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AN EVALUATION OF THE EFFECTIVENESS OF FLOW AUGMENTATION IN THE SNAKE RIVER, 1991-1995

Phase I: FINAL REPORT

Final Report

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AN EVALUATION OF THE EFFECTIVENESS OF FLOW AUGMENTATION IN THE SNAKE RIVER, 199 l- 1995

PHASE I: FINAL REPORT

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Preface

Project 95-070-00 was initiated in FY 1996 in response to the Northwest Power Planning Council's (NPPC) desire to confirm delivery of water designated for use in flow augmentation in the lower Snake River since 1991 and evaluate its effectiveness to provide water for juvenile salmon and steelhead migrants. This effort addresses measure 5.2D.3 of the 1994 NPPC Fish and Wildlife Program and the biological need to ensure that the water requested under the National Marine Fisheries Service's (NMFS) Biological Opinion on the 1994-1998 Operation of the Federal Columbia River Power System (BIOP) is being delivered in the form of flow augmentation for anadromous fish.

The three originally planned phases of Project 95-070-00 are: Phase I - Document the magnitude and timing of water released for flow augmentation below Hell's Canyon and from Dworshak Reservoir. Assess effects on ESA stocks in the Lower Snake River; Phase II - Reconstruct the pre-development hydrograph for comparison with the contemporary hydrograph. Describe and compare the distribution and timing of wild ESA salmon stocks pre- and post-development. Assess the extent to which re-establishing a pre-development hydrograph would be advantageous for contemporary populations; and Phase III - Apply some as yet unidentified economic model to assess the economic consequences of flow augmentation.

The management implications of this project include: 1) determine if the water management network within the Idaho State borders is providing the flow augmentation called for in the NPPC plan and the NMFS BIOP; and 2) provide an assessment of the effects on ESA-listed salmon stocks in the Snake River Basin.

The following report presents the results of the Phase I effort. The conduct of Phase II and Phase III analyses are dependent on support from NPPC and/or NMFS and the regional prioritization process to proceed.

Executive Summary

The purpose of this evaluation was to estimate the volume and shape of flow augmentation water delivered in the Snake Basin during the years 1991 through 1995, and to assess the biological consequences to ESA-listed salmon stocks in that drainage. HDR Engineering, Inc. calculated flow augmentation estimates and compared their values to those reported by agencies in the Northwest. BioAnalysts, Inc. conducted the biological evaluation.

During the smolt migration period in the years 199 1- 1995, the total volume of flow augmentation (FA) water released from storage reservoirs in the Snake Basin increased substantially from a low of 1.35 million acre-feet (maf) in 1992 to a high of 2.56 maf in 1994. The contribution from the upper Snake River exceeded the 427,000 acre-feet (427 kaf) target requested by the Northwest Power Planning Council (NPPC) and National Marine Fisheries Service (NMFS) in four of the five years. In addition, in three of the five years, water that could reasonably be classified as flow augmentation was released during September after 3 1 August, the designated end date for the smolt migratory period. If that September water were included in the accounting, then the 427 kaf target volume was satisfied in all years, and the annual flow augmentation volume delivered would range from 1.5 5 to 2.56 maf.

During the years 199 1- 1995, the water management strategy changed. The allocation of water shifted from predominantly targeting spring migrants to emphasizing summer-migrating fall chinook salmon. In 1991, 74% of the flow augmentation water was released prior to 21 June. By 1995, only 35% of the augmentation occurred during that same period, with the complement released during the summer period ending 3 1 August. Typically,. flow augmentation was insufficient to sustain flow targets at Lower Granite Dam as specified in the National Marine Fisheries Service Biological Opinion. Even so, during the spring, 1991-1995, flow augmentation increased water velocities through Lower Granite Pool an average of 3-13%. During the summer, flow augmentation contributed a much higher proportion of the net water velocity through the pool, increasing it by an estimated 5-38%.

In all years, the majority of the wild spring/summer chinook index populations and wild steelhead passed Lower Granite Dam coincidentally with some amount of flow augmentation. However, the volumes they encountered were quite variable across and within years, as evidenced in Figure 11. For subyearling fall chinook, co-occurrence between passage timing at Lower Granite Dam and flow augmentation generally increased throughout the years examined, from a low of 30% in 1992 to a high of 9 1% in 1995. Similarly, flow augmentation volumes encountered by migrants as they were passing Lower Granite Dam were quite variable.

We used several smolt passage models to assess the effects of the FA provided each year on smolt migration speed. The models yielded different predictions regarding the magnitude of change in smolt travel time attributable to FA. The CRiSP model predicted small to negligible changes in yearling chinook and steelhead travel time from Lower Granite Dam to McNary Dam, as attributable to FA. The decrease in travel time compared to base flow conditions (absent augmentation), does not exceed one day. Expressed as the mean percentage decrease in travel

time each year, estimates ranged from O-5% for yearling chinook and O-6% for steelhead, over the five years. The Berggren and Filardo models (1993) for spring/summer chinook and steelhead predicted greater reductions in travel time as associated with flow augmentation. This was particularly evident in 1992, when base flows were particularly low. Across the five years, the decrease in travel time attributable to FA relative to base flows, was higher than that predicted by CRiSP, ranging from approximately 5- 16% and 6- 17% for spring/summer chinook and steelhead, respectively.

For subyearling fall chinook salmon, the models we selected yielded predictions even more disparate than was the case for spring migrants. The CRiSP model predicts small to negligible changes in smolt travel time through LGR Pool as associated with summer FA. Typically there is no measurable reduction in travel time except for some late migrating groups, where a one day decrease was predicted. The USFWS model we selected (Connor et al. 1994a) presents a contrasting picture. The change in travel time due to FA is substantive. This is particularly evident in July 1992 when FA water comprised much of the total river flow. The model predicted that FA decreased travel time from approximately 34 days (as predicted under ambient runoff) to 19 days. The USFWS model predicts that FA reduced travel time for the index fish greatly, by 19-45% in 1991-1995 (Figure 20). However, later versions of the model as reported by Connor et al. (1994c and 1996) indicate no association between flow and travel time. No consistent characterization describing fall chinook migratory responses to environmental conditions has yet been adopted.

Our ability to translate smolt migration speed into predictions of smolt passage survival was limited. CRiSP was the only model that was readily available to us for use in this study. We would have preferred to have used an additional tool, to provide a basis of comparison. For yearling spring chinook, the predicted change in smolt survival attributable to FA in any year was small, and consistent with travel time predictions. The net increase in survival due to FA for spring-migrating species from the head of Lower Granite Reservoir to Ice Harbor Dam, ranged from about 0.5 to 3 percentage points. For subyearling chinook the change in survival was similar, ranging from about 0.5 to 2 percentage points.

Time series, multiple regression and visual analyses suggest that FA releases from Dworshak are significantly correlated with reduced water temperature downstream as far as Lower Granite Dam. Our study could not document such a relationship for releases from Hell's Canyon. Indications are that releases from Dworshak could be used to keep water temperatures in the Clearwater River and Lower Granite Pool below 20°C during the warmest summer periods. This could reduce fish predation on smolts and may reduce thermal stress.

Table of Contents

Section	Title	Page
1	INTRODUCTION	1
2	METHODS	2
2.1	Water Accounting	2
2.1.1	Estimating Flow Augmentation Volumes	2
2.2	Biological Evaluation	2
2.2.1	Migrational Timing and Water Delivery	2
2.2.2	Water Velocity	3
2.2.3	Smolt Travel Time	3
2.2.4	Smolt Survival	5
2.2.5	Temperature	5
2.2.5.1	Multiple Regression Approach	6
2.2.5.2	Time Series Approach	6
3	RESULTS	7
3.1	Water Accounting	7
3.1.1	Estimating Flow Augmentation Volumes	7
3.1.2	Timing and Shape of Flow Augmentation Water Delivered from Hell's Canyon and Dworshak Dams	8
3.2	Biological Evaluation	14
3.2.1	Migration Timing and Flow Augmentation Timing	14
3.2.2	Changes in Water Velocity Attributable to Flow Augmentation	21
3.2.3	Changes in Smolt Travel Time Attributable to Flow Augmentation	23
3.2.4	Changes in Smolt Survival as Related to Flow Augmentation	33
3.2.5	Changes in Temperature Associated with Flow Augmentation	33
4	DISCUSSION	41
	Literature Cited	45
Appendix A	HDR Report	
Appendix B	ANOVA Tables and regression coefficients for temperature regressions	
Appendix C	Tables of Data used in Figures	

Table of Figures

Figure	Title	Page
1	Daily river flows for Hell's Canyon Dam, Peck and Lower Granite Darn: 199 1	9
2	Daily river flows for Hell's Canyon Dam, Peck and Lower Granite Dam: 1992	10
3	Daily river flows for Hell's Canyon Dam, Peck and Lower Granite Dam: 1993	11
4	**Daily** river flows for Hell's Canyon Dam, Peck and Lower Granite Dam: 1994	12
5	Daily river flows for Hell's Canyon Dam, Peck and Lower Granite Darn: 1995	13
6	Estimated Flow and Timing of Fish Passage at Lower Granite: 199 1	15
1	Estimated Flow and Timing of Fish Passage at Lower Granite: 1992	16
8	Estimated Flow and Timing of Fish Passage at Lower Granite: 1993	17
9	Estimated Flow and Timing of Fish Passage at Lower Granite: 1994	18
10	Estimated Flow and Timing of Fish Passage at Lower Granite: 1995	19
11	Proportion of Fish Encountering Each Level of Flow Augmentation	20
12	Flow-Velocity Relationships for Lower Granite Pool Estimated by CRiSP and HEC-2	22
13	Effect of flow augmentation on water velocity and water particle travel time	24
14	Percent Increase in Water Velocity through Lower Granite Pool due to HDR-Estimates of Flow Augmentation: 199 1 - 1995.	25
15	Estimated Smolt Travel Times for Yearling Chinook	26
16	Percent Decrease in Smolt Travel Time for Yearling Chinook Due to Flow Augmentation	27
17	Estimated Smolt Travel Times for Steelhead	29
18	Percent Decrease in Smolt Travel Time for Steelhead Due to Flow Augmentation	30
19	Estimated Smolt Travel Times for Subyearling Chinook	31
20	Percent Decrease in Smolt Travel Time for Subyearling Chinook Due to Flow Augmentation	32
21	Increase in Estimated Survival Attributable to Augmentation	34
22	Timing of Flow Augmentation Releases and Corresponding Water Temperatures: 199 1	36
23	Timing of Flow Augmentation Releases and Corresponding Water Temperatures: 1992	37
24	Timing of Flow Augmentation Releases and Corresponding Water Temperatures: 1993	38
25	Timing of Flow Augmentation Releases and Corresponding Water Temperatures: 1994	39
26	Timing of Flow Augmentation Releases and Corresponding Water Temperatures: 1995	40

Table of Tables

Table	Title	Page
1	Release dates of modeled experimental groups used in the simulations for the three stocks	4
2	HDR-Estimates of water volumes release for the purpose of improving river conditions for salmon and steelhead in the impounded lower Snake River	7
3	Percent of total FA release during either the spring or the summer using HDR-estimates	8
4	Percentage of annual smolt passage that co-occurred with flow augmentation at Lower Granite Dam	14
5	Percentage of run that passed Lower Granite Dam while the flow exceed the NMFS BIOP	21

1. INTRODUCTION

Since 1983, with the establishment of the Fish Passage Center (FPC), flow augmentation (FA) has been used as a tool to improve downstream, migratory conditions for smolts through the impoundments on the lower Snake River. Over the years, volumes dedicated to that purpose have steadily increased. Water management has become increasingly important as a mitigation strategy since the National Marine Fisheries Service (NMFS) listed several Snake River Salmon stocks as threatened or endangered (NMFS 1992) under the Endangered Species Act (ESA; United States Fish and Wildlife 1988). In the early 1990's, as depressed Snake River salmon stocks received increased attention, the Northwest Power Planning Council (NPPC) requested that 427,000 acre-feet (427 kaf) of water from the Upper Snake River be provided to supplement passage. Subsequently, the NMFS, with the support of the NPPC, has requested that the operation of storage reservoirs upstream from Lower Granite Dam (LGR) be modified to provide specific water volumes dedicated to augment river discharge volumes.

In the Biological Opinion (BIOP; NMFS dated 2 March 1995) NMFS restated, endorsed and extended pre-existing flow targets at Lower Granite Dam: 85 kcfs (i.e., 85,000 cubic feet per second) for the spring (i.e., 4/10 - 6/20); 50 kcfs for the summer (i.e., 6/21 - 8/3 1). These two time frames generally define the downstream migratory period for salmonid stocks in the Snake River. In an effort to achieve the flow targets, NMFS also specified that the Bureau of Reclamation shall continue to provide 427 kaf of water from the upper Snake River Basin, as previously identified by the NPPC in their "Strategy for Salmon." The upper Snake River Basin provides only part of the total flow augmentation for the Snake River; additional water is provided from Dworshak Reservoir on the North Fork of the Clear-water River.

The purpose of this study is to estimate the volume and shape of flow augmentation water delivered in the Snake Basin, and to assess the biological consequences to ESA-listed stocks. The study has two components: water accounting and biological evaluation. HDR Engineering calculated the water volume estimates and BioAnalysts, Inc. conducted the biological evaluation. The study period includes the years 199 1 - 1995.

The biological evaluation treats several issues. Initially, we examine the extent to which the flow augmentation coincided with the passage of ESA-listed salmon stocks. The biological evaluation also describes the effects of flow augmentation on water velocity, associated smolt travel time and the linkage to smolt survival. Additionally, we describe the change in water temperature as related to flow augmentation, and the biological implications.

2. METHODS

2.1 Water Accounting

2.1.1 Estimating Flow Augmentation Volumes:

HDR computed daily estimates of the flow augmentation volumes released through the Clear-water and Upper Snake Rivers from the Dworshak and Brownlee reservoirs, respectively. Flow augmentation (FA) is the volume of water released from storage reservoirs intended to increase total river discharge above base levels for improving migratory conditions for salmon stocks in the lower Snake and Columbia rivers. Flow volumes were indexed at the Peck gaging station on the Clear-water River and at the Hell's Canyon gaging station on the Snake River. Flow augmentation at each gaging station (i.e., Peck and Hell's Canyon) was quantified daily, summed and immediately credited as augmentation available for smolt passage at Lower Granite Dam. HDR-estimates of flow augmentation were computed independently and compared with estimates computed by Bonneville Power Administration (BPA) and Idaho Department of Water Resources (IDWR). Details regarding HDR water accounting can be found in Appendix A.

2.2 Biological Evaluation

2.2.1 Migrational Timing and Water Delivery:

In each of the five years various indices were used to illustrate the coincidence between flow augmentation indexed at Lower Granite Dam and passage of wild smolts from ESA-listed stocks. Wild steelhead were also included in this report as they are a species of special concern and are receiving consideration for listing under the ESA. The data source(s) for each stock are as follows:

a) Wild spring/summer yearling chinook - Smolt passage was indexed using the Passive Integrated Transponder tagged (i.e., PIT-tagged) composite reported by NMFS (Achord et al. 1996). The data were reported as the percent passing Lower Granite Dam for each three-day interval from 1 April to 30 July. Daily estimates of passage were computed using a two-step process. First, linear interpolation was used to estimate daily passage from adjacent three-day estimates. Second, all interpolated values were divided by three to change the three-day measures to daily measures.

b) Wild steelhead - Smolt passage indices (SPI) were obtained from the FPC based on non-fin-clipped smolts observed at Lower Granite.

c) Wild fall subyearling chinook- Two indices were used; the subyearling chinook passage index reported by the FPC, and naturally-produced fall chinook PIT-tagged in the Snake River. PIT-tag data were provided by Billy Connor of the U.S. Fish and Wildlife Service (USFWS). The FPC passage indices are a mixture of wild fall

chinook and small spring/summer chinook salmon, but are presumed to represent primarily fall chinook passage. Before 1993 some unknown fraction of hatchery spring/summer chinook were likely also included in the index. From 1993 on, all hatchery chinook released in the basin were fin-clipped to confirm their origin and distinguish them from ESA stocks.

d) Wild sockeye - The passage of wild Snake River sockeye salmon was indexed at LGR Dam using PIT-tagged wild smolts emanating from the upper Salmon River. The data were extracted from PIT Tag Information System (PITAGIS) on 12 December 1996.

Passage indices were expressed as empirical probability density functions. These density functions were then compared with the HDR-computed flow augmentation to determine the proportions that co-occurred with FA at LGR Dam. On any day, the estimate of FA was the difference between the actual river discharge and the HDR-computed base flow.

2.2.2 Water Velocity:

We examined two tools for use in predicting the change in water velocity attributable to flow augmentation: the HEC-2 model constructed by the Corps of Engineers (model output provided by Les Cunningham, COE) and the water travel time routine embedded in the Columbia River Salmon Passage (CRiSP) model (Anderson et al. 1993). The response zone was Lower Granite Pool from the head of the pool near Lewiston, ID to the dam. We constructed the water particle travel time (WPTT)/flow relationship using HEC-2 model output. Estimated WPTT for the 3 1.7 mile reach was converted into an average velocity and plotted against flow.

For each year, we ran four flow files through the CRiSP model: the actual river discharge as calculated by the COE at Lower Granite Dam, and three separate estimates of what the base flows would have been absent flow augmentation (i.e., the HDR, BPA and IDWR estimates described previously in Appendix A). The difference between the actual flows and the base flows is the change in velocity attributable to flow augmentation. We expressed the information two ways: as the mean water velocity through the pool during the spring and summer migration periods, and as the mean percent increase in water velocity attributable to flow augmentation during the spring and summer migration periods separately.

2.2.3 Smolt Travel Time:

Three different models were used to examine the estimated effects of flow augmentation on travel time. The different models are not directly comparable because they are formulated for different reaches, for different species, often using different stock/tagging data, and sometimes using different metrics for defining the central tendency of the passage distribution. However, we are more concerned with the relative change in travel time attributable to flow augmentation, rather than absolute values predicted by the various models.

Smolt travel time was predicted using the actual flows at Lower Granite Dam each year and these estimates were compared with predicted values obtained using the HDR-estimated base flows. The difference yields the decrease in travel time attributable to flow augmentation. In the modeling analysis, separate groups were released on three different dates to characterize early, middle and late migrants each year (Table 1).

Table 1: Release dates of modeled experimental groups used in the simulations for the three stocks.

	Spring/Summer Chinook	Steelhead	Subyearling Chinook
Early	10 April	15 April	15 June
Middle	1 May	10 May	10 July
Late	25 May	1 June	5 August

The CRiSP model was used to analyze all three species. The model used parameterizations based on these stocks: Snake River wild yearling chinook, subyearling chinook migrating between Rock Island and McNary dams, and Dworshak hatchery steelhead (Josh Hayes, CRiSP modeler, pers. comm.). The latter two stocks were selected since corresponding data for wild Snake River stocks is limited. In the CRiSP model, river conditions including river discharge change in daily time steps.

We used the bivariate models reported by Berggren and Filardo (1993) to estimate the median travel time of yearling spring/summer chinook and steelhead from Lower Granite Dam to McNary Dam (MCN), as related to flow. In contrast to CRiSP, where daily flows were used, we applied the mean flow at Ice Harbor Dam for the period following the release date until 50% passage had occurred. Estimated flows at Ice Harbor were obtained using CRiSP.

As an alternative to the CRiSP characterization of fall chinook, migration rate (MR) was also estimated using a more flow-sensitive model, as reported by Connor et al. (1994a):

$$MR(kmld) = -24.26 + 0.184\ \text{Flow (kcfs)} + 1.073\ \text{Release Temperature } (^\circ C) + 0.052\ \text{Size at Release(mm)}.$$

This equation relates the migration rate of subyearling fall chinook through Lower Granite Pool to flow at Lower Granite Dam. The PIT-tag data used to construct this relationship were obtained from wild fall chinook tagged in the Snake River upstream from Lower Granite, which were recovered at that dam. Fish traversed both free-flowing and reservoir habitat en route to the detection site. In our analyses we held fish size and water temperature constant at 90 mm and

17” C, respectively. Flow was indexed as the mean over the period the fish were at large (as determined by the mean travel time). The migration rate was converted into travel time over a pool length of 5 1 km (3 1.7 miles).

2.2.4 Smolt Survival:

The only model readily available for use in estimating smolt passage survival was the CRiSP model. Although we would have preferred to use an additional model to characterize the contrasting regional theories regarding smolt passage survival, we were unable to access any other models. The survival was estimated using the same fish as those released to estimate travel time. Thus, smolt survival was predicted using the actual flows at Lower Granite Dam each year and these estimates were compared with predicted values obtained using the HDR-estimated base flows. The difference yields the increase in survival attributable to flow augmentation. In CRiSP, mortality increases with increasing predation and increasing nitrogen saturation. Predation is positively correlated to both travel time and temperature; nitrogen saturation is positively correlated to spill. This suggests that summer FA could be beneficial if it decreases both the water temperature and the travel time, but does not increase spill.

2.23 Temperature:

Water temperature is an important environmental variable influencing salmon survival. Excessively warm temperatures put both juvenile and adult salmonids at risk in terms of either species-specific thermal tolerance limits or increased predation of juveniles. Water releases associated with FA not only increase flow through the region, but also have the potential to affect the temperature downstream. The extent to which flow augmentation actions affect water temperature, particularly during the summer, is of concern. A detailed analysis would require that a water mixing model be constructed. This is beyond the scope of this study. We used both visual and statistical methods to evaluate the impact of augmentation on temperature at Lower Granite Dam during out-migration timing. Unfortunately, either of these approaches suffers from the the fact that changes due to forces unrelated to augmentation cannot be separated from changes due to the augmentation except by assumption.

The most basic approach to evaluate the impact of augmentation on temperatures throughout the system was to examine the water temperature visually at various points along the river to see if drastic changes in temperature were evident in the time series following augmentation. A more analytical approach to evaluate the impact of augmentation on temperatures was to construct time series of the water temperature at Anatone, Peck and Lower Granite for years before augmentation and compare these time series to time series during years with augmentation. To examine this possibility, the data were analyzed using two statistical techniques. One approach ignored the time series construct and analyzed the data with multiple regression. The other approach incorporated the time series construct of the data, and analyzed the data using autoregression and an interventive transfer function (Kendall and Ord 1990).

Water temperature data at Anatone gage, Peck gage and Lower Granite Dam were collected for 198 l-l 995. Using the years 198 1- 1990, the mean daily mean temperature at each location was computed. These years were assumed to represent the baseline for temperatures along the Snake River with minimal to no FA. In actuality, there were FA releases provided during the spring of some years, but the volumes, and thus the potential impact, were much reduced prior to 199 1. The years 199 1- 1995 were not used in computing the baseline mean temperatures because temperatures during these years could have been affected by high-volume releases of FA (i.e., the intervention). Using the mean daily mean temperature, the entire time series was differenced to remove any trend. The differenced time series was used as the response variable in both the multiple regression and the time series approach. Data were blocked by year to reduce the error variability in the analysis.

Two predictor variables were created using the FA. FA was quantified as either the amount released or the percentage of the release that was FA on a given day. To determine whether the impact of FA was consistent throughout the NMFS BIOP period, the effects during the spring and summer were estimated separately. To determine whether the impact of FA was consistent across years, the interaction of season and year was included in the models.

2.2.5. I Multiple Regression Approach

Using the differenced time series as the response variable, a linear model was fit to the FA metric. The resultant model equation was:

$$y_t = \beta_j year_j + \beta_k seasonal\ FA_k + \beta_{j\,k}(year_j * seasonal\ FA_k) \qquad (1)$$

where

y_t = Daily mean temperature deviation,

$year_j$ = Blocking factor for years 199 1- 1995, and

seasonal FA_k = FA metric partitioned by season (i.e., spring versus summer).

2.2.5.2 Time Series Approach

Using the differenced time series, an autoregressive model was fit using only the previous time step (i.e., AR(1)) as the predictor. Using the residuals of the AR(1) model, the impact of FA on the time series was examined. The complete model equation was:

$$y_t = \beta_1 y_{t-1} + \beta_j year_j + \beta_k seasonal\ FA_k + \beta_{j,k}(year_j * seasonal\ FA_k) \qquad (2)$$

3. RESULTS

3.1 Water Accounting

3.1.1. *Estimating Flow Augmentation Volumes:*

Total flow augmentation delivered from the Snake and Clear-water rivers during 10 April-3 1 August, as indexed at LGR, ranged from 957.7 to 2560.3 kaf over the five years (Table 2). HDR-estimates of FA were lower than those calculated by either BPA or IDWR in all years. The differences were due to discrepancies in FA water volumes estimated as discharged from Dworshak Reservoir. Details regarding the basis for the different estimates are presented in Appendix A (HDR Report).

Table 2: HDR-estimates of water volumes (kaf) released for the purpose of improving river condition for salmon and steelhead in the impounded lower Snake River. The NMFS Biological Opinion (BIOP) migratory period as indexed at Lower Granite Dam extends from 10 April through 31 August.

	Upper Snake River			Dworshak Reservoir			Total at Lower Granite Dam		
	BIOP Period	Sept.	Sum Total	BIOP Period	Sept.	Sum Total	BIOP Period	Sept.	Sum Total
1991	**246.4**	**200.1**	446.5	711.3	520.1	1231.4	957.7	720.2	1677.9
1992	248.6	**0.0**	248.6	1099.9	200.0	1299.9	1348.5	200.0	1548.5
1993	526.8	**0.0**	526.8	1471.1	0.0	1471.1	1997.9	**0.0**	1997.9
1994	755.9	**0.0**	755.9	1804.4	0.0	1804.4	2560.3	**0.0**	2560.3
1995	428.4	89.0	517.4	1961.2	0.0	1961.2	2389.6	89.0	2478.6

Were the flow volumes (42 7 kaf) as requested in the NMFS BIOP delivered from the upper Snake River Basin?

