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Susitna File # 4.3.1.3

E. WOODY TRIHEY & ASSOCIATES

INSTREAM FLOW AND RIVERINE HABITAT ASSESSMENTS

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June 29, 1985

HARZA-EBASCO SUSITNA HYDROELECTRIC PROJECT DOCUMENT ROUTING		
	LARSON	X GILBERTSON
	CASEY	
X	THRALL	
	CHADDOCK	
	VOLLAND	
	PETTIGREW	
	LAMBERT	
	ROBINSON	
	DYOK	

Larry Gilbertson
Aquatic Studies Leader
Harza-Ebasco Susitna Joint Venture
711 "H" Street
Anchorage, Alaska 99511

Dear Dr. Gilbertson:

Enclosed, for study team review, is Section IV of the draft Middle River modeling report which summarizes the 1984 field work and modeling studies of chum salmon spawning. I would appreciate receiving review comments by July 22.

Sincerely,

E. Woody Trihey

E. Woody Trihey

Rec'd 3:40 p.m. July 3, 1985

SUMMARY OF HYDRAULIC CONDITIONS AND HABITAT FORECASTS AT 1984 MIDDLE RIVER STUDY SITES

Part IV and Appendix C

DRAFT REPORT

Prepared for:

ALASKA POWER AUTHORITY

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Cleveland R. Steward, III

May 1985

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PART IV

CALIBRATION AND APPLICATION OF DIHAB MODELS

Introduction

The habitat requirements of spawning chum salmon differ considerably from those of juvenile chinook. Most notable is their dependence on upwelling water and suitable spawning gravels which limit the availability of potential spawning habitats and fix their locations to specific areas. Side channel and mainstem locations which possess these two requisite characteristics appear to be few in number (Barrett et al. 1984) and represent a very small percentage of the total surface area of the middle Susitna River (Klinger and Kingsley 1985).

The chum spawning which occurs in mainstem and side channel habitats is generally associated with backwater or low velocity areas along shoreline margins. A very limited amount of mid-channel chum salmon spawning has been reported. In part this may be attributable to extremely poor sampling conditions, but high velocities and unsuitable substrate conditions are the more likely reason.

Because of the strong tendency for chum spawning to occur in backwater and shoreline margins, traditional approaches for modeling the response of spawning habitat to incremental changes in streamflow are not the most cost effective to apply. Hydraulic simulation models can be replaced with stage discharge relationships and direct measurement of depth and velocity since depth

is a far more responsive microhabitat variable than velocity in typical chum spawning habitats.

To facilitate the cost-effective analysis of mainstem and side channel chum spawning in the Middle River a simplified version of the HABTAT program was developed to allow direct input of measured depths and velocities and replacement of hydraulic simulation modeling with stage discharge relationships and velocity estimates.

The Direct Input Habitat (DIHAB) model performs WUA calculations in a manner identical to the IFG HABTAT program. However the DIHAB model requires far less calibration effort than the more traditional linkage between IFG hydraulic models and HABTAT.

Hydraulic data (depths and velocities) collected at several discharges supplemented by additional data sets derived from off ice calculations were used with upwelling and substrate data to provide chum spawning WUA forecasts at twelve locations for a range of mainstem discharges between 5,000 and 25,000 cfs.

Methods

Study Site Selection: Fifty candidate study sites were selected following a systematic review of aerial photography and relevant project literature (ADF&G 1981, 1983, and Barrett et al. 1984) (Table IV-1). Study areas were selected for two purposes: (1) evaluation of with-project effects on mainstem and side channel areas where chum salmon spawning had been observed, and (2) evaluation

Table IV-1. Fifty candidate areas for side channel and mainstem chum spawning evaluation.

Site[1] River Mile	Spawning Reported	Study Site	Site[1] River Mile	Spawning Reported	Study Site
100.5 R	1981		129.2 R	1981	No open lead
100.9 R			129.8 R	1981, 1982	3 transect spawning
101.2 R		IFG-4 rearing & spawning	130.5 R	1981	
102.0 L		3 transect spawning	131.0 L	1982, 1983	
105.8 L		3 transect spawning	131.1 L	1981, 1982	4 transect spawning
105.2 R			131.3 L[5]	1982, 1983	IFG-4 rearing & spawning
110.1 L			133.7 R		3 transect spawning
110.8 L[3]		Q-site[2]	134.0 L		SC10, IFG-4
112.2 L[3]		IFG-2 rearing & spawning	134.6 R		
112.7 L[3]		IFG-2 rearing & spawning	135.0 R		Lower SC 11, IFG-2
113.5 C		135.4 R			
114.0 C		3 transect spawning	136.1 R	1981, 1982, 1983	Upper SC 11, IFG-4
114.6 R[4]	1982, 1983		136.8 R	1983	
115.1 R[4]	1982, 1983	Q-site	137.4 R	1982	3 transect spawning
115.9 L			138.3 L[4]	1982	
117.9 L			138.7 L[4]	1982	3 transect spawning
118.9 L	1983	3 transect spawning	139.0 L	1982, 1983	4 transect spawning
119.1 L		4 transect spawning	139.4 L		3 transect spawning
119.4 L			139.7 R		
119.7 C			140.5 R		
124.0 L			141.2 R		
124.9 L		Q-site[2]	141.4 R[6]	1981, 1982, 1983	SC 21, IFG-4
125.0 L		Q-site[2]	141.6 R		
125.1 R			148.2 C	1982	No open lead
127.1 L					
128.6 R	1982				

[1] L, R, and C indicates left, right, and central channel locations, respectively, looking upstream.

[2] Emphasis is placed on measuring total side channel flow as a function of mainstem discharge.

[3] Spawning sites 112.2 L and 112.7 L are contained within the IFG-2 rearing site 112.3 L.

[4] Chum salmon were observed spawning at these sites in 1982 by EWT&A personnel but not reported by ADF&G.

[5] Spawning site 131.3 L is contained in IFG-4 rearing site 131.5 L.

[6] Side Channel 21 identified as side slough spawning escapement in ADF&G reports.

of with-project effects on mainstem and side channel areas with apparent upwelling but where spawning chum salmon had not been previously reported.

The location of upwelling in mainstem and side channel portions of the Middle River was identified using aerial photography obtained in March 1983 and a limited number of winter observations recorded during the winters of 1981-85. Information regarding upwelling was compiled on aerial photo mosaics to provide a convenient reference of potential study areas.

Fourteen sites were chosen for detailed study from among the 50 candidate areas to represent three types of habitat: 1) side channel areas influenced by backwater, 2) side channel areas not influenced by backwater, and 3) mainstem margin areas (Table IV-2, Figure III-1). Of these areas, chum salmon spawning has previously been reported at six by ADF&G Su Hydro (ADF&G 1981-83, Barrett et al. 1984) and the other eight sites were suspected of having upwelling but had not been reported prior to 1984 to be used for spawning by chum salmon.

Field Procedures: Field data collected included water depth and velocity measurements, substrate and cover descriptions, upwelling and fish utilization observations, and streambed profile surveys.

Depth and Velocity: Depth and velocity data were collected over a range of mainstem discharge from 4,300 to 31,700 cfs. From one to five data sets were collected at all DIHAB modeling sites with three sets of measurements being typical. Procedures followed were similar to those used while measuring discharges at IFG model site (see Section III). A minimum of 10 cells were

Table IV-2. 1984 middle river spawning study areas.

Site	Reported Spawning	Type of Study Site: Back Water	Mainstem Margin	Side Channel
120.0 L	No	X		
105.8 L	No		X	
114.0 C	No			X
115.1 R	1982, 1983			X
118.9 L	1983		X	
119.1 L	No		X	
125.0 R	No			X
129.8 R	1981, 1982			X
131.1 L	1981, 1982			X
133.7 R	No		X	
137.4 R	1982	X		
138.7 L	No		X	
139.0 L	1982, 1983		X	
139.4 L	No			X

measured for each data set. Field data collected included: horizontal distance from left bank streambed marker, depth of water, mean column velocity (six tenths the depth beneath the water surface), and hose velocity (0.4 ft above the streambed when the depth was greater than 1 ft). Depth and velocity measurements were collected until depths or velocities become unsafe for wading. Estimates were made of how far the habitat was representative beyond the last cell of each cross section, and above and below each cross section of each study site.

Substrate and Cover: Substrate type was visually determined and coded using criteria in Table III-3. Cover type and percent were coded using criteria in Table III-4. Water clarity (turbid or clear) was also noted.

Upwelling and Fish Utilization: Presence of upwelling was determined at the direct input study sites from field observations during the 1984 open water season and during two winter field reconnaissance trips in 1985, as well as from temperature data. The strength of the upwelling was recorded as slight, moderate or strong based on visual observations. Actual rates of upwelling were not recorded. Slight upwelling was coded in areas where upwelling was observed during the open water season but where no open leads were present during the winter season. In areas where less than ten percent of the area was affected by upwelling, a slight value was also assigned. Moderate upwelling was recorded for areas where 20-60 percent of the area was affected. These areas had open leads that were frozen over during parts of the winter season. Strong upwelling occurred where groundwater could be observed insurging from the substrate above and below the water line. Some upwelling areas

were observed to be heavily used by spawning chum salmon. Fish observations were also recorded.

Upwelling areas were sketched on aerial photography and field notes. These areas were referenced to cross section flagging or identifiable land marks. Figure IV-1 shows an example of an upwelling map which summarizes the data collected for a study site.

Streambed Profile Surveys: Streambed profile surveys were completed for six study sites using the procedures described in the ADF&G Procedure manual (1984). This information is presented in Figures C-1.1 through 1.6 and Tables C-1.1 through 1.7.

Input Requirements of DIHAB Model: Input to DIHAB is similar to that for the IFG's HABTAT model with the exception of depth cards which replace the y-coordinates on the COORD cards and WSEL's on the QHEAD cards. Input data required by DIHAB are mainstem discharge, water surface elevations, and water depth, velocity, substrate type, and upwelling information at each x-coordinate. Suitability criteria for spawning chum salmon were also required as input for the DIHAB model.

Mainstem Discharge: Average daily streamflows for the Susitna River were obtained from the USGS Gold Creek gaging station for each date depth and velocity data were collected.

Water Surface Elevation: Water surface elevations for each cross section were determined from stage-discharge curves developed at each study site (see

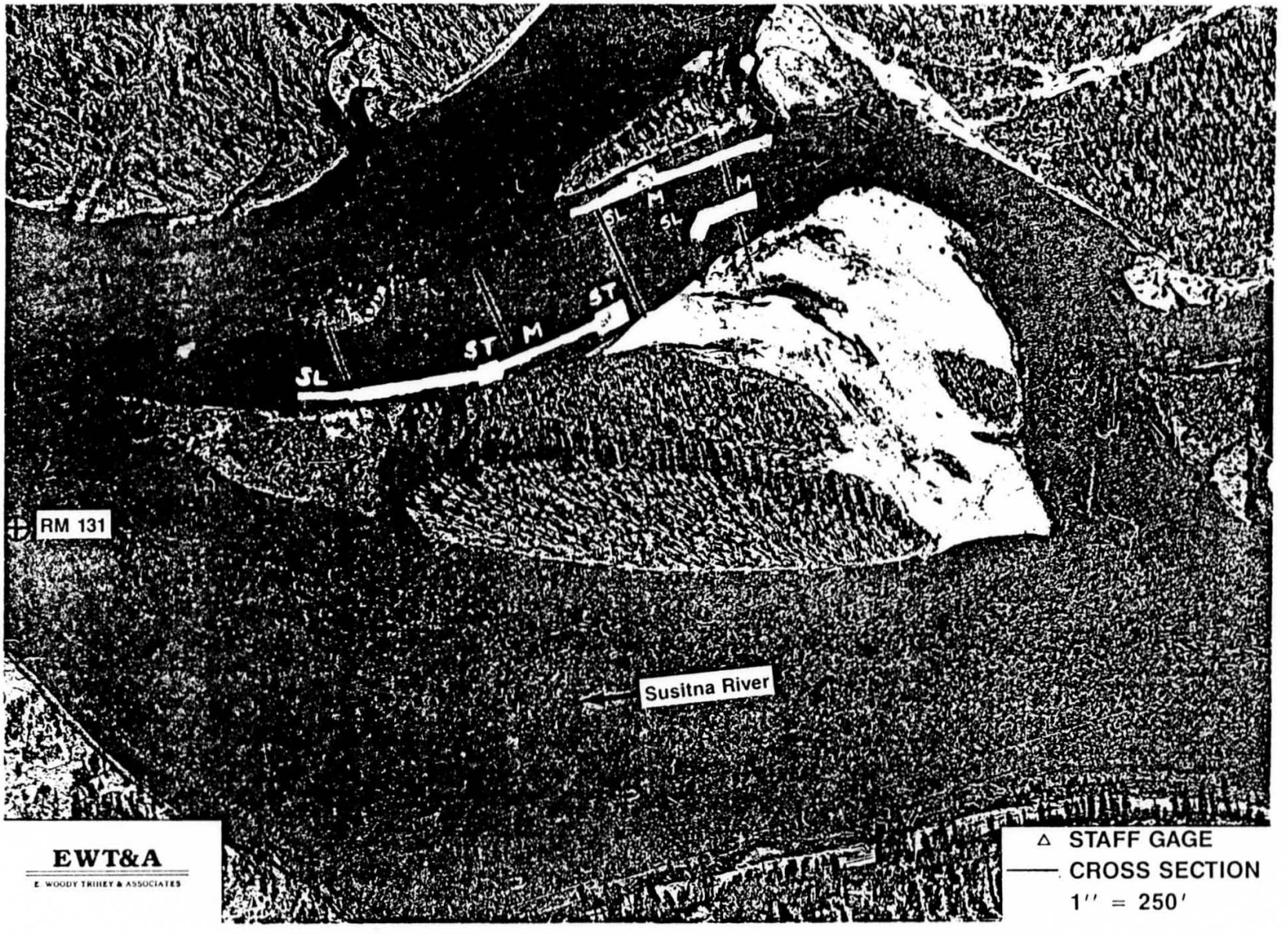


Figure IV-1. Summary locations of upwelling areas at DIHAB modeling site 131.3L.

Section II). Normally only one stage-discharge curve was developed per study area since water surface elevations at cross sections within study areas were approximately the same for any given mainstem discharge (gentle gradient and relatively short reaches between cross sections). At five study areas as many as three stage-discharge curves were developed to account for differences in stage between cross sections.

Depth and Velocity: Average streambed profiles were calculated by subtracting measured depths from water surface elevations at each cross section (Tables C-2.1 through 2.14).

Depth and velocity values are required for each cell of each cross section. It was necessary to interpolate and extrapolate some depth and velocity values in order to complete each data set. Direct field measurements of depth and velocity were not always taken for each cell because of the uniformity of the hydraulics along a cross section. Skipping unnecessary measurements expedited field data collection. In some instances depth and/or velocity prohibited direct field measurements but field notes regarding hydraulic conditions allowed the estimation of additional depth and velocity data. Interpolated and extrapolated values are noted on work sheets which summarize field data for each study area (Tables C-3.1 through 3.14). All interpolations and extrapolations were linear using data from adjacent cells.

Reach lengths associated with the representativeness of the hydraulic conditions at each cross section based on field estimates and aerial photo interpretation were entered into the model.

Substrate Type: Substrate codes were entered for each cell and are presented in Tables C-3.1 through 3.14.

Upwelling Information: Suspected upwelling areas were evaluated by comparing temperature data collected at the study sites during the winter by ADF&G field personnel with temperature data for the mainstem. Upwelling was evidenced by warmer temperatures from inflowing groundwater than were measured in the cooler surface waters of the mainstem. If there was not a significant temperature difference between upwelling areas and the adjacent mainstem it was concluded that upwelling was not present. Several areas suspected of having upwelling were classified as not having upwelling after this analysis with binary criteria used in previous studies (Estes and Vincent-Lang 1984). A suitability index value of 0.0 was entered for cells where upwelling was absent. Slight, moderate and strong upwelling, coded as 1, 2 and 3 respectively, were assigned a suitability index value of 1.0. Why - is slight just as good as strong?

The x-coordinates bounding upwelling areas were estimated by reviewing aerial photography and streambed profiles of cross sections. Lengths of effective areas associated with each cell were estimated from field observations. For example, at cross section 3 slight upwelling was estimated to occur from x-coordinates 48 to 54 ft with an effective length of 20 ft. At the same cross section, moderate upwelling was estimated to occur from x-coordinates 54 to 60 ft with an effective length of 175 ft. Table C-4 summarizes upwelling surface areas and strengths for the DIHAB modeling sites.

Suitability Criteria: Suitability criteria curves for spawning chum salmon have been identified for the Middle River (Estes and Vincent-Lang 1984). They appear as Figures IV-2 through IV-4.

Development of Weighted Usable and Wetted Surface Area Curves

Output of the DIHAB model includes mainstem discharge, total surface area, and weighted usable area values. Summaries of DIHAB output for each study area are presented in Table C-6. Procedures to develop weighted usable and surface area curves are presented below.

Weighted Usable Area Curves: Plots of WUA values versus mainstem discharge were made using DIHAB output for each study area. Curves were developed assuming linearity between plotted values. Weighted usable area values were generally available for mainstem discharges ranging from 7,600 to 18,000 cfs.

Generally, during the chum salmon spawning season (August 12 to September 20) mainstem discharge ranges from 5,000 to 25,000 cfs. To extend the curves to describe this flow range, it was necessary to develop additional WUA values. Additional WUA values were calculated using stage-discharge curves, cross sections and measured velocity data.

Water surface elevations were determined for additional mainstem discharges (Q_A) using the stage-discharge curves developed for each study area (Section II). Water depths corresponding to Q_A were determined by subtracting streambed elevations at each cross section from water surface elevations. In this manner, depths were determined for each cell.

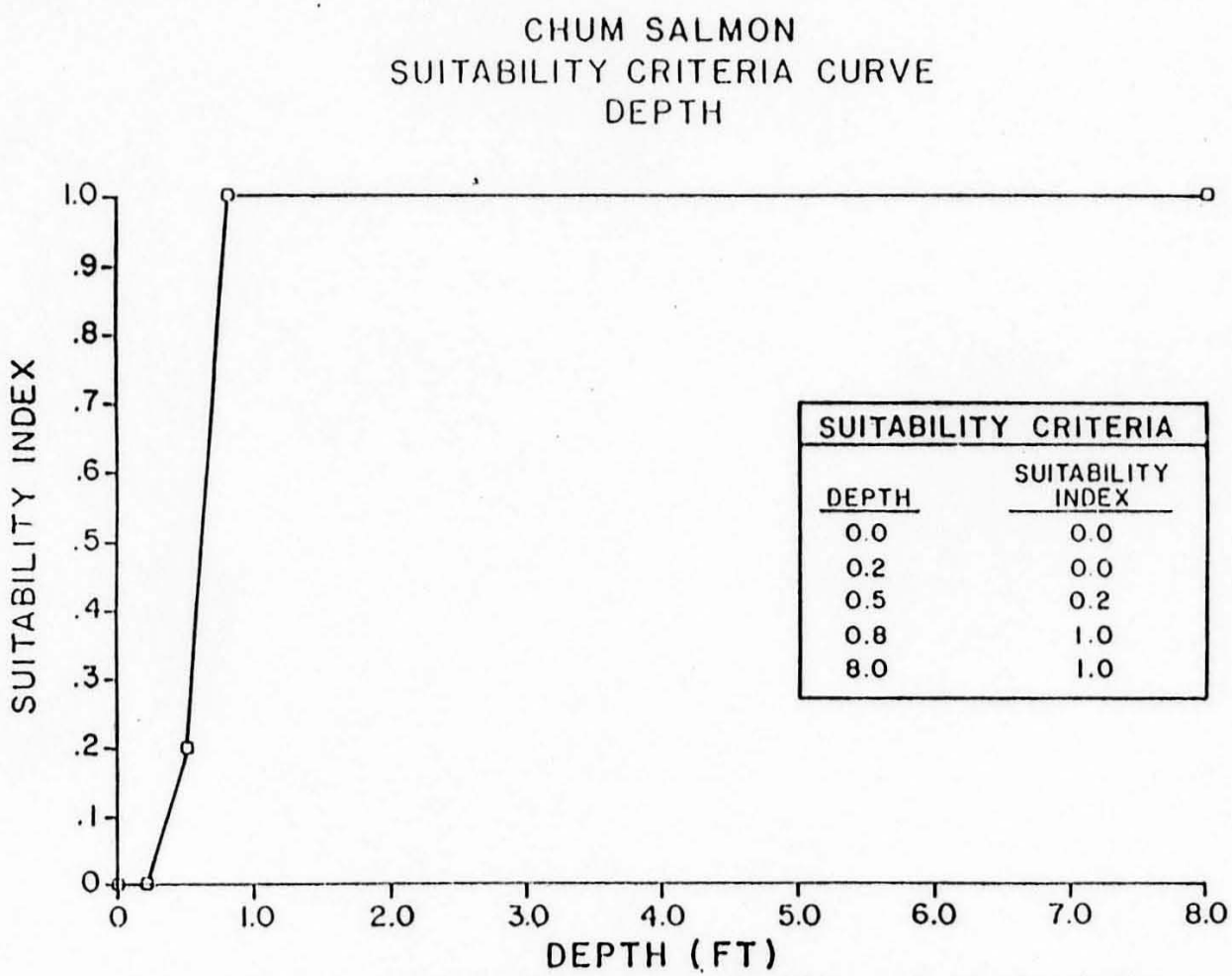


Figure IV-2. Spawning chum salmon suitability criteria for depth.
Source: Estes and Vincent-Lang 1984.

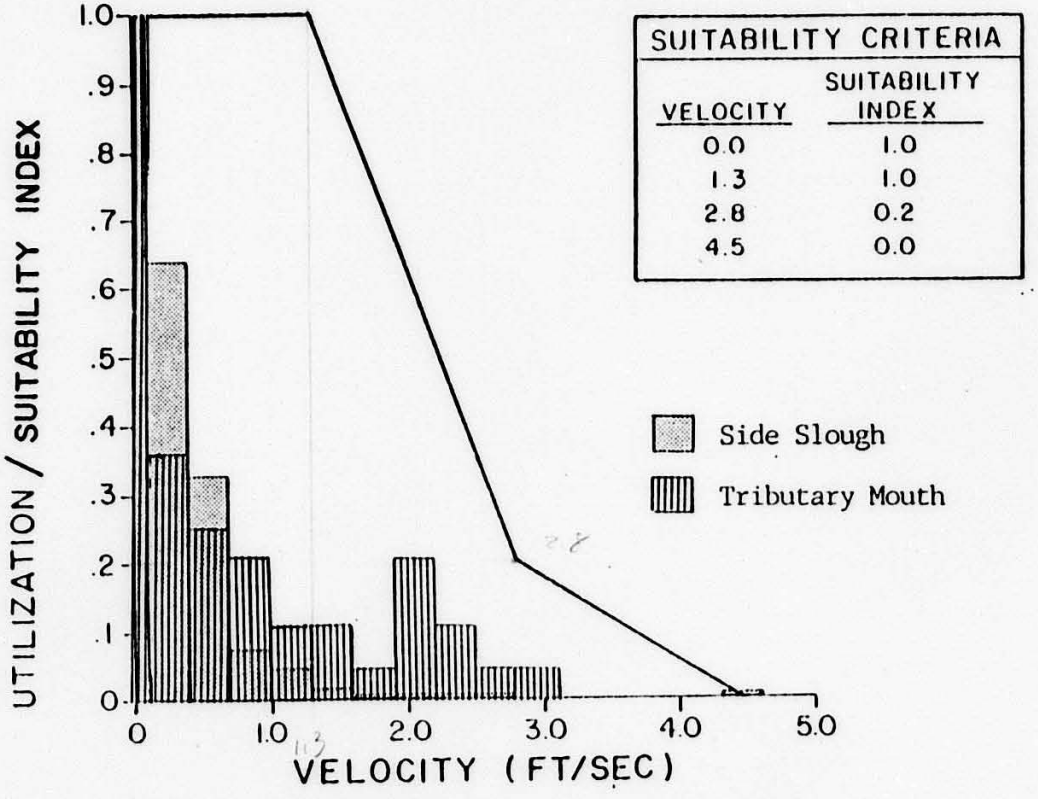
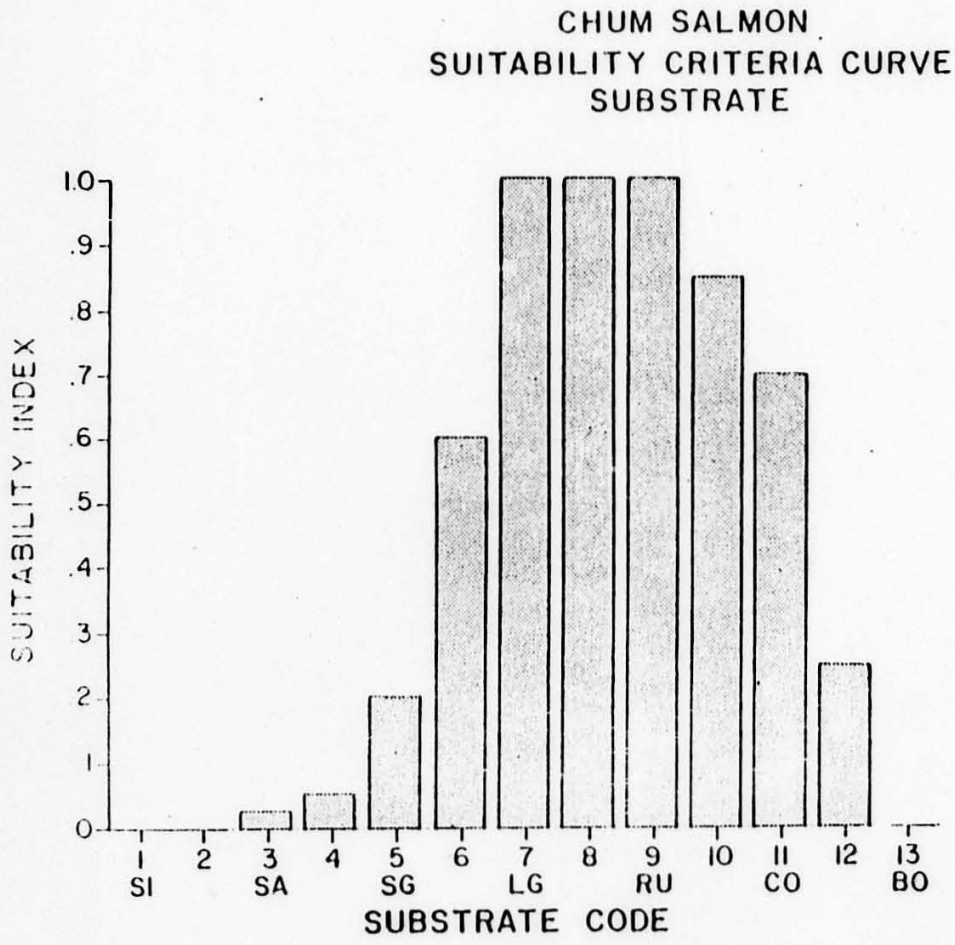


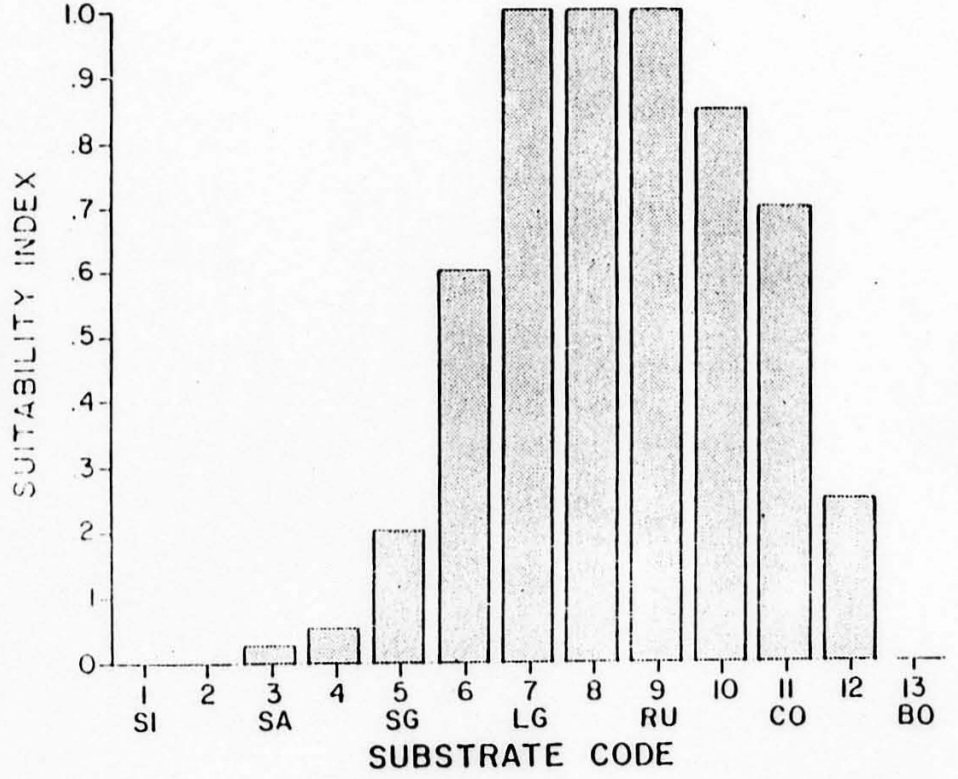
Figure IV-3. Spawning chum salmon suitability criteria for velocity. Source: Estes and Vincent_Lang 1984.



SUITABILITY CRITERIA			
SUBSTRATE CODE		PARTICLE SIZE	SUITABILITY INDEX
1	SI	SILT	0 00
2			0 00
3	SA	SAND	0 025
4			0 05
5	SG	1/8 - 1"	0 20
6			0 60
7	LG	1 - 3"	1 00
8			1 00
9	RU	3-5"	1 00
10			0 85
11	CO	5 - 10"	0 70
12			0 25
13	BO	>10"	0 00

Figure IV-4. Spawning chum salmon suitability criteria for substrate.
Source: Estes and Vincent-Lang 1984.

CHUM SALMON
SUITABILITY CRITERIA CURVE
SUBSTRATE



SUITABILITY CRITERIA			
SUBSTRATE CODE		PARTICLE SIZE	SUITABILITY INDEX
1	SI	SILT	0.00
2			0.00
3	SA	SAND	0.025
4			0.05
5	SG	1/8 - 1"	0.20
6			0.60
7	LG	1-3"	1.00
8			1.00
9	RU	3-5"	1.00
10			0.85
11	CO	5-10"	0.70
12			0.25
13	BO	>10"	0.00

Figure IV-4. Spawning chum salmon suitability criteria for substrate.
Source: Estes and Vincent-Lang 1984.

To estimate velocities for additional mainstem discharges, the following linear relationship was used for each cell:

$$V_A = \frac{Q_A}{Q_M} V_M$$

where:

V_A = cell velocity (ft/sec) of additional discharge

Q_A = mainstem discharge (cfs) of additional data set

Q_M = mainstem discharge (cfs) of a measured data set with similar hydraulic condition to Q_A

V_M = measured cell velocity (ft/sec)

Estimated cell depths and velocities were combined with substrate and upwelling codes, and cell areas, to calculate WUA. These WUA values were plotted with WUA calculated from measured data to develop WUA curves for discharges ranging from 5,000 to 25,000 cfs.

Wetted Surface Area Curves: Plots of WSA values versus mainstem discharge were made using DIHAB output for each study area. Curves were developed assuming linearity between plotted values. Wetted surface area values were available for mainstem discharges ranging from 7,600 to 18,000 cfs.

To further define the wetted surface area curves, additional WSA values were calculated using stage-discharge curves, cross sections and reach lengths.

Water surface elevations were determined for additional mainstem discharges (Q_A) using stage-discharge curves developed for each study area (Section II). For each cross section, wetted top width was determined by projecting the

water surface elevation on each cross section. Surface areas were calculated for each cross section as the product of wetted top width and reach length. By summing the surface areas associated with each cross section, the total surface area was determined for each Q_A. Insufficient cross section information was available to calculated wetted surface areas for Q_A greater than the highest Q_M.

Development of Time Series Curves

Plots of weighted usable area and mainstem discharge as a function of time were made for the period from August 12 to September 20, 1984. Mean daily mainstem discharges were used to calculate weighted usable area values for this period.

Results

Site 101.7L

Site Description: This site is located about 0.5 miles above the mouth of Whiskers slough on the west bank of the Susitna River (Plate IV-1). The study reach is 2450 feet long and 150 feet wide. Three cross sections were established to describe the shallow, low velocity backwater area in the upper two-thirds of the study site and a four cross section to describe the deeper, faster flowing channel at the lower end of the study site (Figure IV-5). The substrate is predominately cobble/rubble overlayed with a thick layer of silt/sand in the upper half of the site. This backwater site was selected for study because of the amount of upwelling present, however, chum salmon spawning

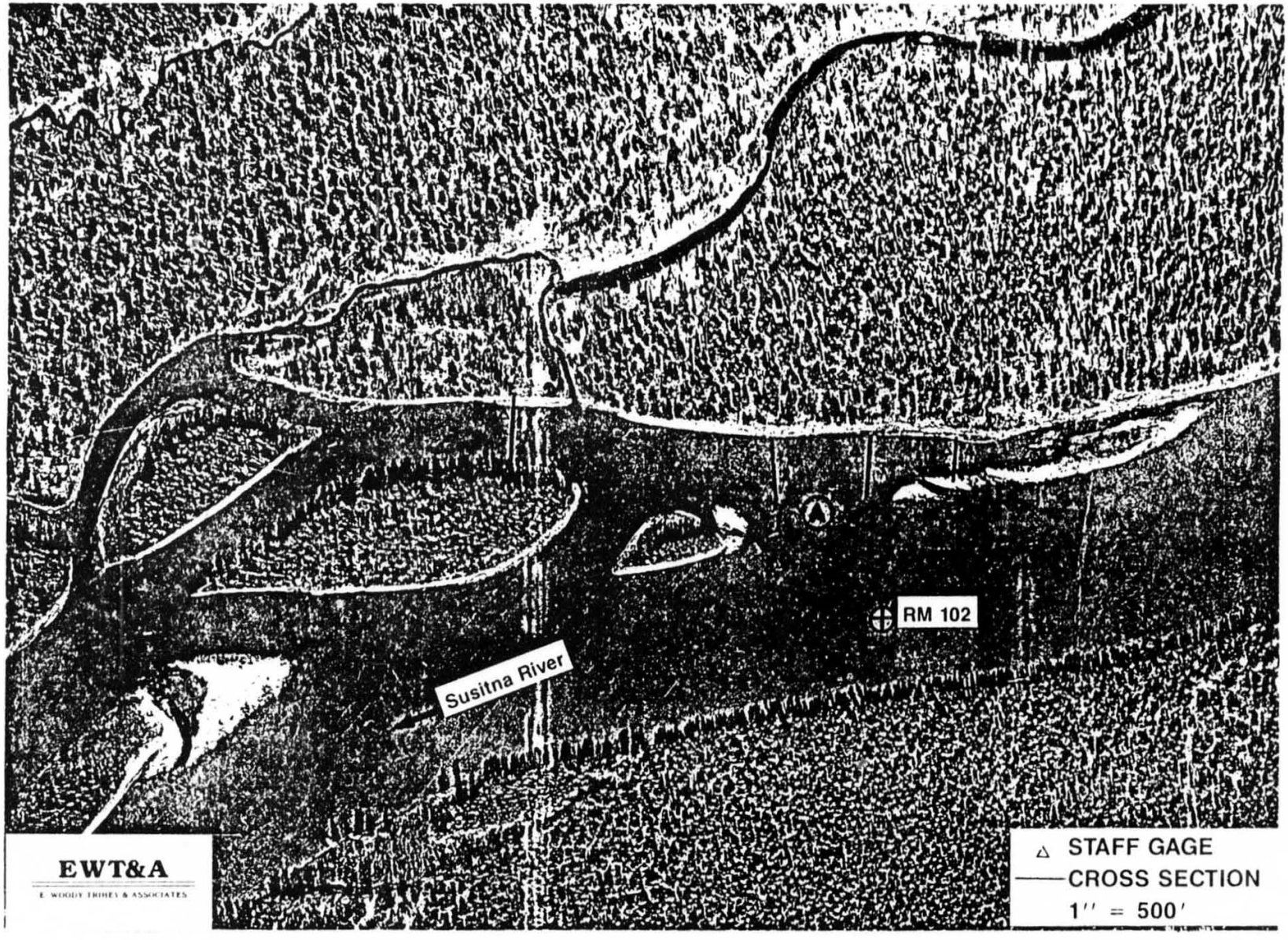
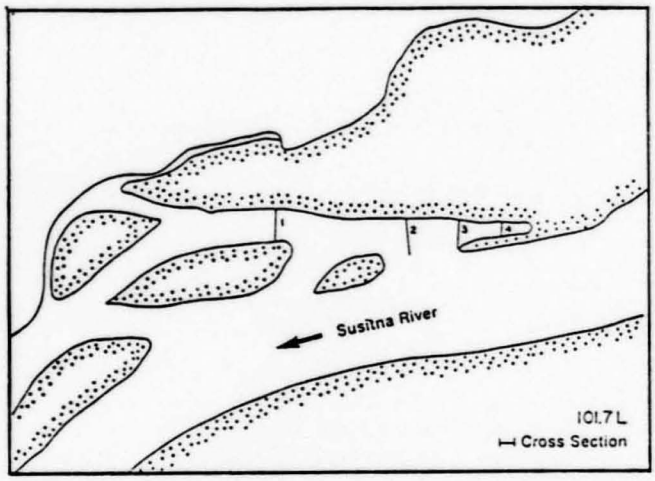


Plate IV-1. Modeling site 101.7L on June 1, 1982 at mainstem discharge: 23,000 cfs.



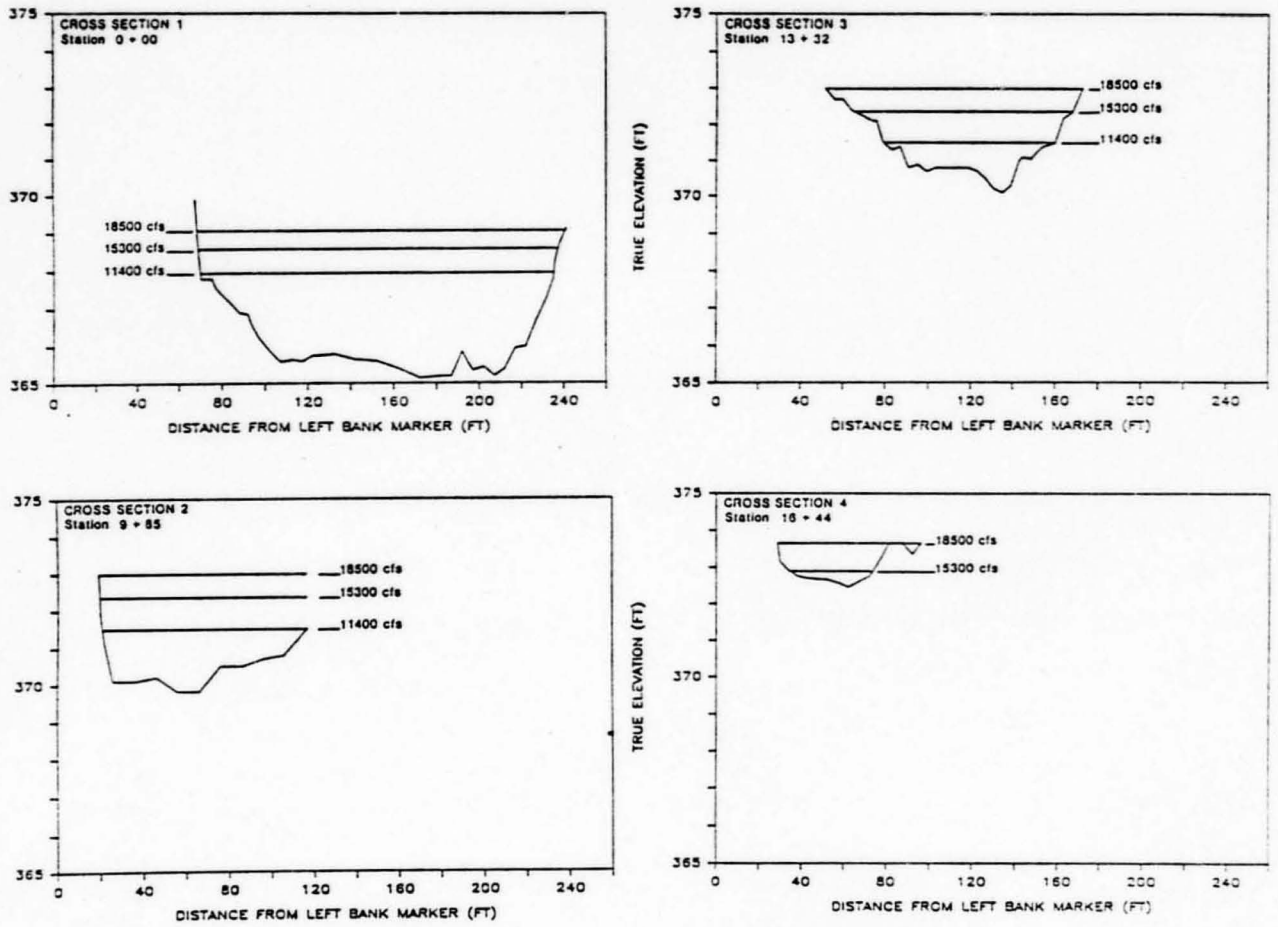


Figure IV-5. Cross sections for 101.7L study site depicting water surface elevations at discharges of 11,400, 15,300 and 18,500 cfs.

had not previously been reported at the site nor was any spawning observed during the 1984 field season.

The sparsely vegetated gravel bar located at the upper end of this site (A) is overtopped at a mainstem discharge of 25,000 cfs. At discharges greater than 9,600 cfs the gravel bar (B) which separates the channel from the mainstem is overtopped and directs flow into the channel. At 23,000 and 10,600 cfs, the entire site is influenced by the mainstem. At 7,400 cfs, the lower half of the study site is affected by backwater and the upper half wetted by upwelling.

Access to the site is not limiting due to the large backwater area in and below the lower half of the site. However, passage above cross section 1 is not possible below the breaching discharge (9,600 cfs).

Upwelling was observed upstream of cross section one throughout the study site. During winter, the warm water influences the water downstream of cross section 1 causing an open lead approximately the same size as the wetted area in unbreached conditions.

Spawning Habitat: The total wetted surface area and WUA curves are provided in Figure IV-6a for study site 101.7L. Figure IV-6b is plotted at an expanded vertical scale to emphasize the response of WUA discharge.

The range of depth and velocity measurements extended from 11,400 to 18,500 cfs. A backwater area is present from cross section 1 to 2 at mainstem discharges below 9,600 cfs. Upwelling can be observed at the upper two cross

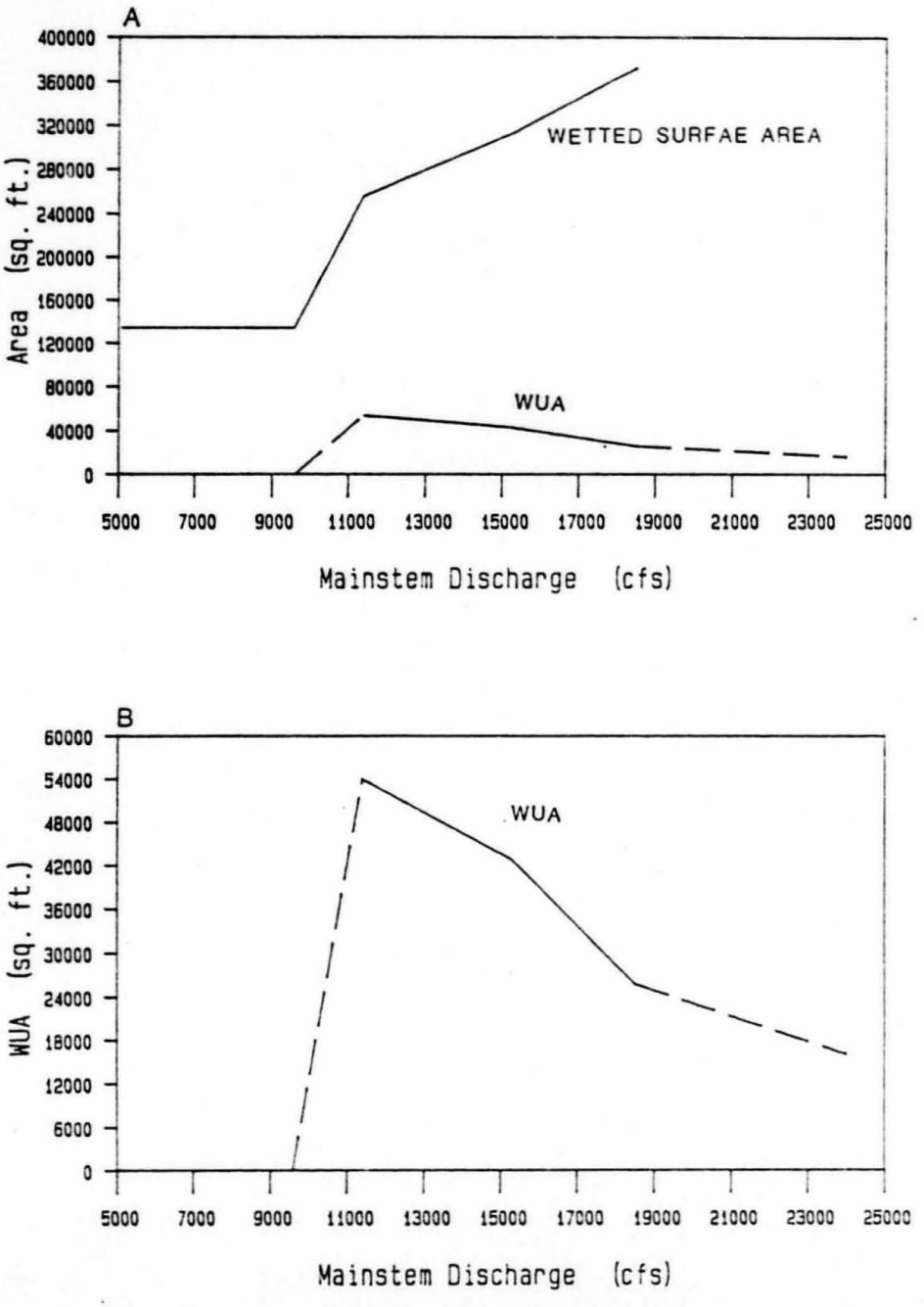


Figure IV-6. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge from August 12 to September 15, 1984 for 101.7L modeling site.

sections but is too shallow to be utilized by spawners. The gravel bar along the right side of the channel is overtopped at discharges greater than 9,600 cfs. The areas that were previously too shallow to support spawning are no longer limiting. As the mainstem discharge increases, the velocities in the upwelling areas increase which in turn decreases usable habitat.

Because the range of mainstem discharges for which site specific depth and velocities were measured only extended from 11,400 to 18,500 cfs was so small, additional data sets were developed for discharges of 5,100 and 24,000 cfs using aerial photography and data obtained from streambed survey notes. The wetted surface area as determined by digitizing enlarged aerial photographs at mainstem discharges of 5,100 and 7,400 cfs were compared and found to be the same. This is an indication the total wetted surface area throughout the study reach remains constant in the unbreached conditions (mainstem flow less than 9,600 cfs). Water surface elevations as measured in the streambed profile survey (Table C-1.1) were used in conjunction with the cross section elevations (Table C-2.1) to determine the depth of flow in the upwelling areas. These depths did not exceed 0.2 ft, therefore the WUA unbreached conditions was assigned a zero value.

The rating curves for the site (Section II of this report) were used to develop an data set at 24,000 cfs which corresponded with an August 10 site visit at which time the upstream berm (A) was overtopped and the backwater area had become a flowing channel. Because of the influence of velocity the WUA index decreases at higher discharges. This agrees with the habitat response curves for other side channel sites in the middle river. The slope of the WUA curve was extended to 25,000 cfs, thus covering the entire range of

discharges from 5,000 to 25,000 cfs. Actual WUA values used to plot this curve are presented in Table C-6. Time series plots of WUA and average daily mainstem discharge are presented in Figure IV-7.

Site 105.8L

Site Description: This study site is located approximately 2 miles upstream of Talkeetna Camp on the west bank of the Susitna River (Plate IV-2). The study area is 1,000 feet long and located along the mainstem margin. Four cross sections were established to describe the mainstem margin (Figure IV-8). Large boulders are predominate throughout the site. This mainstem margin study site was selected because of the presence of upwelling area however chum salmon spawning were not previously recorded.

The study area appears similar over a broad range of mainstem discharges. Bank seepage appears along cross section 1 at low discharges. No spawning or juvenile salmon were observed at the site.

Open thermal leads in the ice were recorded in the 1983 winter photography and during our winter reconnaissance visits. Strong upwelling and bank seepage was identified from cross section 1 through 3. The upwelling strength decreased to moderate above cross section 1.

Spawning Habitat: The WUA response curves plotted in Figure IV-9a are plotted with total surface area and WUA at the same scale. Figure IV-9b provides a plot of the habitat response curve at an expanded vertical scale.

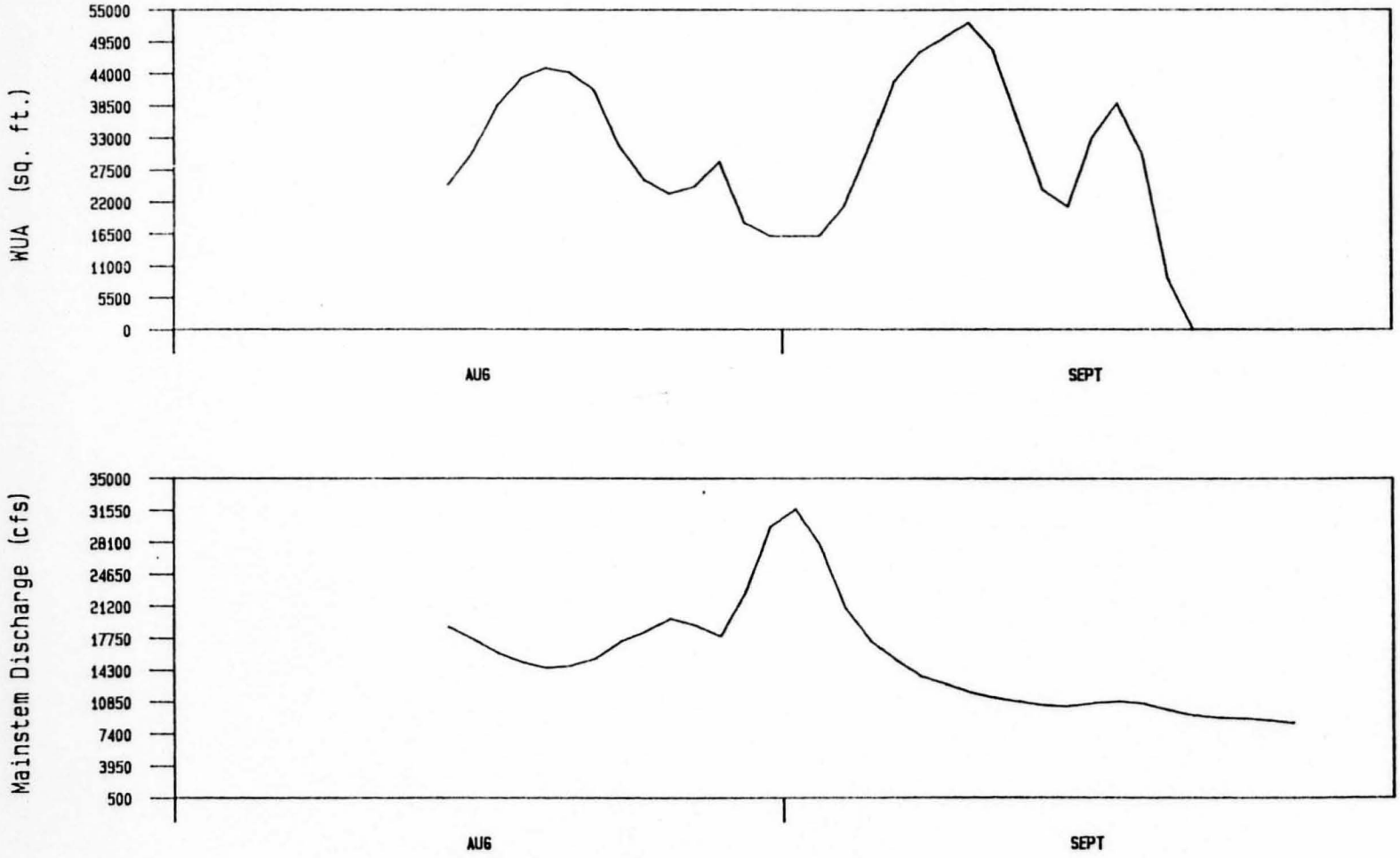


Figure IV-7. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 101.7L modeling site.

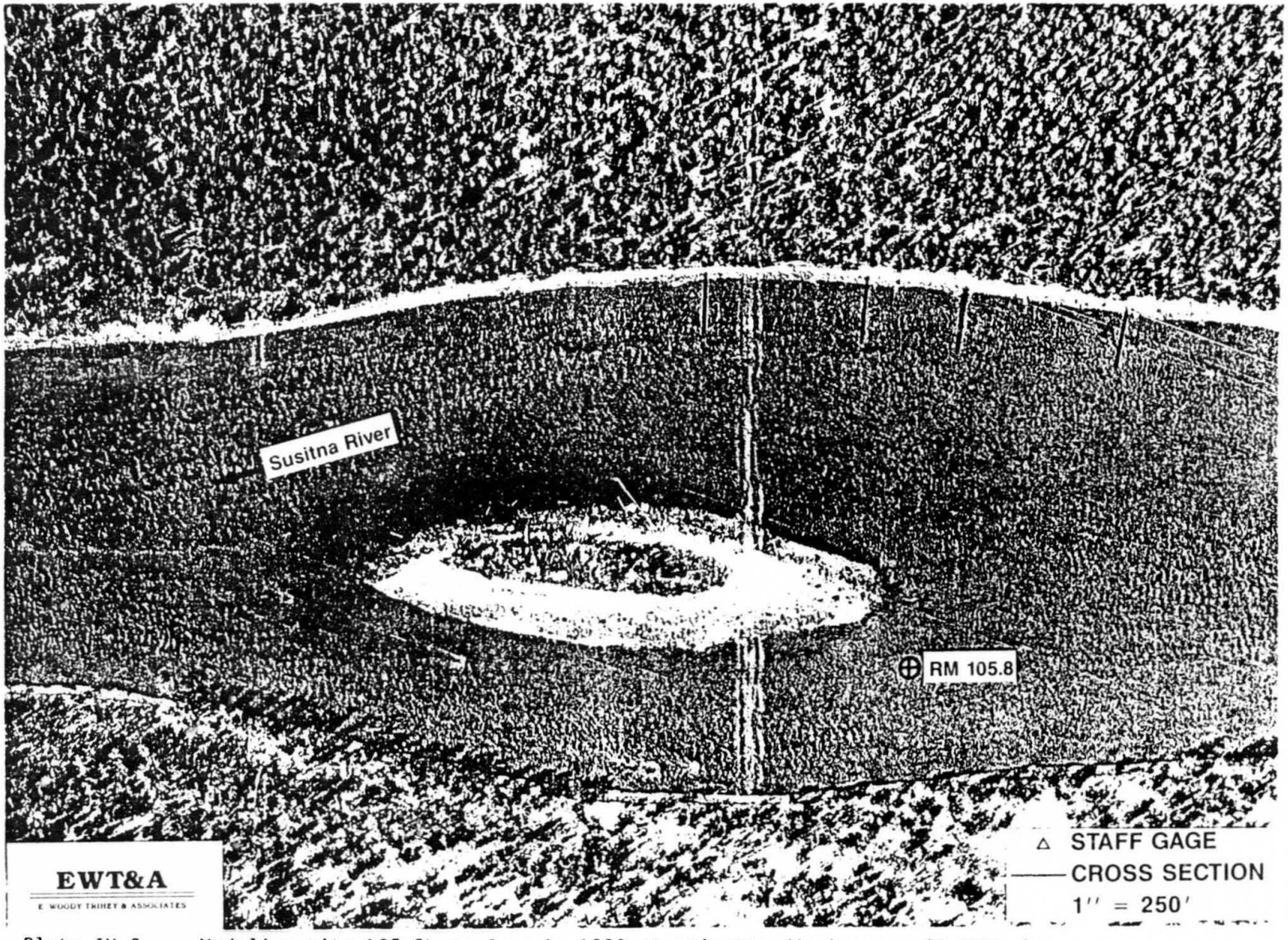
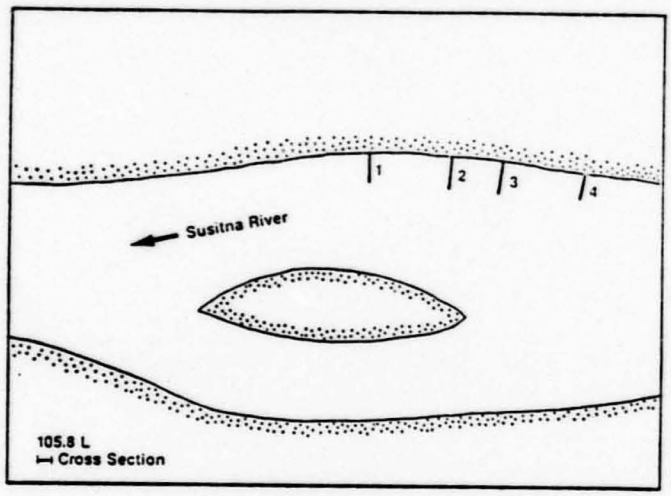


Plate IV-2. Modeling site 105.8L on June 1, 1982 at mainstem discharge: 23,000 cfs.



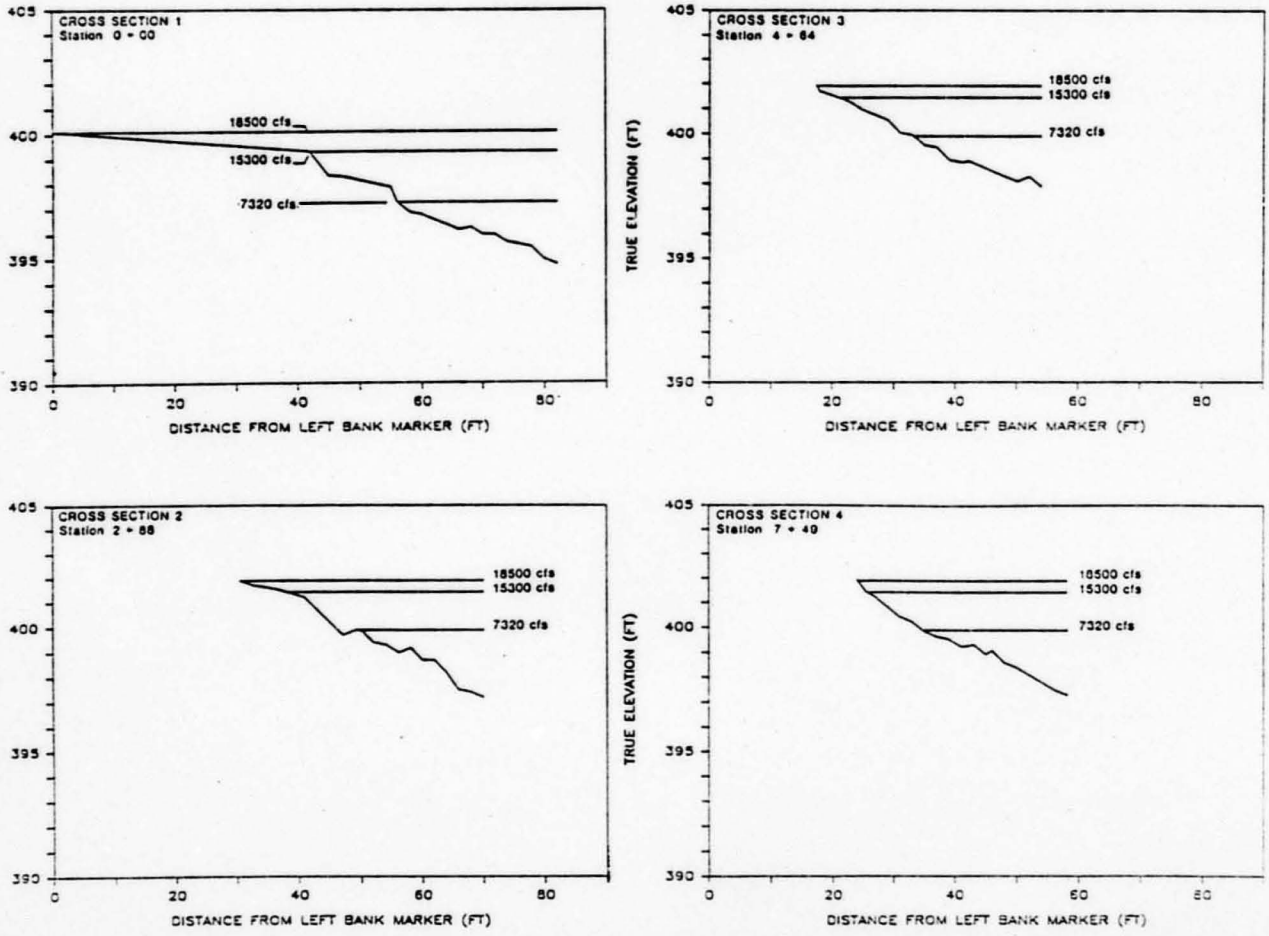


Figure IV-8. Cross sections for 105.8L study site depicting water surface elevations at discharges of 7320, 15,300 and 18,500 cfs.

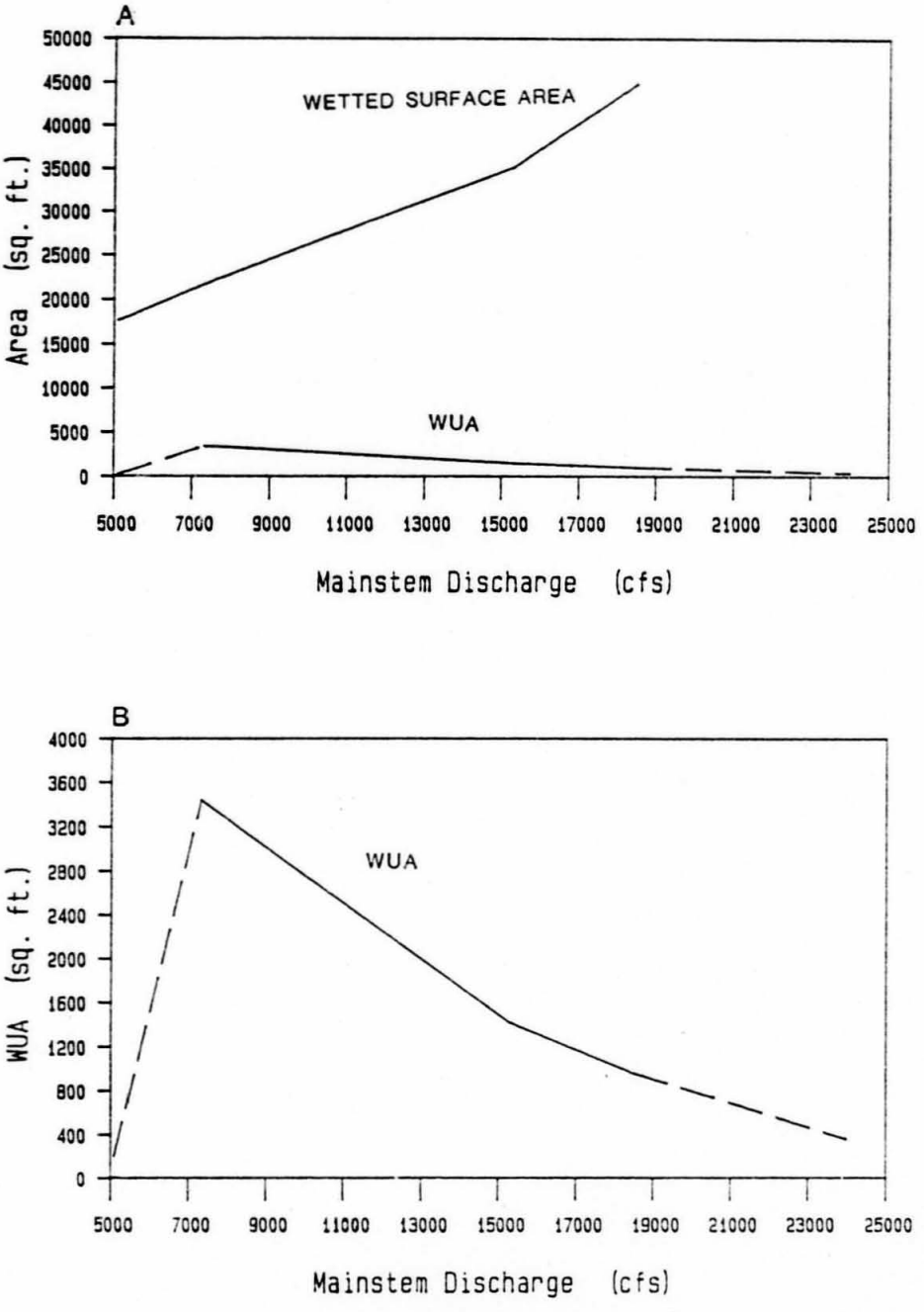


Figure IV-9. Projections of wetted surface area and WUA of snawning chum habitat as a function of discharge for the 105.8L modeling site.

Data sets were collected at 7,320, 15,300 and 18,500 cfs. The stage-discharge curve presented in Section II of this report indicates the WSEL response to mainstem discharge throughout this range of flow remains constant up to a mainstem discharge of 24,000 cfs. Bank seepage was observed along the channel margins. At discharges above 7,000 cfs, the depths over the upwelling areas are sufficient for spawning. The substrate throughout the site is generally too large to be used by spawners, explaining the small amplitude of the habitat response curve. An increase in mainstem discharge causes the velocities at the upwelling areas to increase above the range used by spawning chum salmon. Thus WUA indices decrease with increasing discharge.

Additional data sets were developed for mainstem discharges of 5,100 and 24,000 cfs. The latter flow corresponds to conditions observed during a trip to the study site on August 10. Stage discharges curves for cross sections 1 and 4 were used to determine the water surface elevation at both flows. Nearly all the upwelling area possessed depths less than 0.2 feet at the 5,100 cfs flow level. Thus the WUA rapidly decreases from 7,320 cfs to 5,100 cfs. Velocities at this site are generally unsuitable for spawners at all discharges and become almost entirely unacceptable for spawning at high discharges. Thus the trend in the weighted use of WUA curve continually decreases as mainstem flow increases. Time series plots of WUA and average daily mainstem discharges are plotted in Figure IV-10.

