	87.211	87.074	88.449	**88.662**	88.465	87.658	87.239	86.133

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
84.844	83.856	82.799	81.883	80.834	80.088	79.321	78.557	77.370	76.144	75.227	74.532	73.965	73.427	72.939

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
72.419	71.929	71.405	70.914	70.360	69.540	68.812	68.283	67.718	67.140	66.619	66.013	65.356	64.700	64.024

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
63.399	62.868	62.179	61.503	60.814	60.290	59.864	59.553	59.252	58.994	58.712	58.425	58.111	57.782	57.429

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
57.134	56.828	56.539	56.282	56.062	55.757	55.534	55.345	55.137	54.941	54.812	54.709	54.600	54.455	54.329

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
54.229	54.100	53.941	53.763	53.574	53.414	53.254	53.087	52.866	52.659	52.522	52.368	52.239	52.122	51.998

OCTOBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
57.606	64.893	70.587	75.228	79.151	83.433	86.470	88.137	89.143	91.179	92.873	93.851	94.228	**94.466**	93.518

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
92.547	92.128	91.492	90.919	89.936	89.433	88.820	88.188	86.957	85.662	84.681	84.030	83.641	83.178	82.748

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
82.270	81.792	81.188	80.661	79.983	78.814	77.794	77.012	76.212	75.373	74.772	74.046	73.065	72.106	71.225

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
70.529	69.895	69.255	68.662	68.016	67.560	67.186	66.921	66.646	66.421	66.133	65.888	65.592	65.281	64.933

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
64.671	64.416	64.189	63.996	63.812	63.478	63.232	63.030	62.786	62.529	62.344	62.170	61.978	61.723	61.491

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
61.315	61.097	60.836	60.531	60.251	60.041	59.831	59.614	59.302	59.001	58.796	58.566	58.370	58.192	57.997

Table 27. (continued).

NOVEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
56.137	63.551	69.426	74.248	78.353	82.935	86.226	88.053	89.143	91.253	93.137	94.282	94.819	95.221	94.325

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
93.394	93.060	92.487	91.986	91.035	90.622	90.084	89.515	88.293	86.990	85.988	85.345	84.984	84.539	84.128

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
83.674	83.226	82.628	82.124	81.445	80.221	79.161	78.359	77.532	76.658	76.042	75.307	74.269	73.262	72.337

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
71.612	70.960	70.306	69.707	69.062	68.617	68.256	68.004	67.745	67.532	67.244	67.001	66.699	66.389	66.040

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
65.784	65.539	65.324	65.149	64.981	64.646	64.404	64.212	63.973	63.720	63.543	63.376	63.190	62.932	62.697

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
62.522	62.303	62.037	61.721	61.431	61.223	61.015	60.800	60.481	60.173	59.969	59.737	59.541	59.365	59.171

DECEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
39.054	45.577	51.312	56.469	61.127	66.156	70.352	73.800	76.218	79.158	82.454	84.906	87.078	88.918	89.474

DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
89.725	90.466	90.880	91.414	91.241	91.518	91.636	91.663	91.068	90.343	89.767	89.515	89.517	89.348	89.153

DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
88.960	88.777	88.396	88.150	87.703	86.705	85.861	85.214	84.571	83.860	83.335	82.699	81.794	80.959	80.192

DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
79.647	79.221	78.829	78.521	78.276	78.200	78.169	78.185	78.189	78.230	78.150	78.087	77.925	77.765	77.597

DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
77.515	77.467	77.467	77.497	77.525	77.372	77.263	77.194	77.075	76.919	76.824	76.764	76.688	76.525	76.373

DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
76.270	76.107	75.905	75.649	75.409	75.248	75.081	74.903	74.622	74.344	74.157	73.931	73.727	73.536	73.327

Table 28. Combined and weighted monthly habitat indices for the North Fork Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
27.317	30.366	32.748	34.839	37.024	39.387	41.840	44.249	46.956	50.013	53.309	57.124	60.981	65.198	69.614
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
73.986	77.619	80.857	83.719	85.679	86.849	87.688	88.388	88.950	88.330	87.928	88.296	89.469	90.048	90.517
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
[90.551]	90.550	90.365	89.779	89.079	88.627	88.111	87.490	86.808	86.102	85.618	85.238	84.706	84.204	83.622
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
82.878	82.145	81.386	80.710	80.007	79.198	78.300	77.635	77.166	76.680	76.253	75.939	75.668	75.365	75.094
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
74.473	73.871	73.297	72.825	72.577	72.293	71.972	71.749	71.556	71.433	71.294	71.166	71.142	71.050	70.990
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
70.939	70.833	70.694	70.562	70.616	70.540	70.262	69.695	69.142	68.719	68.283	67.741	66.856	65.987	65.367

FEBRUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
29.424	32.093	33.953	35.717	37.560	39.392	41.288	43.201	45.463	48.240	51.338	55.058	58.831	62.864	67.027
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
71.196	74.871	78.256	81.374	83.711	85.305	86.606	87.768	88.843	88.849	88.960	89.676	90.872	91.561	92.115
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
92.331	92.527	[92.534]	92.187	91.720	91.462	91.120	90.637	90.062	89.459	89.016	88.644	88.106	87.586	86.955
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
86.211	85.475	84.701	83.985	83.249	82.438	81.563	80.884	80.403	79.887	79.416	79.066	78.747	78.411	78.132
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
77.544	76.961	76.406	75.953	75.686	75.392	75.066	74.884	74.748	74.680	74.582	74.483	74.476	74.410	74.366
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
74.330	74.238	74.120	74.002	74.041	73.966	73.726	73.244	72.772	72.404	72.017	71.536	70.761	70.009	69.477

Table 28. (continued).

MARCH

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	32.183	34.942	36.757	38.430	40.110	41.802	43.531	45.302	47.352	49.888	52.668	56.091	59.536	63.187	66.881

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	70.600	73.986	77.190	80.188	82.535	84.261	85.750	87.116	88.432	89.003	89.549	90.469	91.693	92.400	92.974

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	93.297	93.612	**93.768**	93.652	93.387	93.199	92.934	92.529	92.029	91.496	91.026	90.600	90.030	89.470	88.821

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	88.102	87.408	86.677	85.970	85.231	84.443	83.626	82.954	82.460	81.925	81.398	80.982	80.579	80.180	79.864

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	79.346	78.829	78.336	77.945	77.693	77.421	77.109	76.954	76.854	76.794	76.680	76.545	76.470	76.373	76.296

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	76.219	76.086	75.946	75.801	75.748	75.618	75.388	74.991	74.608	74.281	73.926	73.502	72.872	72.258	71.790

APRIL

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	47.660	50.394	52.163	53.094	53.953	54.700	55.473	56.180	57.092	58.487	60.093	62.243	64.448	66.797	69.127

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	71.498	73.645	75.703	77.594	78.998	80.040	80.918	81.701	82.418	82.567	82.752	83.242	84.156	84.516	84.773

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	84.930	85.100	**85.173**	85.095	84.928	84.774	84.521	84.185	83.848	83.436	83.082	82.760	82.419	82.019	81.572

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	81.128	80.640	80.165	79.730	79.267	78.661	78.083	77.338	76.937	76.535	76.139	75.833	75.523	75.218	74.995

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	74.655	74.316	74.006	73.738	73.598	73.434	73.207	73.074	72.993	72.932	72.827	72.688	72.595	72.489	72.410

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	72.332	72.205	72.073	71.943	71.884	71.766	71.575	71.249	70.931	70.593	70.281	69.893	69.345	68.806	68.376

Table 28. (continued).

MAY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
58.278	61.542	63.519	64.392	65.162	65.736	66.194	66.489	66.954	67.826	68.829	70.267	71.798	73.393	74.990
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
76.595	77.964	79.250	80.399	81.149	81.635	81.956	82.185	82.363	82.010	81.779	81.888	82.534	82.664	82.718
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
82.692	82.650	82.533	82.315	82.055	81.839	81.540	81.198	80.897	80.521	80.238	79.999	79.781	79.489	79.158
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
78.840	78.454	78.102	77.806	77.486	77.002	76.552	75.883	75.558	75.243	74.951	74.730	74.511	74.289	74.129
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
73.849	73.572	73.323	73.088	72.977	72.843	72.653	72.514	72.414	72.337	72.238	72.118	72.045	71.949	71.883
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
71.820	71.720	71.612	71.510	71.487	71.406	71.244	70.950	70.656	70.341	70.070	69.718	69.207	68.702	68.304

JUNE

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
65.392	69.526	72.759	74.207	75.375	75.988	76.379	76.284	76.190	76.425	76.741	77.360	78.026	78.743	79.417
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
80.000	80.268	80.432	80.461	80.163	79.785	79.269	78.671	77.992	76.797	75.829	75.253	75.777	75.412	74.973
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
74.562	74.142	73.715	73.230	72.736	72.247	71.692	71.205	70.881	70.455	70.172	69.955	69.871	69.643	69.402
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
69.212	68.908	68.694	68.575	68.459	68.100	67.795	67.064	66.823	66.634	66.474	66.354	66.224	66.075	65.966
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
65.764	65.570	65.415	65.216	65.154	65.053	64.883	64.698	64.535	64.369	64.209	64.048	63.935	63.800	63.717
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
63.640	63.528	63.399	63.286	63.251	63.156	62.966	62.630	62.294	61.888	61.567	61.144	60.551	59.942	59.433

Table 28. (continued).

JULY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
70.391	75.000	78.850	80.570	81.921	82.533	82.860	82.536	82.121	81.983	81.897	82.030	82.191	82.390	82.525
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
82.516	82.152	81.672	81.060	80.169	79.299	78.307	77.240	76.078	74.410	73.029	72.069	72.500	71.865	71.158
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
70.536	69.906	69.306	68.675	68.055	67.426	66.741	66.184	65.854	65.411	65.138	64.945	64.942	64.762	64.582
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
64.471	64.222	64.092	64.079	64.083	63.805	63.590	62.843	62.657	62.546	62.467	62.411	62.339	62.238	62.164
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
62.010	61.866	61.767	61.591	61.559	61.479	61.325	61.118	60.922	60.712	60.523	60.347	60.218	60.065	59.978
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
59.896	59.782	59.648	59.534	59.498	59.401	59.201	58.849	58.496	58.050	57.710	57.258	56.630	55.977	55.420

AUGUST

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
67.705	72.041	75.987	77.581	78.817	79.260	79.483	79.019	78.496	78.327	78.280	78.475	78.706	79.031	79.309
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
79.451	79.172	78.741	78.137	77.178	76.215	75.114	73.931	72.618	70.627	68.996	67.903	68.353	67.668	66.903
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
66.221	65.543	64.888	64.173	63.488	62.834	62.100	61.499	61.152	60.671	60.409	60.236	60.275	60.114	59.952
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
59.860	59.598	59.469	59.479	59.514	59.209	58.972	58.113	57.917	57.813	57.754	57.731	57.692	57.614	57.561
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
57.390	57.234	57.127	56.933	56.916	56.844	56.686	56.463	56.253	56.036	55.849	55.675	55.564	55.413	55.334
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
55.263	55.157	55.020	54.908	54.906	54.824	54.609	54.199	53.788	53.281	52.901	52.390	51.655	50.899	50.276

Table 28. (continued).

SEPTEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
59.189	64.527	69.277	72.168	74.696	76.387	77.669	78.198	78.661	79.355	80.101	81.073	82.044	83.100	84.188
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
85.045	85.306	85.299	85.104	84.463	83.626	82.566	81.392	80.122	78.030	76.310	75.235	75.829	75.228	74.535
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
73.778	72.967	72.144	71.167	70.184	69.316	68.429	67.675	67.122	66.492	66.120	65.872	65.741	65.469	65.156
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
64.833	64.411	64.087	63.904	63.752	63.358	62.964	62.278	62.052	61.885	61.779	61.702	61.634	61.516	61.400
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
61.070	60.757	60.491	60.172	60.039	59.849	59.614	59.337	59.062	58.794	58.570	58.396	58.302	58.152	58.075
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
58.008	57.906	57.769	57.653	57.671	57.590	57.339	56.858	56.379	55.885	55.471	54.929	54.112	53.268	52.591

OCTOBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
39.794	45.928	51.253	55.681	59.966	63.929	67.499	70.390	73.285	76.083	78.853	81.733	84.600	87.762	91.238
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
94.363	96.267	97.543	98.394	98.360	97.626	96.477	95.173	93.712	90.857	88.549	87.367	88.182	87.881	87.505
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
86.618	85.599	84.471	82.903	81.287	80.053	78.880	77.817	76.850	75.903	75.377	75.060	74.670	74.287	73.834
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
73.147	72.471	71.828	71.355	70.908	70.329	69.591	69.190	68.920	68.672	68.542	68.450	68.428	68.320	68.140
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
67.489	66.879	66.304	65.763	65.494	65.161	64.833	64.462	64.058	63.714	63.448	63.293	63.273	63.142	63.083
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
63.042	62.968	62.830	62.718	62.853	62.819	62.484	61.768	61.064	60.547	60.036	59.386	58.280	57.151	56.324

Table 28. (continued).

NOVEMBER

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	38.067	43.857	48.895	53.079	57.203	61.155	64.817	67.859	70.950	73.938	76.934	80.021	83.120	86.582	90.414

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	93.909	96.082	97.566	98.562	**98.576**	97.818	96.624	95.274	93.729	90.637	88.158	86.924	87.724	87.474	87.159

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	86.268	85.250	84.104	82.472	80.804	79.578	78.403	77.324	76.337	75.369	74.864	74.578	74.208	73.858	73.442

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	72.762	72.086	71.440	70.977	70.536	69.943	69.173	68.761	68.493	68.253	68.147	68.087	68.107	68.032	67.874

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	67.199	66.569	65.975	65.421	65.167	64.847	64.528	64.155	63.745	63.409	63.157	63.018	63.027	62.910	62.865

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	62.839	62.781	62.650	62.548	62.725	62.718	62.378	61.621	60.874	60.340	59.816	59.143	57.974	56.788	55.941

DECEMBER

DISCHARGE (CFS)	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
	28.246	31.783	34.637	36.920	39.413	42.397	45.481	48.449	51.732	55.131	58.678	62.548	66.511	70.971	75.825

DISCHARGE (CFS)	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
	80.562	84.104	87.036	89.404	90.637	**90.942**	90.815	90.539	90.035	87.952	86.390	86.028	86.976	87.363	87.698

DISCHARGE (CFS)	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
	87.375	86.969	86.361	85.248	84.081	83.353	82.585	81.756	80.909	80.054	79.594	79.305	78.871	78.494	78.066

DISCHARGE (CFS)	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
	77.372	76.670	75.962	75.398	74.801	74.030	73.110	72.513	72.103	71.702	71.420	71.245	71.150	70.987	70.793

DISCHARGE (CFS)	320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
	70.100	69.448	68.825	68.297	68.082	67.816	67.517	67.229	66.935	66.747	66.589	66.474	66.508	66.421	66.380

DISCHARGE (CFS)	395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
	66.356	66.287	66.158	66.051	66.229	66.228	65.920	65.203	64.495	64.002	63.519	62.890	61.786	60.698	59.959

Table 29. Combined and weighted monthly habitat indices for the Mainstem Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
41.519	46.617	51.658	56.129	61.020	65.032	69.179	72.741	76.322	79.531	83.170	86.164	88.517	90.300	90.767
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
[90.895]	89.929	88.735	87.990	87.025	85.734	84.568	82.731	81.253	79.736	78.272	76.522	75.083	73.909	72.962
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
72.858	71.895	71.251	70.817	70.234	69.459	68.674	68.083	67.946	67.401	66.544	65.899	65.373	64.988	64.776
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
64.223	63.678	63.084	62.643	62.109	61.591	61.241	61.000	60.756	60.445	60.068	59.674	59.114	58.683	58.239
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
57.621	57.069	56.709	56.428	56.088	55.855	55.719	55.625	55.518	55.329	55.008	54.614	54.112	53.679	53.420
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
53.123	52.884	52.673	52.500	52.353	52.257	52.187	52.133	52.008	51.845	51.641	51.364	51.083	50.821	50.421

FEBRUARY

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
39.730	44.094	48.496	52.628	57.418	61.676	66.089	69.924	73.863	77.354	81.174	84.400	87.091	89.299	90.087
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
[90.558]	89.956	89.120	88.589	87.916	86.788	85.750	83.995	82.509	80.973	79.610	77.832	76.356	75.079	74.098
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
74.195	73.194	72.439	72.019	71.386	70.603	69.828	69.215	69.106	68.589	67.812	67.207	66.690	66.267	66.226
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
65.657	65.101	64.529	64.117	63.603	63.077	62.685	62.399	62.111	61.785	61.392	61.090	60.531	60.112	59.664
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
59.099	58.596	58.247	57.949	57.615	57.374	57.239	57.185	57.140	57.041	56.845	56.585	56.251	55.942	55.765
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
55.567	55.420	55.283	55.172	55.082	55.026	54.975	54.927	54.796	54.618	54.390	54.096	53.792	53.498	53.092

Table 29. (continued).

MARCH

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
42.383	46.462	50.553	54.470	58.979	63.122	67.268	70.952	74.630	77.888	81.404	84.314	86.798	88.907	89.815
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
90.427	90.171	89.656	89.293	88.810	87.872	86.999	85.503	84.152	82.742	81.533	79.919	78.528	77.263	76.270
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
76.298	75.338	74.577	74.061	73.334	72.515	71.698	71.015	70.784	70.225	69.487	68.858	68.287	67.777	67.715
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
67.152	66.598	66.051	65.626	65.125	64.622	64.208	63.880	63.549	63.190	62.817	62.569	62.084	61.701	61.289
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
60.825	60.417	60.125	59.869	59.590	59.380	59.263	59.235	59.215	59.148	59.012	58.814	58.574	58.328	58.155
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
57.956	57.806	57.654	57.515	57.389	57.280	57.168	57.050	56.858	56.616	56.316	55.965	55.610	55.262	54.852

APRIL

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
57.603	59.582	61.550	63.606	66.477	69.083	71.600	74.116	76.631	78.794	81.421	83.297	84.876	86.256	86.810
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
87.024	86.701	86.051	85.566	84.930	83.937	83.022	81.779	80.630	79.331	78.184	76.835	75.642	74.591	73.748
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
73.543	72.783	72.328	71.851	71.215	70.516	69.798	69.232	69.003	68.561	67.994	67.508	67.100	66.762	66.647
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
66.285	65.902	65.487	65.101	64.670	64.221	63.891	63.595	63.270	62.917	62.549	62.255	61.822	61.458	61.109
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
60.705	60.328	60.053	59.820	59.590	59.401	59.255	59.150	59.041	58.903	58.730	58.519	58.271	58.059	57.909
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
57.711	57.528	57.338	57.156	56.980	56.834	56.703	56.576	56.379	56.149	55.879	55.574	55.270	54.970	54.630

Table 29. (continued).

MAY

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
70.742	71.452	72.136	72.792	74.503	75.909	77.126	78.647	80.224	81.474	83.286	84.488	85.402	86.107	86.258

DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
86.034	85.464	84.623	84.014	83.187	82.198	81.218	80.114	79.138	78.032	76.905	75.799	74.783	73.952	73.221

DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
72.587	72.002	71.777	71.361	70.896	70.366	69.805	69.388	69.132	68.797	68.351	67.961	67.668	67.432	67.048

DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
66.757	66.454	66.100	65.743	65.352	64.929	64.637	64.361	64.065	63.743	63.373	62.970	62.564	62.206	61.893

DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
61.507	61.137	60.864	60.637	60.418	60.237	60.079	59.934	59.776	59.600	59.397	59.175	58.901	58.697	58.573

DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
58.401	58.230	58.056	57.894	57.739	57.622	57.532	57.451	57.301	57.129	56.934	56.712	56.490	56.276	56.017

JUNE

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
81.795	81.713	81.255	80.865	81.411	81.474	81.351	81.792	82.220	82.472	83.579	83.697	83.601	83.436	82.873

DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
81.916	80.757	79.272	78.196	76.929	75.537	74.263	73.062	72.057	70.839	69.673	68.603	67.666	66.941	66.365

DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
65.901	65.408	65.526	65.167	64.730	64.229	63.697	63.347	63.158	62.854	62.447	62.116	61.894	61.770	61.504

DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
61.372	61.150	60.823	60.412	59.972	59.497	59.187	58.847	58.455	58.030	57.573	57.076	56.584	56.146	55.774

DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
55.297	54.824	54.453	54.130	53.843	53.590	53.324	53.016	52.686	52.348	52.005	51.661	51.254	50.960	50.783

DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
50.535	50.270	50.005	49.749	49.494	49.303	49.175	49.069	48.903	48.733	48.544	48.332	48.131	47.951	47.736

Table 29. (continued).