HDR estimated that the 427 kaf was delivered from the Upper Snake River during the smolt migration period (10 April-3 1 August) in 3 (1993-l 995) of the 5 study years (Table 2). In 1991 and 1992 that volume was not provided before 3 1 August. However, additional water, classified as flow augmentation by some parties, was also released during September in 1991 and 1992 as part of an adult passage/water temperature regulation experiment. In 199 1, the inclusion of this September water provided a total of 446.5 kaf that could justifiably be considered as fish-passage related. Also, in 1995 HDR identified an additional small parcel of water released from

Hell's Canyon Dam that they, but no other party, characterized as FA. Water released during September was beyond the NMFS designated smolt migration period; after the vast majority of juvenile chinook migrants have moved seaward. Thus, September releases were not used in our biological analyses. Furthermore, no empirical data have been collected that describe the response of adult salmon to those September releases, nor has any party developed an adult passage model that could be applied to assess potential effects.

3.1.2 *Timing and Shape of Flow Augmentation Water Delivered from Hell's Canyon and Dworshak Dams:*

Using the water files assembled by HDR, we plotted the daily flow augmentation volumes as indexed at Hell's Canyon Dam on the Snake River and the Peck gage on the Clearwater River, as calculated by HDR, BPA and IDWR. As noted by HDR in Appendix A, the three parties calculated different FA volumes provided from Dworshak Reservoir, which is evident in the Peck gage graphs (Figures l-5). For the years 1991-1993, the estimates provided by the three groups are obviously disparate. In later years, the three estimates of the volume and shaping of FA from Dworshak are nearly identical.

The proportion of total FA water released during the spring and summer periods has shifted dramatically from 199 l- 1995. In 199 1 and 1992, FA was heavily weighted toward spring migrants. In the later years 1993-1995, there has been a tendency to emphasize the use of FA during the summer migratory period. Using the FA volumes calculated by HDR, in 1991 and 1992 respectively, 74% and 67% of all FA were released before 21 June (Table 3). In the subsequent years, 1993-1995, the proportion of all FA water released in the spring decreased substantially to 26%, 44% and 36%, respectively (Table 3).

Table 3: Percent of total FA released during either the spring (10 April - 20 June) or the summer (21 June - 31 August) period using HDR-estimates.

	Spring	Summer
1991	74	26
1992	67	33
1993	25	75
1994	44	56
1995	35	65

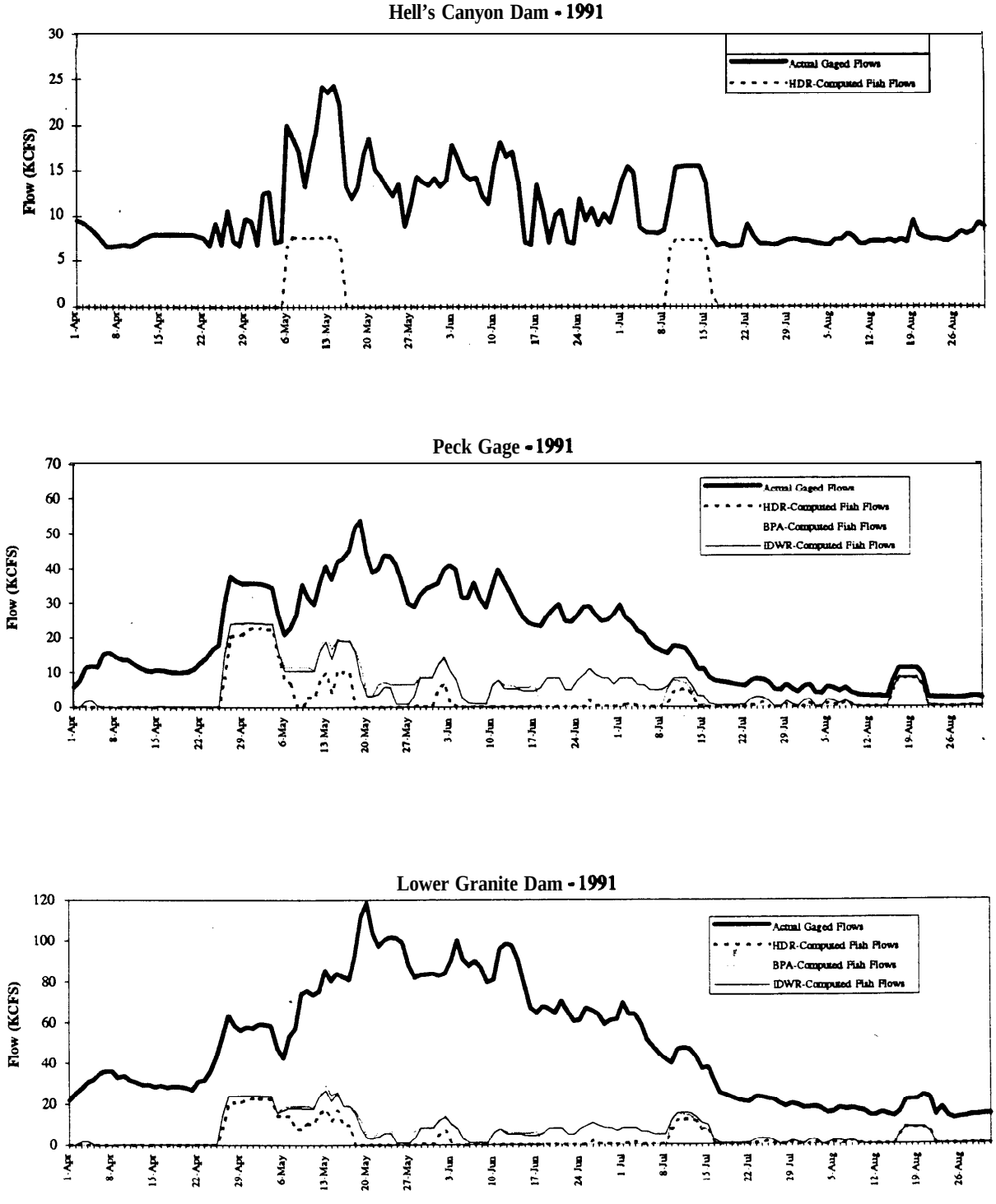
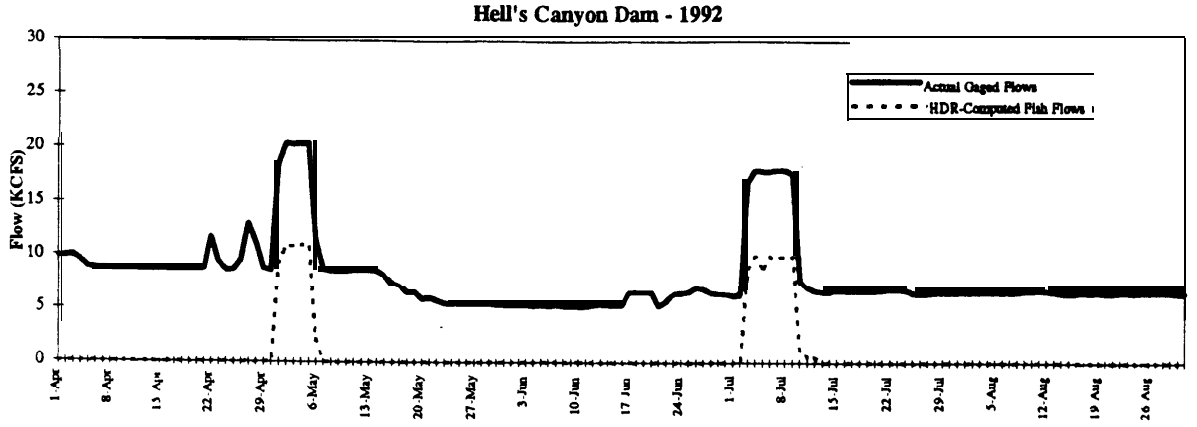
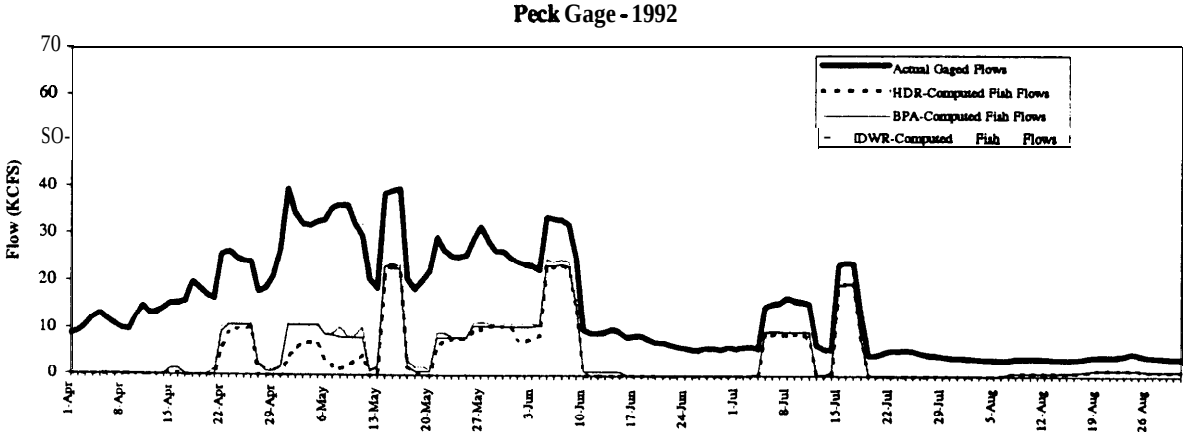


Figure **1:** Daily river flows (uppermost bold, solid line) for the Upper Snake River (as measured at Hell's Canyon), Clearwater River (as measured at Peck, ID Gage) and Lower Granite Dam (as calculated by HDR) for 1 April to 31 August 1991. Three estimates of the flow augmentation water (lower dashed lines) and corresponding release dates as measured at Hell's Canyon and Peck, ID gages are indicated. In the bottom graph, the sum of the Snake and Clearwater flow augmentation releases are displayed.





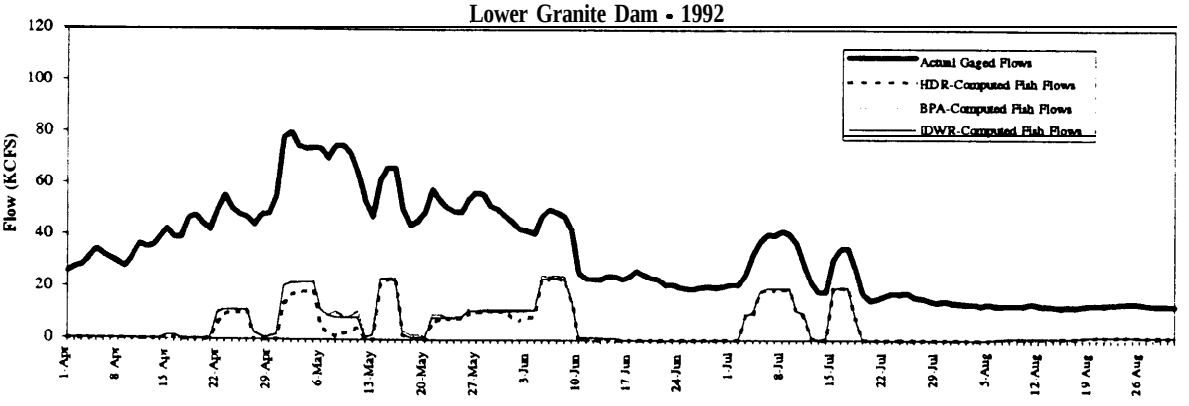


Figure 2: Daily river flows (uppermost bold, solid line) for the Upper Snake River (as measured at Hell's Canyon), Clearwater River (as measured at Peck, ID Gage) and Lower Granite Dam (as calculated by HDR) for 1 April to 31 August 1992. Three estimates of the flow augmentation water (lower dashed lines) and corresponding release dates as measured at Hell's Canyon and Peck, ID gages are indicated. In the bottom graph, the sum of the Snake and Clearwater flow augmentation releases are displayed.

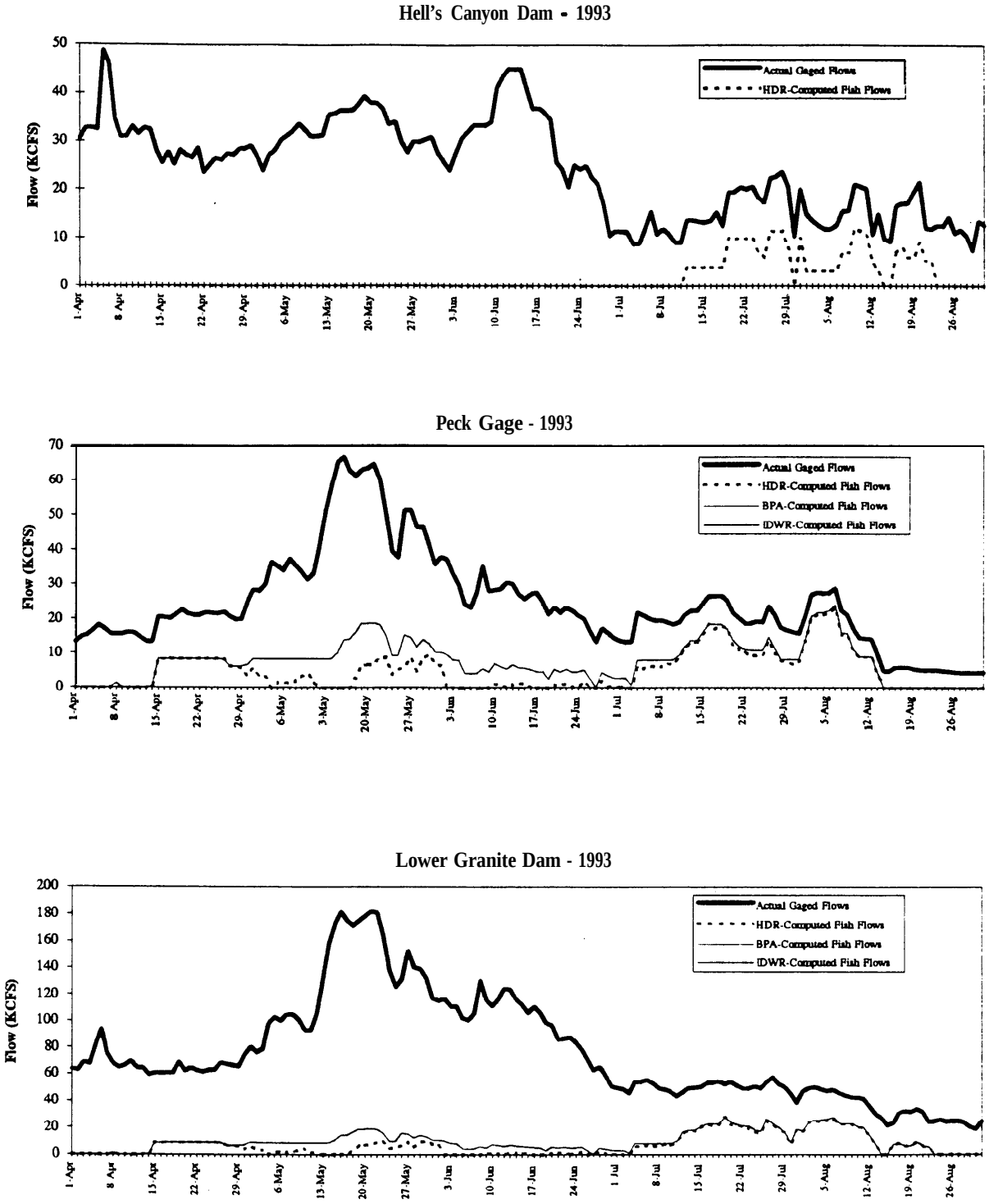


Figure 3 Daily river flows (uppermost bold, solid line) for the Upper Snake River (as measured at Hell's Canyon), Clearwater River (as measured at Peck, ID Gage) and Lower Granite Dam (as calculated by HDR) for 1 April to 31 August 1993. Three estimates of the flow augmentation water (lower dashed lines) and corresponding release dates as measured at Hell's Canyon and Peck, ID gages are indicated. In the bottom graph, the sum of the Snake and Clearwater flow augmentation releases are displayed.

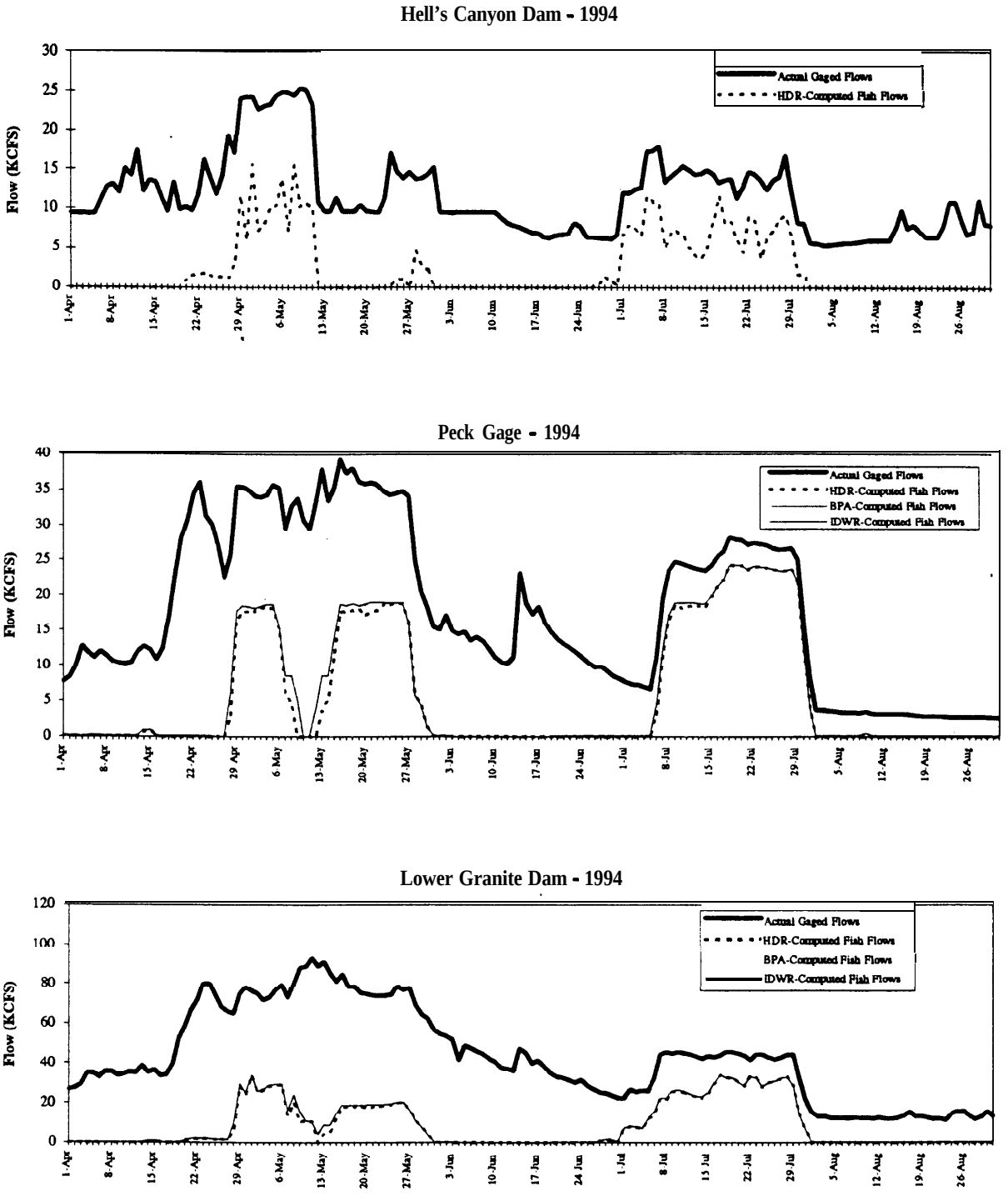


Figure 4: Daily river flows (uppermost bold, solid line) for the Upper Snake River (as measured at Hell's Canyon), Clearwater River (as measured at Peck, ID Gage) and Lower Granite Dam (as calculated by HDR) for 1 April to 31 August 1994. Three estimates of the flow augmentation water (lower dashed lines) and corresponding release dates as measured at Hell's Canyon and Peck, ID gages are indicated. In the bottom graph, the sum of the Snake and Clearwater flow augmentation releases are displayed.

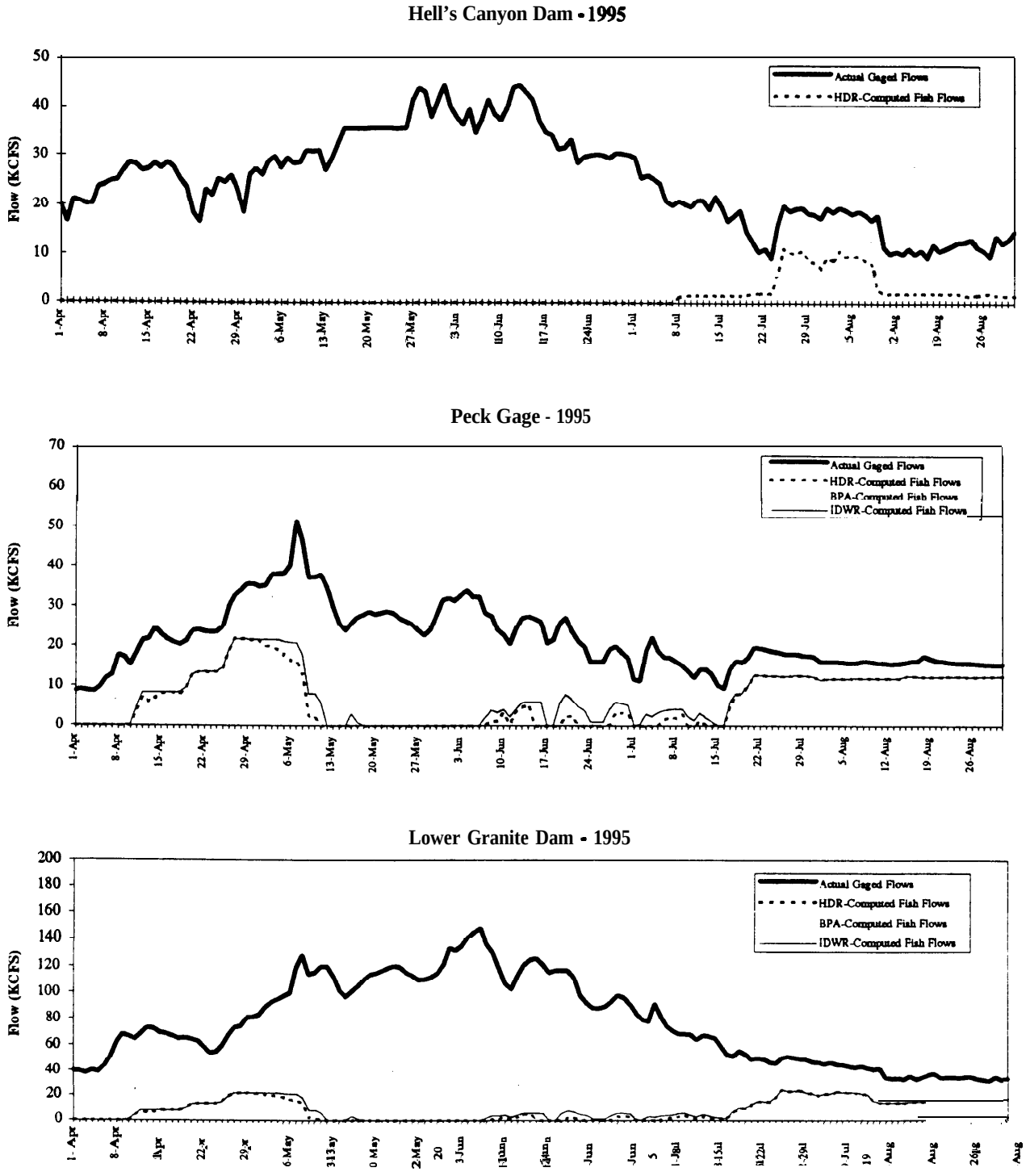


Figure 5: Daily river flows (uppermost bold, solid line) for the Upper Snake River (as measured at Hell's Canyon), Clearwater River (as measured at Peck, ID Gage) and Lower Granite Dam (as calculated by HDR) for 1 April to 31 August 1995. Three estimates of the flow augmentation water (lower dashed lines) and corresponding release dates as measured at Hell's Canyon and Peck. ID gages are indicated. In the bottom graph, the sum of the Snake and Clearwater flow augmentation releases are displayed.

3.2 Biological Evaluation

3.2.1 Migration Timing and Flow Augmentation Timing:

Generally, wild spring/summer yearling chinook, wild steelhead, and Snake River sockeye encountered the spring flow augmentation. Subyearling fall chinook were the primary stock that encountered the summer flow augmentation (Figures 6 - 10).

For all years examined, more than 60% of the wild spring/summer chinook index populations and wild steelhead passed Lower Granite Dam coincidentally with flow augmentation. However, the co-occurrence was greatest in 1994 (Table 4) when greater than 95% of both stocks encountered FA. The proportion of sockeye coincidental with augmentation was quite variable (range = 1 l%-95%) with highest coincidence in 1994 when 95% of this stock encountered FA while passing LGR Dam. For subyearling fall chinook, co-occurrence between passage timing at Lower Granite Dam and flow augmentation generally increased throughout the years examined, as increasingly higher proportions of the total FA was shifted into the summer period (Table 3).

Table 4: Percentage of annual smolt passage that co-occurred with flow augmentation at Lower Granite Dam.