Site 114.1R

Site Description: This site is located 0.4 miles upstream of Lane Creek located mid-channel on a vegetated gravel bar (Plate IV-3). The study reach

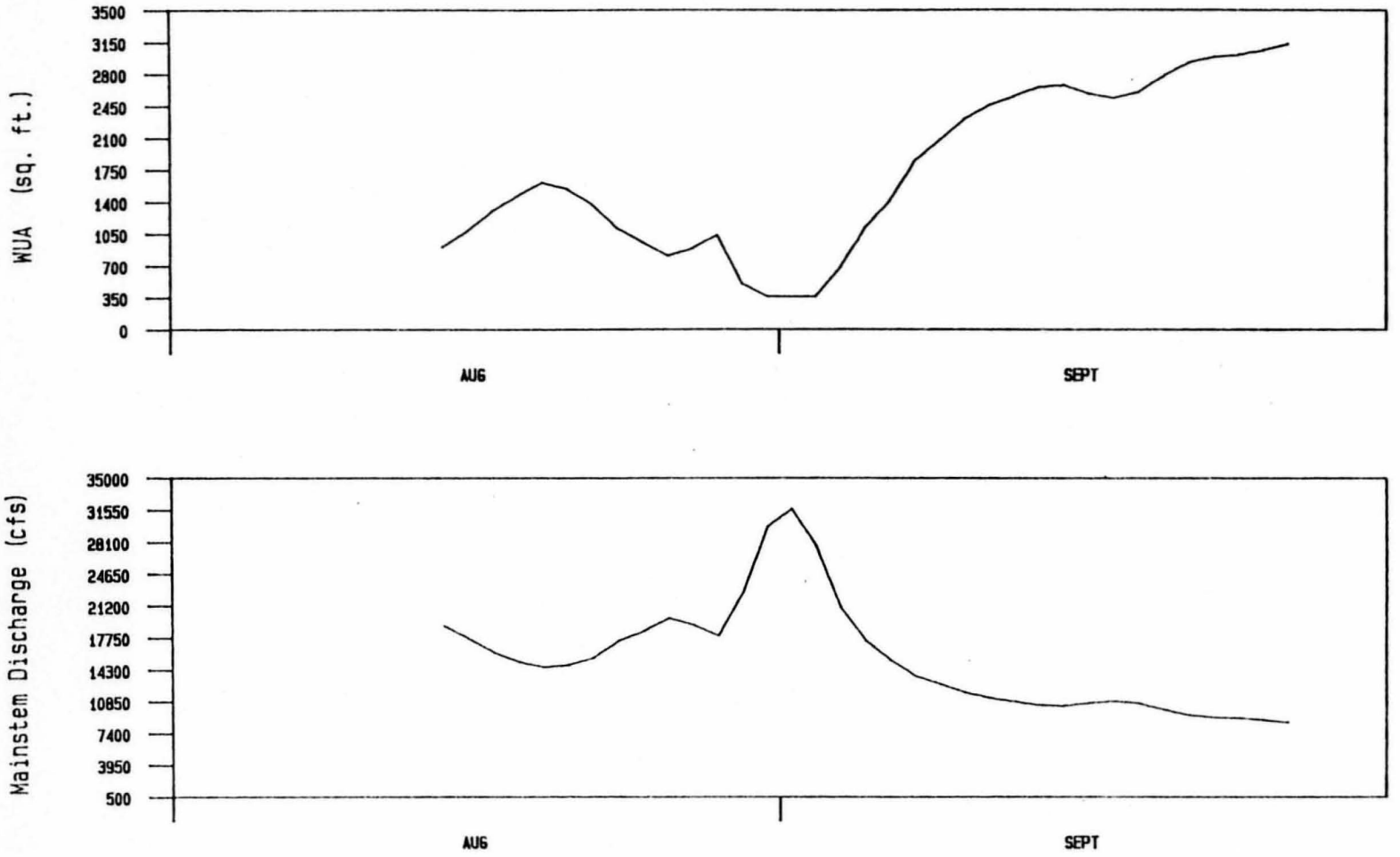


Figure IV-10. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 105.8L modeling site.

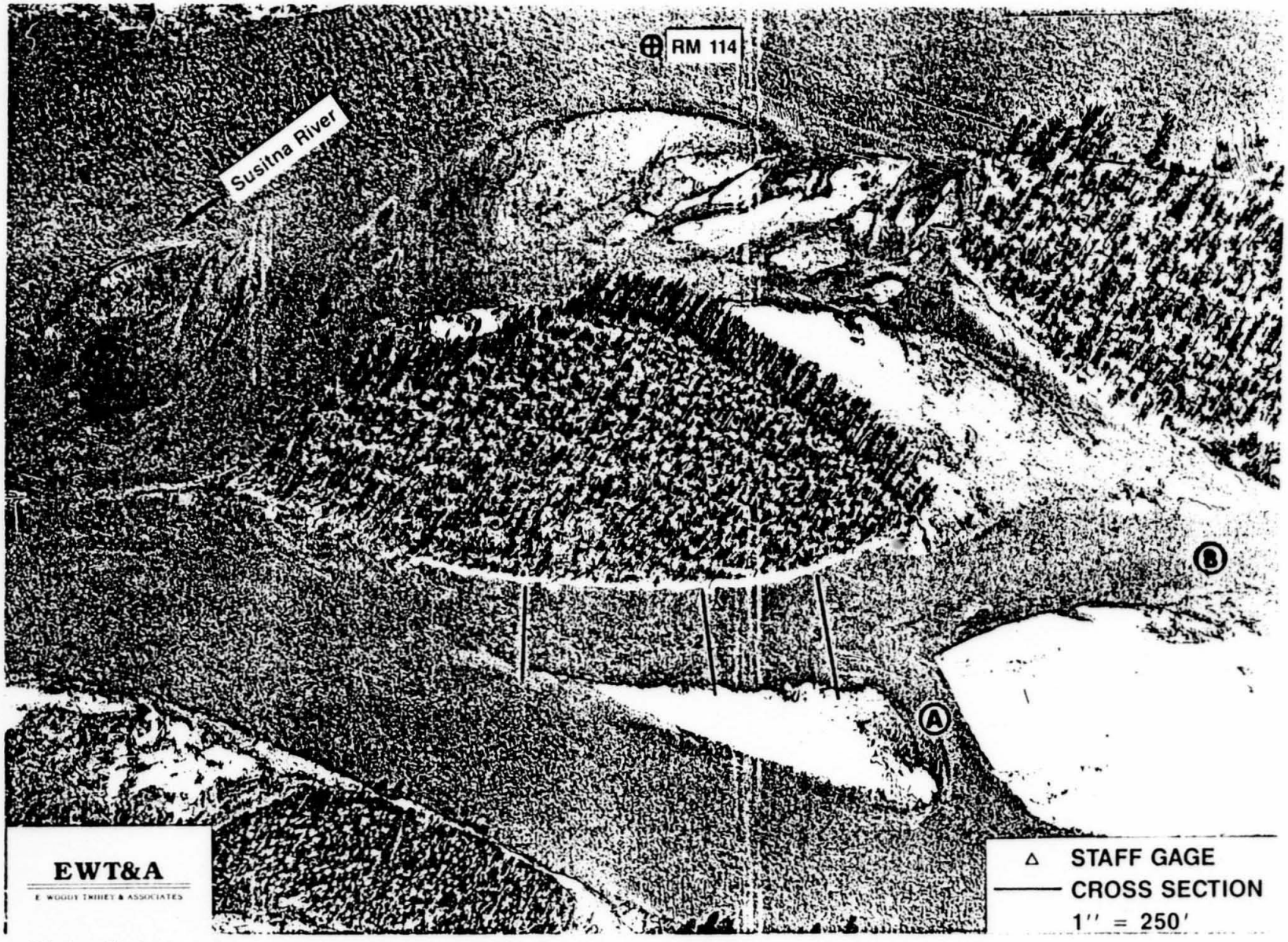


Plate IV-3. Modeling site 114.0R on June 1, 1982 at mainstem discharge: 23,000 cfs.

is 675 feet long and 60 feet wide. Cross section 1 is located in the backwater area at the mouth of the channel. Cross sections 2 and 3 define the shallower, high velocities area (Figure IV-11). This study site was selected because of the open leads visible in March 1983 photography which suggested the presence of upwelling in this side channel. No previous spawning had been reported at this location, but spawning chum salmon were observed in moderate numbers during our study.

Mainstem flow is conveyed through the study reach at discharges less than 5,000 cfs through Channel A and at 10,000 cfs through Channel B (Plate IV-3). At 23,000 cfs, the lower end of the study site a backwater area is present ~~and is by~~ near cross section 1. Access to the site and passage through ~~it~~ is not limiting ~~throughout the range from~~ between 5,000 ~~to~~ and 25,000 cfs.

Open leads are visible in winter photography of this site, and during ~~our~~ winter field work upwelling was identified in slight to moderate amounts, concentrated along the left bank, beginning below cross section 1 and extending upstream of cross section 3 ~~throughout the site~~.

Spawning Habitat: Total surface area and WUA curves for this study site are provided in Figure IV-12a and b. Surface area and WUA values are provided in Appendix Table C-6 . A comparison of the two curves in Figure IV-12a indicates a very small proportion of the wetted surface area provides spawning habitat for spawning chum salmon over a broad range of mainstem discharges. However Figure IV-12b, plotted at an expanded vertical scale, indicates that WUA indices are highest for mainstem discharge in the range of 15,000 cfs.

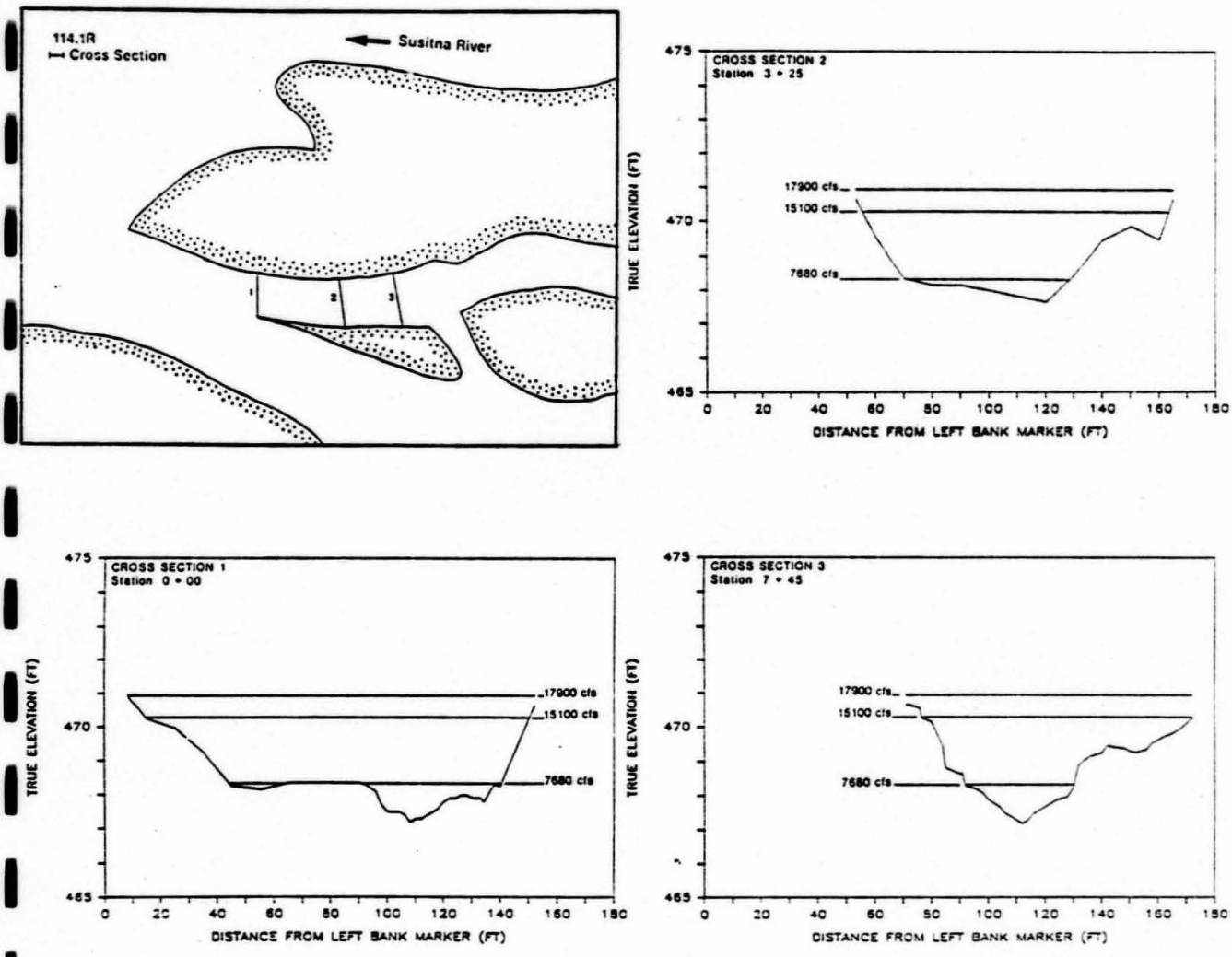
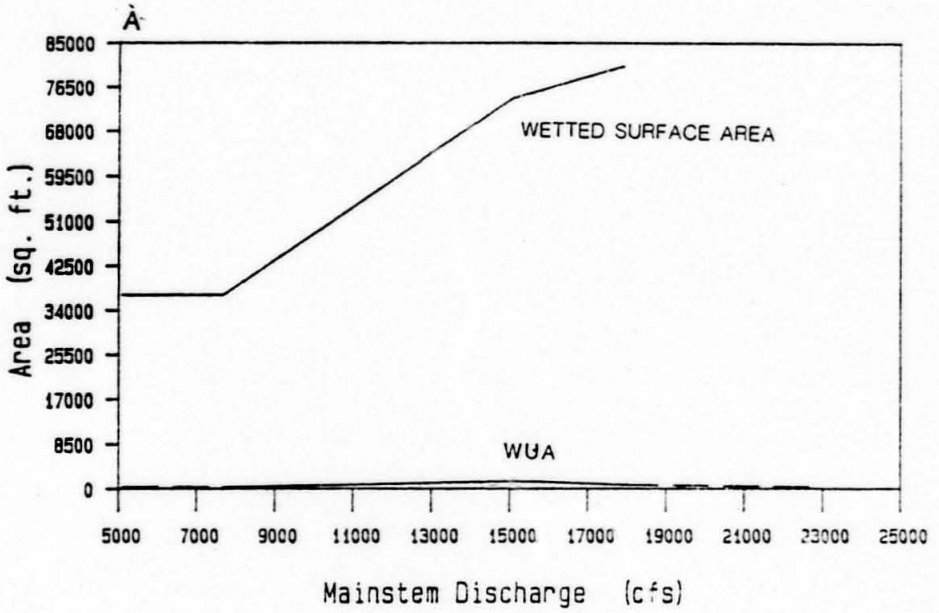


Figure IV-11. Cross sections for 114.1L study site depicting water surface elevations at discharges of 7680, 15,100 and 17,900 cfs.



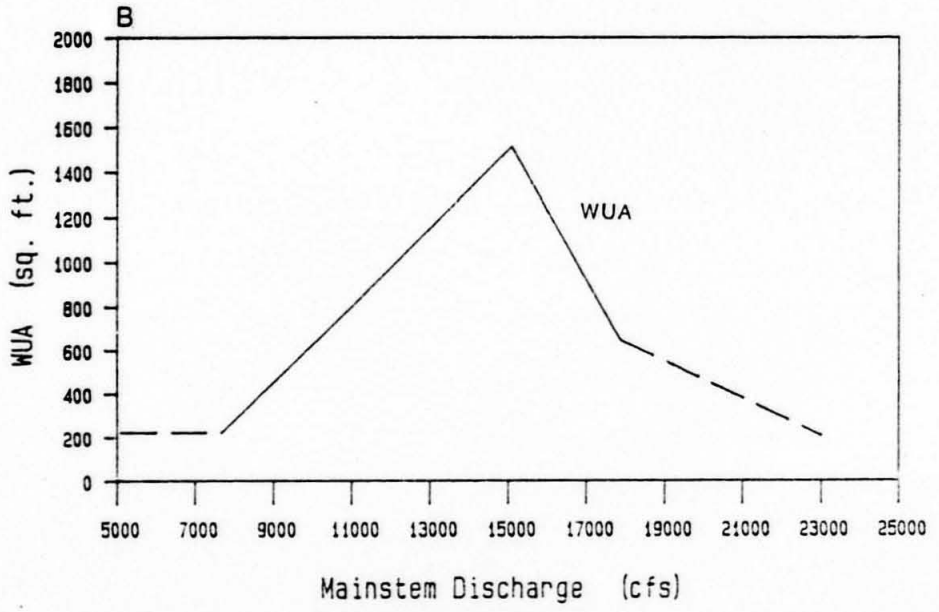


Figure IV-12. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 114.1R modeling site.

Three data sets were collected at discharges ranging from 7,680 to 17,900 cfs (Table C-3.3). The depths in the upper portion of the study site are shallow and poor substrate is present in the upwelling areas. As the channel conveys additional flow, these upwelling areas are no longer limited by shallow depth and WUA indices for spawning peak near 15,000 cfs. Above this flow velocities exceed the maximum velocities preferred by chum salmon which causes a decrease in WUA. Below 8,800 cfs, the water surface elevation remains constant suggesting the wetted surface area of the channel remains relatively constant during unbreached conditions. This corresponds to field observations made from September to October.

Additional data sets were determined for mainstem flows of 5,100 and 23,000 cfs. Field personnel were at the site when the discharge was 23,000 cfs. Water surface elevations for unbreached conditions remained unchanged which enabled the WUA response curve to be extended from 8,800 to 5,100 cfs. Comparisons between the cross section and stage-discharge data, reveal that depths are too shallow in the upper half of the study site for spawning. A backwater at the lower end of the study site provides the majority of the usable spawning habitat at low flows. Time series plots of WUA and mainstem discharges from August 12 to September 15, 1984 are shown in Figure IV-13.

Site 115.0R

Site Description: This site is located in the lower portion of Mainstem II Side Channel which is on the east bank of the Susitna River (Plate IV-4). The study reach is 1,525 feet long and varies from 40 to 80 feet wide. Two channels (A and B) direct mainstem flow into the study site. Cross section 1

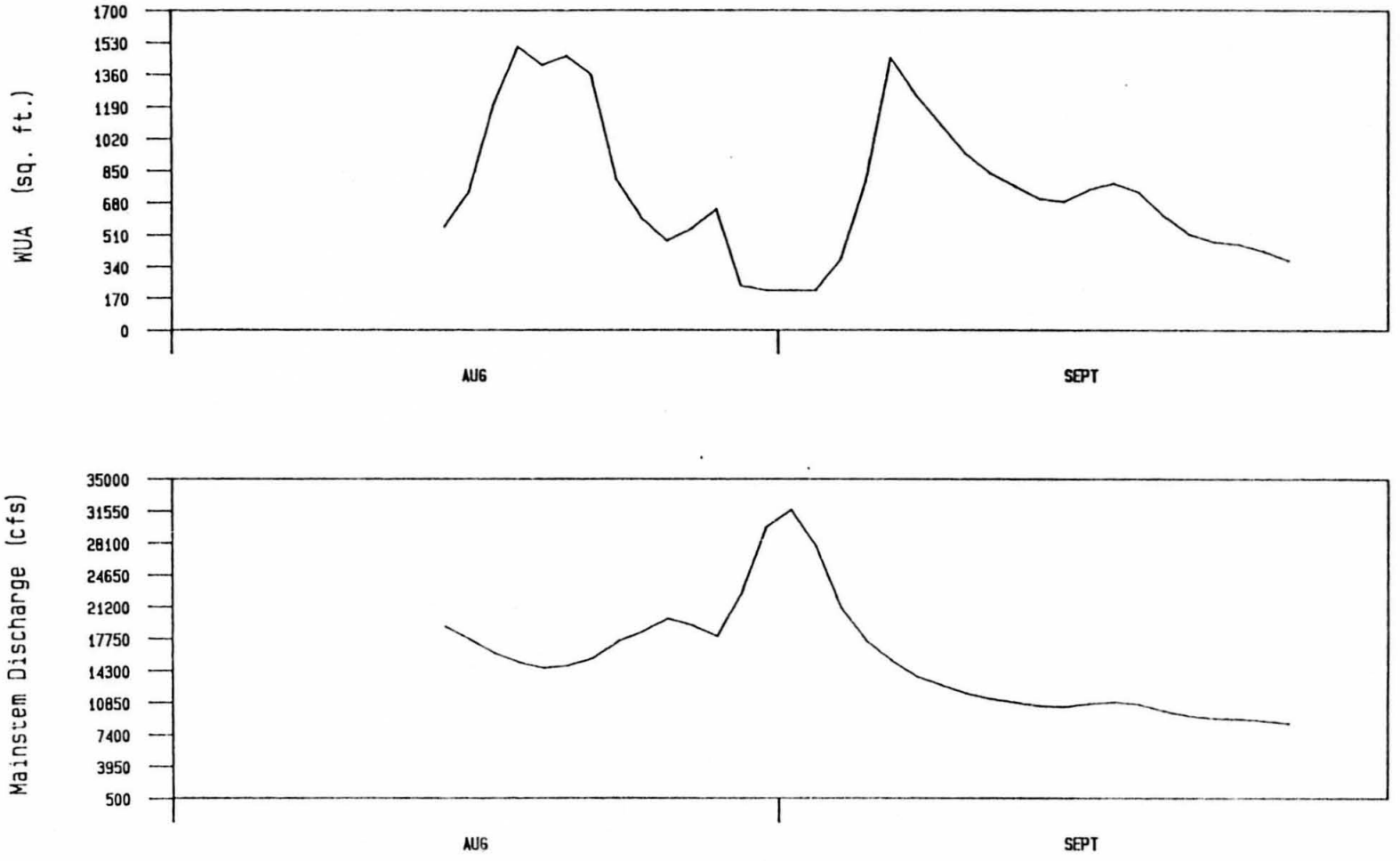


Figure IV-13. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 114.1R modeling site.

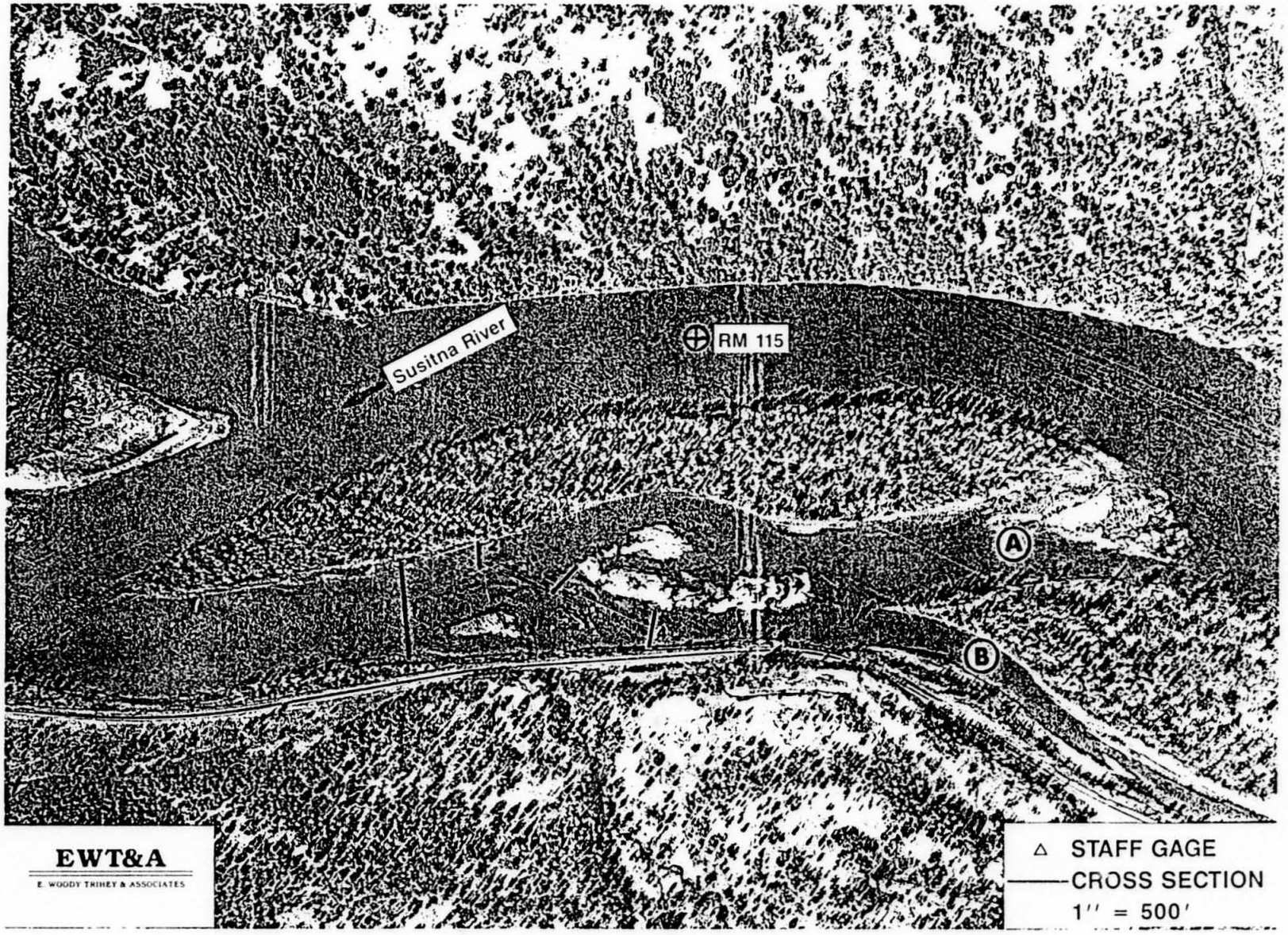


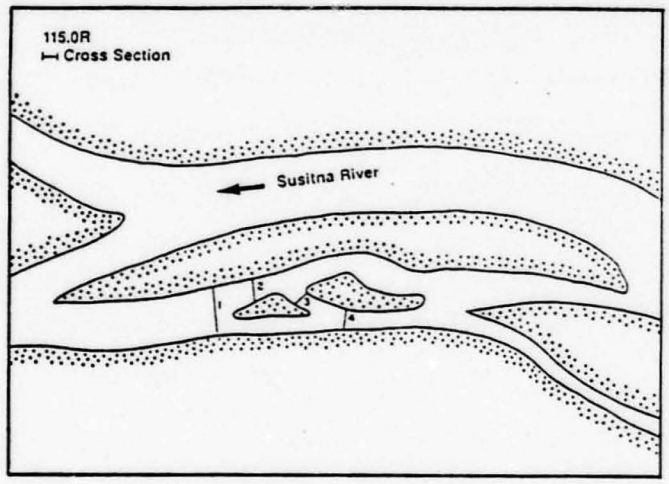
Plate IV-4. Modeling site 115.0R on June 1, 1982 at mainstem discharge: 23,000 cfs.

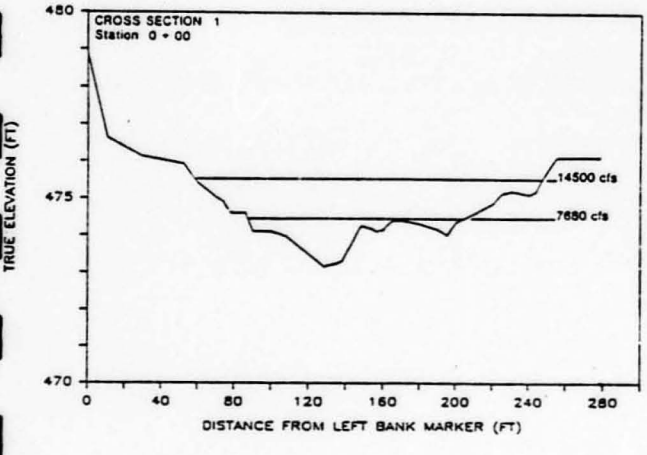
was established to define the large backwater area present in the lower half of the site (Figure IV-14). Cross section 2 described a riffle area just upstream of the backwater. Above this cross section, the channels divide, but the study site is confined to Channel B. Cross section 3 defines a deep pool; cross section 4, a shallow low velocity run. This study site was selected as a known upwelling area where chum spawning had been observed in previous years.

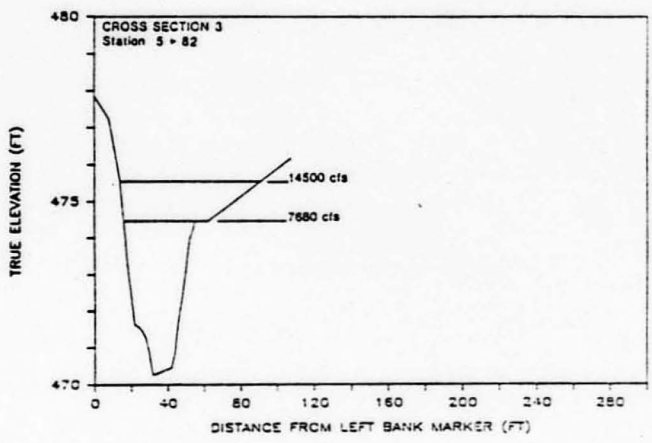
Channels A and B breach at 12,000 and 23,000 cfs respectively. When non-breached, a large backwater area extends from the mouth of the Mainstem II side channel upstream nearly to the confluence of channels A and B. At 23,000 cfs, the entire channel is flowing bankfull. At mainstem discharges of 10,600 and 7,400 cfs, the upper three cross sections are conveying streamflow derived from groundwater and local runoff. Cross section 1 is always influenced by backwater.

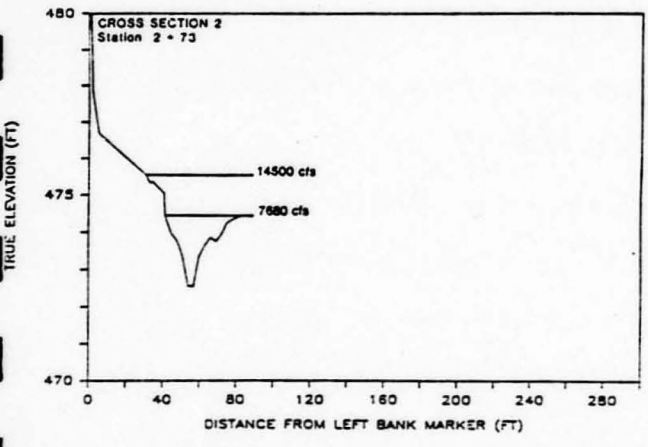
Adult chum, coho, and sockeye salmon have been observed in the side channel. Juveniles of the same species have also been observed in the site. Access to the study site has not been a problem. However, number of passage reaches within the channel have been identified as potential problem at flows below 23,000 cfs.

Upwelling is slight at cross section 2 increasing to moderate at cross sections 3 and 4. Bank seepage was noted along both banks at cross section 1.









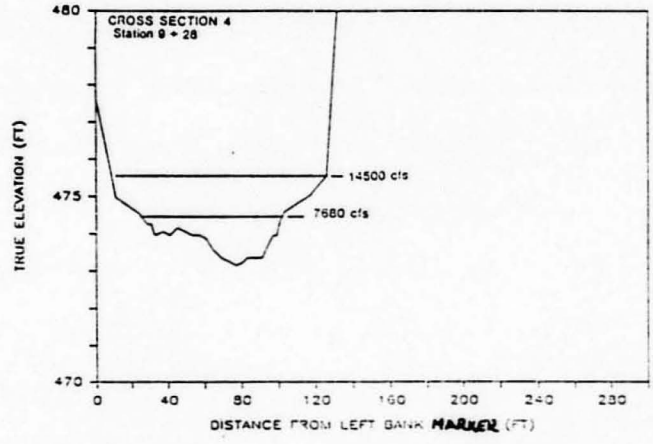
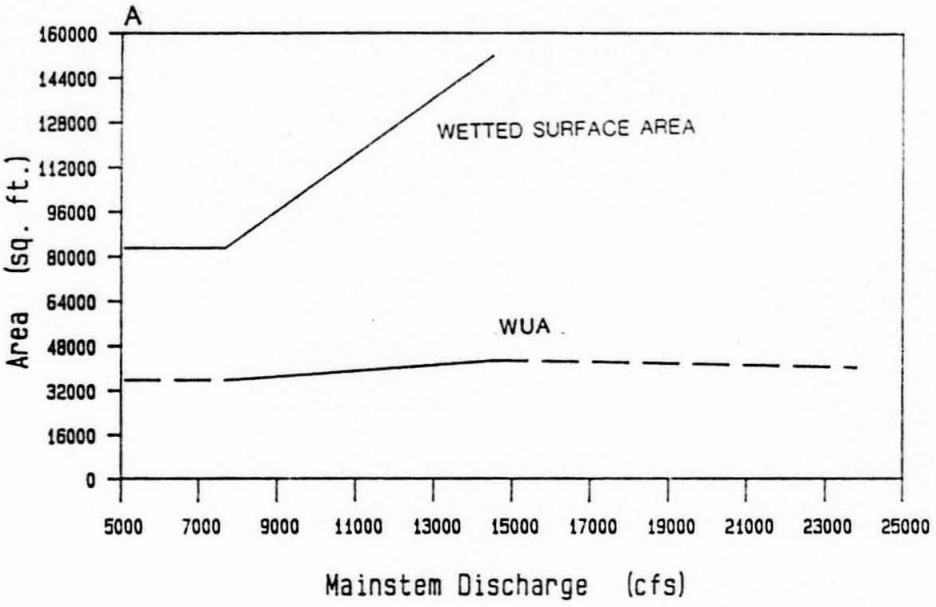


Figure IV-14. Cross sections for 115.0R study site depicting water surface elevations at discharges of 7680 and 14,500 cfs.

Spawning Habitat: Figure IV-15a is a plot of the total wetted surface area and WUA curves. Figure IV-15b is the same WUA curve plotted on an expanded vertical scale to better see how the WUA changes with discharge.

Depths and velocities were measured at all cross sections for two mainstem flows, 7,680 and 14,500 cfs. The northwest head was breached at the time field data were obtained at the higher flow. Neither head was breached when data were collected at 7,680 cfs. Usable habitat remains relatively constant at flows below 10,400 cfs. Above this flow, the influence from the mainstem increases the water surface elevation of the backwater which in turn increases the depth of flow at the upwelling areas creating slightly more usable spawning habitat. WUA continues to increase with increasing discharge up to 14,500 cfs where it remains nearly constant until the northeast channel is breached at 23,000 cfs. No information has been obtained regarding the influence higher stream flows would have on velocities at the upwelling areas.

Additional data sets were developed for discharges of 5,100, 10,600 and 23,000 cfs. The stage-discharge curve developed for cross section 1 indicates the depth remains constant for mainstem flows below 10,400 cfs. Therefore, the WUA and total surface area measured at 7,680 cfs, was assumed to remain constant and be applicable to flows between 5,100 and 10,600 cfs. The upstream portion of the study site, cross sections 3 and 4, provide the same WUA and total surface area until the northeast channel (B) is breached. An additional data set was developed for a mainstem flow of 23,000 cfs by assuming the linear trend in velocities occurring at transects 3 and 4 between mainstem discharges of 7,680 and 14,500 cfs would continue to 23,000 cfs. Above 23,000 cfs, the habitat response curve is expected to decrease as the



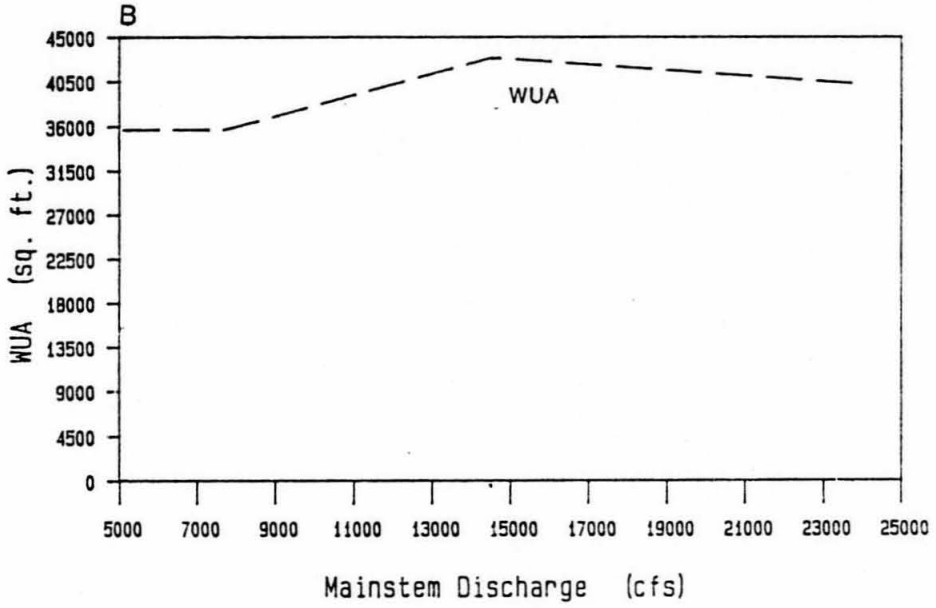


Figure IV-15. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 115.0R modeling site.

velocities in the upwelling areas are expected to increase above the preferred range. This expected response is similar to the responses forecast for other study sites in the Middle River where data are available. Time series plots of WUA and mainstem discharge for the 1984 chum spawning season (August 12 to September 15) are shown in Figure IV-16.

Site 118.9L

Site Description: This site is located along the mainstem margin approximately 1.7 miles below Curry Station on the west bank of the Susitna River (Plate IV-5). Three cross sections were established in the study area which is 475 feet long (Figure IV-17). A small tributary enters the mainstem just above the site. At mainstem discharges less than 23,000 cfs, a small channel is evident immediately downstream of the tributary and extends beyond cross section 3. Rubble and cobble predominate throughout the site with a layer of silt and sand deposited along the bank at cross section 3. Access and passage do not appear to be a problem. This mainstem margin study site was selected because chum salmon spawning was previously recorded at this location. Chum salmon were observed spawning at the site during the 1984 field season.

During our April site visit, open thermal leads were observed in the ice throughout the study area. Slight amounts of bank seepage kept the area from freezing for part of the winter season.

Spawning Habitat: The total surface area and WUA curves for spawning chum are presented in Figure IV-18a, with the WUA curve replotted to an enlarged scale in Figure IV-18b.

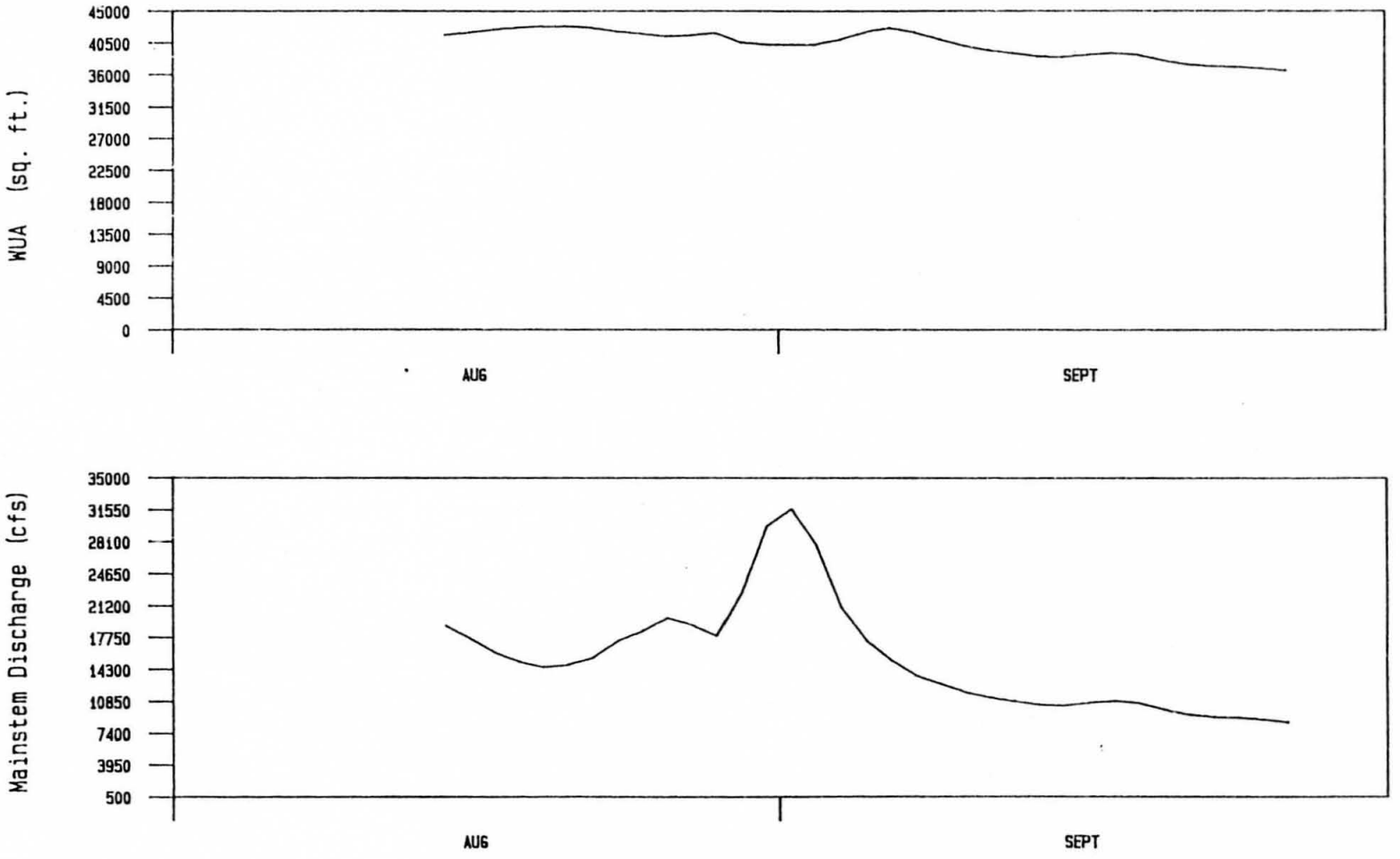


Figure IV-16. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 115.0R modeling site.

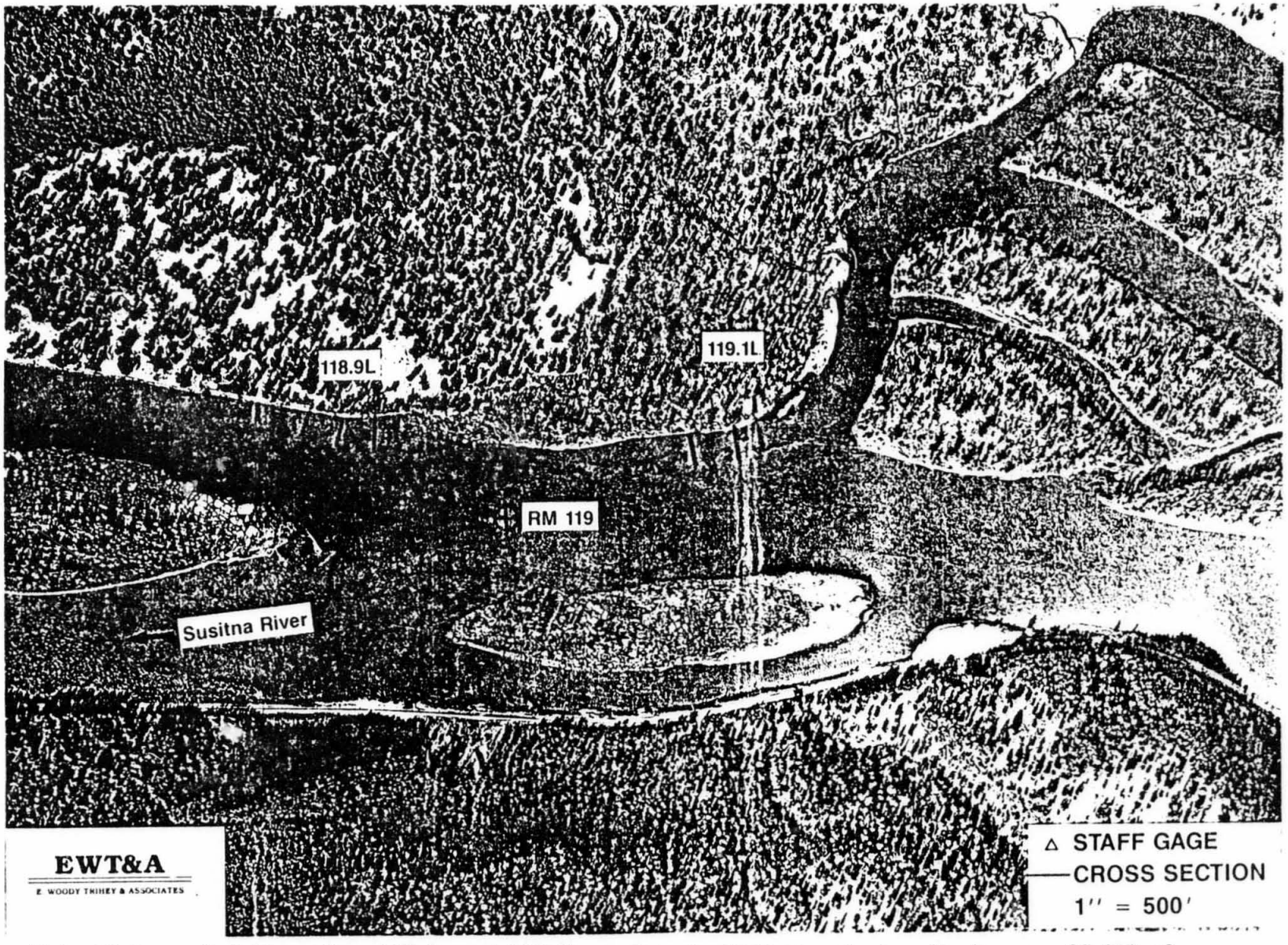


Plate IV-5. Modeling sites 118.9L and 119.1L on June 1, 1982 at mainstem discharge: 23,000 cfs.

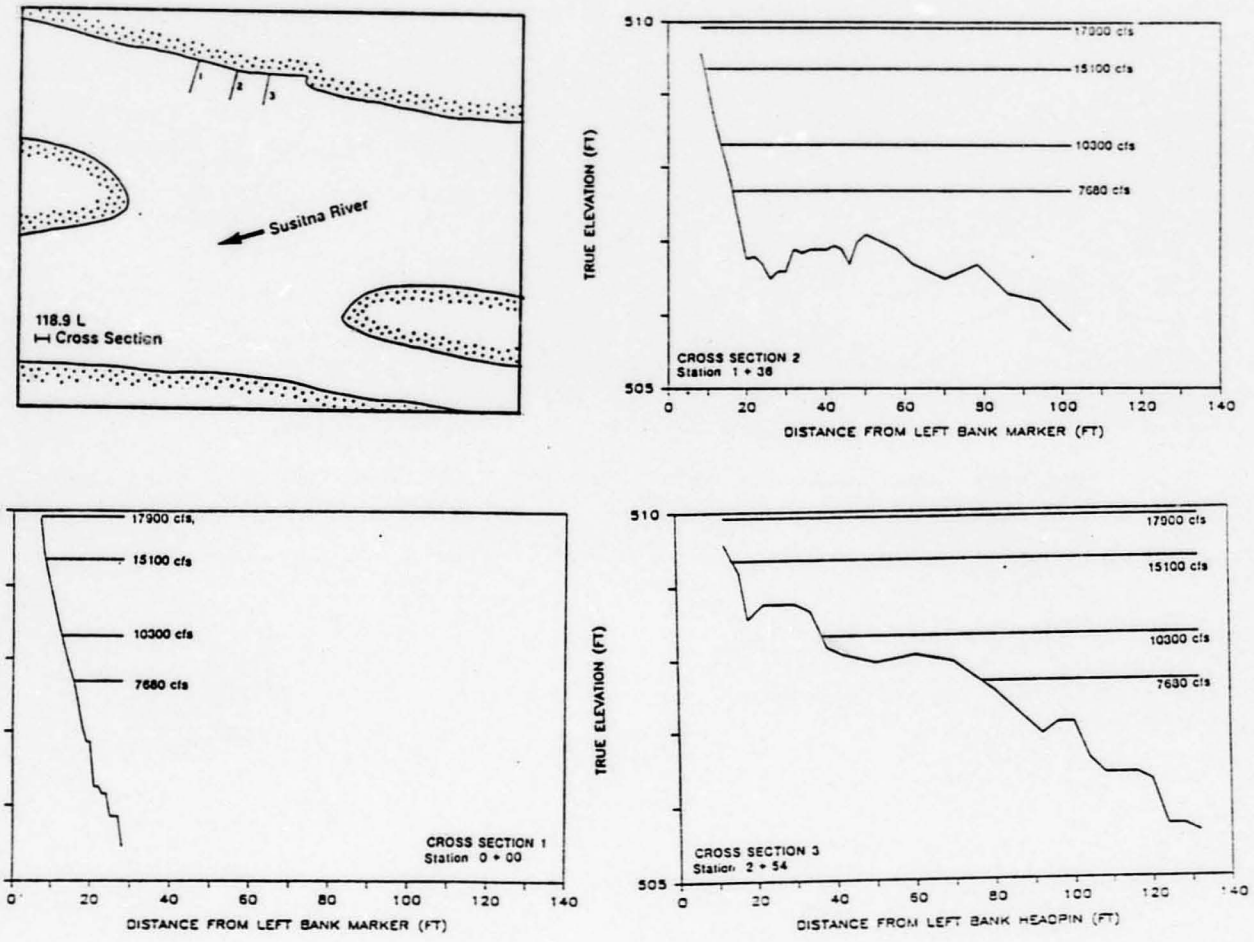


Figure IV-17. Cross sections for 118.9L study site depicting water surface elevations at discharges of 7680, 10,300, 15,100 and 17,900 cfs.

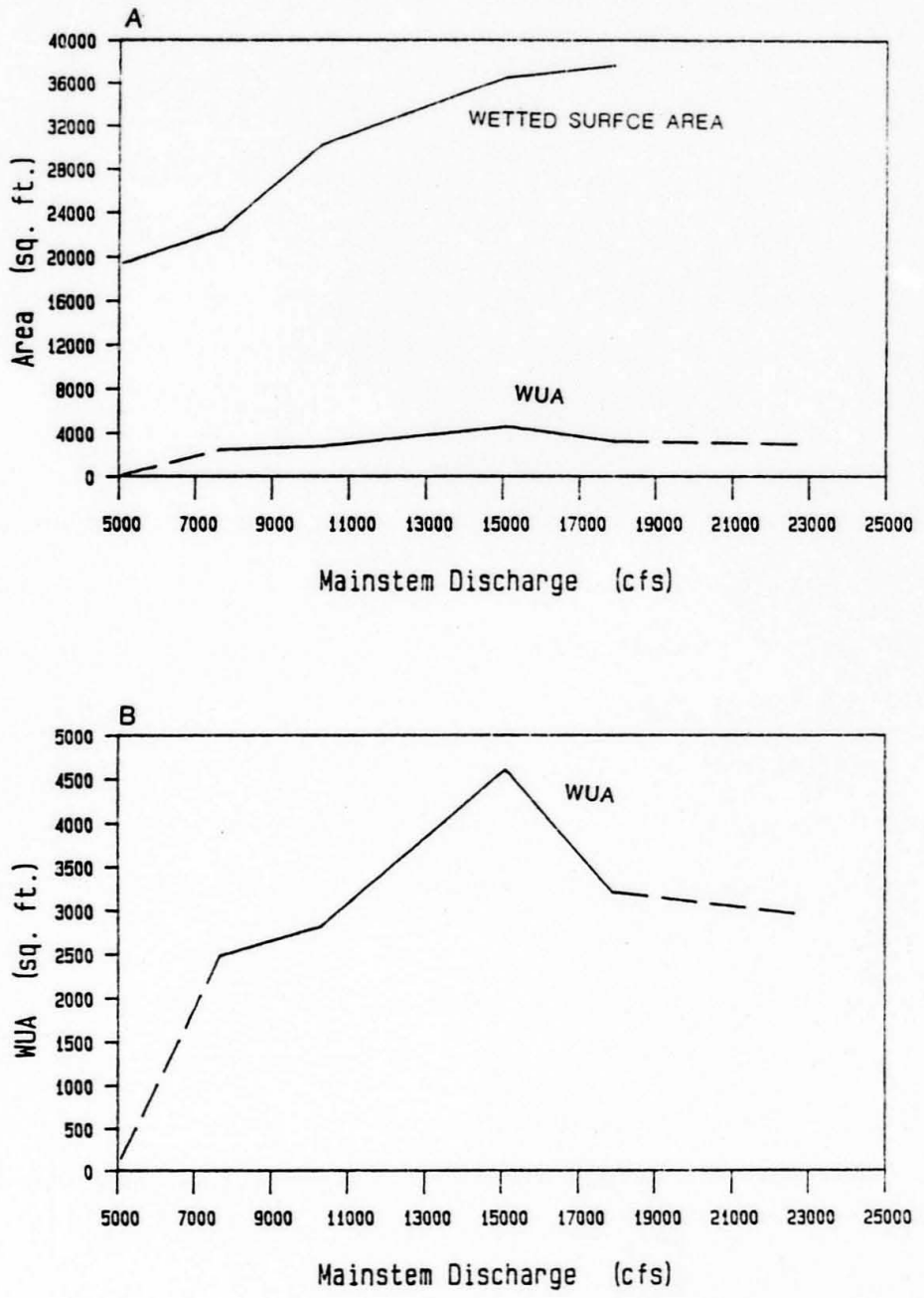


Figure IV-18. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 118.9! modeling site.

Four data sets were collected from mainstem discharges of 7,680 to 17,900 cfs. From Section II of this report, the stage discharge indicates the relationship between water surface elevation and mainstem discharge remains constant from 5,000 to 23,000 cfs. The gravel bar which extends from above the study area down to midway between cross sections 2 and 3 provides shallow depths in upwelling areas. As flows increase up to 15,100 cfs, the depth of flow increases in the upwelling areas until the entire area is optimum for spawning habitat. The WUA function begins to decrease as the velocities begin to limit spawning in the upwelling areas.

To expand the range of flow covered by the WUA curve, additional data sets were developed at 5,100 and 23,000 cfs. The stage-discharge curve for cross section 2 was used to determine the water surface elevation at both flows. A gravel bar influences the stage at the upper end of the study area, particularly, the upwelling areas. At low discharges, the upwelling area appears as bank seepage and is very shallow. The mainstem begins to flood the upwelling area above 7,680 cfs and continues until the entire area is flooded at 15,100 cfs.

Above 15,100 cfs velocities begin to exceed 1.3 ft/sec the ~~largest~~ optimum velocity for chum salmon spawning. This decreasing trend is similar to the habitat response at other side channel sites in the middle river. Time series plots of WUA and mainstem discharge are shown in Figure IV-19 for site 118.9L.

Site 119.1L

Site Description: This site is located approximately 1.5 miles below Curry Station on the west bank of the Susitna River (Plate IV-5). A large side

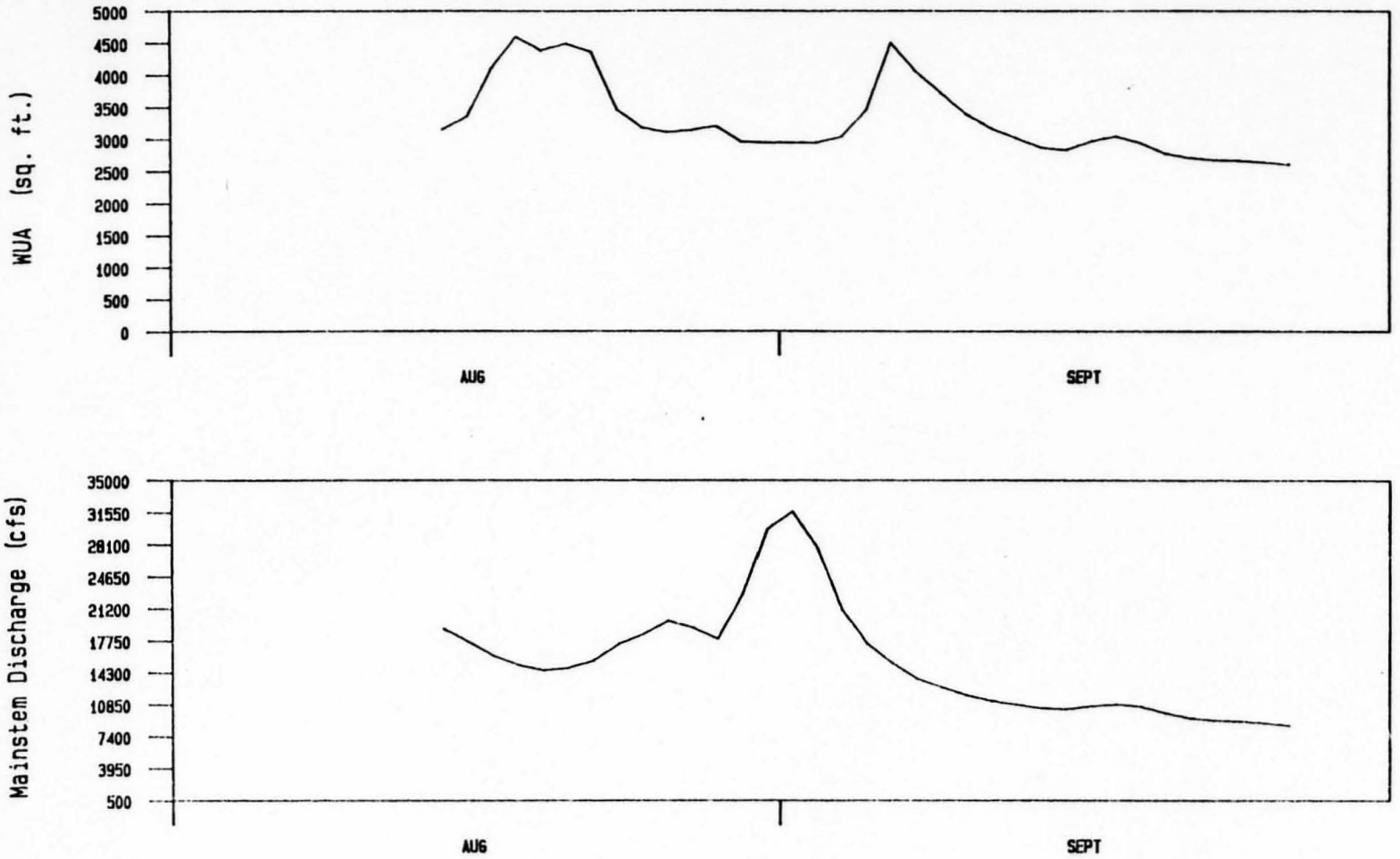


Figure IV-19. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 118.9L modeling site.

channel enters the mainstem at the upstream end of the study area. The study area is 425 feet long and located along the mainstem margin. Three cross sections were established to describe the mainstem margin; a fourth cross section a clear backwater area (Figure IV-20). Below discharges of 18,000 cfs, the backwater area is dewatered. Cobble and large gravel are present throughout the site with some silty sand deposits along the bank and larger substrate in the mainstem. This mainstem study site was selected as a suspected upwelling area, however, chum salmon have not been previously observed at the site.

Cross section 4 has clear water down to 18,000 cfs. Chum salmon were observed spawning in the study site. Juvenile chinook salmon were also observed in the site. No passage or access is limiting at this site except at cross section 4. No open thermal leads in the ice were observed in the winter reconnaissance trips.

Spawning Habitat: Because no upwelling areas were observed throughout the 1984 and 85 field season, no habitat response curves were developed for the site. Clear water was observed ponded above cross section 3 through cross section 4 at discharges greater than 18,000 cfs. Field measurements were made at the site at discharges less than 18,000 cfs when the area was dry. Time series plots of WUA and mainstem discharge is shown in Figure IV-20.

Site 125.0

Site Description: Skull Creek is located below this study site on the east bank of the Susitna River (Plate IV-6). The study reach is 1,475 feet long

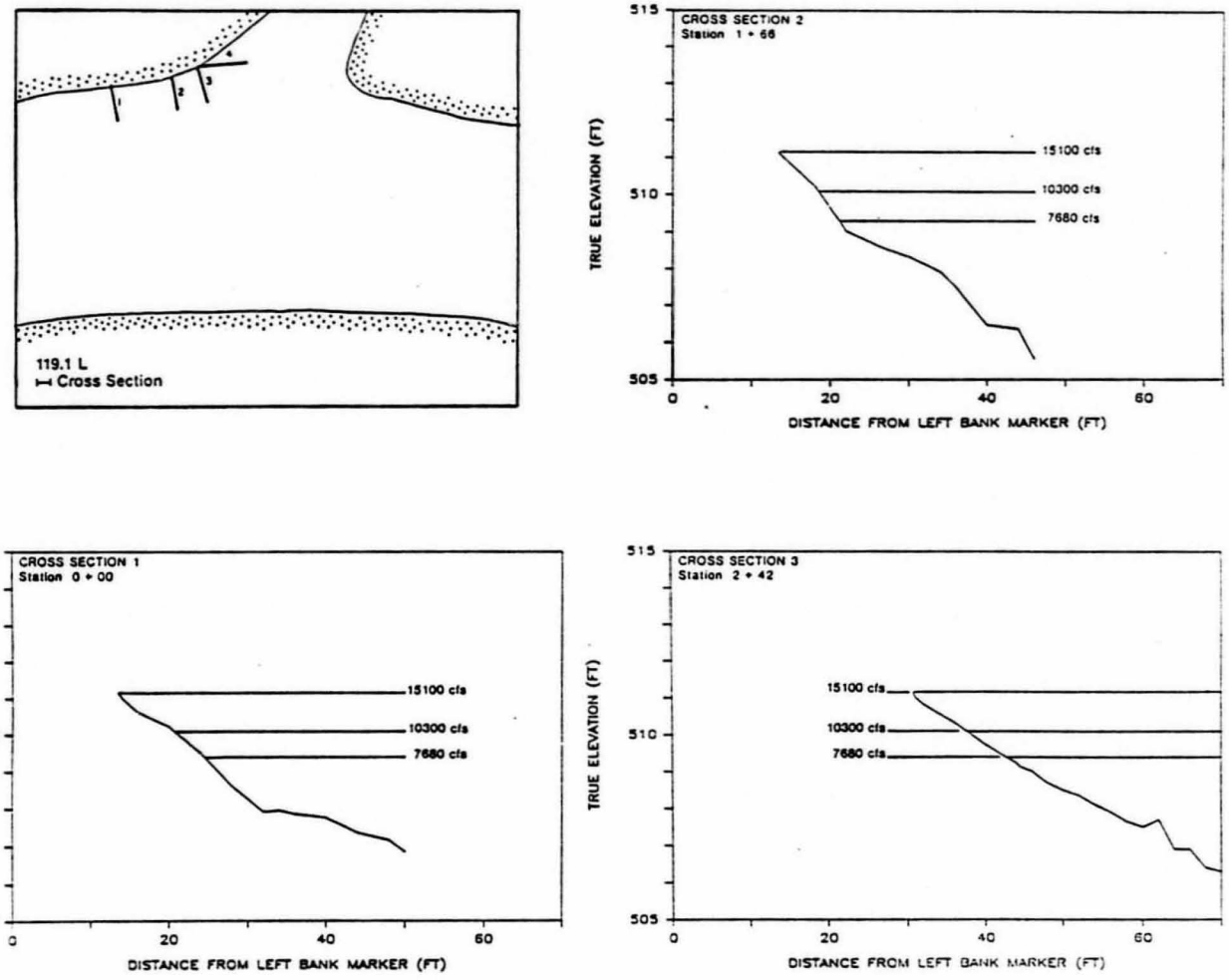


Figure IV-20. Cross sections for 119.1L study site depicting water surface elevations at discharges of 7680, 13,600 and 19,100 cfs.

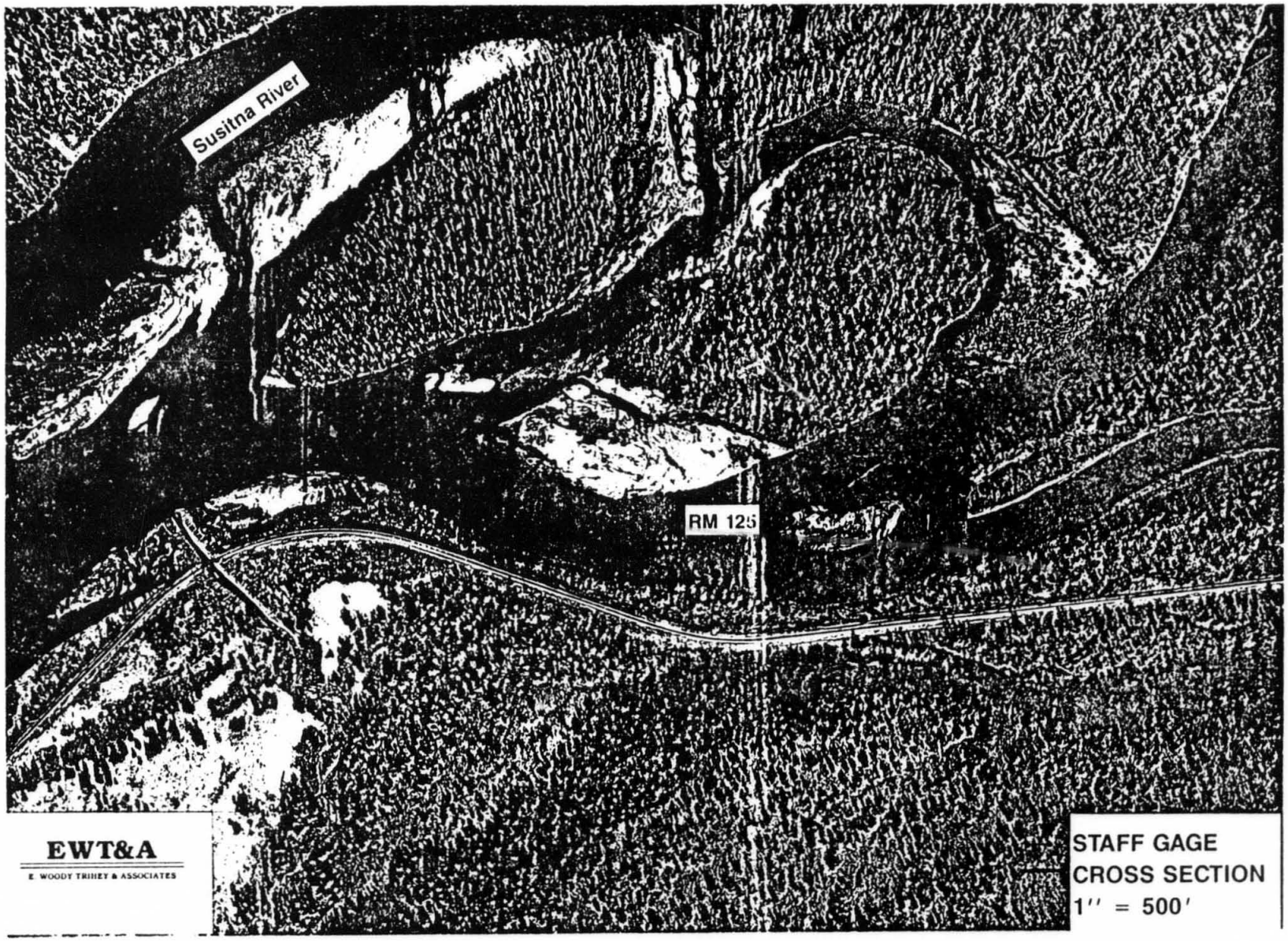


Plate IV-6. Modeling site 125.2R on June 1, 1982 at mainstem discharge: 23,000 cfs.

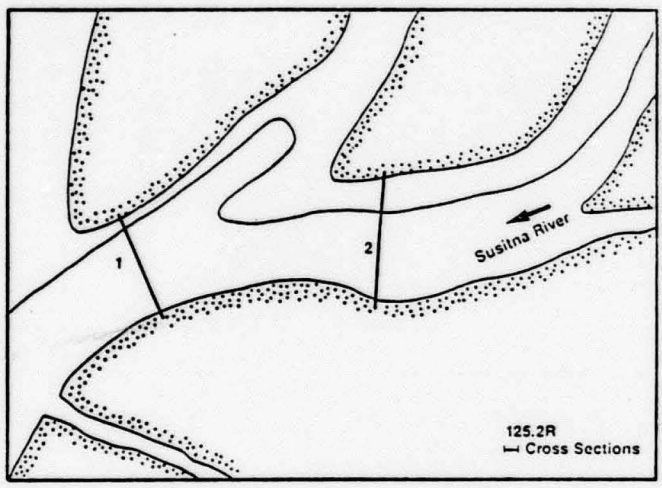
and 250 feet wide. Two cross sections were established to describe the high velocities present throughout the channel (Figure IV-21). Substrate throughout the site is sharp, flat gravel and rubble unlike the typical smooth round substrate generally present throughout the river. This side channel study site was selected as a suspected upwelling area, however chum salmon adults have previously been recorded to use the site. - reference

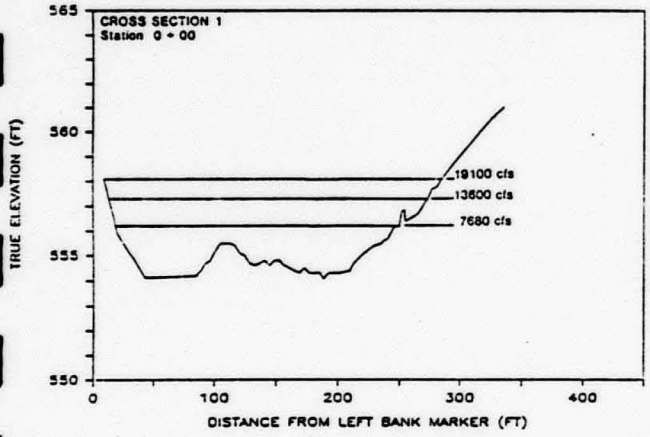
A deep, low velocity area is present along the left bank of cross section 1. A large shoal area is present along the left bank of cross section 2. At low mainstem discharges, a gravel bar alters the water surface elevation from horizontal across cross section 2.

Adult Chum and pink salmon were observed using the site. Chinook fry were found using the site. Access or passage are not problems at this site for any discharge.

Open thermal leads kept the entire channel free of ice and snow. Strong upwelling was observed along the left bank of cross section 1. Slight amounts of upwelling was recorded mid- channel and along the right bank. At cross section 2, moderate amounts of upwelling is present mid-channel and along the right bank.