JULY

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
88.567	88.009	86.894	85.878	85.733	85.010	84.109	83.909	83.669	83.339	84.013	83.519	82.857	82.204	81.244
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
79.890	78.417	76.596	75.280	73.793	72.209	70.802	69.576	68.583	67.336	66.181	65.162	64.295	63.654	63.185
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
62.835	62.411	62.725	62.416	62.016	61.550	61.056	60.759	60.621	60.347	59.976	59.690	59.520	59.467	59.273
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
59.233	59.064	58.761	58.332	57.877	57.385	57.073	56.708	56.276	55.808	55.315	54.777	54.248	53.777	53.381
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
52.864	52.342	51.925	51.557	51.237	50.951	50.630	50.239	49.819	49.398	48.984	48.579	48.106	47.768	47.568
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
47.287	46.977	46.671	46.371	46.070	45.846	45.704	45.592	45.425	45.265	45.090	44.894	44.714	44.562	44.380

AUGUST

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
85.834	85.126	83.880	82.869	82.822	82.149	81.357	81.299	81.236	81.056	81.993	81.633	81.046	80.445	79.449
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
77.995	76.345	74.298	72.838	71.171	69.375	67.777	66.358	65.219	63.785	62.440	61.252	60.265	59.555	59.038
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
58.650	58.169	58.501	58.190	57.775	57.270	56.734	56.434	56.330	56.059	55.652	55.365	55.224	55.233	55.054
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
55.043	54.887	54.573	54.127	53.649	53.124	52.825	52.468	52.032	51.549	51.016	50.419	49.828	49.311	48.883
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
48.296	47.703	47.239	46.836	46.483	46.170	45.823	45.392	44.930	44.465	43.998	43.539	42.995	42.616	42.404
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
42.100	41.760	41.426	41.105	40.784	40.554	40.418	40.317	40.153	39.999	39.832	39.639	39.458	39.308	39.105

Table 29. (continued).

SEPTEMBER

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
82.305	83.103	83.234	83.131	83.824	83.651	83.364	83.551	83.713	83.747	84.801	84.763	84.372	83.768	82.605

DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
81.018	79.039	76.797	75.235	73.460	71.633	69.959	68.326	67.087	65.681	64.287	63.017	61.977	61.231	60.678

DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
60.248	59.705	59.963	59.665	59.297	58.800	58.286	57.978	57.837	57.505	56.988	56.600	56.343	56.220	55.867

DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
55.687	55.385	54.947	54.442	53.877	53.277	52.870	52.450	51.988	51.486	50.917	50.256	49.605	49.050	48.554

DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
47.889	47.242	46.728	46.267	45.836	45.478	45.121	44.702	44.266	43.817	43.334	42.844	42.251	41.809	41.567

DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
41.259	40.942	40.644	40.365	40.099	39.918	39.819	39.750	39.616	39.486	39.336	39.147	38.971	38.836	38.626

OCTOBER

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
67.640	72.578	76.789	79.638	82.611	83.931	85.344	86.457	87.517	88.495	90.311	91.378	91.716	91.406	90.084

DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
88.432	85.803	83.116	81.391	79.411	77.502	75.774	73.695	72.310	70.954	69.464	67.991	66.880	66.164	65.617

DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
65.372	64.708	64.757	64.566	64.346	63.858	63.359	63.072	63.039	62.603	61.787	61.229	60.824	60.609	60.119

DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
59.693	59.204	58.584	58.059	57.424	56.815	56.412	56.097	55.787	55.395	54.902	54.201	53.498	52.946	52.399

DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
51.565	50.801	50.258	49.806	49.296	48.936	48.641	48.287	47.899	47.431	46.806	46.134	45.282	44.597	44.225

DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
43.812	43.453	43.159	42.918	42.716	42.609	42.589	42.612	42.584	42.557	42.512	42.387	42.271	42.215	41.980

Table 29. (continued).

NOVEMBER

DISCHARGE (CFS)	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
	64.754	70.083	74.754	77.985	81.283	82.817	84.532	85.841	87.133	88.341	90.397	91.710	92.233	92.060	90.779

DISCHARGE (CFS)	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
	89.173	86.481	83.727	81.990	79.981	78.038	76.309	74.161	72.754	71.370	69.839	68.312	67.182	66.482	65.946

DISCHARGE (CFS)	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
	65.768	65.089	65.108	64.956	64.774	64.293	63.798	63.535	63.569	63.146	62.298	61.750	61.372	61.214	60.763

DISCHARGE (CFS)	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
	60.345	59.876	59.260	58.762	58.149	57.568	57.222	56.973	56.727	56.384	55.924	55.232	54.531	53.991	53.458

DISCHARGE (CFS)	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
	52.600	51.814	51.277	50.847	50.345	50.000	49.724	49.380	48.996	48.515	47.856	47.144	46.236	45.511	45.124

DISCHARGE (CFS)	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
	44.692	44.318	44.017	43.778	43.580	43.486	43.485	43.534	43.532	43.534	43.524	43.426	43.334	43.301	43.062

DECEMBER

DISCHARGE (CFS)	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
	48.579	54.135	59.634	63.972	68.685	71.933	75.328	78.210	81.142	83.752	86.991	89.731	91.575	92.598	92.451

DISCHARGE (CFS)	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
	91.883	90.142	88.244	87.114	85.570	84.015	82.561	80.539	79.102	77.676	75.952	74.274	72.921	72.011	71.148

DISCHARGE (CFS)	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
	70.408	69.568	69.154	68.797	68.472	67.850	67.184	66.768	66.643	66.164	65.244	64.619	64.195	63.986	63.301

DISCHARGE (CFS)	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
	62.779	62.291	61.691	61.256	60.731	60.244	60.014	59.913	59.818	59.612	59.267	58.644	58.071	57.625	57.206

DISCHARGE (CFS)	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
	56.477	55.816	55.428	55.174	54.817	54.603	54.475	54.321	54.120	53.796	53.266	52.662	51.862	51.237	50.893

DISCHARGE (CFS)	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
	50.497	50.164	49.894	49.695	49.536	49.466	49.455	49.487	49.456	49.407	49.347	49.197	49.041	48.917	48.574

North Fork and mainstem Tolt River. Combined efficiency index values for each river segment are listed in Tables 31, 32, and 33. The percentage identifying the optimum discharge (Q_E) for each month based on combined efficiency indices is indicated with a box.

It should be pointed out that peak percentages, particularly those derived from efficiency index values, may vary from percentages associated with lower discharges by extremely small amounts, suggesting that in some instances a slight reduction in streamflow may be tolerated without significant loss of habitat. However, due to the difficulty of evaluating the impact of selecting flows less than Q_M or Q_E on the availability of physical habitat for individual life stages, only those discharges identified by peak percentage values are used to determine final instream flow recommendations. Monthly Q_M and Q_E streamflows are summarized for all river segments in Table 34.

6.4 Instream Flow Recommendations

Normal and critical water year mean monthly flows (Table 3) were compared to monthly Q_M and Q_E discharges to derive the final instream flow recommendations presented in Table 35. In most months the Q_M and Q_E flows are retained as the recommended flow since they are exceeded by the historical unregulated monthly flows. During critical water years, however, the monthly mean discharge in the South Fork is less than the associated Q_M flow during eight months of the year. Streamflow recommendations based on Q_E discharges are identical under both normal and critical water year conditions for at least nine out of twelve months in all river segments.

Table 30. Combined and weighted monthly efficiency indices for the South Fork Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.267	.297	.326	.355	.382	.405	.424	.439	.448	.460	.475	.485	.496	.505	.508
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.509	.510	.510	[.511]	.508	.506	.503	.501	.496	.490	.485	.482	.479	.475	.471
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.467	.464	.459	.455	.451	.444	.438	.433	.429	.425	.421	.416	.411	.407	.402
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.399	.396	.393	.391	.389	.388	.387	.386	.386	.385	.381	.380	.378	.377	.375
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.374	.373	.373	.372	.371	.370	.369	.368	.367	.365	.364	.363	.362	.361	.360
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.359	.358	.357	.355	.354	.353	.351	.350	.348	.347	.345	.344	.342	.341	.340

FEBRUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.256	.282	.310	.338	.365	.387	.407	.424	.436	.450	.466	.477	.491	.502	.507
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.509	.512	.514	[.516]	.514	.513	.511	.509	.505	.500	.496	.492	.490	.487	.483
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.479	.476	.472	.468	.463	.457	.452	.447	.443	.440	.436	.432	.427	.423	.419
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.416	.414	.411	.409	.408	.407	.407	.406	.406	.405	.401	.400	.399	.398	.397
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.396	.395	.394	.394	.393	.392	.391	.390	.389	.388	.387	.386	.385	.384	.383
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.382	.381	.380	.378	.377	.376	.374	.373	.371	.370	.368	.367	.365	.364	.362

Table 30. (continued).

MARCH

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.272	.297	.323	.348	.373	.392	.410	.427	.438	.451	.466	.476	.489	.500	.505
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.508	.511	.512	.514	.513	.511	.509	.507	.504	.499	.496	.493	.490	.487	.483
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.479	.476	.472	.468	.464	.459	.454	.449	.446	.442	.439	.435	.431	.428	.424
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.421	.419	.417	.415	.414	.414	.413	.413	.412	.412	.408	.407	.406	.405	.403
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.402	.402	.401	.401	.400	.399	.398	.397	.396	.395	.393	.393	.392	.391	.390
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.389	.388	.387	.385	.384	.383	.382	.380	.379	.377	.376	.375	.373	.372	.370

APRIL

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.385	.397	.410	.421	.432	.442	.450	.457	.461	.468	.474	.478	.483	.488	.490
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.490	.489	.487	.487	.484	.482	.479	.476	.472	.467	.463	.459	.456	.452	.448
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.445	.441	.438	.434	.430	.425	.421	.417	.414	.411	.408	.405	.401	.398	.395
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.392	.390	.388	.385	.384	.382	.381	.380	.380	.379	.375	.374	.373	.371	.370
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.369	.368	.367	.366	.365	.364	.363	.362	.361	.360	.359	.358	.358	.357	.356
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.355	.355	.354	.353	.352	.351	.350	.349	.347	.346	.345	.344	.343	.342	.341

Table 30. (continued).

MAY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.463	.469	.480	.482	.485	.489	.491	.494	.493	.495	.495	.494	.494	.496	.494
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.491	.488	.484	.483	.479	.476	.472	.468	.464	.458	.454	.449	.446	.442	.438
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.434	.431	.427	.424	.420	.415	.411	.407	.404	.402	.399	.395	.392	.389	.386
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.383	.381	.378	.376	.374	.372	.370	.369	.368	.367	.363	.362	.360	.359	.357
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.356	.355	.354	.353	.352	.351	.350	.349	.348	.347	.346	.345	.345	.344	.343
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.343	.342	.341	.340	.339	.338	.338	.337	.336	.335	.334	.333	.332	.331	.330

JUNE

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.560	.560	.561	.555	.550	.549	.543	.534	.523	.521	.513	.506	.498	.493	.486
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.477	.469	.462	.456	.449	.443	.437	.431	.424	.417	.411	.405	.401	.396	.391
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.387	.383	.379	.375	.370	.366	.361	.357	.354	.351	.348	.344	.341	.337	.334
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.330	.327	.324	.320	.317	.314	.311	.310	.308	.306	.302	.300	.298	.297	.295
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.293	.291	.289	.288	.287	.285	.284	.282	.281	.280	.279	.279	.278	.277	.276
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.276	.275	.274	.273	.273	.272	.271	.270	.269	.268	.267	.267	.266	.265	.264

Table 30. (continued).

JULY

DISCHARGE (CFS) 20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.618	.615	.611	.600	.590	.586	.575	.558	.543	.538	.526	.514	.502	.493	.483
DISCHARGE (CFS) 95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.471	.461	.451	.443	.434	.426	.419	.413	.405	.396	.390	.383	.378	.373	.368
DISCHARGE (CFS) 170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.363	.359	.355	.350	.346	.341	.336	.332	.329	.325	.322	.319	.315	.312	.308
DISCHARGE (CFS) 245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.304	.301	.297	.292	.288	.285	.282	.280	.278	.276	.271	.269	.267	.265	.263
DISCHARGE (CFS) 320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.261	.259	.257	.255	.253	.252	.250	.249	.248	.246	.245	.245	.244	.243	.243
DISCHARGE (CFS) 395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.242	.241	.241	.240	.239	.238	.237	.237	.236	.235	.234	.233	.233	.232	.232

AUGUST

DISCHARGE (CFS) 20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.610	.605	.597	.586	.577	.575	.564	.545	.529	.525	.514	.502	.489	.481	.471
DISCHARGE (CFS) 95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.459	.448	.438	.429	.420	.412	.406	.399	.390	.381	.374	.368	.362	.357	.352
DISCHARGE (CFS) 170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.348	.343	.339	.335	.330	.325	.320	.316	.312	.309	.305	.301	.298	.294	.290
DISCHARGE (CFS) 245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.286	.282	.278	.273	.269	.265	.262	.260	.258	.256	.252	.250	.247	.245	.243
DISCHARGE (CFS) 320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.241	.239	.237	.235	.233	.232	.230	.229	.228	.226	.226	.225	.224	.224	.223
DISCHARGE (CFS) 395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.222	.222	.221	.220	.219	.218	.218	.217	.216	.215	.214	.213	.213	.212	.212

Table 30. (continued).

SEPTEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.565	.571	.575	.574	.573	.576	.571	.556	.543	.541	.533	.524	.513	.506	.495
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.484	.474	.464	.455	.446	.438	.431	.424	.415	.406	.398	.392	.386	.381	.376
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.371	.366	.361	.356	.351	.345	.339	.335	.331	.327	.323	.319	.314	.310	.305
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.301	.298	.293	.289	.284	.281	.278	.276	.273	.271	.267	.265	.263	.260	.258
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.256	.254	.252	.250	.249	.247	.245	.244	.242	.241	.240	.239	.238	.237	.236
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.235	.234	.233	.232	.231	.230	.229	.228	.227	.226	.225	.224	.223	.222	.221

OCTOBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.442	.476	.504	.524	.541	.559	.566	.562	.556	.557	.558	.556	.552	.548	.538
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.528	.521	.513	.506	.496	.490	.483	.476	.467	.456	.448	.442	.437	.431	.426
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.421	.416	.411	.405	.399	.391	.384	.378	.372	.367	.362	.358	.351	.345	.340
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.335	.331	.326	.322	.318	.315	.312	.310	.307	.305	.301	.299	.296	.294	.292
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.290	.288	.286	.285	.283	.281	.279	.278	.276	.274	.273	.272	.270	.269	.267
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.266	.265	.263	.261	.260	.259	.257	.256	.254	.253	.252	.250	.249	.248	.247

Table 30. (continued).

NOVEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.431	.466	.495	.517	.535	.556	.564	.561	.556	.558	.560	.558	.555	.552	.543
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.533	.526	.518	.512	.502	.496	.490	.483	.474	.463	.455	.448	.444	.438	.433
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.428	.424	.418	.413	.407	.398	.390	.384	.378	.373	.369	.364	.357	.351	.345
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.340	.336	.331	.327	.323	.320	.317	.315	.312	.311	.306	.304	.302	.299	.297
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.295	.293	.291	.290	.288	.286	.284	.283	.281	.279	.278	.277	.276	.274	.273
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.271	.270	.268	.267	.265	.264	.262	.261	.259	.258	.257	.255	.254	.253	.252

DECEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.300	.334	.366	.394	.418	.443	.460	.471	.475	.484	.495	.503	.510	.516	.515
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.512	.511	.509	.508	.503	.501	.498	.495	.489	.481	.475	.470	.467	.463	.459
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.455	.452	.447	.443	.438	.430	.424	.418	.413	.408	.404	.399	.393	.388	.383
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.378	.375	.372	.369	.366	.364	.363	.362	.361	.360	.355	.354	.352	.351	.349
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.347	.346	.345	.345	.344	.342	.341	.340	.339	.337	.336	.335	.334	.333	.332
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.331	.330	.328	.327	.325	.324	.323	.322	.320	.319	.317	.316	.315	.314	.312

Table 31. Combined and weighted monthly efficiency indices for the North Fork Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.237	.256	.270	.283	.296	.312	.326	.342	.360	.380	.402	.428	.453	.480	.508
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.535	.554	.570	.584	.592	.595	[.597]	.597	.592	.582	.573	.569	.573	.574	.574
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.569	.564	.561	.556	.549	.543	.538	.531	.522	.514	.507	.501	.496	.490	.485
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.478	.472	.465	.459	.453	.446	.439	.434	.425	.422	.419	.416	.414	.412	.409
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.405	.401	.398	.394	.392	.390	.388	.386	.385	.384	.382	.381	.380	.379	.379
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.378	.377	.376	.374	.374	.373	.369	.366	.363	.360	.357	.354	.349	.344	.341

FEBRUARY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.255	.270	.280	.290	.301	.312	.322	.333	.348	.367	.387	.412	.437	.463	.489
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.515	.534	.552	.568	.579	.585	.589	[.593]	.592	.585	.579	.578	.582	.584	.584
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.580	.577	.575	.571	.565	.561	.556	.550	.541	.534	.527	.521	.516	.510	.504
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.498	.491	.484	.477	.471	.464	.458	.452	.443	.440	.436	.433	.431	.428	.426
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.422	.418	.414	.411	.409	.407	.405	.403	.402	.401	.400	.399	.398	.397	.397
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.396	.395	.394	.393	.392	.391	.388	.384	.382	.379	.377	.374	.370	.365	.362

Table 31. (continued).

MARCH

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.279	.294	.303	.312	.321	.331	.340	.350	.363	.379	.397	.420	.442	.465	.488
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.510	.528	.545	.560	.570	.577	.583	.588	.589	.586	.583	.583	.587	.589	.590
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.586	.584	.582	.580	.575	.571	.567	.562	.553	.546	.539	.533	.527	.521	.515
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.508	.502	.495	.489	.482	.475	.469	.464	.455	.451	.447	.444	.441	.438	.435
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.432	.428	.425	.422	.420	.418	.416	.414	.413	.412	.411	.410	.409	.408	.407
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.406	.405	.403	.402	.401	.400	.396	.394	.391	.389	.387	.384	.381	.377	.374

APRIL

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.413	.424	.430	.431	.432	.433	.433	.434	.437	.444	.453	.466	.479	.492	.504
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.517	.526	.534	.542	.546	.549	.551	.552	.549	.544	.539	.537	.539	.539	.538
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.533	.530	.529	.527	.523	.520	.516	.511	.504	.498	.492	.487	.482	.478	.473
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.468	.463	.458	.453	.448	.443	.438	.433	.424	.421	.418	.416	.413	.411	.409
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.406	.404	.401	.399	.398	.397	.395	.393	.392	.392	.390	.389	.388	.387	.386
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.385	.384	.383	.382	.381	.379	.376	.374	.372	.370	.368	.365	.362	.359	.356

Table 31. (continued).

MAY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.505	.518	.524	.522	.522	.521	.516	.513	.513	.515	.519	.526	.533	.541	.547
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.554	.556	.559	.561	.561	.559	.558	.555	.549	.540	.533	.528	.529	.527	.525
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.519	.515	.513	.510	.506	.502	.498	.493	.486	.481	.475	.471	.467	.463	.459
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.455	.450	.446	.442	.438	.434	.429	.424	.417	.414	.412	.410	.408	.406	.404
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.402	.400	.398	.396	.395	.393	.392	.390	.389	.388	.387	.386	.385	.384	.383
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.383	.382	.380	.380	.378	.377	.375	.372	.370	.368	.367	.364	.361	.358	.356

JUNE

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.567	.586	.600	.602	.604	.602	.596	.589	.583	.581	.579	.579	.579	.580	.579
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.578	.573	.567	.562	.554	.547	.539	.531	.519	.506	.494	.485	.486	.481	.476
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.468	.462	.458	.453	.448	.443	.437	.432	.426	.420	.416	.412	.409	.406	.402
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.399	.396	.392	.390	.387	.383	.380	.375	.368	.367	.365	.364	.362	.361	.360
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.358	.356	.355	.353	.352	.351	.350	.348	.347	.346	.344	.343	.342	.341	.340
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.339	.338	.337	.336	.335	.334	.331	.329	.327	.324	.322	.320	.316	.313	.310

Table 31. (continued).

JULY

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.610	.632	.651	.653	.656	.654	.646	.637	.629	.623	.618	.614	.610	.607	.602
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.596	.586	.576	.566	.554	.544	.533	.522	.507	.490	.476	.464	.465	.458	.452
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.443	.436	.430	.425	.419	.413	.407	.402	.396	.390	.386	.382	.380	.377	.374
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.372	.369	.366	.364	.363	.359	.357	.351	.345	.344	.343	.342	.341	.340	.339
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.337	.336	.335	.334	.333	.332	.331	.329	.328	.326	.325	.323	.322	.321	.320
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.319	.318	.317	.316	.315	.314	.311	.309	.307	.304	.302	.299	.296	.292	.289

AUGUST

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.587	.507	.627	.629	.631	.628	.620	.610	.601	.595	.590	.588	.584	.582	.579
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.574	.565	.556	.545	.533	.522	.511	.499	.484	.465	.449	.438	.438	.431	.425
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.416	.409	.403	.397	.391	.385	.379	.374	.368	.362	.358	.354	.353	.350	.348
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.345	.342	.340	.338	.337	.333	.331	.325	.319	.318	.317	.316	.316	.315	.314
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.312	.311	.310	.308	.308	.307	.306	.304	.302	.301	.299	.298	.297	.296	.295
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.294	.293	.292	.291	.291	.290	.287	.284	.282	.279	.277	.274	.270	.266	.262

Table 31. (continued).

SEPTEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.513	.543	.572	.585	.598	.605	.606	.604	.602	.603	.604	.607	.609	.612	.614
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.615	.609	.602	.594	.584	.573	.562	.550	.534	.514	.497	.485	.486	.480	.473
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.463	.455	.448	.441	.432	.425	.418	.411	.404	.397	.392	.388	.385	.381	.378
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.374	.370	.366	.363	.361	.357	.353	.348	.342	.341	.339	.338	.337	.336	.335
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.332	.330	.328	.326	.325	.323	.321	.319	.318	.316	.314	.313	.312	.311	.310
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.309	.308	.307	.306	.305	.304	.302	.298	.296	.293	.290	.287	.283	.278	.274

OCTOBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.345	.387	.423	.452	.480	.506	.526	.543	.561	.578	.595	.612	.628	.646	.666
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.682	.687	.688	.687	.680	.669	.656	.643	.624	.598	.577	.563	.565	.560	.555
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.544	.534	.525	.513	.501	.491	.481	.473	.462	.453	.447	.442	.437	.433	.428
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.422	.416	.410	.406	.401	.396	.390	.387	.380	.378	.376	.375	.374	.373	.371
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.367	.363	.360	.356	.354	.352	.350	.347	.344	.342	.340	.339	.338	.337	.336
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.336	.335	.334	.333	.333	.332	.329	.324	.320	.317	.314	.310	.304	.298	.294

Table 31. (continued).

NOVEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.330	.369	.404	.430	.458	.484	.506	.524	.543	.562	.580	.599	.617	.638	.660
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.679	.686	.688	.688	.681	.670	.657	.643	.624	.597	.574	.560	.562	.558	.553
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.542	.531	.522	.511	.498	.488	.478	.470	.459	.450	.444	.439	.434	.430	.426
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.420	.414	.408	.403	.399	.394	.388	.385	.378	.376	.374	.373	.373	.372	.370
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.366	.362	.358	.354	.352	.350	.348	.345	.343	.340	.339	.337	.337	.336	.335
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.335	.334	.333	.332	.332	.331	.328	.323	.319	.316	.313	.309	.303	.296	.292

DECEMBER

DISCHARGE (CFS)														
20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
.245	.268	.286	.299	.316	.336	.355	.374	.396	.419	.443	.468	.494	.523	.553
DISCHARGE (CFS)														
95	100	105	110	115	120	125	130	135	140	145	150	155	160	165
.582	.600	.614	.624	.626	.623	.618	.611	.600	.579	.563	.554	.557	.557	.556
DISCHARGE (CFS)														
170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
.549	.542	.536	.528	.518	.511	.504	.497	.486	.478	.472	.466	.462	.457	.453
DISCHARGE (CFS)														
245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
.447	.440	.434	.429	.423	.417	.410	.406	.398	.395	.392	.391	.389	.388	.386
DISCHARGE (CFS)														
320	325	330	335	340	345	350	355	360	365	370	375	380	385	390
.382	.377	.373	.370	.368	.366	.364	.362	.360	.358	.357	.356	.356	.355	.354
DISCHARGE (CFS)														
395	400	405	410	415	420	425	430	435	440	445	450	455	460	465
.353	.353	.352	.351	.351	.350	.347	.342	.338	.335	.332	.329	.323	.317	.313

Table 32. Combined and weighted monthly efficiency indices for the Mainstem Tolt River. Peak values for each month are indicated by a [ ].

JANUARY

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.154	.166	.176	.188	.199	.209	.219	.226	.234	.239	.245	.251	.254	[.257]	.256
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.254	.250	.245	.242	.237	.232	.227	.221	.215	.209	.204	.199	.194	.189	.186
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.184	.180	.177	.175	.172	.170	.167	.165	.163	.161	.158	.156	.154	.152	.150
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.147	.146	.144	.142	.141	.139	.138	.136	.135	.134	.133	.131	.130	.128	.127
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.124	.122	.121	.120	.119	.118	.118	.117	.117	.116	.116	.115	.113	.112	.111
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.110	.110	.109	.109	.108	.108	.108	.107	.107	.106	.106	.105	.105	.104	.103

FEBRUARY

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.148	.157	.166	.176	.187	.198	.209	.218	.227	.232	.239	.246	.250	[.254]	.254
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.253	.250	.246	.243	.240	.235	.230	.224	.218	.213	.208	.202	.197	.192	.189
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.187	.183	.180	.178	.175	.172	.170	.167	.166	.163	.161	.159	.157	.155	.154
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.151	.149	.147	.146	.144	.142	.141	.139	.138	.137	.135	.134	.133	.131	.130
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.127	.125	.124	.123	.122	.121	.121	.121	.120	.120	.119	.119	.118	.117	.116
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.116	.115	.115	.114	.114	.114	.113	.113	.113	.112	.112	.111	.110	.109	.108

Table 32. (continued).

MARCH

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.158	.165	.173	.182	.192	.203	.213	.221	.229	.234	.240	.245	.249	.253	.253
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.252	.250	.248	.245	.242	.238	.234	.228	.223	.217	.213	.208	.203	.198	.194
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.192	.188	.185	.183	.180	.177	.174	.172	.170	.167	.165	.163	.161	.159	.157
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.154	.152	.150	.149	.147	.146	.144	.142	.141	.140	.139	.138	.136	.135	.133
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.131	.129	.128	.127	.126	.126	.125	.125	.125	.124	.124	.123	.123	.122	.121
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.120	.120	.120	.119	.119	.118	.118	.117	.117	.116	.115	.115	.114	.113	.112

APRIL

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.214	.212	.210	.213	.217	.222	.227	.231	.235	.237	.240	.242	.244	.246	.245
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.243	.241	.238	.235	.232	.227	.223	.218	.213	.208	.204	.200	.195	.191	.188
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.185	.182	.180	.177	.175	.172	.170	.167	.165	.163	.161	.159	.158	.156	.155
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.152	.151	.149	.148	.146	.145	.144	.142	.140	.139	.138	.137	.136	.134	.133
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.130	.129	.128	.127	.126	.126	.125	.125	.124	.124	.123	.123	.122	.121	.121
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.120	.119	.119	.118	.118	.117	.117	.116	.116	.115	.115	.114	.113	.112	.111

Table 32. (continued).

MAY

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.263	.254	.246	.243	.243	.244	.244	.245	.246	.245	.245	.246	.245	.245	.243
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.240	.237	.234	.231	.227	.222	.218	.214	.209	.205	.201	.197	.193	.189	.186
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.183	.180	.178	.176	.174	.172	.170	.168	.166	.164	.162	.160	.159	.158	.156
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.153	.152	.151	.149	.148	.146	.145	.143	.142	.141	.140	.139	.137	.136	.135
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.132	.131	.130	.129	.128	.128	.127	.127	.126	.125	.125	.124	.123	.123	.122
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.121	.121	.120	.120	.119	.119	.119	.118	.118	.117	.117	.116	.116	.115	.114

JUNE

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.304	.291	.278	.270	.266	.262	.258	.255	.252	.248	.246	.244	.240	.238	.234
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.229	.224	.219	.215	.210	.204	.199	.195	.191	.186	.182	.178	.175	.171	.169
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.166	.163	.163	.161	.159	.157	.155	.153	.151	.150	.148	.147	.146	.145	.143
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.141	.140	.139	.137	.136	.134	.133	.131	.130	.128	.127	.126	.124	.123	.121
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.119	.117	.116	.115	.114	.113	.113	.112	.111	.110	.109	.108	.107	.106	.106
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.105	.104	.104	.103	.102	.102	.101	.101	.101	.100	.100	.099	.099	.098	.097

Table 32. (continued).

JULY

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.329	.313	.297	.287	.280	.273	.266	.261	.257	.250	.247	.243	.238	.234	.229
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.223	.218	.212	.207	.201	.195	.190	.185	.181	.177	.173	.169	.166	.163	.161
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.158	.156	.156	.154	.152	.150	.148	.147	.145	.144	.142	.141	.140	.139	.138
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.136	.135	.134	.132	.131	.129	.128	.126	.125	.123	.122	.121	.119	.117	.116
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.114	.112	.111	.110	.109	.108	.107	.106	.105	.104	.103	.102	.101	.100	.099
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.098	.097	.097	.096	.095	.095	.094	.094	.093	.093	.092	.092	.092	.091	.090

AUGUST

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.319	.303	.287	.277	.270	.264	.258	.253	.249	.243	.241	.238	.233	.229	.224
DISCHARGE (CFS) 200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.218	.212	.205	.200	.194	.188	.182	.177	.173	.167	.163	.159	.156	.152	.150
DISCHARGE (CFS) 350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.148	.145	.145	.144	.142	.140	.138	.137	.135	.134	.132	.131	.130	.129	.128
DISCHARGE (CFS) 500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.126	.125	.124	.123	.121	.120	.119	.117	.115	.114	.113	.111	.109	.108	.106
DISCHARGE (CFS) 650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.104	.102	.101	.100	.099	.098	.097	.096	.095	.094	.092	.091	.090	.089	.088
DISCHARGE (CFS) 800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.088	.087	.086	.085	.084	.084	.083	.083	.083	.082	.082	.081	.081	.080	.080

Table 32. (continued).

SEPTEMBER

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.306	.296	.284	.278	.273	.269	.264	.260	.257	.251	.250	.247	.242	.238	.233
DISCHARGE (CFS) 200	**210**	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**	**330**	**340**
.226	.219	.212	.207	.200	.194	.188	.182	.177	.172	.168	.164	.160	.157	.154
DISCHARGE (CFS) 350	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**	**440**	**450**	**460**	**470**	**480**	**490**
.152	.149	.149	.147	.145	.144	.142	.140	.139	.137	.135	.134	.132	.132	.130
DISCHARGE (CFS) 500	**510**	**520**	**530**	**540**	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**
.128	.127	.125	.124	.122	.120	.119	.117	.115	.114	.112	.111	.109	.107	.106
DISCHARGE (CFS) 650	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**	**770**	**780**	**790**
.103	.101	.100	.098	.097	.096	.095	.094	.093	.092	.091	.090	.089	.087	.087
DISCHARGE (CFS) 800	**810**	**820**	**830**	**840**	**850**	**860**	**870**	**880**	**890**	**900**	**910**	**920**	**930**	**940**
.086	.085	.084	.084	.083	.082	.082	.082	.081	.081	.081	.080	.080	.079	.079

OCTOBER

DISCHARGE (CFS) 50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.252	.258	.262	.266	.269	.270	.270	.269	.269	.266	.266	.266	.264	.260	.254
DISCHARGE (CFS) 200	**210**	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**	**330**	**340**
.247	.238	.230	.224	.217	.210	.203	.196	.191	.186	.181	.177	.173	.169	.167
DISCHARGE (CFS) 350	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**	**440**	**450**	**460**	**470**	**480**	**490**
.165	.162	.161	.159	.158	.156	.154	.153	.151	.149	.146	.145	.143	.142	.140
DISCHARGE (CFS) 500	**510**	**520**	**530**	**540**	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**
.137	.135	.133	.132	.130	.128	.127	.125	.124	.123	.121	.119	.117	.116	.114
DISCHARGE (CFS) 650	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**	**770**	**780**	**790**
.111	.109	.107	.106	.105	.104	.103	.102	.101	.100	.098	.097	.095	.093	.092
DISCHARGE (CFS) 800	**810**	**820**	**830**	**840**	**850**	**860**	**870**	**880**	**890**	**900**	**910**	**920**	**930**	**940**
.091	.090	.089	.089	.088	.088	.088	.088	.088	.087	.087	.087	.087	.086	.085

Table 32. (continued).

NOVEMBER

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.241	.250	.255	.261	.265	.266	.268	.267	.267	.265	.266	.267	.265	.262	.256
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.249	.240	.231	.225	.218	.211	.205	.198	.192	.187	.182	.177	.174	.170	.168
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.166	.163	.162	.160	.159	.157	.155	.154	.152	.150	.148	.146	.144	.143	.141
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.138	.137	.135	.133	.132	.130	.129	.127	.126	.125	.123	.121	.120	.118	.116
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.113	.111	.109	.108	.107	.106	.105	.104	.103	.102	.101	.099	.097	.095	.094
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.093	.092	.091	.091	.090	.090	.090	.090	.089	.089	.089	.089	.089	.089	.088

DECEMBER

DISCHARGE (CFS)														
50	60	70	80	90	100	110	120	130	140	150	160	170	180	190
.181	.193	.204	.214	.224	.231	.239	.243	.249	.251	.256	.261	.263	.264	.261
DISCHARGE (CFS)														
200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
.256	.250	.244	.239	.233	.227	.222	.215	.209	.204	.198	.193	.188	.184	.181
DISCHARGE (CFS)														
350	360	370	380	390	400	410	420	430	440	450	460	470	480	490
.177	.174	.172	.170	.168	.166	.163	.162	.160	.158	.155	.153	.151	.150	.147
DISCHARGE (CFS)														
500	510	520	530	540	550	560	570	580	590	600	610	620	630	640
.144	.142	.141	.139	.137	.136	.135	.133	.133	.132	.131	.129	.127	.126	.124
DISCHARGE (CFS)														
650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
.121	.119	.118	.117	.116	.116	.115	.115	.114	.113	.112	.111	.109	.107	.106
DISCHARGE (CFS)														
800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
.105	.104	.103	.103	.102	.102	.102	.102	.102	.101	.101	.101	.100	.100	.099

Table 33. Q_M and Q_E discharges determined for the South Fork, North Fork, and mainstem Tolt River (refer to peak index values in Tables 28-33).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
South Fork												
Q_M	130	130	155	130	110	70	65	50	70	85	85	130
Q_E	110	110	110	90	85	30	20	20	45	50	50	85
North Fork												
Q_M	170	180	180	180	165	110	90	50	100	110	115	120
Q_E	125	130	165	130	110	40	40	40	95	105	105	115
Mainstem												
Q_M	200	200	200	200	190	160	50	50	150	170	170	180
Q_E	180	180	180	180	50	50	50	50	50	100	110	180

Table 34. Q_M (habitat index) and Q_E (efficiency index) - based instream flow recommendations for the South Fork, North Fork, and mainstem Tolt River during normal and critical water years.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
							Q_M					
South Fork												
Normal	130	130	145	130	110	70	65	50	69	85	85	130
Critical	101	122	82	110	110	70	40	23	38	51	85	130
North Fork												
Normal	170	180	180	180	165	110	90	50	100	110	115	120
Critical	170	180	180	180	165	110	90	50	81	95	115	120
Mainstem												
Normal	200	200	200	200	190	160	50	50	150	170	170	180
Critical	200	200	200	200	190	160	50	50	150	170	170	180
							Q_E					
South Fork												
Normal	110	110	110	90	85	30	20	20	45	50	50	85
Critical	101	110	82	90	85	30	20	20	38	50	50	85
North Fork												
Normal	125	130	165	130	110	40	40	40	95	105	105	115
Critical	125	130	165	130	110	40	40	40	81	95	105	115
Mainstem												
Normal	180	180	180	180	50	50	50	50	50	100	110	180
Critical	180	180	180	180	50	50	50	50	50	100	110	180

7.0 DISCUSSION

The development of formal instream flow recommendations based on the optimization of physical habitat for several salmonid species/life stages offers a means of preserving present fisheries habitat in the Tolt River system. It must be stressed, however, that the amount and schedule of streamflows indicated by the recommendations are the product of extensive modelling efforts, with each step capable of introducing a potential bias in the final results. The IFIM and optimization methodologies attempt to minimize this bias through careful attention to the validity of the assumptions and information used in the analyses. It is the responsibility of the individuals involved in the arbitration of the final flow requirements to familiarize themselves with the procedures and data which consitute the analyzes so that informed decisions may be made. FRI has purposefully avoided indicating a preference for the Q_M- or Q_E-based instream flow recommendations, believing that the negotiating process would be better served by the availability of a range of flows from which to choose.

8.0 LITERATURE CITED

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9.0 APPENDIX A

Appendix Table A1. Calibrated input data for South Fork Station 1 IFG-4 model. Changes to original data are underlined.

```
SOUTH FORK STATION 1  CALIBRATED DATA SET
TOLT RIVER 1981-82

XSEC     1         0.     41.32
         1   0.50.00   3.49.17   6.49.49   9.48.53  12.44.04  15.42.41
         1  18.42.43  21.41.90  24.41.81  27.41.93  30.41.82  33.41.74
         1  36.41.83  39.41.32  42.42.05  45.41.37  48.41.51  51.41.84
         1  54.41.61  57.42.12  60.42.91  63.43.75  66.48.04  67.48.74
NS       1       3.0       2.5       2.5       2.5       5.0       5.5
NS       1       6.0       5.5       4.5       6.5       6.5       6.0
NS       1       6.5       7.0       7.0       6.0       6.0       6.5
NS       1       6.0       5.5       4.5       4.5       8.0       8.0
CAL1     1     42.46  31.
VEL1     1     0     0     0     0     0     0     0   .03   .36   .79   .59  1.44
VEL1     1  1.15  2.46  2.23  1.87  1.54  1.18   .75   .36     0     0     0     0
CAL2     1     42.83  103.
VEL2     1     0     0     0     0     0     0   .19   .36   .69  1.84  2.40  3.84
VEL2     1  3.84  4.53  4.00  3.25  2.69   .36  2.03   .99     0     0     0     0
CAL3     1     43.64  272.
VEL3     1     0     0     0     0     0     0  1.50   .80     0  3.80  4.20  4.90
VEL3     1  5.50  5.60  4.90  4.50  3.90  1.00   .70  1.65     0     0     0     0
XSEC     2        50.15  .5  41.32
         2   0.51.76   3.51.32   6.48.66   9.46.57  12.45.09  15.43.88
         2  18.43.75  21.41.84  24.39.98  27.40.08  30.39.33  33.39.63
         2  36.40.33  39.41.34  42.41.84  45.42.58  48.43.87  51.43.96
         2  54.44.50  57.45.71  60.48.27  61.48.28
NS       2       3.5       3.5       3.5       4.0       4.0       5.5
NS       2       5.5       7.0       7.0       7.0       6.5       6.0
NS       2       5.0       6.0       5.5       5.0       7.0       5.0
NS       2       5.5       6.0       3.5       3.5
CAL1     2     42.60  31.
VEL1     2     0     0     0     0     0     0     0   .26  1.12  1.82  1.44  1.33
VEL1     2     0     0     0     0     0     0     0     0     0     0
CAL2     2     43.14  103.
VEL2     2     0     0     0     0     0     0     0   .85  1.08  2.31  3.48  2.00
VEL2     2   .52   .89     0   .43     0     0     0     0     0     0
CAL3     2     43.99  272.
VEL3     2     0     0     0     0     0   .30   .60  1.20  2.90  3.10  4.80  4.75
VEL3     2  1.40  1.05  2.00  1.60   .80     0     0     0     0     0     0
XSEC     3     75.20  .65  44.26
         3   0.53.52   3.51.02   6.52.48   9.49.75  12.48.66  15.47.47
         3  18.47.46  21.46.76  24.47.05  27.47.24  30.46.18  33.44.26
         3  36.44.28  39.44.43  42.44.96  45.45.15  48.45.50  51.45.39
         3  54.45.67  57.46.01  60.47.39  63.46.30  66.48.88  69.46.64
         3  72.48.80  75.46.45  78.46.53  81.46.63  84.50.47  87.52.88
NS       3       1.5       2.0       8.0       8.0       5.0       6.0
NS       3       7.0       8.0       7.5       8.0       7.5       7.0
NS       3       5.0       5.0       7.0       5.5       6.0       6.0
NS       3       6.5       6.0       7.0       7.0       8.0       6.0
NS       3       8.0       4.5       4.5       6.0       4.0       5.5
CAL1     3     46.29  31.
VEL1     3     0     0     0     0     0     0     0     0     0     0  1.31  2.56
VEL1     3     0   .39   .23  1.71  2.13  2.16  2.20   .39     0     0     0     0
VEL1     3     0     0     0     0     0     0
CAL2     3     46.68  103.
VEL2     3     0     0     0     0     0     0     0     0     0     0  4.00  3.64
VEL2     3     0     0  1.36  2.03  1.12   .49  3.08  4.79     0     0     0  1.36
VEL2     3     0   .72   .48   .12     0     0
CAL3     3     47.49  272.
VEL3     3     0     0     0     0     0     0     0  2.25  2.65  4.15  4.30  4.45
VEL3     3  1.10  1.40  2.75  3.75  2.75  2.65  2.70  3.35  1.68  1.00     0  2.05
VEL3     3     0  2.15  1.20   .25     0     0
```

Appendix Table A1. (continued).