	Spring/Summer Chinook[1]	Steelhead	Sockeye[3]	Subyearling Chinook[4]
1991	60.0	60.8	30.0	35.0
1992	89.2	77.9	81.8	29.9
1993	86.7	68.7	66.7	84.2
1994	97.9	94.8	94.9	64.1
1995	66.5	61.4	11.1	91.0

1 - Based on NMFS wild spring/summer chinook PIT tagged groups (Achord et al. 1996)
2,4 - Using the Fish Passage Center's Smolt Passage Indices for wild steelhead, composite subyearling chinook population.
3 - Using PIT-tagged Snake River Sockeye

Although in many years a large fraction of these stocks encountered FA, the augmentation volumes they encountered varied considerably across years and among species. No consistent patterns are evident regarding the weighting of flow volumes for particular stocks (Figure 11).

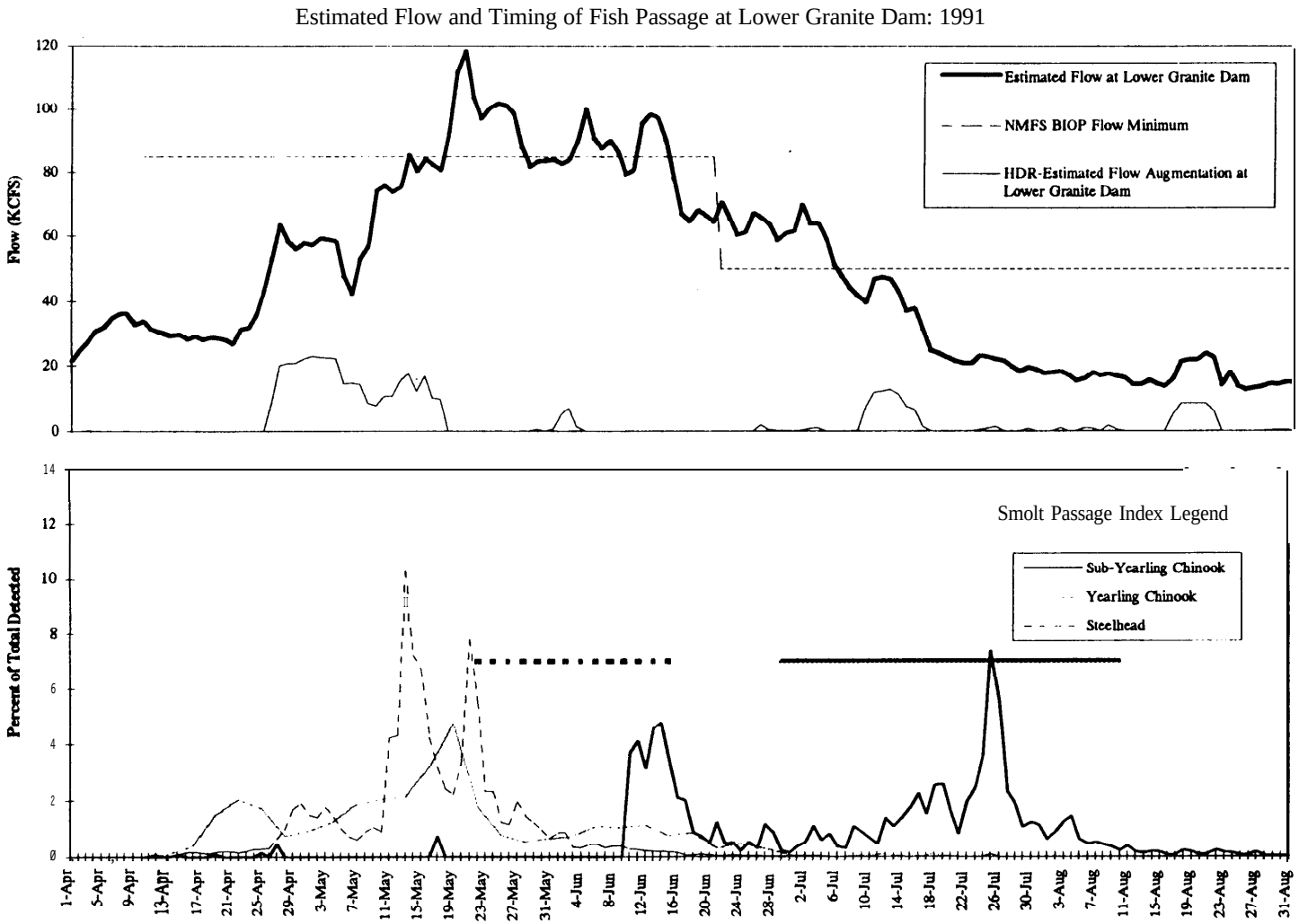


Figure 6: Estimated total flow (heavy solid line in upper graphic), augmentation (fine solid line in upper graphic) and observed fish passage (solid and dashed lines in lower graphic) at Lower Granite Dam between 1 April and 3 1 August 1991. Horizontal dashed line in upper graphic indicates the NMFS BIOP for minimum flow in the spring and summer. Horizontal solid line in lower graph indicates middle 90% passage of PIT-tagged wild, subyearling fall chinook. Horizontal dashed line in lower graphic indicates 100% passage of PIT-tagged wild, sockeye.

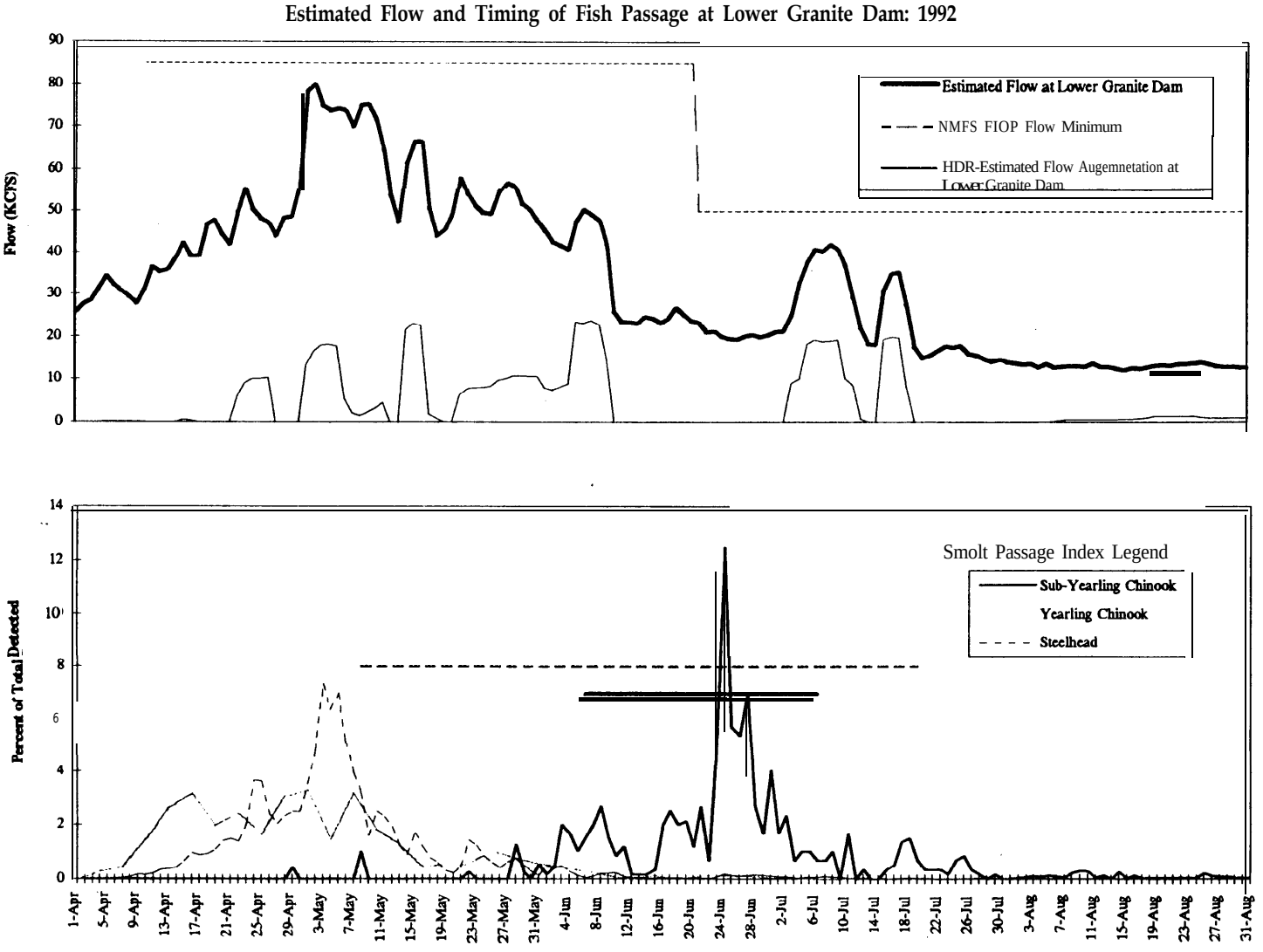


Figure 7: Estimated total flow (heavy solid line in upper graphic), augmentation (fine solid line in upper graphic) and observed fish passage (solid and dashed lines in lower graphic) at Lower Granite Dam between 1 April and 31 August 1992. Horizontal dashed line in upper graphic indicates the NMFS BIOP for minimum flow in the spring and summer. Horizontal solid line in lower graph indicates middle 90% passage of PIT-tagged wild, subyearling fall chinook. Horizontal dashed line in lower graphic indicates 100% passage of PIT-tagged wild, sockeye.

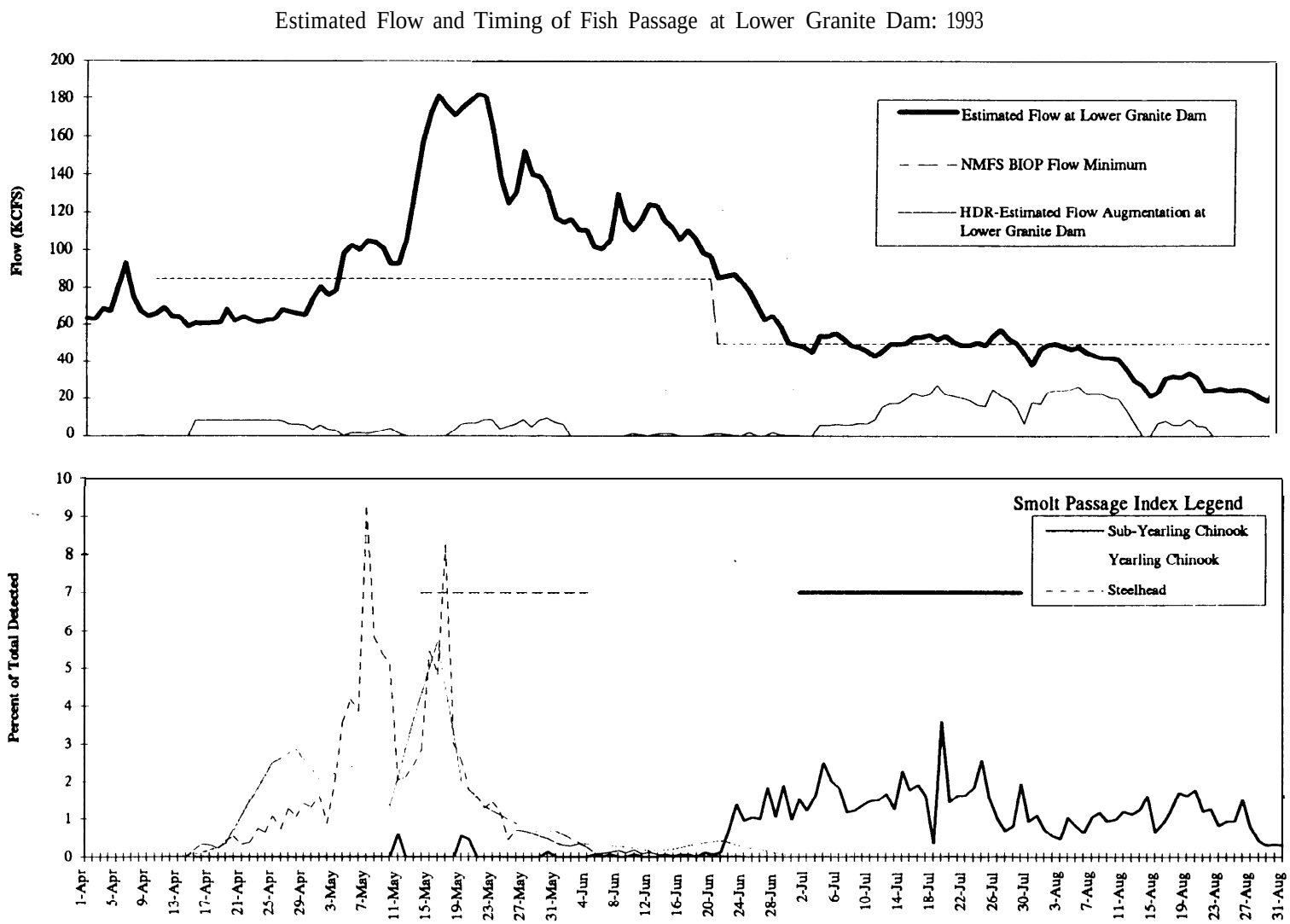


Figure 8: Estimated total flow (heavy solid line in upper graphic), augmentation (ftne solid line in upper graphic) and observed fish passage (solid and dashed lines in lower graphic) at Lower Granite Dam between 1 April and 31 August 1993. Horizontal dashed line in upper graphic indicates the NMFS BIOP for minimum flow in the spring and summer. Horizontal solid line in lower graph indicates middle 90% passage of PIT-tagged wild, subyearling fall chinook. Horizontal dashed line in lower graphic indicates 100% passage of PIT-tagged wild, sockeye.

Estimated Flow and Timing of Fish Passage at Lower Granite Dam: 1994

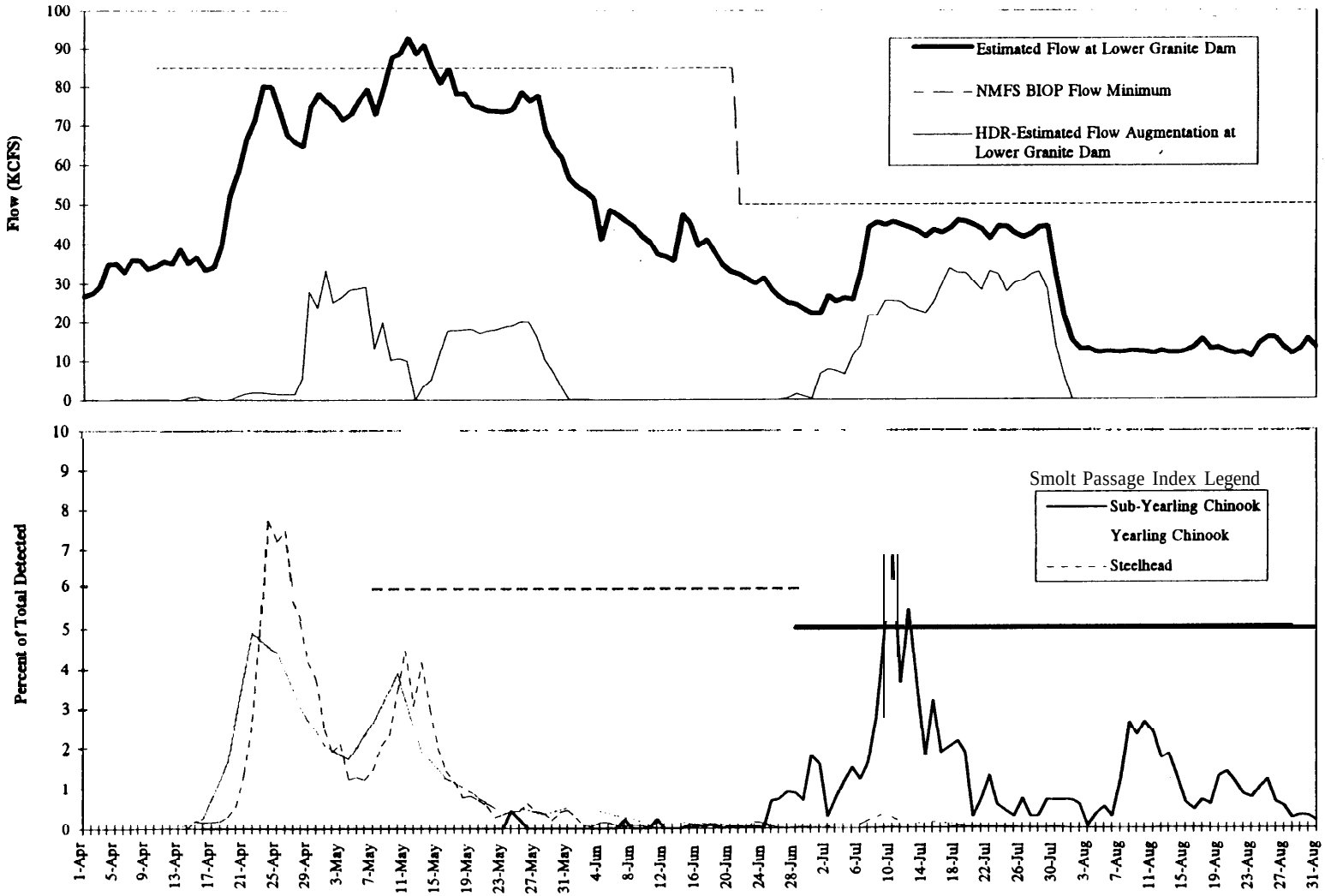


Figure 9: Estimated total flow (heavy solid line in upper graphic), augmentation (fine solid line in upper graphic) and observed fish passage (solid and dashed lines in lower graphic) at Lower Granite Dam between 1 April and 31 August 1994. Horizontal dashed line in upper graphic indicates the NMFS BIOP for minimum flow in the spring and summer. Horizontal solid line in lower graph indicates middle 90 % passage of PIT-tagged wild, subyearling fall chinook. Horizontal dashed line in lower graphic indicates 100% passage of PIT-tagged wild, sockeye.

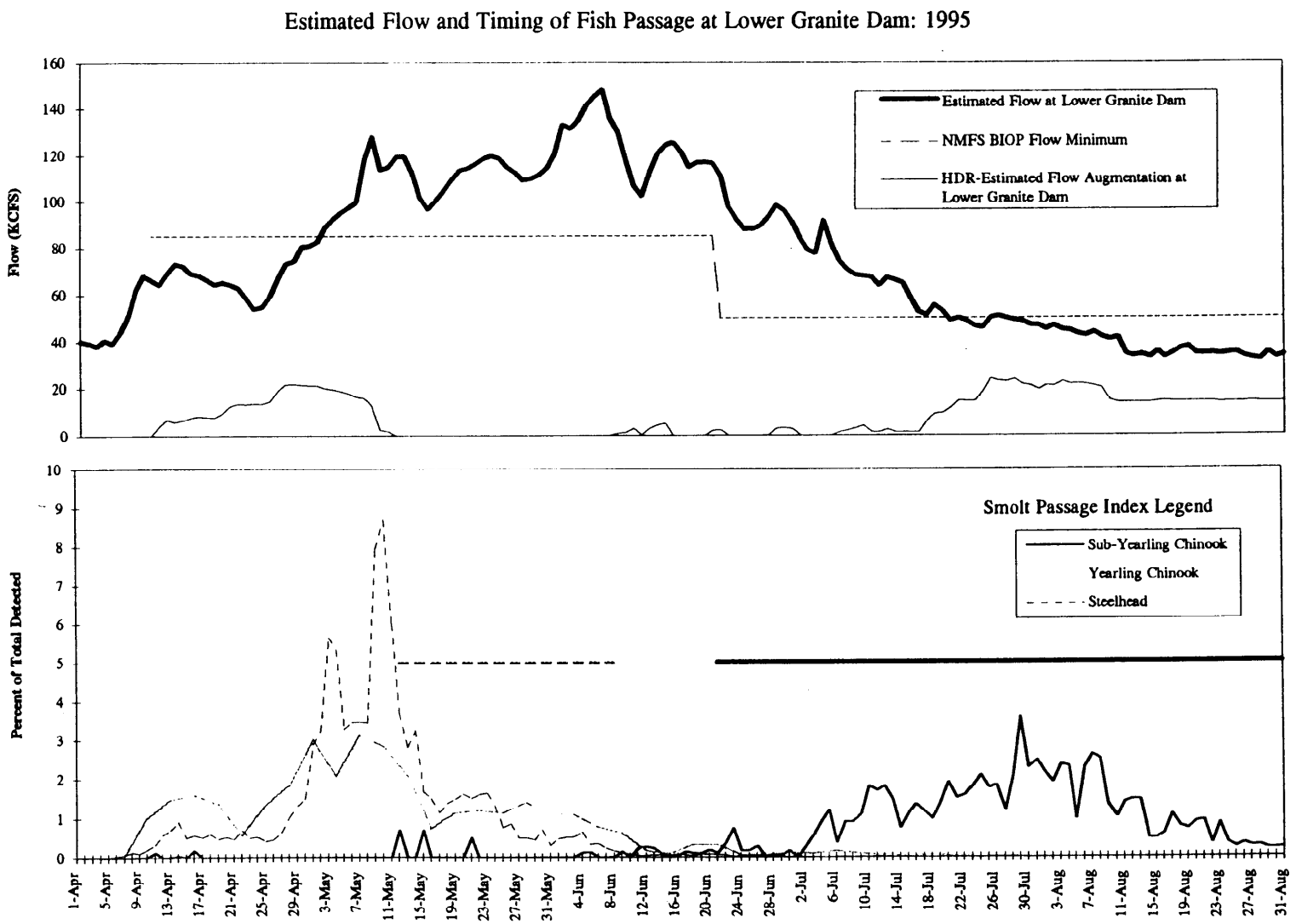


Figure 10: Estimated total flow (heavy solid line in upper graphic), augmentation (fine solid line in upper graphic) and observed fish passage (solid and dashed lines in lower graphic) at Lower Granite Dam between 1 April and 31 August 1995. Horizontal dashed line in upper graphic indicates the NMFS BIOP for minimum flow in the spring and summer. Horizontal solid line in lower graph indicates middle 90% passage of PIT-tagged wild, subyearling fall chinook. Horizontal dashed line in lower graphic indicates 100% passage of PIT-tagged wild, sockeye.

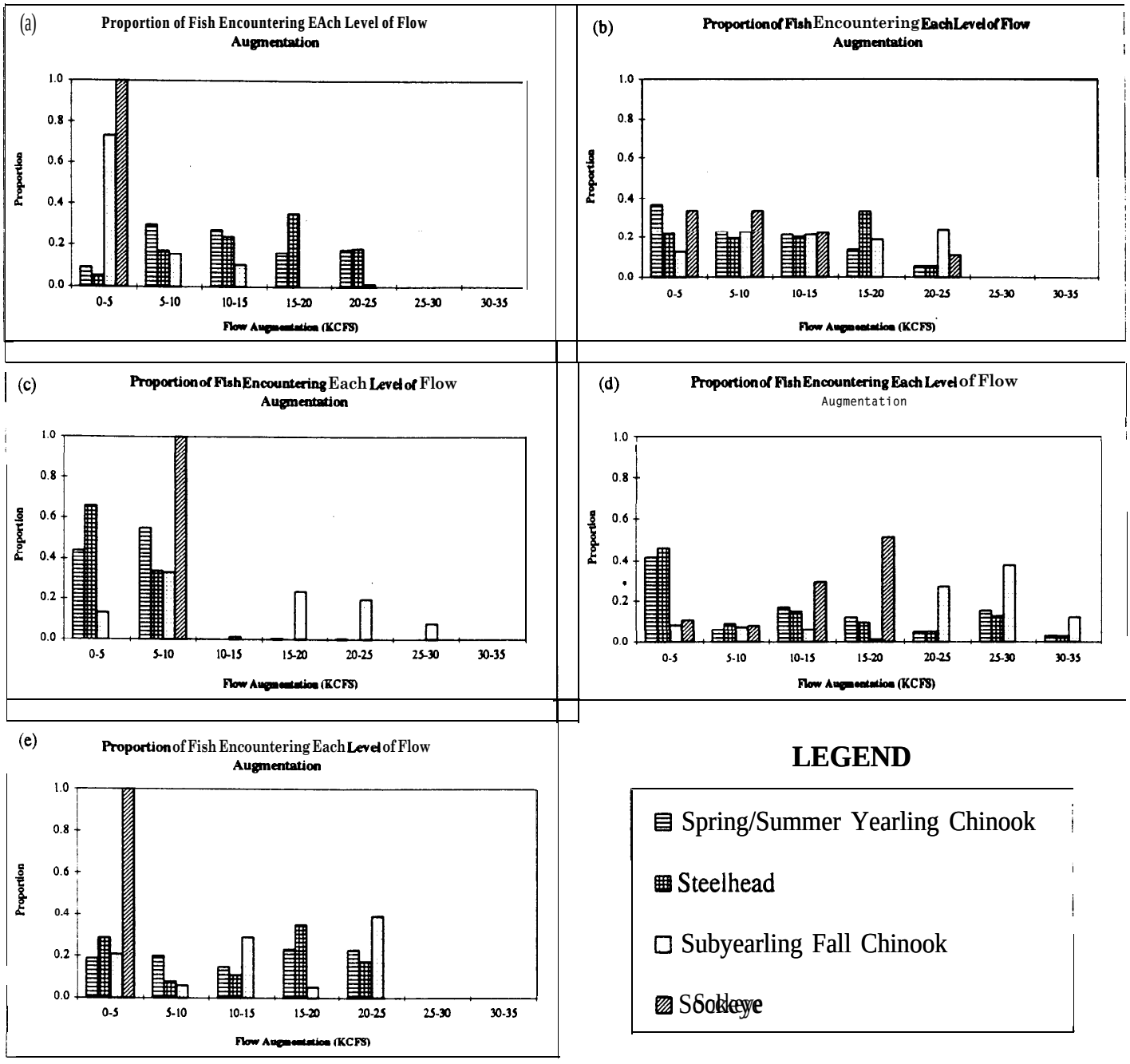


Figure 11: Of those fish that passed Lower Granite Dam during flow augmentation, proportion of fish that **passed Lower Granite** Dam while the estimated release of augmentation was within the range of flow indicated along the x-axis for the years (a) 1991, (b) 1992, (c) 1993, (d) 1994 and (e) 1995. Yearling spring/summer chinook and sockeye data are from PIT-taggd fish whereas steelhead and subyearling fall chinook data are from FPC smolt passage index.