Spawning Habitat: The wetted surface area and chum salmon WUA response curves for this site are representative of medium to large side channel areas (Figure IV-22a and b). Surface area and WUA response curves are presented in Figure IV-22a for site 125.2R. A relatively narrow range of spawning chum WUA exists at mainstem discharges between 5,100 and 23,000 cfs. This is probably caused by





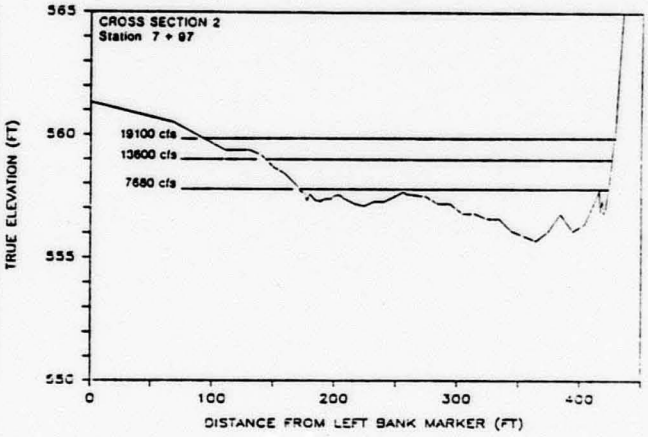


Figure IV-21. Cross sections for 125.2R study site depicting water surface elevations at discharges of 7680, 13,600 and 19,100 cfs.

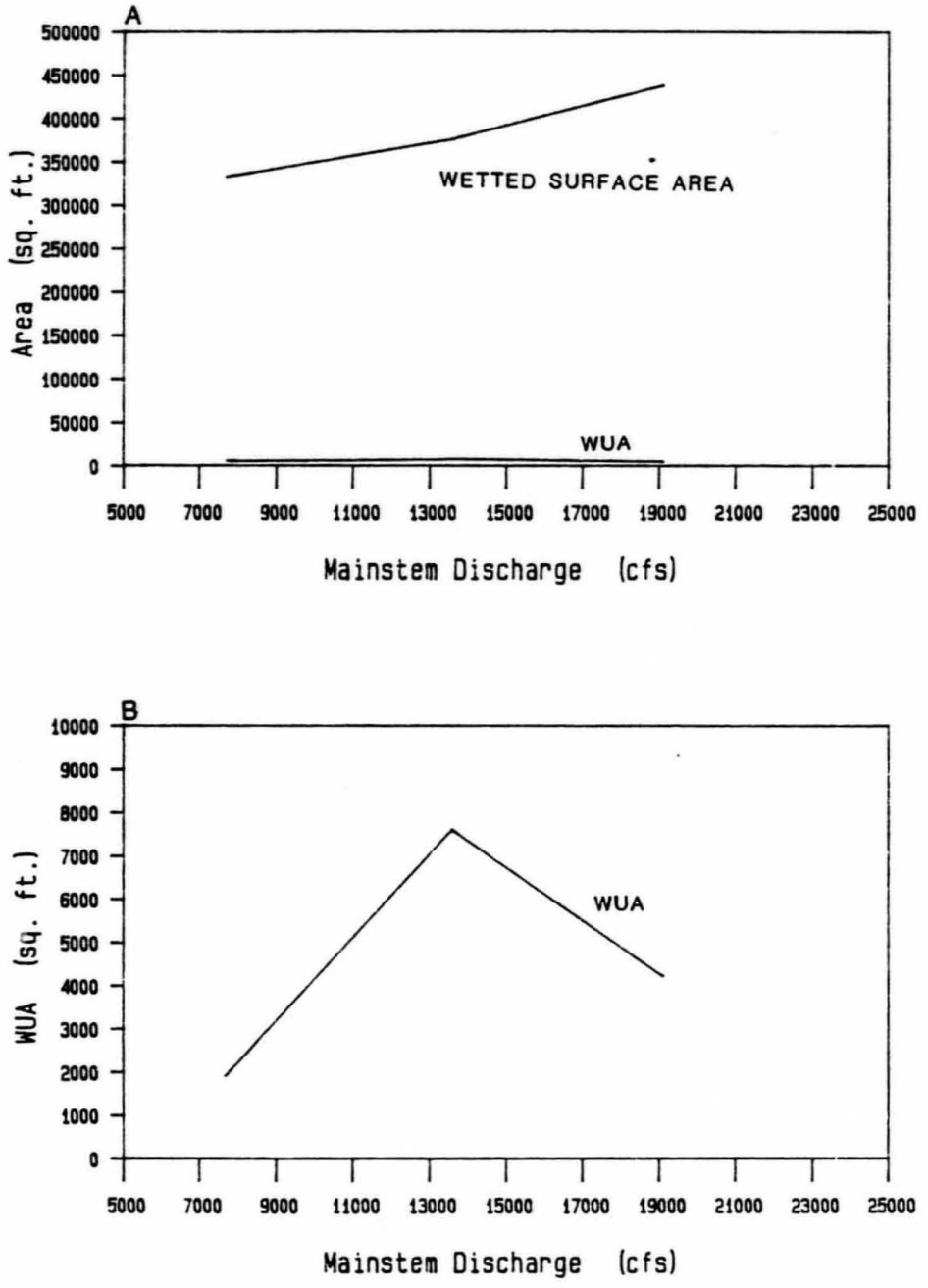


Figure IV-22. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 125.2R modeling site.

comparable rates of gaining and losing habitat at the site. The upwelling areas are located along both banks range in strengths from slight to strong. Most of the suitable spawning habitat occurs along the left bank at cross section 1 in the large backwater area. Velocities are not limiting in this area through the range of available data.

Variations in the mainstem discharge with respect to WUA is shown in Figure IV-22b plotted on an expanded scale. The increase in WUA is caused by the low velocities in the shallow upwelling areas. As the discharge increases, the upwelling areas along the left bank reach an optimum depth while the velocities along the right shore begin decreasing in suitability. The substrate in the study reach is not of optimal quality thus explaining the flat shape in the response curve.

The extrapolation flow at 23,000 cfs was selected due to the availability of aerial photography at this flow. A field reconnaissance trip was made to the study site when mainstem flows were 4,300 cfs. Much of the upwelling areas along both banks, with the exception being the backwater area at cross section 1, were too shallow for use. At 23,000 cfs, the high velocities in the spawning areas limit the upwelling. Time series plots of WUA and mainstem discharge are presented in Figure IV-23.

Site 130.2R

Site Description: Sherman Creek is located just above this large side channel along the east bank of the Susitna River (Plate IV-7). At discharges below 15,000 cfs, a small backwater area can be observed separate from the side

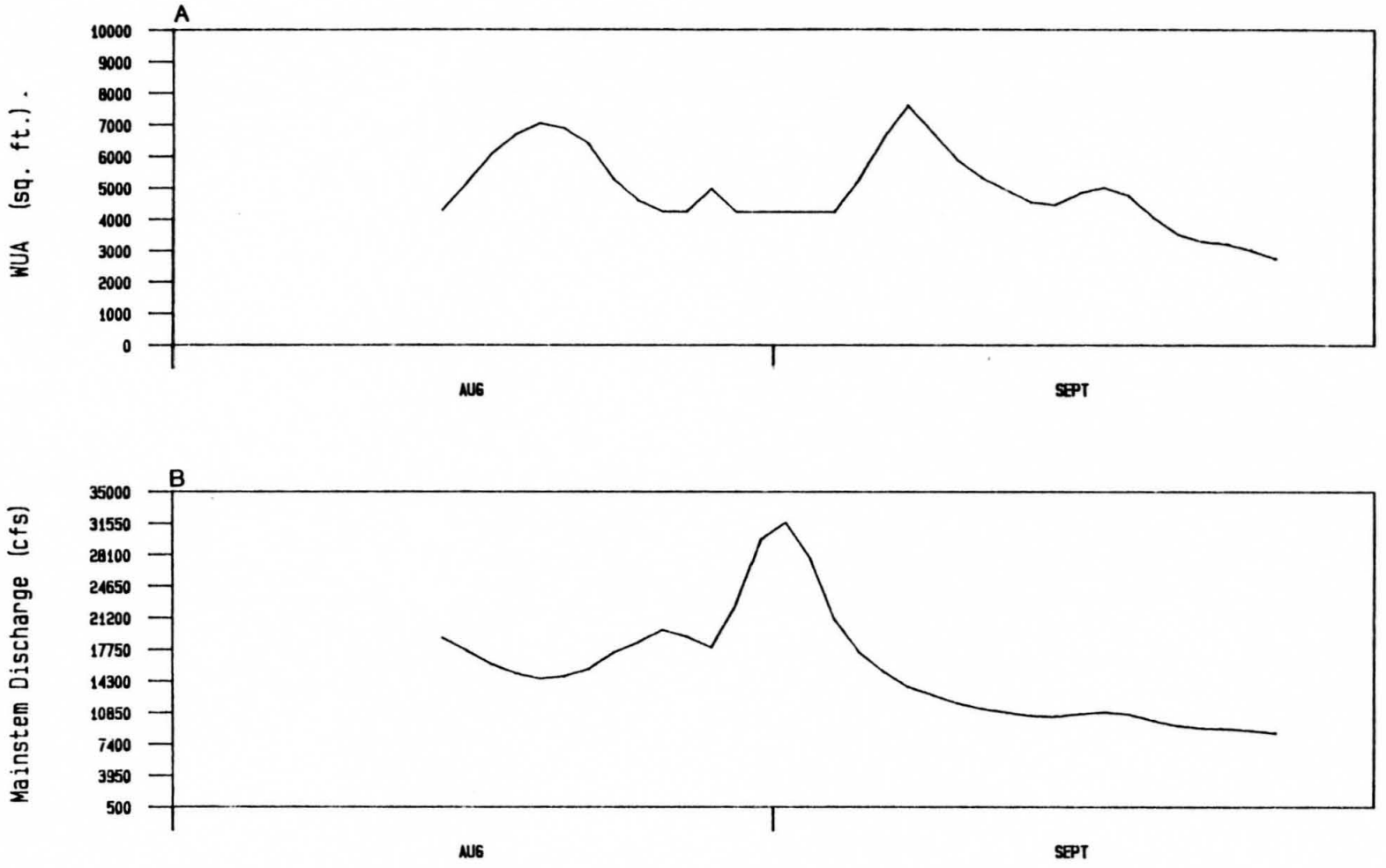


Figure IV-23. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 125.2R modeling site.

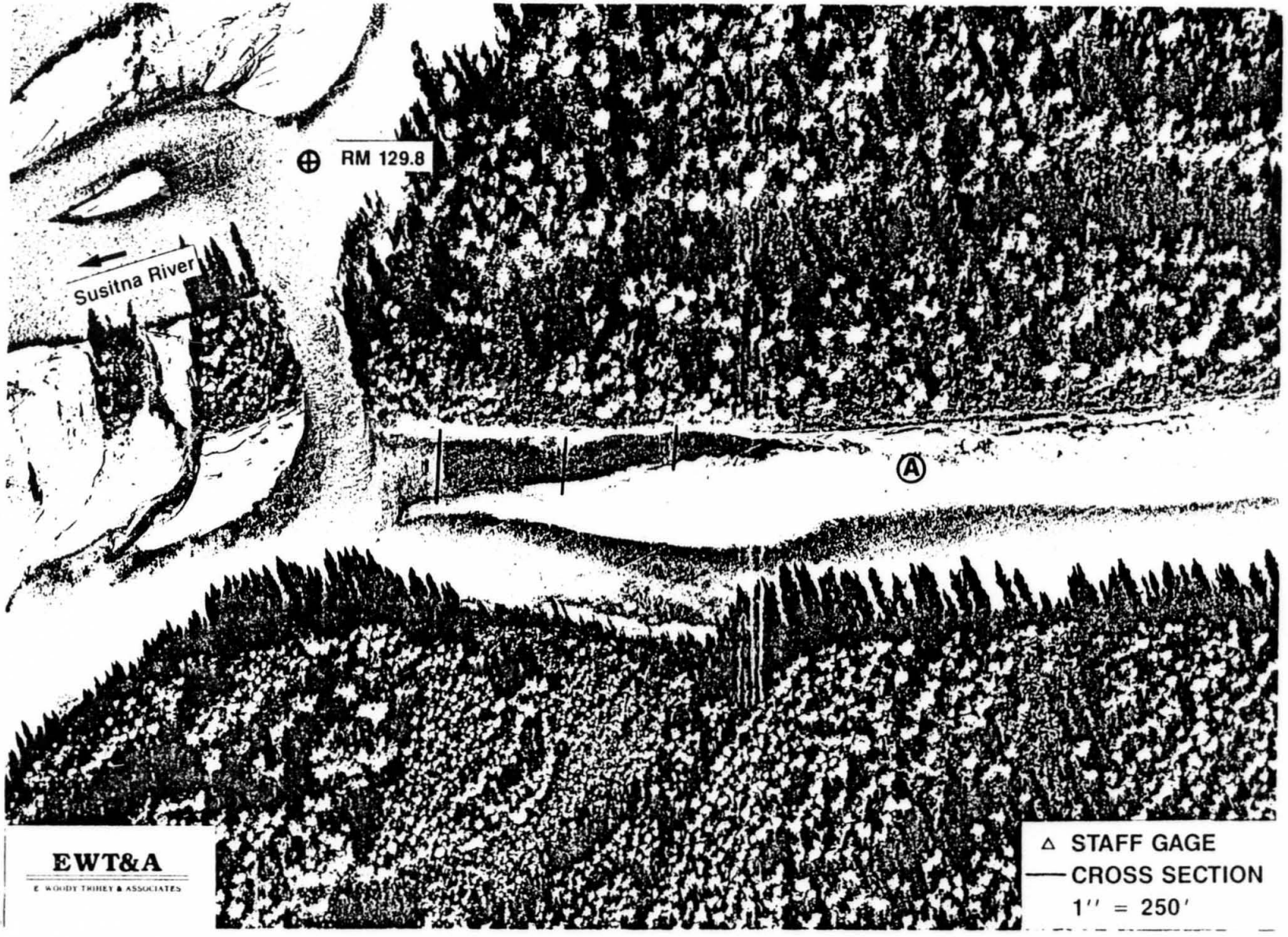


Plate IV-7. Modeling site 130.2R on September 6, 1983 at mainstem discharge: 16,000 cfs.

channel. The study reach is 700 feet long and varies between 100 feet at cross section 1 to 30 feet wide at cross section 3. Three cross sections were installed to define the shallow, low velocity area (Figure IV-24). Cobble and rubble is present throughout the upper half of the site overlayed with a layer of silt, sand in the lower half. This backwater study site was selected as a suspected upwelling area with some spawning activity previously observed.

At 23,000 cfs, the study site is turbid and connected to the side channel. At 10,600 and 7,400 cfs, the channel flow is maintained by groundwater.

Both chum adult and chinook juvenile salmon were observed to utilize the site. Access to the site is not limiting at any discharge. Passage above the riffle upstream of cross section 2 becomes difficult below 10,000 cfs (Figure C-1.3). Upwelling was noted throughout the site during low flows. However, the strength of the upwelling is slight since the site remained frozen over during the winter.

Spawning Habitat: Total wetted surface area and spawning chum WUA curves are presented in Figure IV-25a. Both curves are plotted to the same scale. The largest proportion of wetted surface area provides good spawning habitat at discharges above 14,500 cfs.

The WUA curve plotted in Figure IV-25b at an expanded vertical scale increases near 14,500 cfs when the upwelling areas are no longer too shallow to be used by spawners. Below 14,500 cfs, much of the study reach and upwelling areas are limiting to spawning chum. Above 14,500 cfs, the gravel bar which separates the study area from the side channel retards the flow thereby not permitting velocities to become limiting.

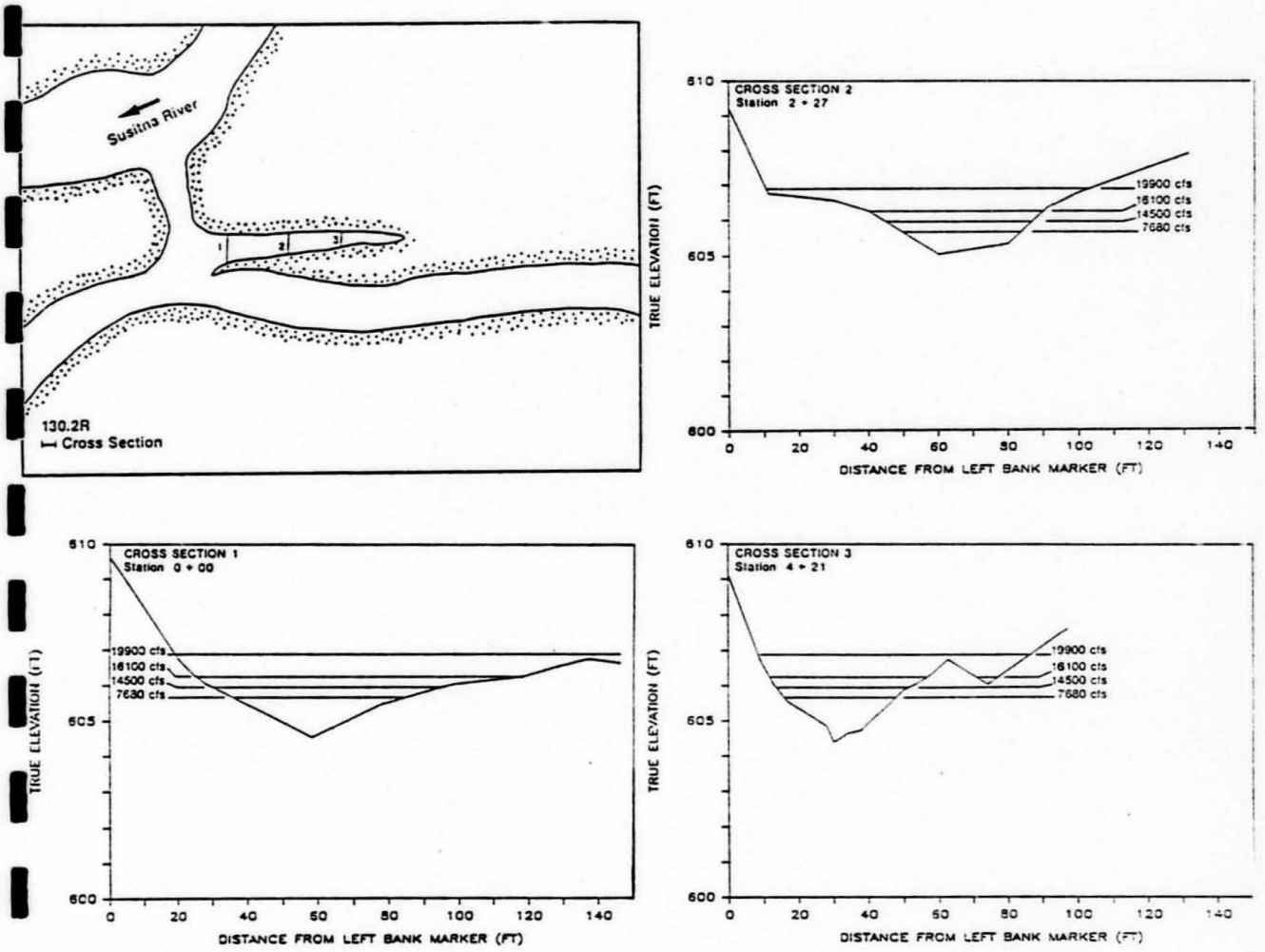
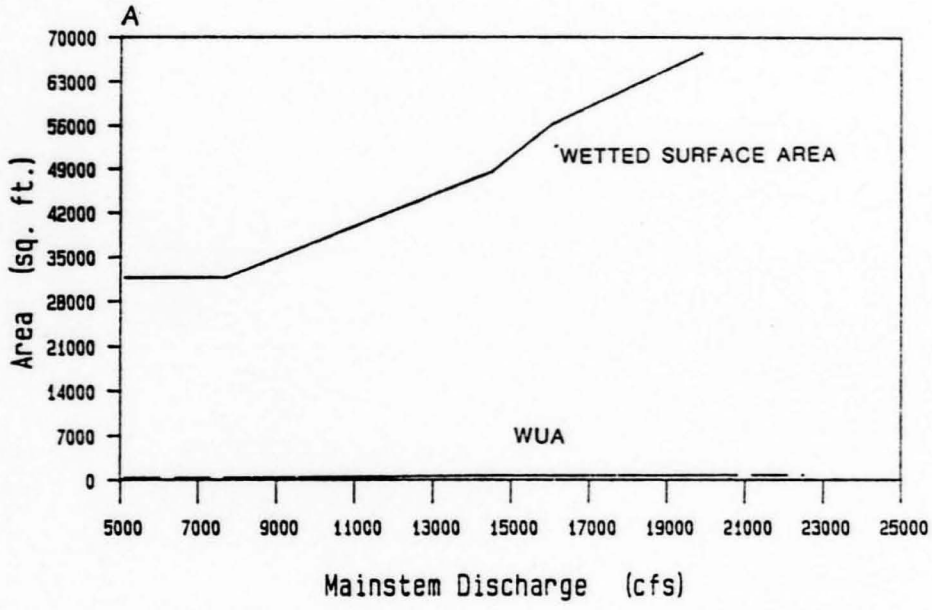


Figure IV-24. Cross sections for 130.2R study site depicting water surface elevations at discharges of 7690, 14,500, 16,100 and 19,900 cfs.



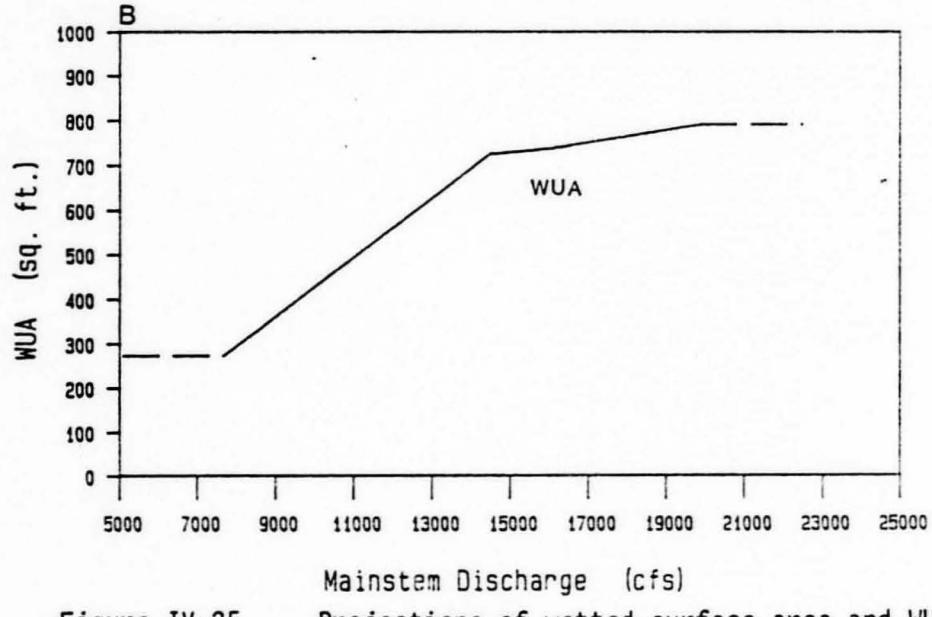


Figure IV-25. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 130.2R modeling site.

To expand the range of the habitat response curve, extrapolation data sets at 5,100 and 23,000 cfs were developed. From the stage discharge curve for cross section 2, it is apparent the water surface elevation remains constant at low flows. The WUA value determined for the data set collected at 7,680 cfs was assigned to 5,100 cfs. The water surface elevation as determined from the stage discharge curves were used in conjunction with the data set collected at 19,900 cfs to determine the WUA at 23,000 cfs. Time series plots of WUA and mainstem discharge are shown in Figure IV-26.

Site 131.3L

Site Description: This study site is located immediately upstream from the confluence of Fourth of July Creek between vegetated gravel bars on the west bank of the Susitna River (Plate IV-8). The study reach is 1,075 feet long and 130 feet wide. Cross section 1 is located in a deep low velocity area; cross sections 2 through 4 in faster, shallower areas (Figure IV-27). The substrate is predominately gravel and rubble throughout the site with a layer of silty sand in the backwater area at the mouth of the channel. This side channel study site was selected as a known upwelling and chum salmon spawning area.

Two heads (A and B) direct flow into the site at 9,000 and 10,700 cfs respectively. Below breaching discharges, groundwater maintains flow through the study reach. Chum salmon were observed spawning in the area particularly along the right bank. A moderate number of chinook fry were collected during sampling efforts. Access to the site is possible below both breaching

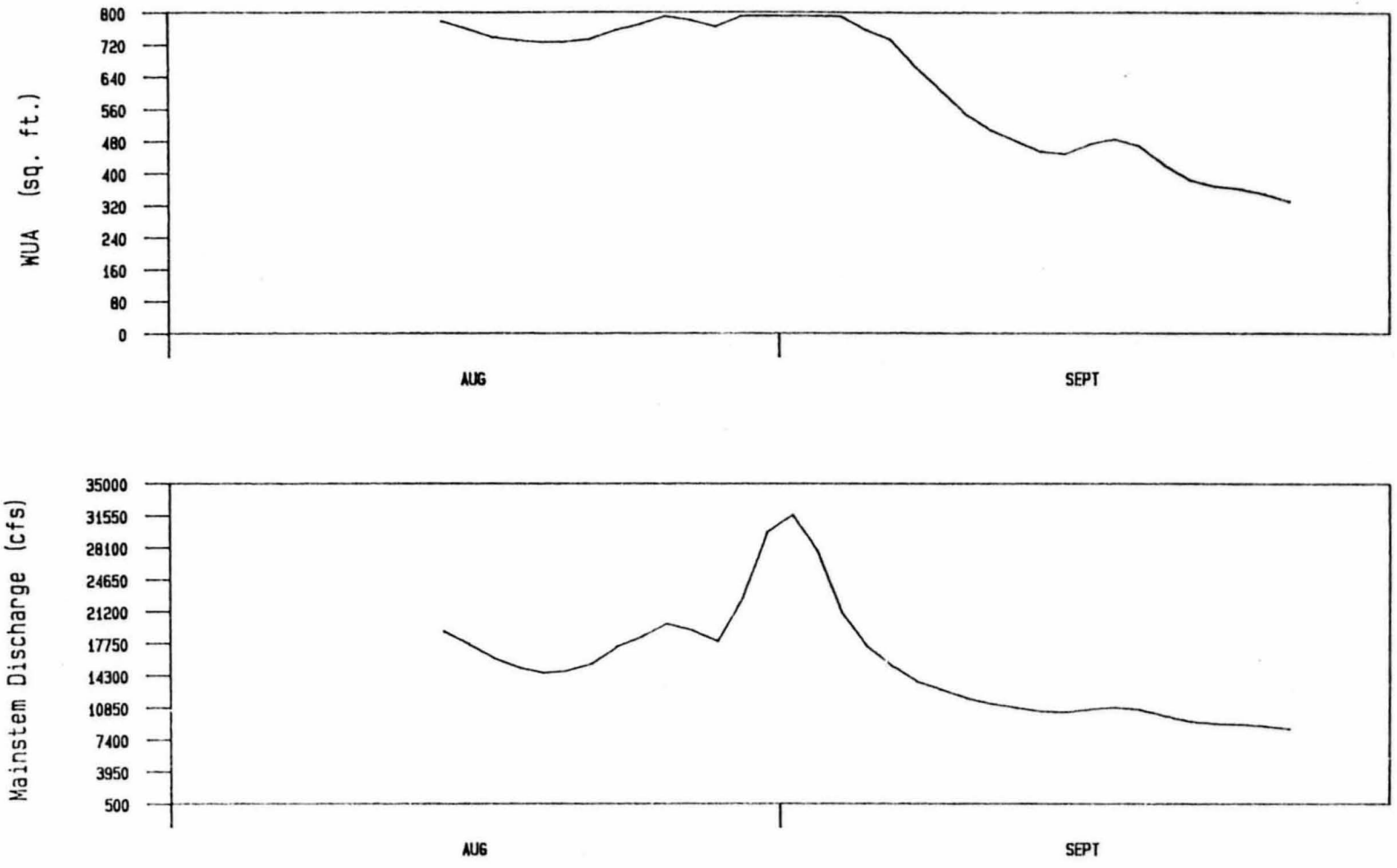


Figure IV-26. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 130.2R modeling site.

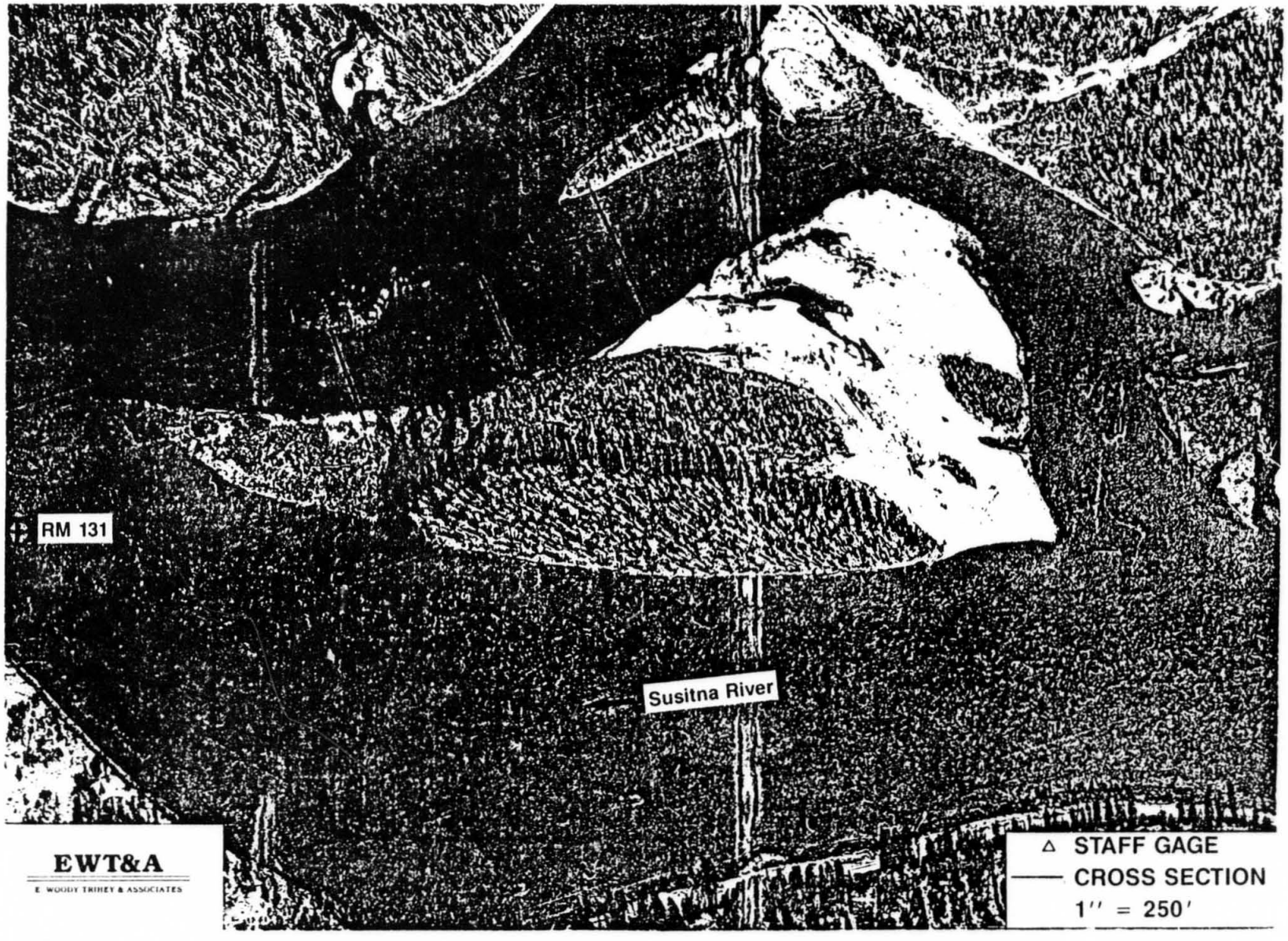
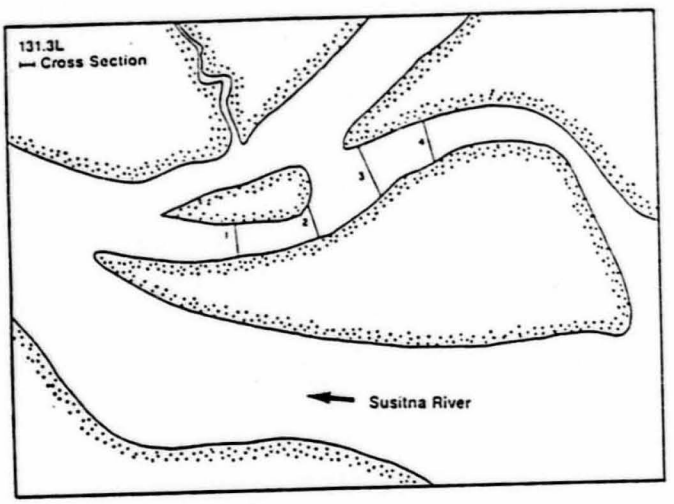


Plate IV-8. Modeling site 131.3L on June 1, 1982 at mainstem discharge: 23,000 cfs.



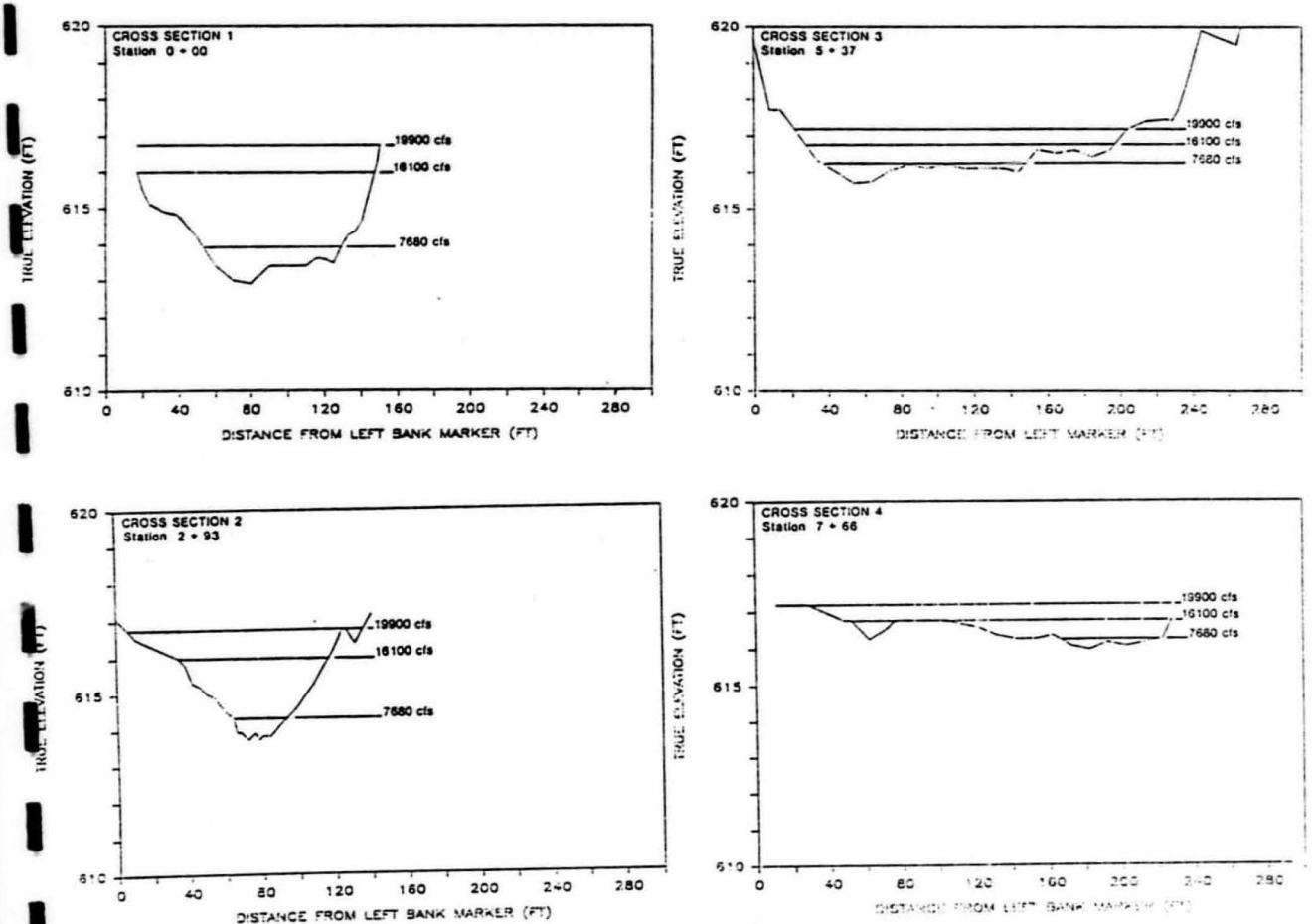


Figure IV-27. Cross sections for 131.3L study site depicting water surface elevations at discharges of 7680, 16,100 and 19,900 cfs.

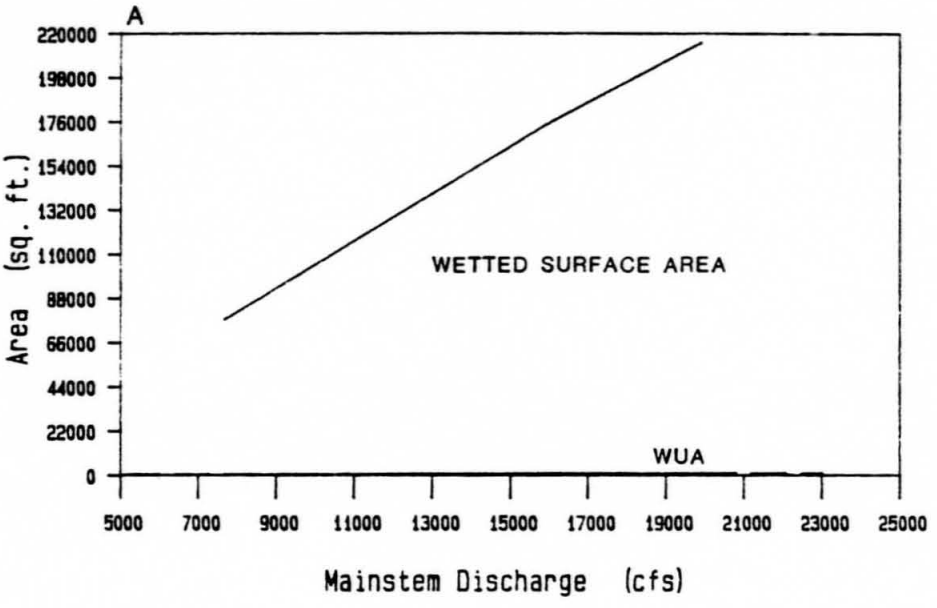
discharges. Passage through the site is possible, but difficult below the breaching discharges.

Moderate to strong strengths of upwelling was noted along the right bank in the lower half of the study site. Moderate volumes of upwelling was measured along the left bank in the upper half of the site.

Spawning Habitat: The surface area and spawning chum WUA curves for 131.3L are plotted to the same vertical scale in Figure IV-28a with the WUA curve replotted to an enlarged scale in Figure IV-28b.

The range of depth and velocity measurements extend from 7,680 to 19,900. Below 9,000 cfs, flow is maintained through the site by upwelling and groundwater inflow. Above 9,000 cfs, the gravel bar on the left side of the channel is overtopped directing flow into the bottom of the study site. Upwelling areas that were previously too shallow for utilization are now available. The habitat response curve continues upward as the head to the channel breaches near 10,700 cfs. At medium and high discharges the stage in the lower half of the channel becomes directly influenced by the mainstem forming a backwater area and depositing a layer of silt. Substrate such as silt and sand are too small to be used by spawning chum thereby decreasing the magnitude of the habitat response curve. Velocities become limiting to the spawners above 16,100 cfs decreasing the trend in the habitat curve.

Extrapolation data sets were constructed at discharges of 5,100 and 23,000 cfs. The stage throughout the study reach remains constant below 9,000 cfs



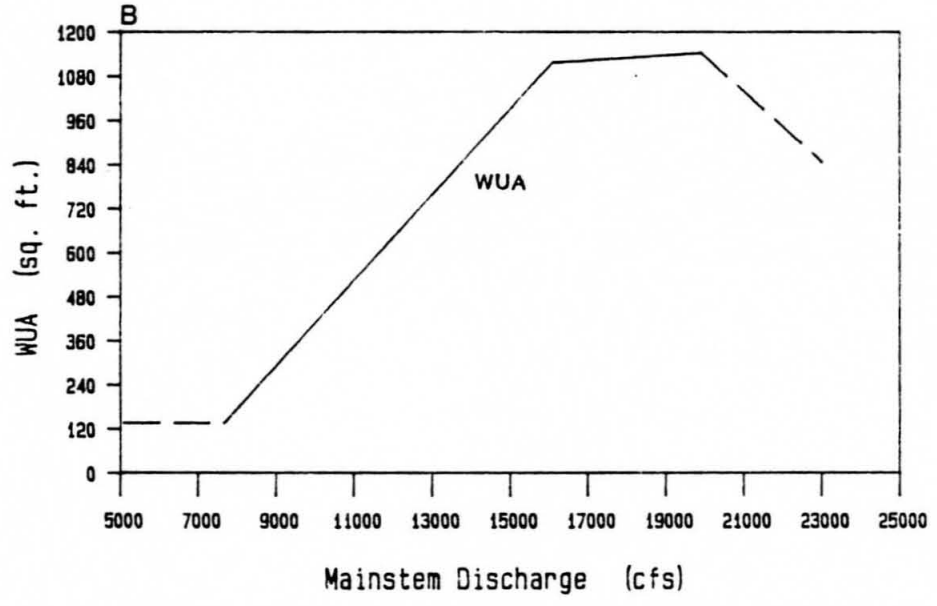


Figure IV-28. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 131.3L modeling site.

which means the WUA in this range also remains constant. The same WUA value determined for the 7,680 cfs data sets was assigned to 5,100 cfs. Time series plots of WUA and mainstem discharge are plotted in Figure IV-29.

Site 133.8R

Site Description: This study site is located at the head of Slough 9A on the east bank of the Susitna River (Plate IV-9). Three cross sections were established beginning on the right bank and converging at a common point on a gravel bar. these cross sections describe the fast velocity area along the mainstem margin (Figure IV-30). The substrate throughout this area varies from silt along the shore to cobble in the main channel. This mainstem margin study site was selected as a suspected upwelling area and no chum salmon spawning ~~were not~~ has been previously recorded.

Below 15,600 cfs, the shoal area along the mainstem margin begins to have a pronounced effect on the depths and velocities in the study area. No adult or juvenile salmon activity was observed at this study site. There are no access or passage limitations at this site.

Small upwelling and open thermal leads in the ice were observed along cross sections 1 and 3. The upwelling is assumed to be slight to moderate in strength as the area was frozen over during part of the winter season.

Spawning Habitat: Total surface area and WUA curves for spawning chum salmon are presented in Figure IV-31a. The WUA curve was replotted to an enlarged

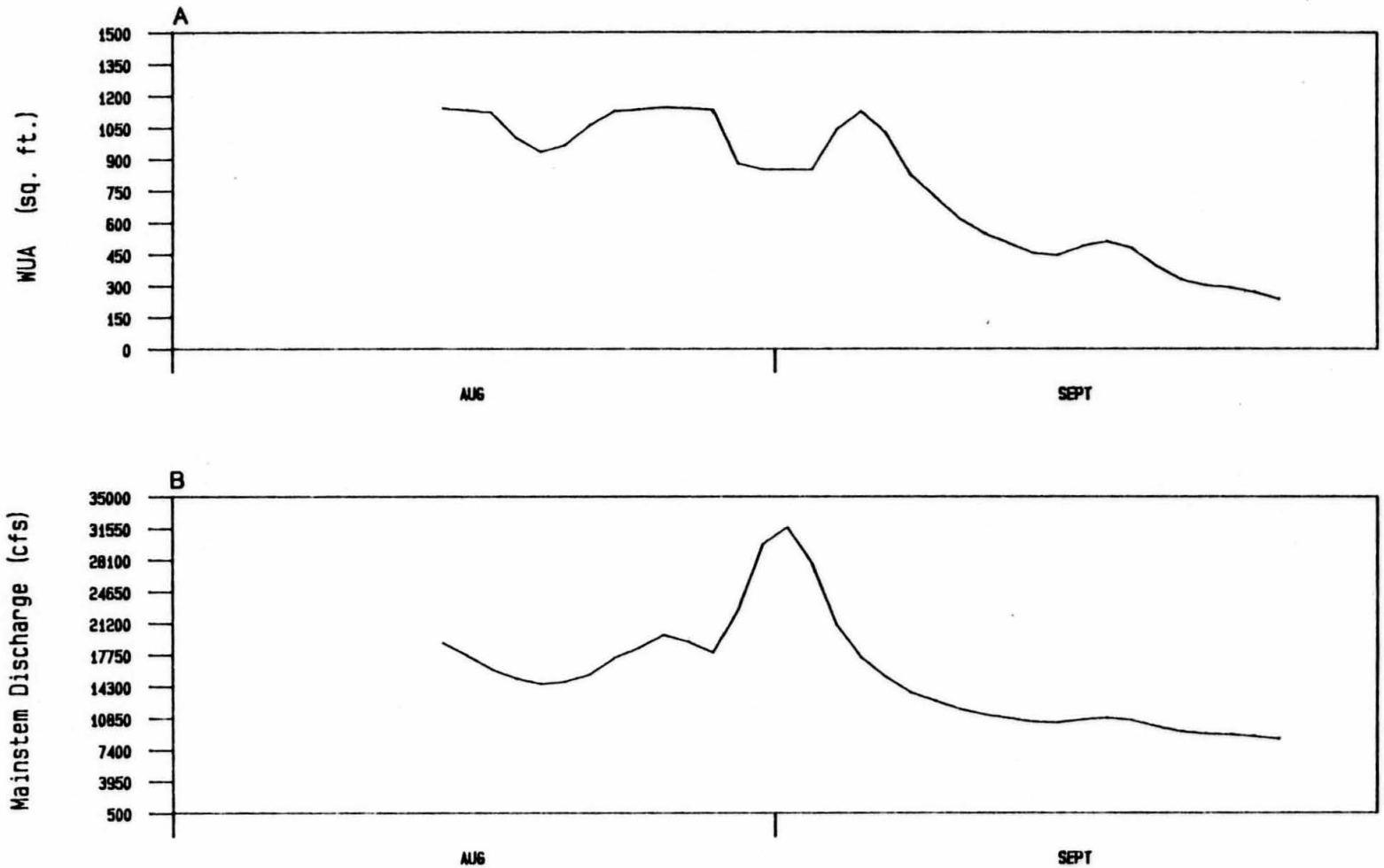


Figure IV-29. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 131.3L modeling site.

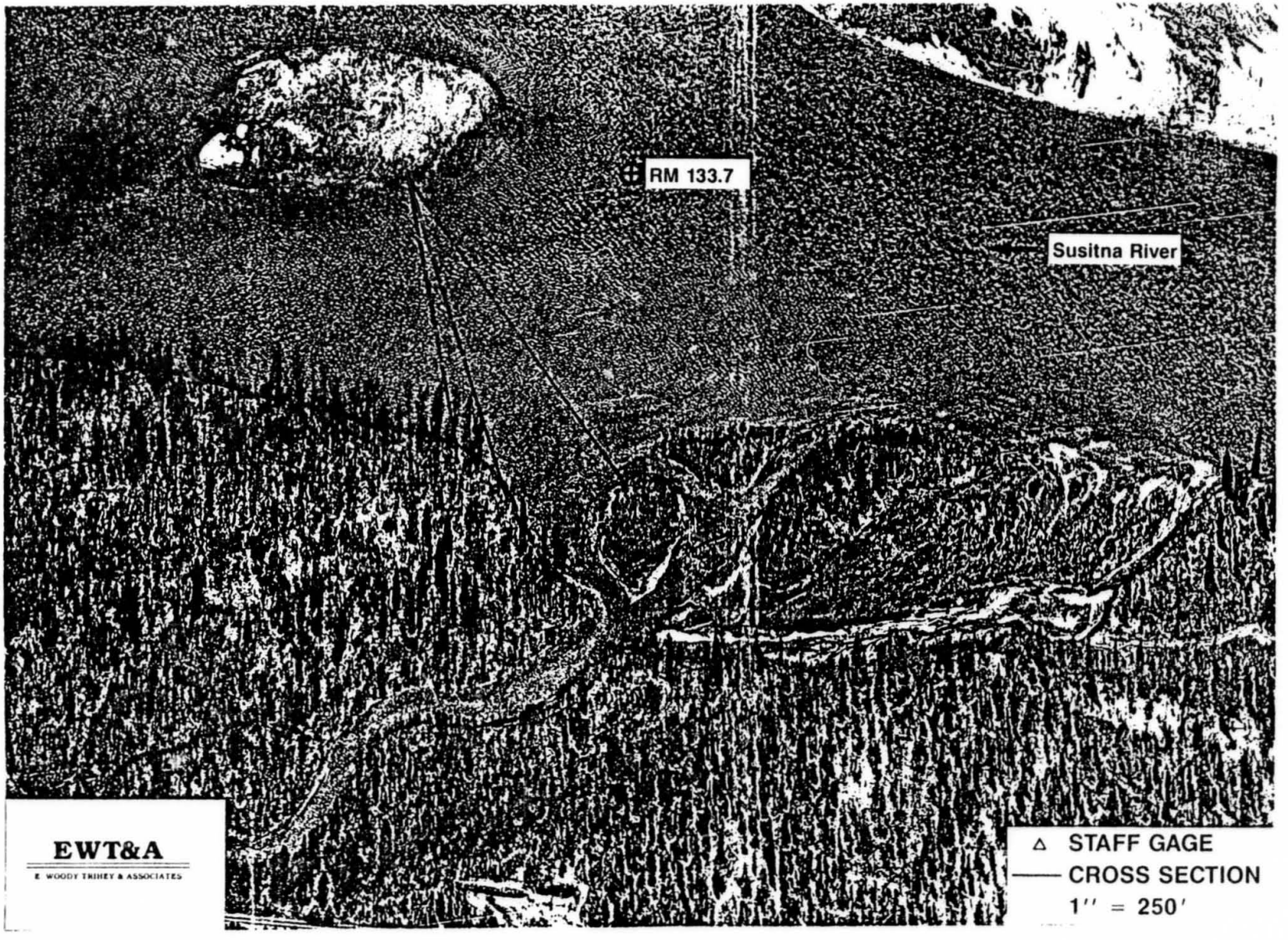


Plate IV-9. Modeling site 133.8R on June 1, 1982 at mainstem discharge: 23,000 cfs.

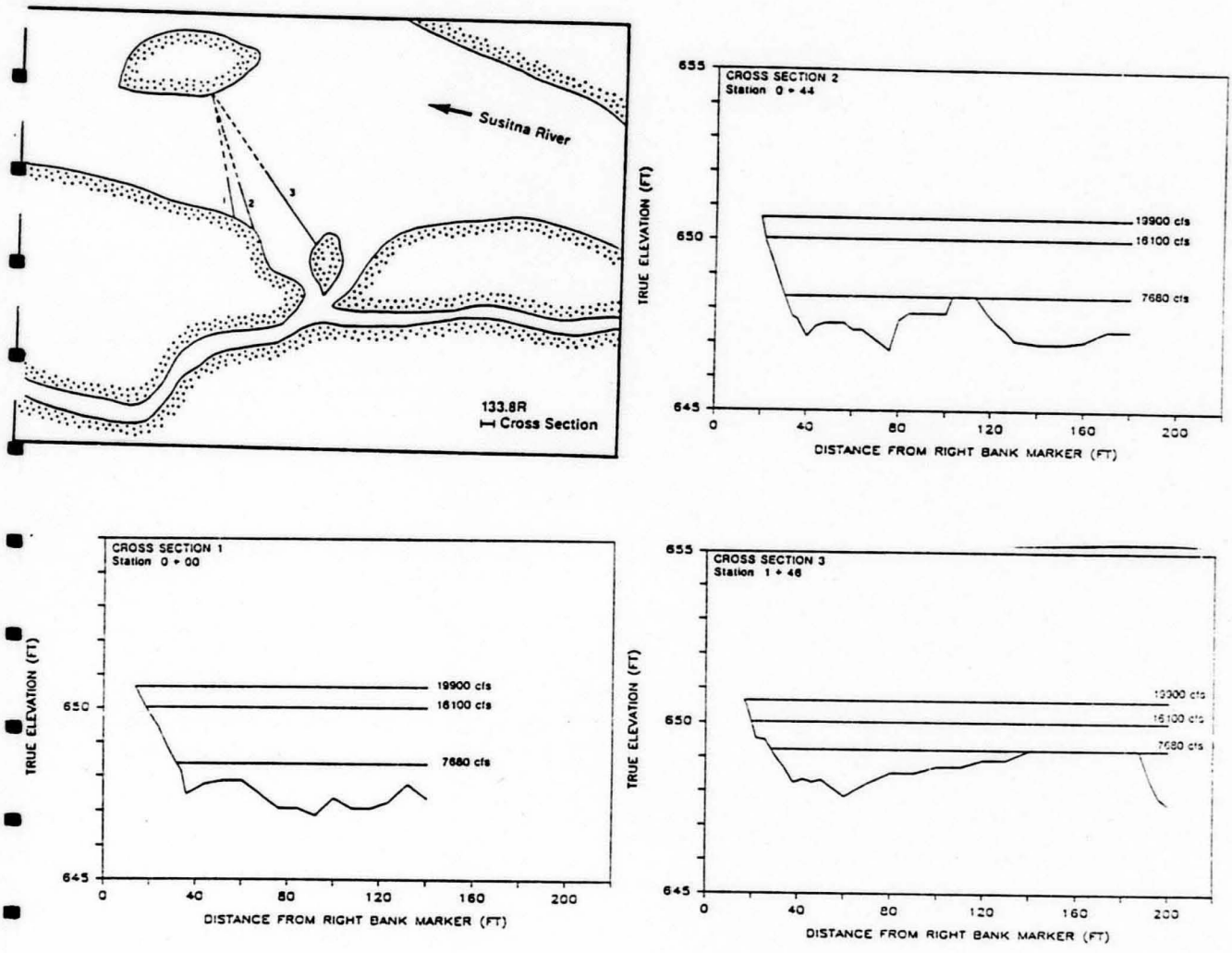


Figure IV-30. Cross sections for 133.8R study site depicting water surface elevations at discharges of 7680, 16,100 and 19,900 cfs.

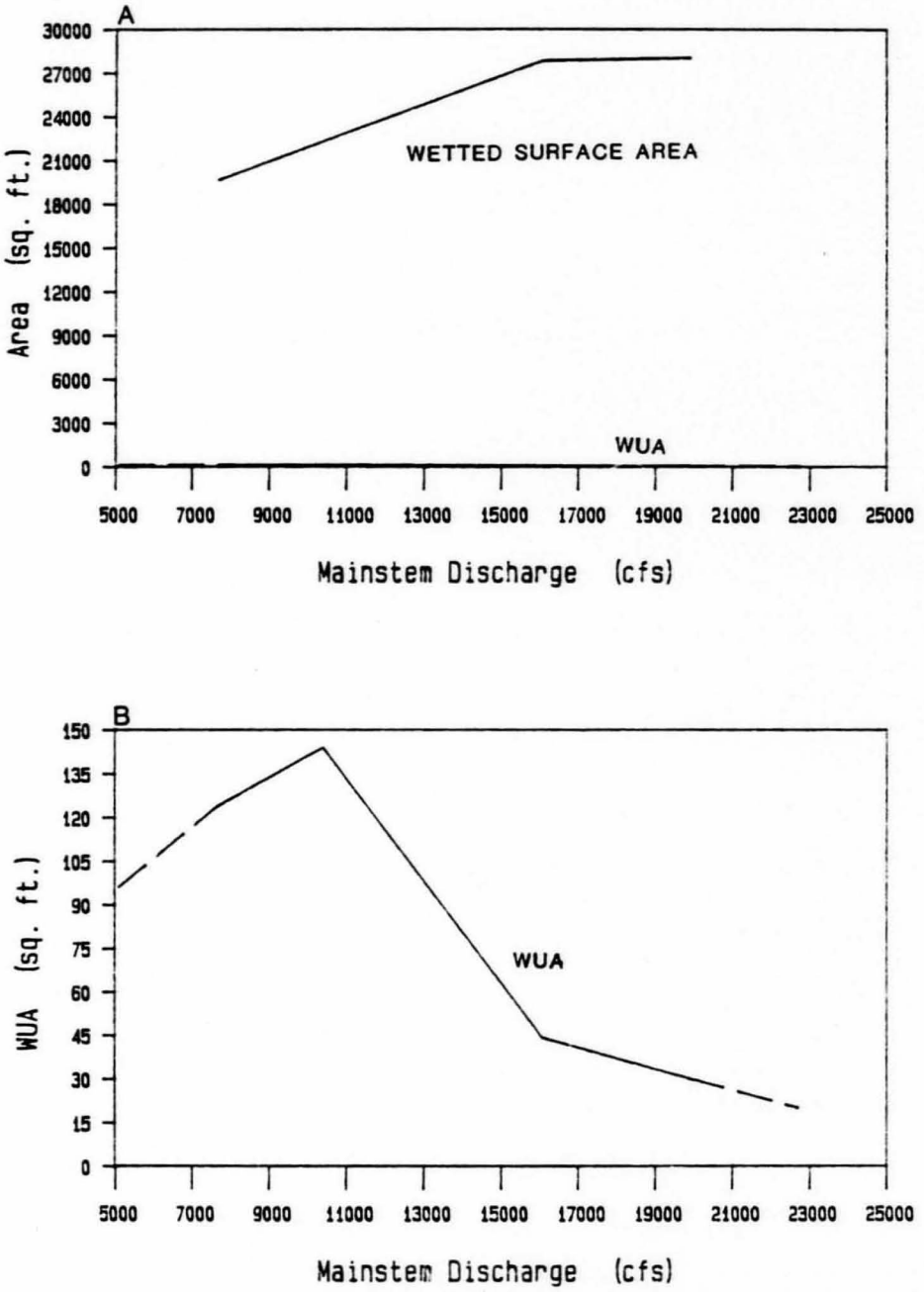


Figure IV-31. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 133.8R modeling site.

scale in Figure IV-31b. Figure a shows that habitat remains relatively constant from 5,000 to 35,000 cfs.

Data sets were collected at discharges of 7,680, 16,100 and 19,900 cfs. Throughout this range, the depths over the upwelling areas are sufficient for spawning. Substrate is also good for spawning. However, there is only two small upwelling areas present within the site which explains the small amplitude of the habitat response curve. An increase in mainstem discharge causes the velocities at the upwelling areas to increase beyond the range of suitable velocities for spawning.

Additional data sets were developed for discharges of 5,100, 10,400 and 22,700 cfs. The latter two discharges correspond to conditions observed during trips to the study site on September 22 and August 24, 1985. The stage discharge curve for cross section 3 was used to determine the water surface elevation at the thru flows. Most of the upwelling areas have depths greater than 0.2 ft at the lower flows and the entire area is optimum with respect to depth at 22,700 cfs. Velocities at this site are usually unsuitable for spawners at all discharges and become less likely to be used at high discharges. This explains the decreasing trend in the WUA curve as mainstem flow increases. Time series plots of WUA versus mainstem discharge are presented in Figure IV-32.

Site 137.5R

Site Description: This study site is located one mile upstream of Gold Creek on the east bank of the Susitna River (Plate IV-10). The study reach is 550

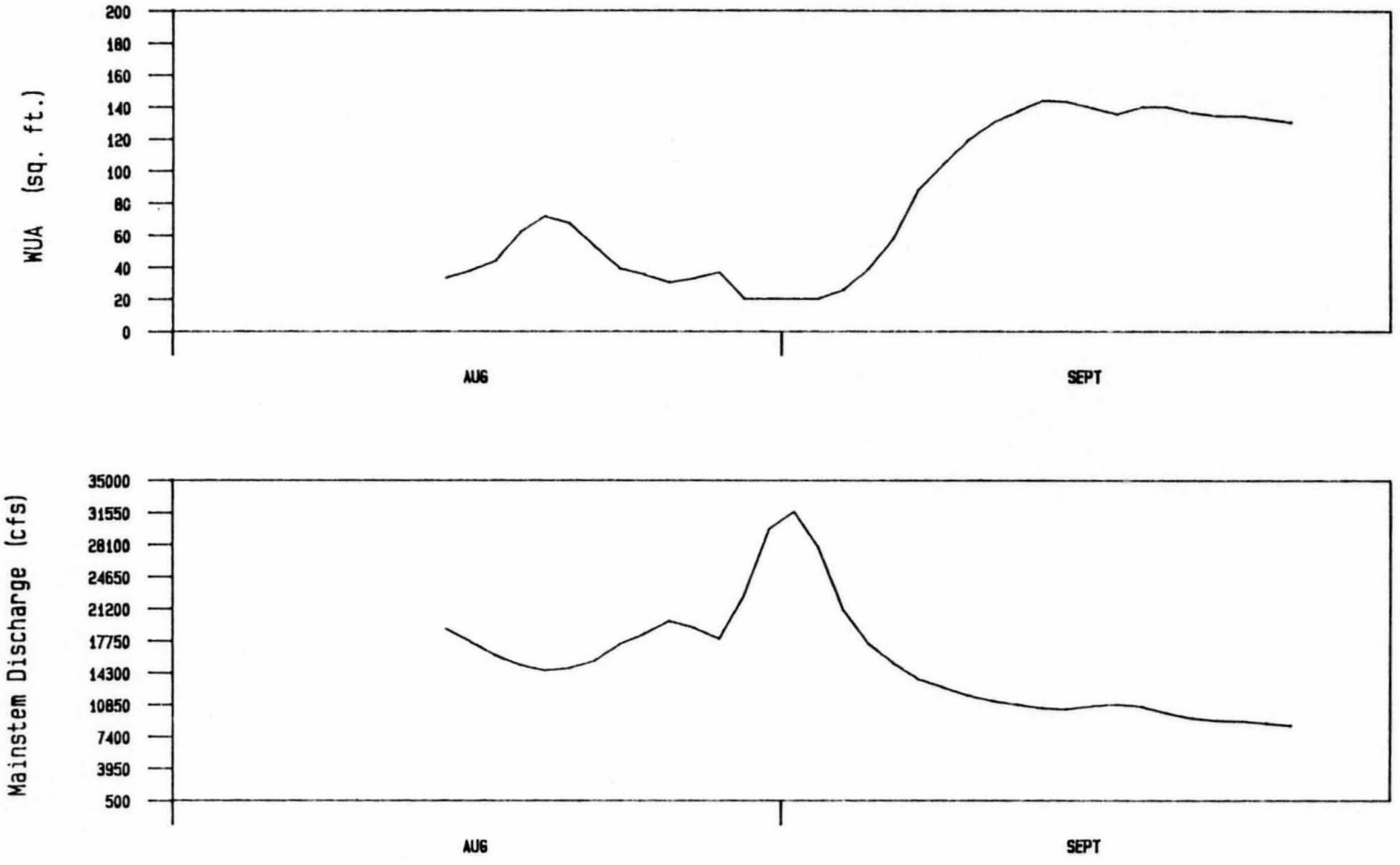


Figure IV-32. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 133.8R modeling site.

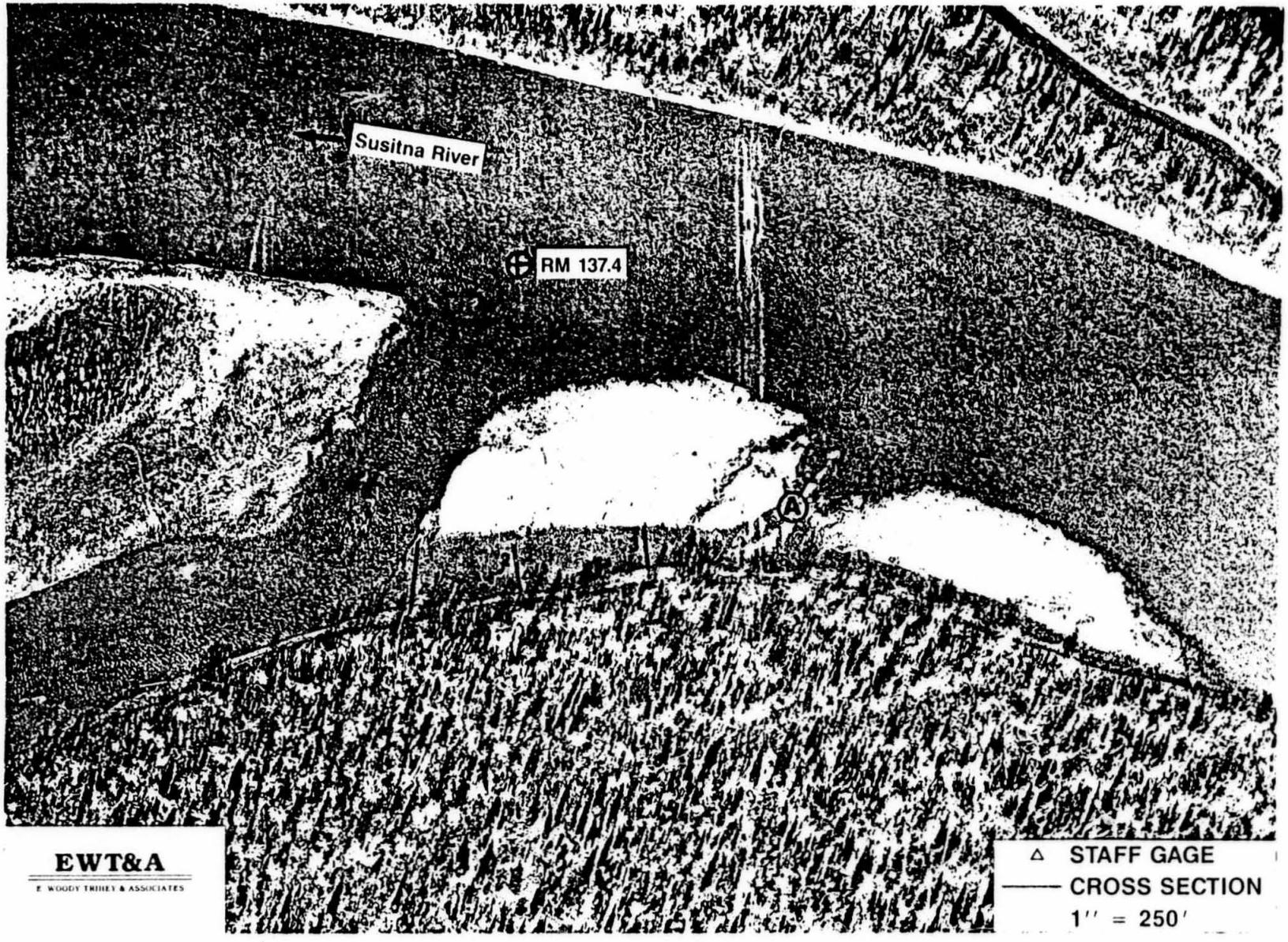


Plate IV-10. Modeling site 137.5R on June 1, 1982 at mainstem discharge: 23,000 cfs.

feet long and varied from 100 to 30 feet wide. Two cross sections were established to describe the shallow, low velocity area throughout the entire site. Cross section 3 describes the riffle area at the head of the study reach (Figure IV-33). Substrate is predominately boulder and cobble overlayed with a layer of silt/sand. This backwater study site was selected as suspected upwelling with some chum salmon spawning observations made in 1982.

Below 11,800 cfs, flow in the site is maintained by upwelling. At discharges greater than 11,800 cfs, a backwater area extends upstream throughout the site. Above 23,000 cfs, flow begins entering the site through channel A.

Turbid water is present in the site at 23,000 cfs but not at either 10,600 or 7,400 cfs. Adult chum and juvenile chinook salmon were observed to utilize the site.

Upwelling was observed throughout the study reach during the streambed profile survey (Figure C-1.5). During the 1984-85 winter season, nearly 50 percent of the site was open for a period of time then froze over. This is an indication the upwelling is slight to moderate in strength.

Spawning Habitat: The total surface area and WUA curves are provided in Figure IV-34a for study site 137.5R. Figure IV-34b is plotted at an expanded scale to emphasize the response of WUA to discharge.

One data set collected at 19,000 cfs. The entire study area is influenced by backwater at mainstem discharges greater than 11,800 cfs. Data sets at 5,100, 16,000 and 21,000 cfs were extrapolated to finish an analysis for the site.