XSEC	4	142.20	.5	48.61								
	4	0.51.83		3.51.41		6.50.07		9.48.99		12.48.92		15.48.61
	4	18.48.94		21.49.08		24.48.70		27.49.10		30.49.94		33.50.41
	4	36.50.73		39.50.22		42.49.55		45.49.22		48.48.75		51.50.44
	4	54.49.42		57.48.88		60.48.69		63.48.52		66.48.95		69.48.83
	4	72.48.72		75.50.09		78.50.31		81.49.55		84.49.69		87.50.45
	4	90.51.49		93.52.33		96.52.82		98.53.31				
NS	4	6.0		4.0		5.5		6.5		6.0		5.5
NS	4	7.0		6.5		6.5		6.5		6.5		5.5
NS	4	5.0		5.0		7.0		6.0		7.0		8.0
NS	4	6.5		7.0		7.0		6.5		6.5		6.5
NS	4	5.5		6.5		6.5		7.0		6.5		6.5
NS	4	6.0		5.5		5.5		1.0				
CAL1	4	49.47	31.									
VEL1	4	0	0	0	.62	.66	.33	1.21	1.77	1.28	.20	0	0
VEL1	4	0	0	0	.10	.83	0	1.61	.75	1.67	1.05	1.57	1.67
VEL1	4	.82	0	0	0	0	0	0	0	0	0		
CAL2	4	49.84	103.										
VEL2	4	0	0	0	3.48	2.53	2.62	2.56	3.05	2.10	.79	0	0
VEL2	4	0	0	1.64	.13	1.05	0	2.79	2.43	2.36	3.54	2.40	2.03
VEL2	4	2.07	0	0	0	0	0	0	0	0	0		
CAL3	4	50.55	272.										
VEL3	4	0	0	.40	3.40	4.50	3.00	4.40	3.20	3.00	1.00	1.75	0
VEL3	4	0	1.13	2.25	2.05	4.30	0	3.30	3.15	3.20	4.30	1.45	1.80
VEL3	4	1.90	2.60	1.30	0	0	0	0	0	0	0		
XSEC	5	104.05	.5	50.95									
	5	0.55.43		3.54.89		6.54.13		9.53.49		12.53.79		15.52.78
	5	18.52.19		21.52.11		24.51.99		27.51.14		30.50.06		33.50.95
	5	36.51.81		39.52.43		42.52.54		45.52.69		48.51.67		51.51.43
	5	54.51.62		57.50.73		60.49.66		63.51.06		66.51.11		69.49.36
	5	72.50.55		75.49.75		78.50.13		81.50.90		84.54.05		87.55.20
	5	90.55.40		93.57.22		97.57.19						
NS	5	3.2		3.2		3.0		5.3		7.0		5.4
NS	5	5.4		4.4		7.0		5.4		5.5		5.5
NS	5	5.2		4.5		4.6		4.6		5.5		5.4
NS	5	5.2		5.9		5.7		7.0		7.0		6.3
NS	5	6.3		5.7		5.8		7.0		3.2		7.0
NS	5	5.0		3.2		1.0						
CAL1	5	52.28	31.									
VEL1	5	0	0	0	0	0	0	0	0	.59	.62	0	.69
VEL1	5	.83	0	0	0	2.10	1.61	1.74	0	.95	.53	1.87	1.28
VEL1	5	1.06	0	.03	.23	0	0	0	0	0			
CAL2	5	52.80	103.										
VEL2	5	0	0	0	0	0	0	0	1.21	.16	.89	.10	1.05
VEL2	5	1.07	1.35	1.25	2.75	3.54	2.40	1.57	.36	1.21	1.35	2.30	1.77
VEL2	5	2.10	0	0	.82	0	0	0	0	0			
CAL3	5	53.59	272.										
VEL3	5	0	0	0	0	0	.20	2.65	1.70	.65	2.00	.80	1.40
VEL3	5	1.30	1.25	1.60	3.80	4.10	1.80	0	.35	3.70	2.00	1.70	2.00
VEL3	5	2.50	.65	.60	2.00	0	0	0	0	0			
XSEC	6	32.95	.15	51.93									
	6	0.56.16		3.55.02		6.54.36		9.53.90		12.53.40		15.54.00
	6	18.52.93		21.52.99		24.52.22		27.52.37		30.52.17		33.51.93
	6	36.54.55		39.52.95		42.52.09		45.51.94		48.52.37		51.54.02
	6	54.52.58		57.53.91		60.51.98		63.52.59		66.54.16		69.53.21
	6	72.53.86		75.53.39		78.53.41		81.53.95		84.54.88		87.56.39
	6	90.57.12		91.58.21								
NS	6	4.4		4.8		5.7		4.0		5.7		5.7
NS	6	5.5		5.9		5.9		5.7		6.0		6.3
NS	6	7.0		7.0		5.7		6.3		6.3		6.3
NS	6	6.0		7.0		6.3		5.8		5.6		5.2
NS	6	4.9		5.0		5.0		7.0		2.4		2.7
NS	6	2.7		2.7								

Appendix Table A1. (continued).

```
CAL1     6     53.57  31.
VEL1     6    0    0    0  .50 1.03    0  .07  .95  .66 1.16  .57  .79
VEL1     6    0  .98 1.12 1.61 1.38    0  .43    0  .13  .66    0  .33
VEL1     6    0    0    0    0    0    0    0    0
CAL2     6     53.99  103.
VEL2     6    0    0    0  .85 1.21  .12  .72 1.74 1.61 1.41  .89 1.80
VEL2     6    0 1.54 1.25 1.97 2.46 1.25 1.74 3.02 1.80 1.54    0  .33
VEL2     6 1.32    0    0    0    0    0    0    0
CAL3     6     54.68  272.
VEL3     6    0    0    0 3.40 2.20  .25 1.20 2.20 1.90 2.55 2.05 2.40
VEL3     6 2.25 2.85 2.20 2.40 2.75 2.65 1.90 3.60 1.30 2.90 2.50 2.10
VEL3     6 2.65  .10  .05    0    0    0    0    0
XSEC     7     39.35 .4  51.93
         7   0.60.00   3.55.60   6.54.00   9.53.67  12.55.79  15.59.13
         7  18.61.68  21.61.77  24.62.10  27.61.41  30.62.86  33.62.85
         7  36.60.80  39.58.89  42.60.11  45.57.55  48.54.37  51.54.89
         7  54.52.12  57.50.27  60.49.62  63.49.43  66.49.56  69.50.10
         7  72.50.65  75.58.25  78.59.19  81.60.60  84.60.79  87.60.91
         7  90.61.97  93.61.42  94.61.80
NS       7       1.0       2.8       6.3       5.7       5.7       7.0
NS       7       1.0       1.0       1.0       7.0       7.0       7.0
NS       7       2.9       2.9       7.0       7.0       6.0       7.0
NS       7       6.3       7.0       6.3       6.3       6.2       6.2
NS       7       6.3       8.0       8.0       8.0       8.0       7.7
NS       7       8.0       8.0       8.0
CAL1     7     53.71  31.
VEL1     7    0    0    0    0    0    0    0    0    0    0    0    0
VEL1     7    0    0    0    0    0    0 1.13  .82  .59  .86  .62 1.13
VEL1     7  .54    0    0    0    0    0    0    0    0
CAL2     7     54.40  103.
VEL2     7    0    0    0  .79    0    0    0    0    0    0    0    0
VEL2     7    0    0    0    0 1.84 2.36 3.67  .89 1.64 1.91 1.30 2.00
VEL2     7  .92    0    0    0    0    0    0    0    0
CAL3     7     55.02  272.
VEL3     7    0    0 1.65 2.05    0    0    0    0    0    0    0    0
VEL3     7    0    0    0    0 4.10 3.00 3.30 1.00 2.15 2.50 1.20 2.20
VEL3     7 1.70    0    0    0    0    0    0    0    0
ENDJOB
```

Appendix Table A2. Calibrated input data for South Fork Station 2 IFG-4 model. Changes to original data are underlined.

```
SOUTH FORK STATION 2  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1        0.          43.1
         1   0. 50.0   3. 49.8   6. 47.0   9. 48.0  12. 47.3  15. 46.3
         1  18. 47.2  21. 45.4  24. 45.0  27. 44.8  30. 45.7  33. 43.8
         1  36. 43.4  39. 43.1  42. 43.3  45. 45.3  48. 46.3  51. 46.4
         1  54. 46.6  57. 47.2  60. 47.9  63. 48.1  66. 48.7  69. 51.2
         1  71. 51.8
NS       1       6.5       6.4       6.0       6.2       5.7       6.2
NS       1       6.1       6.6       6.7       7.0       7.0       6.2
NS       1       6.5       6.4       6.5       6.7       6.2       6.0
NS       1       5.5       5.9       6.0       4.1       1.0       4.2
NS       1       4.3
CAL1     1     45.67  63.
VEL1     1    0    0    0    0    0    0    0 1.32    0  .75    0 1.51
VEL1     1 1.69 2.55 3.42 2.98    0    0    0    0    0    0    0    0
VEL1     1    0
CAL2     1     46.10  139.
VEL2     1    0    0    0    0    0    0    0 3.38 2.76 2.20 2.17 2.49
VEL2     1 3.44 3.46 4.25 3.89    0    0    0    0    0    0    0    0
VEL2     1    0
CAL3     1     46.33  185.
VEL3     1    0    0    0    0    0    0    0 3.50 3.30 2.80 2.30 3.05
VEL3     1 4.15 4.30 5.00 4.60    0    0    0    0    0    0    0    0
VEL3     1    0
XSEC     2     115.4          47.9
         2   0. 53.3   3. 52.0   6. 51.2   9. 50.2  12. 49.6  15. 49.3
         2  18. 49.1  21. 48.9  24. 48.8  27. 48.6  30. 48.6  33. 48.4
         2  36. 47.9  39. 48.1  42. 48.1  45. 48.4  48. 48.2  51. 48.2
         2  54. 48.3  57. 48.2  60. 48.0  63. 48.1  66. 57.4  69. 59.0
         2  72. 59.8
NS       2       7.5       6.8       6.2       5.8       4.7       5.0
NS       2       5.1       4.7       4.8       5.0       5.0       5.0
NS       2       5.0       5.0       5.0       5.0       5.0       5.0
NS       2       5.0       5.0       4.9       5.2       7.8       8.0
NS       2       8.0
CAL1     2     49.02  63.
VEL1     2    0    0    0    0    0    0    0 1.15 1.37 1.59 1.75 1.89
VEL1     2 2.83 2.25 1.82 2.99 2.15 2.18 1.84 2.05 1.00  .99    0    0
VEL1     2    0
CAL2     2     49.45  139.
VEL2     2    0    0    0    0    0  .69 2.10 2.56 2.66 2.72 3.12 3.35
VEL2     2 3.41 3.64 3.90 3.81 3.31 3.08 3.74 2.69  .85    0    0    0
VEL2     2    0
CAL3     2     49.65  185.
VEL3     2    0    0    0    0    0  .50 2.20 2.00 2.95 2.75 3.15 3.42
VEL3     2 3.46 3.81 4.10 4.05 3.48 3.13 3.93 2.77  .75  .40    0    0
VEL3     2    0
XSEC     3      77.5          47.9
         3   0. 54.3   3. 52.9   6. 51.9   9. 51.9  12. 50.1  15. 48.5
         3  18. 47.7  21. 48.0  24. 47.3  27. 46.8  30. 47.1  33. 46.6
         3  36. 48.6  39. 48.6  42. 50.4  45. 49.6  48. 49.9  51. 50.4
         3  54. 54.1  57. 56.9  58. 57.8
NS       3       6.0       6.8       6.7       6.7       6.6       6.7
NS       3       6.8       7.0       7.0       7.0       6.8       6.7
NS       3       6.6       6.5       6.4       5.8       6.2       6.2
NS       3       6.5       6.5       6.6
CAL1     3     49.81  63.
VEL1     3    0    0    0    0    0 1.03 1.85 2.92    0 1.75 2.18 1.75
VEL1     3  .49    0    0 1.57  .80    0    0    0    0
CAL2     3     50.41  139.
VEL2     3    0    0    0    0  .10 1.95 3.10 3.40    0 1.80 3.10 2.25
```

Appendix Table A2. (continued).

```
VEL2     3 1.05  .25  .23 2.70 1.40  .49    0    0    0
CAL3     3     50.60  185.
VEL3     3    0    0    0    0    0 2.23 4.40 3.40    0 1.90 3.30 2.49
VEL3     3 1.15    0  .46 2.49 2.59  .68    0    0    0
XSEC     4       23.6          48.7
         4   0. 61.0   3. 58.9   6. 56.5   9. 54.9  12. 54.7  15. 54.2
         4  18. 52.2  21. 51.3  24. 50.7  27. 49.3  30. 48.8  33. 49.8
         4  36. 48.7  39. 49.3  42. 49.8  45. 49.3  48. 50.4  51. 50.2
         4  54. 49.3  57. 48.9  60. 51.2  63. 49.4  66. 52.1  69. 54.4
         4  72. 56.3  73. 57.5
NS       4       6.8       6.4       6.4       6.7       6.3       7.0
NS       4       7.0       7.0       7.0       7.0       7.0       7.0
NS       4       7.0       6.8       6.8       7.0       7.0       5.2
NS       4       5.3       6.7       6.2       6.4       6.9       7.4
NS       4       7.8       8.0
CAL1     4     51.21  63.
VEL1     4    0    0    0    0    0    0    0    0  .25 1.18 1.42 1.58
VEL1     4 1.82 1.15 1.50 1.79  .78    0  .18  .22  .75  .22    0    0
VEL1     4    0    0
CAL2     4     51.63  139.
VEL2     4    0    0    0    0    0    0    0    0  .30 1.20 2.50 2.70
VEL2     4 2.75 2.25 3.00 2.20 1.50    0  .45  .95 1.95    0    0    0
VEL2     4    0    0
CAL3     4     51.80  185.
VEL3     4    0    0    0    0    0    0    0  .10  .30 1.36 2.84 3.17
VEL3     4 3.72 3.25 3.43 2.66 1.82 1.74  .52 1.94 2.07    0    0    0
VEL3     4    0    0
XSEC     5       42.9          48.7
         5   0. 55.9   3. 53.9   6. 53.1   9. 52.3  12. 52.4  15. 52.6
         5  18. 50.5  21. 49.6  24. 49.6  27. 49.8  30. 49.4  33. 49.9
         5  36. 49.0  39. 49.7  42. 48.4  45. 48.1  48. 48.2  51. 49.4
         5  54. 54.1  57. 54.9  60. 55.8  60. 56.1
NS       5       7.9       7.3       7.3       4.5       4.7       7.0
NS       5       5.1       5.2       6.1       6.0       5.6       6.0
NS       5       5.8       7.0       6.8       6.7       5.6       5.3
NS       5       7.8       7.9       8.0       8.0
CAL1     5     51.46  63.
VEL1     5    0    0    0    0    0    0  .12 1.08  .65  .80    0  .24
VEL1     5  .92 1.13 2.36 1.55    0    0    0    0    0    0
CAL2     5     51.95  139.
VEL2     5    0    0    0    0    0    0  .30 1.70 1.70 1.50  .05  .85
VEL2     5 1.10 2.40 3.80 2.70  .30    0    0    0    0    0
CAL3     5     52.17  185.
VEL3     5    0    0    0    0    0    0  .43 2.05 1.80 2.35  .10  .66
VEL3     5 1.18 2.57 4.55 3.57    0    0    0    0    0    0
XSEC     6       45.0          49.0
         6   0. 59.4   3. 50.0   6. 57.7   9. 54.8  12. 53.3  15. 53.7
         6  18. 53.0  21. 52.3  24. 52.5  27. 51.9  30. 49.4  33. 49.5
         6  36. 49.0  39. 51.7  42. 52.1  45. 51.7  48. 52.1  51. 52.6
         6  54. 54.8  57. 55.0  60. 56.4  63. 59.1  66. 59.1  69. 60.1
         6  71. 61.1
NS       6       6.4       6.5       6.5       6.6       6.5       5.1
NS       6       6.2       5.8       6.1       6.3       6.3       7.0
NS       6       6.4       6.4       7.0       7.0       5.9       6.0
NS       6       6.8       7.0       6.7       5.6       7.0       6.5
NS       6       6.6
CAL1     6     52.24  63.
VEL1     6    0    0    0    0    0    0    0    0    0 1.77 1.83 2.42
VEL1     6 2.01 1.73  .69 1.05  .26    0    0    0    0    0    0    0
VEL1     6    0
CAL2     6     52.69  139.
VEL2     6    0    0    0    0    0    0    0  .45  .95 2.05 3.05 4.20
VEL2     6 2.90 2.50 1.80 1.50  .40    0    0    0    0    0    0    0


VEL2     6    0
CAL3     6     53.01  185.
VEL3     6    0    0    0    0    0    0    0  .20  .39 2.23 3.94 5.25
VEL3     6 5.41 3.22 3.02 2.43  .43    0    0    0    0    0    0    0
VEL3     6    0
ENDJOB
```

Appendix Table A3. Calibrated input data for South Fork Station 3 IFG-4 model. Changes to original data are underlined.

```
SOUTH FORK STATION 3  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1         0.                40.3
         1    0. 50.0    3. 49.4    6. 45.8    9. 45.2   12. 45.1   15. 44.4
         1   18. 42.4   21. 41.2   24. 40.3   27. 41.0   30. 40.5   33. 40.4
         1   36. 40.9   39. 40.9   42. 40.9   45. 41.2   48. 41.9   51. 41.6
         1   54. 42.9   57. 45.5   60. 44.7   63. 44.9   66. 45.7   69. 46.4
         1   72. 46.1   73. 46.1
NS       1        3.8        3.8        3.8        3.9        4.0        5.0
NS       1        6.5        6.8        6.2        6.8        5.7        5.0
NS       1        6.4        6.7        6.5        6.4        6.1        5.8
NS       1        5.0        7.0        7.0        7.0        7.0        7.0
NS       1        3.2        1.5
CAL1     1      42.86  66.
VEL1     1     0     0     0     0     0     0     0   .70   .86   .50   .55   .37
VEL1     1  1.87  2.25  1.60  1.35   .90   .20     0     0     0     0     0     0
VEL1     1     0     0
CAL2     1      43.33  150.
VEL2     1     0     0     0     0     0     0     0  2.36  1.83  1.44  1.08  1.40
VEL2     1  2.40  3.74  2.55  3.15  2.46   .36     0     0     0     0     0     0
VEL2     1     0     0
CAL3     1      43.40  185.
VEL3     1     0     0     0     0     0     0     0  2.39   .80  1.95  1.80  1.65
VEL3     1  2.90  4.00  3.87  2.40  2.70   .55     0     0     0     0     0     0
VEL3     1     0     0
XSEC     2        89.8              42.1
         2    0. 51.4    3. 53.2    6. 45.4    9. 44.6   12. 43.4   15. 43.6
         2   18. 42.4   21. 42.1   24. 43.2   27. 42.6   30. 42.7   33. 42.8
         2   36. 42.9   39. 44.0   42. 44.2   45. 44.5   48. 45.0   51. 45.7
         2   54. 45.3   57. 45.9   60. 44.9   63. 47.8   66. 51.1
NS       2        2.5        2.5        4.7        5.6        4.9        6.4
NS       2        6.7        7.0        7.0        6.6        6.8        7.0
NS       2        6.1        6.4        7.0        5.5        6.5        6.8
NS       2        7.0        6.2        2.9        1.0        1.0
CAL1     2      44.05  66.
VEL1     2     0     0     0     0  1.95  2.95  1.85  4.10  3.05   .42  2.95  1.15
VEL1     2   .32   .48     0     0     0     0     0     0     0     0     0
CAL2     2      44.73  150.
VEL2     2     0     0     0   .46  1.39  3.67  3.50  3.35  4.56   .30  4.23  2.72
VEL2     2  1.90  1.51  1.54     0     0     0     0     0     0     0     0
CAL3     2      44.80  185.
VEL3     2     0     0     0   .53  1.05  3.80  4.55  5.25  5.90   .35  3.80  3.65
VEL3     2  1.50  1.45  1.15     0     0     0     0     0     0     0     0
XSEC     3        80.6              44.5
         3    0. 54.0    3. 53.3    6. 48.6    9. 46.8   12. 44.9   15. 44.9
         3   18. 45.1   21. 44.5   24. 44.6   27. 45.1   30. 44.8   33. 45.7
         3   36. 44.5   39. 44.7   42. 46.0   45. 45.1   48. 44.9   51. 45.9
         3   54. 46.7   57. 48.8   60. 49.9   63. 50.4   66. 52.5
NS       3        2.8        1.9        6.4        6.2        5.7        5.6
NS       3        6.3        6.0        6.2        6.4        6.4        6.8
NS       3        7.0        7.0        7.0        7.0        6.4        6.7
NS       3        5.2        6.0        1.0        1.0        1.0
CAL1     3      46.17  66.
VEL1     3     0     0     0     0     0  2.05  2.55  2.95   .70  1.85  1.20  1.65
VEL1     3  1.38  1.76  2.20   .90   .30   .15     0     0     0     0     0
CAL2     3      46.74  150.
VEL2     3     0     0     0     0     0  2.40  2.82  2.71  1.59  2.69  2.43  2.33
VEL2     3  2.76  2.79  3.84  1.64   .85  1.25   .13     0     0     0     0
CAL3     3      46.85  185.
VEL3     3     0     0     0   .30     0  2.70  3.15  3.45  1.70  3.00  2.95  2.55
VEL3     3  3.40  2.60  4.35  2.10  1.05   .80     0     0     0     0     0
XSEC     4        69.3              44.9
```