To what extent did FA increase river discharge enough to achieve the NMFS BIOP flow targets at Lower Granite Dam?

When flow targets were realized at LGR, it was primarily due to natural runoff. Rarely were the NMFS LGR flow targets satisfied due to the contribution of FA water. Inspection of Figures 6-10 reveals that FA contributed to achieving the NMFS flow targets in only one year, during the summer migration period in 1993. However, there were obvious periods when the FA increased the natural hydrograph considerably, e.g., brief pulses of water in 1992 (Figure 7) and sustained discharges in 1994 and 1995 (Figures 9 and 10).

In 1992 the flows at LGR never reached the 85 kcfs spring target or the 50 kcfs summer target (Figure 7). For practical purposes, they were not achieved in 1994 either, since flows only reached the target for about one week (Figure 9). In all other years (1991, 1993, and 1995) the target volumes were met, but they were never sustained over the entire migratory period. Even so, in those years when the flow targets were met, a considerable proportion of some stocks passed LGR during periods when the NMFS targets were realized (Table 5). In 1993 and 1995, a vast majority of the spring-migrating wild stocks encountered flow levels at or exceeding those specified in the BIOP: 64-67 % of the wild spring/summer chinook, 83-84 % of the wild steelhead and 100% of the wild Snake River sockeye.

Table 5: Percentage of run that passed Lower Granite Dam while the flow exceeded the NMFS BIOP minimum flow during the spring (10 April - 20 June) and summer (21 June - 31 August).

	Steelhead			Yearling Chinook			Subyearling Chinook			Sockeye		
	Spring	Summer	Comb	Spring	Summer	Comb	Spring	Summer	Comb	Spring	Summer	Comb
1991	43.6	0.4	44.0	33.8	3.3	37.1	16.8	8.2	25.0	50.0	0.0	50.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	84.4	0.1	84.5	66.9	2.2	69.1	2.5	13.6	16.0	100	0.0	100
1994	20.5	0.0	20.5	16.6	0.0	16.6	0.0	0.0	0.0	28.2	0.0	28.2
1995	83.3	0.3	83.6	63.8	2.9	66.7	4.5	23.4	27.9	100	0.0	100

3.2.2 Changes in Water Velocity Attributable to FA:

We compared the water velocity through Lower Granite Pool at different river discharge volumes, as predicted by the CRiSP and HEC-2 models. CRiSP consistently predicted lower velocities (Figure 12). At 60,000 and 120,000 cfs the velocity difference translates to 0.37 and 0.18 days WPTT, respectively. These differences are small and of little practical concern, since

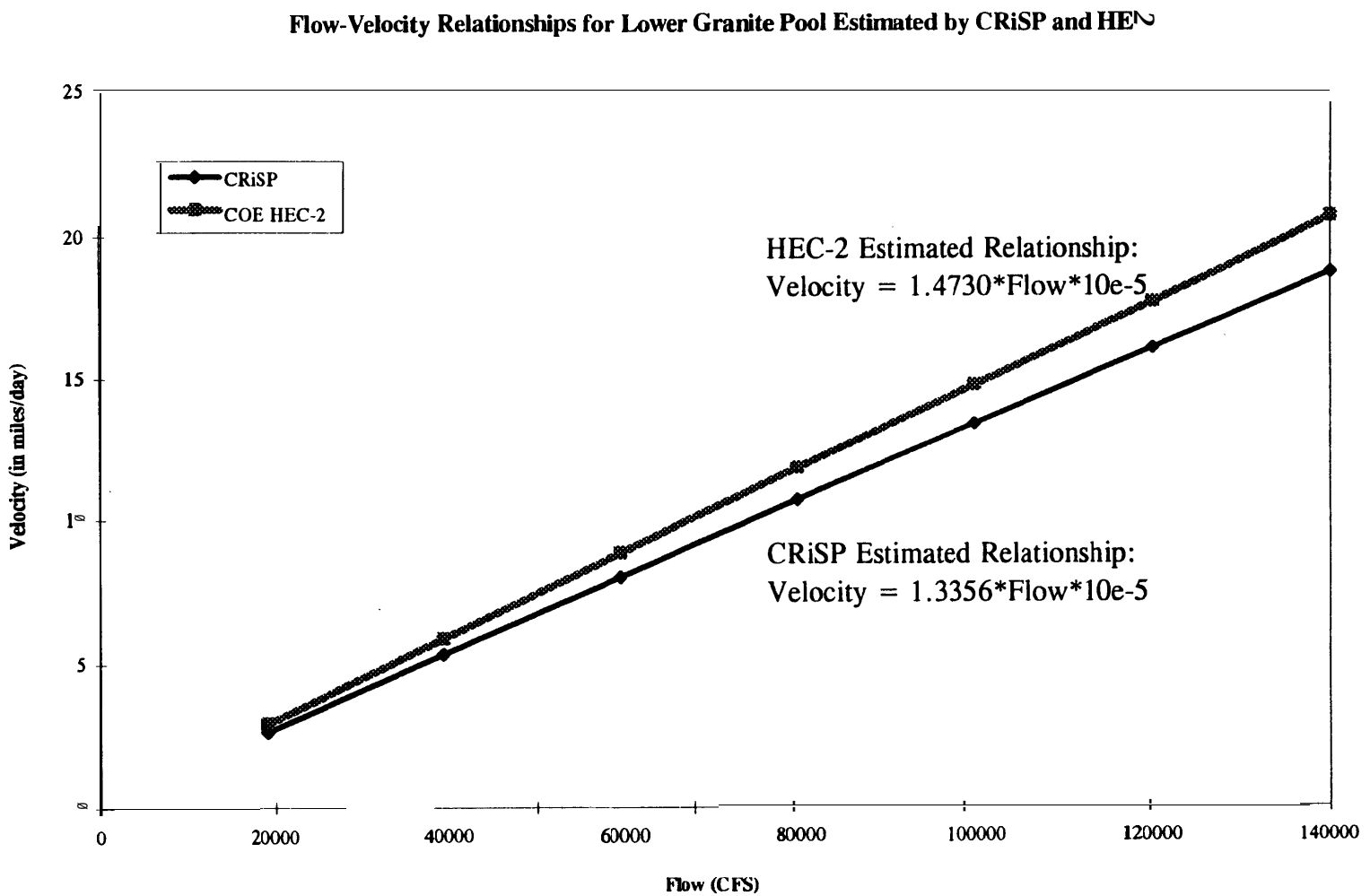


Figure 12: Linear functions relating water velocity to river discharge volume through Lower Granite Pool for the CRiSP and the Corps of Engineers' HEC-2 models.

available analytical tools function in time steps of at least one day. Therefore, in our subsequent analyses we use CRiSP to estimate the change in WPTT associated with flow augmentation.

The FA volumes as calculated by the three different entities (HDR, BPA and IDWR) yielded similar estimates of WPTT through LGR Pool, during both the spring and summer periods, across all five years (Figure 13). Since the predicted WPTT estimates were so similar, we have selected the HDR-estimates of FA to characterize WPTT and associated smolt travel time in subsequent analyses. The reader is reminded that for flexibility in presentation, when displaying these types of data we may refer to the calculated base flows instead of FA estimates, since:

FA volume = total river discharge - estimated base flow.

During the spring, 1991-1995, flow augmentation increased water velocities through Lower Granite Pool an average of 3-13% (Figure 14). During the summer, flow augmentation contributed a much higher proportion of the net water velocity through the pool, increasing it by an estimated 5-38% (Figure 14). As was observed during the spring period, the proportion of the net water velocity attributable to summer flow augmentation was greatest in 1992 and 1994. In general, spring water velocity was approximately twice that estimated during the summer (Figure 13). The average water velocity during the spring ranged from 6.5 mi/day in 1992, to 14.2 mi/day in 1993. During the summer the average water velocity ranged from 2.6 mi/day in 1992 to ***7.5*** mi/day in 1995.

Did flow augmentation appreciably decrease WPTT through Lower Granite Pool?

As for net WPTT, the gains provided by FA during the spring seem modest to negligible (i.e., 3-13%; Figures 13 and 14). This is because ambient natural runoff is high during the spring and the additional flow augmentation is a small additional volumetric contribution, which translates into small changes in WPTT (Figures l-5). However, during the summer, natural runoff is low and the change in WPTT attributable to FA can be substantial (Figures 13 and 14). For example, in 1994 we estimated that averaged over the entire summer migration period, FA increased water velocity through LGR Pool by 38% above what it would have been with only natural runoff. However, net water velocity during the summer still remains slow, averaging about 2.6-7.5 mi/day during the study years. This is less than half the velocity realized during the spring migration period.

3.2.3 Changes in Smolt Travel Time Attributable to FA:

Yearling Chinook Salmon

The CRiSP model predicts small to negligible changes in yearling chinook travel time from LGR Dam to McNary Dam, as associated with FA. When there is a change, typically the reduction in travel time does not exceed one day (Figure 15). Expressed as the mean percentage decrease in travel time each year, estimates ranged from O-5% over the five years (Figure 16).

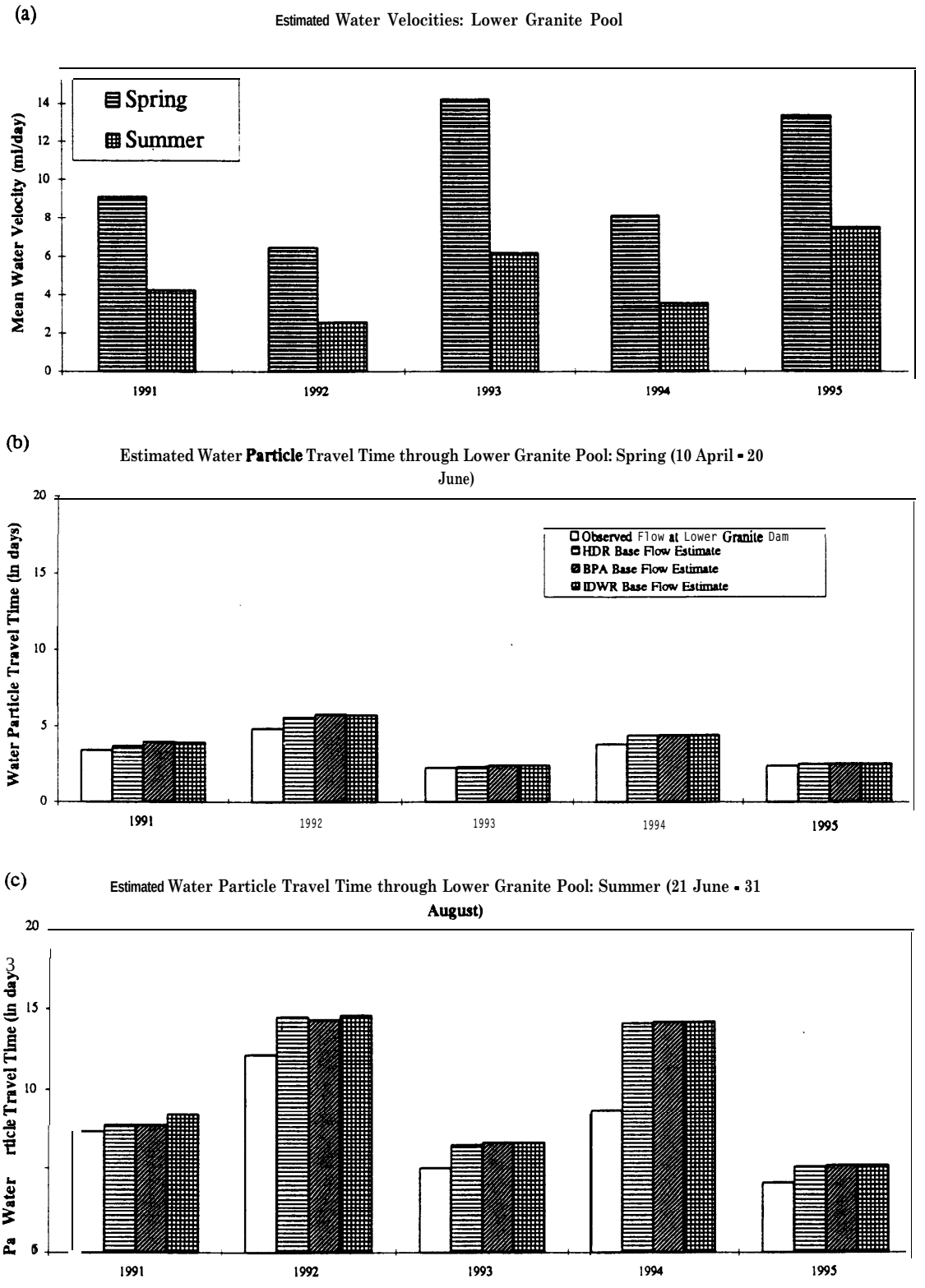


Figure 13: Effect of flow-augmentation on (a) water velocities and (b and c) travel times through Lower Granite Pool (Rk 522.224 to Rk 522.173; Rm 324.139 to Rm 324.108) during the spring (10 April - 20 June) and summer (21 June - 31 August) for 1991-1995 as estimated by CRiSP. The four columns represent the estimated water particle time under (from left to right) observed conditions, and under base flow conditions as estimated by HDR, BPA and IDWR respectively.

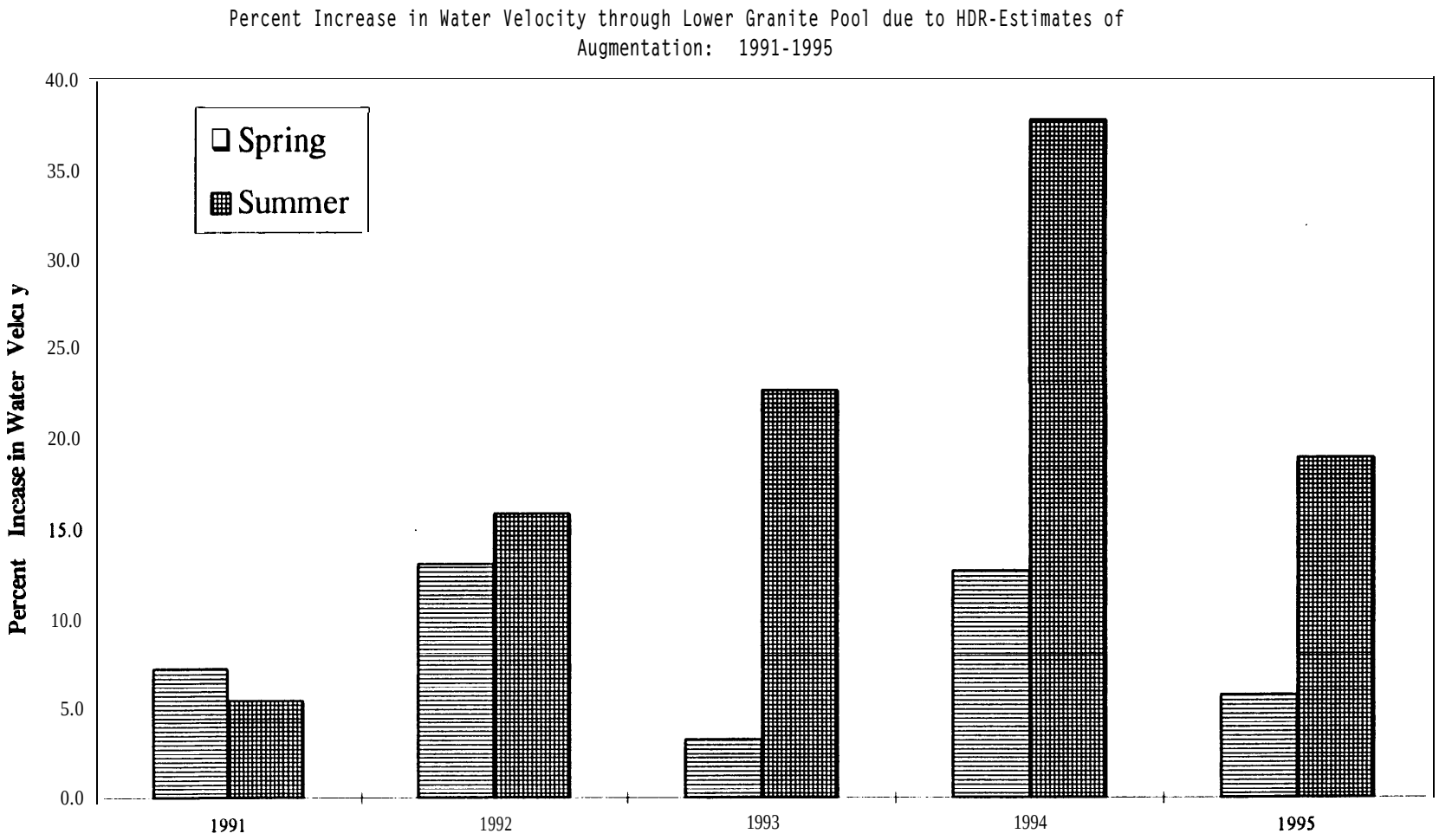


Figure 14: Estimated increase in water velocity (as a percentage of total velocity) that is attributable to flow augmentation volumes as estimated by HDR during the springs (10 April - 20 June) and summers (21 June - 31 August) 1991-1995.

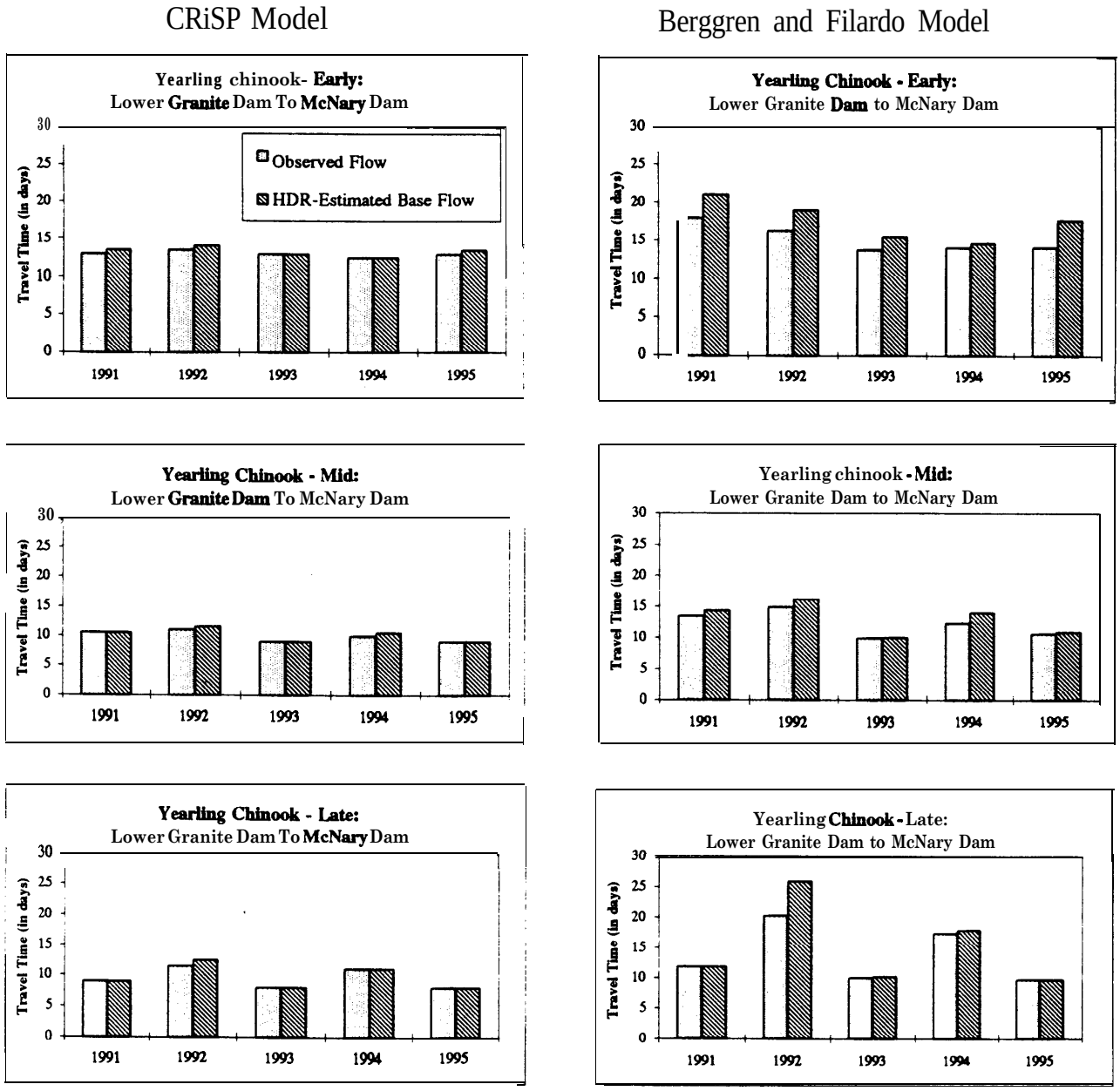


Figure 15: Estimated smolt travel times (median) for yearling chinook under actual river flow levels compared with the longer travel times that would have occurred absent flow augmentation volumes as estimated from base flows calculated by HDR. The difference between the smolt travel times estimated at actual observed flows versus the different base flows is the benefit attributable to flow augmentation. Titles "Early", "Mid" and "Late" refer to the release date (i.e., 10 April, 1 May and 25 May respectively) of the experimental group used in the model.

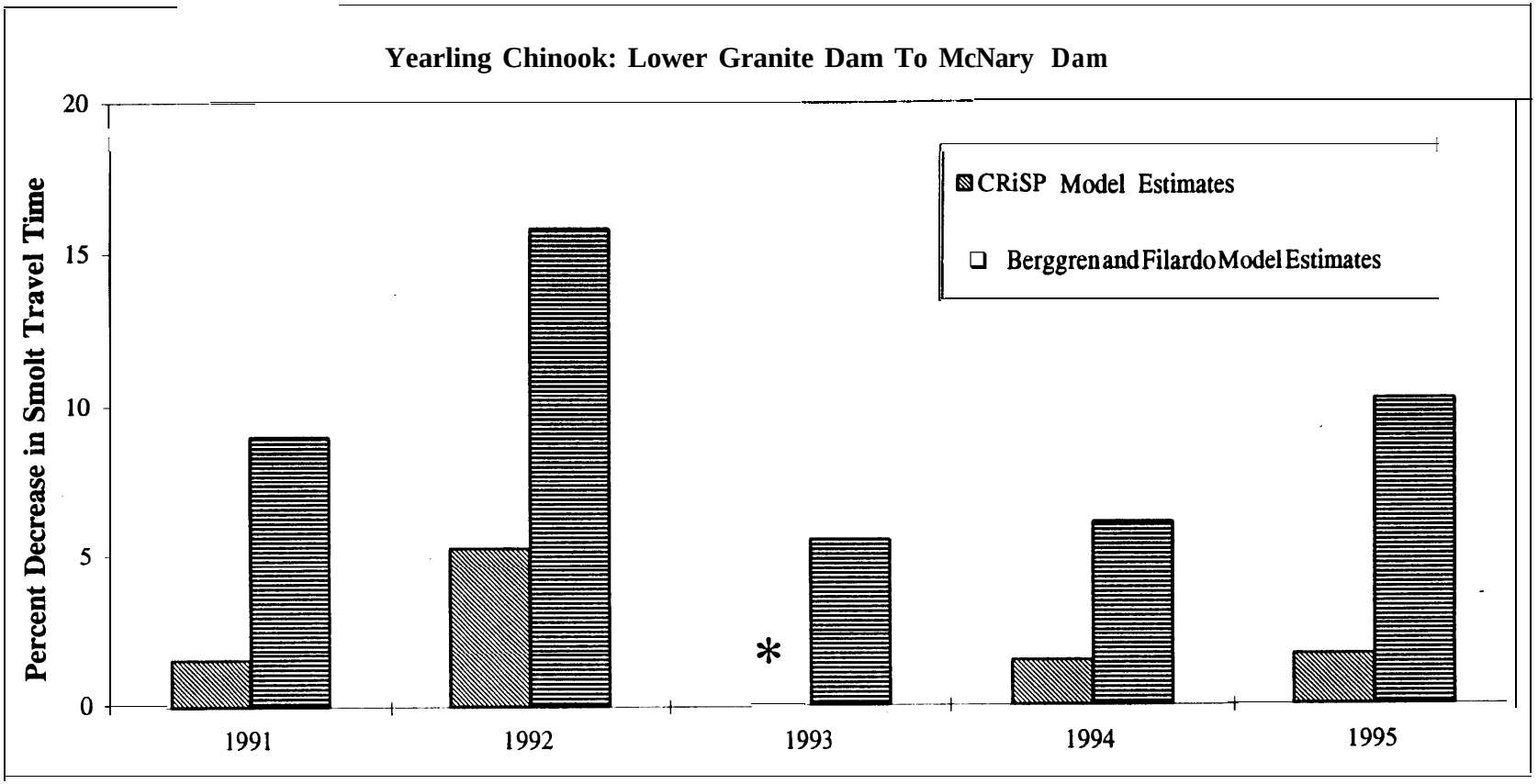


Figure 16: Percent decrease (i.e., benefit attributable to flow augmentation) in estimated smolt travel times (average of the median travel times for-each of the three release dates) for yearling chinook using base flows calculated by HDR. The asterisk in 1993 indicates that the CRiSP model predicted no change in travel time associated with flow augmentation.