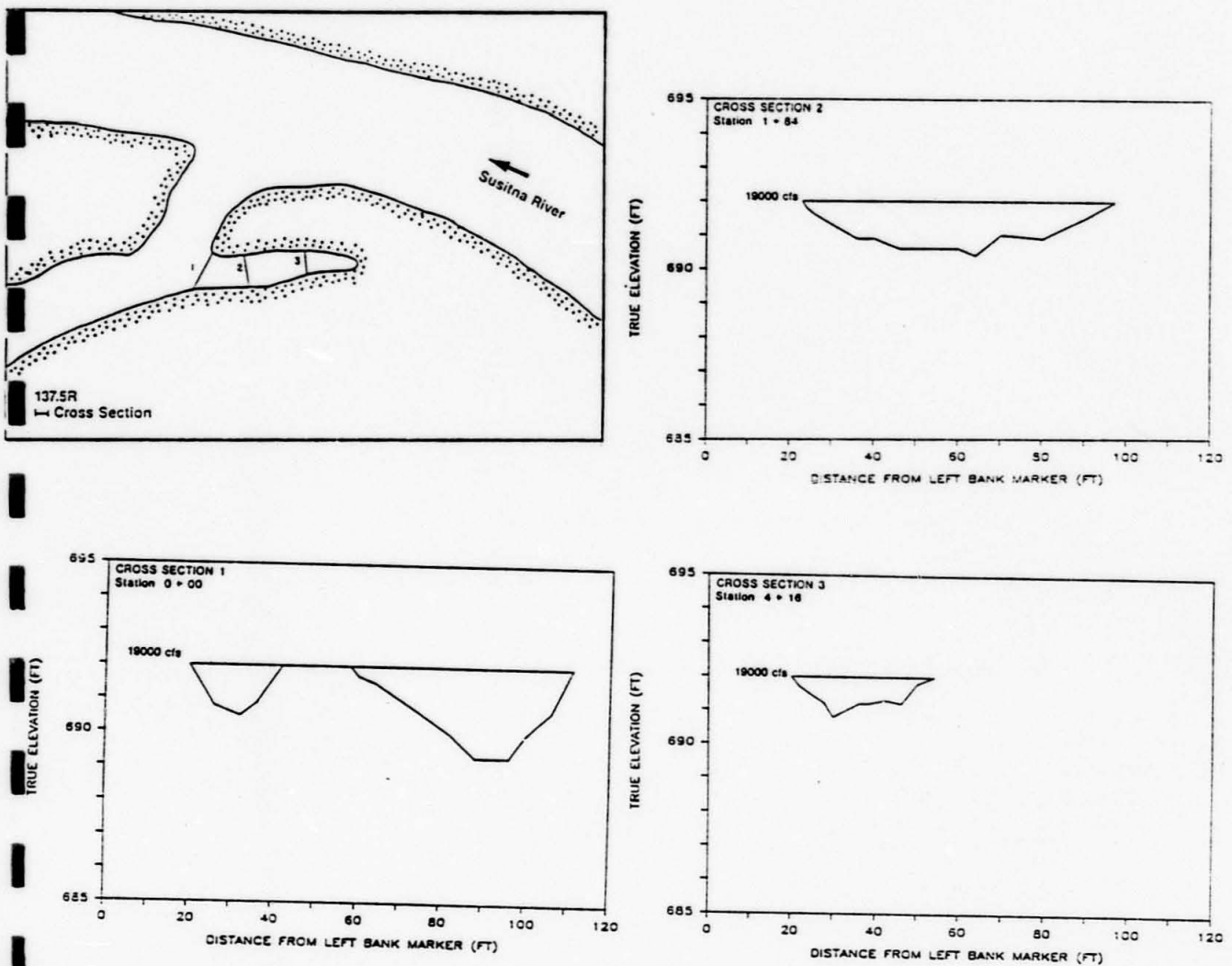
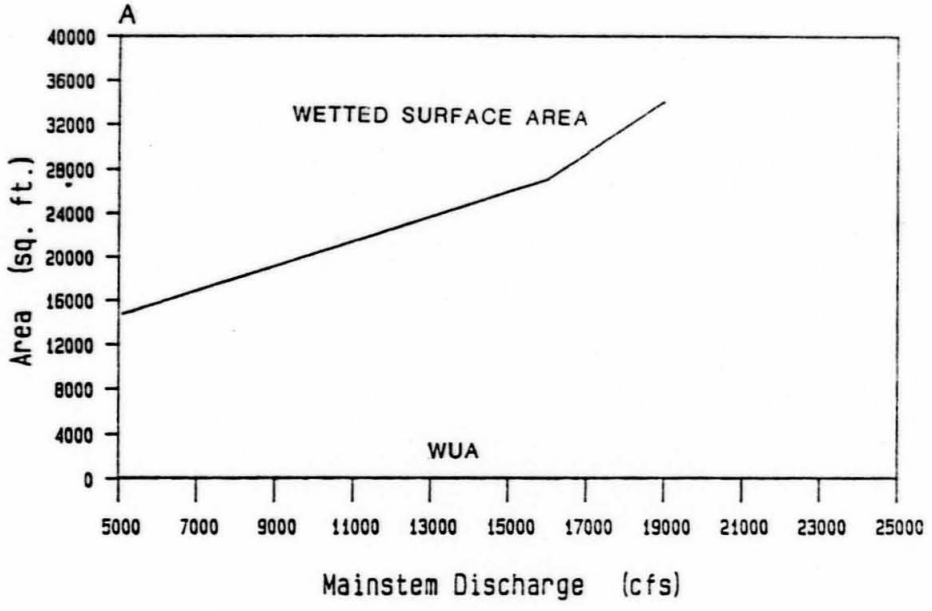


Figure IV-33. Cross sections for 137.5R study site depicting water surface elevations at a discharge of 19,000 cfs.



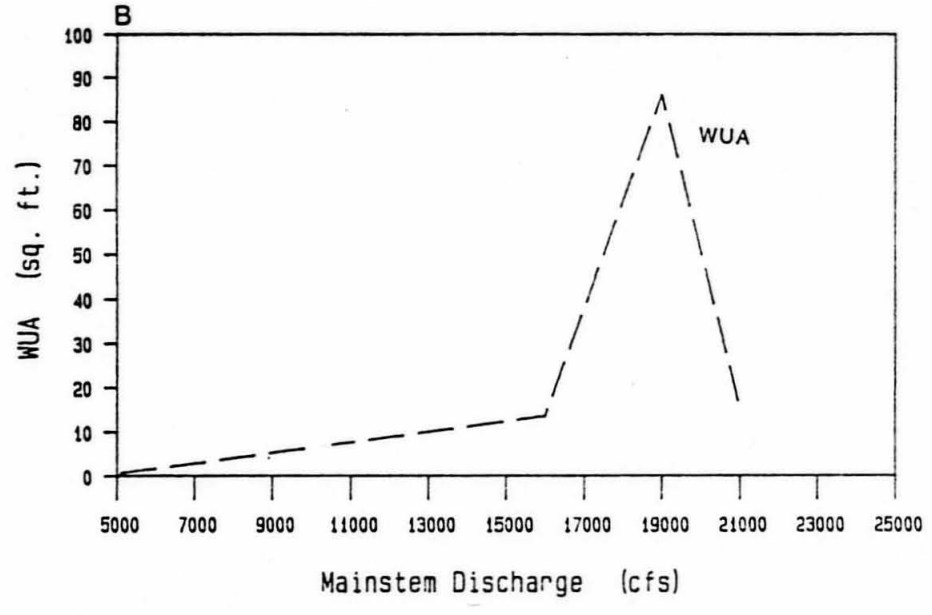


Figure IV--34. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 137.5R modeling site.

Nearly the entire upwelling areas is too shallow to be utilized by spawning chum at 5,100 cfs. As discharges increase and the backwater area begins extending up into the study area, the depths no longer are limiting. The habitat response curve continues on an upward trend then begins to decrease just prior to overtopping of the gravel bar surrounding the site. The upwelling area at cross section 2 provides the WUA for the site as substrate is limiting at the remaining cross sections. Time series plots are shown in Figure IV-35.

Site 138.7L

Site Description: This study site is located immediately above the confluence of Indian River on the west bank of the Susitna River (Plate IV-11). The study area is 675 feet long and along the mainstem margin. The lower two cross sections describe the mainstem along a gentle slope into the main channel while cross section 3 describes 2 steeper slope with some debris (Figure IV-36). The substrate varies from small and large gravel along the bank to rubble and boulder in the main channel. This mainstem margin study site was selected as a suspected upwelling area ~~and~~ no adult chum salmon have been previously recorded ~~in the site.~~

This study area appears to similar at 23,000, 10,600 and 7,400 cfs. Adult chum salmon have been observed in the site along with juvenile chinook salmon. There are no access or passage limitations at this site.

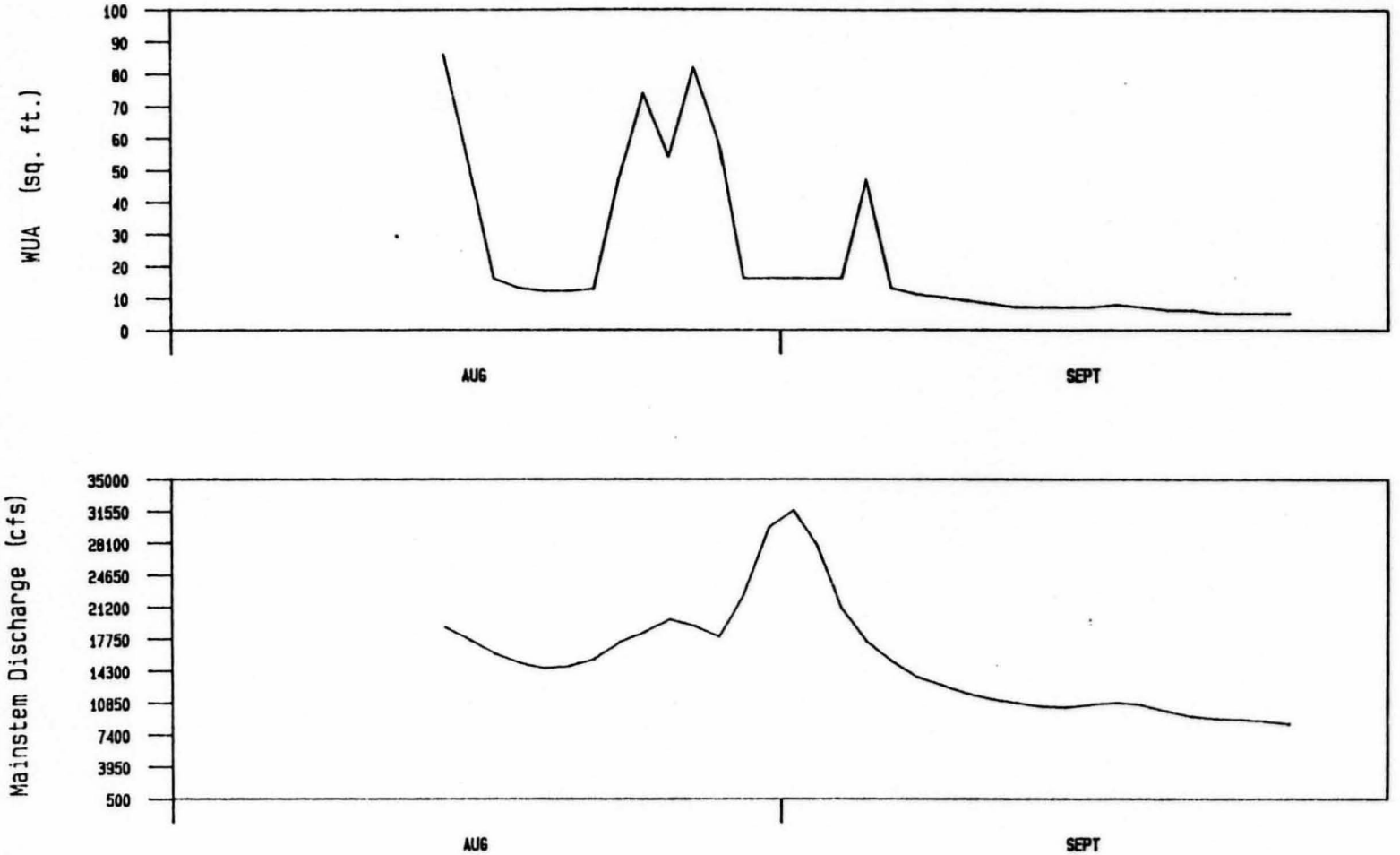


Figure IV-35. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 137.5R modeling site.

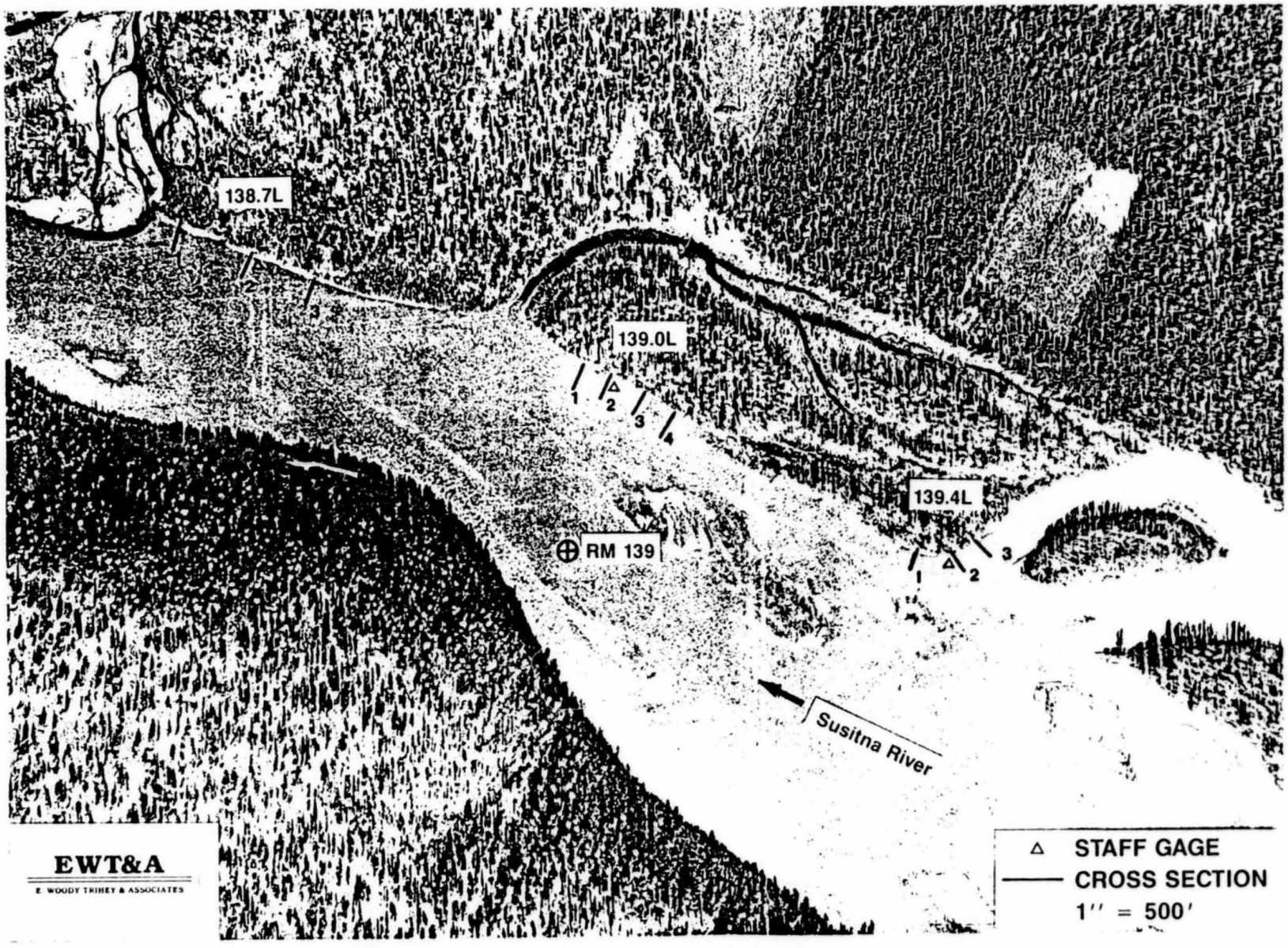


Plate IV-11. Modeling sites 138.7L, 139.0L and 139.4L on June 1, 1982 at mainstem discharge: 23,000 cfs.

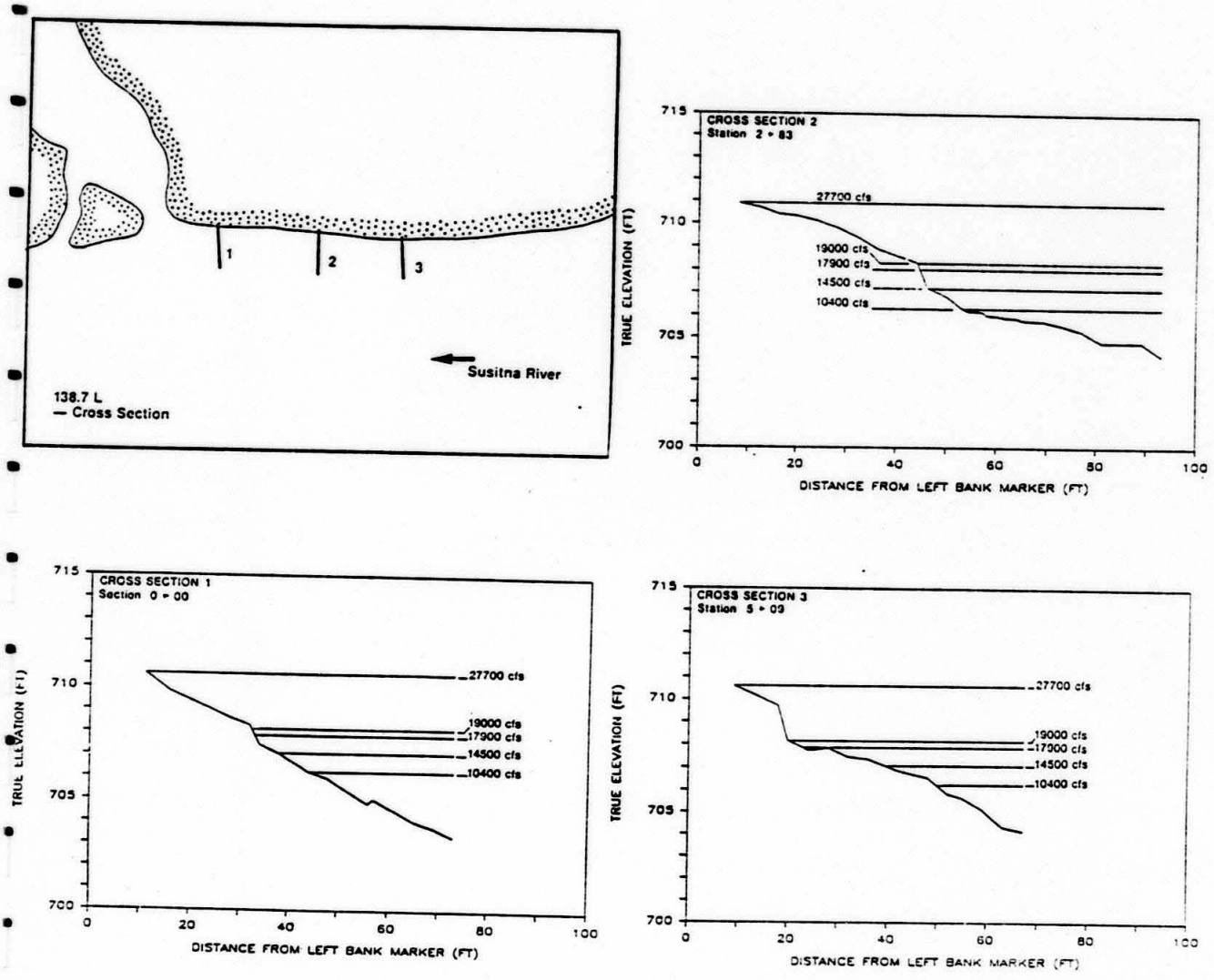


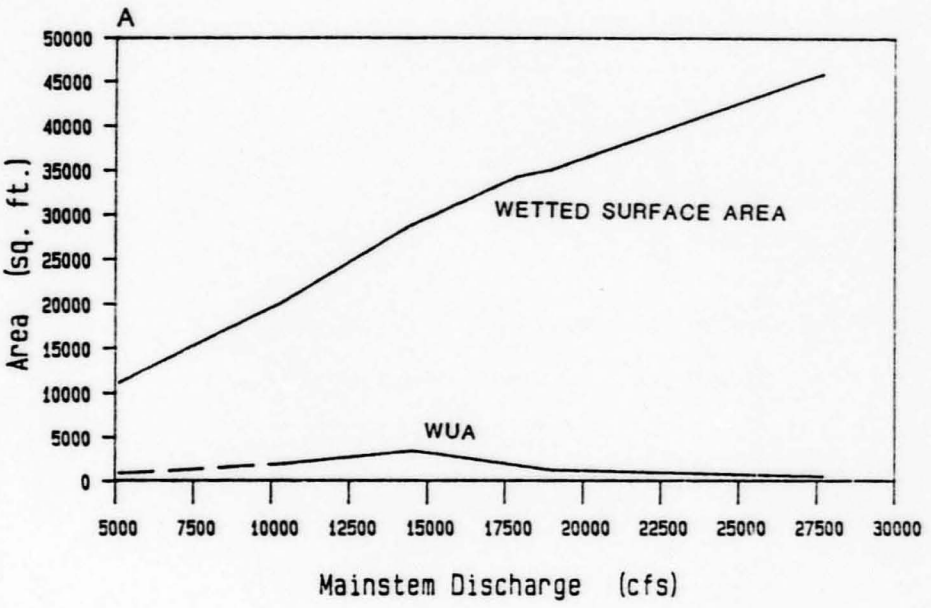
Figure IV-36. Cross sections for 138.7L study site depicting water surface elevations at discharges of 10,400, 14,500, 17,900, 19,000 and 27,700 cfs.

Large amounts of bank seepage were observed from the mouth of Indian River upstream above cross section 2. The amount of upwelling decrease near cross section 3.

Spawning Habitat: The WUA response curves plotted in Figure IV-37a are plotted with total surface area and WUA at the same scale. Figure IV-37b provides a plot of the habitat response curve at an expanded vertical scale. A total of 7.8 percent of the total surface area at 5,100 cfs is considered good habitat compared to 1.0 percent at 27,700 cfs.

Five data sets were collected at discharges from 10,400 to 27,700 cfs. Up to 14,500 cfs, depths are less than optimum to be used by spawning chum salmon. Above 14,500 cfs, higher velocities are present over the upwelling areas reducing the good habitat ~~areas~~. A small percentage of the total study area is influenced by upwelling and good substrate.

An additional data set at 5,100 cfs was constructed to determine the habitat response at low discharges. The stage-discharge curve for the site (Section II) with the cross section elevation (Table C-2.13) were used to develop the depths at 5,100 cfs. A multiplier of 0.49 was used to adjust the velocities measured at 10,400 cfs to provide estimates of the velocities associated with the 5,100 cfs. The suitability values of the depths and velocities, as well as the substrate and upwelling were combined and used in determining the WUA at 5,100 cfs. For the 1984 spawning season from August 12 to September 15, time series plots of WUA and mainstem discharge are presented in Figure IV-38.



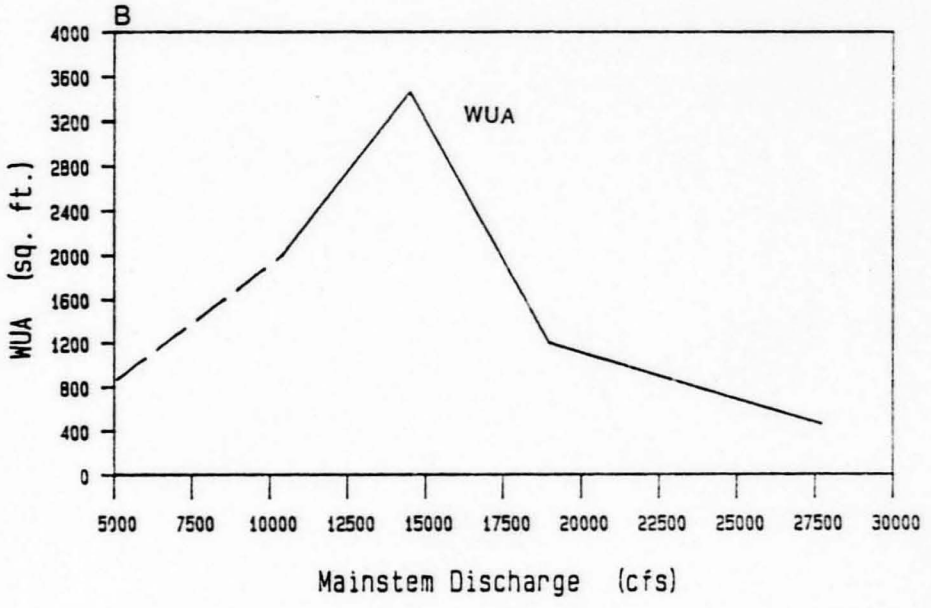


Figure IV-37. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 138.7L modeling site.

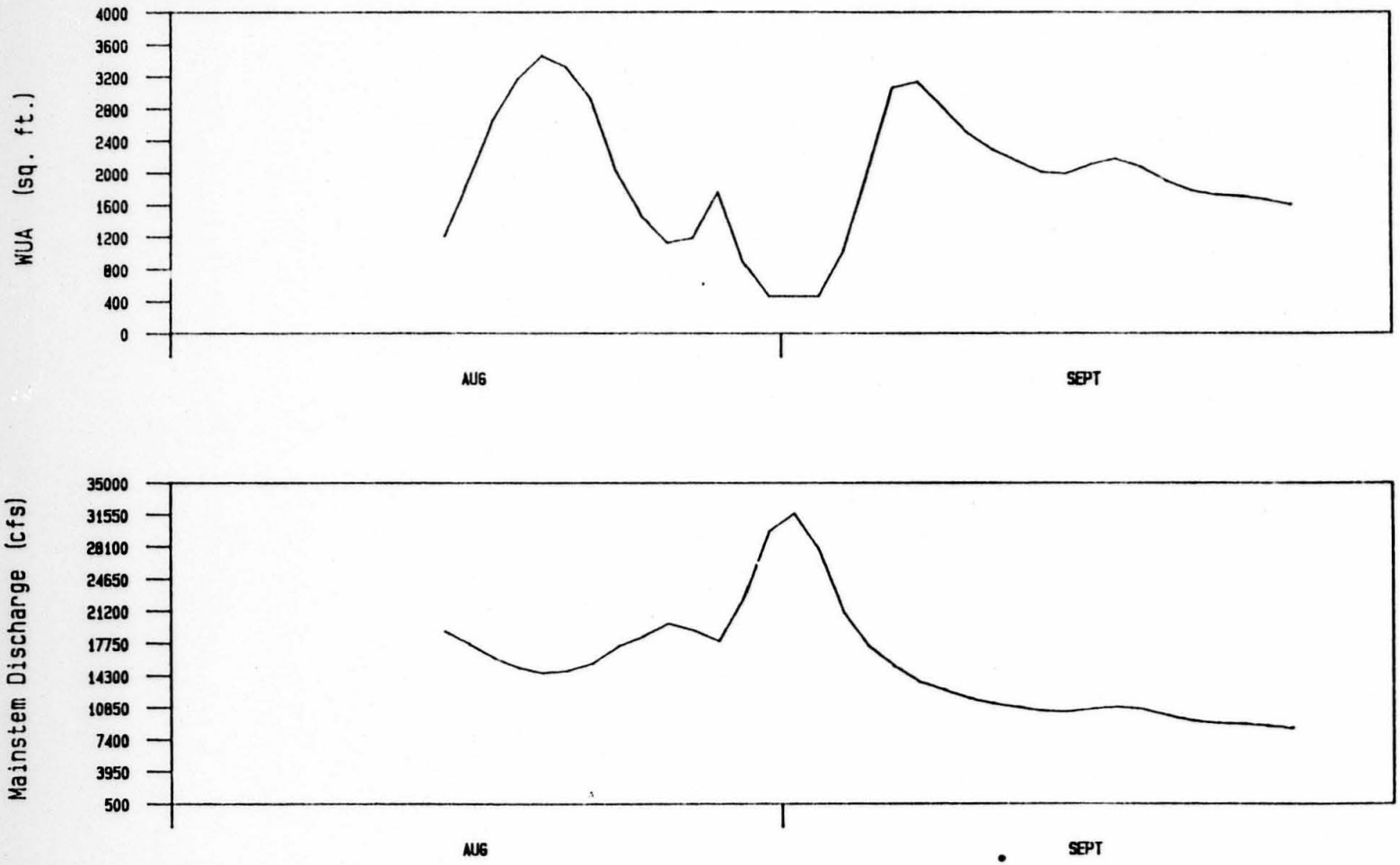


Figure IV-38. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 138.7L modeling site.

Site 139.0L

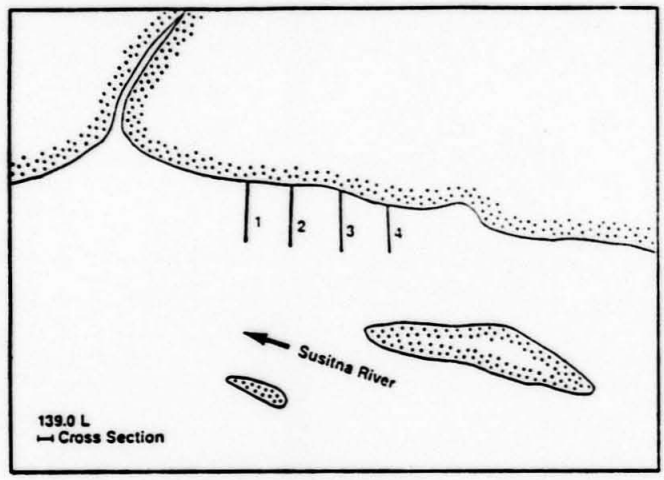
Site Description: Slough 17 is located directly below this site on the west bank of the Susitna River (Plate IV-11). The study area is 750 feet long and along the mainstem margin. Four cross sections describe a small channel along the shoreline margin (Figure IV-39). Gravel and rubble are predominant substrate throughout the site. This mainstem margin study site was selected as a suspected upwelling area known to be used by chum salmon spawning.

A gravel bar extends into the mainstem to separate the study area from the main channel at discharges below 22,500 cfs. At 10,600 and 7,400 cfs, ground water maintains non-turbid flow from cross section 2 to the mouth of the channel.

Chum and sockeye adult salmon have been observed to spawn in this area. Chinook and coho juvenile salmon were also identified to use this study area. Access to the site is not limiting at any discharge. Passage above cross section 2 is limited to discharges greater than 12,000 cfs.

No open thermal leads in the ice were observed in the winter. During the streambed profile survey for the site, upwelling was observed to begin just upstream of cross section 2 and the clear water extend below cross section 1.

Spawning Habitat: Total wetted surface area and WUA curves are plotted in Figure IV-40a for spawning chum salmon. Both curves are plotted to the same scale. The largest proportion of wetted surface area provides good spawning habitat at discharges between 14,500 and 19,000 cfs.



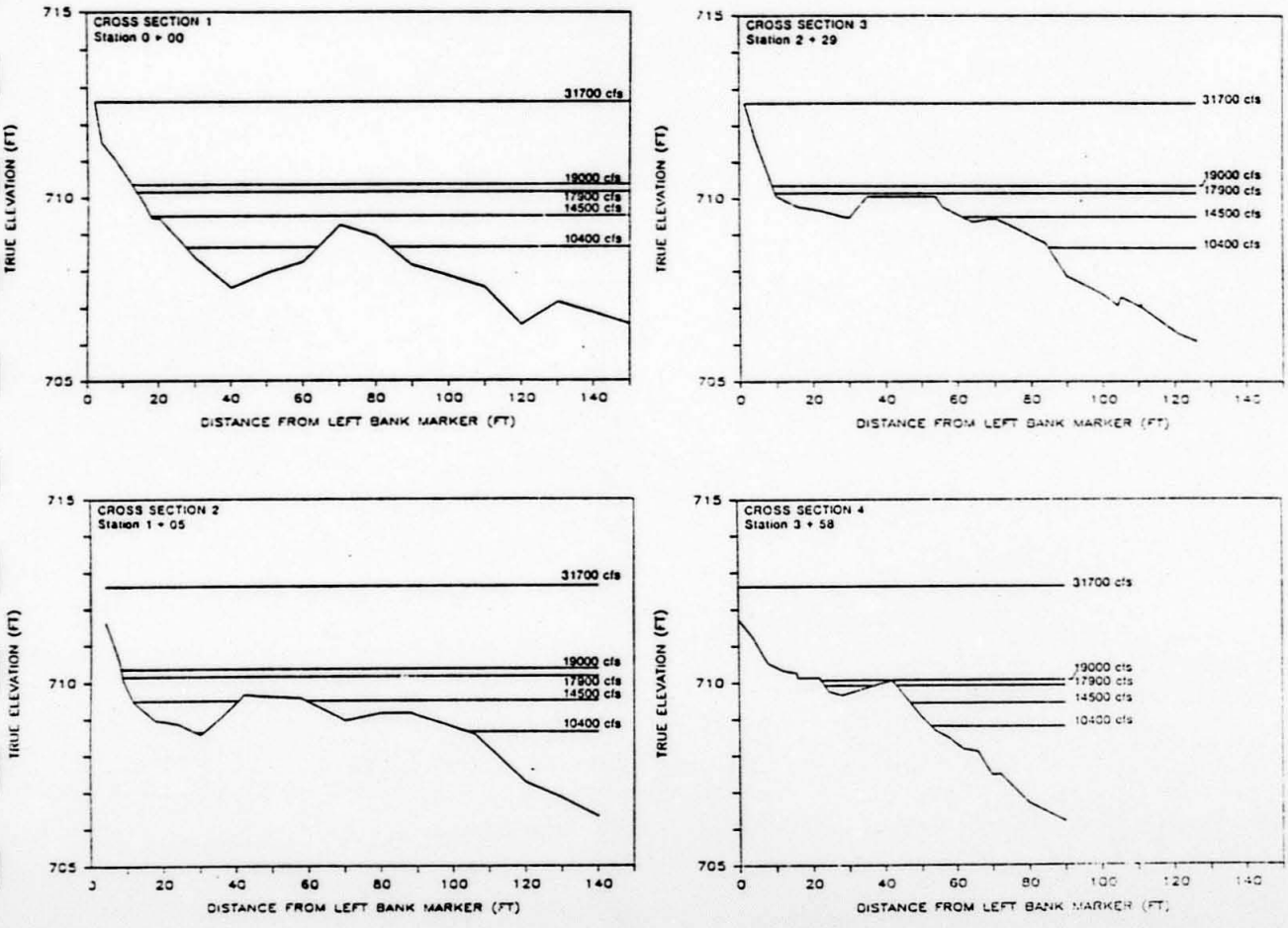
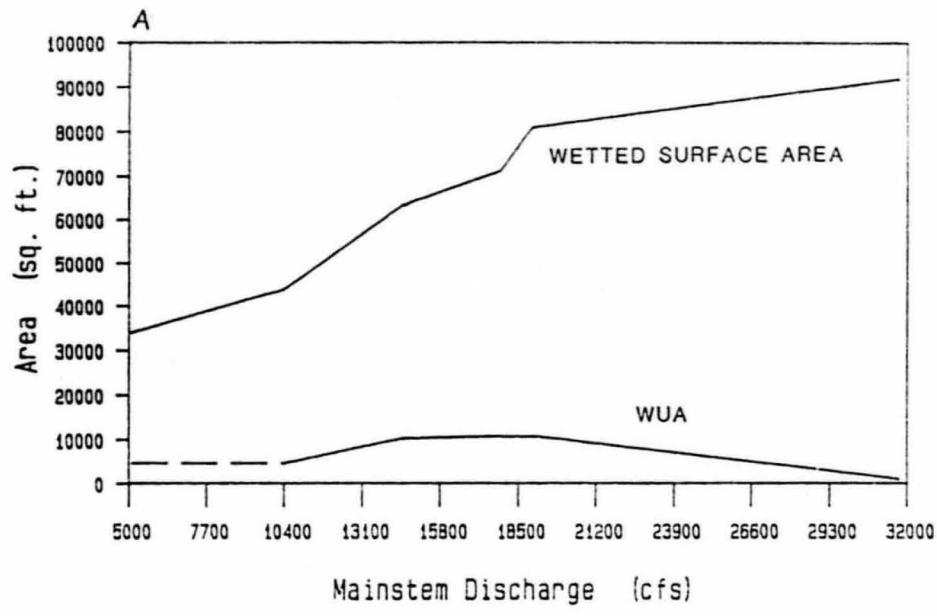


Figure IV-39. Cross sections for 139.0L study site depicting water surface elevations at discharges of 10,400, 14,500, 17,900, 19,000 and 31,700 cfs.



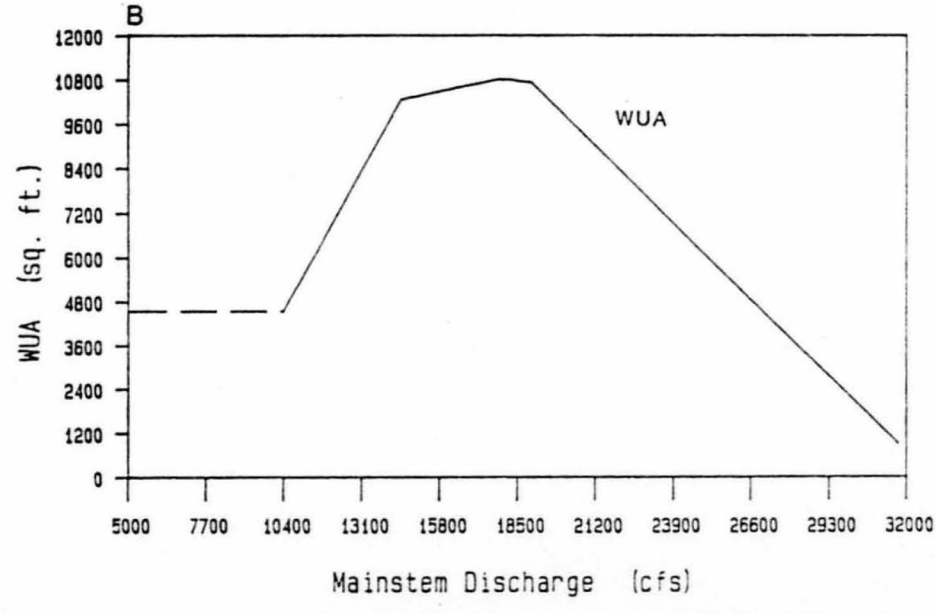


Figure IV-40. Projections of wetted surface area and WUA of spawning chum habitat as a function of discharge for the 139.0L modeling site.

The WUA curve plotted in Figure IV-40b at an expanded vertical scale increases up to 14,500 cfs when the depths are no longer too shallow for spawning. Upwelling and groundwater inflow maintain discharges below 10,400 cfs at approximately the same water surface elevation. A large backwater area begins forming above 10,400 cfs and continues to extend upstream with increase in discharge. The gravel bar which separates the study area from the mainstem, when is overtopped and begins to increase the velocities in the upwelling areas. Near 20,000 cfs, the velocities begin exceeding the optimum usability range which in turn decreases the habitat response curve.

An additional data set at 5,100 cfs was developed using stage and cross section data. The constant water surface elevation below 10,400 cfs implies the WUA at 10,400 is the same at 5,100 cfs. Time series plots of WUA and mainstem discharge are shown in Figure IV-41.

Site 139.4L

Site Description: This study site is located about 0.7 miles above Indian River on the west bank of the Susitna river (Plate IV-11). The study area is 575 feet long and along the mainstem margin. Three cross sections were established to describe the mainstem margin (Figure IV-42). Cobbles and boulders are present in the upper two cross sections while gravel and rubble is present at cross section 1. This mainstem margin study site was selected as a suspected upwelling area. No chum salmon spawning have been observed at this site.

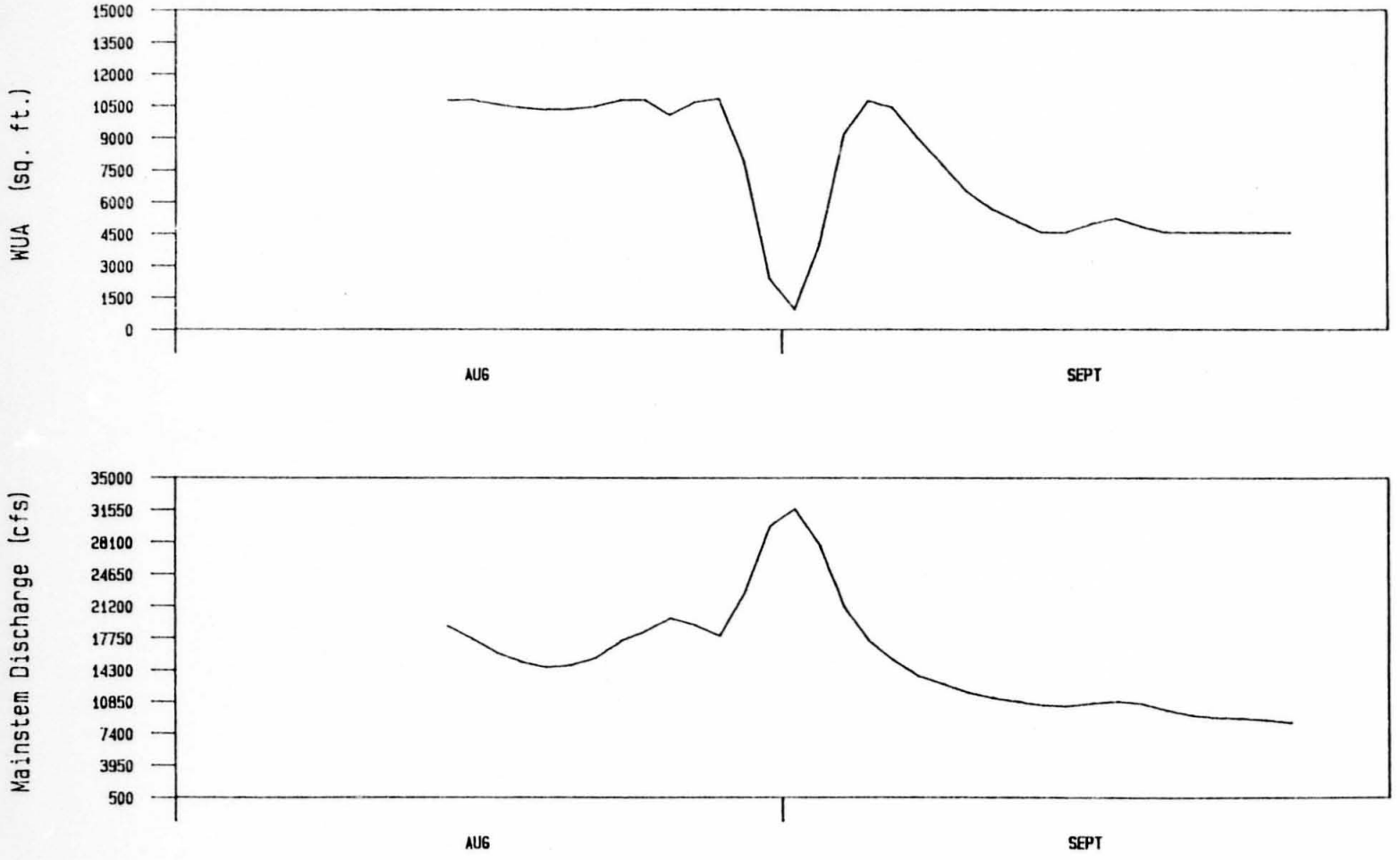


Figure IV-41. Time series plots of spawning chum salmon WUA as a function of discharge from August 12 to September 15, 1984 for 139.0L modeling site.

...appears to be similar at 23,000, 10,600 and 7,400 cfs. No ... chinook juvenile

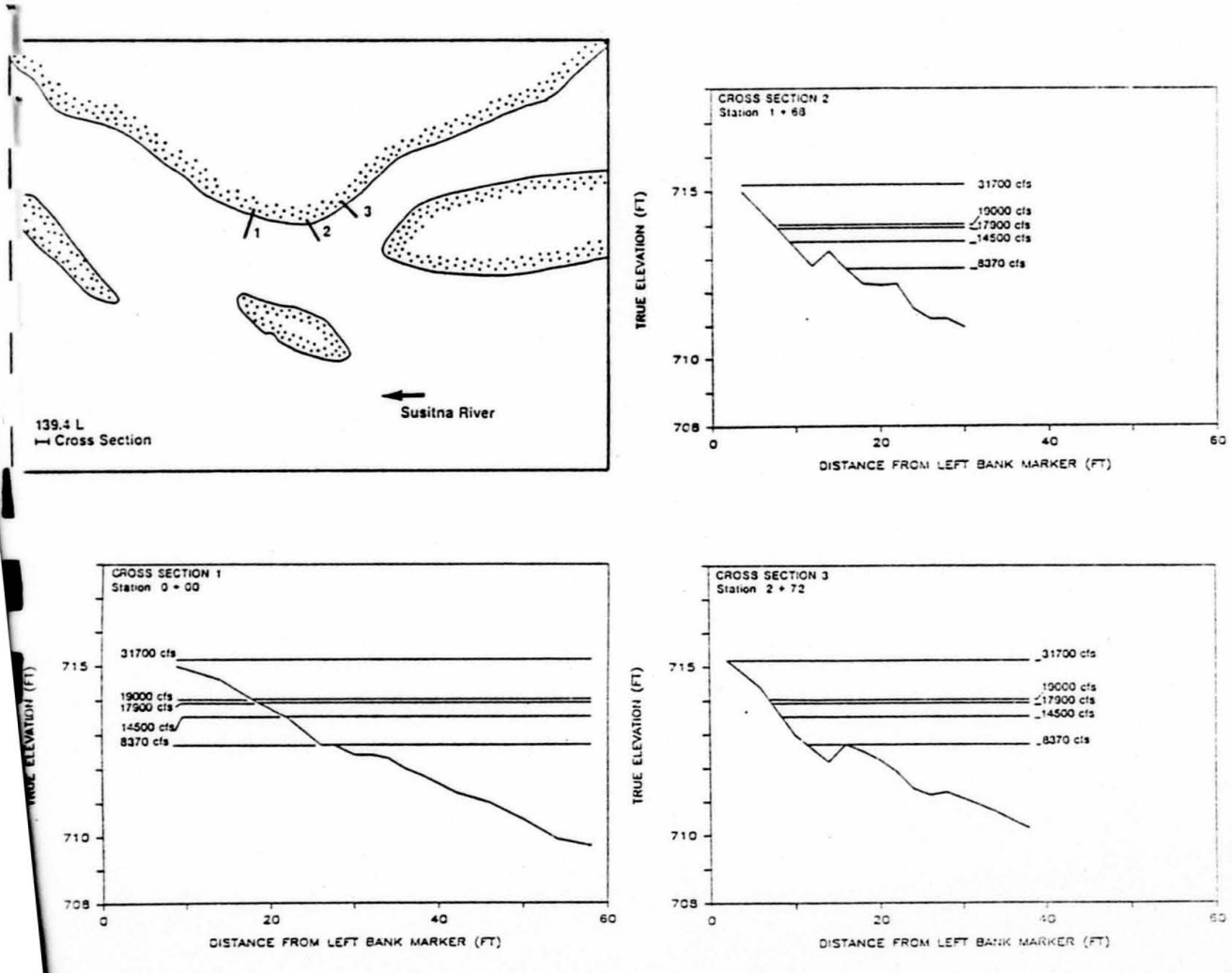


Figure IV-42. Cross sections for 139.4L study site depicting water surface elevations at discharges of 8370, 14,500, 17,900, 19,000 and 31,700 cfs.

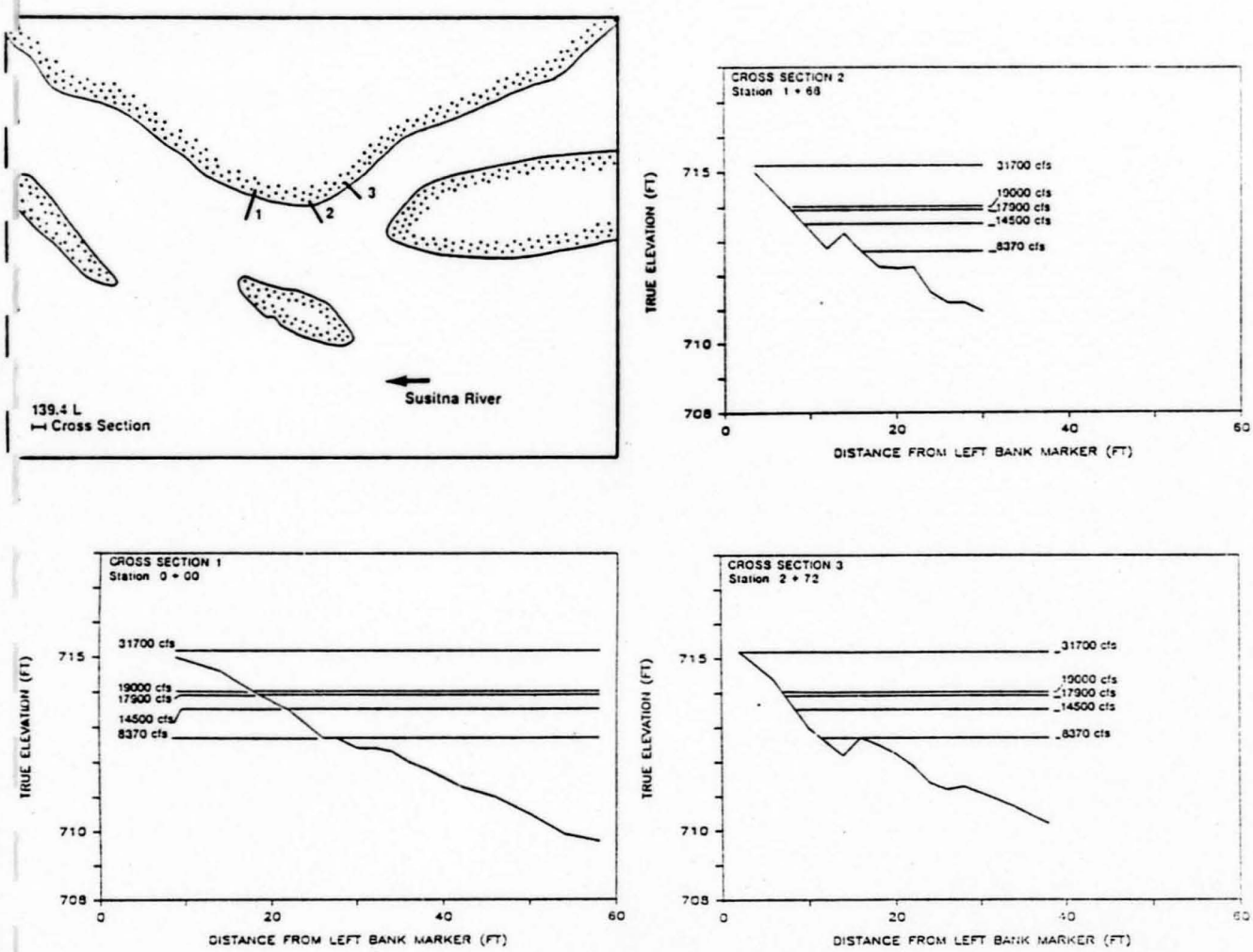


Figure IV-42. Cross sections for 139.4L study site depicting water surface elevations at discharges of 8370, 14,500, 17,900, 19,000 and 31,700 cfs.

This study area appears to be similar at 23,000, 10,600 and 7,400 cfs. No adult salmon were observed in the study area although some chinook juvenile were present during the fall. There are no access or passage limits at this site. A small open thermal area in the ice was recorded near cross section 2 for a short period of time before freezing over.

Spawning Habitat: No upwelling areas were observed throughout the 1984 and 85 field season therefore, no habitat response curves were developed for the site.

Discussion: Side channel areas influenced by backwater had increasing trends in the WUA versus discharge curves then leveled off. These areas were limited by depth in providing usable habitat for spawning chum salmon. Generally, high velocities were not present in these areas.

Mainstem margin areas had downward trends in the WUA versus discharge curves. Depth was usually not limiting in these areas. The amount of available habitat was controlled by high velocities. Increases in discharges correspond to increases in velocities. As the velocities in the upwelling areas the amount of suitable habitat for spawners decreases.

Side channel study areas not located in backwater areas appear to have both increasing and decreasing trends in the WUA versus discharge curves. These areas were initially limited by depths. As discharges increased, the depths in the upwelling areas became optimum (greater than 0.8 ft) then as the velocities in the upwelling areas exceeded 1.3 ft/sec the wetted usable area values decreased.

The amplitude of the WUA versus discharge curve is determined by both the amount of upwelling and quality of substrate present within the site. Quality substrate in upwelling areas yield higher WUA values than sites where either the upwelling is associated with poor spawning substrate or no upwelling present with quality substrate.

Total wetted surface area and WUA curves for spawning chum were obtained at 12 DIHAB study sites corresponding to a range of mainstem discharges from 5,000 to 25,000 cfs. Two of the study areas had no observed upwelling and are not presented.

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SUMMARY OF HYDRAULIC CONDITIONS AND HABITAT FORECASTS AT 1984 MIDDLE RIVER STUDY SITES

DRAFT REPORT

APPENDIX C

DATA SUPPORTING CALIBRATION AND APPLICATION OF DIHAB MODELS

Prepared for:

ALASKA POWER AUTHORITY

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N. Diane Hilliard
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May 1985

APPENDIX FIGURES

APPENDIX TABLES

APPENDIX TABLES

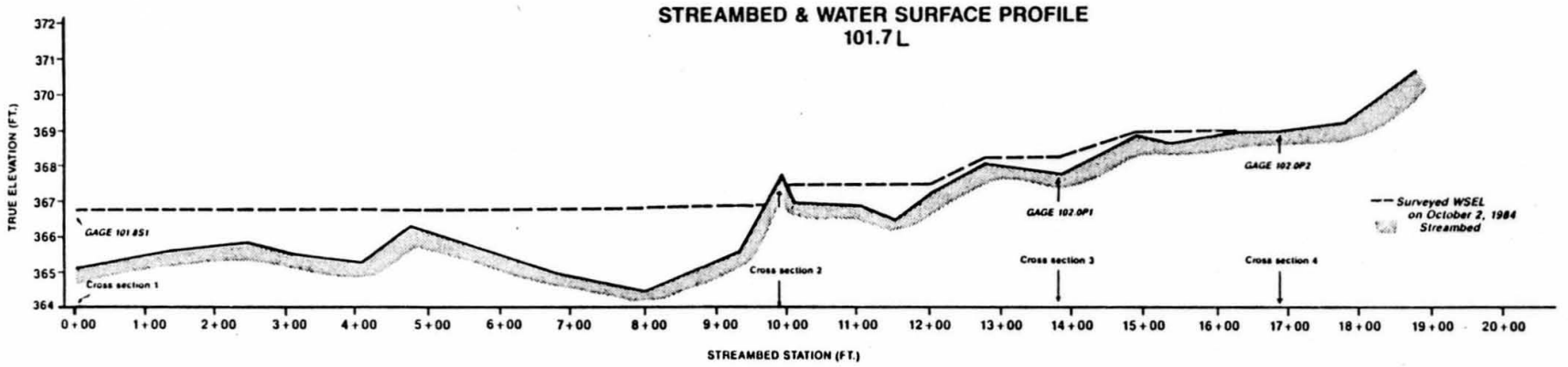

Figure C-1.1 Streambed profile at site 101.7L.

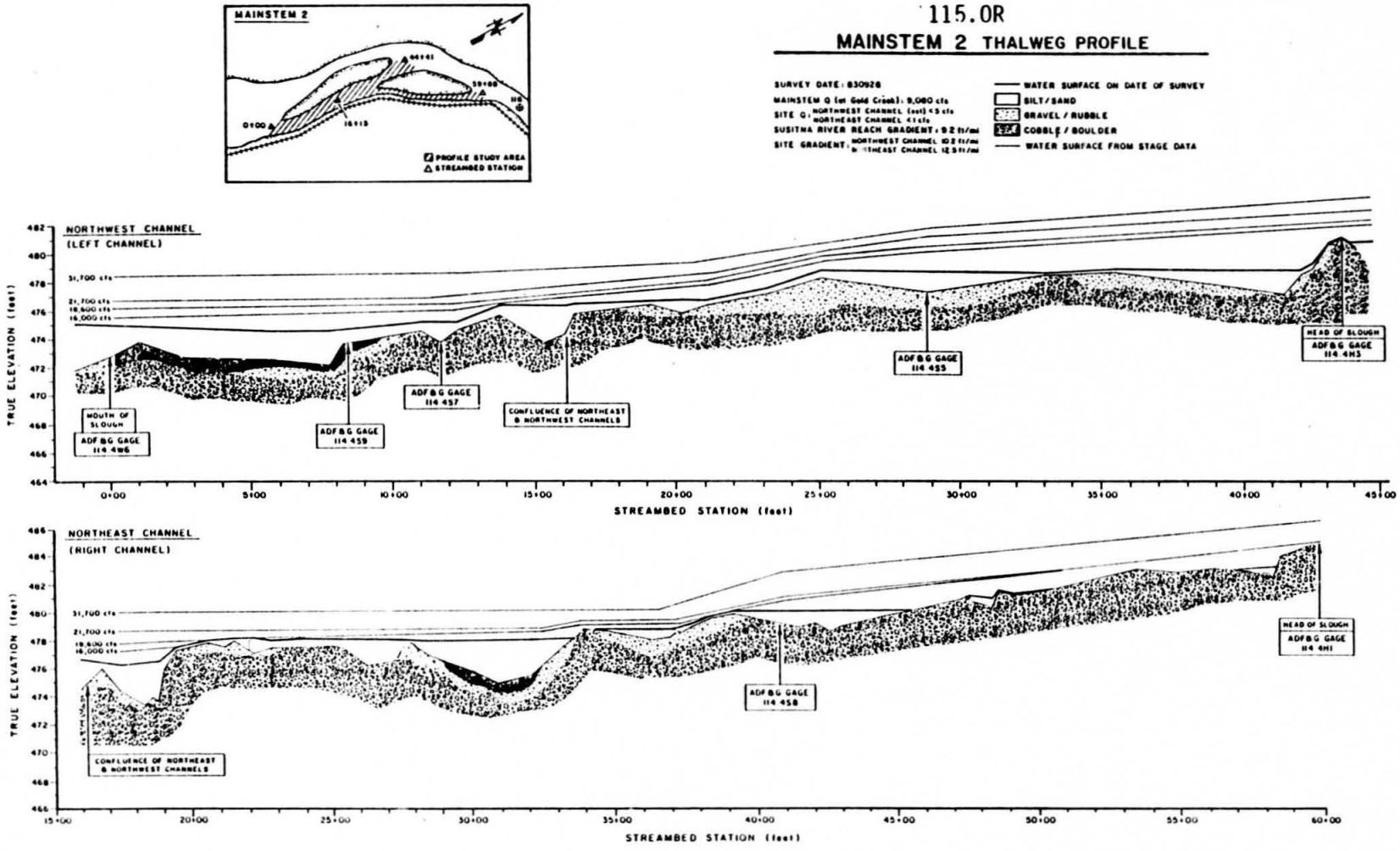

Figure C-1.2 Streambed profile at site 115.0R -northwest and northeast channels. Source: Estes and Vincent-Lang 1984.

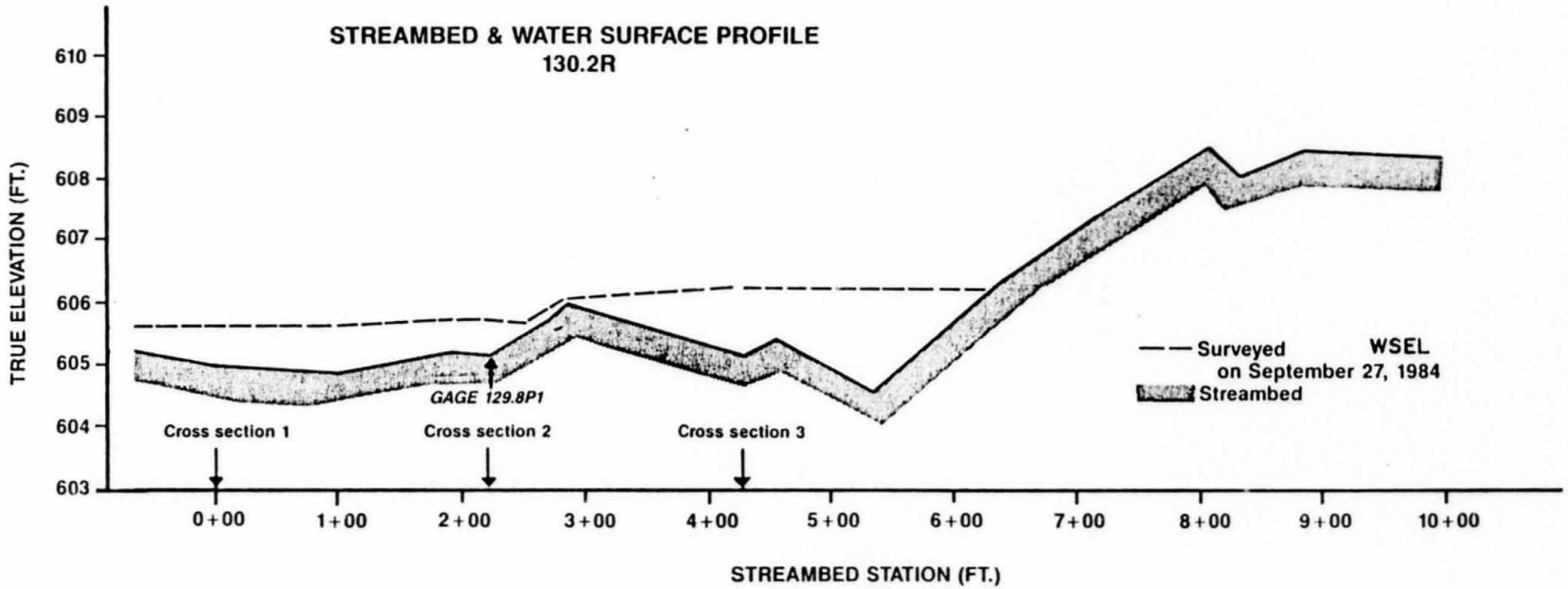

Figure C-1.3 Streambed profile at site 130.2R.

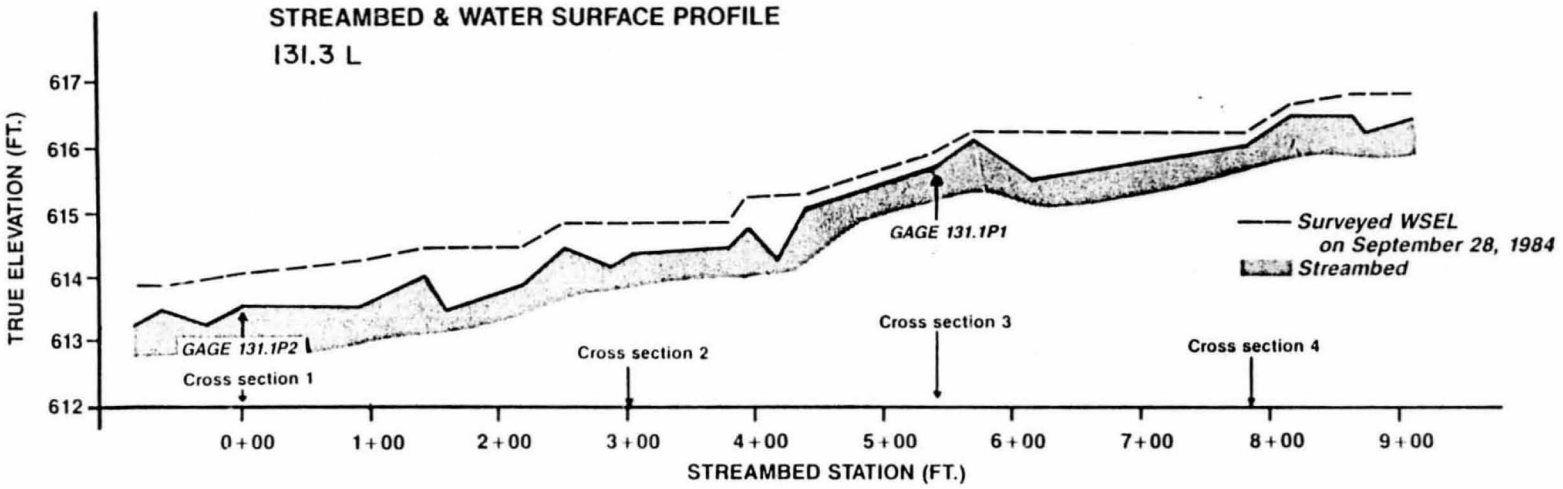

Figure C-1.4 Streambed profile at site 131.3L.

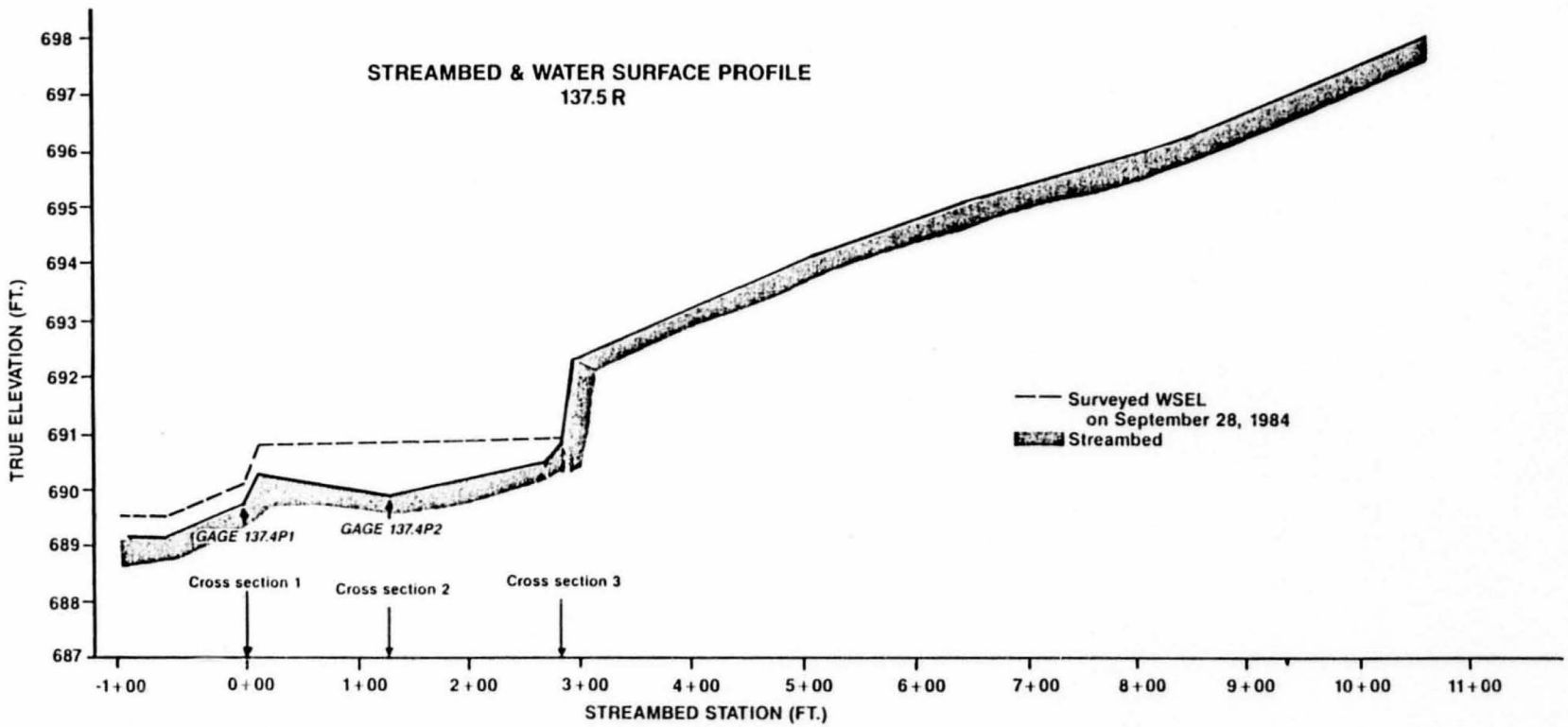

Figure C-1.5 Streambed profile at site 137.5R.