Appendix Table A3. (continued).

```
         4   0. 54.3   3. 51.8   6. 51.3   9. 50.3  12. 50.1  15. 49.7
         4  18. 49.2  21. 48.8  24. 48.3  27. 48.5  30. 48.6  33. 48.0
         4  36. 47.7  39. 47.0  42. 46.4  45. 46.4  48. 46.0  51. 45.9
         4  54. 45.6  57. 44.9  60. 45.3  63. 46.2  66. 47.9  69. 49.3
         4  72. 48.7  75. 49.4  78. 50.0  81. 50.0  84. 50.6  87. 51.5
         4  89. 50.7
NS       4       8.0       8.0       8.0       6.1       5.5       5.5
NS       4       3.6       5.6       6.0       5.0       5.8       5.7
NS       4       5.0       5.3       5.1       5.7       6.6       6.6
NS       4       5.7       8.0       8.0       7.5       6.8       6.8
NS       4       6.4       5.8       5.7       5.8       4.2       4.9
NS       4       5.4
CAL1     4    47.86  66.
VEL1     4    0    0    0    0    0    0    0    0    0    0    0    0
VEL1     4    0   .50 1.25 1.51 1.58 1.52 1.16 1.45 1.52  .65    0    0
VEL1     4    0    0    0    0    0    0    0
CAL2     4    48.41  150.
VEL2     4    0    0    0    0    0    0    0    0    0    0    0    0
VEL2     4 1.25 1.31 1.87 2.55 2.65 3.12 1.77 2.20 2.05 1.90  .75    0
VEL2     4    0    0    0    0    0    0    0
CAL3     4    48.50  185.
VEL3     4    0    0    0    0    0    0    0    0    0    0    0    0
VEL3     4 1.35 1.40 1.80 2.85 3.22 3.70 2.00 2.40 2.46 2.43 1.05    0
VEL3     4    0    0    0    0    0    0    0
XSEC     5     102.6          45.0
         5   0. 53.8   3. 52.8   6. 48.7   9. 47.9  12. 45.4  15. 45.5
         5  18. 45.7  21. 45.0  24. 46.6  27. 47.3  30. 47.6  33. 47.9
         5  36. 48.0  39. 48.6  42. 49.3  45. 50.0  48. 50.4  51. 50.9
         5  54. 51.3  57. 51.9  60. 51.6  63. 51.8  66. 52.7  69. 53.4
         5  72. 53.4  75. 54.0  78. 55.9
NS       5       8.0       7.6       8.0       8.0       8.0       6.8
NS       5       5.3       4.9       4.8       4.9       4.8       4.6
NS       5       4.0       5.3       4.3       3.5       2.6       2.6
NS       5       2.6       2.5       2.4       3.7       2.6       2.5
NS       5       2.5       2.5       2.4
CAL1     5    48.14  66.
VEL1     5    0    0    0 2.45 2.45 2.32 1.63 1.12  .62 1.43 1.49  .27
VEL1     5    0    0    0    0    0    0    0    0    0    0    0    0
VEL1     5    0    0    0
CAL2     5    48.75  150.
VEL2     5    0    0    0 3.30 3.67 2.81 2.59 2.46 2.43 2.13 2.07 1.05
VEL2     5    0    0    0    0    0    0    0    0    0    0    0    0
VEL2     5    0    0    0
CAL3     5    48.85  185.
VEL3     5    0    0    0 3.60 3.90 3.20 2.80 2.70 2.80 2.40 2.10  .80
VEL3     5  .40  .20    0    0    0    0    0    0    0    0    0    0
VEL3     5    0    0    0
XSEC     6     58.3          45.0
         6   0. 55.9   3. 54.7   6. 53.2   9. 51.2  12. 44.8  15. 44.4
         6  18. 44.9  21. 45.5  24. 46.6  27. 46.9  30. 47.4  33. 47.9
         6  36. 48.3  39. 49.1  42. 49.8  45. 50.1  48. 50.1  51. 50.4
         6  54. 51.0  57. 52.4  60. 52.7  63. 52.7  66. 53.7  69. 53.6
         6  72. 54.1  74. 54.5
NS       6       8.0       8.0       8.0       8.0       7.8       7.5
NS       6       7.4       7.0       6.7       6.2       5.7       5.6
NS       6       5.6       6.3       6.2       6.0       6.4       6.5
NS       6       7.0       7.0       4.2       4.0       4.3       4.3
NS       6       4.6       1.5
CAL1     6    48.24  66.
VEL1     6    0    0    0    0 1.40 2.38 1.68 1.05  .78  .33    0    0
VEL1     6    0    0    0    0    0    0    0    0    0    0    0    0
VEL1     6    0    0
CAL2     6    48.79  150.


VEL2     6    0    0    0    0 2.50 4.50 3.87 2.56 1.54 1.12    0  .16
VEL2     6    0    0    0    0    0    0    0    0    0    0    0    0
VEL2     6    0    0
CAL3     6    48.90  185.
VEL3     6    0    0    0    0 2.55 4.60 4.10 2.80 2.20 1.35  .30    0
VEL3     6    0    0    0    0    0    0    0    0    0    0    0    0
VEL3     6    0    0
ENDJOB
```

Appendix Table A4. Calibrated input data for North Fork Station 4 IFG-4 model. Changes to original data are underlined.

```
NORTH FORK STATION 4  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1        0.      43.97
         1   0.50.90   3.49.48   6.49.81   9.46.75  12.46.80  15.46.54
         1  18.46.26  21.45.93  24.46.44  27.46.37  30.45.42  33.44.69
         1  36.43.97  39.44.13  42.44.23  45.44.42  48.44.53  51.45.17
         1  54.44.42  57.44.49  60.44.69  63.44.56  66.45.34  69.45.48
         1  72.45.46  75.46.80  78.46.14  81.46.12  84.45.78  87.46.01
         1  90.46.32  93.46.78  96.46.78  99.47.42 102.48.02 105.48.22
         1 108.48.36 111.48.88 114.49.08 117.49.40 120.49.60 123.49.68
         1 126.49.63 129.49.74 132.50.57 135.51.02 138.51.42
NS       1       2.8       2.5       7.0       6.8       6.0       5.7
NS       1       7.0       5.4       5.8       6.7       6.3       6.8
NS       1       6.2       6.7       6.8       6.4       6.3       6.4
NS       1       7.0       7.0       6.3       6.9       6.5       6.3
NS       1       6.7       6.5       5.7       5.8       6.7       6.4
NS       1       6.0       5.0       4.8       4.9       5.1       6.0
NS       1       5.9       4.9       5.6       5.2       4.8       4.5
NS       1       4.4       4.1       4.3       4.2       4.7
CAL1     1     45.90  118.7
VEL1     1     0    0    0    0    0    0    0   .10    0    0    0   .62
VEL1     1  1.57 2.30 3.25 4.33 3.31 3.84 3.20 3.15 2.26  .95  .89  .59
VEL1     1   .07    0  .03  .07  .06  .06    0    0    0    0    0    0
VEL1     1     0    0    0    0    0    0    0    0    0    0    0
CAL2     1      46.66  327.1
VEL2     1     0    0    0    0    0    0  .39 2.03  .92  .66 1.80 2.95
VEL2     1  3.94 3.12 4.74 5.25 4.76 6.07 5.09 4.74 4.41 2.13 1.48 1.72
VEL2     1   .20    0  .69  .82 1.15 1.28  .95    0    0    0    0    0
VEL2     1     0    0    0    0    0    0    0    0    0    0    0
CAL3     1     46.83  487.6
VEL3     1     0    0    0  .59  .30    0  .46 2.46 2.13  .86 2.51 4.43
VEL3     1  5.12 4.92 6.22 5.25 5.91 6.73 6.40 5.73 6.04 5.41 1.77 2.89
VEL3     1  2.13 1.74  .49 1.77 1.94 1.84 1.74  .23  .11    0    0    0
VEL3     1     0    0    0    0    0    0    0    0    0    0    0
XSEC     2      79.35  .5  43.98
         2   0.50.36   3.50.06   6.49.42   9.48.62  12.47.92  15.46.14
         2  18.47.24  21.46.73  24.46.48  27.45.79  30.45.62  33.44.32
         2  36.44.75  39.43.98  42.44.31  45.44.62  48.45.44  51.46.04
         2  54.45.67  57.45.26  60.44.69  63.44.76  66.45.14  69.45.40
         2  72.45.49  75.45.68  78.45.75  81.46.56  84.46.78  87.47.48
         2  90.48.5   93.49.46  96.49.68  99.50.09 102.50.38 105.50.89
         2 108.51.32 111.51.11 114.50.82 117.50.14 120.51.36 123.51.12
         2 126.49.83 129.47.30 132.47.21 135.47.51 138.47.49 141.47.14
         2 144.47.46 147.48.47 150.50.38 152.51.97
NS       2       5.8       5.4       5.4       5.3       6.4       6.1
NS       2       5.0       4.8       4.4       4.4       5.6       5.0
NS       2       5.7       6.2       6.6       5.0       5.3       5.0
NS       2       5.0       5.0       7.0       6.2       6.3       6.1
NS       2       6.6       5.8       6.3       5.7       6.2       5.9
NS       2       5.4       5.8       5.8       5.4       5.3       5.3
NS       2       5.3       5.3       5.3       5.3       5.3       5.3
NS       2       5.3       5.3       5.6       6.5       5.8       5.7
NS       2       5.6       5.2       4.0       2.6
CAL1     2     46.80  118.7
VEL1     2     0    0    0    0    0    0    0  .36  .72  .21  .72  .85
VEL1     2     0  .10  .69 1.57 1.51 1.21 1.12 1.05 1.02 1.44 1.90 2.13
VEL1     2  1.67  .75 1.15  .69  .33    0    0    0    0    0    0    0
VEL1     2     0    0    0    0    0    0    0    0    0    0    0    0
VEL1     2     0    0    0    0
CAL2     2      47.60  327.1
VEL2     2     0    0    0    0    0    0    0    0    0    0  .26  .79
VEL2     2  1.15 1.48 1.97 2.66 1.97 1.87 2.10 2.66 2.56 3.44 2.89 3.44
```

Appendix Table A4. (continued).

VEL2	2	2.85	3.22	2.53	3.12	1.38	.30	0	0	0	0	0	0
VEL2	2	0	0	0	0	0	0	0	.95	2.82	.43	1.44	2.46
VEL2	2	1.74	0	0	0								
CAL3	2		48.07	487.6									
VEL3	2	0	0	0	0	0	0	0	0	0	.43	.39	.89
VEL3	2	2.40	1.57	2.59	2.95	2.43	2.43	2.95	3.02	2.26	3.74	3.35	3.54
VEL3	2	3.22	3.44	2.62	3.22	1.57	.36	0	0	0	0	0	0
VEL3	2	0	0	0	0	0	0	0	2.49	2.85	.46	.43	2.69
VEL3	2	2.56	0	0	0								
XSEC	3		185.2	.7	46.56								
	3	0.54.06		3.52.76		6.52.40		9.53.27		12.52.74		15.52.31	
	3	18.51.74		21.50.90		24.49.96		27.49.15		30.48.60		33.48.03	
	3	36.47.36		39.47.66		42.49.70		45.46.64		48.47.11		51.46.82	
	3	54.47.54		57.47.22		60.46.99		63.46.82		66.46.64		69.46.56	
	3	72.46.95		75.47.30		78.47.29		81.47.09		84.46.96		87.47.44	
	3	90.47.19		93.47.59		96.49.28		99.49.21		102.50.01		105.52.03	
	3	109.53.05											
NS	3		2.4		2.6		4.7		4.9		4.0		3.4
NS	3		4.1		7.0		5.5		5.3		4.7		5.8
NS	3		7.0		6.2		7.0		6.8		7.0		5.4
NS	3		6.1		6.2		5.7		5.6		5.0		5.6
NS	3		5.8		5.7		5.4		5.0		5.0		6.2
NS	3		5.1		4.8		7.0		6.0		5.7		6.8
NS	3		6.7										
CAL1	3		49.13	118.7									
VEL1	3	0	0	0	0	0	0	0	0	0	0	.23	.39
VEL1	3	.43	.23	0	.66	.66	.07	1.61	1.41	1.87	2.03	1.38	1.84
VEL1	3	1.90	1.28	.98	1.12	1.05	.62	.56	.26	0	0	0	0
VEL1	3	0											
CAL2	3		49.83	327.1									
VEL2	3	0	0	0	0	0	0	0	0	0	.30	.52	.75
VEL2	3	.56	0	0	.89	1.21	.26	2.83	3.28	3.77	4.10	3.61	4.10
VEL2	3	4.10	4.63	2.56	2.36	2.16	1.41	1.71	.92	.59	.20	0	0
VEL2	3	0											
CAL3	3		50.16	487.6									
VEL3	3	0	0	0	0	0	0	0	0	0	.59	.75	.82
VEL3	3	.82	0	0	2.40	1.90	.26	2.46	4.04	4.23	4.86	4.72	4.89
VEL3	3	4.92	6.40	3.90	3.02	2.53	2.82	2.36	1.02	.69	.23	.10	0
VEL3	3	0											
XSEC	4		72.8	.5	46.56								
	4	0.53.08		3.52.08		6.51.81		9.51.76		12.51.25		15.49.61	
	4	18.49.94		21.51.21		24.50.68		27.48.87		30.48.13		33.47.90	
	4	36.47.21		39.48.08		42.47.49		45.47.61		48.47.65		51.47.97	
	4	54.46.76		57.46.31		60.46.39		63.46.65		66.46.68		69.47.59	
	4	72.47.67		75.48.79		78.49.34		81.51.10		84.52.53		87.59.96	
	4	90.61.32		90.51.32									
NS	4		4.0		6.0		5.8		7.0		7.0		6.8
NS	4		6.2		7.0		6.7		6.7		5.9		6.7
NS	4		6.8		6.8		6.7		5.8		5.7		5.6
NS	4		5.4		5.3		5.0		5.8		7.0		6.9
NS	4		6.9		7.4		8.0		8.0		7.8		5.7
NS	4		6.0		5.6								
CAL1	4		49.14	118.7									
VEL1	4	0	0	0	0	0	0	0	0	0	0	.03	1.43
VEL1	4	1.23	2.43	1.32	1.30	2.14	1.71	1.75	2.95	2.53	1.03	.56	1.06
VEL1	4	.20	.11	0	0	0	0	0	0				
CAL2	4		50.01	327.1									
VEL2	4	0	0	0	0	0	0	.59	0	0	0	.10	3.08
VEL2	4	2.79	3.22	2.95	2.46	2.53	3.44	4.89	3.44	3.54	2.58	1.66	1.57
VEL2	4	1.48	1.41	1.35	0	0	0	0	0				
CAL3	4		50.22	487.6									
VEL3	4	0	0	0	0	0	0	.82	0	0	0	.26	3.58
VEL3	4	4.30	4.58	3.86	3.80	3.61	4.43	4.92	4.43	3.94	3.77	2.96	2.79

Appendix Table A4. (continued).

```
VEL3      4 3.38 1.51 1.80    0    0    0    0    0
XSEC      5     127.7  .4  47.45
          5   0.53.47   3.53.95   6.53.96   9.52.14  12.52.83  15.50.05
          5  18.50.05  21.49.79  24.49.98  27.50.22  30.50.23  33.49.06
          5  36.48.04  39.48.56  42.48.26  45.48.02  48.48.00  51.47.73
          5  54.47.45  57.47.58  60.47.81  63.48.06  66.49.63  69.50.12
          5  72.53.02  75.53.93  78.55.16  81.54.92
NS        5       6.8       6.3       7.0       6.4       7.0       6.9
NS        5       8.0       8.0       7.1       8.0       8.0       8.0
NS        5       8.0       6.7       6.0       6.7       6.7       5.7
NS        5       5.8       5.9       6.6       5.8       7.2       8.0
NS        5       6.3       5.5       5.5       6.2
CAL1      5     49.95  118.7
VEL1      5    0    0    0    0    0  .03  .07  .13  .07    0    0 1.43
VEL1      5 2.09 3.09 3.35 1.03 2.60  .10 1.26 2.64 2.87  .47  .38    0
VEL1      5    0    0    0    0
CAL2      5     50.89  327.1
VEL2      5    0    0    0    0    0  .13 1.16  .56  .17 1.35 2.40 3.41
VEL2      5 4.95 5.25 5.02 2.95 3.48 1.31 2.62 3.09 4.10  .80  .80  .75
VEL2      5    0    0    0    0
CAL3      5     51.26  487.6
VEL3      5    0    0    0    0    0  .23 1.21 1.02  .33 2.10 3.05 3.84
VEL3      5 6.89 6.30 5.09 3.12 3.77 1.57 2.76 3.94 5.84 2.40 2.13 1.31
VEL3      5    0    0    0    0
ENDJOB
```

Appendix Table A5. Calibrated input data for Mainstem Station 5 IFG-4 model. Changes to original data are underlined.

```
MAINSTEM STATION 5  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1        0.       45.75
         1   0.50.00   3.48.84   6.48.12   9.48.12  12.48.00  15.48.03
         1  18.47.17  21.47.19  24.46.75  27.46.69  30.46.73  33.46.59
         1  36.45.96  39.46.09  42.46.30  45.46.06  48.46.20  51.46.47
         1  54.46.25  57.46.29  60.46.12  63.46.46  66.46.09  69.45.75
         1  72.46.27  75.46.11  78.46.64  81.46.60  84.46.75  87.46.79
         1  90.47.12  93.47.08  96.47.09  99.47.73 102.46.92 105.47.62
         1 108.48.52 111.47.57 114.47.92 117.47.99 120.48.07 123.49.31
         1 126.49.49 129.50.00 132.50.36 135.52.69 136.53.04
NS       1       1.0       6.7       5.6       5.7       5.8       6.1
NS       1       6.6       6.0       6.7       6.4       6.3       6.7
NS       1       6.8       6.4       7.0       6.7       6.8       6.2
NS       1       5.6       7.0       5.9       7.0       5.8       5.9
NS       1       6.2       6.4       5.8       6.3       6.2       5.7
NS       1       5.9       5.8       6.3       6.7       5.9       6.8
NS       1       6.8       6.5       5.8       5.7       5.2       5.6
NS       1       4.0       5.0       7.2       7.3       6.0
CAL1     1     47.51   156.0
VEL1     1     0    0    0    0    0    0    0  .10  .72 2.40 2.69  .72
VEL1     1 2.43 1.84 2.26 2.69 1.67 2.10 1.61  .45 2.07 2.59 1.25 1.80
VEL1     1    0 1.87 1.54 2.16 2.23 1.08 1.25 1.44  .16    0  .72    0
VEL1     1    0 1.20    0    0    0    0    0    0    0    0    0
CAL2     1     48.25   545.0
VEL2     1     0    0 1.38 1.84    0 2.07 2.85    0 4.79 4.92 4.99 4.17
VEL2     1 3.97 4.07 4.10 4.04 3.81 3.48 3.22 3.22 3.61 4.92 3.05 3.25
VEL2     1 2.69 3.82 3.44 2.76 2.46 3.02 2.85 3.35 3.08 1.28 3.36 3.74
VEL2     1  .90 3.41 2.00 1.80    0    0    0    0    0    0    0
CAL3     1     48.33   713.0
VEL3     1     0    0 2.49 3.25 2.03 2.59 2.43  .13 3.44 5.58 5.40 6.73
VEL3     1 5.51 5.51 4.92 4.74 5.09 4.66 3.41 2.49 4.20 5.91 3.90 3.81
VEL3     1 4.30 4.72 4.69 3.74 3.77 4.07 3.87 4.59 3.02 2.36 4.69 4.23
VEL3     1 1.18 4.86 3.18 3.02    0    0    0    0    0    0    0
XSEC     2       72.6  .5  45.75
         2   0.52.22   3.52.43   6.48.07   9.47.86  12.47.47  15.46.76
         2  18.46.62  21.46.54  24.47.05  27.47.19  30.45.61  33.45.88
         2  36.45.26  39.46.20  42.45.91  45.45.92  48.45.77  51.46.38
         2  54.45.49  57.46.31  60.45.82  63.46.40  66.46.77  69.46.71
         2  72.46.76  75.47.60  78.47.39  81.48.31  84.47.81  87.47.91
         2  90.47.28  93.46.89  96.47.96  99.47.55 102.46.69 105.46.82
         2 108.46.77 111.48.44 114.48.98 117.48.95 120.50.83 122.48.81
NS       2       6.3       7.0       5.1       5.0       4.8       5.6
NS       2       6.2       6.3       6.7       6.8       7.0       7.0
NS       2       7.0       7.0       7.0       6.9       6.8       6.8
NS       2       6.8       6.7       6.5       5.8       6.2       6.6
NS       2       6.7       5.7       6.3       6.7       6.3       6.5
NS       2       6.4       6.4       6.5       6.5       6.5       5.8
NS       2       6.6       6.3       6.4       5.0       4.1       5.2
CAL1     2     47.66   156.0
VEL1     2     0    0    0    0    0 1.08 1.38 2.08 1.27    0 3.03 2.99
VEL1     2 2.66 2.61 2.82 2.08 1.75 1.51 2.49 2.30 1.87  .95 1.72  .62
VEL1     2  .13    0 1.47    0  .49    0    0  .43    0  .23  .30  .62
VEL1     2  .23    0    0    0    0    0
CAL2     2     48.36   545.0
VEL2     2     0    0    0    0    0 2.10 2.46 4.53 2.79 5.64 5.81 5.38
VEL2     2 5.18 5.74 4.43 4.27 4.10 1.05 3.81 4.89 4.17 1.74 3.64 1.28
VEL2     2 1.31    0 1.84 1.90 2.66 2.76 2.46 1.37 1.07  .98 2.17 2.20
VEL2     2  .84    0    0    0    0    0
CAL3     2     48.49   713.0
VEL3     2     0    0    0    0    0 2.82 4.04 5.58 5.25 6.20 6.42 6.35
VEL3     2 5.88 6.24 5.42 5.09 5.25 1.05 4.20 6.23 5.58 4.36 4.33 2.87
```