The Berggren and Filardo relationship predicts more substantive changes in travel time due to FA. This is particularly evident when ambient flows are low, such as in 1992, when the decrease in travel time associated with FA was approximately one week for the late migrants (Figure 15). Correspondingly, the relative decrease in travel time attributable to FA was higher than that predicted by CRiSP, ranging from approximately 516% over the five years (Figure 16).

Steelhead

As with yearling chinook, the CRiSP model predicts small to negligible changes in steelhead travel time from LGR Dam to McNary Dam, as associated with FA. When there is a change, typically the reduction in travel time does not exceed one day, except for a few conditions when a two-day reduction was predicted (Figure 17). Expressed as the mean percentage decrease in travel time attributable to FA each year, estimates ranged from O-6 % over the five years (Figure 18).

The Berggren and Filardo relationship predicts more substantive changes in travel time due to FA. As with yearling chinook, this is particularly evident when ambient flows are low, such as in 1992, when the decrease in travel time associated with FA exceeded one week for the late migrants (Figure 17). The relative decrease in travel time was considerably higher than that predicted by CRiSP, ranging from approximately 6- 17% over the five years (Figure 18).

Subyearling chinook

The CRiSP model predicts small to negligible changes in smolt travel time through LGR Pool as associated with summer FA. Typically there is no measurable reduction in travel time except for some late migrating groups, where a one day decrease is predicted (Figure 19). This reduction in travel time is solely a function of delayed passage at Lower Granite Dam under low flows. Expressed as the mean percentage decrease each year, estimates ranged from O-10% in 1992 and 1993 respectively (Figure 20).

The Connor model (Connor et al. 1994a) presents a contrasting picture. Results are very sensitive to flow volumes, as evidenced by the great variability in travel time estimates across and within years (Figure 19). Correspondingly, the change in travel time due to FA is substantive. This is particularly evident in July 1992 when FA water comprised much of the total river flow (Figures 2 and 7); the Connor model predicted that FA decreased travel time from approximately 34 days (as predicted under ambient runoff) to 19 days (Mid Release; Figure 19). The Connor model predicts that FA reduced travel time for our index fish (i.e., 9Omm) greatly, by 19-45% in 1991-1995 (Figure 20).

CRiSP Model

Berggren and Filardo Model

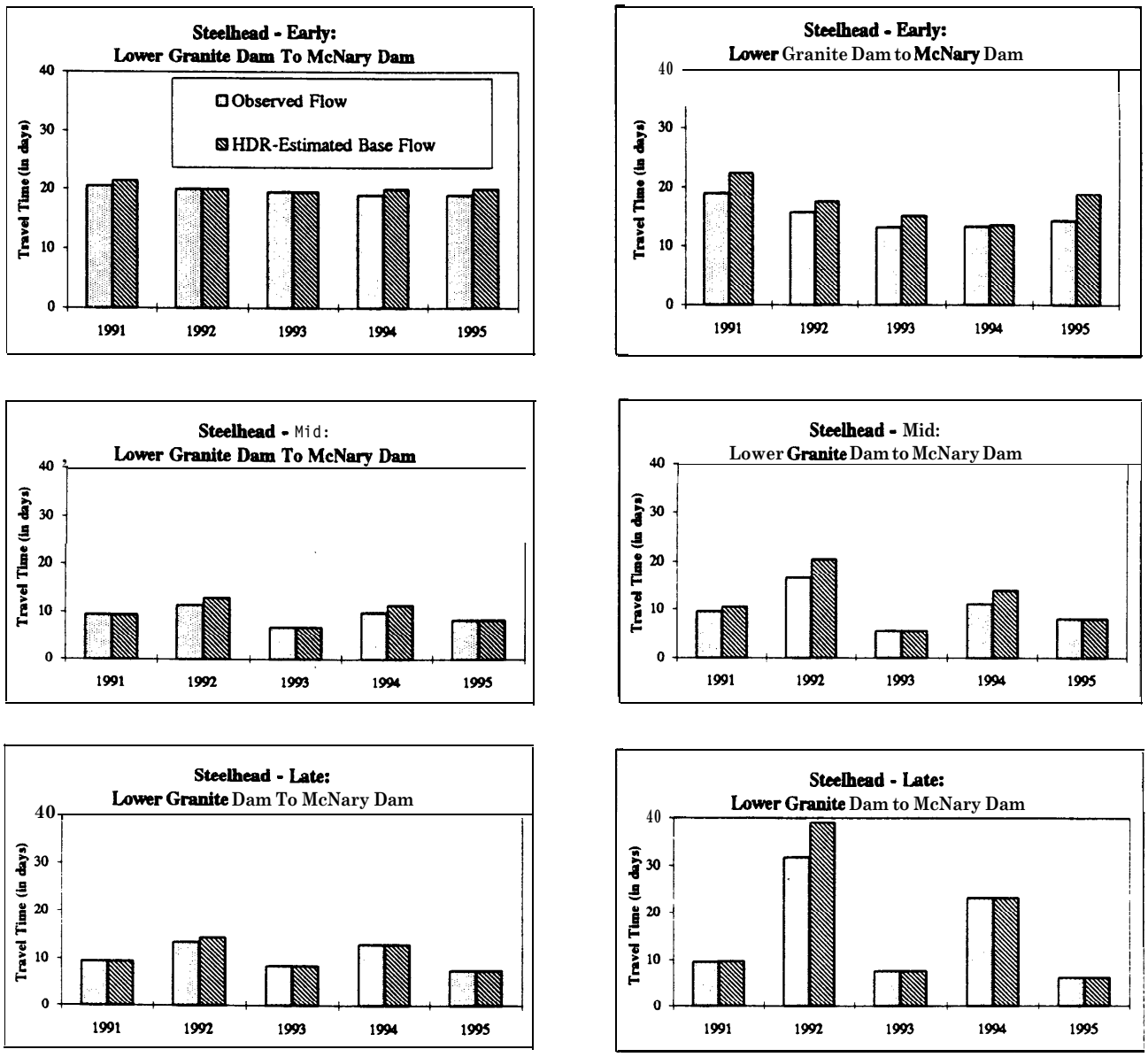


Figure 17: Estimated smolt travel times (median) for steelhead under actual river flow levels compared with the longer travel times that would have occurred absent flow augmentation volumes as estimated from base flows calculated by HDR. The difference between the smolt travel times estimated at actual observed flows versus the different base flows is the benefit attributable to flow augmentation. Titles "Early", "Mid" and "Late" refer to the release date (15 April, 10 May and 1 June respectively) of the experimental group used in the model.

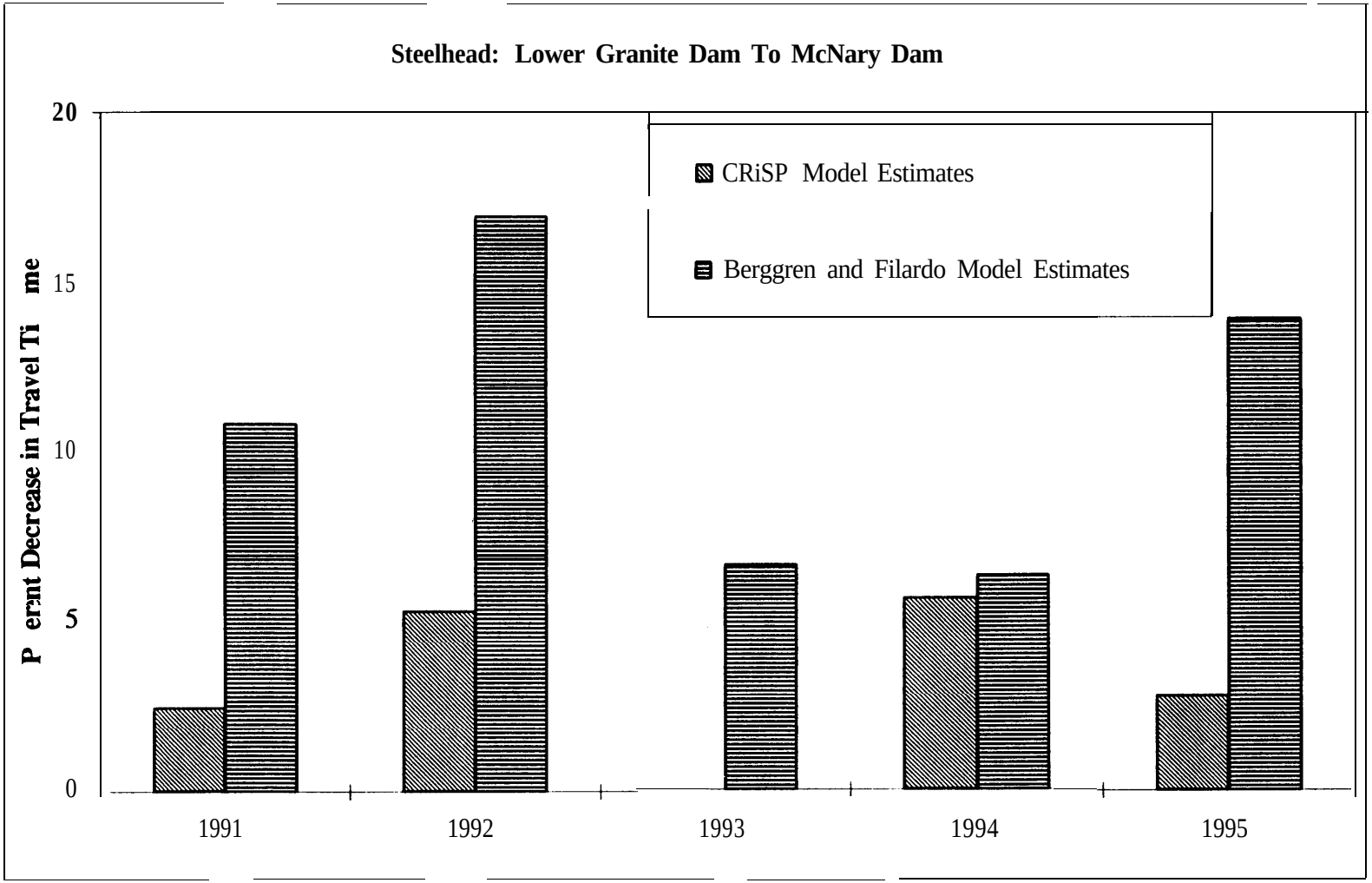


Figure 18: Percent decrease (i.e., benefit attributable to flow augmentation) in estimated smolt travel times (average of the median travel times for each of the three release dates) for steelhead using base flows calculated by HDR. The asterisk in 1993 indicates that the CRiSP model predicted no change in travel time associated with flow augmentation.

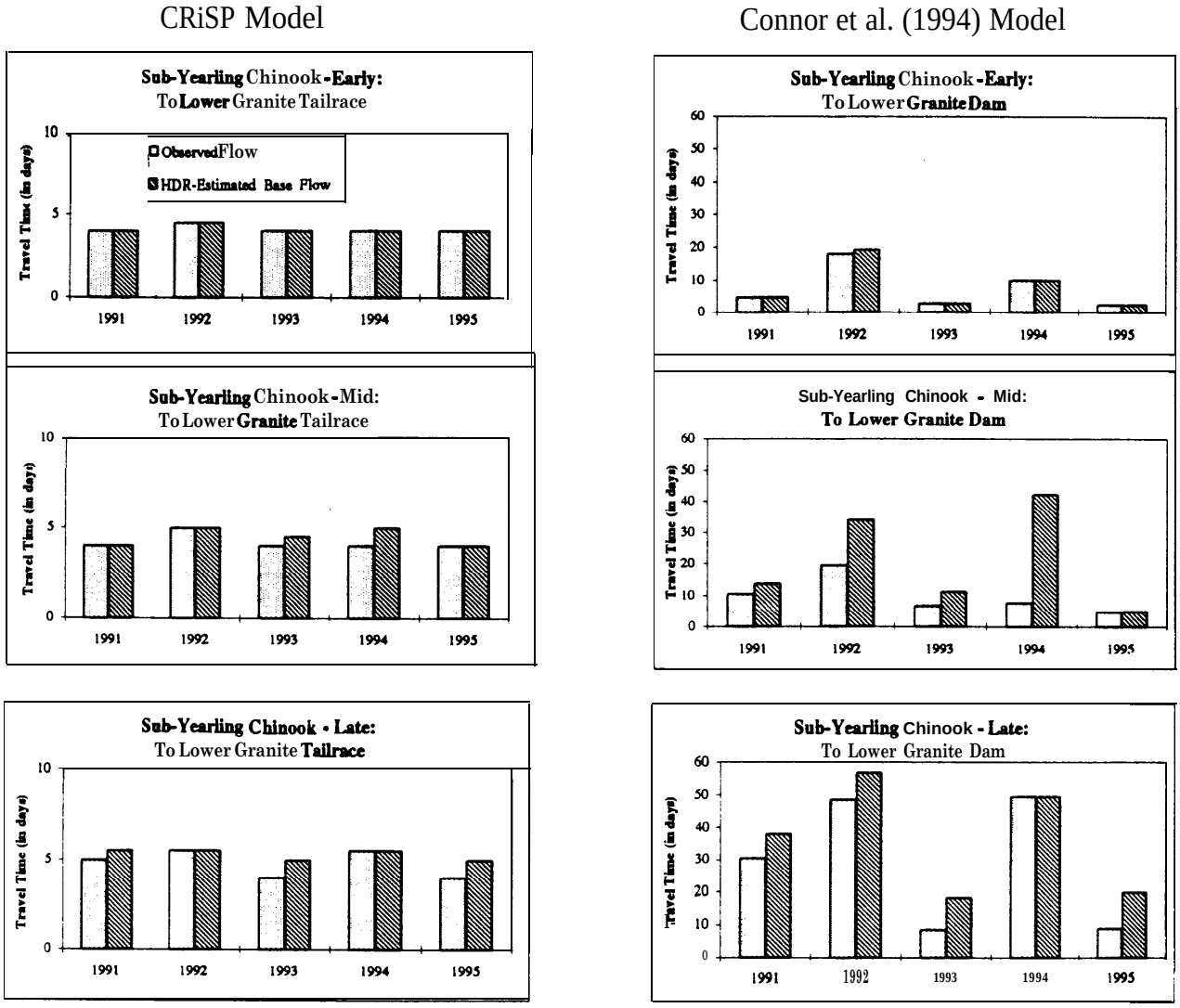


Figure 19: Estimated smolt travel times from Lewiston into Lower Granite Dam for subyearling fall chinook under actual river flow levels compared with the longer travel times that would have occurred absent flow augmentation volumes as estimated from base flows calculated by HDR. The difference between the smolt travel times estimated at actual observed flows versus the different base flows is the benefit attributable to flow augmentation. Titles "Early", "Mid" and "Late" refer to the release date (i.e., 15 June, 10 July and 5 August respectively) of the experimental group used in the model.

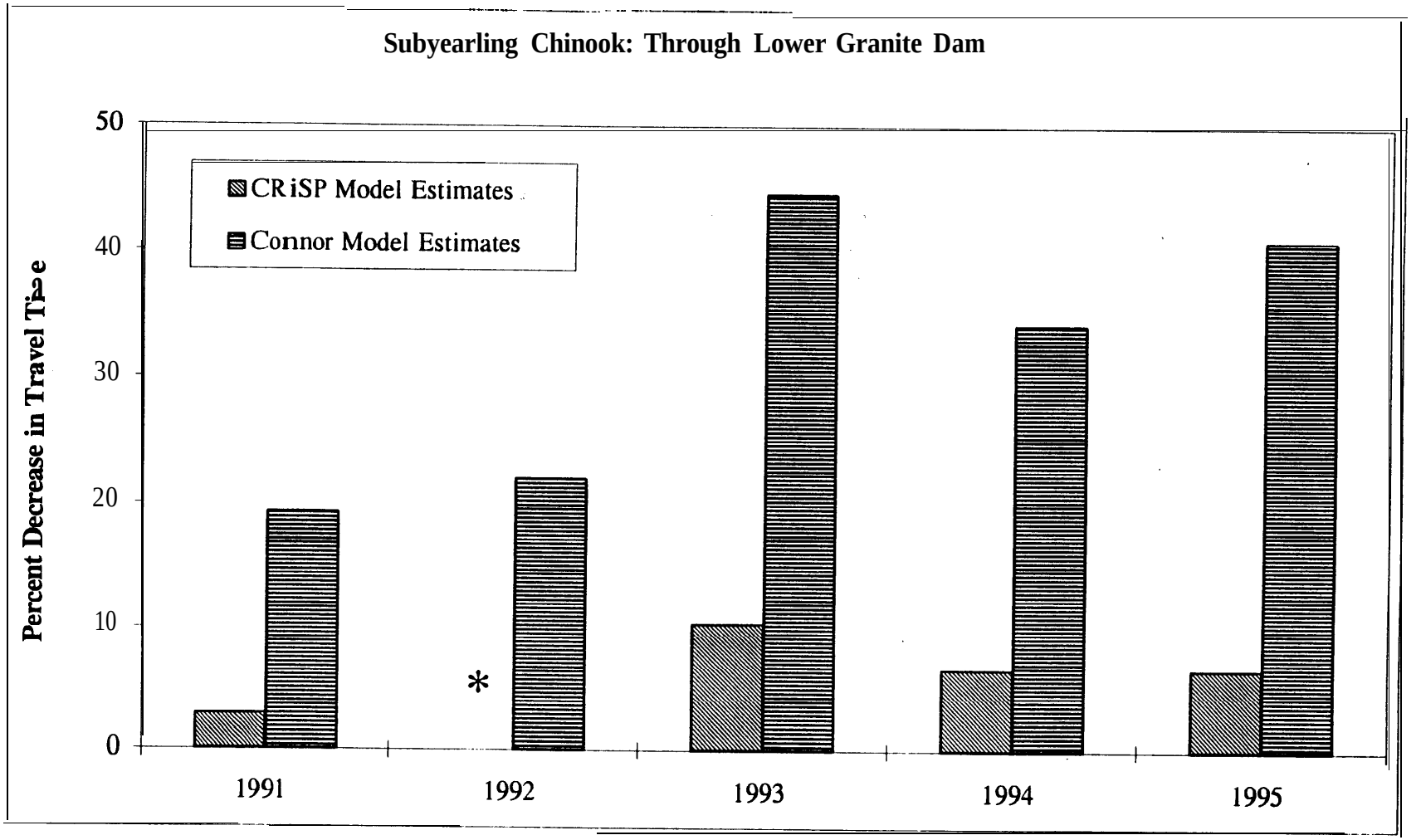


Figure 20: Percent decrease (i.e., benefit attributable to flow augmentation) in estimated smolt travel times (average of the travel times for each **of** the three release dates) from Lewiston through Lower Granite Dam for subyearling fall chinook using base flows calculated by HDR. The asterisk in 1992 indicates that the CRiSP model predicted no change in travel time associated with flow augmentation.

3.2.4 Changes in Smolt Survival As Related to FA:

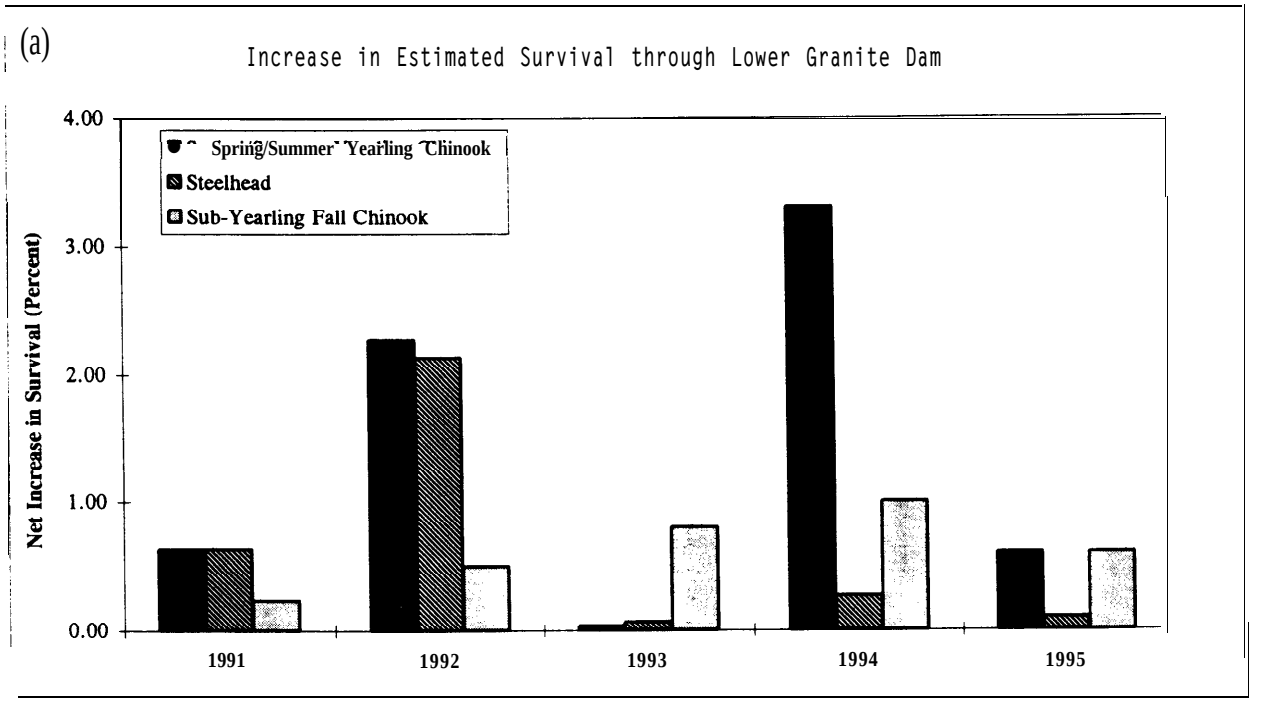
The estimated change in survival predicted by CRiSP, as attributable to flow augmentation, is small. For spring-migrating yearling chinook and steelhead, across all years, FA increased mean smolt survival by no more than 3.5% (Figure 2 1). For each species, the relative change in survival was fairly consistent regardless of the reach examined, e.g., through LGR Pool to the tailrace of the dam (Figure 2 1, upper), or to passage at Ice Harbor Dam (Figure 2 1, lower). The greatest estimated improvement in survival occurs under certain conditions, i.e., when ambient runoff was low and FA volumes were high, contributing much of the total flow. This was the case during the spring 1992, and during 1994. Steelhead did not show the same sizable gain in survival in 1994 as yearling chinook because, in the CRiSP model, steelhead are particularly sensitive to gas saturation associated with spill. This is evident in the 1995 results as well. This illustrates the difficulty in using system survival as a readily interpretable response to any single variable, e.g., flow augmentation, in a complex system.

Empirical evidence is scarce. In the summer of 1996, NMFS reported at an American Fisheries Society (AFS) conference in Eugene, OR that they observed a positive relationship between yearling chinook salmon speed and flow within the impounded Snake River, but not survival and flow (and by inference travel time). Those analyses have not yet been formally incorporated into any predictive relationship or model.

Smith et al. (1996 draft) estimated survival of hatchery fall chinook through impounded reaches of the Snake River in 1995. They reported a positive relationship between survival and river flow, from Lower Granite to Little Goose dams, and Little Goose to Lower Monumental dams. The flow index decreased steadily from approximately 64 to 25 kcfs from 11 July through 11 September, and temperatures remained relatively stable at 19 to 22°C. Corresponding travel time estimates were not reported thus it was not possible to examine the association with survival. This should be pursued by those investigators.