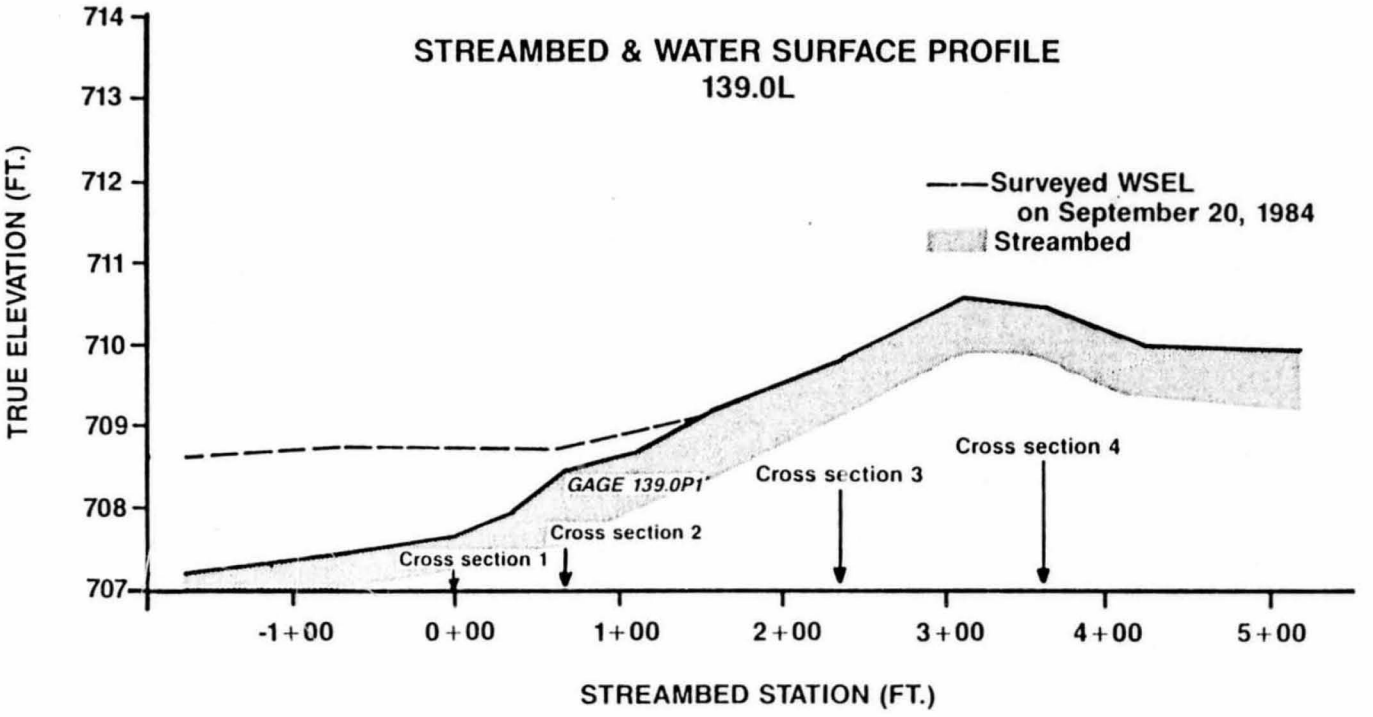

Figure C-1.6 Streambed profile at site 139.0L.

Table C-1.1. Streambed profile at site 101.7L; surveyed on October 2, 1984 (TBM ID: R&M 101.2W1 LB 1982).

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
0+00	365.03	366.68	Cross section 1 - SG 101.8S1
1+39	365.56	366.73	Pool
2+40	365.78	366.76	Pool
3+19	365.45	365.76	Pool
4+05	365.25	366.72	Divided channel
4+74	366.26	366.72	Pool
6+72	364.96	366.79	Construction in pool
7+99	364.42	366.84	Pool
9+30	365.63	366.89	Pool
9+85	367.67	DRY	Cross section 2
10+09	366.90	367.46	Large pool
11+01	366.86	367.46	Pool
11+50	366.49	367.46	Pool
11+96	367.20	367.44	End on pool
12+75	368.02	368.22	Pool
13+77	367.76	368.21	Cross section 3 - SG 102.0P1
14+83	368.82	368.90	Beginning of pool/end of run
15+30	368.61	368.94	Middle of pool
16+37	368.97	DRY	
16+88	368.92	368.99	Cross section 4 - SG 102.0P2
17+67	369.18	DRY	Edge of upwelling
18+77	370.65	DRY	Edge of gravel

Table C-1.2. Streambed profile at site 115.0R Northwest Channel; surveyed on Semptember 28, 1983 (TBM: ADF&G Alcap 114.4H3 RB). Source: Estes and Vincent-Lang 1984.

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
-1+21	471.86	474.85	Mainstem
0+00	472.61	474.78	Mouth of Mainstem II, Backwater
1+06	473.74	474.64	High point in back-water pool
2+91	472.47	747.50	Backwater
5+99	472.47	474.54	Backwater pool
7+96	472.08	474.52	Backwater pool
8+26	473.60	474.42	Riffle/backwater
11+02	474.45	474.81	Pool/riffle
11+60	473.66	474.83	Pool at Gage 114.4S7, mid pool
12+39	474.53	474.85	Riffle/pool
13+86	475.82	476.21	Pool/riffle
15+36	473.48	476.22	Pool
16+13	474.21	476.22	Pool, right channel joins at this point
16+47	475.74	476.26	Riffle/pool
19+19	476.30	476.69	Pool/riffle
20+18	475.88	476.68	Pool
21+06	476.32	476.60	Riffle/pool
23+20	477.11	477.48	Riffle
25+04	478.34	478.70	Pool/riffle
28+91	477.29	478.73	Pool
33+08	478.32	478.59	Riffle/pool
35+40	478.60	478.95	Pool/riffle
38+99	477.66	478.80	Pool
41+53	477.11	478.82	Pool

Table C-1.2. Streambed profile at site 115.0R Northwest Channel; surveyed on Semptember 28, 1983 (TBM: ADF&G Alcap 114.4H3 RB). Source: Estes and Vincent-Lang 1984.

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
42+03	478.61	478.83	Riffle/pool
42+41	479.09	479.39	
43+02	481.09	481.09	High point
43+52	480.90	480.90	SG 114.4H3
44+06	480.30	480.68	Edge of solid ice
44+41	478.85	480.70	Mainstem, head of left fork

Table C-1.3. Streambed profile at site 115.0R northeast channel; Surveyed on September 28, 1983 (TBM ID: ADF&G Alcap 114.4H3 RB). Source: Estes and Vincent-Lang 1984.

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
16+13	474.21	476.22	Mouth of right channel
16+73	475.63	476.20	
16+85	475.94	476.18	
17+13	475.13	476.10	
17+48	474.09	476.09	
18+26	473.29	476.14	
18+69	473.85	476.15	
18+87	473.41	476.16	
19+05	475.77	476.17	
19+21	476.63	476.78	
19+53	477.20	477.35	
20+64	477.65	477.75	
21+18	477.17	477.77	
21+57	477.46	477.76	
22+17	476.82	477.77	
22+84	477.32	477.22	
23+90	477.35	477.75	
25+07	477.38	477.83	
25+43	477.24	477.76	
26+30	475.87	477.77	
27+25	476.32	477.72	
27+37	476.77	477.77	
27+46	477.35	477.70	
27+80	477.72	477.77	
28+48	476.69	477.64	
30+10	475.44	477.64	
30+96	474.48	477.68	

Table C-1.3. Streambed profile at site 115.0R northeast channel; Surveyed on September 28, 1983 (TBM ID: ADF&G Alcap 114.4H3 RB). Source: Estes and Vincent-Lang 1984.

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
32+08	475.05	477.70	
33+85	478.77	478.77	
34+62	478.30	478.40	
36+32	477.62	478.42	
37+03	477.92	478.42	
37+18	478.38	478.58	
37+31	478.29	478.58	
37+83	478.65	478.75	
38+46	479.55	479.65	
39+20	479.67	479.77	
39+33	479.62	479.77	
40+16	479.28	479.78	
41+48	478.47	479.79	
42+07	478.81	479.81	
42+54	478.40	479.80	
42+96	478.84	479.79	
44+36	479.33	479.73	
45+34	479.71	479.71	
46+69	480.25	480.25	
47+32	480.51	480.51	
47+48	480.68	480.68	
47+59	480.14	480.54	
48+17	480.05	480.46	
48+43	479.83	480.47	
48+67	481.54	481.54	
49+20	481.00	481.00	
50+34	481.12	481.12	

Table C-1.3. Streambed profile at site 115.0R Northeast Channel; Surveyed on September 28, 1983 (TBM ID: ADF&G Alcap 114.4H3 RB). Source: Estes and Vincent-Lang 1984.

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
53+39	482.71	482.71	
55+00	482.59	482.59	
56+41	482.77	482.77	
56+98	482.65	482.65	
57+39	482.55	482.65	
57+66	482.42	482.67	
58+07	482.55	482.67	
58+26	481.80	482.69	
58+40	482.61	482.61	
58+46	483.84	483.84	
59+88	484.55	484.55	

Table C-1.4. Streambed profile at site 130.2R; surveyed on September 27, 1984 (TBM ID: R&M TBM 9-1 1982).

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
-0+68	605.22	605.61	Mouth
0+00	605.00	605.64	Cross section 1 pool
1+00	604.87	605.63	Pool
1+92	605.20	605.68	Pool
2+22	605.17	605.67	Cross section 2 SG 129.8P1
2+48	605.50	605.69	Top of pool/bottom of riffle
2+69	605.71	605.92	Riffle
2+84	605.99	606.20	Top of riffle/bottom of pool
4+29	605.14	606.22	Cross section 3 pool
4+55	605.40	606.22	Pool
5+35	604.54	606.21	Pool
6+43	606.33		Edge of pool
7+16	607.38		Beginning of cobble/rubble
8+07	608.50		Sand
8+32	608.02		Sand
7+85	608.48		Sand
9+96	608.36		Edge of vegetation

Table C-1.5. Streambed profile at site 131.3L; surveyed on September 28, 1984 (TBM ID: R&M LRX-35 LB 1980).

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
-0+89	613.20	613.88	Backwater
-0+64	613.49	613.88	Riffle
-0+29	613.27	613.98	Riffle
0+00	613.53	614.07	Cross section 1 - SG 131.1P2
			Riffle
0+94	613.59	614.29	Riffle
1+42	614.01	614.46	Bottom of pool
1+60	613.47	614.47	Pool
2+17	613.88	614.47	Bottom of riffle
2+51	614.47	614.82	Bottom of pool
2+88	614.08	614.82	Pool
3+02	614.37	614.84	Cross section 2 - SG 131.1P1
			Bottom of riffle
3+79	614.45	614.83	Riffle
3+93	614.78	615.23	Bottom of pool
4+18	614.27	615.27	Pool
4+39	615.08	615.27	Bottom of riffle
5+42	615.76	615.95	Cross section 3
5+70	616.11	616.23	Bottom of pool
6+15	615.51	616.25	Pool
7+83	616.08	616.27	Bottom of riffle
8+16	616.50	616.69	Cross section 4 - riffle
8+64	616.50	616.85	Bottom of pool
8+72	616.24	616.84	Pool
9+14	616.47	616.84	Bottom of riffle

Table C-1.6. Streambed profile at site 137.5R; surveyed on September 28, 1984 (TRM ID: R&M LRX-48 LB 1980).

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
-1+13	687.43	689.43	Bottom of riffle
-1+02	689.20	689.55	Bottom of pool
-0+69	689.17	689.52	Pool
0+00	689.74	690.11	Cross section 1 - SG 137.4P1
			Bottom of riffle
0+13	690.30	690.79	Bottom of pool
1+34	689.90	690.81	Cross section 2 - SG 137.4P2
			Pool
2+72	690.55	690.91	Bottom of riffle
2+86	690.80	690.93	Cross section 3
2+97	692.31		Top of rise - boulder/cobble
5+08	694.16		Top of rise - boulder/cobble
6+39	695.07		Top of rise - boulder/cobble
8+07	696.05		Top of rise - boulder/cobble
8+39	696.27		Top of rise - boulder/cobble
10+65	698.15		Head of channel

Table C-1.7. Streambed profile at site 139.0L; surveyed on September 20, 1984 (TBM ID: R&M "Indian" LRX-51 1980).

Streambed Station (ft)	Streambed Elevation (ft)	WSEL (ft)	Comments
-1+69	707.20	708.60	
-0+68	707.46	708.72	Beginning of gravel bar
0+00	707.79	708.71	Cross section 1 - clear
0+35	707.94	708.71	
0+69	708.48	708.71	Edge of pool
1+13	708.70	708.95	Cross section 2 - SG 139.0_1
1+56	709.18		Edge of upwelling
2+36	709.82		Cross section 3
3+08	710.58		
3+65	710.46		Cross section 4
4+25	709.99		Rubble/large gravel
5+19	709.92		Rubble/sand

Table C-2.1 Cross section elevations at site 101.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB marker
Station 0+00	67.0	369.90	
	68.0	368.93	
	70.0	367.79	
	74.0	367.79	
	75.0	367.79	
	77.0	367.54	
	78.0	367.48	
	82.0	367.25	
	83.0	367.19	
	86.0	367.01	
	88.0	366.89	
	92.0	366.84	
	94.0	366.54	
	97.0	366.24	
	98.0	366.17	
	102.0	365.89	
	107.0	365.59	
	108.0	365.60	
	110.0	365.62	
	112.0	365.64	
	117.0	365.59	
	118.0	365.62	
	122.0	365.74	
	126.0	365.76	
	128.0	365.77	
	132.0	365.79	
	134.0	365.76	
	138.0	365.70	
	142.0	365.64	
	148.0	365.61	
	150.0	365.60	
	152.0	365.5?	
	158.0	365.47	
	162.0	365.39	
	164.0	365.34	
	166.0	365.29	
	172.0	365.14	
	174.0	365.15	
	180.0	365.18	
	182.0	365.19	

Table C-2.1 (cont.) Cross section elevations at site 101.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1 Station 0+00 (cont.)	187.0	365.19	
	188.0	365.32	
	190.0	365.58	
	192.0	365.84	
	196.0	365.44	
	197.0	365.34	
	202.0	365.44	
	204.0	365.34	
	207.0	365.19	
	208.0	365.23	
	212.0	365.39	
	214.0	365.61	
	217.0	365.94	
	220.0	365.97	
	222.0	365.99	
	226.0	366.55	
	227.0	366.69	
	228.0	366.81	
	232.0	367.29	
	235.0	367.79	
	236.0	367.79	
	238.0	367.79	
	239.3	367.79	
	241.0	367.79	
Cross Section 2 Station 9+85	0.0		LB Marker
	19.0	372.99	
	20.0	371.87	
	21.0	371.50	
	22.0	371.10	
	24.0	370.60	
	26.0	370.10	
	28.0	370.10	
	34.0	370.10	
	36.0	370.10	
	40.0	370.14	
	46.0	370.20	
	52.0	369.96	
	56.0	369.80	
	58.0	369.80	
	64.0	369.80	

Table C-2.1 (cont.) Cross section elevations at site 101.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 9+85 (cont.)	66.0	369.80	
	70.0	370.08	
	76.0	370.50	
	82.0	370.50	
	86.0	370.50	
	88.0	370.54	
	94.0	370.66	
	96.0	370.70	
	100.0	370.74	
	106.0	370.80	
	112.0	371.19	
	117.0	371.50	
	118.0	371.50	
	125.0	371.50	
Cross Section 3 Station 13+32	0.0		LB Marker
	51.5	372.99	
	56.0	372.69	
	60.0	372.69	
	64.0	372.39	
	66.0	372.33	
	68.0	372.27	
	72.0	372.15	
	74.0	372.09	
	76.0	372.09	
	79.0	371.50	
	80.0	371.45	
	83.0	371.30	
	84.0	371.32	
	87.0	371.40	
	90.0	370.95	
	91.0	370.80	
	94.0	370.87	
	95.0	370.90	
	99.0	370.70	
	100.0	370.72	
	103.0	370.80	
	104.0	370.80	
	107.0	370.80	
	110.0	370.80	
	111.0	370.80	

Table C-2.1 (cont.) Cross section elevations at site 101.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 13+32 (cont.)	114.0	370.80	
	115.0	370.80	
	119.0	370.80	
	120.0	370.77	
	123.0	370.70	
	124.0	370.65	
	127.0	370.50	
	130.0	370.27	
	131.0	370.20	
	134.0	370.12	
	135.0	370.10	
	139.0	370.30	
	140.0	370.47	
	143.0	371.00	
	144.0	371.10	
	148.0	371.06	
	150.0	371.17	
	154.0	371.39	
	160.0	371.50	
	164.0	372.19	
	168.0	372.34	
	170.0	372.61	
	172.8	372.99	
Cross Section 4 Station 16+44	0.0		LB Marker
	28.7	373.66	
	30.0	373.16	
	31.2	373.09	
	32.0	373.04	
	34.0	372.91	
	36.0	372.84	
	38.0	372.76	
	40.0	372.73	
	42.0	372.71	
	46.0	372.68	
	52.0	372.66	
	58.0	372.56	
	62.0	372.46	
	64.0	372.52	
	70.0	372.70	
	72.0	372.76	

Table C-2.1 (cont.) Cross section elevations at site 101.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 4 Station 16+44 (cont.)	74.0	372.94	
	76.0	373.11	
	77.6	373.28	
	81.2	373.66	
	87.4	373.66	
	92.0	373.36	
	96.0	373.66	

Reference elevation: R&M Alcap 101.2W1 LB 1982.

Table C-2.2 Cross section elevations at site 105.8L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	400.10	LB Marker
Station 0+00	42.0	399.31	
	45.0	398.34	
	47.0	398.31	
	48.5	398.23	
	49.0	398.20	
	51.0	398.09	
	53.0	397.97	
	55.0	397.86	
	56.0	397.26	
	57.0	397.06	
	58.0	396.86	
	59.0	396.81	
	60.0	396.76	
	61.0	396.66	
	62.0	396.56	
	63.0	396.46	
	64.0	396.36	
	65.0	396.26	
	66.0	396.16	
	68.0	396.26	
	70.0	395.96	
	72.0	395.96	
	74.0	395.66	
	76.0	395.56	
	78.0	395.46	
	80.0	394.96	
	82.0	394.76	
Cross Section 2	0.0		LB Marker
Station 2+88	30.5	401.90	
	33.0	401.70	
	34.0	401.65	
	35.0	401.60	
	37.0	401.50	
	39.0	401.35	
	41.0	401.20	
	43.0	400.70	
	45.0	400.20	
	47.0	399.70	
	49.0	399.90	

Table C-2.2 (cont.) Cross section elevations at site 105.8L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 2+88 (cont.)	50.0	399.90	
	51.0	399.65	
	52.0	399.40	
	53.0	399.35	
	54.0	399.30	
	56.0	399.00	
	58.0	399.20	
	60.0	398.70	
	62.0	398.70	
	64.0	398.20	
	66.0	397.50	
	68.0	397.40	
	70.0	397.20	
Cross Section 3 Station 4+64	0.0		LB Marker
	17.4	401.94	
	18.0	401.69	
	21.0	401.43	
	22.0	401.33	
	23.0	401.23	
	25.0	400.93	
	26.0	400.83	
	27.0	400.73	
	29.0	400.53	
	30.0	400.28	
	31.0	400.03	
	33.0	399.93	
	34.0	399.73	
	35.0	399.53	
	36.0	399.48	
	37.0	399.43	
	38.0	399.18	
	39.0	398.93	
	40.0	398.88	
	41.0	398.83	
	42.0	398.90	
	44.0	398.70	
	46.0	398.50	
	48.0	398.30	
	50.0	398.10	
	52.0	398.30	
	54.0	397.90	

Table C-2.2 (cont.) Cross section elevations at site 105.8L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 4	0.0		LB Marker
Station 7+49	24.0	401.94	
	25.5	401.43	
	27.0	401.23	
	28.0	401.03	
	29.0	400.83	
	31.0	400.43	
	32.0	400.33	
	33.0	400.23	
	35.0	399.83	
	36.0	399.73	
	37.0	399.63	
	38.0	399.58	
	39.0	399.53	
	40.0	399.38	
	41.0	399.23	
	42.0	399.28	
	43.0	399.33	
	44.0	399.13	
	45.0	398.93	
	46.0	399.10	
	48.0	398.60	
	50.0	398.40	
	52.0	398.10	
	54.0	397.80	
	56.0	397.50	
	58.0	397.30	

Reference elevation: R&M Alcap LRX-10B RB 1982.

Table C-2.3 Cross section elevations at site 114.1R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB Marker
Station 0+00	11.0	470.65	
	15.0	470.25	
	24.0	469.98	
	25.0	469.95	
	26.0	469.88	
	30.0	469.60	
	35.0	469.25	
	36.0	469.15	
	40.0	468.75	
	45.0	468.25	
	50.0	468.20	
	55.0	468.15	
	60.0	468.25	
	65.0	468.35	
	70.0	468.35	
	75.0	468.35	
	80.0	468.35	
	85.0	468.35	
	90.0	468.35	
	92.4	468.29	
	94.0	468.19	
	95.0	468.14	
	96.0	468.09	
	98.0	467.69	
	100.0	467.49	
	102.0	467.49	
	104.0	467.49	
	105.0	467.44	
	106.0	467.39	
	108.0	467.19	
	110.0	467.29	
	112.0	467.29	
	114.0	467.39	
	115.0	467.44	
	116.0	467.49	
	118.0	467.59	
	120.0	467.79	
	122.0	467.89	
	124.0	467.89	
	125.0	467.94	

Table C-2.3 (cont.) Cross section elevations at site 114.1R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1 Station 0+00 (cont.)	126.0	467.99	
	128.0	467.99	
	130.0	467.89	
	131.0	467.89	
	132.0	467.89	
	133.0	467.89	
	134.0	467.79	
	135.0	467.89	
	137.8	468.29	
	140.0	468.25	
	145.0	469.25	
	148.0	469.85	
	149.0	470.05	
	152.0	470.65	
Cross Section 2 Station 3+25	0.0		LB Marker
	53.0	470.65	
	57.0	470.02	
	58.0	469.86	
	60.0	469.55	
	64.0	469.07	
	68.0	468.59	
	70.0	468.35	
	72.0	468.31	
	78.0	468.19	
	80.0	468.15	
	82.0	468.15	
	84.0	468.15	
	86.0	468.15	
	88.0	468.15	
	90.0	468.15	
	92.0	468.11	
	94.0	468.08	
	96.0	468.05	
	98.0	468.01	
	100.0	467.98	
	102.0	467.95	
	104.0	467.91	
	106.0	467.88	
	108.0	467.85	
	110.0	467.81	

Table C-2.3 (cont.) Cross section elevations at site 114.1R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 3+25 (cont.)	114.0	467.75	
	116.0	467.71	
	118.0	467.68	
	120.0	467.65	
	122.0	467.81	
	124.0	467.97	
	126.0	468.13	
	128.0	468.29	
	130.0	468.45	
	138.0	469.25	
	140.0	469.45	
	150.0	469.85	
	160.0	469.45	
	163.0	470.17	
	165.0	470.65	
Cross Section 3 Station 7+45	0.0	470.65	LB Marker
	71.0	470.65	
	72.0	470.55	
	76.0	470.25	
	76.5	470.15	
	80.0	469.45	
	84.0	468.81	
	85.0	468.65	
	90.0	468.65	
	91.0	468.29	
	92.0	468.24	
	94.0	468.19	
	96.0	468.09	
	98.0	467.89	
	100.0	467.79	
	102.0	467.69	
	104.0	467.49	
	106.0	467.39	
	108.0	467.29	
	110.0	467.19	
	112.0	467.29	
	114.0	467.49	
	116.0	467.59	
	118.0	467.69	
	120.0	467.79	

Table C-2.3 (cont.) Cross section elevations at site 114.1R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 7+45 (cont.)	122.0	467.89	
	124.0	467.99	
	128.0	468.24	
	130.0	468.90	
	132.0	469.05	
	134.0	469.15	
	136.0	469.25	
	140.0	469.45	
	142.0	469.41	
	144.0	469.37	
	148.0	469.29	
	150.0	469.25	
	152.0	469.34	
	156.0	469.53	
	158.0	469.62	
	160.0	469.71	
	162.0	469.81	
	165.0	469.95	
	168.0	470.25	
	172.0	470.65	

Reference elevations: R&M Alcap 114.1H1 RB 1982.

Table C-2.4 Cross section elevations at site 115.0R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1 Station 0+00	0.0	480.25	LB Marker
	11.0	478.93	
	29.0	476.62	
	52.0	476.12	
	60.0	475.92	
	70.4	475.41	
	74.0	475.01	
	75.0	474.91	
	78.0	474.81	
	82.0	474.61	
	86.0	474.61	
	90.0	474.61	
	100.0	474.11	
	101.0	474.10	
	102.0	474.08	
	104.0	474.05	
	105.0	474.04	
	106.0	474.02	
	108.0	473.99	
	110.0	473.96	
	112.0	473.88	
	114.0	473.80	
	116.0	473.72	
	118.0	473.64	
	120.0	473.56	
	122.0	473.48	
	124.0	473.40	
	126.0	473.32	
	128.0	473.24	
	130.0	473.16	
	132.0	473.19	
	134.0	473.22	
	135.0	473.24	
	136.0	473.25	
	138.0	473.28	
	140.0	473.31	
	142.0	473.50	
	144.0	473.69	
	146.0	473.88	
	148.0	474.07	
	150.0	474.26	

Table C-2.4 (cont.) Cross section elevations at site 115.0R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1 Station 0+00 (cont.)	152.0	474.23	
	154.0	474.20	
	156.0	474.17	
	160.0	474.11	
	161.7	474.17	
	165.0	474.26	
	170.0	474.41	
	180.0	474.41	
	190.0	474.31	
	195.0	474.16	
	200.0	474.01	
	210.0	474.36	
	220.0	474.61	
	225.0	474.89	
	230.0	475.16	
	240.0	475.21	
	244.0	475.11	
	246.0	475.21	
	247.0	475.41	
	255.0	475.52	
	278.0	476.12	
	299.0	476.12	
Cross Section 2 Station 2+73	0.0	483.03	LB Marker
	2.00	477.86	
	5.50	476.68	
	31.0	475.55	
	33.0	475.35	
	35.0	475.35	
	37.0	475.25	
	41.0	475.05	
	41.5	474.46	
	42.0	474.36	
	45.0	473.96	
	48.0	473.76	
	49.0	473.63	
	51.0	473.36	
	53.0	472.83	
	54.0	472.56	
	57.0	472.56	
	60.0	473.36	

Table C-2.4 (cont.) Cross section elevations at site 115.0R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 2+73 (cont.)	61.0	473.46	
	63.0	473.66	
	65.0	473.79	
	66.0	473.86	
	69.0	473.76	
	72.0	473.96	
	73.0	474.06	
	75.0	474.26	
	77.0	474.33	
	78.0	474.36	
	81.0	474.43	
	82.5	474.46	
	83.0	474.46	
	85.0	474.46	
	87.0	474.46	
	88.9	474.46	
Cross Section 3 Station 5+82	0.0	477.84	LB Marker
	8.0	477.21	
	14.0	475.55	
	16.0	474.46	
	17.0	473.96	
	18.0	473.26	
	20.0	472.46	
	22.0	471.61	
	24.0	471.56	
	26.0	471.46	
	28.0	471.26	
	30.0	470.86	
	32.0	470.26	
	42.0	470.46	
	44.0	470.86	
	46.0	471.76	
	48.0	472.36	
	50.0	473.06	
	52.0	473.96	
	54.0	474.26	
	55.0	474.46	
	60.0	474.46	
	61.8	474.46	
	107.0	476.15	

Table C-2.4 (cont.) Cross section elevations at site 115.0R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 4 Station 9+28	0.0	477.60	LB Marker
	11.0	474.97	
	25.0	474.51	
	25.2	474.46	
	26.0	474.46	
	27.0	474.36	
	29.0	474.26	
	31.0	474.26	
	33.0	473.96	
	35.0	474.01	
	37.0	474.06	
	39.0	474.01	
	41.0	473.96	
	43.0	474.06	
	45.0	474.16	
	47.0	474.11	
	49.0	474.06	
	51.0	474.01	
	53.0	473.96	
	55.0	473.96	
	57.0	473.96	
	59.0	473.91	
	61.0	473.86	
	63.0	473.71	
	65.0	473.56	
	67.0	473.46	
	69.0	473.36	
	71.0	473.31	
	73.0	473.26	
	75.0	473.21	
	77.0	473.16	
	79.0	473.21	
	81.0	473.26	
	83.0	473.36	
	85.0	473.36	
	87.0	473.36	
	89.0	473.36	
	91.0	473.36	
	93.0	473.56	
	95.0	473.76	
	97.0	473.96	

Table C-2.4 (cont.) Cross section elevations at site 115.0R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 4 Station 9+28 (cont.)	99.0	473.96	
	101.0	474.36	
	102.0	474.46	
	103.0	474.59	
	117.0	475.04	
	126.0	475.55	
	133.0	481.10	

Reference elevations: ADF&G TBM Nail in tree base 1984.

Table C-2.5 Cross section elevations at site 118.9L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	509.92	LB Marker
Station 0+00	7.0	509.92	
	8.0	509.42	
	9.0	509.17	
	10.0	508.92	
	12.0	508.42	
	12.5	508.32	
	14.0	508.02	
	16.0	507.62	
	17.0	507.35	
	18.0	507.05	
	19.0	506.85	
	20.0	506.85	
	21.0	506.25	
	22.0	506.25	
	23.0	506.15	
	24.0	506.15	
	25.0	505.85	
	26.0	505.85	
	27.0	505.85	
	28.0	505.45	
Cross Section 2	0.0		LB Marker
Station 1+36	8.0	509.57	
	10.0	509.07	
	12.0	508.57	
	14.0	508.17	
	15.0	507.97	
	16.0	507.77	
	17.5	507.39	
	18.0	507.27	
	20.0	506.77	
	22.0	506.80	
	24.0	506.70	
	26.0	506.50	
	28.0	506.60	
	30.0	506.60	
	32.0	506.90	
	34.0	506.85	
	36.0	506.90	
	38.0	506.90	

Table C-2.5 (cont.) Cross section elevations at site 118.9L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 1+36 (cont.)	40.0	506.90	
	42.0	506.95	
	44.0	506.90	
	46.0	506.70	
	48.0	507.00	
	50.0	507.10	
	54.0	507.00	
	56.0	506.95	
	58.0	506.90	
	62.0	506.70	
	64.0	506.65	
	70.0	506.50	
	78.0	506.70	
	86.0	506.30	
	94.0	506.20	
	102.0	505.80	
Cross Section 3 Station 2+45	0.0		LB Marker
	12.0	509.57	
	16.0	509.17	
	18.0	508.55	
	22.0	508.75	
	24.0	508.75	
	26.0	508.75	
	30.0	508.75	
	34.0	508.65	
	36.0	508.40	
	38.0	508.15	
	42.0	508.05	
	44.0	508.02	
	48.0	507.97	
	50.0	507.95	
	52.0	507.97	
	54.0	507.99	
	56.0	508.01	
	60.0	508.05	
	64.0	508.01	
	68.0	507.97	
	70.0	507.95	
	76.0	507.71	
	80.0	507.55	

Table C-2.5 (cont.) Cross section elevations at site 118.9L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 2+45 (cont.)	84.0	507.35	
	88.0	507.15	
	90.0	507.05	
	92.0	506.95	
	96.0	507.10	
	100.0	507.10	
	104.0	506.60	
	108.0	506.40	
	112.0	506.40	
	116.0	506.40	
	120.0	506.30	
	124.0	505.70	
	128.0	505.70	
	132.0	505.60	

Reference elevation: USGS A107 1965.

Table C-2.6 Cross section elevations at site 119.1L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	511.02	LB Marker
Station 0+00	14.0	511.02	
	16.0	510.62	
	18.5	510.37	
	20.0	510.22	
	21.0	510.04	
	22.0	509.87	
	24.0	509.52	
	26.0	509.07	
	28.0	508.62	
	30.0	508.27	
	32.0	507.92	
	34.0	507.95	
	36.0	507.85	
	38.0	507.80	
	40.0	507.75	
	42.0	507.55	
	44.0	507.35	
	46.0	507.25	
	48.0	507.15	
	50.0	506.85	
Cross Section 2	0.0	511.02	LB Marker
Station 1+66	14.0	511.02	
	16.0	510.62	
	18.0	510.22	
	21.4	509.20	
	22.0	509.02	
	24.0	508.82	
	25.0	508.72	
	26.0	508.62	
	27.0	508.54	
	28.0	508.47	
	30.0	508.32	
	32.0	508.12	
	34.0	507.92	
	36.0	507.50	
	38.0	506.97	

Table C-2.6 (cont.) Cross section elevations at site 119.1L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 1+66 (cont.)	40.0	506.45	
	42.0	506.40	
	44.0	506.35	
	46.0	505.55	
Cross Section 3 Station 2+42	0.0		LB Marker
	31.0	511.02	
	32.0	510.82	
	36.0	510.32	
	40.0	509.72	
	43.5	509.28	
	44.0	509.22	
	44.5	509.12	
	46.0	508.99	
	48.0	508.69	
	50.0	508.49	
	52.0	508.34	
	54.0	508.09	
	56.0	507.89	
	58.0	507.64	
	60.0	507.49	
	62.0	507.69	
	64.0	506.89	
	66.0	506.89	
	68.0	506.39	
	70.0	506.29	

Reference elevation USGS A107 1965.

Table C-2.7 Cross section elevations at site 125.2P.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	558.10	LB Marker
Station 0+00	9.0	558.10	
	12.3	557.49	
	13.0	557.36	
	16.0	556.80	
	17.0	556.57	
	20.0	555.90	
	21.0	555.82	
	25.0	555.50	
	29.0	555.18	
	30.0	555.10	
	33.0	554.91	
	43.0	554.11	
	85.0	554.20	
	89.0	554.40	
	93.0	554.70	
	97.0	554.80	
	101.0	555.20	
	105.0	555.50	
	109.0	555.50	
	110.0	555.50	
	113.0	555.50	
	117.0	555.40	
	121.0	555.10	
	125.0	555.00	
	129.0	554.70	
	133.0	554.60	
	137.0	554.70	
	141.0	554.80	
	145.0	554.60	
	149.0	554.80	
	150.0	554.80	
	153.0	554.80	
	157.0	554.60	
	161.0	554.50	
	165.0	554.40	
	169.0	554.30	
	173.0	554.50	
	177.0	554.30	
	180.0	554.30	
	185.0	554.30	

Table C-2.7 (cont.) Cross section elevations at site 125.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1 Station 0+00 (cont.)	186.0	554.30	
	189.0	554.10	
	193.0	554.30	
	197.0	554.30	
	201.0	554.30	
	209.0	554.40	
	210.0	554.40	
	213.0	554.70	
	214.0	554.75	
	217.0	554.90	
	221.0	555.10	
	222.0	555.14	
	225.0	555.25	
	229.0	555.40	
	232.0	555.45	
	235.0	555.50	
	237.0	555.60	
	241.0	555.70	
	242.0	555.80	
	245.0	556.10	
	246.0	556.20	
	250.0	556.20	
	252.0	556.81	
	254.0	556.85	
	255.0	556.40	
	258.0	556.49	
	262.0	556.61	
	265.0	556.70	
	266.0	556.77	
	269.0	557.00	
	270.0	557.07	
	273.0	557.30	
	274.0	557.40	
	277.0	557.70	
	278.0	557.72	
	281.0	557.80	
	282.0	557.87	
	285.0	558.10	
	310.0	559.63	
	325.0	560.55	
	335.0	561.03	RB Marker

Table C-2.7 (cont.) Cross section elevations at site 125.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2	0.0	561.32	LB Marker
Station 7+97	68.0	560.51	
	110.0	559.36	
	130.0	559.36	
	140.0	559.16	
	144.0	558.96	
	147.0	558.81	
	150.0	558.66	
	151.0	558.63	
	155.0	558.51	
	159.0	558.39	
	160.0	558.36	
	163.0	558.21	
	167.0	558.01	
	170.0	557.86	
	171.0	557.77	
	172.0	557.67	
	176.0	557.57	
	177.0	557.27	
	180.0	557.57	
	184.0	557.32	
	187.0	557.28	
	188.0	557.27	
	192.0	557.37	
	196.0	557.37	
	197.0	557.37	
	200.0	557.52	
	204.0	557.52	
	207.0	557.41	
	208.0	557.37	
	216.0	557.17	
	217.0	557.16	
	224.0	557.07	
	227.0	557.14	
	232.0	557.27	
	237.0	557.27	
	240.0	557.27	
	248.0	557.47	
	256.0	557.67	
	257.0	557.62	
	258.0	557.57	

Table C-2.7 (cont.) Cross section elevations at site 125.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 7+97 (cont.)	274.0	557.47	
	277.0	557.38	
	284.0	557.17	
	294.0	557.17	
	300.0	556.93	
	304.0	556.77	
	314.0	556.77	
	324.0	556.57	
	330.0	556.57	
	334.0	556.57	
	344.0	556.07	
	354.0	555.87	
	364.0	555.67	
	374.0	556.07	
	384.0	556.77	
	394.0	556.07	
	402.0	556.31	
	404.0	556.37	
	408.5	556.86	
	410.5	557.08	
	412.5	557.30	
	414.0	557.47	
	414.5	557.54	
	416.0	557.77	
	416.5	556.83	
	418.5	557.33	
	419.5	556.76	
	421.3	556.96	
	423.5	557.76	
	425.5	558.56	
	427.5	559.66	
	428.5	559.86	
	435.0	565.71	
	437.5	566.12	RB Marker

Date of Survey: Sept. 29, 1984.
Reference elevation: R&M Alcap 124.7T1 RB 1982.

Table C-2.8 Cross section elevations at site 130.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	609.60	LB Marker
Station 0+00	20.0	606.74	
	24.0	606.34	
	25.0	606.26	
	26.0	606.19	
	28.0	606.04	
	30.0	605.94	
	34.0	605.74	
	36.0	605.64	
	38.0	605.54	
	40.0	605.44	
	42.0	605.34	
	46.0	605.14	
	50.0	604.94	
	54.0	604.74	
	58.0	604.54	
	60.0	604.63	
	62.0	604.73	
	66.0	604.92	
	70.0	605.11	
	74.0	605.30	
	78.0	605.49	
	80.0	605.54	
	82.0	605.60	
	86.0	605.71	
	90.0	605.82	
	94.0	605.93	
	98.0	606.04	
	100.0	606.06	
	108.0	606.14	
	110.0	606.16	
	118.0	606.24	
	123.0	606.39	
	128.0	606.54	
	136.5	606.74	
	146.0	606.62	

Table C-2.8 (cont.) Cross section elevations at site 130.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2	0.0	609.21	LB Marker
Station 2+27	11.2	606.74	
	20.0	606.64	
	30.0	606.54	
	40.0	606.24	
	41.0	606.18	
	41.6	606.14	
	42.0	606.12	
	46.0	605.88	
	50.0	605.64	
	53.0	605.46	
	54.0	605.40	
	58.0	605.16	
	60.0	605.04	
	62.0	605.07	
	66.0	605.13	
	70.0	605.19	
	74.0	605.25	
	78.0	605.31	
	80.0	605.34	
	82.0	605.52	
	86.0	605.89	
	87.8	606.05	
	90.5	606.29	
	91.0	606.34	
	95.0	606.54	
	99.0	606.74	
	131.0	607.91	
Cross Section 3	0.0	609.12	LB Marker
Station 4+21	9.0	606.74	
	10.0	606.56	
	11.8	606.25	
	12.0	606.21	
	13.0	606.04	
	14.0	605.91	
	15.0	605.79	
	16.0	605.66	
	17.0	605.54	
	20.0	605.35	
	21.0	605.29	

Table C-2.8 (cont.) Cross section elevations at site 130.2R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 4+21 (cont.)	24.0	605.10	
	25.0	605.03	
	28.0	604.84	
	29.0	604.61	
	30.0	604.39	
	32.0	604.51	
	33.0	604.58	
	34.0	604.64	
	36.0	604.69	
	37.0	604.71	
	38.0	604.74	
	40.0	604.94	
	41.0	605.04	
	42.0	605.14	
	44.0	605.31	
	45.0	605.40	
	46.0	605.49	
	48.0	605.69	
	49.0	605.79	
	50.0	605.89	
	53.0	606.04	
	54.0	606.09	
	55.0	606.15	
	57.0	606.28	
	58.0	606.34	
	62.4	606.74	
	74.0	606.04	
	97.0	607.62	

Date of Survey: Sept. 27, 1985.
Reference elevation: R&M TBM 9-1 1982.

Table C-2.9 Cross section elevations at site 131.3L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0	609.13	LB Marker
Station 0+00	17.0	616.00	
	20.0	615.50	
	24.0	615.10	
	28.0	615.00	
	32.0	614.90	
	40.0	614.80	
	50.0	614.20	
	60.0	613.40	
	70.0	613.00	
	80.0	612.90	
	90.0	613.40	
	91.0	613.40	
	93.0	613.40	
	95.0	613.40	
	97.0	613.40	
	99.0	613.40	
	100.0	613.40	
	101.0	613.40	
	103.0	613.40	
	104.0	613.40	
	110.0	613.40	
	115.0	613.60	
	117.0	613.62	
	119.0	613.59	
	120.0	613.58	
	121.0	613.57	
	123.0	613.52	
	125.0	613.47	
	127.0	613.69	
	129.0	613.92	
	130.0	614.01	
	131.0	614.09	
	133.0	614.27	
	135.0	614.32	
	137.0	614.37	
	141.0	614.67	
	145.0	615.47	
	149.0	616.32	
	150.2	616.77	RB Marker

Table C-2.9 (cont.) Cross section elevations at site 131.3L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 2+93	0.0	617.08	LB Marker
	11.0	616.52	
	34.0	616.00	
	38.0	615.80	
	42.0	615.30	
	46.0	615.20	
	50.0	615.00	
	54.0	614.90	
	60.0	614.50	
	64.0	614.33	
	66.0	613.93	
	68.0	613.93	
	70.0	613.83	
	72.0	613.73	
	74.0	613.83	
	76.0	613.93	
	78.0	613.73	
	80.0	613.83	
	82.0	613.83	
	84.0	613.83	
	86.0	613.93	
	88.0	614.07	
	90.0	614.17	
	92.0	614.27	
	94.0	614.37	
	95.0	614.42	
	98.0	614.57	
	100.0	614.71	
	108.0	615.27	
	110.0	615.44	
	118.0	616.12	
	120.0	616.32	
	122.0	616.52	
	124.0	616.77	
	126.0	616.77	
	131.0	616.38	
	140.0	617.15	RB Marker

Table C-2.9 (cont.) Cross section elevations at site 131.3L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3	0.0	619.62	LB Marker
Station 5+37	8.0	617.71	
	10.0	617.71	
	14.0	617.71	
	20.0	617.29	
	30.0	616.59	
	34.0	616.31	
	35.0	616.28	
	40.0	616.13	
	44.0	616.01	
	48.0	615.89	
	50.0	615.83	
	54.0	615.71	
	56.0	615.72	
	60.0	615.74	
	64.0	615.76	
	66.0	615.82	
	70.0	615.94	
	72.0	616.00	
	74.0	616.06	
	76.0	616.09	
	80.0	616.15	
	84.0	616.21	
	88.0	616.17	
	90.0	616.15	
	92.0	616.13	
	94.0	616.11	
	96.0	616.13	
	100.0	616.17	
	104.0	616.21	
	108.0	616.17	
	110.0	616.15	
	112.0	616.13	
	114.0	616.11	
	116.0	616.11	
	120.0	616.11	
	124.0	616.11	
	128.0	616.11	
	130.0	616.11	
	132.0	616.11	
	134.0	616.11	

Table C-2.9 (cont.) Cross section elevations at site 131.3L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 5+37 (cont.)	136.0	616.09	
	140.0	616.05	
	144.0	616.01	
	148.0	616.25	
	150.0	616.37	
	152.0	616.49	
	154.0	616.61	
	156.0	616.59	
	157.0	616.58	
	160.0	616.55	
	164.0	616.51	
	170.0	616.57	
	174.0	616.61	
	180.0	616.49	
	182.0	616.45	
	184.0	616.41	
	194.0	616.61	
	204.0	617.21	
	214.0	617.41	
	224.0	617.46	
	228.0	617.41	
	231.5	617.71	
	236.0	618.36	
	245.0	619.90	
	264.0	619.50	
	278.0	622.10	RB Marker
Cross Section 4 Station 7+66	0.0		LB Marker
	11.0	617.19	
	28.0	617.19	
	48.0	616.76	
	50.0	616.76	
	52.0	616.76	
	54.0	616.66	
	56.0	616.56	
	58.0	616.46	
	60.0	616.36	
	62.0	616.26	
	64.0	616.32	
	66.0	616.38	
	68.0	616.44	

Table C-2.9 (cont.) Cross section elevations at site 131.3L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 4 Station 7+66 (cont.)	70.0	616.50	
	72.0	616.56	
	74.0	616.66	
	76.0	616.76	
	88.0	616.76	
	92.0	616.76	
	102.0	616.76	
	108.0	616.70	
	112.0	616.66	
	122.0	616.56	
	128.0	616.44	
	132.0	616.36	
	142.0	616.26	
	148.0	616.26	
	152.0	616.26	
	162.0	616.36	
	168.0	616.18	
	172.0	616.06	
	178.0	616.00	
	182.0	615.96	
	188.0	616.08	
	192.0	616.16	
	196.0	616.12	
	197.7	616.10	
	202.0	616.06	
	212.0	616.16	
	222.0	616.26	
	227.0	616.76	RB Marker

Date of Survey: Sept. 27, 1984
Reference elevation: R&M Alcap 131.1S1 RB 1982.

Table C-2.10 Cross section elevations at site 133.8R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		RB Marker
Station 0+00	13.6	650.64	
	16.0	650.34	
	20.0	649.84	
	24.0	649.44	
	28.0	648.84	
	32.0	648.34	
	34.0	648.14	
	36.0	647.47	
	40.0	647.62	
	44.0	647.77	
	50.0	647.84	
	52.0	647.87	
	60.0	647.87	
	68.0	647.47	
	70.0	647.37	
	76.0	647.07	
	80.0	647.07	
	84.0	647.07	
	92.0	646.87	
	100.0	647.37	
	108.0	647.07	
	116.0	647.07	
	124.0	647.27	
	132.0	647.77	
	140.0	647.37	
Cross Section 2	0.0		RB Marker
Station 0+44	19.7	650.64	
	22.0	649.94	
	26.0	649.24	
	30.0	648.44	
	34.0	647.74	
	36.0	647.67	
	38.0	647.42	
	40.0	647.17	
	42.0	647.32	
	44.0	647.47	
	48.0	647.57	
	50.0	647.57	
	52.0	647.57	

Table C-2.10 (cont.) Cross section elevations at site 133.8R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 0+44 (cont.)	56.0	647.57	
	60.0	647.37	
	64.0	647.37	
	68.0	647.17	
	70.0	647.07	
	72.0	646.97	
	76.0	646.77	
	80.0	647.67	
	84.0	647.87	
	88.0	647.87	
	90.0	647.87	
	92.0	647.87	
	96.0	647.87	
	100.0	647.87	
	103.0	648.37	
	110.0	648.37	
	113.0	648.37	
	114.0	648.27	
	118.0	647.87	
	120.0	647.72	
	122.0	647.57	
	126.0	647.37	
	130.0	647.07	
	140.0	646.97	
	150.0	646.97	
	160.0	647.07	
	170.0	647.37	
	180.0	647.37	
	190.0	648.07	
	195.0	648.37	
Cross Section 3 Station 1+46	0.0		RB Marker
	16.7	650.64	
	18.0	650.44	
	20.0	649.99	
	22.0	649.54	
	24.0	649.51	
	26.0	649.49	
	28.0	649.26	
	29.0	649.15	
	30.0	649.04	

Table C-2.10 (cont.) Cross section elevations at site 133.8R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 1+46 (cont.)	32.0	648.86	
	34.0	648.69	
	36.0	648.46	
	38.0	648.24	
	40.0	648.29	
	42.0	648.34	
	46.0	648.25	
	50.0	648.33	
	54.0	648.13	
	58.0	647.93	
	60.0	647.83	
	62.0	647.91	
	66.0	648.07	
	70.0	648.23	
	74.0	648.35	
	78.0	648.47	
	80.0	648.53	
	82.0	648.53	
	86.0	648.53	
	90.0	648.53	
	92.0	648.57	
	100.0	648.73	
	110.0	648.73	
	120.0	648.93	
	130.0	648.93	
	140.0	649.23	
	150.0	649.23	
	187.0	649.23	
	188.0	649.03	
	192.0	648.33	
	196.0	647.83	
	200.0	647.63	
	204.0	648.23	
	208.0	648.43	
	212.0	648.53	
	216.0	648.53	

Reference elevation: ADF&G Alcap 133.8W RB 1983.

Table C-2.11 Cross section elevations at site 137.5R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB Marker
Station 0+00	20.0	692.00	
	26.0	690.80	
	32.0	690.50	
	36.0	690.90	
	42.0	692.00	
	58.0	692.00	
	60.0	691.70	
	64.0	691.50	
	74.0	690.70	
	82.0	690.00	
	88.0	689.30	
	96.0	689.30	
	100.0	690.00	
	106.0	690.70	
	111.0	692.00	
Cross Section 2	0.0		LB Marker
Station 1+84	23.0	692.00	
	24.0	691.80	
	26.0	691.60	
	36.0	690.90	
	40.0	690.90	
	46.0	690.60	
	56.0	690.60	
	60.0	690.60	
	64.0	690.40	
	70.0	691.00	
	80.0	690.90	
	90.0	691.50	
	97.0	692.00	
Cross Section 3	0.0		LB Marker
Station 4+16	20.0	692.00	
	22.0	691.70	
	28.0	691.20	
	30.0	690.80	
	36.0	691.20	
	38.0	691.20	

Table C-2.11 (cont.) Cross section elevations at site 137.5R.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 4+16 (cont.)	42.0	691.30	
	46.0	691.20	
	50.0	691.80	
	54.0	692.00	

Reference elevation: R&M Alcap LRX-48 1982.

Table C-2.12 Cross section elevations at site 138.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB Marker
Station 0+00	11.0	710.61	
	16.0	709.81	
	20.0	709.41	
	21.0	709.31	
	24.0	709.01	
	24.3	708.98	
	26.0	708.81	
	28.0	708.61	
	30.0	708.46	
	32.0	708.31	
	34.0	707.45	
	36.0	707.25	
	38.0	707.05	
	40.0	706.78	
	42.0	706.52	
	44.0	706.25	
	46.0	706.10	
	48.0	705.95	
	49.0	705.81	
	50.0	705.67	
	53.0	705.26	
	54.0	705.12	
	56.0	704.85	
	57.0	705.05	
	60.0	704.67	
	61.0	704.55	
	65.0	704.05	
	68.0	703.82	
	69.0	703.75	
	73.0	703.35	
Cross Section 2	0.0		LB Marker
Station 2+83	8.0	710.91	
	12.0	710.71	
	16.0	710.41	
	20.0	710.31	
	24.0	710.11	
	28.0	709.81	
	31.7	709.44	
	32.0	709.41	

Table C-2.12 (cont.) Cross section elevations at site 138.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 2+83 (cont.)	34.0	709.16	
	36.0	708.91	
	38.0	708.76	
	39.0	708.68	
	40.0	708.61	
	42.0	708.46	
	44.0	708.31	
	46.0	707.21	
	48.0	707.01	
	50.0	706.81	
	53.0	706.31	
	54.0	706.21	
	57.0	706.16	
	58.0	706.01	
	60.0	705.98	
	61.0	705.93	
	62.0	705.91	
	64.0	705.87	
	65.0	705.79	
	69.0	705.76	
	70.0	705.71	
	73.0	705.56	
	77.0	705.31	
	80.0	704.93	
	81.0	704.81	
	84.0	704.81	
	85.0	704.81	
	89.0	704.81	
	93.0	704.21	
Cross Section 3 Station 5+09	0.0		LB Marker
	9.0	710.61	
	12.0	710.31	
	18.0	709.71	
	20.0	708.15	
	22.0	707.95	
	22.6	707.89	
	24.0	707.75	
	26.0	707.80	
	28.0	707.85	
	30.0	707.65	

Table C-2.12 (cont.) Cross section elevations at site 138.7L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 5+09 (cont.)	32.0	707.45	
	34.0	707.40	
	36.0	707.35	
	38.0	707.18	
	40.0	707.02	
	42.0	706.85	
	44.0	706.75	
	47.0	706.60	
	48.0	706.55	
	51.0	706.02	
	52.0	705.85	
	55.0	705.65	
	59.0	705.15	
	60.0	704.95	
	63.0	704.35	
	67.0	704.15	

Reference elevation: R&M Alcap 138.6T1 LB 1982.

Table C-2.13 Cross section elevations at site 139.0L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB Marker
Station 0+00	2.0	712.62	
	4.0	711.52	
	8.0	711.02	
	11.0	710.57	
	12.0	710.42	
	13.7	710.16	
	14.0	710.12	
	16.0	709.82	
	18.0	709.44	
	20.0	709.44	
	22.0	709.22	
	24.0	709.00	
	26.0	708.78	
	27.0	708.67	
	30.0	708.34	
	31.0	708.26	
	32.0	708.18	
	35.0	707.94	
	39.0	707.62	
	40.0	707.54	
	43.0	707.66	
	47.0	707.82	
	50.0	707.94	
	51.0	707.97	
	54.0	708.06	
	55.0	708.09	
	60.0	708.24	
	61.0	708.34	
	63.0	708.54	
	68.0	709.04	
	70.0	709.24	
	74.0	709.12	
	80.0	708.94	
	82.0	708.78	
	90.0	708.14	
	100.0	707.84	
	110.0	707.54	
	120.0	706.54	
	130.0	707.14	
	140.0	706.84	
	150.0	706.54	

Table C-2.13 (cont.) Cross section elevations at site 139.0L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2	0.0		LB Marker
Station 1+05	4.0	711.62	
	8.0	710.52	
	9.0	710.06	
	10.2	709.82	
	12.0	709.46	
	13.0	709.38	
	14.0	709.29	
	16.0	709.13	
	18.0	708.96	
	19.5	708.93	
	20.0	708.93	
	22.0	708.89	
	22.7	708.88	
	24.0	708.86	
	27.6	708.68	
	29.0	708.61	
	30.0	708.56	
	32.0	708.73	
	34.0	708.89	
	36.0	709.06	
	41.6	709.59	
	42.0	709.66	
	46.0	709.63	
	56.9	709.57	
	58.0	709.56	
	60.0	709.46	
	64.0	709.26	
	68.0	709.06	
	70.0	708.96	
	78.0	709.12	
	80.0	709.16	
	88.0	709.16	
	90.0	709.09	
	94.0	708.96	
	98.0	708.83	
	100.0	708.76	
	106.0	708.56	
	108.0	708.37	
	110.0	708.19	
	118.0	707.45	

Table C-2.13 (cont.) Cross section elevations at site 139.0L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 2 Station 1+05 (cont.)	120.0	707.26	
	130.0	706.84	
	140.0	706.34	
Cross Section 3 Station 2+29	0.0		LB Marker
	1.3	712.62	
	4.0	711.72	
	8.0	710.62	
	10.0	710.06	
	12.0	709.96	
	14.1	709.85	
	16.0	709.76	
	22.0	709.66	
	26.0	709.56	
	30.0	709.46	
	35.0	710.06	
	35.6	710.06	
	54.0	710.06	
	56.0	709.76	
	61.7	709.47	
	63.0	709.41	
	64.0	709.36	
	66.0	709.39	
	68.0	709.43	
	70.0	709.46	
	74.0	709.26	
	78.0	709.06	
	80.0	708.96	
	82.0	708.86	
	84.0	708.76	
	86.0	708.46	
	89.0	708.01	
	90.0	707.86	
	92.0	707.76	
	93.0	707.71	
	94.0	707.66	
	97.0	707.51	
	98.0	707.46	
	100.0	707.36	
	101.0	707.28	
	104.0	707.06	

Table C-2.13 (cont.) Cross section elevations at site 139.0L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 2+29 (cont.)	105.0	707.29	
	108.0	707.14	
	111.0	706.99	
	121.0	706.29	
	126.0	706.09	
Cross Section 4 Station 3+58	0.0	711.72	LB Marker
	4.0	711.22	
	8.0	710.52	
	12.0	710.32	
	13.0	710.30	
	15.8	710.24	
	16.0	710.12	
	22.0	710.12	
	24.6	709.74	
	28.0	709.64	
	40.5	710.01	
	42.0	710.06	
	44.0	709.81	
	46.0	709.56	
	47.0	709.43	
	48.0	709.31	
	50.0	709.06	
	52.0	708.86	
	54.0	708.66	
	55.0	708.61	
	56.0	708.56	
	58.0	708.46	
	60.0	708.31	
	62.0	708.16	
	64.0	708.13	
	66.0	708.09	
	68.0	707.76	
	70.0	707.46	
	72.0	707.49	
	74.0	707.29	
	76.0	707.09	
	80.0	706.69	
	90.0	706.19	

Reference elevation: R&M TBM "Indian" LRX-51 1982.

Table C-2.14 Cross section elevations at site 139.4L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 1	0.0		LB Marker
Station 0+00	8.8	714.99	
	14.0	714.59	
	18.0	713.99	
	20.0	713.74	
	20.2	713.71	
	22.0	713.49	
	23.0	713.29	
	24.0	713.09	
	26.0	712.69	
	27.5	712.70	
	28.0	712.64	
	30.0	712.40	
	32.0	712.40	
	34.0	712.30	
	36.0	712.00	
	38.0	711.80	
	40.0	711.55	
	42.0	711.30	
	44.0	711.15	
	46.0	711.00	
	48.0	710.75	
	50.0	710.50	
	54.0	709.90	
	58.0	709.70	
Cross Section 2	0.0		LB Marker
Station 1+68	3.5	714.99	
	8.0	713.89	
	10.0	713.34	
	11.5	712.93	
	12.0	712.79	
	14.0	713.24	
	16.0	712.70	
	18.0	712.25	
	20.0	712.20	
	22.0	712.25	
	24.0	711.50	
	26.0	711.20	
	28.0	711.20	
	30.0	710.94	

Table C-2.14 (cont.) Cross section elevations at site 139.4L.

Location Within site	Horizontal Distance (ft)	Streambed Elevation (ft)	Comments
Cross Section 3 Station 2+72	0.0		LB Marker
	2.0	715.19	
	6.0	714.39	
	9.0	713.34	
	9.6	713.13	
	10.0	712.99	
	11.0	712.79	
	12.0	712.59	
	14.0	712.19	
	16.0	712.70	
	18.0	712.50	
	20.0	712.25	
	22.0	711.90	
	24.0	711.40	
	26.0	711.20	
	28.0	711.30	
	30.0	711.10	
	32.0	710.90	
	34.0	710.70	
	38.0	710.20	

Reference elevation: R&M TBM "Indian" LRX-51 1982.

Table C-5.1 Summary of hydraulic data collected at site 101.7L, Cross section 1.

RATING CURVE: A = 2.25 B = 0.67 CE = 365.00

	DATE: SEPT 21 a	DATE: AUG 30 b	DATE: AUG 20 b	DATE:	DATE:
	REACH US = 300.00	REACH US = 300.00	REACH US = 300.00	REACH US =	REACH US =
	DS = 300.00	DS = 300.00	DS = 300.00	DS =	DS =
	GCD: 11400	GCD: 15300	GCD: 18500	GCD:	GCD:
	WSEL: 367.74	WSEL: 368.58	WSEL: 369.06	WSEL:	WSEL:

STA	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	SUBSTRATE INFO SUB	COV
		1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00								10.00	5.30
54.5	.00	.00		0.03	.00		1.00	.00								10.00	5.30
56.0	.00	.00		0.23	.00		1.20	.00								10.00	5.30
58.0	.00	.00		0.33	.00		1.30	.00								10.00	5.30
62.0	.00	.00		0.62	.00		1.62	.00								10.00	5.30
68.0	.00	.00		0.74	.00		2.10	0.32								10.00	5.30
70.0	.00	.00		0.97	0.05		2.16	0.37								10.00	5.30
74.0	.00	.00		1.14	0.05		2.29	0.46								10.00	5.30
75.0	.00	.00		1.22	0.06		2.32	0.48								10.00	5.30
77.0	0.25	0.00		1.37	0.09		2.38	0.52								10.00	5.30
78.0	0.31	0.00		1.44	0.10		2.41	0.55								10.00	5.30
82.0	0.54	0.00		1.68	0.10		2.65	0.65								10.00	5.30
83.0	0.60	0.00		1.74	0.13		2.71	0.68								10.00	5.30
86.0	0.78	0.00		1.92	0.20		2.88	0.75								10.00	5.30
88.0	0.90	0.00		2.04	0.24		3.00	0.80								10.00	5.30
92.0	0.15	0.10		2.27	0.32		3.29	1.00								10.00	5.30
94.0	1.27	0.17		2.39	0.40		3.43	1.22								10.00	5.30
97.0	1.45	0.18		2.57	0.48		3.65	1.41								10.00	5.30
98.5	1.54	0.19		2.76	0.75		3.72	1.50								10.00	5.30
102.0	1.75	0.21		3.08	0.80		3.95	1.58								10.00	5.30
107.0	2.05	0.23		3.38	0.85		4.22	1.68								10.00	5.30
108.0	2.11	0.24		3.53	0.90		4.29	1.70								10.00	5.30
110.0	2.23	0.26		3.65	0.96		4.38	1.76								10.00	5.30
112.0	2.35	0.28		3.82	1.05		4.28	1.82								10.00	5.30
117.0	2.64	0.36		4.21	1.25		4.27	1.97								10.00	5.30
118.0	2.70	0.41		4.41	1.30		4.27	2.00								10.00	5.30
122.0	2.93	0.49		4.65	1.50		4.21	1.96								10.00	5.30
126.0	3.17	0.57		4.87	1.30		4.15	1.96								10.00	5.30
128.0	3.29	0.62		4.97	1.35		4.12	1.95								10.00	5.30
132.0	3.53	0.69		5.21	1.45		4.15	1.81								10.00	5.30
134.0	3.65	0.74		5.33	1.50		4.16	1.74								10.00	5.30
138.0	3.89	0.84		5.57	1.35		4.19	1.60								10.00	5.30

Table C 3.1 (cont.) Summary of hydraulic data collected at site Tol. 1, Cross Section 1.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
142.0	2.15	0.40		3.29	1.20		4.23	1.70								10.00	5.30
148.0	2.16	0.34		3.32	1.20		4.20	1.85								10.00	5.30
150.0	2.19	0.32		3.33	1.20		4.31	1.81								10.00	5.30
152.0	2.30	0.30		3.36	1.21		4.34	1.77								10.00	5.30
158.0	2.32	0.36		3.46	1.25		4.42	1.65								10.00	5.30
162.0	2.40	0.40		3.55	1.25		4.51	1.85								10.00	5.30
164.0	2.45	0.40		3.57	1.25		4.56	1.95								10.00	5.30
166.0	2.50	0.40		3.64	1.24		4.60	2.05								10.00	5.30
172.0	2.65	0.40		3.79	1.20		4.71	1.63								10.00	5.30
174.0	2.64	0.41		3.78	1.19		4.74	1.75								10.00	5.30
180.0	2.61	0.44		3.75	1.15		4.71	1.75								10.00	5.30
182.0	2.60	0.48		3.72	1.15		4.70	1.75								10.00	5.30
184.0	2.60	0.55		3.63	1.15		4.46	1.81								10.00	5.30
186.0	2.47	0.52		3.61	1.15		4.41	1.83								10.00	5.30
190.0	2.31	0.54		3.58	1.17		4.31	1.65								10.00	5.30
192.0	2.35	0.55		3.56	1.23		4.36	1.90								10.00	5.30
196.0	2.55	0.63		3.49	1.30		4.45	2.00								10.00	5.30
198.0	2.45	0.52		3.50	1.29		4.45	1.95								10.00	5.30
202.0	2.35	0.45		3.57	1.26		4.45	1.55								10.00	5.30
204.0	2.45	0.44		3.59	1.25		4.52	1.45								10.00	5.30
206.0	2.60	0.45		3.57	1.14		4.63	1.30								10.00	5.30
208.0	2.56	0.38		3.57	1.10		4.66	1.25								10.00	5.30
212.0	2.30	0.30		3.54	0.95		4.41	1.42								10.00	5.30
216.0	2.15	0.30		3.40	0.95		4.25	1.50								10.00	5.30
218.0	2.05	0.31		3.38	0.92		4.10	1.40								10.00	5.30
220.0	1.96	0.31		3.42	0.90		3.92	1.30								10.00	5.30
224.0	1.90	0.32		3.53	0.89		4.03	1.12								10.00	5.30
226.0	1.95	0.34		3.55	0.75		4.04	0.75								10.00	5.30
228.0	1.94	0.34		3.55	0.74		3.82	0.70								10.00	5.30
230.0	1.95	0.31		3.61	0.70		3.97	0.65								10.00	5.30
232.0	1.90	0.30		3.72	0.60		3.80	0.80								10.00	5.30
234.0	1.90	0.30		3.70	0.58		3.85	0.81								10.00	5.30
236.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
238.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
240.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
242.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
244.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
246.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
248.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
250.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
252.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
254.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
256.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
258.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
260.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
262.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
264.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
266.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
268.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
270.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
272.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
274.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
276.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
278.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
280.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
282.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
284.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
286.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
288.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
290.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
292.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
294.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
296.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
298.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30
300.0	1.90	0.30		3.82	0.60		3.90	0.85								10.00	5.30

| Extrapolated or interpolated value.

Table C-3.1 (cont.) Summary of hydraulic data collected at site 101.7L, Cross section 2.

RATING CURVE: A = -2.28 B = 0.72 Q = 357.00

	DATE: SEPT 21 a	DATE: AUG 30 b	DATE: AUG 20	DATE:	DATE:
REACH US =	172.00	172.00	172.00		
DS =	100.00	100.00	100.00		
GCD:	11400	15300	18500		
WSEL:	371.37	372.41	373.20		

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUBSTRATE INFO SUB	SUBSTRATE INFO COV
0.0	| .00	0.00 |		| .00	0.00 |		| .00	0.00 |								3.00	2.50
19.0	| .00	0.00 |		.00	0.00		| 0.54	0.00 |								10.00	5.30
20.0	| .00	0.00 |		0.30	0.00		| 1.12	0.00 |								10.00	5.30
21.0	.00	0.00		| 0.65	0.00 |		| 1.49	0.00 |								8.00	5.30
22.0	0.40	[illegible]		1.00	0.00		| 1.89	0.00 |								8.00	5.30
24.0	| 0.90	[illegible] |		1.50	0.70	0.90	| 2.39	0.80 |								8.00	5.30
26.0	1.40	[illegible]		2.10	1.20	0.60	| 2.89	1.50 |								6.00	5.30
28.0	| 1.40	0.26 |		2.30	2.10	0.60	| 2.89	2.60 |								3.00	5.30
34.0	| 1.40	[illegible] |		2.40	2.10	1.80	| 2.89	2.75 |								3.00	5.30
[illegible]	1.40	[illegible]		| 2.57	2.17 |		| 2.89	2.80 |								[illegible]	[illegible]
40.0	| 1.30	[illegible] |		2.90	2.30	1.70	| 2.85	2.70 |								[illegible]	[illegible]
46.0	[illegible]	[illegible]	0.70	2.90	2.00	1.20	| 2.79	3.25 |								[illegible]	[illegible]
52.0	| 1.54	[illegible] |		2.40	2.70	[illegible]	| 3.03	3.60 |								10.00	5.30
[illegible]	1.70	[illegible]	[illegible]	| 2.73	2.37 |		| 3.19	3.60 |								10.00	5.30
[illegible]	| [illegible]	[illegible] |		2.70	2.10	1.60	| 3.19	3.50 |								10.00	5.30
[illegible]	| 1.70	[illegible] |		2.30	1.90	1.60	| 3.19	3.50 |								10.00	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	| 2.73	2.17 |		| 3.19	3.40 |								10.00	5.30
[illegible]	| [illegible]	[illegible]		2.50	[illegible]	1.30	| [illegible]	3.40 |								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		2.30	1.60	1.00	| [illegible]	3.25 |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		2.30	2.50	1.60	| [illegible]	3.10 |								[illegible]	[illegible]
[illegible]	1.00	[illegible]		| [illegible]	2.17 |		| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible]		2.00	2.00	[illegible]	| 2.45	3.10 |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		[illegible]	2.40	2.00	| [illegible]	3.00 |								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		| [illegible]	2.30 |		| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		[illegible]	2.10	[illegible]	| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		[illegible]	[illegible]	[illegible]	| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		| [illegible]	1.70 |		| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		[illegible]	[illegible]	[illegible]	| 1.45	2.10 |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		.00	[illegible]		| [illegible]	[illegible] |								[illegible]	[illegible]
[illegible]	| [illegible]	[illegible] |		| [illegible]	[illegible] |		| [illegible]	[illegible] |								[illegible]	[illegible]

a [illegible]
b [illegible]

| Extrapolated or interpolated value.