Appendix Table A5. (continued).

```
VEL3     2 2.30    0 1.35 2.46 3.41 3.67 2.69 1.57 1.57 1.77 2.23 2.56
VEL3     2 1.21    0    0    0    0    0
XSEC     3     340.7  .1  50.30
         3   0.56.33   3.55.07   6.54.86   9.54.37  12.54.09  15.53.37
         3  18.53.37  21.52.25  24.53.00  27.51.80  30.51.46  33.51.08
         3  36.51.87  39.51.38  42.51.34  45.51.63  48.51.43  51.51.23
         3  54.51.10  57.50.97  60.50.64  63.50.30  66.50.39  69.51.11
         3  72.51.07  75.51.27  78.51.17  81.51.12  84.51.63  87.51.28
         3  90.51.09  93.51.08  96.51.40  99.52.96 102.54.20 105.52.72
         3 108.52.64 111.52.68 114.53.25 117.53.94 120.54.42 123.55.03
         3 126.55.14 129.55.50 132.55.88 135.56.71 138.57.37 140.59.20
NS       3       4.2       4.9       6.7       6.8       6.4       5.9
NS       3       6.4       6.7       7.0       7.0       7.0       6.5
NS       3       6.4       6.3       6.3       6.2       5.0       5.8
NS       3       5.7       5.0       5.3       5.0       5.0       5.7
NS       3       5.6       5.1       5.7       5.8       5.7       5.4
NS       3       5.3       5.3       5.8       5.9       7.0       5.9
NS       3       5.7       5.4       4.0       4.0       4.0       3.5
NS       3       5.0       4.0       4.0       6.1       4.0       3.7
CAL1     3     52.69   156.0
VEL1     3    0    0    0    0    0    0    0  .10    0  .52  .07  .83
VEL1     3 1.39 1.08 1.48 1.25 1.41 1.57 1.71 1.74 1.97 1.94 1.97 1.97
VEL1     3 1.44 1.67 1.22 1.38 1.28 1.25  .85  .56 1.08    0    0    0
VEL1     3    0    0    0    0    0    0    0    0    0    0    0    0
CAL2     3     53.47   545.0
VEL2     3    0    0    0    0    0 1.67 1.51  .75 2.03 2.43 3.25 2.76
VEL2     3 3.15 3.69 3.82 3.85 3.88 3.25 3.31 3.68 3.77 3.78 3.85 3.85
VEL2     3 2.66 2.56 2.72 2.89 2.69 2.43 1.67 1.69 2.46 2.82    0 1.51
VEL2     3 1.12 1.08  .52    0    0    0    0    0    0    0    0    0
CAL3     3     53.59   713.0
VEL3     3    0    0    0    0    0 2.03 1.59  .33 2.53 2.69 3.61 3.44
VEL3     3 3.31 4.41 4.17 4.34 4.34 3.87 3.97 4.57 4.67 4.59 4.36 3.41
VEL3     3 3.67 3.62 3.71 3.81 3.84 3.41 2.43 2.15 3.22 3.64    0 1.94
VEL3     3 1.54 1.48  .69    0    0    0    0    0    0    0    0    0
XSEC     4     162.3  .4  50.30
         4   0.55.89   3.56.18   6.56.10   9.55.88  12.53.50  15.46.91
         4  18.45.61  21.46.32  24.47.14  27.49.15  30.48.90  33.49.09
         4  36.49.99  39.50.74  42.51.19  45.51.61  48.51.82  51.52.22
         4  54.52.36  57.52.93  60.53.23  63.53.72  66.54.57  69.53.82
         4  72.54.49  75.54.62  78.54.85  81.55.03  84.55.11  87.55.79
         4  90.55.50  93.55.75  96.56.10  99.56.27 102.57.91 104.58.35
NS       4       8.0       8.0       8.0       8.0       8.0       8.0
NS       4       7.8       7.7       7.2       7.1       7.0       7.0
NS       4       7.0       6.8       6.9       6.8       6.7       6.5
NS       4       6.3       6.2       6.2       5.6       5.7       5.5
NS       4       6.2       4.0       3.2       3.1       3.3       2.3
NS       4       2.2       2.0       4.4       5.1       2.3       1.0
CAL1     4     52.77   156.0
VEL1     4    0    0    0    0    0 2.52 2.30 1.51 1.44  .72  .75  .43
VEL1     4  .23  .85  .82  .26  .33  .23  .36    0    0    0    0    0
VEL1     4    0    0    0    0    0    0    0    0    0    0    0    0
CAL2     4     53.70   545.0
VEL2     4    0    0    0    0 2.23 5.22 5.58 4.25 2.79 2.13 2.53 1.80
VEL2     4 2.36 1.84 2.36 1.80 1.77 1.87  .79  .43  .16    0    0    0
VEL2     4    0    0    0    0    0    0    0    0    0    0    0    0
CAL3     4     53.92   713.0
VEL3     4    0    0    0    0 2.76 7.69 6.71 4.43 3.77 2.56 3.22 2.89
VEL3     4 2.69 2.46 2.59 2.72 2.10 2.07 1.18  .79  .39  .26    0    0
VEL3     4    0    0    0    0    0    0    0    0    0    0    0    0
XSEC     5     317.1 .75  54.30
         5   0.62.68   3.60.86   6.57.65   9.57.26  12.56.42  15.56.00
         5  18.55.83  21.55.80  24.55.79  27.55.52  30.55.78  33.55.64
         5  36.55.51  39.55.65  42.55.15  45.55.24  48.55.12  51.54.77
```

Appendix Table A5. (continued).

```
         5  54.54.29  57.54.66  60.54.83  63.55.25  66.55.00  69.54.72
         5  72.54.79  75.54.71  78.54.46  81.54.30  84.54.43  87.54.99
         5  90.54.80  93.55.13  96.55.63  99.56.02 102.56.35 105.57.33
         5 108.58.90
NS       5       8.0       8.0       7.4       7.0       6.8       6.7
NS       5       5.3       5.2       5.2       6.0       5.5       5.4
NS       5       5.1       5.9       5.8       5.8       5.6       5.5
NS       5       5.4       5.3       5.8       5.7       6.0       6.1
NS       5       5.5       5.4       5.6       5.6       5.3       5.2
NS       5       5.7       6.1       6.3       6.7       6.9       7.0
NS       5       7.3
CAL1     5     56.43   156.0
VEL1     5    0    0    0    0    0  .11  .23  .23  .39  .62 1.35  .95
VEL1     5    0 1.51 1.74 1.94 2.17 2.13 1.94 2.33 2.07 2.17 2.23 2.07
VEL1     5 1.94 1.84 1.54 1.31 1.08 1.18  .82  .59  .39  .52  .26    0
VEL1     5    0
CAL2     5     57.14   545.0
VEL2     5    0    0    0    0    0  .82 2.53 2.23    0 1.21  .82 3.05
VEL2     5 3.15 3.48 3.77 4.00 4.27 4.07 3.38 3.67 3.44 4.59 4.46 3.71
VEL2     5 3.87 3.97 3.77 3.61 3.58 2.92 2.49 1.84 1.80 1.44  .85  .30
VEL2     5    0
CAL3     5     57.31   713.0
VEL3     5    0    0    0    0  .13 2.36 2.30 3.08  .30 1.28  .66 3.81
VEL3     5 3.51 3.94 4.20 4.72 4.86 4.83 5.09 4.89 5.32 5.15 4.86 4.59
VEL3     5 4.17 4.07 4.20 4.10 4.07 3.67 3.05 2.43 2.43 1.71 1.21  .59
VEL3     5    0
EOF
ENDJOB
```

Appendix Table A6. Calibrated input data for Mainstem Station 6 IFG-4 model. Changes to original data are underlined.

```
MAINSTEM STATION 6  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1         0.       39.74
         1    0. 50.0    3.47.77    6.43.95    9.43.10   12.42.39   15.42.64
         1  18.40.89   21.40.35   24.39.74   27.40.10   30.40.34   33.40.52
         1  36.40.67   39.41.22   42.41.31   45.42.0    48.41.84   51.42.30
         1  54.41.66   57.41.90   60.41.78   63.41.85   66.41.80   69.42.27
         1  72.41.50   75.41.50   78.41.33   81.40.75   84.41.36   87.41.93
         1  90.41.74   93.41.87   96.50.49   99.50.14  102.50.50  105.50.50
         1 108.42.47  111.42.86  114.42.93  117.42.84  120.42.74  123.43.10
         1 126.43.73  129.44.66  131.44.97
NS       1        8.0        8.0        8.0        8.0        8.0        7.1
NS       1        6.9        5.4        5.9        5.5        5.5        5.4
NS       1        5.4        5.5        6.3        6.3        5.9        6.2
NS       1        6.3        6.0        6.4        6.2        5.6        6.1
NS       1        6.2        6.0        5.9        6.2        5.8        6.3
NS       1        5.2        6.5        5.3        5.7        5.2        5.4
NS       1        5.9        6.0        6.0        5.7        5.5        4.9
NS       1        3.2        3.0        2.8
CAL1     1      42.58     197.7
VEL1     1     0     0     0     0   .43   .56     0  1.31  4.17  2.85  2.76  1.08
VEL1     1  2.66  2.20  2.49  2.33  2.26  2.23  3.71     0  2.07  2.56  1.48  2.49
VEL1     1   .39  3.41  1.21  2.23  1.12   .82   .82   .67     0   .07     0   .01
VEL1     1   .01     0     0     0     0     0     0     0     0
CAL2     1      43.13     358.2
VEL2     1     0     0     0   .24  1.60  1.71  1.44  2.69  6.29  3.87  2.80  1.77
VEL2     1  3.26  3.08  3.12  2.72  3.41  2.62  4.86   .43  2.59  3.08  2.36  3.21
VEL2     1  4.88  4.54  2.38  3.90  2.40  1.05   .66  1.28   .46   .20   .03   .15
VEL2     1   .13   .18     0   .05     0     0     0     0     0
CAL3     1      43.72     645.0
VEL3     1     0     0     0   .36  1.80  2.91  1.84  3.22  5.02  5.09  2.82  4.20
VEL3     1  3.48  3.54  4.41  3.22  4.89  3.01  4.63   .58  4.10  3.31  4.00  5.12
VEL3     1  5.51  4.92  3.35  4.66  3.74  2.09  1.94  2.33  1.18   .23   .16   .56
VEL3     1   .43   .56     0   .30     0     0     0     0     0
XSEC     2      237.8   .8   43.99
         2    0.49.00    3.47.61    6.47.23    9.46.64   12.46.62   15.46.63
         2  18.46.52   21.46.51   24.46.39   27.46.40   30.46.39   33.46.30
         2  36.45.86   39.46.00   42.45.47   45.44.71   48.44.55   51.44.60
         2  54.45.33   57.44.67   60.44.67   63.44.57   66.44.76   69.44.30
         2  72.44.27   75.44.05   78.44.33   81.43.99   84.44.32   87.44.57
         2  90.44.39   93.44.68   96.45.07   99.44.95  102.44.70  105.45.21
         2 108.45.13  111.45.30  114.45.61  117.45.92  120.46.22  123.46.13
         2 126.46.33  129.46.28  132.46.28  135.46.06  138.46.51  141.46.50
         2 144.46.17  147.46.63  150.46.69  153.46.62  156.46.62  159.47.16
         2 162.47.69  165.48.10  167.48.75
NS       2        4.0        3.2        3.2        5.5        5.2        6.3
NS       2        6.3        6.5        6.3        6.0        6.2        6.3
NS       2        6.3        5.9        5.5        5.6        5.4        6.2
NS       2        6.3        6.2        6.1        6.2        6.3        6.0
NS       2        5.6        6.2        6.0        5.9        5.9        6.1
NS       2        5.3        5.8        5.5        6.8        5.8        5.7
NS       2        5.2        5.0        5.4        5.9        5.3        5.3
NS       2        5.0        5.0        5.2        5.9        6.1        6.2
NS       2        6.3        6.4        6.4        5.2        3.9        3.2
NS       2        3.1        3.0        2.1
CAL1     2      45.79     197.7
VEL1     2     0     0     0     0     0     0     0     0     0     0     0     0
VEL1     2     0     0  1.61   .43  2.07  2.92  2.46  2.08  1.90  4.10  2.69  3.15
VEL1     2  2.89  4.40  2.75  4.40  4.46  2.56  2.13  1.71  3.41     0  2.40  1.26
VEL1     2   .16     0   .10     0     0     0     0     0     0     0     0     0
VEL1     2     0     0     0     0     0     0     0     0     0
CAL2     2      46.12     358.2
```

Appendix Table A6. (continued).

```
VEL2    2    0    0    0    0    0    0    0    0    0    0    0
VEL2    2    0 2.12 2.23 1.02 2.99 3.87 3.41 3.68 2.76 4.43 4.00 3.74
VEL2    2 2.89 4.83 3.74 4.66 4.91 3.22 1.51 2.71 3.74 2.64 3.02 1.61
VEL2    2  .20  .20  .33    0    0    0    0    0    0    0    0    0
VEL2    2    0    0    0    0    0    0    0    0    0
CAL3    2     46.65   645.0
VEL3    2    0    0    0  .62 1.41  .79  .16 2.46 1.90 2.26 1.61 2.79
VEL3    2    0 3.53 3.82 2.53 3.86 4.76 4.92 2.85 4.92 4.95 5.07 4.99
VEL3    2 5.28 5.44 4.20 4.76 5.41 4.97 3.76 4.10 4.53 4.99 4.09 3.09
VEL3    2 2.46 1.18 1.30 2.30 1.71 1.08 1.54  .72  .69  .85  .66  .89
VEL3    2 1.15  .94  .72  .36  .18    0    0    0    0
XSEC    3     243.2 .25  47.80
        3   0.55.85   3.52.75   6.50.90   9.49.54  12.48.40  15.48.17
        3  18.48.87  21.48.87  24.48.43  27.48.76  30.49.14  33.48.67
        3  36.48.80  39.48.81  42.48.58  45.48.71  48.49.54  51.49.52
        3  54.49.32  57.48.20  60.47.80  63.48.14  66.48.28  69.48.63
        3  72.48.94  75.48.52  78.49.53  81.48.79  84.48.95  87.49.05
        3  90.49.13  93.49.07  96.49.25  99.49.54 102.49.44 105.49.67
        3 108.50.06 111.49.99 114.50.04 117.50.13 120.50.53 123.50.53
        3 126.50.74 129.50.44 132.50.07 135.49.80 138.49.50 141.49.60
        3 144.49.67 147.49.67 150.49.66 153.49.81 156.49.81 159.49.90
        3 162.49.69 165.50.02 168.50.44 171.50.23 174.50.25 177.51.19
        3 180.51.80 183.52.44 185.52.66
NS      3      3.2      4.1      5.4      5.7      5.6      5.7
NS      3      5.5      5.4      6.3      5.7      6.1      6.4
NS      3      6.0      6.6      5.5      6.3      6.4      6.3
NS      3      6.5      5.8      5.5      5.5      6.6      5.8
NS      3      5.5      6.3      6.0      5.7      5.3      6.1
NS      3      5.6      5.6      5.4      5.6      6.0      5.3
NS      3      5.6      6.6      5.5      5.5      5.6      5.0
NS      3      5.2      4.3      5.6      5.7      5.6      5.4
NS      3      5.3      5.0      5.3      5.3      5.0      5.1
NS      3      5.0      5.1      5.6      5.6      5.5      4.0
NS      3      3.3      3.2      3.2
CAL1    3     49.78   197.7
VEL1    3    0    0    0  .82 1.64 3.35 2.40 1.77 2.23 2.26 1.02 2.59
VEL1    3 2.36  .72 3.77 2.33 1.44 2.18 3.22 3.18 2.99 2.79 2.49 2.56
VEL1    3 2.13 1.71 1.61 1.35  .59 1.80 1.44 1.18  .62  .56  .30  .32
VEL1    3    0    0    0    0    0    0    0    0    0    0  .37  .63
VEL1    3  .50  .37  .13    0    0    0    0    0    0    0    0    0
VEL1    3    0    0    0
CAL2    3     49.91   358.2
VEL2    3    0    0    0  .39 2.06 3.48 2.69 2.53 2.72 3.25 1.77 1.94
VEL2    3 4.40 2.89 4.59 3.49 2.76 4.44 4.66 4.12 3.56 4.07 3.38 2.76
VEL2    3 3.31 2.95 2.13 2.59  .85 2.95 1.92 1.52 1.61 1.61  .49  .86
VEL2    3    0    0    0    0    0    0    0    0    0  .52  .72 1.05
VEL2    3  .92  .92  .46  .66  .66  .33  .56    0    0    0    0    0
VEL2    3    0    0    0
CAL3    3     50.27   645.0
VEL3    3    0    0    0    0 2.85 3.77 4.00 3.77 3.87 4.31 3.61 3.71
VEL3    3 5.00 3.13 5.99 5.45 4.56 5.23 5.59 5.59 4.59 4.72 4.49 3.97
VEL3    3 3.90 3.87 3.08 3.05 2.03 3.35 3.12 2.53 2.66 2.13 2.08 1.73
VEL3    3 1.12 1.61 1.31  .66    0    0    0    0 1.18 1.10 1.46 1.72
VEL3    3 3.08 3.25 3.15 1.92 1.66 1.23 1.40 2.17    0  .13  .07    0
VEL3    3    0    0    0
XSEC    4     147.0  .5  47.80
        4   0.54.32   3.50.54   6.49.76   9.50.06  12.49.06  15.48.15
        4  18.47.65  21.47.27  24.47.36  27.47.32  30.47.13  33.47.01
        4  36.47.13  39.47.28  42.47.29  45.47.88  48.47.64  51.48.16
        4  54.48.69  57.48.66  60.49.22  63.49.23  66.49.39  69.49.71
        4  72.50.32  75.50.54  78.50.62  81.51.27  84.51.62  87.51.62
        4  90.52.18  93.52.01  96.52.83  99.54.18 102.52.76 105.52.73
        4 108.52.67 111.52.66 114.51.97 117.51.72 120.51.58 123.51.08
```