3.2.5 Changes in Temperature Associated with Flow Augmentation

Water releases associated with FA have the potential to affect the temperature downstream. The estimates of the magnitude and the seasonality of temperature fluctuations associated with flow augmentation depended upon which model we used. Using the multiple regression approach, FA significantly affected the water temperatures at all sites (i.e., Peck, Anatone and Lower Granite) during the summer ($p<O.OOl$; Appendix B). At Lower Granite Dam, there was a significant improvement ($p<0.03$) to the model fit by also including the spring FA; at Anatone, the improvement was marginal ($p=O.101$ for main effect and interaction combined). However, in all cases, the summer FA accounted for a larger proportion of the sums of squares than did the spring augmentation. Generally, FA during the spring was correlated to increases in the water temperature whereas FA in the summer was correlated to decreases in the water temperature. The fit to the data was greatest at Peck ($r^2=0.307$), intermediate at Lower Granite Dam ($r^2=0.144$) and least at Anatone ($r^2=0.117$). The multiple regression approach



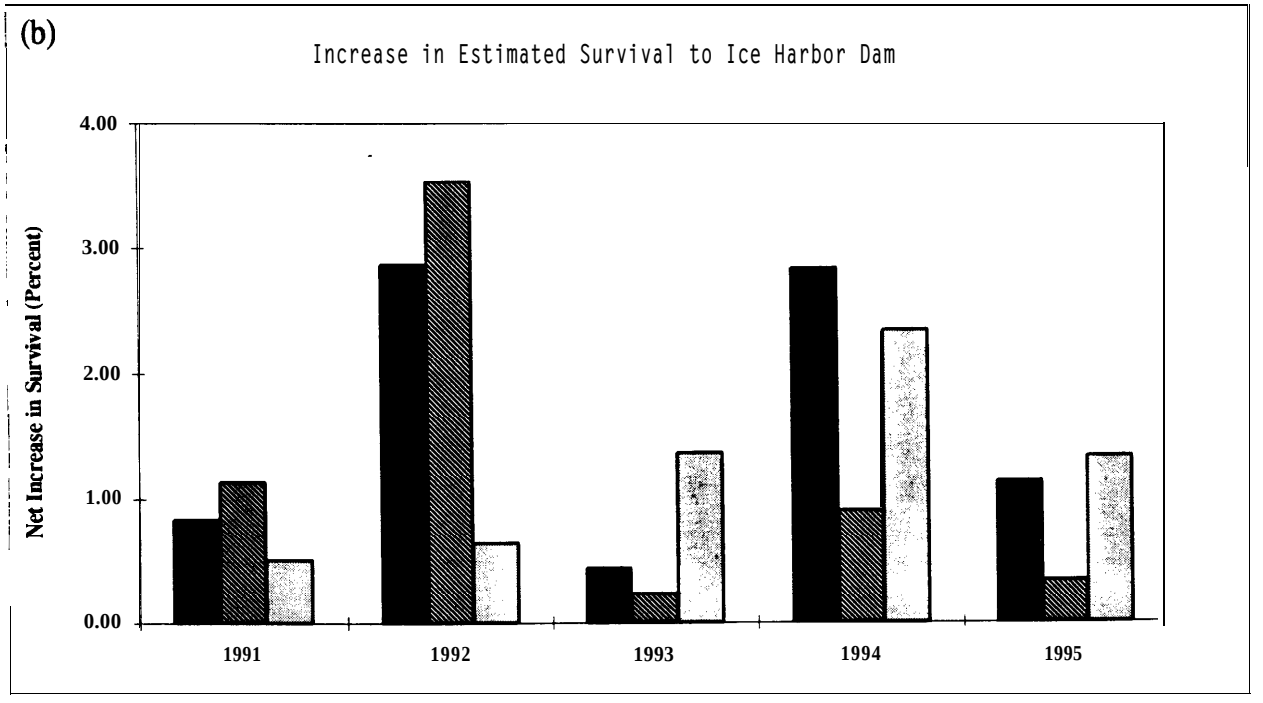
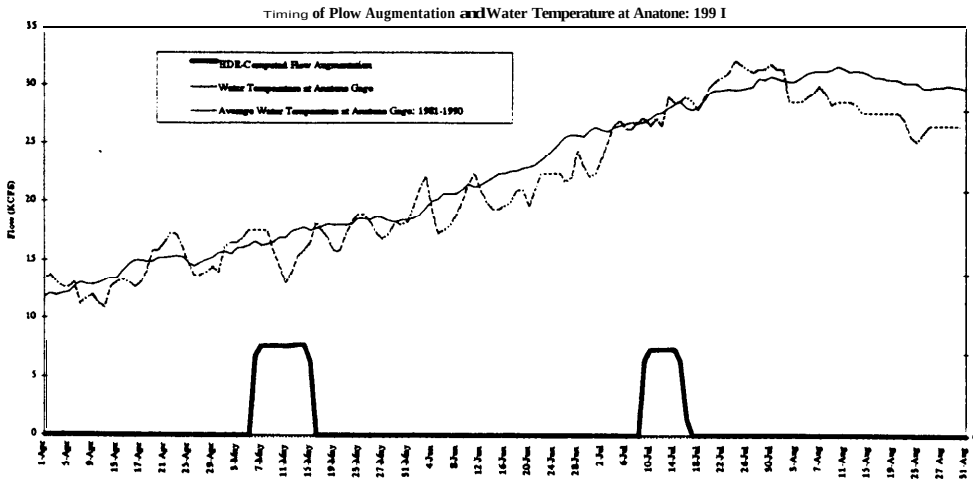


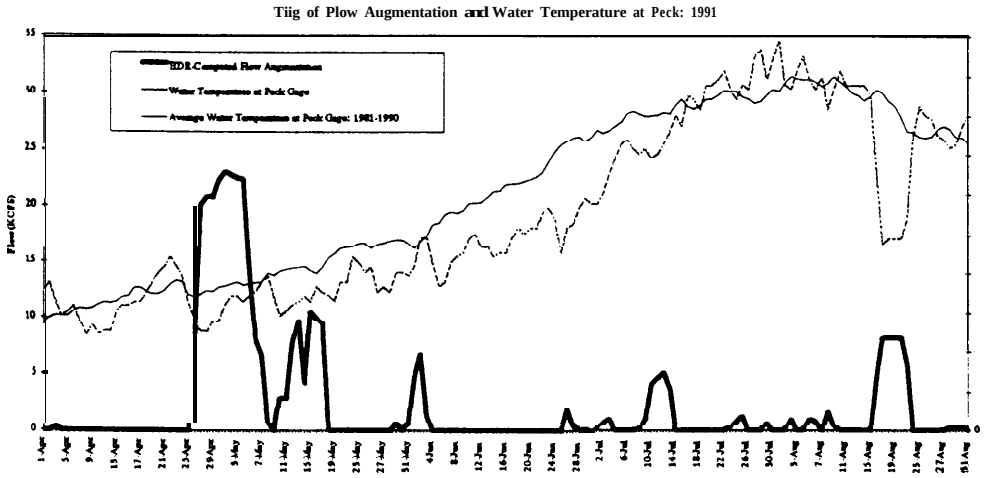
Figure 21: Average increase in survival attributable to flow augmentation for yearling chinook, steelhead and sub-yearling chinook from release point at the head of Lower Granite Pool (a) through Lower Granite Dam and (b) to Ice Harbor Dam. Survival estimates were derived using the CRiSP model under three release scenarios (i.e., Early, Mid and Late).

suffers from ignoring the autoregressive nature of the data. In doing so, the assumption of independent error terms is violated, and such an analysis would tend to attribute a greater portion of the signal to the FA than is valid. In addition, the fits to the data are poor because this autoregressive component is ignored.

Using the time series analysis, we found that only during the summer was FA significantly correlated to decreases in the water temperature. Water temperature was significantly ($p<0.0000$ **1;** Appendix B) related to either FA volume or percent contribution to total river discharge at the Peck gage and Lower Granite Dam. Water temperature decreased significantly in concert with FA. No such relationship was evident at Anatone gage ($p=0.46$). FA releases during the spring were not significantly correlated to water temperature. The fit to the data was consistent across all sites, predominantly due to the fit of the autoregressive term (at Peck ($r^2=0.875$), at Lower Granite Dam ($r^2=0.883$) and at Anatone ($r^2=0.867$)). Using the absolute FA metric always provided a slightly larger reduction in the error sums of squares. Although the time series analysis does consider the autoregressive component explicitly, the effect of the FA and the autoregressive terms are confounded. Thus, the impact of the FA is not readily interpretable from the individual regression coefficients. The result of multiple days of augmentation is to recursively decrease the temperature, partially through the effect of the FA coefficient, and partially through the effect of the autoregressive term. For instance, at Peck in 1992, without the FA coefficient, the temperature will track the mean temperature. However, after 1 day of 10 kcfs FA, the model with the FA coefficient predicts a 1.4°C decrease from the mean. After 5 days of 10 kcfs FA, the model predicts that the decrease is 5.5 °C. Similarly, at Lower Granite Dam after 1 day of 10 kcfs FA, the model with the FA coefficient predicts a 0.11 °C decrease from the mean. After 5 days of 10 kcfs FA, the model predicts that the decrease is 0.50°C.

Visual inspection of hydrologic and temperature profiles suggests that decreases in water temperature did co-occur with flow augmentation (Figures 22-26). These events were most evident above the confluence of the Snake and Clearwater Rivers. Usually, by the time the water reached Lower Granite Dam little effect was noticeable. At all sites examined, water temperature changed within two days after the initiation of the FA release. After the FA was suspended, the change in water temperature persisted for less than a week. When evident, decreases in water temperature during the summer were much more pronounced than changes observed during the spring. Furthermore, fluctuations in water temperatures measured at Peck were often more predominant than at Anatone gage. During the latter part of the summers of 1993-1995, when a greater proportion of the total flow consisted of FA water, the graphics suggest that augmentation helped to reduce the water temperature at Lower Granite by -3 °C, and in doing so, reduced the temperature to below 20" C for a week or more. Water temperature fluctuations were much more pronounced at Peck. Several times at Peck, decreases in water temperature of 6- 12°C coincided with FA releases from Dworshak. The effects associated with FA releases from Hell's Canyon were less clear. Water releases from Dworshak Reservoir travel only 29.4 miles before the effect is measured at Peck gage, and other sources contribute little to no additional flow. Also, water released from Dworshak during the summer is much cooler than





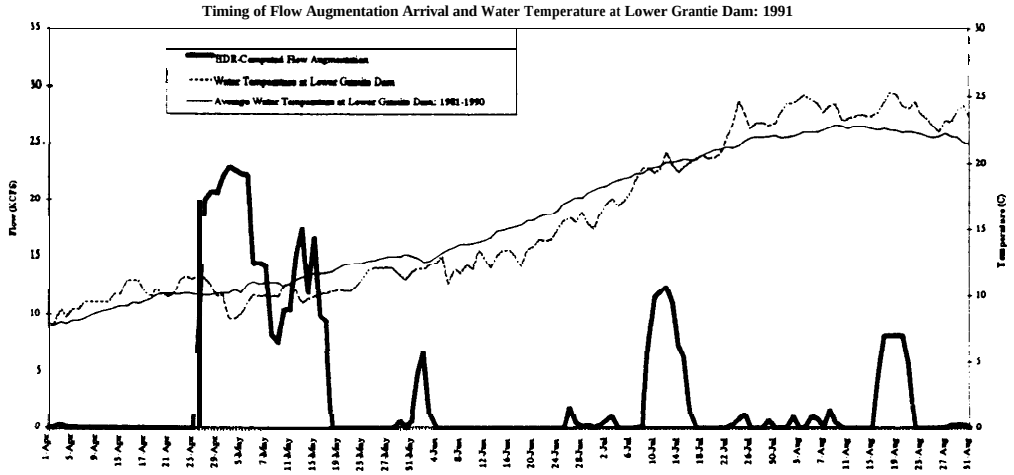
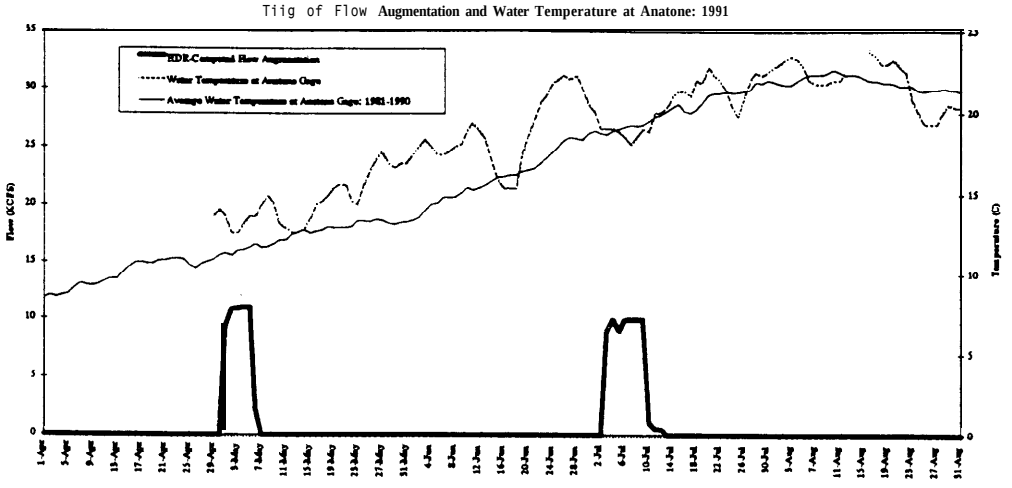
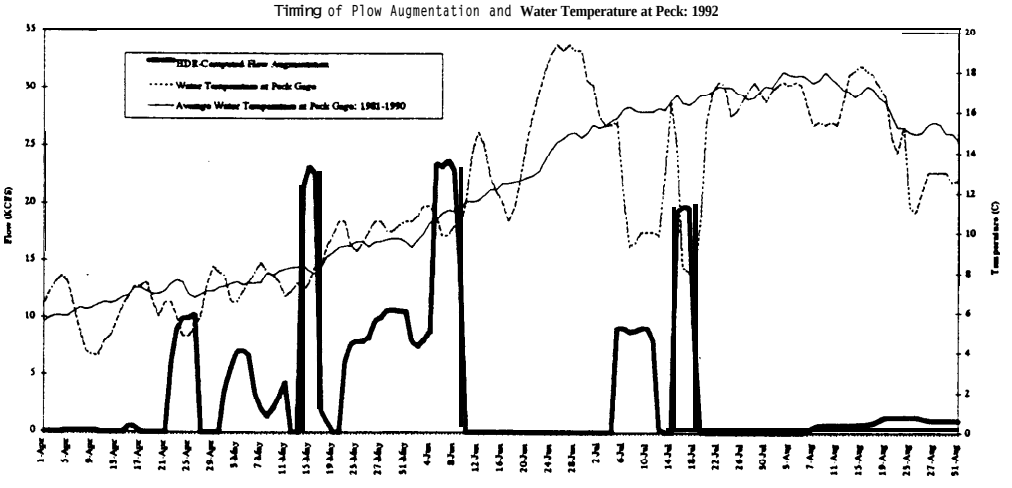


Figure 22: Timing of flow augmentation releases at Hell's Canyon, Dworshak and Lower Granite Dam along with the corresponding water temperatures at Anatone, Peck and Lower Granite Dam respectively between 1 April and 31 August 1991.





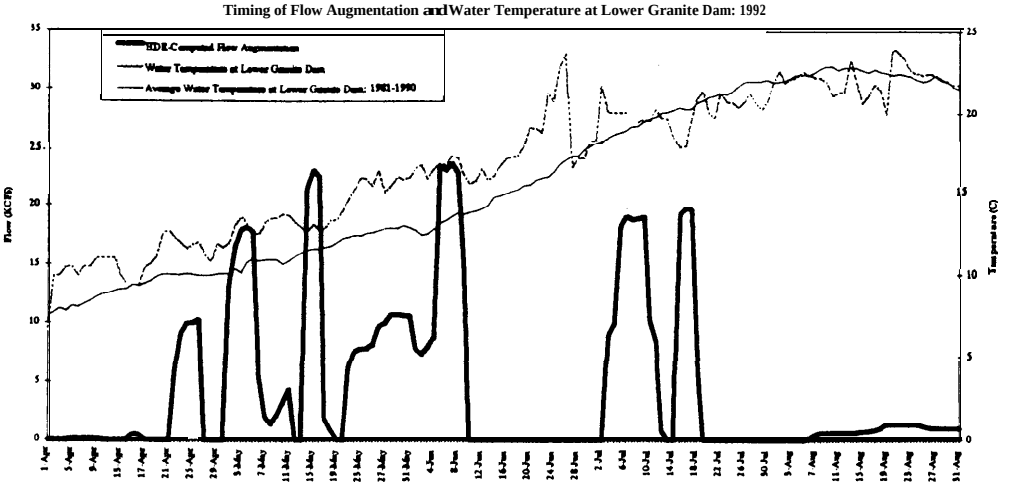
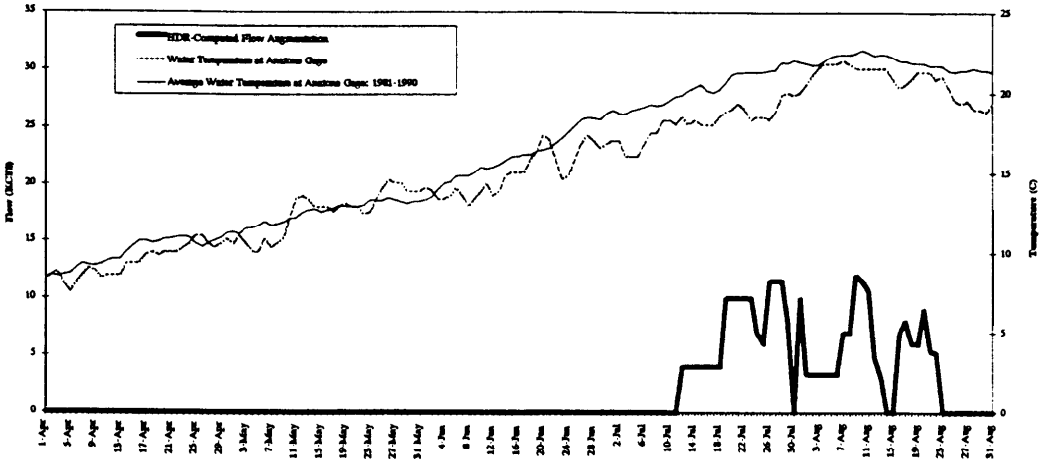
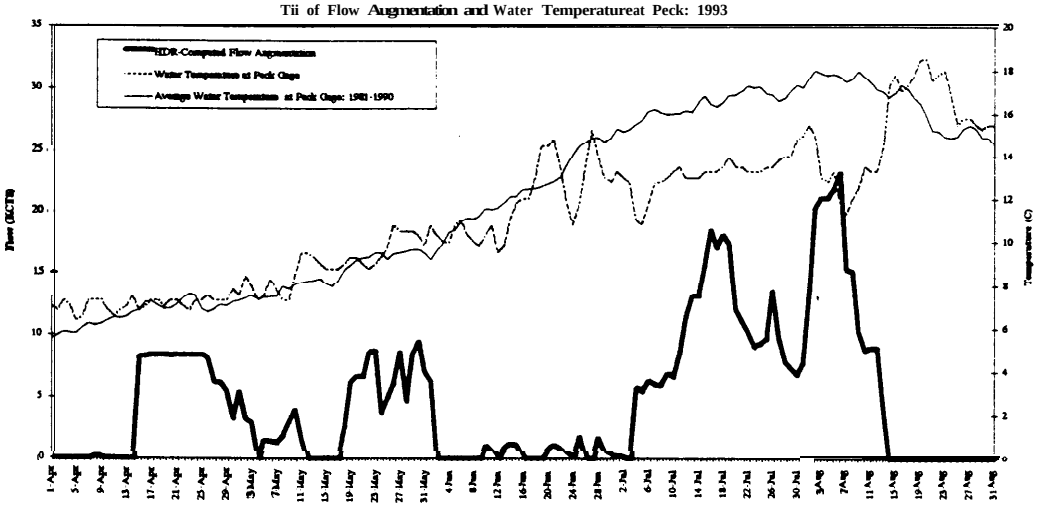


Figure 23: Timing of flow augmentation releases at Hell's Canyon, Dworshak and Lower Granite Dam along with the corresponding water temperatures at Anatonge, Peck and Lower Granite Dam respectively between 1 April and 3 1 August 1992.

Timing of Flow Augmentation and Water Temperature at Anatone; 1993



Tii of Flow Augmentation and Water Temperatureat Peck: 1993



Timing of Flow Augmentation and Water Temperature at Lower Granite Dam: 1993

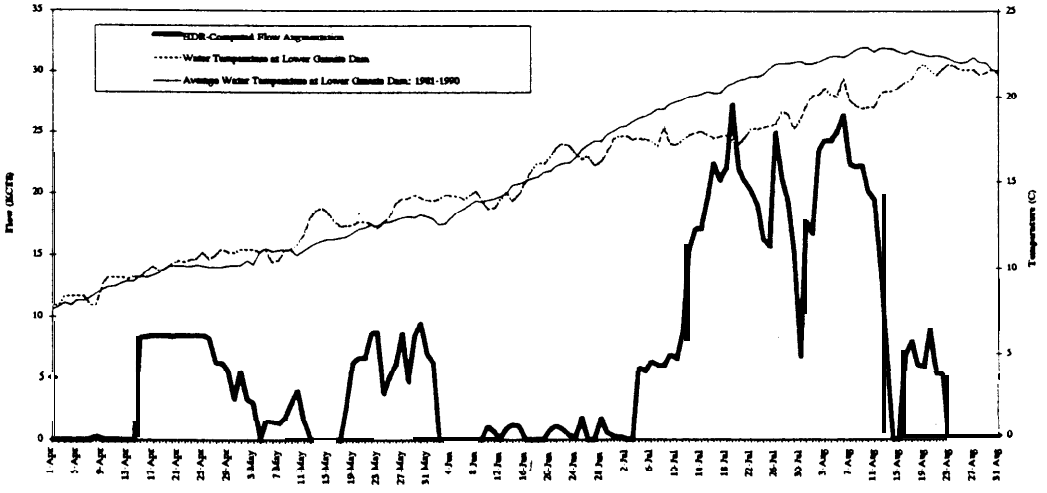


Figure 24: Tuning of flow augmentation releases at Hell's Canyon, Dworshak and Lower Granite Dam along with the corresponding water temperatures at Anatone, Peck and Lower Granite Dam respectively between 1 April and 31 August 1993.

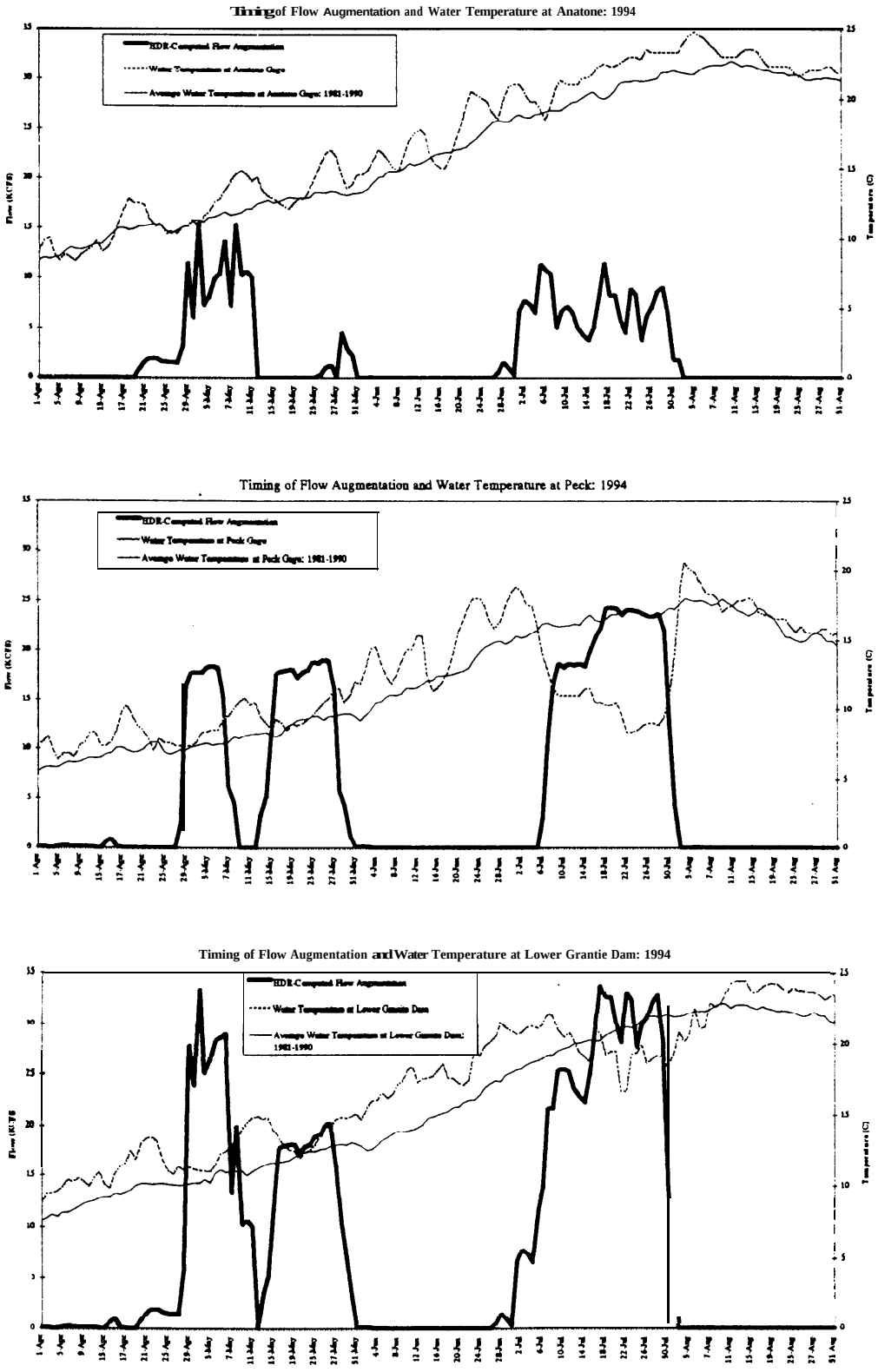
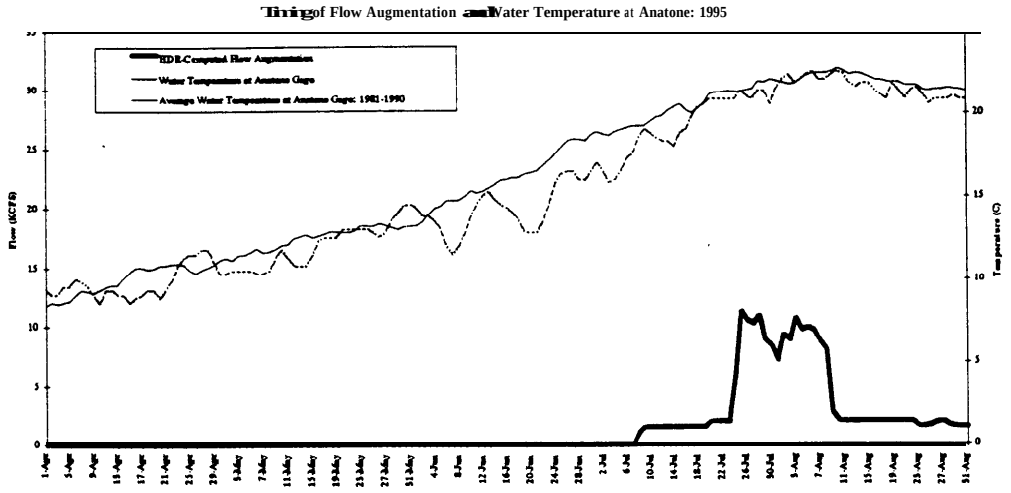
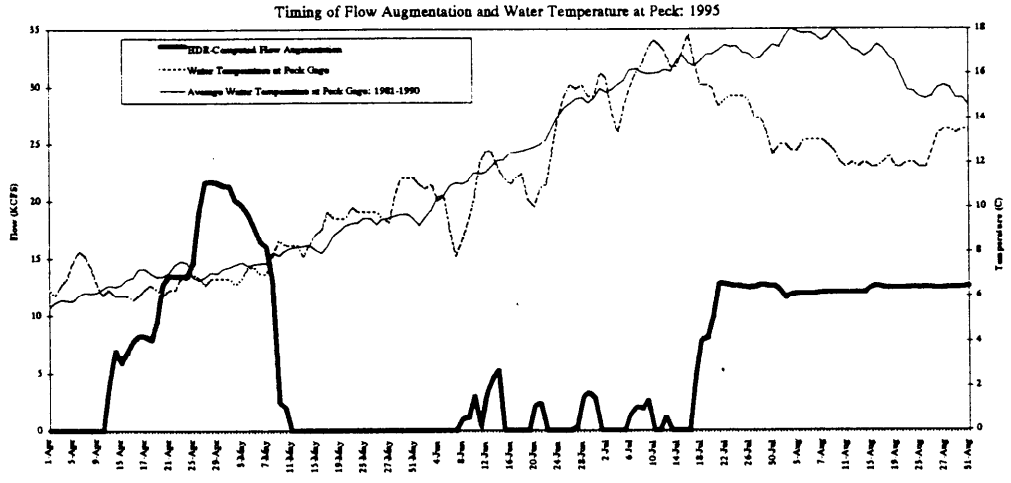


Figure 25: Timing of flow augmentation releases at Hell's Canyon, Dworshak, and Lower Granite Dam along with the corresponding water temperatures at Anatone, Peck and Lower Granite Dam respectively between 1 April and 31 August 1994.