Table C 3.1 (cont.) Summary of hydraulic data collected at site 101.7L, Cross section 3.

RATING CURVE: a = 2.28 B = 0.72 CF = 367.00

	1	2	3	4	5
DATE:	SEPT [illegible] a	AUG 30 b	AUG 30 c		
REACH US =	156.00	156.00	156.00		
DS =	172.00	172.00	172.00		
GCQ:	11400	15300	18500		
WSEL:	371.37	372.41	373.26		

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUBSTRATE INFO SUB	SUBSTRATE INFO COV
0.0	.00	.00		.00	.00		.00	.00								3.00	2.50
51.5	.00	.00		.00	.00		.00	.00								10.00	5.30
[illegible]	.00	.00		.00	.00		0.30	0.00								10.00	5.30
[illegible]	.00	.00		.00	.00		0.30	0.00								10.00	5.30
64.0	.00	.00		.00	.00	0.00	0.50	0.00	0.00							10.00	5.30
[illegible]	.00	.00		0.50	0.00	0.00	0.66	0.00								10.00	5.30
[illegible]	.00	.00		0.60	0.00	0.00	0.72	0.00								10.00	5.30
72.0	.00	.00		0.80	0.00	0.00	0.84	0.00								10.00	5.30
[illegible]	.00	.00		[illegible]	0.00		0.90	0.00	0.00							10.00	5.30
[illegible]	.00	.00		0.80	0.00	0.00	0.90	0.00								9.00	5.30
[illegible]	.00	.00		0.95	0.00		0.90	0.00								9.00	5.30
[illegible]	[illegible]	.00		1.00	0.00	0.00	0.90	0.00								9.00	5.30
[illegible]	[illegible]	.00		1.12	0.00		0.90	0.00								9.00	5.20
[illegible]	0.18	.00		1.16	0.00		0.90	0.00	0.00							9.00	5.20
[illegible]	0.10	[illegible]		[illegible]	0.00		1.16	0.00								9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	0.00	0.00	1.41	0.00								9.00	5.20
[illegible]	0.70	[illegible]		[illegible]	0.00		1.50	0.00								9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	0.00		1.75	0.00	0.00							9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	0.00		[illegible]	0.00								9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	0.00		[illegible]	0.00								9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	0.00	[illegible]	[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								3.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	0.00		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	0.00	[illegible]	[illegible]								3.00	[illegible]
[illegible]	[illegible]			[illegible]	0.00		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							[illegible]	[illegible]
[illegible]		[illegible]		[illegible]	0.00		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]				[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							[illegible]	[illegible]

Table C-3.1 (cont.) Summary of hydraulic data collected at site 101.7L, Cross section 3.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
127.0	1.00	0.05		1.91	0.07		2.20	0.15								3.00	5.10
130.0	1.23	0.13		2.00	0.10	0.10	2.20	0.15								3.00	5.10
131.0	1.30	0.15		2.01	0.10		2.20	0.15								3.00	5.10
134.0	1.38	0.11		2.01	0.10		2.20	0.15	0.15							3.00	5.10
135.0	1.40	0.10		2.05	0.10		2.20	0.14								3.00	5.10
139.0	1.20	0.05		2.09	0.10		2.10	0.08								3.00	5.10
140.0	1.00	0.04		2.10	0.10	0.10	2.17	0.06								3.00	5.10
143.0	0.50	0.00		1.83	0.07		2.16	0.02								3.00	5.10
144.0	0.40	0.00		1.74	0.06		2.15	0.00	0.00							3.00	1.10
148.0	0.44	0.00		1.38	0.02		1.93	0.00								3.00	1.10
150.0	0.33	0.00		1.20	0.00	0.00	1.82	0.00								3.00	1.10
154.0	0.11	0.00		1.12	0.00		1.80	0.00	0.00							3.00	1.10
160.0	.00	0.00		1.00	0.00		1.72	0.00								3.00	1.10
164.0	.00	0.00		0.60	0.00		0.30	0.00	0.00							3.00	1.10
166.0	.00	0.00		0.20	0.00		0.05	0.00	0.00							3.00	1.10
170.0	.00	0.00		.00	0.00		0.03	0.00								3.00	1.10
172.8	.00	0.00		.00	0.00		.00	0.00	0.00							3.00	1.10

a Mostly clear backwater above cross section 3. Head breaches below cross section, causing slight turbidity & circular current.

b Clear water.

c No fish observed.

I Extraploated or interpolated value.

Table C-3.1 (cont.) Summary of hydraulic data collected at site [illegible], cross section 4.

[illegible] RATING CURVE:			A = 1.95		B = 65.00		CF = 367.00										
DATE: SEPT 21 a			DATE: AUG 30 b				DATE: AUG 20 c			DATE:			DATE:				
REACH US = 40.00			REACH US = 40.00				REACH US = 50.00			REACH US =			REACH US =				
DS = 156.00			DS = 156.00				DS = 156.00			DS =			DS =				
GCQ: 11400			GCQ: 15300				GCQ: 18500			GCQ:			GCQ:				
WSEL: 371.86			WSEL: 372.89				WSEL: 373.66			WSEL:			WSEL:			SUBSTRATE INFO	

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUB	COV
0.0	.00	.00		.00	.00		.00	.00								3.00	2.50
28.7	.00	.00		.00	.00		.00	.00								3.00	1.10
30.0	.00	.00		.00	.00		0.50	0.00								3.00	1.10
[illegible]	.00	.00		.00	.00		0.58	0.00								3.00	1.10
32.0	.00	.00		0.30	0.00	0.00	0.63	0.00								3.00	1.10
34.0	.00	.00		0.20	0.00	0.00	0.75	0.00								3.00	1.10
36.0	.00	.00		0.70	0.00	0.00	0.83	0.00								3.00	6.20
38.0	.00	.00		0.60	[illegible]		0.90	0.00								3.00	3.20
[illegible]	.00	.00		0.30	0.10	0.00	0.91	0.00								3.00	6.20
[illegible]	.00	.00		[illegible]	[illegible]		0.95	0.00								3.00	6.20
[illegible]	.00	.00		0.70	0.00	0.00	0.98	0.00								3.00	6.20
[illegible]	.00	.00		[illegible]	0.00	[illegible]	1.00	0.00								3.00	6.20
58.0	.00	.00		0.70	0.00	0.00	1.10	0.00								3.00	6.20
62.0	.00	.00		[illegible]	0.00		1.20	0.00								3.00	6.20
64.0	.00	.00		0.90	0.00	0.00	1.14	0.00								3.00	6.20
[illegible]	.00	.00		0.70	[illegible]	0.00	0.92	0.00								3.00	6.20
[illegible]	.00	.00		[illegible]	[illegible]		0.90	0.00								3.00	5.20
[illegible]	.00	.00		[illegible]	[illegible]		0.73	0.00								3.00	6.20
[illegible]	[illegible]	.00		[illegible]	[illegible]		[illegible]	0.00								3.00	6.20
[illegible]	[illegible]	.00		.00	[illegible]		[illegible]	[illegible]								3.00	6.20
81.2	[illegible]	.00		[illegible]	.00		.00	[illegible]								3.00	6.20
[illegible]	[illegible]	.00		[illegible]	.00		.00	[illegible]								3.00	6.20
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	0.00								3.00	5.20
[illegible]	[illegible]	.00		[illegible]	.00		.00	0.00								3.00	5.20

a [illegible] not breached.
[illegible]
[illegible]
[illegible]

| Extrapolated or interpolated value.

Table C-3.2 Summary of hydraulic data collected at site 105.6L, Cross Section 1.

RATING CURVE:		n =	.07	B =	0.09	CF =	395.00												
DATE: SEPT 28		DATE:	AUG 30 a			DATE:	AUG 20 a			DATE:				DATE:					
REACH US =	144.00	REACH US =	144.00			REACH US =	144.00			REACH US =				REACH US =					
DS =	999.00		DS =	999.00			DS =	999.00			DS =				DS =				
GCD:	7320		GCD:	15300			GCD:	10500			GCD:				GCD:				
WSEL:	397.24		WSEL:	399.31			WSEL:	400.10			WSEL:				WSEL:			SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00	.00									
42.0	.00	.00		.00	.00		1.50	.00								10.00	8.20
45.0	.00	.00		0.97	.00		1.67	.00								10.00	8.20
47.0	.00	.00		0.97	.00		1.79	0.20								10.00	8.20
48.5	.00	.00		0.97	0.10		1.87	0.20								10.00	8.20
49.0	.00	.00		0.97	0.20		1.90	0.38								10.00	8.20
51.0	.00	.00		0.97	0.20		2.01	1.09								10.00	8.20
53.0	.00	.00		0.97	0.30		2.13	1.80								10.00	8.20
55.0	.00	.00		0.97	1.50		2.24	2.37								10.00	8.20
56.0	.00	.00		0.97	1.90		2.30	2.65								12.00	5.30
57.0	0.20	0.00		1.41	2.30		2.50	2.75								12.00	5.30
58.0	0.40	0.00		1.91	2.45		2.70	3.22								12.00	5.30
59.0	0.45	0.10		1.96	2.60		2.75	3.50								12.00	5.30
60.0	0.50	0.20		2.01	2.85		2.80	4.00								12.00	5.30
61.0	0.60	0.20		2.11	3.10		2.90	4.00								12.00	5.30
62.0	0.70	0.20		2.21	3.30		3.00	4.00								12.00	5.30
63.0	0.80	0.20		2.31	3.50		3.10	4.00								12.00	5.30
64.0	0.90	0.20		2.41	3.75		3.20	4.00								12.00	5.30
65.0	1.00	0.20		2.51	4.00		3.30	4.00								12.00	5.30
66.0	1.20	0.20	0.20	2.61	4.00		3.40	4.00								12.00	5.30
67.0	1.30	0.30	0.30	2.71	4.00		3.50	4.00								12.00	5.30
68.0	1.40	0.30	0.30	2.81	4.00		3.60	4.00								12.00	5.30
69.0	1.50	0.30	0.30	2.91	4.00		3.70	4.00								12.00	5.30
70.0	1.75	0.30	0.30	3.16	4.00		3.95	4.00								12.00	5.30
71.0	2.00	0.30	0.30	3.41	4.00		4.20	4.00								12.00	5.30
72.0	2.25	0.30	0.30	3.66	4.00		4.45	4.00								12.00	5.30
73.0	2.50	0.30	0.30	3.91	4.00		4.70	4.00								12.00	5.30

| Extrapolated or interpolated value.

Table C-5.2 (cont.) Summary of hydraulic data collected at site **105.8L**, cross section ..

RATING CURVE: A = -0.74 B = 0.37 CF = 395.00

	1			2			3			4			5			SUBSTRATE INFO	
	DATE: SEPT 20			DATE: AUG 30			DATE: AUG 20			DATE:			DATE:				
	REACH US = 88.00			REACH US = 70.00			REACH US = 88.00			REACH US =			REACH US =				
	DS = 144.00			DS = 100.00			DS = 500.00			DS =			DS =				
	GCQ: 7320			GCQ: 15300			GCQ: 18500			GCQ:			GCQ:				
	WSEL: 397.90			WSEL: 401.43			WSEL: 401.90			WSEL:			WSEL:				
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
0.0	.00	.00		.00	.00		.00	.00								1.00	6.30
30.5	.00	.00		.00	.00		.00	.00								12.00	6.30
33.0	.00	.00		.00	.00		0.20	0.20								12.00	6.30
34.0	.00	.00		.00	.00		0.25	0.20								12.00	6.30
35.0	.00	.00		0.20	0.00		0.30	0.20								12.00	6.30
37.0	.00	.00		0.50	0.20		0.40	0.20								12.00	6.30
39.0	.00	.00		0.60	0.10	0.10	0.55	1.00								12.00	6.30
41.0	.00	.00		0.80	0.40	0.40	0.70	1.80	2.70							12.00	6.30
43.0	.00	.00		1.50	1.50	1.40	1.20	2.37								12.00	6.30
45.0	.00	.00		1.90	2.30	0.40	1.70	2.93								12.00	6.30
47.0	.00	.00		2.20	2.60	0.60	2.20	3.50	3.20							12.00	6.30
49.0	.00	.00		2.30	3.10	2.70	2.00	4.00								12.00	6.30
50.0	.00	.00		2.35	3.30		2.00	4.00								12.00	6.30
51.0	0.25	0.00		2.40	3.50	3.00	2.25	4.00								10.00	6.30
52.0	0.50	0.00		2.60	3.75		2.50	4.00								10.00	6.30
53.0	0.55	0.15		2.80	4.00	2.30	2.55	4.00								10.00	6.30
54.0	0.60	0.30		2.14	4.00		2.60	4.00								10.00	6.30
56.0	0.90	0.50	0.50	2.44	4.00		2.90	4.00								10.00	6.30
58.0	0.70	0.70		2.24	4.00		2.70	4.00								10.00	6.30
60.0	1.20	1.20		2.74	4.00		3.20	4.00								10.00	6.30
62.0	1.20	1.60	1.50	2.74	4.00		3.20	4.00								12.00	6.30
64.0	1.70	1.50	1.20	3.24	4.00		3.70	4.00								12.00	6.30
66.0	2.40	1.20	0.40	3.94	4.00		4.40	4.00								12.00	6.30
68.0	2.50	2.00	1.20	4.04	4.00		4.50	4.00								12.00	6.30
70.0	2.70	2.70	1.60	4.24	4.00		4.70	4.00								12.00	6.30

Table C-3.2 (cont.) Summary of hydraulic data collected at site 105.8L, Cross section 3.

	RATING CURVE: A = 0.74 B = 0.37 CF = 395.00															
	DATE: SEPT 28 a			DATE: AUG 30			DATE: AUG 20			DATE:			DATE:			
	REACH US = 143.00			REACH US = 143.00			REACH US = 143.00			REACH US =			REACH US =			
	DS = 88.00			DS = 106.00			DS = 88.00			DS =			DS =			
	GCQ: 7320			GCQ: 15300			GCQ: 18500			GCQ:			GCQ:			
	WSEL: 399.90			WSEL: 401.43			WSEL: 401.90			WSEL:			WSEL:			SUBSTRATE INFO
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00								13.00	6.30
17.4	.00	.00		.00	.00		.00	.00								10.00	6.30
18.0	.00	.00		.00	.00		0.25	0.20								10.00	6.30
21.0	.00	.00		.00	.00		0.66	0.73								10.00	6.30
22.0	.00	.00		0.10	0.00		0.80	0.90	1.00							10.00	6.30
23.0	.00	.00		0.20	0.00	0.00	0.90	1.13								10.00	6.30
25.0	.00	.00		0.50	0.30	0.30	1.10	1.56								10.00	6.30
26.0	.00	.00		0.60	0.75		1.20	1.80	1.50							10.00	6.30
27.0	.00	.00		0.70	1.20	1.30	1.33	2.10								10.00	6.30
29.0	.00	.00		0.90	1.40	1.50	1.58	2.70								10.00	6.30
30.0	.00	.00		1.15	1.75		1.70	3.00	2.60							10.00	6.30
31.0	.00	.00		1.40	2.10	1.70	1.85	3.25								10.00	6.30
33.0	.00	.00		1.50	2.50	2.10	2.15	3.75								10.00	6.30
34.0	.00	.00		1.70	2.75		2.30	4.00	3.60							10.00	6.30
35.0	.00	.00		1.90	3.00	2.00	2.35	4.15								10.00	6.30
36.0	0.30	0.50		1.95	3.30		2.40	4.30	3.70							12.00	6.30
37.0	0.45	0.60		2.00	3.60	3.40	2.45	4.40								12.00	6.30
38.0	0.60	0.70		2.25	3.55		2.60	4.40								12.00	6.30
39.0	0.75	0.90		2.50	3.50	2.20	2.75	4.40								12.00	6.30
40.0	0.90	1.10		2.55	3.50		2.90	4.40								12.00	6.30
41.0	0.95	0.40		2.60	3.50	2.40	2.95	4.40								12.00	6.30
42.0	1.00	1.70	1.70	2.64	4.40		3.00	4.40								12.00	6.30
44.0	1.20	2.60	1.70	2.74	4.40		3.20	4.40								12.00	6.30
46.0	1.40	3.20	2.70	2.94	4.40		3.40	4.40								12.00	6.30
48.0	1.60	3.50	3.20	3.14	4.40		3.60	4.40								12.00	6.30
50.0	1.80	4.00	2.90	3.34	4.40		3.80	4.40								12.00	6.30
52.0	1.60	4.70	4.00	3.14	4.40		3.60	4.40								12.00	6.30
54.0	2.00	4.40	2.90	3.54	4.40		4.00	4.40								12.00	6.30

a Turbid water.

| Extrapolated or interpolated value.

Table C-3.2 (cont.) Summary of hydraulic data collected at site 105.8L, Cross section 4.

RATING CURVE:			A = -0.74		B = 0.37		CF = 395.00										
DATE: SEPT 28 a			DATE: AUG 30			DATE: AUG 20			DATE:			DATE:					
REACH US = 500.00			REACH US = 50.00			REACH US = 250.00			REACH US =			REACH US =					
DS = 143.00			DS = 143.00			DS = 143.00			DS =			DS =					
GCD: 7320			GCD: 15300			GCD: 16500			GCD:			GCD:					
WSEL: 399.90			WSEL: 401.43			WSEL: 401.90			WSEL:			WSEL:			SUBSTRATE INFO		
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00	.00								10.00	6.30
24.0	.00	.00		.00	.00		.00	.00								12.00	6.30
25.5	.00	.00		.00	.00		0.26	0.26								12.00	6.30
27.0	.00	.00		0.20	0.00	0.00	0.53	0.53								12.00	6.30
28.0	.00	.00		0.40	0.15		0.70	0.70	0.70							12.00	6.30
29.0	.00	.00		0.60	0.30	0.40	0.88	0.80								10.00	6.30
31.0	.00	.00		1.00	0.60	0.60	1.23	1.00								10.00	6.30
32.0	.00	.00		1.10	0.80		1.40	1.10	1.20							10.00	6.30
33.0	.00	.00		1.20	1.00	1.10	1.50	1.23								10.00	6.30
35.0	.00	.00		1.60	1.10	0.50	1.70	1.48								10.00	6.30
36.0	.00	.00		1.70	1.20		1.80	1.60	1.50							10.00	6.30
37.0	0.20	0.00		1.80	1.30	1.10	1.95	1.75								10.00	6.30
38.0	0.40	0.00		1.85	1.70		2.10	1.90								10.00	6.30
39.0	0.45	0.03		1.90	2.10	1.60	2.25	2.05								10.00	6.30
40.0	0.50	0.05		2.05	2.20		2.40	2.20	2.00							10.00	6.30
41.0	0.45	0.03		2.20	2.30	1.50	2.38	2.45								10.00	6.30
42.0	0.40	0.00		2.15	2.35		2.35	2.70								10.00	6.30
43.0	0.60	0.05		2.10	2.40	2.00	2.33	2.95								10.00	6.30
44.0	0.80	0.10		2.30	2.40		2.30	3.20	3.20							10.00	6.30
45.0	0.80	0.35		2.50	2.40	1.70	2.50	3.10								10.00	6.30
46.0	0.80	0.60		2.54	2.40		2.70	3.00	2.00							10.00	6.30
48.0	1.30	0.80		2.84	2.40		3.30	3.00								10.00	6.30
50.0	1.50	1.20		3.04	2.40		3.50	3.00								10.00	6.30
52.0	1.80	1.30	1.10	3.34	2.40		3.80	3.00								10.00	6.30
54.0	2.10	1.60		3.64	2.40		4.10	3.00								10.00	6.30
56.0	2.40	1.90	1.30	3.94	2.40		4.40	3.00								10.00	6.30
58.0	2.60	1.90	0.90	4.14	2.40		4.60	3.00								10.00	6.30

a Turbid water.

| Extrapolated or interpolated value.

Table C-3.3 Summary of hydraulic data collected at site 114.1R, cross section 1.

RATING CURVE:			A = -2.14			B = 0.69			CF = 465.00										
DATE:	SEPT 26 a		DATE:	AUG 15		DATE:	AUG 23 b		DATE:			DATE:							
REACH US =	228.00		REACH US =	162.00		REACH US =	162.00		REACH US =			REACH US =							
DS =	100.00		DS =	20.00		DS =	50.00		DS =			DS =							
GCQ:	7680		GCQ:	15100		GCQ:	17900		GCQ:			GCQ:							
WSEL:	468.47		WSEL:	470.54		WSEL:	471.23		WSEL:			WSEL:						SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV		
		1			2			3			4			5					
0.0	.00	.00		.00	.00		.00	.00								3.00	8.10		
11.0	.00	.00		.00	.00		.00	.00								3.00	4.20		
15.0	.00	.00		.00	.00		0.40	0.41								3.00	4.20		
24.0	.00	.00		.00	.00		0.67	0.97								3.00	4.20		
25.0	.00	.00		0.10	0.10		0.70	1.03								3.00	4.20		
26.0	.00	.00		0.20	0.20		0.77	1.07								3.00	4.20		
30.0	.00	.00		0.50	0.25		1.05	1.21								3.00	4.20		
35.0	.00	.00		0.83	0.46		1.40	1.38								3.00	4.20		
36.0	.00	.00		0.90	0.50		1.50	1.44								3.00	4.20		
40.0	.00	.00		1.30	0.90		1.90	1.67								3.00	4.20		
45.0	.00	.00		1.40	1.00		2.40	1.96								4.00	4.20		
50.0	.00	.00		1.50	1.10		2.45	2.03								4.00	4.20		
55.0	.00	.00		1.55	0.95		2.50	2.10								3.00	4.20		
60.0	.00	.00		1.60	0.80		2.40	2.15								3.00	4.20		
65.0	.00	.00		1.50	0.90		2.30	2.20								3.00	1.10		
70.0	.00	.00		1.40	1.00	1.00	2.30	2.04								3.00	1.10		
75.0	.00	.00		1.45	0.97		2.30	1.88	1.80							6.00	1.10		
80.0	.00	.00		1.50	0.95	0.90	2.30	1.97								6.00	1.10		
85.0	.00	.00		1.65	0.80		2.30	2.05								6.00	1.10		
90.0	.00	.00		1.80	0.65	0.60	2.30	2.01								6.00	1.10		
92.4	.00	.00		1.85	0.67		2.30	1.98								6.00	1.10		
94.0	0.10	.00		1.88	0.69		2.30	1.97								6.00	1.10		
95.0	0.15	.00		1.90	0.70		2.30	1.96								6.00	1.10		
96.0	0.20	0.90		1.92	0.71		2.29	1.96								3.00	1.10		
98.0	0.60	1.50		1.96	0.73		2.27	1.97								3.00	1.10		
100.0	0.80	1.80		2.00	0.75	0.70	2.25	1.98								3.00	1.10		
102.0	0.80	1.95		2.08	0.79		2.23	1.99								3.00	1.10		
104.0	0.80	1.75		2.16	0.83		2.21	2.00								3.00	1.10		
105.0	0.85	1.73		2.20	0.85		2.20	2.00	1.51							3.00	1.10		
106.0	0.90	1.70		2.24	0.87		2.24	2.01								3.00	1.10		
108.0	1.10	1.90		2.32	0.91		2.32	2.02								3.00	1.10		
110.0	1.00	1.70		2.40	0.95	0.70	2.40	2.03								3.00	1.10		

Table C-3.3 (cont.) Summary of hydraulic data collected at site 114.1R, Cross section 1.

Sta	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
112.0	1.00	1.55	1.25	2.42	0.93		2.40	2.04								3.00	1.10
114.0	0.90	1.60		2.44	0.91		2.56	2.05								3.00	1.10
115.0	0.85	1.50		2.45	0.90		2.60	2.05	1.62							3.00	1.10
116.0	0.80	1.40		2.46	0.89		2.64	2.04								3.00	1.10
118.0	0.70	1.10		2.48	0.87		2.72	2.02								3.00	1.10
120.0	0.50	1.10		2.50	0.85	0.90	2.80	2.01								3.00	1.10
122.0	0.40	0.90		2.64	0.85		2.88	1.99								3.00	1.10
124.0	0.40	0.80		2.78	0.85		2.96	1.97								3.00	1.10
125.0	0.35	0.88		2.85	0.85		3.00	1.96								3.00	1.10
126.0	0.30	0.95		2.92	0.85		3.04	1.94								3.00	1.10
128.0	0.30	0.75		3.06	0.85		3.12	1.89								3.00	1.10
130.0	0.40	1.00		3.20	0.85	0.80	3.20	1.85								3.00	1.10
131.0	0.40	1.00		3.19	0.87		3.24	1.82								3.00	1.10
132.0	0.40	0.95		3.18	0.88		3.28	1.80								3.00	1.10
133.0	0.40	0.85		3.17	0.90		3.32	1.78								3.00	1.10
134.0	0.50	0.85		3.16	0.91		3.36	1.75								3.00	1.10
135.0	0.40	1.00		3.15	0.93		3.40	1.73								3.00	1.10
137.8	.00	0.00		3.12	0.97		2.84	1.45								3.00	1.10
140.0	1.03	0.00		3.10	1.00	0.70	2.40	1.22								3.00	1.10
145.0	0.00	0.00		1.90	0.70	0.50	1.40	0.71								3.00	4.20
148.0	.00	0.00		0.50	0.00	0.00	0.80	0.41								3.00	4.20
149.0	.00	0.00		.00	0.00		0.60	0.31								3.00	4.20
152.0	.00	0.00		.00	0.00		.00	0.00								3.00	4.20

a Treached.
b No upwelling, no fish observed.
| Extrapolated or interpolated value.

Table C-3.2 (cont.) Summary of hydraulic data collected at site 114.0F, Cross section 2.

RATING LEVEL: A = 2.14 B = 0.69 CF = 465.00

DATE: SEPT 26 a	DATE: AUG 15 b	DATE: AUG 23 c	DATE:	DATE:
REACH US = 105.00	REACH US = 109.00	REACH US = 105.00	REACH US =	REACH US =
DS = 78.00	DS = 162.00	DS = 162.00	US =	DS =
GCG: 7660	GCG: 15100	GCG: 17900	GCG:	GCG:
WSEL: 468.47	WSEL: 470.54	WSEL: 471.23	WSEL:	WSEL:

STA	DEPTH 1	VEL 1	V.4	DEPTH 2	VEL 2	V.4	DEPTH 3	VEL 3	V.4	DEPTH 4	VEL 4	V.4	DEPTH 5	VEL 5	V.4	SUBSTRATE INFO SUB	COV
0.0	.00	.00		.00	.00		.00	.00								3.00	8.10
53.0	.00	.00		.00	.00		.00	.00								3.00	5.20
57.0	.00	.00		.00	.00		0.63	0.38								3.00	5.20
58.0	.00	.00		0.20	0.00		0.79	0.48								3.00	5.20
60.0	.00	.00		0.60	0.05		1.10	0.67								3.00	5.20
66.0	.00	.00		1.30	0.30		1.58	1.28								3.00	5.20
68.0	.00	.00		1.70	0.50		2.06	1.89								3.00	5.20
70.0	.00	.00		1.75	0.75		2.30	2.20								3.00	5.20
72.0	.00	.00		1.80	1.00		2.31	2.37								3.00	5.20
74.0	.00	.00		1.80	1.30		2.45	2.89								3.00	5.20
76.0	0.05	.00		1.80	1.40		2.50	3.06	2.37							3.00	5.20
82.0	0.05	.00		1.84	1.42		2.50	3.10								3.00	5.20
84.0	0.10	.00		1.88	1.44		2.50	3.15								3.00	5.20
86.0	0.10	.00		1.92	1.46		2.50	3.19								3.00	5.20
88.0	0.10	.00		1.96	1.48		2.50	3.24								3.00	5.20
90.0	0.15	.00		2.00	1.50		2.50	3.28								3.00	5.20
92.0	0.10	.00		2.00	1.48		2.50	3.29								3.00	5.20
96.0	0.05	.00		2.00	1.46		2.50	3.24								3.00	5.20
98.0	0.00	.00		2.00	1.44		2.50	3.19								3.00	5.20
100.0	0.00	.00		2.00	1.42		2.50	3.15								3.00	5.20
102.0	0.00	.00		2.00	1.40		2.50	3.10								3.00	5.20
104.0	0.00	.00		2.00	1.38		2.50	3.06								3.00	5.20
106.0	0.00	.00		2.00	1.36		2.50	3.01								3.00	5.20
108.0	0.00	.00		2.00	1.34		2.50	2.97								3.00	5.20
110.0	0.00	.00		2.00	1.32		2.50	2.92								3.00	5.20
112.0	0.00	.00		2.00	1.30		2.50	2.88								3.00	5.20
114.0	0.00	.00		2.00	1.28		2.50	2.83								3.00	5.20
116.0	0.00	.00		2.00	1.26		2.50	2.79								3.00	5.20
118.0	0.00	.00		2.00	1.24		2.50	2.74								3.00	5.20
120.0	0.00	.00		2.00	1.22		2.50	2.70								3.00	5.20
122.0	0.00	.00		2.00	1.20		2.50	2.65								3.00	5.20
124.0	0.00	.00		2.00	1.18		2.50	2.61								3.00	5.20
126.0	0.00	.00		2.00	1.16		2.50	2.56								3.00	5.20
128.0	0.00	.00		2.00	1.14		2.50	2.52								3.00	5.20
130.0	0.00	.00		2.00	1.12		2.50	2.47								3.00	5.20
132.0	0.00	.00		2.00	1.10		2.50	2.43								3.00	5.20
134.0	0.00	.00		2.00	1.08		2.50	2.38								3.00	5.20
136.0	0.00	.00		2.00	1.06		2.50	2.34								3.00	5.20
138.0	0.00	.00		2.00	1.04		2.50	2.29								3.00	5.20
140.0	0.00	.00		2.00	1.02		2.50	2.25								3.00	5.20
142.0	0.00	.00		2.00	1.00		2.50	2.20								3.00	5.20
144.0	0.00	.00		2.00	0.98		2.50	2.16								3.00	5.20
146.0	0.00	.00		2.00	0.96		2.50	2.11								3.00	5.20
148.0	0.00	.00		2.00	0.94		2.50	2.07								3.00	5.20
150.0	0.00	.00		2.00	0.92		2.50	2.02								3.00	5.20
152.0	0.00	.00		2.00	0.90		2.50	1.98								3.00	5.20
154.0	0.00	.00		2.00	0.88		2.50	1.93								3.00	5.20
156.0	0.00	.00		2.00	0.86		2.50	1.89								3.00	5.20
158.0	0.00	.00		2.00	0.84		2.50	1.84								3.00	5.20
160.0	0.00	.00		2.00	0.82		2.50	1.80								3.00	5.20
162.0	0.00	.00		2.00	0.80		2.50	1.75								3.00	5.20

Table C-3.3 (cont.) Summary of hydraulic data collected at site 114.1R, Cross section 2.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
126.0	0.80	2.40		|2.10	0.44|		|2.52	2.27|								6.00	1.10
128.0	0.50	1.75		|2.00	0.42|		|2.36	2.21|								6.00	1.10
130.0	0.40	1.00		1.90	0.40		2.20	2.15	1.88								6.00	1.10
138.0	.00	0.00		|1.10	0.24|		|1.40	1.81|								6.00	1.10
140.0	.00	0.00		1.00	0.20		1.20	1.73	1.47								6.00	1.10
150.0	.00	0.00		0.50	0.20		0.80	0.80									6.00	1.10
160.0	.00	0.00		|0.58	0.08|		1.20	0.29									3.00	1.10
163.0	.00	0.00		0.60	0.00		|0.48	0.12|									3.00	1.10
165.0	.00	0.00		| .00	0.00|		.00	0.00									3.00	4.10

a Gage greveled in at bottom.
b Fish observed.
c No upwelling or fish observed, middle station skipped, current too swift.
\| Extrapolated or interpolated value.

Table C-3.3 (cont.) Summary of hydraulic data collected at site 114.1R, Cross section 3.

RATING CURVE: A = -2.14 B = 0.69 CF = 465.00

	1	2	3	4	5
DATE:	SEPT 2[illegible]	AUG 15	AUG 23 [illegible]		
REACH US =	30.00	50.00	100.00		
DS =	105.00	21.00	105.00		
GCQ:	7660	15100	17900		
WSEL:	468.47	470.54	471.23		

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUBSTRATE INFO SUB	SUBSTRATE INFO COV
0.0	.00	.00		.00	.00		.00	.00								11.00	8.10
71.0	.00	.00		.00	.00		.00	.00								8.00	4.20
72.0	.00	.00		.00	.00		0.10	.00								8.00	4.10
76.0	.00	.00		.00	.00		0.40	.00								6.00	4.20
76.5	.00	.00		.00	.00		0.50	.00								6.00	4.20
80.0	.00	.00		0.75	0.65	0.75	1.20	2.20	2.05							6.00	4.20
84.0	.00	.00		1.50	1.00	1.10	1.84	3.24								6.00	4.20
85.0	.00	.00		1.50	1.08		2.00	3.50	2.44							6.00	4.20
90.0	.00	.00		1.50	1.50	2.00	2.00	4.18	2.43							6.00	4.20
91.0	.00	.00		1.52	1.68		1.79	4.14								6.00	4.20
92.0	0.05	.50		1.52	1.87		1.95	4.11								6.00	4.20
94.0	0.10	.00		1.57	2.2[illegible]		1.97	4.07								6.00	4.20
96.0	0.20	0.50		1.60	2.60	2.80	1.76	4.02								8.00	4.20
98.0	0.40	2.1[illegible]		1.67	2.55		1.94	3.97								8.00	4.20
100.0	0.50	[illegible]		1.73	2.47		1.93	3.92								8.00	4.20
102.0	0.60	[illegible]		[illegible]	2.40	2.50	1.71	3.68								[illegible]	4.20
104.0	0.80	[illegible]		1.80	2.29		1.90	3.83								8.00	4.20
106.0	0.90	[illegible]		1.86	2.13		1.88	3.75								8.00	4.20
108.0	1.00	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	3.72								[illegible]	[illegible]
110.0	1.10	[illegible]		[illegible]	[illegible]		[illegible]	3.59								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1.87	[illegible]		[illegible]	3.64								[illegible]	[illegible]
116.0	[illegible]	[illegible]		[illegible]	2.26	[illegible]	[illegible]	3.57								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	3.54								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	3.50								[illegible]	[illegible]
120.0	[illegible]	[illegible]		[illegible]	[illegible]	2.10	[illegible]	3.45								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	3.40								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	2.22		[illegible]	3.32								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	2.02		[illegible]	3.21								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.89		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	3.24								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]

Table C-3.3 (cont.) Summary of hydraulic data collected at site 114.1R, Cross section 3.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
140.0	0.10	.00		0.83	1.34		1.20	3.28	2.92							6.00	5.20
14..0	0.08	.00		0.80	1.25	1.30	1.24	3.24								6.00	5.20
144.0	0.05	.00		0.80	1.34		1.28	3.19								6.00	5.20
148.0	0.05	.00		0.80	1.51		1.3a	3.10								6.00	5.20
150.0	0.05	.00		0.80	1.60	1.70	1.40	3.06								6.00	5.20
152.0	0.05	.00		0.80	1.65		1.31	3.06								6.00	4.20
156.0	0.05	.00		0.80	1.75		1.12	3.06								6.00	4.20
158.2	0....	.00		0.80	1.80	1.80	1.03	3.06								6.00	4.20
160.0	0.05	.00		0.70	1.40		0.93	3.06								6.00	4.20
162.0	.00	.00		0.60	1.00	1.60	0.84	3.06								6.00	4.20
165.0	.00	.00		0.30	0.50		0.70	3.06								6.00	4.20
168.0	.00	.00		.00	0.00		0.40	1.75								6.00	4.20
172.0	.00	.00		.00	0.00		.00	0.00								3.00	4.20

a Deep hole from 90-130 .
b No fish observed, some ground seepage.
| Extrapolated or interpolated value.

Table C 3.4 Summary of hydraulic data collected at site 115.0R, Cross section 1.

RATING CURVE: A = -1.54 B = 0.55 CF = 470.00

	DATE: SEPT 26 a	DATE: AUG 17 b	DATE:	DATE:	DATE: OCT 1 c	
	REACH US = 75.00	REACH US = 137.00	REACH US =	REACH US =	REACH US =	
	DS = 75.00	DS = 500.00	DS =	DS =	DS =	
	GCQ: 7660	GCQ: 14500	GCQ:	GCQ:	GCQ: 7740	
	WSEL: 474.46	WSEL: 475.61	WSEL:	WSEL:	WSEL: 474.41	

STA	1 DEPTH	1 VEL	1 V.A	2 DEPTH	2 VEL	2 V.A	3 DEPTH	3 VEL	3 V.A	4 DEPTH	4 VEL	4 V.A	5 DEPTH	5 VEL	5 V.A	SUBSTRATE INFO SUB	COV
0.0	.00	.00		.00	.00											1.00	8.00
11.0	.00	.00		.00	.00											1.00	9.00
29.0	.00	.00		.00	.00											1.00	1.10
52.0	.00	.00		.00	.00											1.00	1.10
60.0	.00	.00		.00	.00											1.00	1.10
70.5	.00	.00		.00	.00											1.00	1.10
74.0	.00	.00		0.40	0.00	0.00										9.00	5.10
75.0	.00	.00		0.50	0.00											9.00	5.10
78.0	.00	.00		0.60	0.30	0.00										9.00	5.10
82.0	.00	.00		0.80	0.00	0.00										9.00	5.10
85.0	.00	.00		0.80	0.00	0.00										9.00	5.10
90.0	.00	.00		0.80	0.00	0.00										9.00	5.10
100.0	.00	.00		1.30	0.00	0.00										9.00	5.10
101.0	.00	.00		1.32	0.00											9.00	5.10
102.0	0.05	0.00		1.33	0.00											9.00	5.10
104.0	0.20	0.00		1.36	0.00											9.00	5.10
105.0	0.25	0.00		1.36	0.00											9.00	5.10
106.0	0.30	0.00		1.37	0.00											9.00	5.10
107.0	0.35	0.00		1.38	0.00											9.00	5.10
108.0	0.40	0.00		1.38	0.00											9.00	5.10
109.0	0.45	0.00		1.39	0.00											9.00	5.10
110.0	0.50	0.00		1.39	0.00											9.00	5.10
111.0	0.55	0.00		1.39	0.00											9.00	5.10
112.0	0.60	0.00		1.39	0.00											9.00	5.10
113.0	0.65	0.00		1.39	0.00											9.00	5.10
114.0	0.70	0.00		1.39	0.00											9.00	5.10
115.0	0.75	0.00		1.39	0.00											9.00	5.10
116.0	0.80	0.00		1.39	0.00											9.00	5.10
117.0	0.85	0.00		1.39	0.00											9.00	5.10
118.0	0.90	0.00		1.39	0.00											9.00	5.10
119.0	0.95	0.00		1.39	0.00											9.00	5.10
120.0	1.00	0.00		1.39	0.00											9.00	5.10
121.0	1.05	0.00		1.39	0.00											9.00	5.10
122.0	1.10	0.00		1.39	0.00											9.00	5.10
123.0	1.15	0.00		1.39	0.00											9.00	5.10
124.0	1.20	0.00		1.39	0.00											9.00	5.10
125.0	1.25	0.00		1.39	0.00											9.00	5.10
126.0	1.30	0.00		1.39	0.00											9.00	5.10
127.0	1.35	0.00		1.39	0.00											9.00	5.10
128.0	1.40	0.00		1.39	0.00											9.00	5.10
129.0	1.45	0.00		1.39	0.00											9.00	5.10
130.0	1.50	0.00		1.39	0.00											9.00	5.10
131.0	1.55	0.00		1.39	0.00											9.00	5.10
132.0	1.60	0.00		1.39	0.00											9.00	5.10
133.0	1.65	0.00		1.39	0.00											9.00	5.10
134.0	1.70	0.00		1.39	0.00											9.00	5.10
135.0	1.75	0.00		1.39	0.00											9.00	5.10
136.0	1.80	0.00		1.39	0.00											9.00	5.10
137.0	1.85	0.00		1.39	0.00											9.00	5.10

Table C-3.4 (cont.) Summary of hydraulic data collected at site 115.0R, Cross section 1.

STA	DEPTH (1)	VEL (1)	V.4 (1)	DEPTH (2)	VEL (2)	V.4 (2)	DEPTH (3)	VEL (3)	V.4 (3)	DEPTH (4)	VEL (4)	V.4 (4)	DEPTH (5)	VEL (5)	V.4 (5)	SUB	COV
135.0	1.05	0.00		2.18	0.35											9.00	5.10
136.0	1.00	0.00		2.16	0.38											9.00	5.10
138.0	0.90	0.00		2.13	0.44											9.00	5.10
140.0	0.90	0.00		2.10	0.50											9.00	5.10
142.0	0.90	0.00		1.91	0.46											9.00	5.10
144.0	0.90	0.00		1.72	0.42											9.00	5.10
146.0	0.90	0.00		1.53	0.38											9.00	5.10
148.0	0.80	0.00		1.34	0.34											9.00	5.10
150.0	0.80	0.00		1.15	0.30											9.00	5.20
152.0	0.80	0.00		1.18	0.30											9.00	5.20
154.0	0.85	0.00		1.21	0.30											9.00	5.20
156.0	0.70	0.00		1.24	0.30											9.00	5.20
160.0	0.21	0.00		1.30	0.30	0.10										9.00	5.20
161.7	.00	0.00		1.25	0.32											5.00	4.20
165.0	.00	0.00		1.15	0.35											5.00	4.20
170.0	.00	0.00		1.00	0.40											5.00	4.20
180.0	.00	0.00		1.00	0.50											5.00	4.20
190.0	.00	0.00		1.10	0.30	0.20										5.00	4.20
195.0	.00	0.00		1.25	0.30											5.00	4.20
200.0	.00	0.00		1.40	0.30											5.00	4.20
210.0	.00	0.00		1.05	0.10											5.00	4.20
220.0	.00	0.00		0.80	0.00	0.00										5.00	5.10
225.0	.00	0.00		0.53	0.00											9.00	5.10
230.0	.00	0.00		0.25	0.00											9.00	5.10
240.0	.00	0.00		0.20	0.00											9.00	5.10
244.0	.00	0.00		0.30	0.00											9.00	5.10
246.0	.00	0.00		0.20	0.00											9.00	5.10
247.0	.00	0.00		.00	0.00											9.00	5.10
255.0	.00	0.00		.00	0.00											9.00	5.10
278.0	.00	0.00		.00	0.00											3.00	4.10
295.0	.00	0.00		.00	0.00											3.00	4.10

a Used true WSEL

b No fish seen. Cross section representative of channel from riffle to mouth

c Cross section survey.

| Extrapolated or interpolated value.

Table C 3.4 (cont.) Summary of hydraulic data collected at site 115.0R, Cross section 2.

RATING CURVE: A = [illegible] B = 0.55 CF = 470.00

	1	2	3	4	5
DATE:	SEP 26 a	AUG 16 b			OCT 1 c
REACH US =	155.00	155.00			
DS =	137.00	137.00			
GCQ:	7680	14500			7740
WSEL:	474.46	475.61			474.41

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUBSTRATE INFO SUB	SUBSTRATE INFO COV
0.0	.00	.00		.00	.00											3.00	5.10
2.0	.00	.00		.00	.00											3.00	5.10
5.5	.00	.00		.00	.00											9.00	5.10
31.0	.00	.00		.00	.00											9.00	5.10
33.0	.00	.00		0.20	0.00	0.00										9.00	5.10
35.0	.00	.00		0.20	0.00	0.00										9.00	5.10
37.0	.00	.00		0.30	0.12	0.20										9.00	5.20
41.0	.00	.00		0.40	0.37	0.20										9.00	5.20
[illegible]	.00	.00		0.50	0.49											9.00	[illegible]
[illegible]	0.10	[illegible]		0.50	0.43											9.00	5.20
[illegible]	0.50	[illegible]		1.20	0.61	0.30										9.00	[illegible]
48.0	0.70	0.10		1.35	0.79											9.00	[illegible]
49.0	0.83	0.10		1.40	0.86	0.50										9.00	5.20
51.0	1.10	0.10		1.63	0.98											9.00	5.20
53.0	1.55	0.07		1.85	1.10											9.00	[illegible]
[illegible]	[illegible]	0.05		[illegible]	1.10											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.10	0.40										9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.33											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.40											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.55											9.00	5.20
[illegible]	[illegible]	[illegible]		[illegible]	1.70											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	•1.63											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.25											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	0.40											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]										9.00	[illegible]

Table C-3.4 (cont.) Summary of hydraulic data collected at site 115.0R, Cross section 2.

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
87.0	.00	.00		0.40	0.00	0.00										9.00	5.10
88.9	.00	.00		.00	0.00											9.00	5.10

a Data from Oct 1st.
b No fish seen.
c Cross section survey.
I Extrapolated or interpolated value.

Table C 3.4 (cont.) Summary of hydraulic data collected at site 115.0R, Cross section 3.

	Rating Curve:	A = -1.54	B = 0.55	CF = 470.00													
	Date: SEP 26 a	DATE: AUG 16 b		DATE:			DATE:			DATE: OCT 1 c							
	REACH US = 50.00	REACH US = 160.00		REACH US =			REACH US =			REACH US =							
	DS = 45.00	DS = 155.00		DS =			DS =			DS =							
	QCH: 7480	QCH: 14500		QCH:			QCH:			QCH: 7740							
	WSEL: 474.46	WSEL: 474.46		WSEL:			WSEL:			WSEL: 474.41						SUBSTRATE INFO	
STA	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	SUB	COV
				2			3			4			5				
0.0	| .00	.00 |		| .00	.00 |										3.00	1.10
8.0	| .00	.00 |		| .00	.00 |										3.00	1.10
14.0	| .00	.00 |		| .00	.00 |										3.00	1.10
16.0	.00	.00		.00	.00											3.00	1.10
17.0	0.50	0.00		0.50	0.00	0.00										3.00	1.10
18.0	1.00	0.00		1.00	0.00	0.00										9.00	1.10
20.0	2.00	0.00	0.00	2.00	0.00	0.00										9.00	1.10
22.0	2.85	0.00		2.70	0.00	0.00										9.00	1.10
24.0	3.90	.00		3.10	0.00	0.00										9.00	1.10
26.0	4.00	0.00	0.00	3.90	0.00	0.00										9.00	1.10
28.0	4.00	0.00		3.90	0.00	0.00										9.00	1.10
30.0	4.00	0.00		4.20	0.00	0.00										9.00	1.10
32.0	4.00	0.00		|4.20	0.00 |											9.00	1.10
42.0	4.20	0.00	0.00	4.20	0.00	0.00										9.00	1.10
44.0	3.60	0.00		3.60	0.00	0.00										9.00	1.10
46.0	2.00	.00		3.05	0.00	0.00										9.00	1.10
48.0	1.50	.00	0.00	|2.15	0.00 |											9.00	1.10
50.0	1.20	.00		1.20	0.00	0.00										9.00	1.10
52.0	.00	.00		|1.08	0.00 |											9.00	5.20
56.0	.00	.00		0.75	0.00	0.00										9.00	5.20
58.0	.00	.00		|0.35	0.00 |											9.00	5.20
60.0	| .00	.00 |		0.35	0.00	0.00										9.00	5.20
61.5				0.00	0.00											9.00	5.20

\| Extrapolated or interpolated value.

Table C 3.4 (cont.) Summary of hydraulic data collected at site 115.0R, Cross section 4.

RATING CURVE:	A = [illegible]	B = 0.55	CF = 470.00		
DATE: SEP 25	DATE: AUG 16 a	DATE:	DATE:	DATE: OCT 1 b	
REACH US = 75.00	REACH US = 200.00	REACH US =	REACH US =	REACH US =	
DS = 30.00	DS = 160.00	DS =	DS =	DS =	
GCQ: 7680	GCQ: 14500	GCQ:	GCQ:	GCQ: 7740	
WSEL: 474.46	WSEL: 474.46	WSEL:	WSEL:	WSEL: 474.41	SUBSTRATE INFO

STA	DEPTH (1)	VEL (1)	V.4 (1)	DEPTH (2)	VEL (2)	V.4 (2)	DEPTH (3)	VEL (3)	V.4 (3)	DEPTH (4)	VEL (4)	V.4 (4)	DEPTH (5)	VEL (5)	V.4 (5)	SUB	COV
0.0	.00	.00		.00	.00											3.00	1.10
11.0	.00	.00		.00	.00												
25.0	.00	.00		.00	.00												
25.2	.00	.00		.00	.00											9.00	1.10
26.0	.00	.00		0.05	.00											9.00	1.10
27.0	0.10	0.00		0.05	.00											9.00	1.10
29.0	0.20	[illegible]		0.13	.00											9.00	1.10
31.0	0.29	[illegible]		0.20	.00	0.05										9.00	1.10
33.0	0.50	[illegible]		0.35	.00											9.00	1.10
35.0	0.45	[illegible]		[illegible]	.00	0.00										9.00	1.10
37.0	0.40	0.02		[illegible]	.00											9.00	1.10
39.0	[illegible]	[illegible]		[illegible]	.00	0.00										9.00	1.10
41.0	0.50	0.02		0.45	.00											9.00	1.10
43.0	0.40	0.02		0.40	.00	0.00										9.00	1.10
45.0	[illegible]	[illegible]		0.50	.00											9.00	1.10
47.0	[illegible]	[illegible]		[illegible]	.00	0.00										9.00	1.10
49.0	[illegible]	[illegible]		[illegible]	.00											9.00	1.10
51.0	[illegible]	[illegible]		[illegible]	.00	0.00										9.00	1.10
[illegible]	[illegible]	[illegible]		[illegible]	.00											9.00	1.10
[illegible]	[illegible]	[illegible]		[illegible]	.00	0.00										9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00											9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00	0.00										9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00	0.00										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00	0.00										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00	0.00										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]										[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]											[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	.00	[illegible]										[illegible]	[illegible]

Table C-3.4 (cont.) Summary of hydraulic data collected at site **115.0R**, Cross section 1.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
81.0	1.20	0.00	0.00	|1.04	.00|										9.00	1.10
83.0	1.10	0.00		|1.03	.00|										9.00	1.10
85.0	1.10	0.00		|1.01	.00|										9.00	5.20
87.0	1.10	0.00	0.00	1.00	.00	0.00										9.00	5.20
89.0	1.10	0.00		|0.85	.00|										9.00	5.20
91.0	1.10	0.00		0.70	.00	0.00										9.00	5.20
93.0	0.90	0.00		|0.65	.00|										9.00	5.20
95.0	0.70	0.00		0.60	.00	0.00										9.00	5.20
97.0	0.50	0.00		|0.35	.00|										9.00	5.20
99.0	0.50	0.00		0.10	.00	0.00										9.00	5.20
101.0	0.10	0.00		|0.05	.00|										9.00	5.20
102.0	.00	0.00		.00	.00											9.00	5.20
103.0	.00	0.00		.00	.00											9.00	5.20
117.0	.00	0.00		.00	.00											9.00	5.20
126.0	.00	0.00		.00	.00											9.00	5.20
133.0	.00	0.00		.00	.00											12.00	6.30

a No fish seen, changed WSEL to same as time 1, all nose velocities 0.
b Cross section survey.
| Extrapolated or interpolated value.

Table C-3.5 Summary of hydraulic data collected at site 118.9L, Cross section 1.

RATING CURVE:			A = -2.57		B = 0.72		LF = 505.00												
DATE:	SEPT 26		DATE:	SEPT 22		DATE:	AUG 15 a		DATE:	AUG 23		DATE:							
REACH US =	68.00		REACH US =	68.00		REACH US =	68.00		REACH US =	68.00		REACH US =							
DS =	50.00		DS =	100.00		DS =	200.00		DS =			DS =							
GCQ:	7680		GCQ:	10300		GCQ:	15100		GCQ:	17900		GCQ:							
WSEL:	507.68		WSEL:	508.31		WSEL:	509.35		WSEL:	509.92		WSEL:					SUBSTRATE INFO		
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4		SUB	COV	
	1			2			3			4			5						
6.0	.00	.00		.00	.00		.00	.00		.00	.00						10.00	5.20	
7.0	.00	.00		.00	.00		.00	.00		.00	.00						10.00	5.20	
8.0	.00	.00		.00	.00		.00	.00		0.50	0.84						10.00	5.20	
9.0	.00	.00		.00	.00		.00	.00		0.75	1.27						10.00	5.20	
10.0	.00	.00		.00	.00		0.40	0.40	0.70	1.00	1.70						10.00	5.20	
12.0	.00	.00		.00	.00		1.10	1.40	0.80	1.50	2.55	2.15					10.00	5.20	
12.5	.00	.00		.00	.00		1.20	1.50		1.60	2.67						10.00	5.20	
14.0	.00	.00		0.45	0.20		1.50	1.80	0.60	1.90	3.03						10.00	5.20	
16.0	.00	.00		0.80	1.50		2.00	2.10	0.30	2.30	3.50	2.39					10.00	5.20	
17.0	0.50	0.30		0.95	1.90		2.35	2.60		2.57	3.50						10.00	5.20	
18.0	0.80	1.10		1.10	2.30	1.90	2.70	3.10	0.60	2.87	3.50						10.00	5.20	
19.0	1.00	1.30	0.10	1.50	2.40		3.00	3.30		3.07	3.50						10.00	5.20	
20.0	1.00	1.90		1.90	2.50	1.80	3.30	3.50	0.00	3.07	3.50						10.00	5.20	
21.0	1.60	1.10		1.95	2.85		3.15	3.50		3.67	3.50						10.00	5.20	
22.0	1.60	1.90	1.00	2.00	3.20		3.15	3.50		3.67	3.50						10.00	5.20	
23.0	1.70	2.10		2.25	2.98		3.25	3.50		3.77	3.50						10.00	5.20	
24.0	1.70	2.40		2.50	2.75	1.30	3.25	3.50		3.77	3.50						10.00	5.20	
25.0	2.00	2.30	0.70	2.65	2.88		3.55	3.50		4.07	3.50						10.00	5.20	
26.0	2.00	2.30		2.80	3.00	1.65	3.55	3.50		4.07	3.50						10.00	5.20	
27.0	2.00	2.60		2.58	3.00		3.55	3.50		4.07	3.50						10.00	5.20	
28.0	2.40	1.70	1.10	2.98	3.00		3.95	3.50		4.47	3.50						10.00	5.20	

a No fish or upwelling, negative nose velocity at 70 .

| Extrapolated or interpolated value.

Table C-3.5 (cont.) Summary of hydraulic data collected at site 118.9L, Cross section 2.

RATING CURVE:				A = -2.37		B = 0.72		CF = 505.00															
DATE: SEPT 26				DATE: SEPT 22				DATE: AUG 15 a			DATE: AUG 23			DATE:									
REACH US = 59.00				REACH US =				REACH US = 71.00			REACH US = 59.00			REACH US =									
DS = 68.00				DS =				DS = 68.00			DS = 68.00			DS =									
GCD: 7680				GCD: 10300				GCD: 15100			GCD: 17900			GCD:									
WSEL: 507.68				WSEL: 508.31				WSEL: 509.35			WSEL: 507.92			WSEL:							SUBSTRATE INFO		
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5									
0.0	.00	.00		.00	.00		.00	.00		.00	.00											10.00	6.30
8.0	.00	.00		.00	.00		.00	.00		.00	.00											10.00	6.30
10.0	.00	.00		.00	.00		.00	.00		0.50	0.81											10.00	6.30
12.0	.00	.00		.00	.00		0.80	0.30	0.30	1.00	1.62	1.62										10.00	6.30
14.0	.00	.00		.00	.00		0.90	1.50	0.30	1.40	2.18											10.00	6.30
15.0	.00	.00		.00	.00		1.05	1.60		1.60	2.46											10.00	6.30
16.0	.00	.00		0.20	0.00		1.20	1.70	1.00	1.80	2.74	1.92										10.00	6.30
17.5	.00	.00		0.54	0.68		1.73	2.60		2.18	2.94											10.00	6.30
18.0	0.10	0.00		0.65	0.90		1.90	2.10		2.30	3.01											10.00	6.30
20.0	0.40	1.20		1.20	1.45	1.35	2.30	2.30		2.80	3.28	1.92										10.00	6.30
22.0	0.70	1.40		1.50	1.90		2.50	2.90	0.50	2.77	3.28											10.00	6.30
24.0	0.80	1.60		1.40	1.95	1.95	2.50	3.10		2.87	3.28											10.00	6.30
26.0	1.00	1.60		1.50	2.08		2.60	2.90		3.07	3.28											10.00	6.30
28.0	0.90	1.50		1.60	2.20	2.10	2.60	2.80		2.97	3.28											10.00	6.30
30.0	0.90	1.00		1.45	2.05		2.60	2.70	1.00	2.97	3.28											10.00	6.30
32.0	0.60	1.00		1.30	1.90	1.80	2.45	2.60		2.67	3.28											10.00	6.30
34.0	0.65	1.00		1.30	2.18		2.30	2.50		2.72	3.28											10.00	6.30
36.0	0.60	0.60		1.30	2.45	2.35	2.30	2.75		2.67	3.28											10.00	6.30
38.0	0.60	0.40		1.15	2.13		2.30	3.00	1.30	2.67	3.28											10.00	6.30
40.0	0.60	0.80		1.00	1.80	1.80	2.20	2.85		2.67	3.28											10.00	6.30
42.0	0.55	0.30		1.10	1.60		2.10	2.70		2.62	3.28											10.00	6.30
44.0	0.60	0.00		1.20	1.40	1.30	2.10	2.95		2.67	3.28											10.00	6.30
46.0	0.80	0.05		1.15	2.10		2.10	3.20	0.90	2.87	3.28											10.00	6.30
48.0	0.50	1.00		1.10	2.80	2.60	2.00	3.10		2.57	3.28											10.00	6.30
50.0	0.40	1.10		1.10	2.85		1.90	3.00	0.80	2.47	3.28											10.00	6.30
54.0	0.50	2.50		1.10	2.95		2.05	3.00		2.57	3.28											10.00	6.30
56.0	0.55	2.25		1.10	3.00	3.10	2.10	3.00		2.62	3.28											10.00	6.30
58.0	0.60	2.00		1.17	3.00		2.15	3.00		2.67	3.28											10.00	6.30
62.0	0.80	1.70		1.30	3.00		2.35	3.00		2.87	3.28											10.00	6.30
64.0	0.85	1.7		1.45	3.00	2.50	2.40	3.00		2.92	3.28											10.00	6.30
70.0	1.00	1.90		1.56	3.00		2.55	3.00		3.07	3.28											10.00	6.30
78.0	0.80	1.40		1.38	3.00		2.35	3.00		2.87	3.28											10.00	6.30

Table C-3.5 (cont.) Summary of hydraulic data collected at site 118.9L, Cross section 2.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
86.0	1.20	0.80	0.30	1.78	3.00		2.75	3.00		3.27	3.28					10.00	6.30
94.0	1.30	1.10		1.88	3.00		2.85	3.00		3.37	3.28					10.00	6.30
102.0	1.70	1.40	0.60	2.28	3.00		3.25	3.00		3.77	3.28					10.00	6.30

a No fish or upwelling.

| Extrapolated or interpolated value.

Table C-3.5 (cont.) Summary of hydraulic data collected at site 110.4L, cross section 3.

	RATING CURVE:	n = -.17	B = 0.72	CF = 506.00											
	DATE: SEPT 20		DATE: SEPT 22		DATE: AUG 15 a			DATE: AUG 23 b			DATE:				
	REACH US = 60.00		REACH US =		REACH US = 50.00			REACH US = 100.00			REACH US =				
	DS = 59.00		DS =		DS = 47.00			DS = 59.00			DS =				
	GCQ: 7680		GCQ: 10300		GCQ: 15100			GCQ: 17900			GCQ:				
	WSEL: 507.60		WSEL: 508.31		WSEL: 509.35			WSEL: 509.92			WSEL:			SUBSTRATE INFO	
STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
0.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	8.50
12.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	5.10
16.0	.00	.00		.00	.00		.00	.00		0.40	0.12					3.00	1.10
18.0	.00	.00		.00	.00		0.50	0.00		0.60	0.18					3.00	1.10
22.0	.00	.00		.00	.00		0.30	0.00		0.67	0.18					3.00	1.10
24.0	.00	.00		.00	.00		0.30	0.00		0.70	0.18					3.00	1.10
26.0	.00	.00		.00	.00		0.30	0.00		0.60	0.12					3.00	1.10
30.0	.00	.00		.00	.00		0.30	0.00		0.40	0.00					3.00	1.10
34.0	.00	.00		.00	.00		0.40	0.30	0.60	0.47	0.21					3.00	1.10
36.0	.00	.00		.00	.00		0.65	0.45		0.50	0.32					3.00	1.10
38.0	.00	.00		.00	.00		0.90	0.60	0.30	0.63	0.42					10.00	1.10
42.0	.00	.00		.00	.00		1.00	0.80	0.40	0.90	0.63					10.00	1.10
44.0	.00	.00		.00	.00		1.03	0.88		1.03	0.66					10.00	1.10
46.0	.00	.00		0.15	0.00		1.08	1.03		1.30	0.72	0.65				10.00	5.20
50.0	.00	.00		0.10	0.30		1.10	1.10	0.40	1.23	0.93					10.00	5.20
52.0	.00	.00		0.20	0.60		1.08	1.18		1.17	1.14					10.00	5.20
54.0	.00	.00		0.15	0.30		1.06	1.26		1.10	1.35	1.35				10.00	5.20
56.0	.00	.00		0.10	0.00		1.04	1.34		1.20	1.55					10.00	5.20
60.0	.00	.00		0.30	1.00		1.00	1.50	1.70	1.40	1.96	1.70				10.00	5.20
64.0	.00	.00		0.30	0.45		1.04	1.54		1.44	2.34					10.00	5.20
68.0	.00	.00		0.30	0.10		1.08	1.58		1.48	2.73					10.00	5.20
70.0	.00	.00		0.30	0.28		1.10	1.60	1.50	1.50	2.92	2.39				10.00	5.20
76.0	.00	.00		0.30	0.80		1.34	1.96		1.50	3.27					10.00	5.20
80.0	.00	.00		0.40	0.55		1.50	2.20	0.80	1.50	3.50	3.13				10.00	5.20
84.0	.00	.00		0.50	0.30		1.70	2.64		1.58	3.53					10.00	5.20
88.0	0.10	0.00		0.60	0.78		1.90	3.08		1.66	3.56					10.00	5.20
90.0	0.30	0.10		0.65	1.01		2.00	3.30	2.40	1.70	3.57					10.00	5.20
92.0	0.50	0.20		0.70	1.25		2.10	3.47		2.75	3.80					10.00	5.20
96.0	0.40	0.30		0.75	1.73		2.30	3.80	2.00	2.65	3.80					10.00	5.20
100.0	0.40	1.10		0.80	2.20		2.08	3.80		2.65	3.80					10.00	5.20
104.0	0.90	1.50		1.15	2.15		2.50	3.80		3.15	3.80					10.00	5.20
108.0	1.10	1.40		1.50	2.10	1.95	2.78	3.80		3.35	3.80					10.00	5.20

Table C-3.5 (cont.) Summary of hydraulic data collected at site 118.9L, Cross section 3.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	CDV
112.0	1.10	2.00	1.20	1.45	2.05		2.78	3.80		3.35	3.80					10.00	5.20
116.0	1.10	2.70		1.40	2.00	1.90	2.78	3.80		3.35	3.80					10.00	5.20
120.0	1.20	2.50		1.50	2.10		2.88	3.80		3.45	3.80					10.00	5.20
124.0	1.80	3.30	1.80	1.60	2.20	1.70	2.48	3.80		4.05	3.80					10.00	5.20
128.0	1.80	2.80		2.43	2.80		3.43	3.80		4.05	3.80					10.00	5.20
132.0	1.90	2.80	1.60	2.53	2.80		3.58	3.80		4.15	3.80					10.00	5.20

a Upwelling above cross section, no fish observed.
b Fish at 90 ft.
| Extrapolated or interpolated value.

Table C-3.6 Summary of hydraulic data collected at site 119.1L, Cross section 1.

RATING CURVE:			A =	-1.30		B =	0.50	CF =	505.00									
DATE:	SEPT 20			DATE:	SEPT 22			DATE:	AUG 15		DATE:			DATE:				
REACH US =	67.00			REACH US =	67.00			REACH US =	67.00		REACH US =			REACH US =				
DS =	25.00			DS =	150.00			DS =			DS =			DS =				
GCU:	7680			GCU:	10300			GCU:	15100		GCU:			GCU:				
WSEL:	509.37			WSEL:	510.09			WSEL:	511.16		WSEL:			WSEL:			SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00								8.00	8.50
14.0	.00	.00		.00	.00		.00	.00								8.00	7.30
16.0	.00	.00		.00	.00		0.40	0.00	0.10							8.00	7.30
18.5	.00	.00		.00	.00		0.65	0.44								8.00	4.20
20.0	.00	.00		0.50	0.05		0.80	0.70	0.50							8.00	4.20
21.0	.00	.00		0.63	0.05		0.98	0.84								8.00	4.20
22.0	0.15	0.00		0.75	0.05	0.03	1.15	1.05								8.00	4.20
24.0	0.50	0.10		1.10	0.15	0.15	1.50	1.40	1.00							8.00	4.20
26.0	0.75	0.10		1.35	0.25	0.63	1.95	1.55								9.00	4.20
28.0	0.90	0.15		1.50	0.60	0.45	2.40	1.70	0.70							9.00	4.20
30.0	1.10	0.25		1.70	0.73		2.75	1.95								9.00	4.20
32.0	1.25	0.20		1.90	0.85	0.60	3.10	2.20	0.60							12.00	4.20
34.0	1.30	0.40	0.30	2.00	0.90		3.07	2.20								12.00	4.20
36.0	1.45	0.40		2.10	0.95	0.60	3.17	2.20								12.00	4.20
38.0	1.60	0.60		2.15	1.20		3.22	2.20								12.00	4.20
40.0	1.65	0.80	0.55	2.20	1.45	1.00	3.27	2.20								12.00	4.20
42.0	1.80	0.60		2.40	1.50		3.47	2.20								12.00	4.20
44.0	1.90	0.80		2.60	1.55	1.10	3.67	2.20								12.00	4.20
46.0	2.20	1.05	0.40	2.70	1.60		3.77	2.20								12.00	4.20
48.0	2.20	1.40		2.80	1.65	1.65	3.87	2.20								12.00	4.20
50.0	2.40	1.30	0.75	3.10	1.65		4.17	2.20								12.00	4.20

Table C-3.6 (cont.)   Summary of hydraulic data collected at site 119.1L, Cross section 2.

RATING CURVE: A = 1.30 B = 0.50 CF = 505.00

	Date 1	Date 2	Date 3	Date 4	Date 5
DATE:	SEPT 26	SEPT 22	AUG 15 a		
REACH US =	38.00	38.00	38.00		
DS =	67.00	67.00	300.00		
GCQ:	7680	10300	15100		
WSEL:	509.37	510.07	511.16		

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUBSTRATE INFO SUB	SUBSTRATE INFO COV
0.0	.00	.00		.00	.00		.00	.00								8.00	6.20
14.0	.00	.00		.00	.00		.00	0.00								8.00	5.20
16.0	.00	.00		.00	.00		0.40	0.00	0.00							5.00	5.20
18.0	.00	.00		.00	.00		0.80	0.00	0.00							5.00	4.20
21.4	.00	.00		.00	.00		1.82	0.34								5.00	4.20
22.0	.00	.00		0.10	0.12		2.00	0.40	0.30							5.00	4.20
24.0	.00	.00		0.45	0.50		2.20	0.70								5.00	4.20
25.0	.00	.00		0.63	0.60		2.30	0.85								5.00	4.20
26.0	0.20	0.30		0.80	0.70		2.40	1.00	0.60							10.00	4.20
27.0	0.50	0.50		1.05	0.78		2.48	1.13								10.00	4.20
28.0	0.70	0.45		1.30	0.85	0.85	2.55	1.25								10.00	4.20
30.0	1.00	0.50		1.60	1.00		2.70	1.50	0.30							10.00	4.20
32.0	1.55	0.40		1.75	0.15	0.15	2.90	1.65								10.00	4.20
34.0	1.75	0.80	0.60	2.10	1.23		3.10	1.80	0.60							10.00	4.20
36.0	1.90	0.85		2.45	1.35	1.30	3.52	1.80								10.00	4.20
38.0	2.30	0.95		2.98	1.38		4.05	1.80								10.00	4.20
40.0	2.50	0.95	0.80	3.50	1.40	1.25	4.57	1.80								10.00	4.20
42.0	2.70	0.90		3.55	1.43		4.62	1.80								10.00	4.20
44.0	3.00	1.05		3.60	1.45	1.35	4.67	1.80								10.00	4.20
46.0	3.70	1.30	0.70	4.40	1.45		5.47	1.80								10.00	4.20

a Upwelling just above cross section at 32', below large boulder.

| Extrapolated or interpolated value.