Appendix Table A6. (continued).

```
         4 126.51.16 129.50.92 132.50.53 135.50.24 138.49.51 141.49.55
         4 144.49.60 147.49.71 150.49.91 153.50.70 156.52.62 159.55.68
         4 161.56.43
NS       4       3.5       3.2       5.4       6.2       6.1       6.0
NS       4       5.5       5.8       5.8       5.1       4.9       5.0
NS       4       5.1       5.2       5.8       6.2       6.0       5.8
NS       4       5.6       5.4       4.9       5.0       6.1       5.5
NS       4       5.8       5.6       5.4       5.5       5.0       5.0
NS       4       5.2       4.9       5.4       4.9       4.0       4.9
NS       4       5.3       5.2       5.4       5.6       5.7       5.5
NS       4       5.2       5.0       5.6       5.7       5.1       4.5
NS       4       4.5       4.9       5.0       5.4       5.0       2.4
NS       4       2.2
CAL1     4     50.28   197.7
VEL1     4     0    0   .26  .56  .85 1.02 1.31 1.44 1.61 1.57 1.71 1.77
VEL1     4 1.84 1.97 2.00 1.94 1.74 1.58 1.45 1.09  .86  .89  .83  .86
VEL1     4     0    0    0    0    0    0    0    0    0    0    0    0
VEL1     4     0    0    0    0    0    0    0    0    0    0  .07    0
VEL1     4   .03    0    0    0    0    0    0
CAL2     4     50.40   358.2
VEL2     4     0    0   .36 1.02 1.57 1.80 1.61 2.59 2.66 2.40 2.36 2.39
VEL2     4 2.20 2.76 2.56 3.48 3.41 3.22 2.18 1.84 1.82 1.08 1.02 1.40
VEL2     4 1.43    0    0    0    0    0    0    0    0    0    0    0
VEL2     4     0    0    0    0    0    0    0    0    0  .33  .39  .52
VEL2     4   .59  .45  .16    0    0    0    0
CAL3     4     50.74   645.0
VEL3     4     0    0   .20 1.90 2.72 3.08 3.15 3.51 4.45 4.00 4.23 4.86
VEL3     4 4.76 4.46 4.86 4.46 4.79 2.82 3.12 2.36 2.49 1.97 1.61 2.07
VEL3     4 1.57  .39  .56    0    0    0    0    0    0    0    0    0
VEL3     4     0    0    0    0    0    0    0    0 1.08 1.57  .92 1.00
VEL3     4   .89  .87  .26    0    0    0    0
XSEC     5     351.0 .15  49.19
         5   0.55.41   3.54.55   6.54.33   9.53.90  12.53.81  15.53.23
         5  18.51.58  21.51.57  24.50.96  27.51.03  30.50.56  33.50.58
         5  36.49.19  39.49.20  42.49.23  45.49.69  48.50.04  51.50.30
         5  54.50.61  57.50.98  60.51.08  63.51.21  66.51.45  69.51.50
         5  72.51.61  75.51.68  78.51.64  81.51.70  84.51.78  87.51.88
         5  90.51.87  93.51.86  96.51.81  99.51.70 102.51.66 105.51.53
         5 108.51.25 111.50.98 114.50.59 117.49.98 120.49.39 123.49.61
         5 126.52.07 129.54.29 131.55.07
NS       5       3.2       4.4       3.2       3.1       3.1       3.2
NS       5       6.0       6.0       6.1       6.2       6.0       6.6
NS       5       5.5       4.9       5.0       5.2       5.3       5.0
NS       5       5.0       5.1       5.0       5.0       4.9       4.9
NS       5       4.9       4.9       5.0       5.0       5.1       5.0
NS       5       5.0       4.5       4.9       5.0       5.0       4.8
NS       5       4.7       4.7       4.3       5.2       5.4       5.5
NS       5       3.9       5.5       4.8
CAL1     5     51.94   197.7
VEL1     5     0    0    0    0    0  .50  .59  .92 1.81 2.56 3.38
VEL1     5 3.47 2.79 3.19 3.19 2.56 2.46 2.59 2.43 2.33 1.51 1.42 1.26
VEL1     5 1.28 1.13 1.07 1.03    0    0    0    0    0    0    0    0
VEL1     5    0  .50  .32  .21    0    0    0    0    0
CAL2     5     52.17   358.2
VEL2     5     0    0    0    0    0    0 1.20 1.74 1.28 2.99 3.15 4.33
VEL2     5 4.43 4.13 4.00 3.48 3.42 3.22 3.18 3.84 3.82 3.08 3.02 2.40
VEL2     5 2.43 1.90 1.44 1.21 1.51 1.12  .75    0    0  .82  .73  .59
VEL2     5  .36  .82  .96  .70  .16  .13    0    0    0
CAL3     5     52.71   645.0
VEL3     5     0    0    0    0    0    0 1.94 2.66 2.53 3.51 4.07 4.99
VEL3     5 5.36 4.97 4.74 4.30 4.20 4.74 4.04 4.84 4.41 4.15 3.82 3.22
VEL3     5 3.19 2.86 2.76 2.82 2.62 2.53 2.30 2.40 2.37 2.23 2.00 1.90
VEL3     5 2.00 2.36 2.23 1.71 1.20 1.16    0    0    0
ENDJOB
```

Appendix Table A7. Calibrated input data for Mainstem Station 7 IFG-4 model. Changes to original data are underlined.

```
MAINSTEM STATION 7  CALIBRATED DATA SET
TOLT RIVER  1981-82

XSEC     1        0.       43.81
         1   0.50.00   3.49.50   6.48.59   9.48.20  12.46.98  15.46.62
         1  18.47.02  21.46.63  24.46.57  27.46.59  30.46.57  33.46.64
         1  36.46.62  39.46.64  42.46.60  45.46.66  48.46.57  51.47.66
         1  54.46.98  57.46.78  60.46.93  63.46.18  66.46.06  69.45.24
         1  72.45.88  75.44.91  78.44.42  81.44.28  84.44.42  87.44.26
         1  90.44.42  93.44.41  96.44.70  99.43.81 102.44.17 105.44.54
         1 108.44.77 111.44.81 114.44.29 117.44.87 120.45.00 123.45.11
         1 126.45.46 129.45.61 132.45.98 135.46.69 138.47.01 141.47.39
         1 144.47.54 147.47.90 150.49.09 152.52.63
NS       1       4.4       5.0       5.4       6.3       5.3       5.4
NS       1       5.6       5.1       5.0       5.4       6.0       5.7
NS       1       4.9       4.9       5.6       5.4       6.1       6.1
NS       1       6.4       5.6       6.0       6.0       5.8       5.6
NS       1       5.6       5.7       6.1       5.7       4.9       5.5
NS       1       6.4       6.1       6.5       6.1       7.0       6.0
NS       1       6.0       6.1       6.2       6.2       5.7       5.9
NS       1       5.6       5.4       5.8       6.5       6.5       5.3
NS       1       4.7       4.8       5.0       4.0
CAL1     1     46.17    143.5
VEL1     1     0    0    0    0    0    0    0    0    0    0    0    0
VEL1     1     0    0    0    0    0    0    0    0    0    0    0  .66  .69
VEL1     1  1.12 1.64 1.61 1.80 1.97 2.30 1.80 2.46 1.26 2.69 2.67 2.66
VEL1     1  1.94 2.00  .56  .80 1.31 1.41  .62  .03    0    0    0    0
VEL1     1     0    0    0    0
CAL2     1     46.56    335.0
VEL2     1     0    0    0    0    0    0    0    0    0    0    0    0
VEL2     1     0    0    0    0    0    0    0    0    0  .43  .85 1.05
VEL2     1  2.03 2.10 2.10 3.22 3.31 3.77 3.67 3.71 3.07 4.30 3.38 4.10
VEL2     1  2.59 2.81 2.37 1.54 3.22 2.46 1.54  .59  .30    0    0    0
VEL2     1     0    0    0    0
CAL3     1     47.15    767.0
VEL3     1     0    0    0    0 1.61 2.43 1.80 2.13 2.56 2.59 2.49 1.87
VEL3     1  1.84 3.25 2.59 2.43 2.89    0 1.44 1.08 1.02 2.69 2.53 2.10
VEL3     1  3.54 2.85 2.59 4.76 5.09 5.41 5.68 5.89 6.40 6.56 5.58 5.25
VEL3     1  4.86 5.09 4.92 3.66 5.09 4.27 4.04  .89  .76 1.74  .07    0
VEL3     1     0    0    0    0
XSEC     2       93.0       43.81
         2   0.50.57   3.50.33   6.50.05   9.50.02  12.49.81  15.49.73
         2  18.49.31  21.48.91  24.48.47  27.48.39  30.48.37  33.48.35
         2  36.48.51  39.47.64  42.47.66  45.47.62  48.47.47  51.47.86
         2  54.47.17  57.47.54  60.47.62  63.47.16  66.47.02  69.46.83
         2  72.46.46  75.47.55  78.45.63  81.45.84  84.44.95  87.44.66
         2  90.44.43  93.43.75  96.43.81  99.44.88 102.43.84 105.44.19
         2 108.43.62 111.43.67 114.43.77 117.44.80 120.44.10 123.44.31
         2 126.44.95 129.45.44 132.46.75 135.48.25 138.50.95 140.52.63
NS       2       5.0       5.0       5.6       5.4       5.3       4.9
NS       2       5.2       5.3       3.2       5.1       4.6       5.0
NS       2       5.4       6.1       4.7       5.4       5.7       6.5
NS       2       5.8       6.3       6.2       5.5       5.9       5.5
NS       2       6.2       6.0       6.2       6.4       5.6       5.6
NS       2       6.4       6.1       5.6       5.7       5.5       6.6
NS       2       6.1       6.0       5.8       5.4       6.1       5.7
NS       2       4.8       4.7       6.0       5.4       6.2       4.9
CAL1     2     46.45    143.5
VEL1     2     0    0    0    0    0    0    0    0    0    0    0    0
VEL1     2     0    0    0    0    0    0    0    0    0    0    0    0
VEL1     2     0    0 1.05    0  .69 1.30 1.21 1.42 1.05  .79 1.48 1.87
VEL1     2  1.10 2.92 2.59  .26 1.57 1.05  .49  .39    0    0    0    0
CAL2     2     47.01    335.0
```