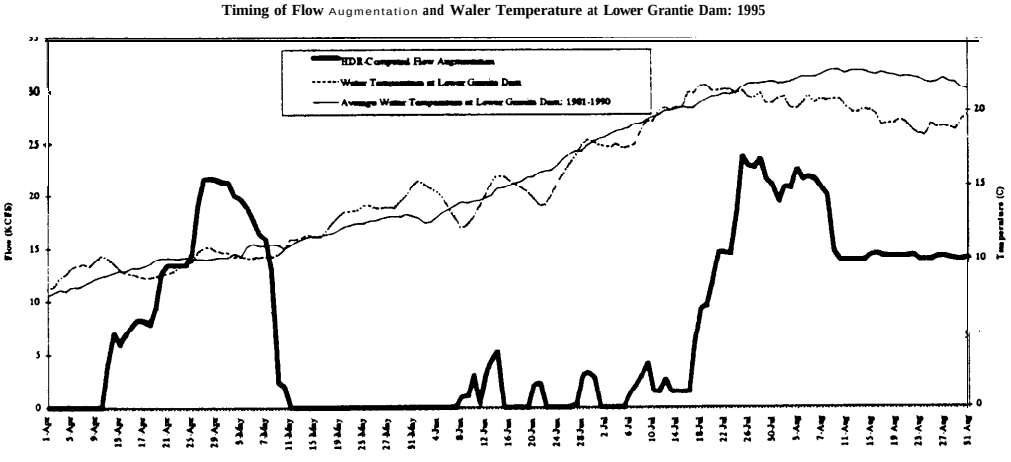


Figure 26: Timing of flow augmentation releases at Hell's Canyon, Dworshak and Lower Granite Dam along with the corresponding water temperatures at Anatone, Peck and Lower Granite Dam respectively between 1 April and 3 1 August 1995.

ambient water within the mainstem of the Clearwater River. On the other hand, releases at Hell's Canyon travel 79.6 miles before being measured at Anatone gage, during which time any impacts can be diluted. If non-summer flows in the Upper Snake Basin can be used an indicator, during the summer, flows from the Salmon, the Imnaha and the Grande Ronde Rivers likely contribute a large portion (e.g., >25%) of the flow being measured at the Anatone gage (Connor et al. 1994b).

4. DISCUSSION

From 199 l-l 995 the total volume of flow augmentation water released from storage reservoirs in the Snake Basin increased substantially from a low of 1.59 maf in 1992 to a high of 2.56 maf in 1994. The contribution from the upper Snake River exceeded the 427 kaf target requested by the NPPC and NMFS, in four of the five years, if water releases provided during September 1991 are included in the total (Table 2). In September 1991, water was released from Dworshak Reservoir as part of a temperature-control experiment to improve migratory conditions for adult salmon (Karr et al. 1992). This release could be justifiably classified as migration-related, even though it occurred outside the migratory period identified for salmon smolts (10 April - 3 1 August).

Over the same period (i.e., 199 1- 1995) there was a dramatic change in strategy regarding the allocation of FA between spring and summer migrants. Early on (i.e., 1991, 1992) the majority of the FA was provided during the spring period to improve migratory conditions for yearling chinook salmon and steelhead. In 1993-1995 the majority of the FA water was directed at juvenile fall chinook during the summer period (Table 3).

Flow augmentation during the summer clearly provided the greater percentage increase in water velocity as indexed in Lower Granite Pool (Figure 14). However, the net water velocity is still low during the summer, at approximately one-half to one-third that occurring the preceding spring (Figure 13). The higher the natural runoff volume, or base river flow, the smaller the change in water velocity associated with the addition of FA water. During the spring when base flows are typically near maximum, the change in WPTT attributable to FA was less than one day. For example, during the high runoff springs of 1993 and 1995 the predicted change was negligible (Figure 13). During the summer the change in WPTT associated with FA is greater, typically ranging from about l-2 days, with a reduction of more than 5 days in summer 1994 (Figure **13).**

Shifting FA into the summer implies that subyearling fall chinook benefit from FA to a greater extent than spring migrating species. It also suggests the change in water velocity attributed to FA is large enough to elicit measurable changes in migratory responses such as smolt travel time or survival. As for spring migrants, (i.e., yearling chinook and steelhead) the passage models predicted different travel time responses. Within any year, CRiSP predicted negligible to slight reductions in travel time, from LGR to MCN Dam no more than a one day reduction in travel time for either species, which typically traverse the reach in 10 to 20 days (Figures 15 and

17). Using the Berggren and Filardo (1993) models, a more substantive reduction in smolt travel time is predicted. This is particularly evident when base flows are low, such as throughout 1992, and during the early part of the migration period each year (Figures 15 and 17). Under low base flow conditions, the estimated reduction in smolt travel time attributable to FA can range from about two to six days through the same reach.

For fall chinook, the two models were even more disparate in their predictions regarding the effectiveness of FA. CRiSP predicted that FA decreased smolt travel time through LGR Pool by O-10% during the summers of 1991-1995. Conversely, the Connor et al. (1994a) model predicted large decreases in travel time, from approximately 19-45% (Figure 20). Several explanations could account for the discrepant predictions. Neither the CRiSP nor Connor models clearly represent the response of actively migrating fall chinook through LGR Pool. CRiSP predictions are based on data acquired from PIT-tagged ocean-type chinook actively migrating from Rock Island Dam to McNary Dam on the Columbia River. A weak smolt travel time/flow relationship was apparent in those data (Anderson et al. 1996). A critical assumption is that those Columbia River data are representative of Snake River fall chinook. An alternative approach may be to examine migratory data from PIT-tagged hatchery fall chinook used by NMFS in recent survival studies conducted in the Snake River (Smith et al., Draft 1996). Additional estimates will soon be available for 1996 and 1997, which should provide a more comprehensive characterization of migratory behavior. We expect and recommend that these recent empirical estimates be reviewed in the PATH forum, so a representative passage model for Snake River fall chinook can be developed.

The model of Connor et al. (1994a) may not be entirely representative either. Since their fish were tagged while still rearing in the Snake river, the travel time of these fish to LGR reflects a mixture of rearing time and migration time. Separating those processes is difficult, or impossible. Also, the Connor model was constructed from known subyearling fall chinook that were captured, PIT-tagged and released while residing in the free-flowing Snake River upstream from LGR Pool. There are two important considerations regarding the use of those fish to predict flow effects on active migrants. First, the sample was a mixture of fish that varied in size and age, and were developmentally diverse, spanning the range of behaviors from resident-rearing through active-migrant. This may obfuscate any flow response specifically attributable to active migrants in the population. Also, the experimental fish traversed both free-flowing and reservoir conditions en route to LGR Dam. It cannot be determined whether the flow component in the model could have been influenced more by the velocity dynamics associated with the swift free-flowing reach, or by the slower reservoir. Furthermore, more recent findings by Connor et al. (1994c, 1996) do not comport with the earlier model we selected for our analyses. For example, they found that in 1993, flow did not appear to be an influential variable that explained observed variation in travel time. Several additional years of information are available from that ongoing research, but results have not yet been published. A synthesis of the collective information would be most instructive toward the development of a fall chinook passage model. We intentionally selected Connor et al.'s most flow-sensitive model to provide a contrast with the relatively flow-insensitive characterization embedded in CRiSP We wanted to depict the range of uncertainty

regarding the migratory characteristics of this stock.

Translating migration speed into survival predictions is a much more tenuous exercise. CRiSP was the only model that was readily available for use in this study. We would have preferred to have another tool to provide a basis of comparison. For yearling spring chinook, the predicted change in smolt survival attributable to FA in any year was small, and consistent with travel time predictions. The net increase in survival due to FA ranged from < 0.5 to approximately **3** percentage points. Interpreting the change in steelhead survival due to FA is difficult because, steelhead are particularly sensitive to gas saturation in CRiSP. Consequently, the mortality associated with the spill/gas saturation process may offset any survival gains that may have accompanied swifter migration. This underscores the difficulty in isolating FA/travel time effects on survival from other concurrent mortality mechanisms acting in this complex system.

However, there are means to examine the soundness of these model predictions. From 1995-1996, NMFS has been studying yearling chinook survival through the lower Snake River. Survival estimates from 1993-1995 have been reported by Muir et al. (1995). They observed that over a broad range of flow conditions across years, survival through the pool to LGR Dam was quite consistent, averaging 90%, 92% and 93% in the years 1993- 1995, respectively. At the AFS conference held in Eugene OR summer 1996, NMFS further reported that to date, survival of yearling chinook past several impoundments to Lower Monumental Dam showed no relationship to prevailing flow volumes. This is consistent with the CRiSP predictions where only small net changes in survival, l-3 percentage points, were attributable to FA.

What is the role of flow augmentation and what specifically is it meant to accomplish?

Flow augmentation can serve many purposes. It can be used to achieve or approach the LGR flow targets prescribed by NMFS; to coincide with the passage of certain ESA stocks through particular sections of the Snake River; to prop-up a declining hydrograph or fill in the troughs of a broadly fluctuating one; to hasten the migration of stocks that are the most sensitive to changes in water velocity, perhaps by releasing large volumes over a brief period; or to reduce water temperature during particularly hot periods.

Inspection of the FA profiles in figures l-10 and 22-26 suggests that across the years, the water delivery may have addressed many of those purposes, and that the strategy likely changed annually. Some of these purposes were clearly not achieved. For example, it is clear that current FA volumes cannot regularly contribute sufficiently to achieve the NMFS flow targets. This is particularly evident during low runoff years, such as 1994, when FA fell far short of providing the LGR flow targets specified in the BIOP. Because water is limited, it may be advantageous to focus on ESA stocks and to concentrate FA to provide flow targets during brief periods coincidental with their passage timing. In 1992 it is clear that none of the ESA stocks passed LGR when the flow targets were being met, and in 1994 few to none of the ESA fish encountered the flow targets (Table 5). Strategies for prescribing the timing and magnitude of flow augmentation will change annually, depending on forecasts and the actual runoff realized in-

season. It seems reasonable that a formalized decision flow chart could be developed that would establish alternative goals and strategies for allocating and shaping water as certain conditions arose.

In recent years the strategy to shift the emphasis in water allocation from spring to summer seems to be predicated on the premise that fall chinook benefit more from FA than spring migrants. However, in our view, the rationale for, and evidentiary material supporting the premise, have not been adequately presented. Certainly the proportional change in water velocity was greater during the summers over our study period, but net water velocity remained low, at less than half that observed during the spring (Figure 13). Furthermore, the passage models we used in these analyses yield very different characterizations of migrational responses to river discharge volume. Additionally, the models do not necessarily comport well with the collective empirical information gathered in the Snake River for both spring/summer and fall chinook salmon. The region has yet to resolve these discrepancies and adopt a single model that accurately characterizes the migrational dynamics of these species. Since 1993, estimates of smolt migration speed, smolt survival and corresponding river conditions has been acquired. This information should be synthesized and incorporated into a regional passage model. The PATH forum is addressing many of these issues and will hopefully provide guidance on this matter.

Models that can predict WPTT through the free-flowing reaches from Hell's Canyon or Dworshak dams to the head of LGR pool across a range of base flows may have some utility. Although CRiSP contains flow-velocity relationships for these reaches, WPTT for the Clear-water during low flow seems excessive. It is our understanding that Battelle is developing a tool for the COE that may serve this purpose. If a primary objective is to provide FA for a specific stock that is passing either LGR Dam or some other target site, delays of a few days between the release and arrival of FA water may be an important consideration in achieving the objective. Systematically integrating run timing predictions at specific geographical locations with water transport and fish travel time models could be a useful strategy for optimizing the use of FA.

The significant association between water temperature decreases observed at Lower Granite Dam and the magnitude of FA water released from Dworshak Reservoir suggests that temperature can be regulated, at least through Lower Granite Pool. This is consistent with the findings of Karr et al. (1992) and Bennett et al. (1994). However, no such opportunity is apparent using water delivered from Hell's Canyon during our study periods. Our analyses offer no predictions as to the amount of change in temperature associated with specific FA volumes. A mixing model such as the **COLTEMP** model constructed by the **COE** is more appropriate for that purpose.

Indications are that by releasing sufficient volumes from Dworshak Reservoir, water temperature can be held at or below approximately 20°C during the summer. Absent that water, such as in 1993, water temperature during August could have been as much as 3 °C warmer. Fall chinook dominate the juvenile salmon population this time of the year. Their sensitivity to such water temperature with respect to migratory behavior and survival have not been well described.

However, Groves (1992) cited several papers and assembled a table that identified temperature tolerances for fall chinook juveniles and migratory adults as 5.5 to 20°C. There is no clear indication what tolerance means in terms of mortality or impaired performance.

Reducing water temperatures to below 20 °C can be beneficial in decreasing the consumption rates of northern squawfish *(Ptychocheilus oregonensis)*, a primary predator of salmon smolts. Vigg and Burley (199 1) developed a model that predicts decreasing water temperature from 2 1.5 to 17 °C could reduce the number of prey consumed by squawfish from 7.01 to 4.25 per day. This result suggests that water temperature regulation in the Snake River could provide survival benefits to juvenile fall chinook indirectly. However, survival estimates acquired in 1995 clearly indicated that fall chinook survival continued to decline throughout the summer, even as water temperature remained relatively constant at 18 - 22°C (Smith et al. 1996 Draft). As yet, the effects of summer water temperature on juvenile fall chinook has not been systematically evaluated.

The principal adult salmonid migrating through the Snake River in the summer is steelhead. They can be sensitive to water temperature, retarding their movement upstream if water temperatures become excessive. Bjornn and Perry (1992) reviewed the literature regarding adult salmonid passage in the lower Snake River. Based on limited information, it appears that temperatures above 21-22°C cause steelhead to delay migration. At least in one year, when temperatures dropped below 21 °C, the migration was reinitiated. Fall chinook move through the Lower Snake River during September when water temperatures are declining and rarely remain above 20°C for very long.

To the extent that FA can maintain water temperature at or below 20°C in the Lower Snake River, it could be advantageous to adult steelhead. However, Karr et al. (1992) demonstrated that the ability to regulate temperature downstream from Lower Granite Dam diminished considerably, with only slight effect apparent at Ice Harbor Dam. Thus, the biologically effective zone may only extend through the upper impoundments of the lower Snake River. Furthermore, temperature effects may be vertically localized. Those same investigators noted that the cooler water released from Dworshak Reservoir does not mix well and sinks to the bottom of reservoirs, creating a vertically stratified condition. They found this to persist through several reservoirs in the system.

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Report to

BioAnalysts, Inc.

WATER AVAILABILITY FROM THE SNAKE RIVER SYSTEM

HDR ENGINEERING, INC.
SALT LAKE CITY, UT

APRIL 1997

TABLE OF CONTENTS

SECTION 1
EXECUTIVE SUMMARY 1-2
SECTION 2
INTRODUCTION 2-2
Study Area 2-2
Background 2-2
Objective 2-4

SECTION 3
METHODS
Flow Augmentation Definition 3-2
Spreadsheet Definitions 3-2
Assumptions 3-2
Research Approach 3-3
Comparison of Calculations 3-4
Snake River 3-6
Clearwater River 3-6
Coordination 3-6
Time Period Covered 3-7
Flow Records 3-8
USGS Water Resource Data Reports 3-8
Idaho Power Company Records 3-8
Water District Records 3-9
COE Dworshak Records 3-9
USBR Records 3-10
BPA Records 3-10
FPC Records 3-10
Analytical Methods 3-11
Snake River 3-l 1
Clearwater River 3-11

SECTION 4
STUDY RESULTS 4-2
Flow Augmentation From Upper Snake River 4-2
Flow Augmentation From Clearwater River 4-2
Flow Augmentation At Lower Granite 4-3
Comparison of Results 4-3

SECTION 5
CONCLUSIONS 5-2

SECTION 6
REFERENCES 6-2

SECTION 7

TABLES 7-2
Understanding the Spreadsheets 7.2
Snake River 7.2
Column 2 - Recorded @ Hells 7-2
Column 3 - Fish Flows @ Brownlee 7-2
Column 4 - Computed Base 7-3
Clearwater River 7-3
Column 5 - Recorded @ Peck 7-3
Column 6 - HDR Fish Flows at Dwsk 7-3
Column 7 - HDR Computed Base 7-3
Column 8 - IDWR Fish Flows @ Dwsk 7-3
Column 9 - IDWR Computed Base 7-3
Column 10 - BPA Fish Flows 7-3
Column 11 - BPA Computed Base 7-4
Column 12 - Recorded @ LWGT 7-4
Column 13 - HDR Fish Flows @ LWGT 7-4
Column 14 - HDR Computed Base 7-4
Column 15 - IDWR Fish Flows @ LWGT 7-4
Column 16 - IDWR Computed Base 7-4
Column 17 - BPA Fish Flows @ LWGT 7-4
Column 18 - BPA Computed Base 7-5
Base Flow and Fish Augmentation Flow Determination - 1991 7-6
Base Flow and Fish Augmentation Flow Determination - 1992 ..... 7- 14
Base Flow and Fish Augmentation Flow Determination - 1993 7-23
Base Flow and Fish Augmentation Flow Determination - 1994.. 7-29
Base Flow and Fish Augmentation Flow Determination - 1995 7-36

SECTION 8

FIGURES

2-l Location Map 8-2
2-2 Stream Gage Locations 8-3
2-3 Water District Locations - Idaho 8-4
3-l Storage Reservoir Location Map 8-5
3-2 Historic Reservoir Operations at Dworshak (1973 - 1978) 8-6
3-3 Historic Reservoir Operations at Dworshak (1979 - 1984) 8-7
3-4 Historic Reservoir Operations at Dworshak (1985 - 1990) 8-8
3-4 Historic Reservoir Operations at Dworshak (199 1 - 1995) 8-9

APPENDIX A

USGS Data A-2
Water District Data A-16
Dworshak Reservoir Operations 199 1 - 1995 ..... A-22

SECTION 1

EXECUTIVE SUMMARY

SECTION 1 - EXECUTIVE SUMMARY

The main objective of this study was to assess the historic operation of the Snake River and tributaries to determine: (1) if 427,000 acre feet of water was provided from the upper Snake River storage system during the migration period of the salmon, and (2) the volume of flow augmentation provided from Dworshak reservoir, located on the North Fork Clear-water River, during the same period. The period covered by our study was 199 1 to 1995.

Historically there have been conflicting opinions among the various water agencies regarding the methods used to quantify augmentation flows. We have defined flow augmentation as, *"those flows associated with a storage release or reshaping of historic releases. These flows are directly attributable to specific operations that result in distinctly larger flows at the Lower Granite Project, than would occur had the releases not been made"*. Using this definition allowed for a systematic analysis to be completed in evaluating the historic operations and quantifying augmentation flows at the Hells Canyon gaging station on the Snake River and the Peck gaging station on the Clear-water River.

To quantify augmentation flows originating from the upper Snake River, we compared method and augmentation volumes computed by BPA, USBR, IPC and COE. Even though each method produced slightly different annual volumes, the differences are readily understood and easily rectified into common data set. Our process included an independent evaluation of each method and the development of a common data set that represented the actual system operations.

We evaluated the existing methods of computing augmentation flow releases from Dworshak reservoir (1993-1995) and found them unable to adequately quantify these flows according to our definition. We developed a new method which addressed the volume of runoff experienced each year and the associated operation to satisfy multiple purposes. This method generally produced smaller augmentation flows, however it did not include releases that would have occurred as a result of non-augmentation operational matters.

The computed augmentation flows determined at the gaging station named above were transferred directly to the Lower Granite Project. Using records of computed inflow into Lower Granite reservoir, flow augmentation values and corresponding base flows were determined for the migration season, as well as the month of September.

The volume of augmentation flows provided from the upper Snake River system exceeded the required 427,000 acre feet, in three of the five years in our period of study. There would be one additional year that would have exceeded that volume if the period was extended through September.

Flow augmentation volumes provided from Dworshak reservoir ranged from a low of 711,300 acre feet in 199 1 to a high of 1,96 1,200 acre feet in 1995. There were additional flows provided during September that were beyond the defined migration system. To produce these flows, with a minimum amount of impact, the current reservoir operations have been modified from those of the past.

The resulting augmentation flows at the Lower Granite Project are the results of upstream operations. The target flows identified at this location were not used to measure the

augmentation flows computed in our study. Rather, the volume of augmentation flows that occurred, producing flows larger than would have occurred normally, were determined based upon criteria applied to upstream facilities. When considering the period April 1 through August 3 1, the range of augmentation flows that were developed at the Lower Granite Project during our period of study varied from 957,700 acre feet (199 1) to 2,389,600 acre feet (1995).

SECTION 2

INTRODUCTION

SECTION 2 - INTRODUCTION

This study investigated the magnitude and timing of flow augmentation directed at enhancing migrating conditions for both downstream and upstream migrating salmon, as measured at Lower Granite Dam on the Snake River. The primary emphasis of the study was to determine if the 427,000 acre-feet (af) of water that has been identified to be supplied from the upper Snake River, actually occurred in the time frame needed to assist migrating salmon. Flow augmentation releases made from Dworshak Dam were also examined to determine their impacts on increasing flows during the migration season.

STUDY AREA

We investigated flows upstream of Lower Granite Dam, which lies on the Snake River just west of the Idaho-Oregon border (see Figure 2- 1). The area upstream from Lower Granite Dam covers 103,200 square miles. Public and private water storage facilities on the Snake River, and the U.S. Army Corps of Engineers' Dworshak Dam on the Clearwater River, influence flows at Lower Granite Dam. We assessed flows at locations downstream from Hells Canyon Dam on the Snake River and Dworshak Dam. We obtained data from long-established gaging stations operated by the U.S. Geological Survey (USGS) gaging stations (Figure 2-2.)

Lower Granite Dam is located at river-mile 107.5 in the State of Washington below the confluence of the Clearwater River and the Snake River. We computed base and fish augmentation flows within the State of Idaho at the USGS locations, at Hells Canyon on the Snake River and at the Peck gaging station on the Clearwater River. These locations were used because there are no storage locations from which flow could be augmented between these gaging locations and Lower Granite Dam. Therefore the flow augmentation values determined at these upstream locations could be translated directly downstream to Lower Granite Dam inflow.

BACKGROUND

On November 15, 1982 the Northwest Power Planning Council (NPPC) adopted the Fish and Wildlife Program. The NPPC Fish and Wildlife Program (Section 300 "Water Budget and Mainstream Flows" and Section 400 "Downstream Passage") called for a water budget program that would be beneficial to juvenile and adult salmonids. The Program was amended in December 1991 and May 1992 adding Phase Two and Phase Three respectfully. Phase Two and Phase Three integrated a system-wide plan into the Program to help the salmonid migrations (CRWMR 1992 p. 83).

In years prior to 1993, as required by Section 303(c) of the Northwest Power Planning and Conservation Act Fish and Wildlife Program titled, "Coordination of Water Budget", calls for a meeting by January 15 of each year of ". . . a committee composed of the fish passage manager, the Council's fish passage advisor, and operations of the power system". The objective of the meeting is to develop an annual Water Budget Coordinated Plan of Operation (CPO). Once accepted by the involved parties, the CPO becomes the annual operating plan for CPO purposes

and is reported in the annual reports of the Fish Passage Center (FPC). The overall operating methodology focused upon "shaping" the storage releases to match the specified CPO volumes.

In November 199 1, the National Marine Fisheries Service (NMFS) designated the Snake River sockeye salmon as endangered. A threatened species listing was finalized for the Snake River spring/summer chinook and fall chinook during April 1992, authorized under provisions of the 1972 Threatened and Endangered Species Act. This required corrective actions be taken to restore, where as possible, the population of salmon returning to the Snake River. NMFS appointed the Snake River Salmon Recovery Team (SRSRT) to recommend measures for salmon recovery. It was determined that certain "target flows" should be maintained as inflow into Lower Granite Project to enhance survival rates. The target flows that were suggested are as follows:

TABLE 2-l
TARGET FLOWS AT LOWER GRANITE DAM

PERIOD	TARGET FLOWS (CFS)
April 16 - June 20	85,000 to 140,000
June 21 - July 31	50,000 to 55,000
August 1 - August 31	50,000 to 55,000

These target flows resulted in modified operations of upstream reservoirs during certain parts of the year. In an attempt to meet these inflows at Lower Granite Dam, various adjustments were made to upstream operations at storage facilities to match/provide the target flows in the designated time periods. Efforts by agencies such as Bonneville Power Administration (BPA), who rented water from the Upper Snake River Water Bank and arranged for its release during the time frames in which the flows at Lower Granite fell below the desired flow levels, were undertaken as early as 199 1.