Table C-3.6 (cont.) Summary of hydraulic data collected at site 119.IL, Cross section 3.

RATING CURVE: A = -1.30 B = 0.50 CF = 505.00

	DATE: SEPT 26	DATE: SEPT 22	DATE: AUG 15 a	DATE:	DATE:		
	REACH US = 71.00	REACH US = 26.00	REACH US = 51.00	REACH US =	REACH US =		
	DS = 38.00	DS = 38.00	DS = 38.00	DS =	DS =		
	GCQ: 7680	GCQ: 10300	GCQ: 15100	GCQ:	GCQ:		
	WSEL: 509.39	WSEL: 510.09	WSEL: 511.16	WSEL:	WSEL:	SUBSTRATE INFO	

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00								12.00	6.10
31.0	.00	.00		.00	.00		.00	.00								6.00	4.20
32.0	.00	.00		.00	.00		0.20	0.00								6.00	4.20
36.0	.00	.00		.00	.00		0.70	0.00	0.00							6.00	4.20
40.0	.00	.00		.00	.00		1.30	0.00	0.00							6.00	4.20
43.5	.00	.00		.00	.00		1.74	0.70								6.00	4.20
44.0	.00	.00		0.10	0.00		1.80	0.80	0.40							6.00	4.20
44.5	.00	.00		0.20	0.00		1.90	0.85								6.00	4.20
46.0	0.30	0.05		0.50	0.00		2.20	1.00								6.00	4.20
48.0	0.60	0.20		0.80	0.45		2.60	1.20	0.70							6.00	4.20
50.0	0.80	0.50		1.20	0.85		2.95	1.60								6.00	4.20
52.0	0.95	0.70		1.55	1.45		3.30	2.00	1.00							6.00	4.20
54.0	1.20	1.00		1.78	1.48		2.93	2.00								6.00	4.20
56.0	1.40	1.05		2.00	1.50		3.13	2.00								6.00	4.20
58.0	1.65	1.10	0.90	2.28	1.63		3.38	2.00								6.00	4.20
60.0	1.80	1.30		2.55	1.75		3.53	2.00								6.00	4.20
62.0	1.60	1.30		2.68	1.63		3.33	2.00								6.00	4.20
64.0	2.40	1.45	0.80	3.20	1.50		4.13	2.00								6.00	4.20
66.0	2.40	1.30		3.30	1.75		4.13	2.00								6.00	4.20
68.0	2.90	1.70		3.40	2.00		4.63	2.00								6.00	4.20
70.0	3.00	1.60	0.55	3.68	2.00		4.73	2.00								6.00	4.20

a Lots of upwelling at the edge.

| Extrapolated or interpolated value.

Table C-3.7 Summary of hydraulic data collected at site **125.2R**, Cross section 1.

RATING CURVE: n = -0.97 B = 0.41 CF = 552.00

	DATE: SEPT 26 a			DATE: AUG 31 b			DATE: AUG 22 c			DATE:			DATE: SEPT 19 d				
	REACH US = 200.00			REACH US = 200.00			REACH US = 100.00			REACH US =			REACH US =				
	DS = 150.00			DS = 400.00			DS = 200.00			DS =			DS =				
	GCQ: 7680			GCQ: 13600			GCQ: 19100			GCQ:			GCQ: 7410				
	WSEL: 556.20			WSEL: 557.31			WSEL: 556.10			WSEL:			WSEL: 556.14			SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	0.00	0.00		0.00	0.00		.00	0.00								3.00	1.10
7.0	0.00	0.00		0.00	0.00		.00	0.00								3.00	1.10
12.3	0.00	0.00		0.00	0.00		0.61	0.08								3.00	1.10
13.0	0.00	0.00		0.30	0.00		0.74	0.10								3.00	1.10
16.0	0.00	0.00		1.05	0.00		1.30	0.16	0.18							3.00	1.10
17.0	0.00	0.00		1.30	0.00		1.53	0.18								3.00	1.10
20.0	0.30	0.00		1.60	0.08		2.20	0.18	0.26							3.00	1.10
21.0	0.38	0.00		1.70	0.10	0.00	2.28	0.16								3.00	7.10
25.0	0.70	0.00		2.15	0.00	0.00	2.60	0.09								3.00	7.10
29.0	1.02	0.00		2.20	0.05	0.00	2.92	0.02								3.00	7.10
30.0	1.10	0.00		2.30	0.04		3.00	0.00	0.00							3.00	1.10
33.0	1.49	0.00		2.60	0.00	0.00	3.39	0.13								3.00	1.10
43.0	2.29	0.00		3.40	0.00	0.00	4.19	0.57								3.00	1.10
85.0	2.00	0.00		3.11	1.88		3.90	2.41								8.00	5.20
89.0	1.80	0.05	0.00	2.91	2.06		3.70	2.58								8.00	5.20
93.0	1.50	0.01		2.61	2.24		3.40	2.76								8.00	5.20
97.0	1.40	0.30		2.51	2.42		3.30	2.93								8.00	5.20
101.0	1.00	0.50	0.30	2.11	2.60		2.90	3.11								8.00	5.20
105.0	0.70	0.50		1.81	2.78		2.60	3.28								8.00	5.20
109.0	0.70	1.00		1.81	2.96		2.60	3.46								8.00	5.20
110.0	0.70	1.00		1.81	3.00		2.60	3.50								8.00	5.20
113.0	0.70	1.00		1.81	3.05		2.60	3.58								8.00	5.20
117.0	0.80	1.30		1.91	3.12		2.70	3.68								8.00	5.20
121.0	1.10	1.70		2.21	3.19		3.00	3.78								10.00	6.20
125.0	1.20	1.80	1.10	2.31	3.26		3.10	3.88								10.00	6.20
129.0	1.50	0.90		2.61	3.33		3.40	3.98								10.00	6.20
133.0	1.80	2.20		2.71	3.40		3.50	4.08								10.00	6.20
137.0	1.50	2.40		2.61	3.47		3.40	4.18								10.00	6.20
141.0	1.40	2.50	1.60	2.51	3.54		3.30	4.28								10.00	6.20
145.0	1.60	1.90		2.71	3.61		3.50	4.38								10.00	6.20
149.0	1.40	2.20		2.51	3.68		3.30	4.48								10.00	6.20
150.0	1.40	2.18		2.51	3.70		3.30	4.50									

Table C-3.7 (cont.) Summary of hydraulic data collected at site **125.2R**, Cross section 1.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
153.0	1.40	2.10	1.40	2.51	3.73		3.30	4.51								10.00	6.20
157.0	1.60	2.10		2.71	3.77		3.50	4.52								10.00	6.20
161.0	1.70	2.50		2.81	3.81		3.60	4.54								10.00	6.20
165.0	1.80	2.30	0.30	2.91	3.85		3.70	4.55								10.00	6.20
169.0	1.90	2.20		3.01	3.89		3.80	4.56								10.00	6.20
173.0	1.70	2.60		2.81	3.93		3.60	4.58								10.00	6.20
177.0	1.90	2.30	0.90	3.01	3.97		3.80	4.59								10.00	6.20
180.0	1.90	2.34		3.01	4.00		3.80	4.60								10.00	6.20
185.0	1.90	2.40		3.01	3.93		3.80	4.26								10.00	6.20
186.0	1.90	2.10		3.01	3.91		3.80	4.26								10.00	6.20
189.0	2.10	2.30		3.21	3.87		4.00	4.24								10.00	6.20
193.0	1.90	2.40	1.50	3.01	3.81		3.80	4.22								10.00	6.20
197.0	1.90	2.10		3.01	3.75		3.80	4.20								10.00	6.20
201.0	1.90	2.20		3.01	3.69		3.80	4.18								10.00	6.20
209.0	1.80	2.00		2.91	3.57		3.70	4.14								10.00	6.20
210.0	1.80	1.90	1.20	2.91	3.56		3.70	4.13								10.00	6.20
213.0	1.50	1.30		2.61	3.51		3.40	4.12								10.00	6.20
214.0	1.45	1.33		2.56	3.50		3.35	4.10								10.00	6.20
217.0	1.30	1.40		2.41	3.23		3.20	4.01								10.00	6.20
221.0	1.10	1.30		2.21	2.89		3.00	3.90								10.00	6.20
222.0	1.06	1.20	0.90	2.60	2.80	2.10	2.96	3.87								10.00	6.20
225.0	0.95	0.90		2.45	2.76		2.85	3.78								10.00	6.20
229.0	0.80	1.10		2.25	2.70		2.70	3.67								10.00	6.20
232.0	0.75	0.90		2.10	2.65	2.30	2.65	3.58								10.00	6.20
235.0	0.70	0.70		1.98	2.68		2.60	3.50								10.00	6.20
237.0	0.60	0.60		1.90	2.70		2.50	3.44								10.00	6.20
241.0	0.50	0.20		1.74	2.74		2.40	3.32								10.00	6.20
242.0	0.40	0.15		1.70	2.75	2.80	2.30	3.29								10.00	6.20
245.0	0.10	0.00		1.40	2.38		2.00	3.21								10.00	6.20
246.0	.00	0.00		1.30	2.25		1.90	3.18								10.00	6.20
250.0	.00	0.00		0.90	1.75		1.90	3.06								10.00	6.20
252.0	.00	0.00		0.70	1.50		1.90	3.01								10.00	6.20
254.0	.00	0.00		0.66	1.40		1.90	2.95								10.00	6.20
255.0	.00	0.00		0.64	1.35		1.70	2.92	2.55							10.00	6.20
258.0	.00	0.00		0.59	1.20		1.61	2.78								10.00	6.20
262.0	.00	0.00		0.50	1.00		1.45	2.58								10.00	6.20
265.0	.00	0.00		0.35	0.78		1.40	2.44	2.20							10.00	6.20
266.0	.00	0.00		0.30	0.70		1.35	2.30								10.00	6.20
267.0	.00	0.00		0.15	0.18		1.10	1.88	1.51							10.00	6.20
270.0	.00	0.00		0.10	0.00		1.03	1.73								10.00	6.20
273.0	.00	0.00		0.05	0.00		0.80	1.29	1.62							10.00	6.20

Table C-3.7 (cont.) Summary of hydraulic data collected at site 125.2R, Cross section 1.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
274.0	.00	0.00		0.00	0.00		0.70	1.09								10.00	6.20
277.0	.00	0.00		0.00	0.00		0.40	0.49								10.00	6.20
278.0	.00	0.00		0.00	0.00		0.38	0.37								10.00	6.20
281.0	.00	0.00		0.00	0.00		0.30	0.00								10.00	6.20
282.0	.00	0.00		0.00	0.00		0.23	0.00								10.00	6.20
285.0	.00	0.00		0.00	0.00		0.00	0.00								10.00	6.20
310.0	.00	0.00		0.00	0.00		0.00	0.00								8.00	5.20
325.0	.00	0.00		0.00	0.00		0.00	0.00								8.00	5.20
335.0	.00	0.00		0.00	0.00		0.00	0.00								8.00	5.20

a LWE is deep pool with no velocity.
b Channel divides about 100' upstream.
c No fish or upwelling seen.
d Cross section survey.
| Extrapolated or interpolated value.

Table C-3.7 (cont.) Summary of hydraulic data collected at site **125.2R**, Cross section 2.

RATING CURVE: A = -0.56 B = 0.34 CF = 552.00

	DATE: SEPT 28	DATE: AUG 31 a	DATE: AUG 22 b	DATE:	DATE: SEPT 29 c	
	REACH US = 200.00	REACH US = 179.00	REACH US = 300.00	REACH US =	REACH US =	
	DS = 20.00	DS = 100.00	DS = 150.00	DS =	DS =	
	GCD: 7680	GCD: 13600	GCD: 19100	GCD:	GCD: 7410	
	WSEL: 557.77	WSEL: 559.00	WSEL: 559.86	WSEL:	WSEL: 557.70	SUBSTRATE INFO

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	0.00								0.00	5.20
60.0	.00	.00		.00	.00		.00	0.00								10.00	5.20
110.0	.00	.00		.00	.00		0.50	0.00								10.00	5.20
130.0	.00	.00		.00	.00		0.50	0.56								10.00	5.20
140.0	.00	.00		.00	.00		0.70	1.32								10.00	5.20
144.0	.00	.00		.00	.00		0.90	1.77								10.00	5.20
147.0	.00	.00		0.05	0.00		1.05	2.10								10.00	5.20
150.0	.00	.00		0.20	0.04		1.20	2.44	2.24							10.00	5.20
151.0	.00	.00		0.25	0.05		1.23	2.50								10.00	5.20
155.0	.00	.00		0.35	1.00		1.35	2.75								10.00	5.20
159.0	.00	.00		0.50	0.85		1.47	3.00								10.00	5.20
160.0	.00	.00		0.50	1.10		1.50	3.06	2.86							10.00	5.20
163.0	.00	.00		0.50	1.85		1.65	3.19								10.00	5.20
167.0	.00	.00		1.00	1.90	1.90	1.85	3.37								10.00	5.20
170.0	.00	.00		1.15	2.02		2.00	3.50	2.50							10.00	5.20
171.0	.00	0.00		1.20	2.06		2.09	3.51								10.00	5.20
172.0	0.10	0.00		1.25	2.10		2.19	3.52								10.00	5.20
176.0	0.20	0.50		1.45	2.28		2.29	3.56								10.00	5.20
177.0	0.20	0.50		1.50	2.30	2.10	2.59	3.57								10.00	5.20
180.0	0.20	0.50		1.50	2.51		2.29	3.61								10.00	5.20
184.0	0.45	0.70		1.50	2.79		2.54	3.65								10.00	5.20
187.0	0.49	0.81		1.50	3.00	2.95	2.58	3.68								10.00	5.20
188.0	0.50	0.85		1.50	3.01		2.59	3.69								10.00	5.20
192.0	0.40	1.10		1.50	3.03		2.47	3.73								10.00	5.20
196.0	0.40	0.70		1.50	3.05		2.49	3.78								10.00	5.20
197.0	0.40	0.60		1.50	3.05	2.75	2.49	3.79								10.00	5.20
200.0	0.25	0.50		1.47	2.89		2.34	3.82								10.00	5.20
204.0	0.25	0.40		1.15	2.67		2.34	4.00								10.00	5.20
207.0	0.36	0.20		1.30	2.50	1.30	2.46	3.97								10.00	5.20
208.0	0.40	0.20		1.42	2.52		2.49	3.90								10.00	5.20
216.0	0.60	0.00		1.58	2.68		2.69	3.79								10.00	5.20
217.0	0.61	0.61		1.60	2.70	2.50	2.71	4.00								10.00	5.20

Table C-3.7 (cont.) Summary of hydraulic data collected at site 125.2R, Cross section 2.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
224.0	0.70	0.70		1.67	2.49		2.79	4.02								10.00	5.20
227.0	0.63	0.74		1.70	2.40	2.40	2.72	4.02								10.00	5.20
232.0	0.50	0.80		1.65	2.38		2.59	4.04								10.00	5.20
237.0	0.50	0.55		1.60	2.35	2.00	2.59	4.05								10.00	5.20
240.0	0.50	0.40		1.51	2.36		2.59	4.06								10.00	5.20
248.0	0.30	0.40		1.27	2.38		2.39	4.07								10.00	5.20
256.0	0.10	0.00		1.00	2.40		2.19	4.09								10.00	5.20
257.0	0.15	0.60		1.00	2.40	2.40	2.24	4.10								10.00	5.20
258.0	0.20	1.20		1.03	2.41		2.29	4.10								10.00	5.20
274.0	0.30	0.50		1.51	2.57		2.39	4.14								10.00	5.20
277.0	0.37	0.50		1.60	2.60	2.40	2.48	4.14								10.00	5.20
284.0	0.60	0.50		1.70	2.64		2.69	4.16								10.00	5.20
294.0	0.60	1.20		1.83	2.70		2.69	4.19								10.00	5.20
300.0	0.84	1.38		1.91	2.73		2.93	4.20								10.00	5.20
304.0	1.00	1.50		1.97	2.75		3.09	4.23								10.00	5.20
314.0	1.00	1.30	0.90	2.11	2.81		3.09	4.31								10.00	5.20
324.0	1.20	2.00		2.24	2.87		3.29	4.39								10.00	5.20
330.0	1.20	1.52		2.33	2.90		3.29	4.44								10.00	5.20
334.0	1.20	1.20		2.36	2.94		3.29	4.47								10.00	5.20
344.0	1.70	2.30	0.30	2.52	3.04		3.79	4.55								3.00	4.20
354.0	1.90	1.90		2.65	3.13		3.99	4.62								3.00	4.20
364.0	2.10	1.90		2.79	3.23		4.19	4.70								3.00	4.20
374.0	1.70	1.80	0.60	2.93	3.33		3.79	4.78								3.00	4.20
384.0	1.00	2.40		3.06	3.43		3.09	4.86								3.00	4.20
394.0	1.70	2.20		3.20	3.52		3.79	4.94								3.00	4.20
402.0	1.46	2.68		3.31	3.60		3.55	5.00								3.00	4.20
404.0	1.40	2.80	2.40	3.34	3.36		3.47	4.82								3.00	4.20
408.5	0.91	2.35		3.40	2.90	2.22	3.00	3.76								3.00	4.20
410.5	0.87	2.10		2.80	2.50	2.35	2.78	3.37								3.00	4.20
412.5	0.47	1.95		2.40	2.05	2.00	2.56	2.99								3.00	4.20
414.0	0.30	1.80		2.25	2.05		2.39	2.70								3.00	4.20
414.5	0.23	1.35		2.20	2.05	1.80	2.32	2.61								3.00	4.20
416.0	.00	0.00		1.90	1.98		2.09	2.32								3.00	4.20
416.5	.00	0.00		1.80	1.95	1.75	3.03	2.22								3.00	4.20
417.0	.00	0.00		1.50	1.75	1.20	2.53	1.84								3.00	4.20
417.5	.00	0.00		0.84	0.77		3.10	1.65	1.65							3.00	4.20
421.5	.00	0.00		.00	.00		2.90	1.10	0.97							3.00	9.10
423.5	.00	0.00		.00	.00		2.10	0.76	0.75							3.00	9.10
425.5	.00	0.00		.00	.00		1.30	0.85	0.76							3.00	9.10
427.5	.00	0.00		.00	.00		0.20	0.00								3.00	9.10
429.5	.00	0.00		.00	.00		.00	.00								3.00	9.10

Table C-3.7 (cont.) Summary of hydraulic data collected at site **125.2R**, Cross section 2.

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
435.0	.00	0.00	|	| .00	.00	|	.00	.00								3.00	9.30
437.5	.00	0.00	|	| .00	.00	|	.00	.00								3.00	8.30

a Chum seen.
b No upwelling, fish on left bank.
c Cross section surveyed.
| Extrapolated or interpolated value.

Table C 2.8 Summary of hydraulic data collected at site 130.2R, Cross section 1.

	RATING CURVE:	A = 1.25	B = 0.49	CF = 600.00											
	DATE: SEPT 25 a	DATE: AUG 16 b		DATE: AUG 14 c		DATE: AUG 21 d		DATE: SEPT 27 e							
	REACH US = 114.00	REACH US = 114.00		REACH US = 114.00		REACH US = 114.00		REACH US =							
	DS = 75.00	DS = 100.00		DS = 75.00		DS = 75.00		DS =							
	GCO: 7630	GCO: 14500		GCO: 16100		GCO: 19900		GCO: 7470							
	WSEL: 605.70	WSEL: 606.15		WSEL: 606.48		WSEL: 607.19		WSEL: 605.70						SUBSTRATE INFO	
STA	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	2.20
20.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	1.10
24.0	.00	.00		.00	.00		.00	.00		0.40	0.00	0.00				3.00	1.10
25.0	.00	.00		.00	.00		.00	.00		0.48	0.01					3.00	1.10
26.0	.00	.00		.00	.00		0.06	0.00		0.55	0.03					3.00	1.10
28.0	.00	.00		0.10	0.00		0.18	0.00		0.70	0.05	0.10				3.00	1.10
30.0	.00	.00		0.20	0.00		0.30	0.00		0.80	0.08					3.00	1.10
34.0	.00	.00		0.50	0.00		0.43	0.00		1.00	0.14					3.00	1.10
36.0	.00	.00		0.50	0.00		0.80	0.00		1.10	0.17					3.00	1.10
38.0	0.10	0.00		0.50	0.00		0.85	0.00		1.20	0.20	0.10				3.00	1.10
40.0	0.10	0.00		0.70	0.00		0.90	0.00		1.30	0.23					3.00	1.10
42.0	0.10	0.00		0.90	0.00		1.05	0.00		1.40	0.26					3.00	4.10
46.0	0.10	0.00		0.90	0.00		1.26	0.00		1.60	0.32					3.00	4.10
50.0	0.40	0.00		1.30	0.00		1.30	0.00		1.80	0.38					3.00	4.10
54.0	0.50	0.10		1.50	0.00		1.58	0.00		2.00	0.44					3.00	1.10
58.0	0.30	0.00		1.50	0.30		1.66	0.00		2.20	0.50	0.20				3.00	1.10
60.0	0.40	0.00		1.50	0.00		1.70	0.00		2.11	0.48					3.00	1.10
62.0	0.20	0.00		1.30	0.00		1.50	0.00		2.01	0.46					3.00	1.10
66.0	0.40	0.00		1.50	0.00		1.10	0.00		1.82	0.42					3.00	1.10
70.0	0.30	0.00		1.40	0.00		0.90	0.00		1.63	0.38					3.00	1.10
74.0	0.10	0.00		1.20	0.00		0.70	0.00		1.44	0.34					3.00	1.10
76.0	0.10	0.00		1.00	0.00		0.70	0.00		1.35	0.30	0.10				3.00	1.10
80.0	0.00	0.00		0.80	0.00		0.70	0.00		1.20	0.30					3.00	1.10
82.0	0.00	0.00		0.50	0.00		0.62	0.00		1.14	0.30					3.00	1.10
86.0	0.00	0.00		0.30	0.00		0.48	0.00		1.02	0.30					3.00	1.10
90.0	0.00	0.00		0.20	0.00		0.30	0.00		0.92	0.30					3.00	1.10
94.0	0.00	0.00		0.00	0.00		0.20	0.00		0.82	0.30					3.00	1.10
98.0	0.00	0.00		0.00	0.00		0.10	0.00		0.72	0.30					3.00	1.10
100.0	0.00	0.00		0.00	0.00		0.00	0.00		0.62	0.30	0.20				2.00	1.00
102.0	0.00	0.00		0.00	0.00		0.00	0.00		0.52	0.30					2.00	1.00
104.0	0.00	0.00		0.00	0.00		0.00	0.00		0.42	0.30	0.20				2.00	1.00
106.0	0.00	0.00		0.00	0.00		0.00	0.00		0.32	0.30					3.00	1.10

Table C-3.8 (cont.) Summary of hydraulic data collected at site 130.2R, Cross section 1.

Stn	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
123.0	.00	0.00		.00	0.00		.00	0.00		0.35	0.15					3.00	1.10
128.0	.00	0.00		.00	0.00		0.03	0.00		0.20	0.10					3.00	1.10
136.5	.00	0.00		.00	0.00		.00	0.00		.00	0.00					3.00	1.10

a Clear water, used true WSEL.
b Not breached, clear water, no fish observed.
c Backwater, silty, turbid water, no fish observed.
d Breached, turbid water, no fish observed.
e Cross section survey, used true WSEL.

| Extrapolated or interpolated value.

Table C 3.8 (Cont.) Summary of hydraulic data collected at site 130.2R, Cross section 2.

RATING CURVE A = -1.25 B = 0.49 CF = 600.00

	DATE: SEPT 25 a	DATE: AUG 16 b	DATE: AUG 14 c	DATE: AUG 21 d	DATE: SEPT 27 e
REACH US =	20.00	97.00	97.00	97.00	
DS =	114.00	114.00	114.00	114.00	
GCD:	7880	14500	16100	19900	7470
WSEL:	605.70	606.15	606.48	607.19	605.70

STA	DEPTH 1	VEL 1	V.4	DEPTH 2	VEL 2	V.4	DEPTH 3	VEL 3	V.4	DEPTH 4	VEL 4	V.4	DEPTH 5	VEL 5	V.4	SUBSTRATE INFO SUB	COV
0.0	|.00	.00|		|.00	.00|		|.00	.00|		|.00	.00|					
11.2	|.00	.00|		|.00	.00|		|.00	.00|		.00	.00				10.00	2.20
20.0	|.00	.00|		|.00	.00|		|.00	.00|		0.10	0.00				10.00	5.20
30.0	|.00	.00|		|.00	.00|		|.00	.00|		0.20	0.00				10.00	5.20
40.0	|.00	.00|		|.00	.00|		|.00	.00|		0.50	0.10				10.00	5.20
41.0	|.00	.00|		|.00	.00|		.00	.00			|0.54	0.12|			10.00	5.20
41.5	|.00	.00|		0.30	0.00			|0.12	0.00|		0.60	0.12				10.00	5.20
42.3	|.00	.00|		0.32	0.00			0.20	0.00			0.62	0.13				10.00	5.20
46.0	|.00	.00|		0.50	0.00			0.40	0.00			0.82	0.19				3.00	5.20
50.0	|.00	.00|		0.90	0.00			0.60	0.00			1.10	0.25				3.00	5.20
53.0	.00	.0		|0.96	0.00|		|0.80	0.00|		1.28	0.30				3.00	1.10
54.0	0.10	0.0		|1.00	0.00|		|0.86	0.00|		1.34	0.31				3.00	1.10
56.0	0.10	0.00		1.10	0.00		|1.12	0.00|		|1.58	0.37|					3.00	1.10
60.0	|0.10	0.00|		|1.25	0.00|	1.25	0.00			1.70	0.40		0.25			3.00	1.10
62.0	0.10	0.00		1.40	0.00		|1.26	0.00|		|1.67	0.42|					3.00	1.10
66.0	0.10	0.00		1.40	0.00		|1.20	0.00|		|1.61	0.45|					3.00	1.10
70.0	0.50	0.00		1.50	0.00		1.50	0.00		|1.56	0.46|					3.00	1.10
78.0	0.50	0.00		1.50	0.00		|1.18	0.00|		|1.45	0.50|					3.00	1.10
80.0	0.50	0.00		1.50	0.00		|1.00	0.00|		|1.43	0.50|					3.00	1.10
82.0	0.50	0.00		|1.05	0.00|		1.00	0.00		1.40	0.52		0.25			3.00	1.10
84.0	.00	.00		.00	0.00		|0.78	0.00|		|1.22	0.47|					3.00	1.10
86.0	.00	.00		.00	0.00		.00	0.00		|1.05	0.39|					3.00	4.20
88.0	.00	.00		.00	0.00		|0.13	0.00|		.00	.00					3.00	4.20
90.0	.00	.00		|.00	0.00|		.00	0.00		|0.45	0.15|					3.00	1.20
92.0	.00	.00		.00	0.00		|0.00	0.00|		0.80	0.30					3.00	4.20
94.0	.00	.00		.00	0.00		.00	0.00		0.20	0.10					3.00	1.20
100.0	.00	.00		.00	0.00		.00	0.00		.00	0.00						1.20

\| Extrapolated or interpolated value.

Table C-3.4 (cont.) Summary of hydraulic data collected at site 130..., Cross section 3.

RATING CURVE: A = 1.1... B = 0.49 CF = 600.00

	Date: SEPT 26 a	Date: AUG 16 b	DATE: AUG 14 c	DATE: AUG 21 d	DATE: SEPT 27 e
REACH US =	150.00	REACH US = 150.00	REACH US = 150.00	REACH US = 75.00	REACH US =
DS =	50.00	DS = 97.00	DS = 97.00	DS = 97.00	DS =
GCD:	7607.	GCD: 14500	GCD: 16100	GCD: 19900	GCD: 7470
WSEL:	605.70	WSEL: 606.15	WSEL: 606.48	WSEL: 607.19	WSEL: 605.70

STA	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	DEPTH	VEL	V.A	SUBSTRATE INFO SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	2.20
5.0	.00	.00		.00	.00		.00	.00		.00	.00					3.00	4.20
10.0	.00	.00		.00	.00		.00	.00		0.18	0.04					3.00	4.30
11.0	.00	.00		.00	.00		0.18	0.00		0.49	0.11					3.00	4.30
12.0	.00	.00		0.00	0.00		0.20	0.00		0.53	0.11					3.00	4.30
13.0	.00	.00		0.25	0.00		0.25	0.00		0.70	0.13	1.50				3.00	4.30
14.0	.00	.00		0.50	0.00		0.50	0.00		0.93	0.18					3.00	4.70
15.0	.00	.00		0.50	0.00		0.38	0.00		0.75	0.20					3.90	4.30
16.0	0.25	0.00		0.50	0.00		0.67	0.00		1.08	0.23					3.00	4.40
17.0	0.50	0.00		0.50	0.00		0.75	0.00		1.20	0.25	0.20				3.00	4.30
18.0	0.50	0.00		0.75	0.00		1.00	0.00		1.39	0.34					3.00	4.30
19.0	0.50	0.00		1.00	0.00		1.09	0.00		1.45	0.40	0.35				3.90	4.30
20.0	0.70	0.00		1.10	0.00		1.35	0.00		1.64	0.44					3.00	4.30
21.0	0.75	0.00		1.25	0.00		1.45	0.00		1.71	0.46					3.90	4.30
22.0	0.75	0.00		1.50	0.00		1.72	0.00		1.90	0.50	0.40				3.00	4.30
23.0	0.75	0.00		1.50	0.00		1.81	0.00		2.13	0.53					3.00	4.30
24.0	0.75	0.00		1.50	0.00		1.70	0.00		2.35	0.60	0.60				3.90	4.30
25.0	0.75	0.00		1.50	0.00		1.60	0.00		2.23	0.61					3.00	4.30
26.0	0.75	0.00		1.50	0.00		1.75	0.00		2.15	0.61					3.00	4.30
27.0	0.75	0.00		1.50	0.00		1.70	0.00		2.15	0.60	0.60				3.00	4.30
28.0	0.75	0.00		1.50	0.00		1.60	0.00		2.05	0.58					3.00	4.30
29.0	0.75	0.00		1.50	0.00		1.65	0.00		2.03	0.57					3.00	4.30
30.0	0.75	0.00		1.50	0.00		1.50	0.00		2.08	0.58	0.40				3.00	4.30
31.0	0.75	0.00		1.45	0.00		1.40	0.00		1.98	0.54					3.00	4.30
32.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
33.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
34.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
35.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
36.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
37.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
38.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
39.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
40.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
41.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
42.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
43.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
44.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
45.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
46.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
47.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
48.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
49.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
50.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
51.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
52.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
53.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
54.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
55.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
56.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
57.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
58.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
59.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
60.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
61.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
62.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
63.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
64.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
65.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
66.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
67.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
68.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
69.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
70.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
71.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
72.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
73.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
74.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
75.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
76.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
77.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
78.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
79.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
80.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
81.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
82.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
83.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
84.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
85.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
86.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
87.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
88.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
89.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
90.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
91.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
92.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
93.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
94.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
95.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
96.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
97.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
98.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
99.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
100.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
101.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
102.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
103.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
104.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
105.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
106.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
107.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
108.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
109.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
110.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
111.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
112.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
113.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
114.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
115.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
116.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
117.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
118.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
119.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
120.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
121.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
122.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
123.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
124.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
125.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
126.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
127.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
128.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
129.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
130.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
131.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
132.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
133.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
134.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
135.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
136.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
137.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
138.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
139.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
140.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
141.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
142.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
143.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
144.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
145.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
146.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
147.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
148.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
149.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30
150.0	0.75	0.00		1.40	0.00		1.40	0.00		1.98	0.54					3.00	4.30

Table C-3.B (cont.) Summary of hydraulic data collected at site 130.2R, Cross section 3.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
53.0	.00	.00		0.15	0.00		0.17	0.00		0.70	0.19					3.00	4.10
54.0	.00	.00		0.08	0.00		0.13	0.00		0.65	0.20	0.20				3.00	4.10
55.0	.00	.00		.00	.00		0.09	0.00		0.59	0.15					3.00	4.10
57.0	.00	.00		.00	.00		.00	0.00		0.46	0.05					3.00	4.10
58.0	.00	.00		.00	.00		0.08	.00		0.40	0.00					3.00	4.10
62.4	.00	.00		.00	.00		.00	.00		.00	0.00					3.00	4.10

a Used true WSEL.
b Not breached, clear water, no fish observed.
c Near head of backwater, low turbidity clear water, no fish observed.
d Breached, turbid water, no fish observed, changed velocity 1.5 to .15 at 13' & 50'.
e Cross section survey, used true WSEL.

| Extrapolated or interpolated value.

Table C-3.9 Summary of hydraulic data collected at site 131.3L, Cross section 1.

RATING CURVE: A = [illegible] B = 0.57 CF = 610.00

	Set 1	Set 2	Set 3	Set 4	Set 5
DATE:	SEPT 26 a	AUG 14 b	AUG 21 c		SEPT 27 d
REACH US =	238.00	149.00	149.00		
DS =	100.00	250.00	300.00		
GCQ:	7680	15100	19900		7470
WSEL:	614.30	616.00	616.77		616.25

SUBSTRATE INFO

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUB	COV
0.0	.00	.00		.00	0.00		0.00									3.00	4.10
17.0	.00	.00		.00	0.00		0.77									3.00	1.10
20.0	.00	.00		0.50	0.00		1.27									3.00	1.10
24.0	.00	.00		0.90	0.30		1.67									3.00	1.10
28.0	.00	.00		1.00	0.30		1.77									3.00	1.10
32.0	.00	.00		1.10	0.50		1.87									3.00	1.10
40.0	.00	.00		1.20	0.70		1.97									3.00	1.10
50.0	.00	.00		1.80	0.80		2.57									3.00	1.10
60.0	.00	.00		2.60	1.20		3.37									3.00	1.10
70.0	.00	.00		3.00	1.40		[illegible]									3.00	1.10
80.0	.00	.00		3.10	1.15		3.67									3.00	1.10
90.0	.00	[illegible]		2.90	0.95		3.37									3.00	1.10
91.0	0.20	0.70		2.60	0.92		3.37									3.00	1.10
93.0	0.20	0.70		2.60	0.86		3.37									3.00	1.10
95.0	0.30	0.90		2.60	0.80		3.37									3.00	1.10
97.0	0.20	0.80		2.60	0.74		3.37									3.00	1.10
99.0	.00	0.85		2.60	0.58		3.37									3.00	1.10
100.0	0.15	0.88		2.50	0.65		[illegible]									3.00	1.10
101.0	0.20	[illegible]		[illegible]	1.51		3.37									3.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]									3.00	[illegible]
[illegible]	.00	[illegible]		[illegible]	0.47		[illegible]									3.00	[illegible]
[illegible]	.00	[illegible]		[illegible]	0.25		[illegible]									[illegible]	[illegible]
[illegible]	.00	[illegible]		[illegible]	[illegible]		[illegible]									3.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	1.50	[illegible]							[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		3.18	[illegible]								3.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	1.50								[illegible]	[illegible]
[illegible]	0.10	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.20	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							[illegible]	[illegible]
[illegible]	0.40	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.40	1.20		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]							3.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								3.00	[illegible]

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Table C-3.7 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 1.

Stn	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
131.0	0.40	1.00		0.96	0.00		2.68	0.80								3.00	1.10
133.0	.00	0.00		0.48	0.00		2.50	0.80	0.60							3.00	1.10
135.0	.00	0.00		.00	0.00		2.45	0.80								3.00	1.10
137.0	.00	0.00		.00	0.00		2.40	0.80	0.60							3.00	1.10
141.0	.00	0.00		.00	0.00		2.10	0.50	0.50							3.00	1.10
145.0	.00	0.00		.00	0.00		1.30	0.30	0.00							3.00	1.10
149.0	.00	0.00		.00	0.00		0.45	0.00								3.00	1.10
[illegible]	.00	0.00		.00	0.00		.00	0.00								3.00	1.10

a Clear water.
b Turbid, many chum.
c Fish observed.
d Cross section survey.
| Extrapolated or interpolated value.

Table C-3.9 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 2.

RATING CURVE: A = -1.62 B = 0.57 CF = 610.00

	DATE: SEPT 26 a	DATE: AUG 14 b	DATE: AUG 21 c	DATE:	DATE: SEPT 27 d	
	REACH US = 123.00	REACH US = 123.00	REACH US = 221.00	REACH US =	REACH US =	
	DS = 60.00	DS = 149.00	DS = 149.00	DS =	DS =	
	GCD: 7680	GCD: 16100	GCD: 19900	GCD:	GCD: 7470	
	WSEL: 614.30	WSEL: 616.00	WSEL: 616.77	WSEL:	WSEL: 614.31	SUBSTRATE INFO

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00									5.60	4.30
34.0	.00	.00		.00	.00		0.77									5.00	5.20
38.0	.00	.00		0.20	0.40		0.97									5.00	5.20
42.0	.00	.00		0.70	2.20		1.47									5.00	5.20
46.0	.00	.00		0.80	2.20		1.57									5.00	5.20
50.0	.00	.00		1.00	1.90		1.77									5.00	5.20
54.0	.00	.00		1.10	2.00		1.87									5.00	5.20
60.0	.00	.00		1.50	1.60		2.27									5.00	5.20
64.0	.00	.00		1.50	1.30		2.27									5.00	5.20
66.0	0.80	0.20		1.60	1.35		2.37									5.00	5.20
68.0	0.40	0.20		1.70	1.30		2.47									5.00	5.20
70.0	0.50	0.20		1.75	1.70		2.52									5.00	5.20
72.0	0.60	0.20		1.80	1.80		2.57									5.00	5.20
76.0	0.50	0.20		1.85	1.70		2.62									5.00	5.20
78.0	0.40	0.10		1.90	2.00		2.67									5.00	5.20
82.0	0.30	0.20	0.20	1.95	2.10		2.72									5.00	5.20
86.0	0.70	1.30	0.30	2.00	2.20		2.77									5.00	5.20
92.0	0.50	1.20		2.05	2.15		2.82									5.00	5.20
96.0	0.50	1.10		2.04	2.08		2.81									5.00	5.20
100.0	0.50	0.90		2.06	2.06		2.83	3.39								5.00	5.20
104.0	0.40	1.30		2.00	1.83		2.78	3.10	1.80							5.00	5.20
108.0	0.30	0.90		2.10	1.80		2.88	2.98								5.00	5.20
112.0	0.40	0.70		2.05	1.75		2.83	2.93								5.00	5.20
116.0	0.50	0.90		2.05	1.85		2.83	3.09								5.00	5.20
120.0	0.50	0.90		2.05	1.90		2.83	3.06								5.00	5.20
124.0	0.50	0.90		2.00	1.80		2.78	2.93	2.60							5.00	5.20
128.0	0.50	0.90		2.00	1.50		2.78	2.64								5.00	5.20
132.0	0.40	0.80		1.90	1.40		2.68	2.54	1.40							5.00	5.20
136.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
140.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
144.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
148.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
152.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
156.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
160.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
164.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
168.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
172.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
176.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20
180.0	0.40	0.80		1.90	1.40		2.68	2.54								5.00	5.20

Table C-3.9 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 2.

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
124.0	.00	0.00		0.17	0.23		.00	0.00								3.00	5.10
126.0	.00	0.00		.00	0.00		.00	0.00								3.00	5.10

a Changed to true WSEL.
b Upwelling with spawning chum along right bank at cross section.
c Fish seen.
d Cross section survey.
| Extrapolated or interpolated value.

Table C-3.9 (cont.) Summary of hydraulic data collected at site **131.3L**, Cross section 3.

RATING CURVE: A = -0.37 B = 0.29 CF = 610.00

	DATE: SEPT 26 a	DATE: AUG 14 b	DATE: AUG 21 c	DATE:	DATE: SEPT 27 d	
	REACH US = 152.00	REACH US = 130.00	REACH US = 109.00	REACH US =	REACH US =	
	DS = 123.00	DS = 123.00	DS = 25.00	DS =	DS =	
	GCD: 7680	GCD: 16100	GCD: 19900	GCD:	GCD: 7470	
	WSEL: 616.24	WSEL: 616.78	WSEL: 617.19	WSEL:	WSEL: 615.41	SUBSTRATE INFO

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00	.00								9.00	5.30
8.0	.00	.00		.00	.00		.00	.00								9.00	5.20
10.0	.00	.00		0.50	0.00		.00	.00								9.00	5.20
14.0	.00	.00		0.62	0.00		.00	.00								9.00	5.20
20.0	.00	.00		0.80	0.00		0.42	0.15								9.00	4.20
30.0	.00	.00		1.20	0.20		1.12	0.40								9.00	4.20
34.0	.00	.00		1.20	0.12		1.40	0.50	0.50							5.00	4.20
35.0	.00	.00		1.20	0.10		1.43	0.47								5.00	4.20
40.0	0.19	0.00		1.20	0.00		1.58	0.32								5.00	4.20
44.0	0.35	0.00		1.28	0.04		1.70	0.20	0.25							5.00	4.20
48.0	0.50	0.00		1.36	0.08		1.82	0.46								5.00	4.20
50.0	0.53	0.00		1.40	0.10		1.88	0.59								5.00	4.20
54.0	0.58	0.00		1.34	0.14		2.00	0.85	0.80							5.00	4.20
56.0	0.60	0.00		1.16	0.16		1.99	0.86								5.00	4.20
60.0	0.60	0.00		1.00	0.20		1.97	0.88								5.00	4.20
64.0	0.47	0.00		0.96	0.40		1.95	0.90	0.80							5.00	4.20
66.0	0.40	0.00		0.94	0.50		1.89	0.94								5.00	4.20
70.0	0.27	0.00		0.90	0.70		1.77	1.02								5.00	4.20
72.0	0.20	0.00		0.90	0.76		1.71	1.06								5.00	4.20
74.0	0.20	0.05		0.90	0.82		1.65	1.10	0.95							5.00	4.20
76.0	0.20	0.15		0.90	0.88		1.62	1.13								5.00	4.20
80.0	0.10	0.00		0.90	1.00		1.56	1.19								5.00	4.20
84.0	0.10	0.00		0.86	1.04		1.50	1.25	1.10							5.00	4.20
86.0	0.10	0.00		0.82	1.08		1.54	1.27								5.00	4.20
90.0	0.15	0.05		0.80	1.10		1.56	1.28								5.00	4.20
92.0	0.20	0.10		0.84	1.16		1.58	1.29								5.00	4.20
94.0	0.20	0.05		0.88	1.22		1.60	1.30								5.00	4.20
98.0	0.20	0.00		0.92	1.28		1.58	1.35								5.00	4.20
100.0	0.10	0.00		0.94	1.40		1.54	1.42								5.00	4.20
104.0	0.10	0.00		0.92	1.72		1.50	1.55								5.00	4.20
108.0	0.20	0.00		0.88	2.04		1.54	1.59								5.00	4.20
110.0	0.25	0.05		0.80	2.20		1.56	1.61								5.00	4.20

Table C-3.7 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 3.

Sta	DEPTH 1	VEL 1	V.4	DEPTH 2	VEL 2	V.4	DEPTH 3	VEL 3	V.4	DEPTH 4	VEL 4	V.4	DEPTH 5	VEL 5	V.4	SUM	COV
112.0	0.30	0.10		0.84	2.18		1.58	1.63								5.00	4.20
114.0	0.20	0.05		0.88	2.16		1.60	1.65	1.10							5.00	4.20
116.0	0.10	0.00		0.92	2.14		1.60	1.60								5.00	4.20
120.0	0.10	0.00		1.00	2.10		1.60	1.50								5.00	4.20
124.0	0.10	0.00		1.00	2.02		1.60	1.40								5.00	4.20
128.0	0.10	0.00		1.00	1.94		1.60	1.40								5.00	4.20
130.0	0.10	0.00		1.00	1.90		1.60	1.40								5.00	4.20
132.0	0.10	0.00		0.98	1.94		1.60	1.40								5.00	4.20
134.0	0.10	0.00		0.96	1.98		1.60	1.40								5.00	4.20
136.0	0.10	0.00		0.94	2.02		1.62	1.42								5.00	4.20
140.0	0.10	0.00		0.90	2.10		1.66	1.46								5.00	4.20
144.0	0.20	0.30		0.94	1.58		1.70	1.50	1.10							5.00	4.20
148.0	0.20	0.10		0.98	1.06		1.46	1.46								5.00	4.20
150.0	0.15	0.05		1.00	0.80		1.34	1.44								5.00	4.20
152.0	0.10	0.00		0.98	0.70		1.22	1.42								3.00	4.20
154.0	0.10	0.00		0.96	0.60		1.10	1.40								3.00	4.20
156.0	0.10	0.00		0.94	0.50		1.12	1.37								3.00	1.10
157.0	.00	.00		0.93	0.45		1.13	1.36								3.00	1.10
160.0	.00	.00		0.90	0.30		1.16	1.31								3.00	1.10
164.0	.00	.00		0.86	0.94		1.20	1.25	1.60							3.00	1.10
170.0	.00	.00		0.80	1.90		1.14	1.40								3.00	1.10
174.0	.00	.00		0.64	1.54		1.10	1.50								3.00	1.10
180.0	.00	.00		0.40	1.00		1.22	1.44								3.00	1.10
182.0	.00	.00		.00	.00		1.26	1.42								3.00	1.10
184.0	.00	.00		0.74	.00		1.30	1.40								3.00	1.10
194.0	.00	.00		0.54	.00		1.10	1.30								3.00	1.10
204.0	.00	.00		.00	.00		0.50	1.20	1.50							3.00	1.10
214.0	.00	.00		.00	.00		0.30	1.25								3.00	1.10
224.0	.00	.00		.00	.00		0.25	0.45								3.00	1.10
228.0	.00	.00		.00	.00		0.30	0.40								3.00	1.10
231.5	.00	.00		.00	.00		.00	0.00								3.00	1.10

a Clear water, algal hairs on rocks.

b [illegible]

c Fish observation.

d Cross section survey.

| Extrapolated or interpolated value.

Table C-3.9 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 4.

RATING CURVE:			a =	0.37		B =	0.29	DF =	610.00												
DATE:	SEP 26 a		DATE:	AUG 14 b				DATE:	AUG 21 c			DATE:				DATE:					
REACH US =	75.00		REACH US =	150.00				REACH US =	50.00			REACH US =				REACH US =					
DS =	65.00		DS =	87.00				DS =	109.00			DS =				DS =					
GCQ:	7680		GCQ:	16100				GCQ:	19900			GCQ:				GCQ:					
WSEL:	616.24		WSEL:	616.76				WSEL:	617.19			WSEL:				WSEL:				SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5								
0.0	.00	.00		.00	.00		.00	.00											9.00	6.20
11.0	.00	.00		.00	.00		.00	.00											9.00	5.20
28.0	.00	.00		.00	.00		1.00	0.90	0.90										8.00	4.30
48.0	.00	.00		.00	.00		1.00	2.50	2.50										8.00	4.30
50.0	0.10	.00		.00	.00		0.99	2.63											8.00	4.30
52.0	0.10	.00		.00	.00		0.98	2.76											8.00	4.30
54.0	0.10	.00		0.10	.00		0.97	2.89											8.00	4.30
56.0	0.10	.00		0.20	.00		0.96	3.02											8.00	4.30
58.0	0.20	0.30		0.30	.00		0.95	3.15											8.00	4.30
60.0	0.20	0.10		0.40	.00		0.94	3.28											8.00	4.30
62.0	0.20	0.20		0.50	.00		0.93	3.41											8.00	4.30
64.0	0.20	0.10		0.44	.00		0.92	3.54											8.00	4.30
66.0	0.20	0.20		0.38	.00		0.91	3.67											8.00	4.30
68.0	0.10	.00		0.32	.00		0.90	3.80	4.00										8.00	4.30
70.0	0.20	.00		0.26	.00		0.91	3.74											8.00	4.30
72.0	0.10	.00		0.20	.00		0.92	3.68											8.00	4.30
74.0	0.10	.00		0.10	.00		0.93	3.62											8.00	4.30
76.0	.00	.00		.00	.00		0.94	3.56											8.00	4.30
88.0	.00	.00		.00	.00		1.00	3.20	3.20										8.00	4.30
92.0	.00	.00		.00	.00		0.96	3.15											8.00	4.30
102.0	.00	.00		.00	.00		0.86	3.03											8.00	4.30
108.0	.00	.00		0.00	.00		0.80	2.75	3.00										8.00	4.30
112.0	.00	.00		0.10	.00		0.77	2.66											8.00	4.30
122.0	.00	.00		0.20	1.00		0.70	1.94											3.00	4.30
128.0	.00	.00		0.32	1.54		0.65	1.50	1.70										3.00	4.30
132.0	.00	.00		0.40	1.90		0.69	1.26											3.00	1.10
142.0	.00	.00		0.50	1.80		0.79	0.66											3.00	1.10
148.0	.00	.00		0.50	1.56		0.95	0.30	0.25										3.00	1.10
158.0	.00	.00		.00	1.40		0.84	0.40											3.00	1.10
162.0	.00	.00		0.30	1.80		0.82	0.65											3.00	1.10
168.0	.00	.00		0.50	2.10		0.80	0.80	0.80										3.00	1.10
178.0	.00	.00		0.70	2.40		0.96	1.00											3.00	1.10

Table C-3.9 (cont.) Summary of hydraulic data collected at site 131.3L, Cross section 4.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
178.0	.00	.00		0.76	2.40		1.20	1.30	0.80							3.00	1.10
182.0	.00	.00		0.80	2.40		0.96	1.38								3.00	1.10
188.0	.00	.00		0.68	2.34		0.60	1.50	1.60							3.00	1.10
192.0	.00	.00		0.60	2.30		0.65	1.30	1.55							3.00	1.10
196.0	.00	.00		0.64	2.22		0.50	0.85	1.10							3.00	1.10
197.7	.00	.00		0.66	2.19		.00	.00								3.00	1.10
202.0	.00	.00		0.70	2.10		.00	.00								3.00	1.10
212.0	.00	.00		0.60	2.00		.00	.00								3.00	1.10
222.0	.00	.00		0.50	0.40		.00	.00								3.00	1.10
227.0	.00	.00		.00	.00		.00	.00								3.00	1.10

a Clear water, algal infested rocks.
b No fish seen, turbid water 112-227', clear water 52-102'.
c Chum seen.
| Extrapolated or interpolated value.

Table C 3.10 Summary of hydraulic data collected at site 133.0R, Cross Section 1, a

	RATING CURVE:	A = 1.57	b = 0.54	CF = 545.00											
	DATE: SEPT 26 b	DATE: AUG 14 c		DATE: AUG 21 d		DATE:		DATE:							
	REACH US = 44.00	REACH US = 44.00		REACH US = 44.00		REACH US =		REACH US =							
	DS = 0.00	DS = 0.00		DS = 0.00		DS =		DS =							
	GCQ: 7680	GCQ: 16100		GCQ: 19500		GCQ:		GCQ:							
	WSEL: 649.20	WSEL: 650.03		WSEL: 650.64		WSEL:		WSEL:						SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
9.0	.00	.00		.00	.00		.00	.00								5.00	1.10
15.0	.00	.00		.00	.00		.00	.00								9.00	5.20
16.0	.00	.00		.00	.00		0.30	0.05								8.00	5.20
20.0	.00	.00		.00	.00		0.80	1.45	1.00							8.00	5.20
24.0	.00	.00		0.40	0.90		1.20	2.70	2.30							8.00	5.20
28.0	.00	.00		0.60	2.00		1.80	3.40	2.40							9.00	5.20
32.0	.00	.00		1.10	2.30		2.30	3.50	2.90							9.00	5.20
34.0	0.45	0.30		1.45	2.55		2.50	3.60	2.50							9.00	5.20
36.0	0.90	0.50		1.60	2.90		3.17	3.60								9.00	5.20
40.0	0.75	0.40		2.40	3.30		3.02	3.60								9.00	5.20
48.0	0.60	0.20		2.40	3.30		2.87	3.60								9.00	5.20
52.0	0.33	0.35		2.40	3.30		2.60	3.60								9.00	5.20
56.0	0.50	0.40		2.40	3.24		2.77	3.60								9.00	5.20
60.0	0.50	0.40		2.40	3.00		2.77	3.60								9.00	5.20
64.0	0.90	1.10	1.10	2.81	2.56		3.17	3.60								9.00	5.20
68.0	1.00	1.50		3.00	2.45		3.27	3.60								9.00	5.20
72.0	1.30	2.00	2.20	2.94	2.63		3.57	3.60								9.00	5.20
76.0	1.30	2.00		2.90	2.79		3.57	3.60								9.00	5.20
80.0	1.30	1.80	2.30	2.95	2.71		3.50	3.60								9.00	5.20
84.0	1.30	1.80	2.00	2.76	2.84		3.37	3.60								9.00	5.20
88.0	1.00	1.30		2.55	3.03		3.17	3.60								9.00	5.20
92.0	1.00	1.30	1.60	2.55	3.03		3.17	3.60								9.00	5.20
96.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
100.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
104.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
108.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
112.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
116.0	1.30	1.60		2.75	2.75		3.37	3.60								9.00	5.20
120.0	.00	.00		.00	.00		.00	.00								9.00	5.20

| Extrapolated or interpolated value.

Table C-3.10 (cont.) Summary of hydraulic data collected at site 133.8R, Cross section 2. a

RATING CURVE:	A = -1.57	B = 0.54	CF = 645.00		
DATE:	SEPT 25 b	AUG 14	AUG 21 d		
REACH US =	102.50	102.50	102.50		
DS =	44.00	44.00	44.00		
GCD:	7680	16100	19900		
WSEL:	649.20	650.03	650.64		

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUB (SUBSTRATE INFO)	COV (SUBSTRATE INFO)
0.0	.00	.00		.00	.00		.00	.00								3.00	1.10
17.7	.00	.00		.00	.00		.00	.00								10.00	6.20
22.0	.00	.00		.00	.00		0.70	0.20								10.00	6.20
25.0	.00	.00		.00	.00		1.40	1.15	0.95							10.00	6.20
[illegible]	.00	.00		0.80	0.60		2.20	2.60	1.70							10.00	6.20
[illegible]	.00	.00		2.00	1.80		2.90	2.65	1.50							11.00	6.20
[illegible]	0.70	[illegible]		2.25	1.98		2.97	3.05								11.00	6.20
[illegible]	0.95	0.20		2.50	1.95		3.32	3.05								11.00	6.20
[illegible]	1.20	[illegible]	0.30	2.55	2.38		3.47	3.05								11.00	6.20
[illegible]	[illegible]	[illegible]		2.60	2.80		3.22	3.05								11.00	6.20
[illegible]	[illegible]	[illegible]		2.50	2.85		3.17	3.05								11.00	6.20
[illegible]	[illegible]	[illegible]		2.30	2.95		3.07	3.05								11.00	[illegible]
[illegible]	[illegible]	[illegible]		2.20	3.00		3.07	3.05								11.00	[illegible]
[illegible]	[illegible]	[illegible]		2.28	[illegible]		3.07	3.05								8.00	5.20
[illegible]	[illegible]	[illegible]		2.44	[illegible]		3.07	3.05								8.00	[illegible]
[illegible]	[illegible]	[illegible]	0.50	[illegible]	[illegible]		3.27	3.05								8.00	[illegible]
[illegible]	[illegible]	[illegible]	0.70	2.40	[illegible]		3.27	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		3.47	3.05								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		3.57	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		3.27	3.05								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		3.67	3.05								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		2.97	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								8.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	3.05								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		1.60	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	3.05								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]								[illegible]	[illegible]

Table C-3.10 (cont.) Summary of hydraulic data collected at site **133.8R**, Cross section 2.

Sta	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
118.0	0.50	0.90		1.86	0.52		2.77	3.05								9.00	
120.0	0.65	0.95		2.00	0.40		2.92	3.05								9.00	
122.0	0.80	1.00		2.12	0.56		3.07	3.05								9.00	
126.0	1.00	1.90	1.90	2.36	0.88		3.27	3.05								9.00	
130.0	1.30	2.20	2.20	2.60	1.20		3.57	3.05								9.00	
140.0	1.40	2.50	2.40	2.70	2.00		3.67	3.05								9.00	
150.0	1.40	2.60	2.40	3.00	3.05		3.67	3.05								9.00	
160.0	1.30	2.20	2.20	2.96	3.05		3.57	3.05								9.00	
170.0	1.00	2.50	2.50	2.66	3.05		3.27	3.05								9.00	
180.0	1.00	2.30	2.30	2.66	3.05		3.27	3.05								9.00	
190.0	0.30	0.40		1.96	3.05		2.57	3.05								9.00	
195.0	.00	.00		1.66	3.05		2.27	3.05								9.00	

a All measurements from RWE.
b Clear water.
c Turbid water.
d No fish.
| Extrapolated or interpolated value.

Table C-3.10 (cont. Summary of hydraulic data collected at site 133.8R, Cross section 3. a

RATING CURVE: A = 1.?7 B = 0.54 Q0 = 645.00

	1	2	3	4	5
DATE:	SEPT 26 b	AUG 14 c	AUG 21		
REACH US =	0.00	0.00	0.00		
DS =	102.50	102.50	102.50		
GCQ:	7800	16100	19900		
WSEL:	647.2?	650.03	650.64		

SUBSTRATE INFO

STA	DEPTH 1	VEL 1	V.4 1	DEPTH 2	VEL 2	V.4 2	DEPTH 3	VEL 3	V.4 3	DEPTH 4	VEL 4	V.4 4	DEPTH 5	VEL 5	V.4 5	SUB	COV
0.0	.00	.00		.00	.00		.00	.60								6.00	4.20
16.7	.00	.00		.60	.00		.00	.00								5.00	4.20
18.0	.00	.00		.00	.00		0.26	0.00								5.00	4.20
20.0	.00	.00		.00	.00		0.65	0.18								5.00	4.20
22.0	.00	.00		0.25	0.50		1.10	0.35	0.65							5.00	4.20
24.0	.00	.00		0.50	1.00		1.13	0.85								5.00	4.20
26.0	.00	.00		0.65	1.35		1.15	1.35	1.45							5.00	4.20
28.0	.00	.00		0.80	1.70		1.38	1.78								5.00	4.20
29.0	.00	.00		0.9?	1.85		1.49	1.99								5.00	4.20
30.0	0.10	0.0?		1.05	2.00		1.6?	2.20	2.00							5.00	4.20
32.0	0.35	0.?0		1.30	2.30		1.78	2.53								5.00	4.20
34.0	0.50	0.??		1.40	2.35		1.95	2.90	2.40							5.00	4.20
36.0	0.70	1.1?		1.60	2.40		2.13	2.93								5.00	4.20
38.0	0.80	1.40		1.75	2.60		2.40	2.9?	2.95							8.00	5.20
40.0	0.80	1.25		1.90	2.80		2.?5	3.10								8.00	5.20
42.0	0.30	1.10		1.?6	3.0?		2.?0	3.30	2.40							8.00	5.20
45.0	0.50	1.40		1.?8	3.45		2.37	3.?0								6.00	5.20
50.0	0.60	0.?0		1.70	3.70		2.31	[illegible]								8.00	5.?0
[illegible]	0.85	0.70		1.90	4.00		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.75	[illegible]		2.10	4.2?		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.20	[illegible]		2.20	4.3?		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.50	[illegible]		2.12	4.1?		[illegible]	[illegible]								9.00	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	3.7?		[illegible]	[illegible]								9.00	[illegible]
[illegible]	0.50	[illegible]		[illegible]	3.30		2.4?	[illegible]								[illegible]	[illegible]
[illegible]	0.80	0.??		[illegible]	3.10		[illegible]	3.30								[illegible]	[illegible]
72.?	0.50	[illegible]		[illegible]	2.9?		[illegible]	3.30								[illegible]	[illegible]
[illegible]	0.??	[illegible]		[illegible]	[illegible]		[illegible]	3.??								9.00	[illegible]
[illegible]	0.50	[illegible]		[illegible]	2.7?		[illegible]	[illegible]								[illegible]	[illegible]
[illegible]	0.10	[illegible]		[illegible]	2.7?		[illegible]	[illegible]								9.0?	[illegible]
[illegible]	0.12	[illegible]		[illegible]	2.7?		[illegible]	[illegible]								9.0?	[illegible]
[illegible]	.00	[illegible]		[illegible]	2.6?		[illegible]	[illegible]								9.00	[illegible]
[illegible]	.00	[illegible]		[illegible]	2.4?		[illegible]	3.30								9.00	[illegible]

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Table C-3.10 (cont.) Summary of hydraulic data collected at site **133.8R**, cross section 3.

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
110.0	.00	0.00		1.30	1.80		1.91	3.30								9.00	
120.0	.00	0.00		1.10	2.20		1.71	3.30								9.00	
130.0	.00	0.00		1.10	2.60		1.71	3.30								9.00	
140.0	.00	0.00		0.80	2.50		1.41	3.30								9.00	
150.0	.00	0.00		1.20	2.40		1.41	3.30								9.00	
187.0	.00	0.00		0.60	2.40		1.41	3.30								9.00	
188.0	0.20	0.00		1.00	2.40		1.61	3.30								9.00	
192.0	0.90	0.00		1.70	2.40		2.31	3.30								9.00	
196.0	1.40	0.00		2.20	2.40		2.81	3.30								9.00	
200.0	1.60	0.00		2.40	2.40		3.01	3.30								9.00	
204.0	1.00	0.50		1.80	2.40		2.41	3.30								9.00	
208.0	0.80	0.90		1.60	2.40		2.21	3.30								9.00	
212.0	0.70	1.50		1.50	2.40		2.11	3.30								9.00	
216.0	0.70	1.30		1.50	2.40		2.11	3.30								9.00	

a All measurements from RWE.
b Clear water, algal growth on rocks.
c Turbid water, one adult salmon observed.

| Extrapolated or interpolated value.

Table C-3.11 Summary of hydraulic data collected at site 137.5R, Cross section 1.

RATING CURVE:		A = -3.11		B = 0.89		CF = 687.00													
DATE:	AUG 12 a	DATE:				DATE:				DATE:				DATE:					
REACH US =	92.00	REACH US =				REACH US =				REACH US =				REACH US =					
DS =	50.00	DS =				DS =				DS =				DS =					
GCD:	19000	GCD:				GCD:				GCD:				GCD:					
WSEL:	691.99	WSEL:				WSEL:				WSEL:				WSEL:				SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV		
		1			2			3			4			5					
0.0	.00	.00														3.00	6.10		
20.0	.00	.00														3.00	6.10		
26.0	1.20	0.10														3.00	6.10		
32.0	1.50	0.00														3.00	1.10		
38.0	1.10	0.05														3.00	1.10		
42.0	.00	0.00														3.00	1.10		
58.0	.00	0.00														3.00	1.10		
60.0	0.30	0.00														3.00	1.10		
64.0	0.50	0.00														3.00	1.10		
74.0	1.30	0.00														3.00	1.10		
82.0	2.00	0.00														3.00	1.10		
88.0	2.70	0.00														3.00	1.10		
98.0	2.70	0.00														3.00	1.10		
100.0	2.00	0.00														3.00	1.10		
106.0	1.30	0.00														3.00	1.10		
111.0	.00	0.00														3.00	1.10		

a Turbid water, backwater.

| Extrapolated or interpolated value.

Table C. 3.11 (cont.) Summary of hydraulic data collected at site 13.5K, Cross section 2.

Rating CURVE:			A =			B =			L^a =														
DATE: AUG 12 &			DATE:			DATE:			DATE:			DATE:											
REACH US = 116.00			REACH US =			REACH US =			REACH US =			REACH US =											
DS = 92.00			DS =			DS =			DS =			DS =											
GCD: 1980			GCD:			GCD:			GCD:			GCD:											
WSEL: 871.97			WSEL:			WSEL:			WSEL:			WSEL:										SUBSTRATE INFO	
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV						
		1			2			3			4			5									
0.0	.00	.00														3.00	8.20						
23.0	.00	.00														3.00	6.10						
24.0	0.20	0.00														3.00	6.10						
26.0	0.40	0.00														3.00	6.10						
36.0	1.10	0.10														3.00	6.10						
40.0	1.10	0.00														3.00	6.10						
46.0	1.40	0.00														3.00	4.10						
56.0	1.40	0.00														3.00	4.10						
60.0	1.40	0.00														3.00	4.10						
64.0	1.50	0.00														3.00	4.10						
70.0	1.00	0.00														3.00	4.10						
80.0	1.10	0.00														3.00	4.10						
90.0	0.50	0.00														3.00	4.10						
97.0	.00	0.00														3.00	1.10						

a Turbulent flow observed.

| Extrapolated or interpolated value.

Table C-3.11 (cont.) Summary of hydraulic data collected at site 157.5R, Cross section 2.

RATING CURVE:			A =			B =			CF =												
DATE: AUG 12 a			DATE:				DATE:				DATE:				DATE:						
REACH US = 50.00			REACH US =				REACH US =				REACH US =				REACH US =						
DS = 116.00			DS =				DS =				DS =				DS =						
GCD: 19000			GCD:				GCD:				GCD:				GCD:						
WSEL: 691.97			WSEL:				WSEL:				WSEL:				WSEL:						
																			SUBSTRATE INFO		
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV	
		1			2			3			4			5							
0.0	.00	.00																			
20.0	.00	.00																	13.00	6.30	
22.0	0.30	0.00																	13.00	6.30	
26.0	0.80	0.30																	13.00	6.30	
30.0	1.20	0.00																	13.00	6.30	
36.0	0.80	0.00																	13.00	6.30	
38.0	0.60	0.00																	13.00	6.30	
42.0	0.70	0.00																	13.00	6.30	
46.0	0.80	0.00																	13.00	6.30	
50.0	0.20	0.00																	13.00	6.30	
54.0	.00	0.00																	13.00	6.30	

a Clear water, unbracketed.

| Extrapolated or interpolated value.

Table C-3.12 Summary of hydraulic data collected at site 136.7L, Cross section 1.

RATING CURVE: A = -6.07 B = 1.54 CF = 705.00

	DATE: SEPT 20 a	DATE: AUG 16	DATE: AUG 23 b	DATE: AUG 12	DATE: AUG 27 c	
	REACH US = 142.00	REACH US = 142.00	REACH US = 142.00	REACH US = 142.00	REACH US =	
	DS = 250.00	DS = 200.00	DS = 250.00	DS = 300.00	DS =	
	GCO: 10400	GCO: 14500	GCO: 17900	GCO: 19000	GCO: 27700	
	WSEL: 706.25	WSEL: 707.08	WSEL: 707.87	WSEL: 708.15	WSEL: 710.61	SUBSTRATE INFO

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		3.00	8.20
11.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		8.00	8.20
16.0	.00	.00		.00	.00		.00	.00		.00	.00		0.80	1.40	1.40	8.00	4.20
20.0	.00	.00		.00	.00		.00	.00		.00	.00		1.20	2.00	2.00	8.00	4.20
21.0	.00	.00		.00	.00		.00	.00		.00	.00		1.30	2.08		8.00	4.20
24.0	.00	.00		.00	.00		.00	.00		0.20	1.25		1.60	2.30	2.20	8.00	4.20
24.3	.00	.00		.00	.00		.00	.00		0.23	1.30		1.63	2.33		8.00	4.20
26.0	.00	.00		.00	.00		0.13	0.62		0.40	1.60		1.80	2.50		8.00	4.20
28.0	.00	.00		.00	.00		0.40	1.35		0.60	1.80		2.00	2.70	2.50	8.00	4.20
30.0	.00	.00		.00	.00		0.55	1.35		0.80	2.00		2.15	2.70		8.00	4.20
32.0	.00	.00		0.10	0.00		0.70	1.35	1.60	0.75	2.10		2.30	2.70	2.10	8.00	4.20
34.0	.00	.00		0.10	0.00		0.70	1.60		0.70	2.20		2.40	2.70		8.00	5.20
36.0	.00	.00		0.10	0.00		0.70	1.85	1.90	0.90	2.30		2.50	2.70	2.40	10.00	5.20
38.0	.00	.00		0.20	0.50		0.95	1.90		1.10	2.40		2.75	3.15		10.00	5.20
40.0	.00	.00		0.50	0.95		1.20	1.95	1.90	1.37	2.20		3.00	3.60	2.80	10.00	5.20
42.0	.00	.00		0.80	1.40	1.60	1.25	2.05		1.63	2.00		3.99	3.60		10.00	5.20
44.0	.00	.00		0.85	1.70		1.30	2.15	2.40	1.90	1.80		4.04	3.60		10.00	5.20
46.0	0.08	0.04		0.90	2.00	2.00	1.63	2.28		2.05	2.25		4.44	3.60		10.00	5.20
48.0	0.16	0.08		1.25	2.04		1.97	2.40		2.20	2.70		4.52	3.60		10.00	5.20
49.0	0.20	0.10		1.43	2.06		2.13	2.40		2.34	2.75		4.56	3.60		10.00	5.20
50.0	0.35	0.33		1.60	1.40	1.40	2.30	2.40	1.90	2.48	2.80		4.71	3.60		10.00	5.20
53.0	0.80	1.00		2.02	2.15		2.63	2.25		2.89	2.95		5.16	3.60		10.00	5.20
54.0	0.90	1.10		2.16	2.17		3.00	2.20	2.10	3.03	3.00		5.26	3.60		10.00	5.20
56.0	1.10	1.30		2.44	2.21		2.72	2.90		3.30	3.10		5.46	3.60		10.00	5.20
57.0	1.20	1.40	1.30	2.58	2.24		2.82	2.90		3.10	3.10		5.56	3.60		10.00	5.20
60.0	1.50	1.50		3.00	2.30	1.60	3.20	2.90		3.40	3.10		5.94	3.60		10.00	5.20
61.0	1.70	1.65	1.65	3.09	2.38		3.32	2.90		3.60	3.10		6.06	3.60		8.00	5.20
65.0	2.30	1.90	1.40	3.44	2.68		3.86	2.90		4.10	3.10		6.56	3.60		8.00	5.20
66.0	2.43	1.71		3.70	2.90	2.40	4.05	2.90		4.33	3.10		6.79	3.60		8.00	5.20
68.0	2.50	1.75	1.60	3.83	2.90		4.12	2.90		4.40	3.10		6.86	3.60		8.00	5.20
72.0	2.90	2.15	1.60	3.76	2.90		4.52	2.90		4.80	3.10		7.26	3.60		12.00	5.20

a Bank seepage extends 50 ft upstream.

b Fish, bank seepage between cross section 1 & cross section 2 to mouth of Indian River.

c Upwelling, cream.

| Extrapolated or interpolated value.