Appendix Table A7. (continued).

```
VEL2    2    0    0    0    0    0    0    0    0    0    0    0    0
VEL2    2    0    0    0    0    0    0    0    0    0    0    0  .33
VEL2    2  .36    0 1.69  .30 1.38 2.13 1.41 2.15 2.66 2.52 3.44 4.07
VEL2    2 2.29 3.67 3.74 1.14 2.29 1.84 1.05  .56  .26    0    0    0
CAL3    2      47.89    767.0
VEL3    2    0    0    0    0    0    0    0    0    0    0    0    0
VEL3    2    0  .33  .69 1.28 1.94    0 1.84 1.51 1.44 1.25  .29 1.51
VEL3    2 3.41 3.90 3.31 1.51 3.05 4.76 3.87 4.27 5.41 5.41 5.68 5.84
VEL3    2 5.58 5.91 5.58 4.53 3.25 2.40 2.17  .72  .20    0    0    0
XSEC    3      126.1   .7  43.81
        3   0.51.29    3.50.52    6.50.51    9.50.55   12.50.24   15.49.93
        3  18.49.66   21.49.31   24.49.35   27.48.74   30.48.38   33.48.24
        3  36.48.20   39.47.92   42.47.68   45.47.70   48.46.60   51.46.63
        3  54.45.18   57.45.05   60.44.75   63.44.30   66.44.30   69.43.76
        3  72.43.58   75.43.62   78.43.77   81.43.99   84.43.92   87.44.38
        3  90.44.14   93.47.39   96.45.47   99.46.85  102.47.64  105.49.33
        3 108.50.86  111.53.33  113.54.88
NS      3       3.9        5.0        4.9        5.0        5.2        5.2
NS      3       5.5        6.0        5.8        5.5        5.4        6.0
NS      3       5.5        5.7        5.4        4.8        5.6        5.9
NS      3       5.9        5.6        5.4        5.4        5.3        5.2
NS      3       6.2        5.6        5.6        5.6        5.5        6.1
NS      3       6.3        7.0        6.1        6.7        5.6        5.7
NS      3       5.5        5.0        4.6
CAL1    3     46.60    143.5
VEL1    3    0    0    0    0    0    0    0    0    0    0    0    0
VEL1    3    0    0    0    0  .10    0  .20  .66 1.15 1.80 1.44 1.44
VEL1    3 1.41 1.94 2.43 2.36 1.61 1.18 1.02    0  .10    0    0    0
VEL1    3    0    0    0
CAL2    3     47.31    335.0
VEL2    3    0    0    0    0    0    0    0    0    0    0    0    0
VEL2    3    0    0    0    0  .52 1.18  .89 1.87 2.26 2.68 3.35 2.20
VEL2    3 2.76 3.43 3.79 3.61 2.72 2.33 1.74    0  .49  .16    0    0
VEL2    3    0    0    0
CAL3    3     48.21    767.0
VEL3    3    0    0    0    0    0    0    0    0    0    0    0    0
VEL3    3  .10    0  .46 1.15 1.97 2.46 3.22 4.10 4.59 4.76 5.41 4.76
VEL3    3 5.55 5.76 5.55 5.58 4.87 4.04 3.22 2.56 1.08  .92  .46    0
VEL3    3    0    0    0
XSEC    4     244.8      49.09
        4   0.54.07    3.53.45    6.53.65    9.53.64   12.53.54   15.53.65
        4  18.53.47   21.53.52   24.53.82   27.53.45   30.52.85   33.52.72
        4  36.52.39   39.51.97   42.51.97   45.52.01   48.52.04   51.51.93
        4  54.51.92   57.51.25   60.50.94   63.50.77   66.50.36   69.50.36
        4  72.50.00   75.50.03   78.49.43   81.49.33   84.49.56   87.49.12
        4  90.49.35   93.49.11   96.49.42   99.49.28  102.49.64  105.49.38
        4 108.49.33  111.49.09  114.49.28  117.49.14  120.49.52  123.49.43
        4 126.49.90  129.50.17  132.50.11  135.50.41  138.49.87  141.50.01
        4 144.49.93  147.49.53  150.49.42  153.49.63  156.50.36  159.50.55
        4 162.52.67  165.50.65  168.51.23  171.51.92  174.52.46  177.52.52
        4 179.52.83
NS      4       5.7        4.9        5.3        5.4        5.5        5.0
NS      4       5.6        5.7        5.7        5.7        5.6        5.6
NS      4       5.6        5.6        5.4        5.0        5.6        5.6
NS      4       5.4        5.6        5.7        5.7        5.7        5.8
NS      4       5.9        5.9        5.8        6.6        6.4        6.1
NS      4       6.3        5.8        6.4        6.6        6.4        6.2
NS      4       5.8        5.9        6.1        5.9        6.1        6.2
NS      4       6.3        6.3        6.2        6.0        6.0        5.8
NS      4       6.0        6.3        6.1        5.9        5.7        5.0
NS      4       6.2        6.0        6.2        5.1        4.0        4.0
NS      4       4.0
CAL1    4     50.40    143.5
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Appendix Table A7. (continued).

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VEL1    4    0    0    0    0    0    0    0    0    0    0    0    0
VEL1    4    0    0    0    0    0    0    0    0    0    0  .41  .83
VEL1    4 1.25 1.25 3.28 2.43 2.94 3.22 2.14 2.30 2.69 2.43  .66 3.94
VEL1    4 3.54 3.48 1.97 1.97 1.85 1.95  .82  .89  .69  .33  .43  .52
VEL1    4  .13  .26  .20    0    0    0    0    0    0    0    0    0
VEL1    4    0
CAL2    4     50.95   335.0
VEL2    4    0    0    0    0    0    0    0    0    0    0    0    0
VEL2    4    0    0    0    0    0    0    0    0    0    0 1.61 2.05
VEL2    4 3.51 2.59 4.08 2.40 3.38 4.07 3.97 2.43 4.33 2.92 4.30 4.34
VEL2    4 4.02 3.87 3.28 2.69 2.85 2.95 1.21 1.23 1.35 1.31 1.54  .82
VEL2    4  .82  .59  .33  .36  .43    0    0    0    0    0    0    0
VEL2    4    0
CAL3    4     51.71   767.0
VEL3    4    0    0    0    0    0    0    0    0    0    0    0    0
VEL3    4    0    0    0    0    0    0    0  .72 1.44 1.84 3.35 4.40
VEL3    4 4.89 5.09 4.75 3.62 4.86 4.92 4.92 5.25 5.41 4.59 4.44 5.09
VEL3    4 4.92 5.09 5.25 3.67 3.94 3.94 3.61 3.02 3.74 3.41 2.99 2.62
VEL3    4 2.40 2.23  .56 2.13  .39    0    0    0    0    0    0    0
VEL3    4    0
XSEC    5    275.3  .4  50.91
        5   0.57.44   3.54.98   6.54.30   9.54.41  12.53.57  15.53.29
        5  18.52.97  21.52.81  24.52.79  27.52.72  30.52.67  33.52.56
        5  36.52.24  39.52.51  42.52.05  45.51.84  48.51.81  51.51.47
        5  54.51.00  57.51.18  60.51.37  63.51.20  66.51.24  69.51.12
        5  72.51.08  75.50.91  78.51.21  81.51.18  84.51.22  87.51.21
        5  90.51.46  93.51.00  96.51.28  99.51.30 102.51.15 105.51.42
        5 108.51.99 111.51.58 114.52.23 117.53.02 120.53.94 123.55.18
        5 126.55.56 127.55.51
NS      5       3.8       4.6       3.4       5.1       4.6       5.4
NS      5       6.0       5.3       5.3       5.3       5.6       5.7
NS      5       5.7       6.7       6.3       5.7       5.6       5.6
NS      5       5.7       5.6       5.4       5.3       5.8       6.2
NS      5       6.7       6.7       6.6       6.2       5.8       5.9
NS      5       5.9       5.8       5.4       5.8       5.8       5.9
NS      5       5.9       5.8       5.4       5.0       5.2       5.0
NS      5       5.2       5.2
CAL1    5     52.35   143.5
VEL1    5    0    0    0    0    0    0    0    0    0    0    0    0
VEL1    5  .13    0  .26  .33  .49 1.97 1.27 2.17 2.49 2.36 2.36 2.95
VEL1    5 2.76 2.30 2.95 2.46 2.49 2.30 1.36 1.71 1.53 2.30 2.03 1.87
VEL1    5 1.48 1.90    0    0    0    0    0    0
CAL2    5     52.77   335.0
VEL2    5    0    0    0    0    0    0    0    0    0  .03  .07  .08
VEL2    5  .12 1.06 1.23 1.67 1.25 2.75 1.70 3.46 3.77 3.85 3.75 3.69
VEL2    5 4.09 3.64 4.03 3.84 3.83 3.30 2.39 2.59 3.03 3.41 4.00 3.77
VEL2    5 4.26 3.41 2.62    0    0    0    0    0
CAL3    5     53.36   767.0
VEL3    5    0    0    0    0    0    0  .40  .14  .18  .66 1.12 1.58
VEL3    5 1.34 2.92 3.97 3.87 3.84 4.89 3.13 4.76 5.74 5.22 5.12 5.12
VEL3    5 5.25 5.22 5.38 5.22 5.25 4.82 4.85 3.91 5.66 5.63 5.36 5.22
VEL3    5 4.15 4.76 3.58 1.58    0    0    0    0
ENDJOB
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APPENDIX B

Appendix Table B1. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at South Fork Station 1.

Discharge	Chum WUA	Pink WUA
20.00	990.27	593.39
25.00	1042.38	653.01
30.00	1076.70	678.38
35.00	1135.22	715.72
40.00	1214.64	741.94
45.00	1292.28	763.45
50.00	1345.92	779.86
55.00	1392.32	778.12
60.00	1430.78	769.69
65.00	1461.68	772.53
70.00	1480.23	767.23
75.00	1477.08	722.01
80.00	1388.75	678.56
85.00	1374.78	668.00
90.00	1362.87	673.45
95.00	1382.80	683.63
100.00	1414.30	690.60
105.00	1417.60	696.39
110.00	1422.72	700.46
115.00	1441.36	707.29
120.00	1466.98	720.71
125.00	1487.81	711.63
130.00	1482.58	697.91
135.00	1476.74	681.52
140.00	1480.28	670.22
145.00	1474.33	678.38
150.00	1470.64	685.96
155.00	1459.33	691.32
160.00	1424.74	694.42
165.00	1390.40	697.45
170.00	1364.00	700.94
175.00	1345.00	704.35
180.00	1318.15	706.90
185.00	1296.51	708.23
190.00	1276.05	710.13
195.00	1261.15	711.71
200.00	1248.53	712.41
205.00	1237.06	712.54
210.00	1226.09	712.38
215.00	1215.12	711.38
220.00	1204.42	708.55
225.00	1186.49	706.15
230.00	1164.87	703.93
235.00	1132.17	701.30
240.00	1087.04	697.06
245.00	1043.36	691.93
250.00	1011.70	686.32

Appendix Table B1. (continued).

Discharge	Chum WUA	Pink WUA
255.00	984.12	680.70
260.00	955.81	675.20
265.00	934.85	670.07
270.00	925.58	666.47
275.00	917.14	659.80
280.00	912.18	648.77
285.00	906.56	637.30
290.00	897.41	623.01
295.00	887.92	608.95
300.00	879.14	595.10
305.00	871.74	581.14
310.00	865.92	567.07
315.00	859.04	550.25
320.00	849.33	529.69
325.00	837.13	513.18
330.00	826.42	497.02
335.00	817.26	480.89
340.00	808.56	462.22
345.00	800.00	438.25
350.00	789.65	415.43
355.00	779.07	396.05
360.00	769.47	377.63
365.00	775.28	369.74
370.00	809.98	378.05
375.00	842.13	391.39
380.00	874.21	405.94
385.00	889.47	421.48
390.00	890.92	437.75
395.00	915.37	466.98
400.00	947.63	499.66
405.00	987.04	525.70
410.00	1031.89	547.23
415.00	1071.92	569.16
420.00	1091.90	589.99
425.00	1111.20	611.65
430.00	1129.50	633.68
435.00	1147.59	656.32
440.00	1178.06	686.19
445.00	1228.72	716.21
450.00	1282.33	746.55
455.00	1339.75	777.62
460.00	1400.90	809.58
465.00	1456.67	843.23

Appendix Table B2. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at South Fork Station 2.

Discharge	Chum WUA	Pink WUA
20.00	4951.77	2897.98
25.00	7040.98	4456.69
30.00	8031.37	5641.22
35.00	8416.02	6594.19
40.00	8560.53	7455.75
45.00	8354.57	8098.29
50.00	8089.98	8280.34
55.00	7786.47	8428.12
60.00	7283.82	8308.65
65.00	6998.26	8330.98
70.00	6651.56	8332.62
75.00	6266.22	8109.96
80.00	5901.24	7606.05
85.00	5584.55	7274.04
90.00	5260.66	7010.46
95.00	4886.47	6648.42
100.00	4549.00	6389.89
105.00	4166.63	6076.89
110.00	3871.92	5755.82
115.00	3652.03	5505.69
120.00	3424.10	5303.07
125.00	3183.43	4978.22
130.00	2938.57	4671.09
135.00	2701.90	4456.35
140.00	2505.56	4272.91
145.00	2314.24	4018.87
150.00	2165.89	3771.77
155.00	2193.14	3641.89
160.00	2226.75	3574.21
165.00	2166.66	3507.98
170.00	2082.75	3452.04
175.00	2020.97	3376.29
180.00	1988.91	3238.53
185.00	1964.41	3103.89
190.00	1941.79	2976.37
195.00	1918.66	2867.19
200.00	1887.47	2759.86
205.00	1831.27	2665.43
210.00	1779.96	2582.40
215.00	1720.73	2505.19
220.00	1651.07	2435.12
225.00	1576.11	2369.24
230.00	1515.07	2299.33
235.00	1459.57	2231.44
240.00	1413.53	2168.88
245.00	1382.71	2106.06
250.00	1356.00	2046.79

Appendix Table B2. (continued).

Discharge	Chum WUA	Pink WUA
255.00	1333.75	1991.47
260.00	1316.49	1948.94
265.00	1301.19	1913.69
270.00	1286.77	1880.39
275.00	1274.19	1834.34
280.00	1264.85	1780.08
285.00	1255.70	1731.01
290.00	1246.43	1686.34
295.00	1236.47	1644.73
300.00	1226.86	1605.50
305.00	1217.60	1568.78
310.00	1208.28	1539.50
315.00	1199.23	1511.30
320.00	1190.50	1487.61
325.00	1180.30	1464.85
330.00	1171.39	1444.15
335.00	1161.41	1422.48
340.00	1151.89	1401.65
345.00	1146.19	1383.02
350.00	1146.61	1365.37
355.00	1147.25	1348.88
360.00	1148.23	1334.93
365.00	1151.56	1328.73
370.00	1155.96	1323.69
375.00	1161.81	1319.42
380.00	1166.93	1316.06
385.00	1167.46	1313.80
390.00	1167.84	1313.10
395.00	1167.70	1315.02
400.00	1167.54	1306.71
405.00	1167.46	1276.37
410.00	1171.14	1247.21
415.00	1175.99	1218.73
420.00	1181.88	1190.90
425.00	1189.49	1163.92
430.00	1201.99	1137.31
435.00	1215.33	1111.07
440.00	1229.09	1087.75
445.00	1236.48	1087.81
450.00	1244.75	1088.07
455.00	1253.55	1088.53
460.00	1262.69	1089.18
465.00	1266.67	1090.24

Appendix Table B3. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at South Fork Station 3.

Discharge	Chum WUA	Pink WUA
255.00	1680.28	1225.76
260.00	1686.89	1226.60
265.00	1688.50	1236.37
270.00	1693.76	1244.14
275.00	1701.54	1252.14
280.00	1712.70	1260.45
285.00	1726.26	1268.53
290.00	1746.07	1274.45
295.00	1761.07	1281.11
300.00	1757.08	1289.28
305.00	1754.52	1298.09
310.00	1749.76	1307.30
315.00	1746.33	1318.09
320.00	1741.13	1331.47
325.00	1736.36	1319.79
330.00	1712.17	1299.21
335.00	1689.67	1270.00
340.00	1668.35	1239.23
345.00	1648.28	1204.84
350.00	1635.69	1169.54
355.00	1624.88	1129.67
360.00	1613.41	1089.57
365.00	1599.63	1064.73
370.00	1582.58	1058.85
375.00	1561.65	1051.80
380.00	1538.92	1044.43
385.00	1514.27	1037.35
390.00	1492.63	1033.69
395.00	1459.64	1030.20
400.00	1429.37	1026.79
405.00	1399.92	1023.52
410.00	1372.92	1020.39
415.00	1347.41	1013.36
420.00	1325.04	1005.78
425.00	1303.37	998.20
430.00	1282.52	990.62
435.00	1262.61	983.05
440.00	1243.51	975.69
445.00	1225.08	969.20
450.00	1207.81	962.73
455.00	1190.96	951.37
460.00	1174.56	931.60
465.00	1158.66	

Appendix Table B3. (continued).

Discharge	Chum WUA	Pink WUA
20.00	173.74	167.60
25.00	198.15	211.74
30.00	230.14	254.33
35.00	262.27	277.34
40.00	287.41	306.90
45.00	305.48	343.67
50.00	369.47	416.36
55.00	421.27	500.13
60.00	475.39	547.63
65.00	571.27	552.81
70.00	685.17	576.50
75.00	760.34	642.74
80.00	837.95	706.24
85.00	929.40	761.43
90.00	1035.25	816.49
95.00	1138.69	875.54
100.00	1242.50	933.15
105.00	1348.68	989.20
110.00	1484.04	1070.73
115.00	1579.41	1157.59
120.00	1617.82	1241.36
125.00	1604.10	1265.92
130.00	1606.96	1275.28
135.00	1624.72	1280.44
140.00	1785.99	1375.28
145.00	1791.87	1417.14
150.00	1809.56	1450.53
155.00	1802.62	1478.54
160.00	1766.53	1507.51
165.00	1735.27	1530.74
170.00	1712.66	1452.76
175.00	1693.11	1366.34
180.00	1683.47	1321.14
185.00	1674.65	1298.18
190.00	1664.61	1285.82
195.00	1656.66	1281.46
200.00	1647.51	1284.91
205.00	1631.90	1282.60
210.00	1620.31	1280.87
215.00	1621.10	1279.63
220.00	1623.54	1278.95
225.00	1629.86	1276.96
230.00	1636.42	1273.18
235.00	1633.67	1273.01
240.00	1642.12	1258.17
245.00	1655.03	1244.63
250.00	1670.99	1234.43

Appendix Table B4. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at North Fork Station 4.

Discharge	Chum WUA	Pink WUA
20.00	1128.77	1138.69
25.00	1103.92	1200.01
30.00	1141.61	1250.16
35.00	1201.68	1313.67
40.00	1327.03	1372.23
45.00	1463.67	1366.12
50.00	1674.24	1465.99
55.00	1858.85	1579.65
60.00	2000.80	1684.58
65.00	2143.22	1783.27
70.00	2262.55	1883.35
75.00	2350.44	1980.98
80.00	2439.51	2055.99
85.00	2524.31	2115.58
90.00	2576.13	2114.94
95.00	2601.73	2084.11
100.00	2552.25	2044.83
105.00	2534.06	2054.28
110.00	2540.36	2060.34
115.00	2575.15	2073.09
120.00	2616.76	2085.54
125.00	2664.17	2101.25
130.00	2683.53	2070.41
135.00	2671.44	2016.94
140.00	2625.19	1966.12
145.00	2575.33	1916.39
150.00	2520.33	1889.40
155.00	2474.09	1824.71
160.00	2429.39	1760.84
165.00	2391.55	1697.47
170.00	2357.29	1657.10
175.00	2265.85	1642.74
180.00	2179.05	1629.89
185.00	2130.39	1618.55
190.00	2092.26	1613.12
195.00	2071.84	1610.03
200.00	2060.91	1606.80
205.00	2054.75	1603.24
210.00	2066.80	1600.98
215.00	2110.47	1627.78
220.00	2065.02	1650.42
225.00	2051.61	1689.45
230.00	2059.01	1733.51
235.00	2073.44	1778.44
240.00	2026.77	1825.94
245.00	1976.40	1874.96
250.00	1935.03	1919.19

Appendix Table B4. (continued).

Discharge	Chum WUA	Pink WUA
255.00	1928.88	1951.47
260.00	1927.66	1983.49
265.00	1932.40	2012.76
270.00	1916.79	2026.73
275.00	1869.69	2044.55
280.00	1830.93	2058.71
285.00	1805.88	2077.88
290.00	1800.15	2094.24
295.00	1784.24	2110.19
300.00	1760.17	2119.33
305.00	1759.42	2129.52
310.00	1750.70	2138.82
315.00	1733.51	2144.93
320.00	1725.96	2153.62
325.00	1726.59	2163.08
330.00	1730.20	2173.40
335.00	1729.17	2183.56
340.00	1722.61	2193.18
345.00	1715.71	2203.02
350.00	1708.27	2210.96
355.00	1701.51	2216.85
360.00	1694.04	2223.02
365.00	1685.66	2220.02
370.00	1675.99	2216.03
375.00	1666.18	2212.44
380.00	1656.74	2209.45
385.00	1647.16	2177.45
390.00	1635.19	2129.75
395.00	1619.91	2079.74
400.00	1604.80	2026.71
405.00	1589.78	1971.63
410.00	1571.90	1918.33
415.00	1552.05	1867.49
420.00	1523.87	1817.32
425.00	1491.10	1789.25
430.00	1460.41	1774.85
435.00	1433.56	1760.38
440.00	1411.99	1745.71
445.00	1393.19	1734.02
450.00	1373.68	1721.22
455.00	1354.35	1707.12
460.00	1341.69	1695.34
465.00	1337.23	1679.02

Appendix Table B5. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at Mainstem Station 5.

Discharge	Chum WUA	Pink WUA
50.00	1910.33	1270.26
60.00	2464.79	1368.88
70.00	2908.50	1446.42
80.00	3180.11	1470.31
90.00	3312.56	1552.05
100.00	3394.68	1627.35
110.00	3486.64	1705.18
120.00	3576.96	1774.18
130.00	3569.38	1821.28
140.00	3477.74	1839.43
150.00	3270.58	1804.75
160.00	3102.63	1763.93
170.00	2956.72	1729.41
180.00	2822.06	1739.17
190.00	2633.17	1745.57
200.00	2442.11	1745.40
210.00	2300.70	1735.20
220.00	2180.17	1715.73
230.00	2063.08	1692.31
240.00	1945.39	1665.35
250.00	1840.33	1629.52
260.00	1767.84	1562.70
270.00	1689.22	1494.91
280.00	1621.94	1442.22
290.00	1560.26	1396.94
300.00	1526.60	1331.72
310.00	1506.04	1293.25
320.00	1491.95	1275.49
330.00	1482.75	1268.39
340.00	1480.28	1242.72
350.00	1481.07	1204.06
360.00	1512.13	1168.03
370.00	1553.74	1138.34
380.00	1614.00	1126.80
390.00	1689.70	1111.51
400.00	1771.71	1097.17
410.00	1835.98	1082.87
420.00	1872.80	1069.23
430.00	1921.04	1056.66
440.00	1972.30	1046.82
450.00	2021.68	1042.03
460.00	2063.86	1042.56
470.00	2107.28	1044.22
480.00	2147.35	1048.45
490.00	2158.55	1056.29
500.00	2173.31	1068.02
510.00	2185.61	1076.17
520.00	2187.92	1081.13

Appendix Table B5. (continued).

Discharge	Chum WUA	Pink WUA
530.00	2172.12	1086.27
540.00	2154.67	1098.73
550.00	2133.87	1112.02
560.00	2093.11	1126.12
570.00	2051.18	1140.71
580.00	2011.92	1150.61
590.00	1970.97	1155.88
600.00	1926.39	1134.38
610.00	1881.65	1113.25
620.00	1831.36	1112.56
630.00	1782.26	1113.28
640.00	1733.52	1114.44
650.00	1701.36	1115.81
660.00	1671.41	1117.58
670.00	1650.26	1121.90
680.00	1633.10	1131.05
690.00	1617.49	1140.03
700.00	1605.07	1132.50
710.00	1598.57	1122.58
720.00	1577.92	1116.97
730.00	1544.83	1120.04
740.00	1510.09	1122.96
750.00	1474.49	1126.07
760.00	1452.30	1129.30
770.00	1434.60	1132.25
780.00	1418.51	1133.60
790.00	1402.53	1135.92
800.00	1386.16	1139.01
810.00	1360.70	1139.80
820.00	1336.77	1137.15
830.00	1310.92	1126.17
840.00	1286.50	1109.14
850.00	1265.42	1095.20
860.00	1246.71	1082.54
870.00	1230.29	1080.20
880.00	1213.56	1078.00
890.00	1201.06	1075.32
900.00	1189.65	1072.80
910.00	1181.32	1070.78
920.00	1174.91	1068.89
930.00	1169.61	1067.66
940.00	1164.78	1066.60
950.00	1159.46	1066.08
960.00	1153.38	1066.40
970.00	1147.23	1063.95
980.00	1143.03	1061.75
990.00	1138.85	1061.23
1000.00	1135.51	1061.11

Appendix Table B6. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at Mainstem Station 6.

Discharge	Chum WUA	Pink WUA
50.00	2536.64	1524.38
60.00	3086.99	1786.57
70.00	3644.44	1937.12
80.00	3973.27	2195.58
90.00	4208.45	2453.82
100.00	4424.28	2739.90
110.00	4589.39	2973.11
120.00	4743.49	3070.63
130.00	4738.12	3132.06
140.00	4746.08	3280.94
150.00	4685.45	3398.39
160.00	4653.73	3505.30
170.00	4693.73	3589.45
180.00	4684.85	3505.99
190.00	4662.38	3403.44
200.00	4697.81	3514.74
210.00	4678.58	3620.18
220.00	4676.74	3740.18
230.00	4899.93	3914.90
240.00	5221.84	4038.30
250.00	5400.53	4175.12
260.00	5541.60	4368.48
270.00	5755.76	4595.69
280.00	5971.06	4785.66
290.00	6119.48	4982.86
300.00	6306.16	5170.68
310.00	6634.62	5296.63
320.00	6957.85	5438.33
330.00	7178.06	5714.84
340.00	7365.02	5997.79
350.00	7516.65	6205.23
360.00	7738.52	6390.26
370.00	7956.58	6599.12
380.00	8098.34	6800.93
390.00	8210.22	6956.26
400.00	8287.06	7110.16
410.00	8346.81	7280.00
420.00	8426.27	7438.05
430.00	8487.18	7556.47
440.00	8509.82	7670.36
450.00	8531.19	7753.45
460.00	8522.48	7859.53
470.00	8493.78	7933.28
480.00	8527.00	8035.16
490.00	8595.21	8159.73
500.00	8636.31	8254.83
510.00	8650.22	8336.51
520.00	8650.12	8402.28

Appendix Table B6. (continued).

Discharge	Chum WUA	Pink WUA
530.00	8627.97	8463.56
540.00	8615.62	8534.51
550.00	8665.44	8591.89
560.00	8732.16	8583.30
570.00	8813.00	8559.80
580.00	8896.42	8545.14
590.00	9027.31	8507.76
600.00	9129.14	8508.64
610.00	9190.39	8537.93
620.00	9222.20	8575.31
630.00	9230.46	8632.33
640.00	9225.67	8617.54
650.00	9198.71	8555.00
660.00	9179.17	8492.28
670.00	9146.20	8428.13
680.00	9083.80	8393.27
690.00	9016.41	8356.29
700.00	8939.09	8307.33
710.00	8875.43	8186.19
720.00	8827.55	8074.53
730.00	8755.27	7967.43
740.00	8686.98	7877.54
750.00	8605.75	7783.97
760.00	8490.15	7713.67
770.00	8351.59	7654.65
780.00	8204.26	7622.93
790.00	8079.22	7589.67
800.00	7934.41	7469.47
810.00	7788.64	7334.21
820.00	7616.27	7225.45
830.00	7426.90	7061.78
840.00	7237.91	6868.69
850.00	7063.30	6707.97
860.00	6894.46	6615.89
870.00	6718.04	6532.99
880.00	6556.42	6458.53
890.00	6428.33	6378.76
900.00	6303.73	6268.96
910.00	6184.72	6115.99
920.00	6096.91	5980.90
930.00	6052.23	5909.02
940.00	6011.01	5867.22
950.00	5971.26	5805.53
960.00	5944.49	5731.16
970.00	5908.65	5657.37
980.00	5865.89	5579.41
990.00	5835.09	5505.82
1000.00	5812.57	5452.48

Appendix Table B7. WUA (ft^2/1000 ft) as a function of discharge (cfs) for chum and pink spawning at Mainstem Station 7.

Discharge	Chum WUA	Pink WUA
50.00	1306.35	506.06
60.00	1378.51	550.10
70.00	1482.10	584.48
80.00	1527.53	599.89
90.00	1524.84	604.22
100.00	1457.46	607.48
110.00	1378.19	610.68
120.00	1368.57	616.41
130.00	1299.40	572.21
140.00	1230.48	502.18
150.00	1149.56	471.18
160.00	1066.73	443.35
170.00	1003.90	408.18
180.00	946.98	376.95
190.00	887.29	347.69
200.00	824.63	327.79
210.00	772.04	306.83
220.00	731.26	291.19
230.00	699.78	277.94
240.00	677.85	267.76
250.00	651.88	253.80
260.00	631.41	247.58
270.00	621.85	259.09
280.00	620.82	272.74
290.00	617.78	288.02
300.00	622.38	298.97
310.00	639.18	305.50
320.00	651.41	312.42
330.00	660.10	321.70
340.00	669.00	332.43
350.00	677.18	343.23
360.00	686.53	353.05
370.00	717.49	374.04
380.00	750.98	396.21
390.00	780.57	417.36
400.00	811.19	439.12
410.00	840.95	461.56
420.00	864.24	484.53
430.00	870.75	507.88
440.00	875.14	532.53
450.00	882.09	558.04
460.00	889.05	581.96
470.00	893.71	600.93
480.00	904.87	619.90
490.00	920.92	650.08
500.00	951.13	676.13
510.00	981.62	698.71
520.00	1011.80	717.07

Appendix Table B7. (continued).

Discharge	Chum WUA	Pink WUA
530.00	1033.51	734.28
540.00	1054.68	752.61
550.00	1082.45	774.95
560.00	1123.73	802.17
570.00	1162.60	829.96
580.00	1224.35	872.44
590.00	1284.94	916.81
600.00	1330.71	960.38
610.00	1364.68	1003.96
620.00	1378.77	1047.19
630.00	1382.48	1090.17
640.00	1389.92	1134.65
650.00	1407.65	1185.43
660.00	1429.19	1206.69
670.00	1450.95	1205.53
680.00	1471.93	1197.15
690.00	1492.19	1189.10
700.00	1509.13	1176.71
710.00	1529.22	1172.69
720.00	1557.40	1174.53
730.00	1590.80	1178.71
740.00	1623.95	1200.02
750.00	1656.12	1222.42
760.00	1686.78	1248.94
770.00	1728.46	1277.35
780.00	1773.92	1303.52
790.00	1818.55	1328.96
800.00	1852.50	1350.91
810.00	1883.03	1371.06
820.00	1915.23	1391.34
830.00	1940.31	1408.25
840.00	1959.48	1427.76
850.00	1981.06	1454.37
860.00	2003.62	1482.33
870.00	2023.80	1508.63
880.00	2031.73	1533.53
890.00	2035.73	1555.65
900.00	2041.23	1578.28
910.00	2054.19	1606.56
920.00	2067.07	1635.39
930.00	2087.39	1667.20
940.00	2106.35	1692.24
950.00	2124.70	1717.08
960.00	2146.12	1741.29
970.00	2170.83	1764.96
980.00	2197.84	1784.64
990.00	2225.25	1804.24
1000.00	2270.34	1824.60