Table C-3.12 (cont.) Summary of hydraulic data collected at site 130.7L, Cross section 2.

RATING CURVE: A = 6.07 B = 1.54 DF= 705.00

	DATE: SEPT 20			DATE: AUG 16			DATE: AUG 23 a			DATE: AUG 12			DATE: AUG 27			
	REACH US = 113.00			REACH US = 113.00			REACH US = 113.00			REACH US = 113.00			REACH US =			
	DS = 142.00			DS = 142.00			DS = 142.00			DS = 142.00			DS =			
	GCD: 10400			GCD: 14500			GCD: 17900			GCD: 19000			GCD: 27700			
	WSEL: 706.31			WSEL: 707.18			WSEL: 708.02			WSEL: 708.31			WSEL: 710.91			SUBSTRATE INFO
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		10.00	5.20
8.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		10.00	5.20
12.0	.00	.00		.00	.00		.00	.00		.00	.00		0.20	0.00		10.00	5.30
16.0	.00	.00		.00	.00		.00	.00		.00	.00		0.50	1.00	1.10	10.00	5.30
20.0	.00	.00		.00	.00		.00	.00		.00	.00		0.60	1.60	1.50	10.00	5.30
24.0	.00	.00		.00	.00		.00	.00		.00	.00		0.80	1.70	1.80	10.00	6.30
28.0	.00	.00		.00	.00		.00	.00		.00	.00		1.10	2.20	2.10	12.00	6.30
31.7	.00	.00		.00	.00		.00	.00		.00	.00		1.47	2.57		12.00	6.30
32.0	.00	.00		.00	.00		0.03	0.05		.00	.00		1.50	2.60	2.20	12.00	6.30
34.0	.00	.00		.00	.00		0.25	0.35		.00	.00		1.75	2.60		12.00	6.30
36.0	.00	.00		.00	.00		0.28	0.50		0.50	0.20		2.00	2.60	2.40	12.00	6.30
38.0	.00	.00		.00	.00		0.30	0.65		0.55	0.50		2.15	3.00		12.00	6.30
39.0	.00	.00		.00	.00		0.48	0.84		0.58	0.65		2.23	3.20		12.00	6.30
40.0	.00	.00		0.10	0.10		0.65	1.03		0.60	0.80		2.30	3.40	3.00	12.00	6.30
42.0	.00	.00		0.30	0.30		1.00	1.40	1.40	0.7	0.88		2.45	3.65		12.00	6.30
44.0	.00	.00		0.40	0.45		1.15	1.80		0.90	0.95		2.60	3.90	3.70	12.00	6.30
46.0	.00	.00		0.50	0.60	1.00	1.30	2.20	2.05	1.10	1.50		3.70	4.20		12.00	6.30
48.0	.00	.00		0.65	1.15		1.40	2.28		1.30	2.05		3.90	4.20		12.00	6.30
50.0	.00	.00		0.80	1.70	1.70	1.50	2.35	2.00	1.50	2.10		4.10	4.20		12.00	6.30
53.0	0.10	0.00		0.80	1.70		1.88	2.43		1.80	2.18		4.60	4.20		12.00	6.30
54.0	0.15	0.15		0.80	1.70	1.80	2.00	2.45	2.00	1.90	2.20		4.70	4.20		12.00	6.30
57.0	0.30	0.60		1.10	2.10		1.93	2.45		2.05	2.95		4.75	4.20		12.00	6.30
58.0	0.33	0.65		1.20	2.23		1.90	2.45	2.40	2.10	3.20		4.90	4.20		12.00	6.30
60.0	0.38	0.75		1.40	2.50	2.40	2.10	3.08		2.17	3.23		4.93	4.20		12.00	6.30
61.0	0.40	0.80		1.54	2.54		2.20	3.39		2.20	3.25		4.98	4.20		12.00	6.30
62.0	0.44	0.94		1.68	2.58		2.30	3.70	2.80	2.23	3.27		5.00	4.20		12.00	6.30
64.0	0.52	1.22		1.96	2.66		2.15	4.20		2.30	3.30		5.04	4.20		12.00	6.30
65.0	0.55	1.36		2.10	2.70		2.23	4.20		2.52	4.20		5.12	4.20		12.00	6.30
69.0	0.55	1.70		2.65	2.86		2.26	4.20		2.55	4.20		5.15	4.20		12.00	6.30
70.0	0.60	1.58		2.80	2.90	1.70	2.31	4.20		2.60	4.20		5.20	4.20		12.00	6.30
75.0	0.75	1.20		2.74	3.02		2.46	4.20		2.75	4.20		5.35	4.20		12.00	6.30
77.0	1.00	1.10		2.66	3.13		2.71	4.20		3.00	4.20		5.60	4.20		12.00	6.30

Table C-3.12 (cont.) Summary of hydraulic data collected at site 138.7L, cross section 2.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
80.0	|1.30	1.95|		2.60	3.30	2.00	|3.09	4.20|		|3.38	4.20|		|5.98	4.20|	12.00	6.30
81.0	1.50	1.90		|2.58	3.53|		3.21	4.20			3.50	4.20			6.10	4.20		12.00	6.30
84.0	|1.50	2.28|		2.50	4.20	3.00	3.21	4.20			3.50	4.20			6.10	4.20		12.00	6.30
85.0	1.50	2.40		|2.37	4.20|		3.21	4.20			3.50	4.20			6.10	4.20		12.00	6.30
89.0	1.50	3.20		|2.37	4.20|		3.21	4.20			3.50	4.20			6.10	4.20		12.00	6.30
93.0	2.10	3.30		|2.97	4.20|		|3.81	4.20|		|4.10	4.20|		|6.70	4.20|		12.00	6.30

a No fish observed.

\| Extrapolated or interpolated value.

Table C-3.12 (cont.) Summary of hydraulic data collected at site 138.7L, cross section 3.

	RATING CURVE: A = -6.07 B = 1.54 CF = 705.00															
	DATE: SEPT 20			DATE: AUG 16 a			DATE: AUG 23 b			DATE: AUG 12			DATE: AUG 27 c			
	REACH US = 170.00			REACH US = 300.00			REACH US = 200.00			REACH US = 100.00			REACH US =			
	DS = 113.00			DS = 113.00			DS = 113.00			DS = 113.00			DS =			
	GCD: 10400			GCD: 14500			GCD: 17900			GCD: 19000			GCD: 27700			
	WSEL: 706.75			WSEL: 707.08			WSEL: 707.87			WSEL: 708.15			WSEL: 710.61			SUBSTRATE INFO
STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		12.00	8.50
9.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		12.00	6.30
12.0	.00	.00		.00	.00		.00	.00		.00	.00		0.30	0.60		12.00	6.30
18.0	.00	.00		.00	.00		.00	.00		.00	.00		0.90	1.90	2.10	12.00	6.30
20.0	.00	.00		.00	.00		.00	.00		.00	.00		1.10	2.05		12.00	6.30
22.0	.00	.00		.00	.00		.00	.00		0.20	0.50		1.30	2.20	1.30	12.00	6.30
22.6	.00	.00		.00	.00		.00	.00		0.26	0.53		1.36	2.26		12.00	6.30
24.0	.00	.00		.00	.00		.00	.00		0.40	0.60		1.50	2.40		12.00	6.30
26.0	.00	.00		.00	.00		0.05	0.00		0.35	0.90		1.70	2.60	1.10	12.00	6.30
28.0	.00	.00		.00	.00		0.10	0.00		0.30	1.20		1.75	2.90		12.00	6.30
30.0	.00	.00		.00	.00		0.18	0.45		0.50	0.85		1.80	3.20	1.20	12.00	6.30
32.0	.00	.00		.00	.00		0.25	0.90		0.70	0.50		1.70	3.50		12.00	6.30
34.0	.00	.00		.00	.00		0.28	0.85		0.75	1.05		1.60	3.60	1.90	12.00	6.30
36.0	.00	.00		.00	.00		0.30	0.80		0.80	1.60		1.85	4.20		12.00	6.30
38.0	.00	.00		0.20	0.15		0.70	1.03		0.97	2.03		2.10	4.60	3.60	12.00	6.30
40.0	.00	.00		0.40	0.30	0.60	1.10	1.25	1.05	1.13	2.47		3.59	4.60		12.00	6.30
42.0	.00	.00		0.55	0.75		1.20	2.08		1.30	2.90		3.76	4.60		12.00	6.30
44.0	.00	.00		0.70	1.20	1.00	1.30	2.90	2.40	1.40	3.20		3.86	4.60		12.00	6.30
47.0	.00	.00		0.93	2.10		1.45	2.98		1.55	3.65		4.01	4.60		12.00	6.30
48.0	0.07	0.00		1.00	2.40	2.40	1.50	3.00	2.70	1.60	3.80		4.06	4.60		12.00	6.30
51.0	0.05	0.00		1.30	1.88		1.80	3.23		2.15	4.25		4.41	4.60		10.00	6.30
52.0	0.19	0.35		1.40	1.70	1.40	1.90	3.30	3.10	2.30	4.40		4.55	4.60		10.00	6.30
55.0	0.60	1.40		1.93	2.41		2.22	3.60		2.60	4.40		4.96	4.60		10.00	6.30
57.0	1.10	2.70	2.75	2.65	3.36		2.72	3.60		3.00	4.40		5.46	4.60		10.00	6.30
60.0	1.30	2.70		2.80	3.60	2.30	2.92	3.60		3.20	4.40		5.60	4.60		10.00	6.30
63.0	1.90	2.70	2.20	2.73	3.60		3.52	3.60		3.80	4.40		6.26	4.60		10.00	6.30
67.0	2.10	3.35	2.50	2.93	3.60		3.72	3.60		4.00	4.40		6.46	4.60		10.00	6.30

a Silty, turbid water, adult chum observed.
b No fish observed.
c Velocity at 30', changed from 4.2 to 3.2 .

| Extrapolated or interpolated value.

Table C.3.12 Summary of hydraulic data collected at site 13[illegible].0L, Cross section 1.

RATING CURVE: A = -2.01 B = 0.64 C = 705.00

	a	b	c	d	e
DATE:	SEPT 20	AUG 16	AUG 23	AUG 12	AUG 26
REACH US =	74.00	21.00	53.00	53.00	53.00
DS =	[illegible]0.00	75.00	150.00	300.00	300.00
GCD:	10400	14500	17900	19000	31700
WSEL:	708.96	709.50	710.15	710.35	712.62

SUBSTRATE INFO

STA	DEPTH (1)	VEL (1)	V.4 (1)	DEPTH (2)	VEL (2)	V.4 (2)	DEPTH (3)	VEL (3)	V.4 (3)	DEPTH (4)	VEL (4)	V.4 (4)	DEPTH (5)	VEL (5)	V.4 (5)	SUB	COV
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		7.00	8.50
2.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		7.00	9.50
4.0	.00	.00		.00	.00		.00	.00		.00	.00		1.10	1.50	1.55	7.00	4.30
8.0	.00	.00		.00	.00		.00	.00		.00	.00		1.60	3.10	2.65	7.00	4.30
11.0	.00	.00		.00	.00		.00	.00		.00	.00		2.05	3.59		7.00	4.30
12.0	.00	.00		.00	.00		.00	.00		0.10	0.17		2.20	3.75	3.60	7.00	4.30
13.7	.00	.00		.00	.00		.00	.00		0.27	0.46		2.46	3.75		7.00	4.30
14.0	.00	.00		.00	.00		0.10	0.00		0.30	0.51		2.50	3.75		7.00	4.30
16.0	.00	.00		.00	.00		0.25	0.03		0.50	0.85		2.80	3.75	3.30	7.00	5.30
18.0	.00	.00		.00	.00		0.40	0.05		0.70	0.89		3.18	3.75		7.00	5.30
20.0	.00	.00		.00	.00	0.00	0.55	0.23		0.90	0.93		3.18	3.75		7.00	5.30
22.0	.00	.00		0.22	0.00		0.70	0.40	0.45	1.10	0.96		3.40	3.75		7.00	5.30
24.0	.00	.00		0.44	0.00		0.85	0.45		1.30	1.00		3.62	3.75		7.00	5.30
26.0	.00	.00		0.65	0.00		1.00	0.50	0.50	1.50	1.04		3.84	3.75		7.00	5.30
27.0	.05	0.00		0.77	0.00		1.18	0.50		1.60	1.06		3.95	3.75		7.00	5.30
30.0	0.1[illegible]	[illegible].04		1.10	0.00	0.00	1.70	0.50	0.45	1.90	1.11		4.28	3.75		7.00	5.30
31.0	0.3[illegible]	[illegible]		1.18	0.00		1.75	0.47		2.00	1.13		4.3[illegible]	3.75		7.00	5.30
32.0	0.4[illegible]	[illegible]		1.26	0.00		1.80	0.43		2.10	1.15		4.[illegible]4	3.75		7.00	5.30
35.0	[illegible]	[illegible]		1.50	0.00		1.9[illegible]	0.40		2.[illegible]	0.94		4.[illegible]	3.75		7.00	5.30
38.0	[illegible]	[illegible]		1.62	0.00		2.15	0.41		2.54	0.6[illegible]		5.0[illegible]	3.75		7.00	5.30
40.0	[illegible]	[illegible]		1.90	0.00	[illegible]	2.[illegible]	0.40	0.50	1.90	0.60		[illegible]	[illegible]		7.00	5.30
42.0	[illegible]	[illegible]		1.78	0.00		2.1[illegible]	0.42		2.16	0.57		4.7[illegible]	3.75		7.00	5.30
47.0	[illegible]	[illegible]		1.62	0.00		2.0[illegible]	0.44		2.[illegible]	[illegible]		4.9[illegible]	3.75		7.00	5.30
50.0	[illegible]	[illegible]		1.50	0.00	[illegible]	2.00	0.45	0.4[illegible]	2.25	0.50		4.[illegible]	3.75		7.00	5.30
51.0	[illegible]	[illegible]		1.47	0.00		1.9[illegible]	0.47		2.18	0.5[illegible]		[illegible]	[illegible]		7.00	5.30
54.0	[illegible]	[illegible]		1.38	0.00		1.72	0.61		[illegible]	[illegible].10		4.5[illegible]	3.75		7.00	5.30
56.0	[illegible]	[illegible]		1.35	0.00		1.[illegible]	0.55		2.[illegible]2	1.1[illegible]		[illegible]	[illegible]		7.00	5.30
60.0	[illegible]	[illegible]		1.30	[illegible]	[illegible]	[illegible]	0.[illegible]5	[illegible]	[illegible]	1.3[illegible]		[illegible]	3.75		7.00	5.30
61.[illegible]	[illegible]	[illegible]		1.15	[illegible]		[illegible]	0.7[illegible]		[illegible]	1.3[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		0.5[illegible]	0.0[illegible]		[illegible]	[illegible]05		[illegible]	1.4[illegible]		[illegible]	[illegible]		[illegible]	5.[illegible]
[illegible]	[illegible]	[illegible]		0.4[illegible]	0.0[illegible]		[illegible]	1.[illegible]		[illegible]	1.3[illegible]		[illegible]	[illegible]		[illegible]	5.[illegible]
[illegible]	[illegible]	[illegible]		0.2[illegible]	0.1[illegible]	[illegible]	[illegible]	1.[illegible]	[illegible]	1.[illegible]	1.74		[illegible]	[illegible]		[illegible]	5.30

Table C-3.13 (cont.) Summary of hydraulic data collected at site 139.0L, cross section 1.

STA	DEPTH	VEL 1	V.4	DEPTH	VEL 2	V.4	DEPTH	VEL 3	V.4	DEPTH	VEL 4	V.4	DEPTH	VEL 5	V.4	SUB	COV
74.0	.00	0.00		0.32	0.18		0.82	1.98		1.00	2.30		3.50	3.75		9.00	5.30
80.0	.00	0.00		0.50	0.30	2.30	1.00	2.70	2.70	1.08	2.49		3.68	3.75		9.00	5.30
82.0	0.01	0.00		0.68	0.54		1.08	2.72		1.10	2.55		3.84	3.75		9.00	5.30
90.0	0.85	0.00		1.30	1.50	1.90	1.40	2.80	2.60	1.90	3.40		4.48	3.75		9.00	5.30
100.0	0.95	0.00		1.60	1.90	1.50	2.00	3.10	2.50	2.20	3.30		4.78	3.75		9.00	5.30
110.0	1.25	0.00		1.90	2.00	1.90	2.30	3.00	2.50	2.40	3.40		5.08	3.75		9.00	5.30
120.0	2.25	0.00		2.90	2.40	2.10	3.37	3.00		3.52	3.40		6.08	3.75		9.00	5.30
130.0	1.65	0.00		2.30	2.40	1.70	2.77	3.00		2.92	3.40		5.48	3.75		9.00	5.30
140.0	1.95	0.00		2.60	2.80	1.80	3.07	3.00		3.22	3.40		5.78	3.75		9.00	5.30
150.0	2.25	0.00		2.90	2.90	2.40	3.37	3.00		3.52	3.40		6.08	3.75		9.00	5.30

a Clear water, measured only where upwelling occurred, dead chum.
b Measurements by 10' increments on rope.
c Gravel bar extends from cross section 2 to 5' above cross section 1.

d Chum seen.
e Used true WSEL.
| Extrapolated or interpolated value.

Table C C.13 (cont.) Summary of hydraulic data collected at Site 139.0L, Cross section 2.

RATING CURVE: a = [illegible] b = 0.64 CI = 705.00

DATE: SEPT 20 a	DATE: AUG 16 b	DATE: AUG 23 c	DATE: AUG 12 d	DATE: AUG 26 e
REACH US = 10.00	REACH US = 50.00	REACH US = 62.00	REACH US = 62.00	REACH US = 62.00
DS = 21.00	DS = 84.00	DS = 53.00	DS = 53.00	DS = 53.00
GCU: 10400	GCU: 14500	GCU: 17900	GCU: 19000	GCU: 31700
WSEL: 708.96	WSEL: 709.50	WSEL: 710.15	WSEL: 710.35	WSEL: 712.62

Sta	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUBSTRATE INFO SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		6.00	7.30
4.0	.00	.00		.00	.00		.00	.00		.00	.00		1.00	1.00	1.00	6.00	4.20
8.0	.00	.00		.00	.00		.00	.00		.00	.00		2.10	2.05	1.55	6.00	4.20
9.0	.00	.00		.00	.00		.00	.00		.00	.00		2.30	1.98		6.00	4.20
10.2	.00	.00		.00	.00		.00	.00		0.24	0.38		2.54	1.90		8.00	4.20
12.0	.00	.00		.00	.00		0.31	0.31		0.60	0.95		2.90	1.77		8.00	4.20
13.0	.00	.00		.00	.00	0.00	0.48	0.48		0.68	0.99		3.10	1.70	1.30	8.00	4.20
14.0	.00	.00		0.00	0.00		0.65	0.65		0.77	1.03		3.36	3.60		8.00	4.20
16.0	.00	.00		0.10	0.00	0.00	1.00	0.73		0.93	1.12		3.39	3.60		8.00	4.20
18.0	.00	.00		0.75	0.00		0.72	1.00	0.95	1.10	1.20		3.41	3.60		8.00	1.20
19.5	.00	.00		1.00	0.00		0.88	0.76		1.15	1.25		3.49	3.60		8.00	4.20
20.0	.00	.00		0.00	0.00	0.00	0.80	0.78		1.13	1.27		3.51	3.60		8.00	1.20
22.0	.00	.00		0.62	0.00		0.90	0.70	0.90	1.17	1.33		3.61	3.60		8.00	1.20
22.7	.00	.00		0.63	0.00		0.91	0.65		1.18	1.36		3.62	3.60		8.00	4.20
24.0	.00	.00		0.64	0.00		0.92	0.67		1.20	1.40		3.65	3.60		8.00	1.20
27.5	.00	.00		0.66	0.00		0.94	0.82		1.38	1.31		3.67	3.60		8.00	4.20
29.0	0.20	0.00		0.69	0.00		0.97	0.86		1.45	1.28		3.68	3.60		8.00	4.20
30.0	0.10	0.00		0.70	0.00	0.00	0.98	0.88		1.50	1.25		3.69	3.60		8.00	1.20
31.0	0.15	0.00		0.71	0.00		1.00	0.90	0.50	1.53	0.96		3.71	3.56		10.00	1.20
34.0	.00	0.00		0.74	0.00		1.03	0.93		1.57	0.55		3.80	3.60		10.00	4.20
36.0	.00	0.00		0.76	0.00	0.00	1.05	0.94		1.60	0.20		3.89	3.60		10.00	5.00
37.0	.00	0.00		0.77	0.00		1.06	0.95		0.47	0.99		3.91	3.56		10.00	5.00
38.0	.00	0.00		0.78	0.00		1.07	0.96		0.40	1.05		3.94	3.60		10.00	5.00
39.0	.00	0.00		0.79	0.00		1.08	0.97		0.43	0.98		3.96	3.60		10.00	5.00
41.0	.00	0.00		0.81	0.00		0.00	0.00		0.49	0.47		3.98	3.56		10.00	5.00
42.0	.00	0.00		0.82	0.00	0.00	0.01	0.00		0.50	0.45		3.99	3.60		10.00	5.00
43.0	.00	0.00		0.83	0.00	0.00	0.02	0.00		0.47	0.39		4.01	3.56		10.00	5.00
44.0	.00	0.00		0.84	0.00		0.03	0.00		0.43	0.26		4.03	3.60		10.00	5.00
45.0	.00	0.00		0.85	0.00		0.04	0.00		0.39	0.16		4.05	3.60		10.00	5.00
46.0	.00	0.00		0.86	0.00	0.00	0.05	0.00		1.10	0.10		4.07	3.53		10.00	5.00
47.0	.00	0.00		0.87	0.00		0.06	0.00	0.50	0.73	0.56		4.09	3.60		10.00	5.00
48.0	.00	0.00		0.88	0.00	0.00	0.07	0.00		0.70	0.50		4.11	3.57		10.00	5.00

Table C-3.13 (cont.) Summary of hydraulic data collected at site 139.0L, cross section 2.

Sta	DEPTH 1	VEL 1	V.4	DEPTH 2	VEL 2	V.4	DEPTH 3	VEL 3	V.4	DEPTH 4	VEL 4	V.4	DEPTH 5	VEL 5	V.4	SUB	COV
88.0	.00	0.00		0.28	0.08		0.80	1.10	1.40	0.90	1.70		3.51	3.60		10.00	5.30
90.0	.00	0.00		0.30	0.10	0.00	0.86	1.32		0.97	1.83		3.57	3.60		10.00	5.30
94.0	.00	0.00		0.42	0.54		0.98	1.78		1.10	2.10		3.69	3.60		10.00	5.30
98.0	.00	0.00		0.54	0.98		1.10	2.20	2.00	1.23	2.40		3.81	3.60		10.00	5.30
100.0	0.06	0.00		0.60	1.20	1.50	1.18	2.36		1.30	2.55		3.89	3.60		10.00	5.30
106.0	0.30	0.00		0.78	1.74		1.42	2.64		1.50	3.00		4.13	3.60		10.00	5.30
108.0	0.38	0.00		0.84	1.92		1.50	3.00	2.80	1.69	3.09		4.21	3.60		10.00	5.30
110.0	0.50	0.00		0.90	2.10	1.50	1.68	3.08		1.87	3.17		4.39	3.60		10.00	5.30
118.0	1.20	0.00		1.70	2.42		2.40	3.40	2.80	2.61	3.51		5.11	3.60		10.00	5.30
120.0	1.25	0.00		1.90	2.50	1.90	2.37	3.40		2.80	3.60		5.08	3.60		10.00	5.30
130.0	1.95	0.00		2.60	3.20	1.80	3.07	3.40		3.22	3.60		5.78	3.60		10.00	5.30
140.0	2.45	0.00		3.10	3.20	2.60	3.57	3.40		3.72	3.60		6.26	3.60		10.00	5.30

a Only backwater where upwelling occurs.
b Measured in 10' increments with rope.
c Chum seen, gravel bar at 41.6-56.9', Overtopped with flow at 90 degree angle.
d Chum seen.
e Next to staff gage at 13'.
| Extrapolated or interpolated value.

Table C 3.13 (cont.) Summary of hydraulic data collected at site 139.0L, cross section 3.

RATING CURVE: a = -2.01 B = 0.64 SF = 705.00

DATE: SEPT 20	DATE: AUG 16 a	DATE: AUG 23 b	DATE: AUG 12	DATE: AUG 26
REACH US = 65.00	REACH US = 65.00	REACH US = 65.00	REACH US = 65.00	REACH US = 65.00
DS = 62.00	DS = 62.00	DS = 62.00	DS = 62.00	DS = 62.00
GCQ: 13400	GCQ: 14500	GCQ: 17900	GCQ: 19000	GCQ: 31700
WSEL: 708.96	WSEL: 709.50	WSEL: 710.15	WSEL: 710.35	WSEL: 712.42

STA	1 DEPTH	1 VEL	V.1	2 DEPTH	2 VEL	V.2	3 DEPTH	3 VEL	V.3	4 DEPTH	4 VEL	V.4	5 DEPTH	5 VEL	V.5	SUBSTRATE INFO SUB	COV
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		6.00	B.40
1.3	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		6.00	B.40
4.0	.00	.00		.00	.00		.00	.00		.00	.00		0.90	1.10	1.00	6.00	B.40
8.0	.00	.00		.00	.00		.00	.00		.00	.00		2.00	1.40	1.20	6.00	4.20
10.0	.00	.00		.00	.00		.00	.00		.00	.00		2.30	1.90		6.00	4.20
12.0	.00	.00		.00	.00		.00	.00		0.10	0.10		2.60	2.45	1.85	6.00	5.20
14.1	.00	.00		.00	.00		.00	.00		0.21	0.27		2.71	2.42		6.00	5.20
15.0	.00	.00		.00	.00		0.02	.00		0.30	0.40		2.80	1.40	1.85	6.00	4.20
27.0	.00	.00		.00	.00		0.20	.00		0.40	1.10		2.96	2.95		6.00	4.20
28.0	.00	.00		.00	.00		0.25	.00		0.50	0.62		3.06	2.75		6.00	4.20
30.0	.00	.00		.00	.00		0.35	.00		0.60	0.15		3.16	2.95		6.00	4.20
35.0	.00	.00		.00	.00		0.01	.00		.00	0.00		2.56	2.95		10.00	6.20
35.6	.00	.00		.00	.00		0.02	.00		.00	0.00		2.56	2.95		10.00	6.20
36.1	.00	.00		.00	.00		.00	.00		.00	0.00		2.56	2.95		10.00	6.20
36.6	.00	.00		.00	.00		.00	.00		0.20	0.05		2.66	2.75		10.00	6.20
41.7	.00	.00		.00	.00		.00	.00		0.29	0.35		3.15	2.95		10.00	6.20
42.3	.00	.00		.00	.00		0.11	0.11		0.65	0.32		3.21	2.95		10.00	6.20
44.0	.00	.00		0.02	0.00		0.11	0.11		0.70	0.7		3.26	2.95		10.00	6.20
46.2	.00	.00		0.24	0.00		.00	0		0.6	0.36		3.22	2.95		10.00	6.20
48.1	.00	.00		0.36	0.00		0.00	0.00		0.81	0.00		3.17	2.75		10.00	6.20
49.3	.00	.00		0.43	0.00		0.00	0.00	0.15	0.85	0.15		3.32	2.95		10.00	6.20
50.0	.00	.00		0.50	0.00		0.00	0.00	0.20	0.90	0.20		3.36	2.95		10.00	6.20
50.5	.00	.00		0.55	0.00		0.00	0.00	.00	1.00	0.00		3.46	3.10		12.00	6.20
51.0	.00	.00		0.60	0.00		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
52.0	.00	.00		0.67	1.10		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
54.0	.00	.00		0.95	1.20		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
56.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
58.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
60.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
62.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
64.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
66.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
68.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
70.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
72.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
74.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
76.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
78.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
80.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
82.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
84.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
86.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
88.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
90.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
92.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
94.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
96.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
98.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
100.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
102.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
104.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
106.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
108.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
110.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
112.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
114.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
116.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
118.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
120.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
122.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
124.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
126.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
128.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
130.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
132.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
134.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
136.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
138.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
140.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
142.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
144.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
146.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
148.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
150.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
152.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
154.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
156.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
158.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
160.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
162.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
164.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
166.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
168.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
170.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
172.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
174.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
176.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
178.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
180.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
182.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
184.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
186.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
188.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
190.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
192.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
194.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
196.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
198.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20
200.0	0.00	0.00		1.00	1.40		0.00	0.00	0.00	1.00	0.00		3.46	3.10		12.00	6.20

Table C-3.13 (cont.) Summary of hydraulic data collected at site 139.0R, Cross section 3.

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	CBV
		1			2			3			4			5			
97.0	1.00	1.50	1.50	1.80	1.88		2.25	2.08		2.55	2.45		5.11	2.95		12.00	5.20
98.0	1.00	1.50		1.90	1.85		2.30	2.10	1.65	2.60	2.48		5.16	2.95		12.00	5.20
100.0	1.25	1.50		2.00	1.80	1.30	2.35	2.22		2.70	2.55		5.28	2.95		12.00	5.20
101.0	1.30	1.50	1.42	2.10	1.92		2.39	2.28		2.78	2.65		5.34	2.95		12.00	5.20
104.0	1.45	1.73		2.40	2.28		2.48	2.46		3.00	2.95		5.56	2.95		12.00	5.20
105.0	1.50	1.80		2.50	2.40	2.00	2.51	2.52		2.77	2.95		5.33	2.95		12.00	5.20
108.0	1.65	2.03		2.30	2.40		2.60	2.70	2.30	2.92	2.95		5.48	2.95		12.00	5.20
111.0	1.80	2.25	1.56	2.45	2.40		2.92	2.70		3.07	2.95		5.63	2.95		12.00	5.20
121.0	2.50	1.90	1.96	3.15	2.40		3.62	2.70		3.77	2.95		6.33	2.95		12.00	5.20
126.0	2.70	2.40	2.70	3.35	2.40		3.82	2.70		3.97	2.95		6.53	2.95		12.00	5.20

a No fish observed.
b Fish tag on bank, ponded from 14.1' to 35.0'.
| Extrapolated or interpolated value.

Table E.3.13 (cont.) Summary of hydraulic data collected at site 132.0L, Cross section 4.

RATING CURVE: A = 2.61 B = 0.64 CF = 705.00

	DATE: SEPT 20	DATE: AUG 16 a	DATE: AUG 25 b	DATE: AUG 12 c	DATE: AUG 26 d
REACH US =	150.00	80.00	300.00	50.00	75.00
DS =	65.00	65.00	65.00	65.00	65.00
GCQ:	16400	14500	17900	19000	31700
WSEL:	708.96	709.50	710.15	710.35	712.62

SUBSTRATE INFO

STA	DEPTH (1)	VEL (1)	V.4 (1)	DEPTH (2)	VEL (2)	V.4 (2)	DEPTH (3)	VEL (3)	V.4 (3)	DEPTH (4)	VEL (4)	V.4 (4)	DEPTH (5)	VEL (5)	V.4 (5)	SUB	COV
0.0	.00	.00		.00	.00		.00	.00		.00	.00		0.90	1.35	1.20	6.00	4.20
4.0	.00	.00		.00	.00		.00	.00		.00	.00		1.40	1.80	1.75	6.00	4.20
8.0	.00	.00		.00	.00		.00	.00		.00	.00		2.10	2.15	1.85	6.00	4.20
12.0	.00	.00		.00	.00		.00	.00		.00	.00		2.30	2.70	1.70	6.00	4.20
13.0	.00	.00		.00	.00		.00	.00		.00	.00		2.32	2.73		6.00	4.20
15.0	.00	.00		.00	.00		.00	.00		0.08	0.04		2.30	3.00		6.00	4.20
16.0	.00	.00		.00	.00		.00	.00		0.08	0.04		2.59	3.10	2.15	6.00	4.20
22.0	.00	.00		.00	.00		.00	.00		0.25	0.12		2.50	[illegible]	2.35	6.00	4.20
24.0	.00	.00		.00	.00		.00	.00		0.32	0.35		2.68	2.80		6.00	4.20
[illegible]	.00	.00		.00	.00		.00	.00		0.42	0.29		2.98	2.80		6.00	5.20
[illegible]	.00	.00		.00	.00		.00	.00		0.05	0.02		2.61	2.60		10.00	5.20
42.0	.00	.00		.00	.00		0.17	0.19		.00	0.00		2.58	2.85		10.00	5.20
44.0	.00	.00		.00	.00		0.40	0.35		0.25	0.20		2.61	2.83		10.00	5.20
[illegible]	.00	.00		.00	.00		0.45	0.43		0.50	0.40		3.06	2.80		10.00	5.20
[illegible]	.00	.00		.00	.00		0.40	0.40		[illegible]	0.43		3.19	2.80		10.00	5.20
[illegible]	.00	.00		[illegible]	0.05		0.50	0.33		0.75	0.45		3.31	2.80		10.00	5.20
[illegible]	.00	.00		[illegible]	0.15		0.70	0.60		1.00	0.56		[illegible]	2.60		10.00	5.20
[illegible]	.00	.00		[illegible]	0.22		0.90	0.75	[illegible]	1.20	0.85		[illegible]	[illegible]		[illegible]	5.20
[illegible]	.00	.00		[illegible]	[illegible]		1.05	0.76		1.40	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	.00	[illegible]		[illegible]	[illegible]		1.13	[illegible]		1.45	[illegible]		[illegible]	[illegible]		12.00	[illegible]
56.5	[illegible]	[illegible]		[illegible]	[illegible]		1.25	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		12.00	[illegible]
58.0	0.25	[illegible]		[illegible]	[illegible]		1.35	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	1.20		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.00		1.70	1.40		1.50	1.52		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		1.90	[illegible]	[illegible]	[illegible]	1.65		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	1.33		2.15	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		2.40	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	1.25	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		12.00	[illegible]
[illegible]	[illegible]	1.50		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	1.65		[illegible]	1.60		2.80	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		12.00	[illegible]
[illegible]	[illegible]	1.80		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		12.00	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		12.00	[illegible]

Table C-3.13 (cont.) Summary of hydraulic data collected at site 139.0L, Cross section 4.

STA	DEPTH	VEL 1	V.A	DEPTH	VEL 2	V.A	DEPTH	VEL 3	V.A	DEPTH	VEL 4	V.A	DEPTH	VEL 5	V.A	SUB	COV
90.0	2.60	2.50	1.60	| 3.25	2.50 |		| 3.72	2.80 |		| 3.87	2.80 |		| a.43	2.80 |		12.00	5.20

a Chum seen.
b Chum seen ponded 15.8' to 24.6'.
c Ponded below gravel bar 13.42'.
d Fish seen, head pin under water.
| Extrapolated or interpolated value.

Table C-3.14 Summary of hydraulic data collected at site 139.4L, Cross section 1.

RATING CURVE: A = -1.49 B = 0.49 CF = 710.00

	DATE: SEPT 18 a	DATE: AUG 16 b	DATE: AUG 23 c	DATE: AUG 12 d	DATE: AUG 26	
	REACH US = 84.00	REACH US = 59.00	REACH US = 84.00	REACH US = 84.00	REACH US =	
	DS = 100.00	DS = 60.00	DS = 200.00	DS = 300.00	DS =	
	GCU: 8,570	GCU: 14,500	GCU: 17,900	GCU: 19,000	GCU: 31,700	
	WSEL: 712.70	WSEL: 713.54	WSEL: 713.93	WSEL: 714.04	WSEL: 715.19	SUBSTRATE INFO

STA	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
	1			2			3			4			5				
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		3.00	9.50
8.8	.00	.00		.00	.00		.00	.00		.00	.00		0.20	0.95		3.00	4.20
14.0	.00	.00		.00	.00		.00	.00		.00	.00		0.60	1.85	1.75	3.00	4.20
18.0	.00	.00		.00	.00		.00	.00		.00	.00		1.20	2.60	2.30	6.00	4.20
20.0	.00	.00		.00	.00		.00	.00		.00	.00		1.45	2.65		6.00	4.20
20.2	.00	.00		.00	.00		.00	.00		0.03	0.03		1.48	2.66		6.00	5.20
22.0	.00	.00		.00	.00		0.19	0.24		0.30	0.25		1.70	2.70	2.80	6.00	5.20
23.0	.00	.00		.00	.00		0.29	0.37		0.45	0.38		1.90	2.78		6.00	5.20
24.0	.00	.00		0.20	0.08		0.40	0.50		0.60	0.50		2.10	2.85		6.00	5.20
26.0	.00	.00		0.60	0.24		0.55	0.55		1.00	0.70		2.50	3.00	3.00	8.00	5.20
27.5	.00	.00		0.90	0.36		0.63	0.59		1.30	0.74		2.73	3.17		8.00	5.20
28.0	0.06	0.02		1.00	0.40		0.70	0.60		1.40	0.75		2.80	3.23		8.00	5.20
30.0	0.30	0.10		1.10	0.47		1.20	0.78		1.60	0.98		3.10	3.45	3.25	8.00	5.20
32.0	0.30	0.10		1.20	0.53		1.70	0.95		1.80	1.20		2.79	3.45		8.00	5.20
34.0	0.40	0.20		1.30	0.60		1.85	1.18		1.90	1.45		2.89	3.45		8.00	5.20
36.0	0.70	0.22		1.47	0.80		2.00	1.40		2.00	1.70		3.19	3.45		3.00	5.20
38.0	0.90	0.85	0.30	1.63	1.00		2.20	1.60		2.20	2.03		3.39	3.45		3.00	5.20
40.0	1.15	0.65		1.80	1.20	1.10	2.40	1.80		2.40	2.35		3.64	3.45		3.00	5.20
42.0	1.40	0.45	0.45	2.07	1.43		2.65	2.13		2.70	2.49		3.89	3.45		3.00	5.20
44.0	1.55	0.63		2.33	1.67		2.90	2.45		3.00	2.62		4.04	3.45		3.00	5.20
46.0	1.70	0.80	0.45	2.60	1.90	1.20	3.05	2.83		3.20	3.04		4.19	3.45		3.00	5.20
48.0	1.95	0.95		2.79	2.00		3.20	3.20		3.40	3.45		4.44	3.45		3.00	5.20
50.0	2.20	1.10	0.70	3.04	2.00		3.43	3.20		3.54	3.45		4.69	3.45		3.00	5.20
54.0	2.80	1.45	0.85	3.64	2.00		4.03	3.20		4.14	3.45		5.29	3.45		9.00	5.20
58.0	3.00	.00	1.60	3.84	2.00		4.23	3.20		4.34	3.45		5.49	3.45		9.00	5.20

a No fish seen.
b Rapid increase in depth & velocity for next 10', no fish seen.
c No fish seen.
d Backwater extends 10', surface velocity fast to 135', gravel bar extends 65' DS.

| Extrapolated or interpolated value.

Table C-3.14 (cont.) Summary of hydraulic data collected at site 139.4L, cross section 2.

RATING CURVE: n = 1.4% P = 0.47 CF = 710.00

	DATE: SEPT 18 a	DATE: AUG 16	DATE: AUG 23 b	DATE: AUG 12 c	DATE: AUG 26 d	
	REACH US = 26.00	REACH US = 52.00	REACH US = 72.00	REACH US = 52.00	REACH US =	
	DS = 84.00	DS = 84.00	DS = 84.00	DS = 84.00	DS =	
	GCU: 8520	GCU: 14500	GCU: 17900	GCU: 19000	GCU: 31700	
	WSEL: 712.70	WSEL: 713.54	WSEL: 713.93	WSEL: 714.04	WSEL: 715.19	SUBSTRATE INFO

Stn	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	DEPTH	VEL	V.4	SUB	COV
		1			2			3			4			5			
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		6.00	8.50
3.5	.00	.00		.00	.00		.00	.00		.00	.00		0.20	1.10		6.00	4.30
8.0	.00	.00		.00	.00		.00	.00		.00	.00		1.30	2.90	2.90	12.00	8.30
10.0	.00	.00		.00	.00		.00	.00		0.60	0.40		1.85	3.65		12.00	8.30
11.5	.00	.00		.00	.00		.00	.00		0.98	1.19		2.26	4.21		12.00	8.30
12.0	.00	.00		.00	.00		.00	.00		1.10	1.45		2.40	4.40	3.20	12.00	8.30
14.0	.00	.00		0.30	1.40		0.30	0.90		1.30	2.60		1.95	4.70		10.00	8.30
16.0	.00	.00		0.65	1.55		0.60	1.80		1.50	2.40		2.30	4.70		10.00	8.30
18.0	0.45	0.45		1.00	1.70	1.70	0.70	1.98		1.70	2.40		2.65	4.70		10.00	8.30
20.0	0.50	1.45		1.30	2.60		0.80	2.15	2.15	2.10	4.30		2.95	4.70		10.00	8.30
22.0	0.45	3.25	2.20	1.60	3.50	3.00	1.50	3.23		2.50	3.30		3.25	4.70		10.00	8.30
24.0	1.20	3.00	2.75	1.85	4.00		2.20	4.30	3.20	2.35	4.70		3.50	4.70		10.00	8.30
26.0	1.50	3.15	2.25	2.10	4.50	3.80	2.49	4.70		2.60	4.70		3.75	4.70		10.00	8.30
28.0	1.50	3.30	3.20	2.35	4.60		2.74	4.70		2.85	4.70		4.00	4.70		10.00	8.30
30.0	1.70	3.90		2.60	4.70	3.80	2.99	4.70		3.10	4.70		4.25	4.70		10.00	8.30

a brave bar 125 ft.
b No fish observed.
c Turbid water, no fish.
d Bage not visible.

| Extrapolated or interpolated value.

Table C-3.14 (cont.) Summary of hydraulic data collected at site 139.4L, cross section 3.

RATING CURVE: a = 1.47 b = 0.47 CI = 710.00

	1	2	3	4	5	
DATE:	SEPT 16 a	AUG 16 b	AUG 23 c	AUG 27 d	AUG 28 e	
REACH US =	350.00	500.00	300.00	500.00	100.00	
DS =	77.00	52.00	31.00	52.00	52.00	
GCD:	8370	14500	17900	19000	31700	
WSEL:	712.70	713.54	713.93	714.04	715.19	

STA	1 DEPTH	1 VEL	V.4	2 DEPTH	2 VEL	V.4	3 DEPTH	3 VEL	V.4	4 DEPTH	4 VEL	V.4	5 DEPTH	5 VEL	V.4	SUBSTRATE INFO SUB	COV
0.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		10.00	8.50
2.0	.00	.00		.00	.00		.00	.00		.00	.00		.00	.00		10.00	9.50
6.0	.00	.00		.00	.00		.00	.00		.00	.00		0.80	2.95	3.30	10.00	8.30
9.0	.00	.00		.00	.00		.00	.00		0.30	0.00		1.85	3.59		10.00	4.30
9.6	.00	.00		.00	.00		.00	.00		0.30	0.18		2.06	3.72		10.00	4.30
10.0	.00	.00		.00	.00		0.15	0.00		0.30	0.30		2.20	3.80	3.40	10.00	4.30
11.0	.00	.00		.00	.00		0.39	0.45		0.85	0.95		2.40	3.93		10.00	4.30
12.0	.00	.00		0.20	0.10		0.63	0.90		1.40	1.60		2.60	4.05		10.00	4.30
14.0	.00	.00		0.50	0.80		1.10	1.60		1.50	2.05		3.00	4.30	4.10	10.00	4.30
16.0	.00	.00		0.80	1.50	1.50	1.50	2.55		2.10	3.30		2.49	4.30		10.00	4.30
18.0	0.20	0.20		1.20	2.20		1.90	3.30	2.30	2.40	3.50		2.69	4.30		10.00	4.30
20.0	0.45	1.00		1.60	2.90	2.20	2.25	3.40		3.20	3.50		2.94	4.30		10.00	4.30
22.0	0.80	1.45	1.50	1.87	3.10		2.60	3.50	2.20	2.60	3.58		3.29	4.30		8.00	4.30
24.0	1.30	2.05	2.00	2.13	3.30		1.70	3.40	2.75	2.00	3.65		3.79	4.30		8.00	4.30
26.0	1.50	2.30	2.05	2.40	3.50	2.50	2.73	3.40		2.84	3.65		3.99	4.30		8.00	4.30
28.0	1.40	2.30	2.30	2.45	3.50		2.63	3.40		2.74	3.65		3.89	4.30		8.00	4.30
30.0	1.60	2.80	2.45	2.50	3.50	2.80	2.83	3.40		2.94	3.65		4.09	4.30		8.00	4.30
32.0	1.80	2.85		2.80	3.40	2.70	3.03	3.40		3.14	3.65		4.29	4.30		8.00	4.30
34.0	2.00	2.75	2.10	2.84	3.40		3.23	3.40		3.34	3.65		4.49	4.30		8.00	4.30
38.0	2.50	2.65	1.90	3.34	3.40		3.73	3.40		3.84	3.65		4.99	4.30		8.00	4.30

a Sharp drop off.
b Distance measured with rope marked with 10 ft intervals.
c No fish observed, but tags on bank.
d Water turbid.
e Large high velocity channel.
| Extrapolated or interpolated value.

Table C-4. Summary of surface areas and strengths of upwelling at direct input modeling sites.

Study Site	Cross Section	Horizontal Distance (ft)	Reach Length (ft)	Upwelling Strength
101.7L	1	-	-	-
	2	21 - 46	850	MOD
		46 - 117	600	MOD
	3	64 - 170	250	MOD
	4	32 - 76	350	STR
105.8L	1	56 - 70	350	STR
	2	50 - 70	225	STR
	3	35 - 46	250	STR
	4	36 - 45	175	MOD
114.1R	1	92.4 - 108	300	SLI
	2	78 - 90	225	MOD
	3	91 - 104	100	MOD
115.0R	1	101 - 106	250	MOD
		148 - 152	90	SLI
	2	42 - 78	275	SLI
	3	16 - 55	350	MOD
	4	26 - 102	425	SLI
118.9L	1	16 - 20	70	SLI
	2	18 - 50	150	SLI
	3	30 - 70	120	MOD
119.1L	1	-	-	-
	2	-	-	-
	3	-	-	-
	4	-	-	-

Table C-4. Summary of surface areas and strengths of upwelling at direct input modeling sites.

Study Site	Cross Section	Horizontal Distance (ft)	Reach Length (ft)	Upwelling Strength
125.2R	1	30 - 43	550	STR
		106 - 110	400	SLI
		235 - 265	450	SLI
	2	200 - 208	350	MOD
		408.5 - 416.5	100	MOD
130.2R	1	38 - 80	300	SLI
	2	54 - 80	175	SLI
	3	16 - 49	400	SLI
131.3L	1	123 - 133	225	MOD
	2	86 - 95	350	MOD
		95 - 100	30	STR
	3	48 - 54	20	MOD
		54 - 60	175	SLI
		120 - 150	60	STR
	4	60 - 70	275	MOD
		172 - 182	100	STR
133.8R	1	40 - 50	5	MOD
	2	-	-	-
	3	30 - 40	20	SLI
137.5R	1	32 - 36	280	MOD
	2	60 - 64	70	MOD
	3	36 - 42	30	MOD

Table C-4. Summary of surface areas and strengths of upwelling at direct input modeling sites.

Study Site	Cross Section	Horizontal Distance (ft)	Reach Length (ft)	Upwelling Strength
138.7L	1	44 - 61	175	STR
	2	50 - 70	275	STR
	3	44 - 55	225	MOD
139.0L	1	27 - 63	250	SLI
	2	27.6 - 34	125	MOD
	3	-	-	-
	4	-	-	-
139.4L	1	-	-	-
	2	-	-	-
	3	-	-	-

SITE FOURTH OF JULY SPAWNING SITE RM(131.3L)
NXSEC 4
NQS 3 7680.0 16100.0 19900.0
WSELS 613.93 616.00 616.77

XSEC	1	40	1	225.0	225.0						
CELL	X	S	C	U	RL	D1	V1	D2	V2	D3	V3
1	.0	3.	.0	.0	.0	.0	.0	.0	.0	.8	.0
2	17.0	3.	.0	.0	.0	.0	.0	.0	.0	.8	.0
3	20.0	3.	.0	.0	.0	.0	.0	.5	.0	1.3	.0
4	24.0	3.	.0	.0	.0	.0	.0	.9	.3	1.7	.0
5	28.0	3.	.0	.0	.0	.0	.0	1.0	.3	1.8	.0
6	32.0	3.	.0	.0	.0	.0	.0	1.1	.5	1.9	.0
7	40.0	3.	.0	.0	.0	.0	.0	1.2	.7	2.0	.0
8	50.0	3.	.0	.0	.0	.0	.0	1.8	.8	2.6	.0
9	60.0	3.	.0	.0	.0	.0	.0	2.6	1.2	3.4	.0
10	70.0	3.	.0	.0	.0	.0	.0	3.0	1.4	3.8	.0
11	80.0	3.	.0	.0	.0	.0	.0	3.1	1.1	3.9	.0
12	90.0	3.	.0	.0	.0	.0	.0	2.6	.9	3.4	.0
13	91.0	3.	.0	.0	.0	.2	.7	2.6	.9	3.4	.0
14	93.0	3.	.0	.0	.0	.2	.7	2.6	.9	3.4	.0
15	95.0	3.	.0	.0	.0	.3	.9	2.6	.8	3.4	.0
16	97.0	3.	.0	.0	.0	.2	.8	2.6	.7	3.4	.0
17	99.0	3.	.0	.0	.0	.0	.9	2.6	.7	3.4	.0
18	100.0	3.	.0	.0	.0	.2	.9	2.6	.6	3.4	.0
19	101.0	3.	.0	.0	.0	.2	.9	2.6	.6	3.4	.0
20	103.0	3.	.0	.0	.0	.1	.0	2.6	.5	3.4	.0
21	104.0	3.	.0	.0	.0	.0	.0	2.6	.5	3.4	.0
22	110.0	3.	.0	.0	.0	.0	.0	2.6	.3	3.4	.0
23	115.0	3.	.0	.0	.0	.0	.0	2.4	.1	3.2	.0
24	117.0	3.	.0	.0	.0	.1	.0	2.3	.1	3.2	1.5
25	119.0	3.	.0	.0	.0	.1	.0	2.2	.0	3.2	1.5
26	120.0	3.	.0	.0	.0	.1	.0	2.2	.0	3.2	1.5
27	121.0	3.	.0	.0	.0	.1	.0	2.1	.0	3.2	1.5
28	123.0	3.	.0	.0	225.0	.1	.0	1.9	.0	3.3	1.3
29	125.0	3.	.0	.0	225.0	.2	.6	1.7	.0	3.3	1.0
30	127.0	3.	.0	.0	225.0	.4	.7	1.5	.0	3.1	.9
31	129.0	3.	.0	.0	225.0	.4	1.2	1.3	.0	2.8	.8
32	130.0	3.	.0	.0	225.0	.4	1.1	1.2	.0	2.8	.8
33	131.0	3.	.0	.0	225.0	.4	1.0	1.0	.0	2.7	.8
34	133.0	3.	.0	.0	225.0	.0	.0	.5	.0	2.5	.8
35	135.0	3.	.0	.0	.0	.0	.0	.0	.0	2.5	.8
36	137.0	3.	.0	.0	.0	.0	.0	.0	.0	2.4	.8
37	141.0	3.	.0	.0	.0	.0	.0	.0	.0	2.1	.5
38	145.0	3.	.0	.0	.0	.0	.0	.0	.0	1.3	.3
39	149.0	3.	.0	.0	.0	.0	.0	.0	.0	.4	.0
40	150.2	3.	.0	.0	.0	.0	.0	.0	.0	.0	.0

WSELS 614.33 616.00 616.77

XSEC	2	34	1	350.0	350.0						
CELL	X	S	C	U	RL	D1	V1	D2	V2	D3	V3
1	.0	5.	.0	.0	.0	.0	.0	.0	.0	.8	.0
2	34.0	5.	.0	.0	.0	.0	.0	.0	.0	.8	.0
3	38.0	5.	.0	.0	.0	.0	.0	.2	.4	1.0	.0
4	42.0	5.	.0	.0	.0	.0	.0	.7	2.2	1.5	.0
5	46.0	5.	.0	.0	.0	.0	.0	.8	2.2	1.6	.0
6	50.0	5.	.0	.0	.0	.0	.0	1.0	1.9	1.8	.0
7	54.0	5.	.0	.0	.0	.0	.0	1.1	2.0	1.9	.0
8	60.0	5.	.0	.0	.0	.0	.0	1.5	1.6	2.3	.0
9	64.0	5.	.0	.0	.0	.0	.0	1.5	1.3	2.3	.0
10	66.0	5.	.0	.0	.0	.4	.2	1.6	1.5	2.4	.0
11	68.0	5.	.0	.0	.0	.4	.2	1.7	1.6	2.5	.0

Table C-5. Example of input data deck for DIHAB model at site 131.3L.

12	70.0	5.	.0	.0	.0	.5	.3	1.8	1.7	2.5	.0
13	72.0	5.	.0	.0	.0	.6	.3	1.8	1.8	2.6	.0
14	74.0	5.	.0	.0	.0	.5	.3	1.9	1.9	2.6	.0
15	76.0	5.	.0	.0	.0	.4	.1	1.9	2.0	2.7	.0
16	78.0	5.	.0	.0	.0	.6	.2	2.0	2.1	2.7	.0
17	80.0	5.	.0	.0	.0	.5	.3	2.0	2.2	2.8	.0
18	82.0	3.	.0	.0	.0	.5	.2	2.0	2.1	2.8	.0
19	84.0	3.	.0	.0	.0	.5	.1	2.0	2.0	2.8	.0
20	86.0	3.	.0	.0	350.0	.4	.0	2.1	2.0	2.8	.0
21	88.0	3.	.0	.0	350.0	.4	.0	2.1	1.9	2.7	3.3
22	90.0	3.	.0	.0	350.0	.3	.0	2.1	1.8	2.6	3.2
23	92.0	3.	.0	.0	350.0	.2	.0	2.1	1.7	2.5	3.2
24	94.0	3.	.0	.0	350.0	.1	.0	2.1	1.7	2.4	3.1
25	95.0	3.	.0	.0	350.0	.0	.0	2.1	1.6	2.3	3.1
26	98.0	3.	.0	.0	30.0	.3	.0	2.0	1.6	2.2	3.0
27	100.0	3.	.0	.0	30.0	.3	.0	2.0	1.5	2.1	2.8
28	108.0	3.	.0	.0	.0	.0	.0	1.3	1.2	1.5	2.2
29	110.0	3.	.0	.0	.0	.0	.0	1.1	1.1	1.3	1.9
30	118.0	3.	.0	.0	.0	.0	.0	.6	.8	.6	.9
31	120.0	3.	.0	.0	.0	.0	.0	.5	.7	.4	.6
32	122.0	3.	.0	.0	.0	.0	.0	.3	.5	.3	.4
33	124.0	3.	.0	.0	.0	.0	.0	.2	.2	.0	.0
34	126.0	3.	.0	.0	.0	.0	.0	.0	.0	.0	.0
WSELS						616.24		616.76		617.19	
XSEC	3	63	1	450.0	400.0						
CELL	X	S	C	U	RL	D1	V1	D2	V2	D3	V3
1	.0	9.	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	8.0	9.	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	10.0	9.	.0	.0	.0	.0	.0	.5	.0	.0	.0
4	14.0	9.	.0	.0	.0	.0	.0	.6	.0	.0	.0
5	20.0	9.	.0	.0	.0	.0	.0	.8	.0	.4	.2
6	30.0	9.	.0	.0	.0	.0	.0	1.2	.2	1.1	.4
7	34.0	5.	.0	.0	.0	.0	.0	1.2	.1	1.4	.5
8	35.0	5.	.0	.0	.0	.0	.0	1.2	.1	1.4	.5
9	40.0	5.	.0	.0	.0	.2	.0	1.2	.0	1.6	.3
10	44.0	5.	.0	.0	.0	.3	.0	1.3	.0	1.7	.2
11	48.0	5.	.0	.0	20.0	.5	.0	1.4	.1	1.8	.5
12	50.0	5.	.0	.0	20.0	.5	.0	1.4	.1	1.9	.6
13	54.0	5.	.0	.0	20.0	.6	.0	1.2	.1	2.0	.9
14	56.0	5.	.0	.0	175.0	.6	.0	1.2	.2	2.0	.9
15	60.0	5.	.0	.0	175.0	.6	.0	1.0	.2	2.0	.9
16	64.0	5.	.0	.0	.0	.5	.0	1.0	.4	2.0	.9
17	66.0	5.	.0	.0	.0	.4	.0	.9	.5	1.9	.9
18	70.0	5.	.0	.0	.0	.3	.0	.9	.7	1.8	1.0
19	72.0	5.	.0	.0	.0	.2	.0	.9	.8	1.7	1.1
20	74.0	5.	.0	.0	.0	.2	.1	.9	.8	1.6	1.1
21	76.0	5.	.0	.0	.0	.2	.1	.9	.9	1.6	1.1
22	80.0	5.	.0	.0	.0	.1	.0	.9	1.0	1.6	1.2
23	84.0	5.	.0	.0	.0	.1	.0	.9	1.0	1.5	1.3
24	88.0	5.	.0	.0	.0	.1	.0	.8	1.1	1.5	1.3
25	90.0	5.	.0	.0	.0	.2	.1	.8	1.1	1.6	1.3
26	92.0	5.	.0	.0	.0	.2	.1	.8	1.2	1.6	1.3
27	94.0	5.	.0	.0	.0	.2	.1	.9	1.2	1.6	1.3
28	96.0	5.	.0	.0	.0	.2	.0	.9	1.3	1.6	1.4
29	100.0	5.	.0	.0	.0	.1	.0	1.0	1.4	1.5	1.5
30	104.0	5.	.0	.0	.0	.1	.0	.9	1.7	1.5	1.5
31	108.0	5.	.0	.0	.0	.2	.0	.8	2.0	1.5	1.6
32	110.0	5.	.0	.0	.0	.3	.1	.8	2.2	1.6	1.6
33	112.0	5.	.0	.0	.0	.3	.1	.8	2.2	1.6	1.6
34	114.0	5.	.0	.0	.0	.2	.1	.9	2.2	1.6	1.6

Table C-5. Example of input data deck for DIHAB model at site 131.3L.

35	116.0	5.	.0	.0	.0	.1	.0	.9	2.1	1.6	1.6
36	120.0	5.	.0	.0	60.0	.1	.0	1.0	2.1	1.6	1.5
37	124.0	5.	.0	.0	60.0	.1	.0	1.0	2.0	1.6	1.4
38	128.0	5.	.0	.0	60.0	.1	.0	1.0	1.9	1.6	1.4
39	130.0	5.	.0	.0	60.0	.1	.0	1.0	1.9	1.6	1.4
40	132.0	5.	.0	.0	60.0	.1	.0	1.0	1.9	1.6	1.4
41	134.0	5.	.0	.0	60.0	.1	.0	1.0	2.0	1.6	1.4
42	136.0	5.	.0	.0	60.0	.1	.0	.9	2.0	1.6	1.4
43	140.0	5.	.0	.0	60.0	.1	.0	.9	2.1	1.7	1.5
44	144.0	5.	.0	.0	60.0	.2	.3	.9	1.6	1.7	1.5
45	148.0	5.	.0	.0	60.0	.2	.1	1.0	1.1	1.5	1.5
46	150.0	5.	.0	.0	60.0	.2	.1	1.0	.8	1.3	1.4
47	152.0	3.	.0	.0	.0	.1	.0	1.0	.7	1.2	1.4
48	154.0	3.	.0	.0	.0	.1	.0	1.0	.6	1.1	1.4
49	156.0	3.	.0	.0	.0	.1	.0	.9	.5	1.1	1.4
50	157.0	3.	.0	.0	.0	.0	.0	.9	.4	1.1	1.4
51	160.0	3.	.0	.0	.0	.0	.0	.9	.3	1.2	1.3
52	164.0	3.	.0	.0	.0	.0	.0	.9	.9	1.2	1.3
53	170.0	3.	.0	.0	.0	.0	.0	.8	1.9	1.1	1.4
54	174.0	3.	.0	.0	.0	.0	.0	.6	1.5	1.1	1.5
55	180.0	3.	.0	.0	.0	.0	.0	.4	1.0	1.2	1.4
56	182.0	3.	.0	.0	.0	.0	.0	.0	.0	1.3	1.4
57	184.0	3.	.0	.0	.0	.0	.0	.7	.0	1.3	1.4
58	194.0	3.	.0	.0	.0	.0	.0	.5	.0	1.1	1.3
59	204.0	3.	.0	.0	.0	.0	.0	.0	.0	.5	1.2
60	214.0	3.	.0	.0	.0	.0	.0	.0	.0	.3	1.3
61	224.0	3.	.0	.0	.0	.0	.0	.0	.0	.3	.4
62	228.0	3.	.0	.0	.0	.0	.0	.0	.0	.3	.4
63	231.5	3.	.0	.0	.0	.0	.0	.0	.0	.0	.0
WSELS						616.24		616.76		617.19	
XSEC	4	42	1	275.0	275.0						
CELL	X	S	C	U	RL	D1	V1	D2	V2	D3	V3
1	.0	9.	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	11.0	9.	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	28.0	8.	.0	.0	.0	.0	.0	.0	.0	1.0	.9
4	48.0	8.	.0	.0	.0	.0	.0	.0	.0	1.0	2.5
5	50.0	8.	.0	.0	.0	.1	.0	.0	.0	1.0	2.6
6	52.0	8.	.0	.0	.0	.1	.0	.0	.0	1.0	2.8
7	54.0	8.	.0	.0	.0	.1	.0	.1	.0	1.0	2.9
8	56.0	8.	.0	.0	.0	.1	.0	.2	.0	1.0	3.0
9	58.0	8.	.0	.0	.0	.2	.3	.3	.0	.9	3.2
10	60.0	8.	.0	.0	275.0	.2	.1	.4	.0	.9	3.3
11	62.0	8.	.0	.0	275.0	.2	.2	.5	.0	.9	3.4
12	64.0	8.	.0	.0	275.0	.2	.1	.4	.0	.9	3.5
13	66.0	8.	.0	.0	275.0	.2	.2	.4	.0	.9	3.7
14	68.0	8.	.0	.0	275.0	.1	.0	.3	.0	.9	3.8
15	70.0	8.	.0	.0	275.0	.2	.0	.3	.0	.9	3.7
16	72.0	8.	.0	.0	.0	.1	.0	.2	.0	.9	3.7
17	74.0	8.	.0	.0	.0	.1	.0	.1	.0	.9	3.6
18	76.0	8.	.0	.0	.0	.0	.0	.0	.0	.9	3.6
19	88.0	8.	.0	.0	.0	.0	.0	.0	.0	1.0	3.2
20	92.0	8.	.0	.0	.0	.0	.0	.0	.0	1.0	3.2
21	102.0	8.	.0	.0	.0	.0	.0	.0	.0	.9	3.0
22	108.0	8.	.0	.0	.0	.0	.0	.1	.0	.8	3.0
23	112.0	8.	.0	.0	.0	.0	.0	.1	.0	.8	2.7
24	122.0	3.	.0	.0	.0	.0	.0	.2	1.0	.7	1.9
25	128.0	3.	.0	.0	.0	.0	.0	.3	1.5	.6	1.5
26	132.0	3.	.0	.0	.0	.0	.0	.4	1.9	.7	1.3
27	142.0	3.	.0	.0	.0	.0	.0	.5	1.8	.8	.7
28	148.0	3.	.0	.0	.0	.0	.0	.5	1.6	.9	.3

Table C-5. Example of input data deck for DIHAB model at site 131.3L.

29	152.0	3.	.0	.0	.0	.0	.0	.5	1.4	.8	.4
30	162.0	3.	.0	.0	.0	.0	.0	.4	1.8	.8	.6
31	168.0	3.	.0	.0	.0	.0	.0	.6	2.2	.8	.8
32	172.0	3.	.0	.0	100.0	.0	.0	.7	2.4	1.0	1.0
33	178.0	3.	.0	.0	100.0	.0	.0	.8	2.4	1.2	1.3
34	182.0	3.	.0	.0	100.0	.0	.0	.8	2.4	1.0	1.4
35	188.0	3.	.0	.0	.0	.0	.0	.7	2.3	.6	1.5
36	192.0	3.	.0	.0	.0	.0	.0	.6	2.3	.6	1.3
37	196.0	3.	.0	.0	.0	.0	.0	.6	2.2	.5	.9
38	197.7	3.	.0	.0	.0	.0	.0	.7	2.2	.0	.0
39	202.0	3.	.0	.0	.0	.0	.0	.7	2.1	.0	.0
40	212.0	3.	.0	.0	.0	.0	.0	.6	2.0	.0	.0
41	222.0	3.	.0	.0	.0	.0	.0	.5	.4	.0	.0
42	227.0	3.	.0	.0	.0	.0	.0	.0	.0	.0	.0

Table C-5. Example of input data deck for DIHAB model at site 131.3L.

Table C-6. Habitat response and wetted surface areas with corresponding mainstem discharges for direct input modeling sites.

Study Site	Mainstem Discharge (cfs)	Wetted Surface Area (ft^2)	Spawning Chum WUA (ft^2)
101.7L	5100.	134000.	0.
	11400.	255925.	53951.
	15300.	313420.	42700.
	18500.	372685.	25705.
	24000.	*	16013.**
105.8L	5100.	17575.	199.
	7320.	21700.	3434.
	15300.	35144.	1412.
	18500.	44850.	952.
	24000.	*	354.**
114.1R	5100.	36840.	221.
	7680.	36840.	221.
	15100.	74400.	1512.
	17900.	80550.	644.
	23000.	*	208.**
115.0R	5100.	82900.	35608.
	7680.	82900.	35608.
	14500.	151743.	42877.
	23800.	*	40176.**
118.9L	5100.	19375.	145.
	7680.	22413.	2484.
	10300.	30238.	2817.
	15100.	36550.	4609.
	17900.	37675.	3201.
	23000.	*	2934.**
125.2R	7680.	332038.	4901.
	13600.	376033.	7595.
	19100.	438218.	4216.

* Value not available at time of publication.
** Value determined from extrapolated data set.

Table C-6. Habitat response and wetted surface areas with corresponding mainstem discharges for direct input modeling sites.

Study Site	Mainstem Discharge (cfs)	Wetted Surface Area (ft^2)	Spawning Chum WUA (ft^2)
130.2R	5100.	31613.	272.
	7680.	31613.	272.
	14500.	48480.	724.
	16100.	56388.	737.
	19900.	67600.	790.
	22500.	*	790.**
131.3L	5100.		135.
	7680.	77344.	135.
	16100.	176463	1117.
	19900.	215549.	1144.
	23000		847.
133.7R	5100.	10133.	96.
	7680.	10980.	124.
	10400.	12425.	144.
	16100.	13930.	44.
	19900.	14032.	30.
	22700.	*	20.**
137.5R	5100.	14725.	1.
	16000.	27050.	14.
	19000.	34038.	86.
	21000.	*	16.**
138.7L	5100.	11100.	865.
	10400.	20250.	2001.
	14500.	28813.	3459.
	17900.	34324.	1762.
	19000.	35138.	1195.
	27700.	45950.	460.
139.0L	5100.	33875.	4533.
	10400.	43838.	4533.
	14500.	63313.	10269.
	17900.	71331.	10825.
	19000.	80950.	10712.
	31700.	91919.	917.

* Value not available at time of publication.
** Value determined from extrapolated data set.