Typical of other years since 1983 a CPO was developed for the water budget operation on the Snake River system for '91 - '93. One significant change occurred during the development of the 1993 CPO. This CPO specified a different method of accounting for Dworshak flow augmentation releases. Under terms of the CPO, all releases from Dworshak over 1,200 cfs (after April 15th) were credit towards the flow augmentation volumes. In previous years only the requested releases by the FPC Manager were credited towards flow augmentation volumes.

On May 28, 1993, NMFS released their Biological Opinion resulting from the Endangered Species Act. This Opinion changed the operating regime for flow augmentation volumes to target flows at the Lower Granite project. These flows are the same as the ones shown on Table 2-l which were developed by the SRSRT. These target flows were the basis for making releases from the storage system on the Snake River.

The 1993 Biological Opinion called for the establishment of an In-season Management Team which are herein after referred to as the Technical Management Team (TMT). Included in the team were representatives from BPA, United States Bureau of Reclamation (USBR), NMFS, USF&WS and the U.S. Army Corps of Engineers (COE). The primary team responsibility was to direct the operation of the Columbia and Snake Rivers during the periods in which the target

flows were designated and to control flows to meet the desired levels as inflow into Lower **Granite Dam. One** June 2, 1993 the TMT initiated the flow requests rather than through the **FPC** manager.

The 1993 Biological Opinion on the Federal Columbia River Power System called for specific flow augmentation amounts on the Upper Snake River and the Columbia River as well. The 1993 Biological Opinion called for 427,000 af flow augmentation from the Upper Snake River and Brownlee Reservoir. The flows were to be released in a spring (April 10 - June 20) and a summer (June 2 1 - July 3 1) time schedule. This water supply was to be specifically supplied from sources within Water District 01 (Upper Snake), Water District 63 (Boise River) and Water **District** 65 (Payette River) for flow augmentation. Each of these districts have federal storage facilities that contain uncontracted storage space, contracted space that was for sale, and rental pools from which the water could be leased on an annual basis. This water was to be provided as **directed by** the **TMT** in an attempt to achieve the target flow levels. The boundaries of each District are shown on Figure 2-3.

In 1995 NMFS prepared a new Biological Opinion. The 1995 Biological Opinion called for a continuation of the 427,000 af flow augmentation schedule specified in the 1993 Biological Opinion for the years 1995 - 1998. Furthermore, the 1995 Opinion called for the BOR to make plans and arrangements to acquire additional amounts of water by 1998.

OBJECTIVE

This study had two objectives; first, determine if the 427,000 af of water was supplied from the Upper Snake River system in the desired time frame and secondly, quantify the augmentation flows provided from Dworshak Reservoir.

SECTION 3

METHODS

SECTION 3 - METHODS

FLOW AUGMENTATION DEFINITION

There have been numerous discussions among various Federal agencies, the TMT members, and other affected parties concerning the definition of augmentation flows. At the time of the writing of this report there was clearly no consensus among all of the parties regarding the definition of flow augmentation. Therefore, we defined flow augmentation as follows: *flow augmentations are those flows associated with a storage release or reshaping of releases intended for achieving other purposes (i.e., power generation, flood control, refill for summer recreation, etc.). These flows are directly attributable to specific operations that result in distinctly larger flows at Lower Granite Dam, than would occur had the releases not been made.*

SPREADSHEET DEFINITIONS

The following acronyms are used on the spreadsheets:

TABLE 3-l
SPREADSHEET DEFINITIONS

Term	Definition
KCFS	Thousand (000) Cubic Feet per Second- A measurement of flow
KSFD	Thousand (000) Second Feet Day-The Volume of 1KCFS running for a 24-hour period (1 day)
KAF	Thousand (000) Acre-Feet-The Volume of 1 KSFD converted to acre-feet.

ASSUMPTIONS

The recorded gage flows at the two USGS gaging stations used in this study were viewed as containing both base flow and augmentation flow:

Total flow at gage = Base flow + Augmentation flow

We represent the relationship with the following algorithm:

$$Q_t = B_f + F_a \qquad \text{(Equation 3.1)}$$

In this equation we assumed the base flows to be the unregulated flow (operational releases for purposes other than flow augmentation) occurring in the streams without augmentation flows. By nature of our assigned definition of flow augmentation, we infer that flows at the Lower Granite project resulting from upstream reservoir operations which were not made specifically for flow augmentation purposes would be considered to be base (unregulated for flow augmentation purposes) flows. It is recognized that designating these flows as "unregulated" may suggest they represent a condition where there is no upstream storage (regulation) to control flows; therefore producing an unregulated flow condition. Because that is not the case, the base

flows (called unregulated flows) represent the results of upstream regulation for purposes other than flow augmentation. Base flows vary yearly depending upon the annual volume of water produced from the watershed and the corresponding reservoir operations. Augmentation flows produce larger flows than those of the base flow alone.

By rearranging Equation 3.1 the base flows can be determined once the fish flows have been quantified. The following equation results:

$$B_f = Q_t - F_a \qquad \text{(Equation 3.2)}$$

To determine the flow augmentation (F_a) for this study, we assessed storage releases from upstream reservoirs, using water accounting methods or quantifying the direct releases from either Brownlee or Dworshak Reservoirs. This information was recorded by the Water District from which the water was supplied or from the records of the entity that either purchased the water from a rental bank or requested its release. In all instances, flow augmentation volumes were accounted separately from other operation affecting the flows at specific locations.

RESEARCH APPROACH

To quantify augmentation flows we obtained and evaluated flow and storage release records from as many sources as possible. Consistent with our definition of flow augmentation we sought to quantify storage releases or flow reshaping that resulted in larger flows at Lower Granite Dam. In the evaluation, various comparisons were made to verify flow correspondence between sources and to identify any unusual numbers claimed by any party.

To develop base flows (B_f) as described in the previous section, we obtained the total flows (Q_t) at the designated USGS river gaging stations, determined the fish augmentation flow (F_a) at those locations, then solve for B_f using Equation 3.2 The estimated augmentation flows at the gaging stations on the Snake and Clear-water Rivers were then transposed directly to Lower Granite Dam. Estimates of water particle travel time from Brownlee Dam to Lower Granite Reservoir (139 miles) range from 5.5 days to 13 days depending upon the flow conditions. The estimated travel time from Dworshak Dam to Lower Granite Reservoir (74 miles) ranged from 1.5 days to 4.5 days. Particle travel time estimations only partially indicate stream response to varied flow conditions. The velocity of a wavefront associated with modified reservoir releases is much greater than the mean particle velocity in any cross section. This means the affect of flow modifications could easily be realized downstream in a matter of hours rather than days.

The wide range of travel times did not allow for an accurate determination to be made without completely evaluating the river hydraulics. We therefore assumed the augmentation flows determined at Hells Canyon and on the Snake River and the Peck gaging station on the Clearwater would be credited as flow augmentation volumes at Lower Granite reservoir the same day they occurred at the upstream gaging stations. The maximum error that could occur using this assumption is 13 days at the end of the migration season. Because the volume of augmentation flows were generally small during the last few days of August, no adjustment was made.

As discussed in Section 2, the Lower Granite Dam inflows are the target flows shown in Table 2- 1. The augmentation flows that are defined in this study were provided to seek the target

flow levels. Notable, the inflow into Lower Granite Reservoir is not measured directly because there is no gaging station at that location. Using gages that measure reservoir storage and discharge, the inflow values can be computed using the algorithm:

Inflow = Outflow ,+ Change in Storage.

This algorithm, when expressed in equation format, is:

$$I = O \pm S_c \qquad \text{(Equation 3.3)}$$

The computed inflow values for Lower Granite reservoir were obtained from the COE and used in this study as the total flow (Q_t) at that location.

Our study was not intended to evaluate the past success in meeting the target flows. Rather, we quantified the water that was made available as fish augmentation flows.

Comparison of Calculations

The fish augmentation flows and associated base flows have been determined in a number of different ways by different entities, i.e., BPA, USBR, IPC and COE. Each of their respective computations were made from their particular perspective. In some instances, the manner of computation resulted in different values for the same time frame. Since there have been multiple entities involved in fish augmentation releases on the Snake River, we compared the various calculation methods.

We analyzed the flow augmentation data from IPC, IDWR, Water Districts 01, 63, and 65, USBR, and BPA records for the years of 1991 through 1995. The table below shows the amount of augmented flow that each group claimed on an annual basis.

TABLE 3-2
COMPARISON OF
SNAKE RIVER FLOW AUGMENTATION VOLUMES
USING DIFFERENT METHODS
(AF)

YEAR	IPC	IDWR	WTRMTR*	USBR	BPA**
1991	146,36 1	274,000	N/A	200,000	450,000
1992	109,3 10	299,000	N/A	90,000	250,800
1993	526,606	526,619	3 59,647	424,000	525,000
1994	759,935	755,279	485,137	428,000	759,000
1995	399,996	662,237	426,99 1	427,000	N/A

*Water-master records for water districts 0 1,63 and 65 (Records included in Appendix A.
**BPA records provided by Mr. Dan Daley.

The apparent inconsistencies of the values shown in the table were analyzed in depth to understand the differences. Even though these numbers were reported as annual volumes, the actual period covered within the year for each entity varied. As we analyzed records for 1991 this inconsistency became evident. The period reported by IPC covered only May 6 through May 16. The period reported by BPA during this same year began on April 1 and continued through September 2 1. Examining the record shows BPA purchased water from the Upper Snake rental pool for delivery at two additional time periods beyond those reported by IPC. BPA provided 100 KAF for delivery between July 8 and July 16 plus an additional 200 KAF that was released from storage between September 4 and September 21. The BPA release made after August 3 1, the target flow period at Lower Granite Dam, were made primarily for temperature modifications downstream of Brownlee. When BPA's time frame is limited to that reported by IPC the volume of flow augmentation released during May totals 150 KAF which is within 3 KAF of the amount reported by IPC.

The difference of 127 KAF between IDWR and IPC is unexplainable. The source of IDWR's numbers for 1991 and 1992 was from the Columbia River Water Management Report for the respective years and there was no explanation regarding the time period involved or the source of the data. If one assumed that it covered April 1 though August 3 1, then their accounting would have included the IPC releases plus the additional 100 KAF from the rental pool, leaving only 27 KAF beyond that described by IPC. Since it was not possible to track either the IDWR and USBR numbers, we used the IPC record in conjunction with the BPA releases as the most representative for 199 1.

For similar reasons as 199 1, we used the IPC and BPA records for 1992.

Another problem noted in the comparison table involves the difference of using calendar years versus water years. The watermaster records are kept on a water year (Oct. 1 - Sept. 30) basis. When rental pool water is utilized, in some instances it was used after the beginning of the next water year even though it was still within the same calendar year. The problem of comparison is further complicated with agreements that were made between IPC and USBR to replace flow augmentation waters that were released from Brownlee Dam earlier in the year, but were subsequently replaced later that year, following the migration period.

In 1993, 1994, and 1995 documented records of flow augmentation releases were maintained, therefore comparisons and conclusions may be made for these years.

The table below compares the recorded data for 1993 and 1994. The table shows that for the individual years, the Water Master's data and the USBR data has some inconsistencies, while the IPCO and IDWR data is relatively the same.

TABLE 3-3
1993 vs. 1994 COMPARISON
(AF)

YEAR	IPCO	IDWR	WTRMTR	USBR
1993	526,606	526,619	3 59,647	424,000
1994	759,935	755,279	485,137	428,000
TOTAL	1,286,541	1,281898	844,784	852,000
DIFFERENCE	4,643		7,216	

However, when the flow amounts for the two years are summed together, the total difference in the amount of augmented flow water that was released is relatively small for the Water Master's vs. USBR (7,216 AF) and the IPCO vs. IDWR (4,643). An explanation for the individual year difference, may be explained by a difference in water year vs. calendar year.

In 1993 IDWR initiated a rather extensive accounting procedure to identify the owner of the water supply, the source reservoir, the entity renting water and the time frame as it moved through the Snake River upstream of Brownlee Reservoir. This method incorporated records from the watermaster of each District and the associated accounting of storage releases which is the accepted practice in the State of Idaho.

We cross checked numbers from the various entities for the 1993 and 1995 period and found the IDWR records most accurately represent the operations for flow augmentation. Therefore, we used this method to determine flow augmentation values for that period.

Methods of determining fish augmentation flows vary widely among management entities on the Snake and Clearwater Rivers. The following describes the basic differences.

Snake River

Snake River augmentation flow values were computed from the sources described above. HDR compared data supplied from each of the entities for each year and determined if adjustments were needed to resolve differing numbers. For the most part, very few adjustments were needed. In the earlier years ('91-'92) the biggest adjustment accounted for releases outside of the April 1 through August 31 period of time. The releases during September were directed towards temperature control and were considered augmentation flows. In the later years ('93-'95) only minor adjustments were needed when comparing all of the methods used. This resulted in a common method which produced a single value for fish augmentation flows on the Snake River.

Clearwater River

As noted previously, the changes that occurred in 1993, resulting from both the CPO changes and the Biological Opinion implementation, most dramatically affected computation methods for defining flow augmentation from Dworshak Reservoir. The 1993 CPO defined all releases in excess of the minimum flows as contributing to flow augmentation. This year also brought

about a different operational criteria that focused upon meeting the specified target flows at the Lower Granite project rather than providing certain storage volumes identified in the CPO that were released at the request of the FPC manager.

Unlike the Upper Snake River storage system where each storage release is accounted for by a Watermaster, the Dworshak releases are quantified by the COE. During '91-'92 the releases were made to match the requests of the FPC manager. During '93-'95 releases were made at the request of the TMT. This shift and the associated change in the method of quantifying flow augmentation releases from Dworshak Reservoir raised the question of comparability of the data from both periods.

Since BPA reported data for both periods, it was determined to use their data for '91-'95 as a check of consistency. Since IDWR did not initiate their accounting methods, based on the CPO, until 1993 there was insufficient data to compare both of the periods. HDR recognized the controversial nature of quantifying all flows beyond minimum flows as flow augmentation releases. In an attempt to account for some of the other functions for which historic releases had been made (i.e., flood control), HDR developed a method for estimating these other functional releases. This simplified operating methodology, adjusted the accounting process to exclude as flow augmentation reservoir releases which had historically been made for other purposes. Even though the HDR model is recognized as being somewhat incomplete, it allowed for an estimate to be made during the '93-'95 period that would account for releases in a manner similar to the '91-'92 period. The objective in performing this analysis was to-estimate release values for both periods which would reflect water supply and reservoir operations rather than a new accounting method.

COORDINATION

Upon completion of the hydrologic and water supply portion of the study, we determined that a status meeting should be held with various federal agencies to describe the methods and results. This meeting was held in Portland on July 10, 1996. The NPPC, USBR, BPA, Columbia River Alliance (CRA) and the Environmental Defense Fund (EDF) were represented at that meeting.

All attendees were supplied copies of the study result of this report. During the meeting, several comments were received concerning format and definitions. All of the suggested changes are incorporated into this report. All parties were invited to provide additional comments following their detailed review. The comments were to be provided by July 19, 1996. No comments were received.

TIME PERIOD COVERED

The period covered in our study begins in 199 1 and continues to 1995. During 199 1 and 1992 the Water Budget CPO was the basis for shaping storage releases for flow augmentation. In 1993 however, the target flows were established as the basis of operations. For sake of consistency of analysis, the years prior to 1993 were analyzed using the same period as shown on Table 2- 1. The annual period of analysis begins on April 1 st and continues through August 3 1 st. This period generally coincides with the usual migration period for salmon. There were three years (199 1, 1992 and 1995) in which this period was extended into September to account for

experimental release of water directed at modulating water temperatures in the Lower Snake River to improve adult passage conditions.

We reported the September volumes which occurred during 199 1, 1992 and 1995. However they were not added to the volumes reported from the Snake River since they fell outside of the migration period. The reason for not including them involved one of the basic tenents of this study; viz., did the 427,000 af of water from the Upper Snake arrive at the Lower Granite Project within the April 1 to August 3 1 time frame.

FLOW RECORDS

We used existing records from various sources. No additional measurements were made as part of this study. The flows records from the USGS were considered to be accurate representations of the flows in the streams.

USGS Water Resource Data Reports

The Water Resources Data reports prepared by USGS were used for obtaining the river flows at the gaging stations on both the Clearwater and Snake Rivers. These annual records are prepared using data from continuous recorders. The flow values are computed on a daily basis, which reflects mean daily values at each gaging location. The gaging locations used in this report were:

TABLE 3-4
USGS GAGING STATIONS

Station Name	USGS .Number	Period of Record	Location
Snake River at Hells Canyon Dam	13290450	1965 to present	0.6 mi. downstream of Hells Canyon Dam
Clearwater River near Peck, ID	13341050	1964 to present	3 mi. downstream North Fork Clearwater River

The daily flow values used at these locations represent the total flow in the river (Q_t). The accuracy (+ 5- 10%) of these records is typical of "rated-section" stream-gaging methods.
The annual records at both locations for the period of study are contained in Appendix A.

Idaho Power Company Records

The Hells Canyon complex of storage reservoirs is owned and operated by IPC. The complex consists of Brownlee, Oxbow and Hells Canyon Dams (see Figure 2-2). These facilities were constructed and are currently operated primarily for power production. The IPC facilities are downstream of the federal storage reservoirs that supply the augmentation flows. Thus IPC must cooperate with other agency operations to assure their delivery. In cooperation efforts, IPC has worked in conjunction with the TMT, BPA and USBR to provide for releases from their storage facilities to match the desired target flows at Lower Granite. Obviously, without their cooperation it would be difficult to schedule releases from upstream storage facilities to match the required flow patterns at Lower Granite Dam.

The records provided from IPC contain measured releases from their storage reservoirs to meet the downstream need. The daily records supplied by IPC have been included in Appendix A.

The IPC, a private company, is not required to release water to meet the downstream target flows. However, due to their location in the Snake River system and their ability to control the flows they receive from the upstream operations, the cooperation of IPC is essential to assure releases made from upstream facilities are allowed to "pass through" their complex to meet downstream target flows. As presently operated, the IPC releases are subsequently replaced with water from the upstream federal facilities. It is apparent that an "exchange" involving the storage from the upstream facilities and the IPC complex would tend to maximize overall system operations and accomplish a very important goal of maintaining the largest amount of storage as "high" in the system as possible, for the longest time possible. This requires IPC to make the immediate releases to satisfy downstream requirements with the released water being subsequently replaced from the upstream federal storage units.

To facilitate efficient operations, IPC, BPA and USBR agree annually on the method of operation during the year. It is an accepted practice to have IPC make releases based upon the requests of the TMT. These releases are then replaced at a later date by releases from USBR facilities with BPA providing an energy exchange which compensates for head losses and changes in energy prices. In some years this replacement water has been delayed beyond the target flow period, as reflected in the annual agreement between USBR, BPA and IPC. Special attention was given to this operation to assure accurate accounting of fish augmentation flows and guard against "double counting" of replacement flows.

Water District Records

Available records were obtained from the three Water Districts located on the Snake, Boise and Payette Rivers. These records contain information regarding flow segregation and storage deliveries. The respective watermasters prepare these records on a daily basis to account for the delivery of the water within their Districts. These records segregate the river flows into natural flows and storage releases. This separation allows for specific records to be kept for individual users regarding their utilization vs. their entitlement. The watermasters of the respective districts kept separate accounts reflective of fish augmentation flows provided from storage reservoirs within their districts. This was an independent and very useful check of the fish augmentation flow values computed using other means. The annual records for each District are contained in Appendix A.

COE Dworshak Records

The records for the operation of Dworshak reservoir and dam were obtained for the entire period since the dam was constructed. These records were made available from the Portland River Control Center of the COE. The records contained daily information on the inflow into the reservoir, reservoir contents, outflow and spills. The records are included in Appendix A.

The record of the reservoir operations pre- 199 1 was compared to the period during which releases were made for fish augmentation flows post 1991. The comparison was made to identify operational changes related to fish augmentation flows. Opinions vary concerning the amount of water that should be credited to fish augmentation flows because current operations

blend all releases for all downstream uses, i.e., power production, flood control, fish augmentation, etc. There is no segregation of flow into its respective components. It is stated in the 1993 Biological Opinion that all flows, beyond the minimum flows (1,200 cfs) from Dworshak Dam should be considered fish augmentation flows. Upon close examination of the reservoir operations since 1991 we concluded that use of the Biological Opinion method of flow augmentation would not comport with our definition. Therefore we developed a new method of computing augmentation flows using the historical reservoir records.

USBR Records

Records were obtained from the USBR that contained USBR estimates of the annual volumes provided to the fish augmentation flows. These values taken from a document entitled, *"Salmon Listings and Water from Reclamation Projects"*, August 8, 1995.

Figure 3-l shows the locations of the storage facilities used by USBR in providing the fish augmentation flows. These facilities are located on the mainstem Snake River or its tributaries. The water is supplied from storage space that was historically uncontracted and/or from the water banks (rental pools) within each of the drainages. All of the federal storage facilities are upstream from IPC's Hells Canyon complex of three reservoirs.

BPA Records

The operations of the Snake River and Clearwater systems prior to the period of study were based upon Water Budget measures of the Northwest Power Planning and Conservation Act Fish and Wildlife Program. The annual Water Budget Coordinated Plan of Operation provided the basis for operational activities during each year. The BPA, COE, and FPC were directly involved in the implementation of these annual plans.

The 1991 and 1992 Water Budget Coordinated Plan of Operations described operations that required releases from both the Snake River storage system and Dworshak Reservoir. The BPA record of these releases was only available as a total volume not separated into daily flow values. Since there were no daily flows defined in either of these years, HDR had to assume a magnitude and distribution of flow values. The flows were distributed in a manner to assure total volume delivery within the described time frame. The non-linear distribution was shaped based upon observations at upstream gaging stations.

FPC Records

We reviewed the annual reports of the FPC to obtain augmentation flow volumes. Their record summarized augmentation flows from the Snake River and Clearwater River into a single number indexed at the Lower Granite Project. Estimates of augmentation flows are available for each year during the period of study except 1995.

ANALYTICAL METHODS

Snake River

We computed the Snake River fish augmentation flows with data provided from IPC, USBR, IDWR and BPA. The flow amounts were determined by each of the respective entities with their own methods. The IPC computes fish augmentation flows as the amount of storage released from Brownlee Reservoir, as requested by the TMT. Releases then travel through their two downstream storage facilities, Oxbow and Hells Canyon reservoirs (operated as run-of-the-river facilities) where they are measured at the Hells Canyon gaging station. These releases are generally incompatible with IPC's normal operations. The storage releases are made to match the downstream needs at Lower Granite Dam. Agreements between BPA, USBR and IPC allow for the replacement of the IPC storage releases with water releases from upstream federal facilities. If Brownlee Reservoir is full, or simply not drafting while upstream augmentation is released, flow releases made from upstream facilities are "passed through" without adding to or detracting from IPC storage amounts.

The USBR managers view their contribution to the fish augmentation flows as the storage releases they make from the various federal facilities. The agreement between USBR and IPC, which is allowed by the power exchange agreement between BPA and IPC, allows for delayed replacement of IPC storage releases, which USBR counts as flow augmentation releases even though they might occur outside of the target flow period. In evaluating the replacement flows, HDR carefully avoided double counting the volumes released earlier with the replacement flows.

The IDWR computes fish augmentation flows with information provided them from their watermasters in the individual water districts. This data are based upon release requests specifically for augmentation flows. The water accounting methods within each district segregate flows into the components of natural flows and storage. Releases from storage are identified for each entity making the release request. This method of accounting has been utilized within each of the Districts for a number of years and is considered to be an accurate method by water users within each District. Fish augmentation flows are specifically accounted for each year since 1993.

The BPA quantified fish augmentation flows as the amounts purchased from upstream water banks and provided to satisfy target flows. The BPA methods relied upon flow segregation by the Water-masters within the individual districts.

Clearwater River

Unlike the Snake River, there are no organized water districts on the Clearwater River and the releases made from Dworshak reservoir are not segregated into individual components by an independent entity. As mentioned in earlier sections, the methods of quantifying reservoir releases for flow augmentation changed during 1993. In prior years the releases were quantified as those requested by the FPC manager based upon the annual CPO. During 1993 and subsequent years the release quantities, in excess of minimum flows (1,200 cfs), were credited as flow augmentation, resulting in relatively different values during certain periods of the year. The following describes each of the accounting methods considered in this report.

The IDWR method was a rather simple approach for computing augmentation flows (F,). It is based on the concept conveyed in the 1993 CPO. The basic concept involves evaluation of the inflow and discharge from the reservoir. Anytime the inflow is less than 1,200 cfs and the discharge is 1,200 cfs you are drafting storage which is considered to be augmentation. When inflows are greater than 1,200 cfs and outflow equals 1,200 cfs that is storage for future augmentation. It used the release through the outlets from the reservoir, not including any amount that was spilled over the spillway. From the outflow amount, the minimum flow of 1,200 cfs was subtracted, which produced their estimate of fish augmentation flows. The equation representing this algorithm is:

$$(F_a) = Q_t - 1{,}200 \qquad \text{(Equation 3.4)}$$

The BPA method produced larger values than both the HDR and IDWR methods in '91 and '92 primarily resulting from their inclusion of releases that occurred in September. If September was eliminated from their data the results would be comparable to those of IDWR, but still considerably higher then HDR values. These differences can be noted on the spreadsheets shown in the Tables Section.

There were other estimates of F_a made by BPA staff (not included in this study) that involved examining the coordinated power production, energy content curves and shifted flood control space requirements of Dworshak Reservoir. This rather complex and complicated method was briefly examined during the study, but was determined to be beyond our work scope. In order to properly account for each element, a rather elaborate model would be required to account for activities on the Columbia River as well as the Clearwater River. This is an area that would merit consideration for future studies.

The purpose for creating the HDR model (method) was to produce a methodology accounting for releases, which recognized historic flood control operations in the springtime. Dworshak reservoir was placed in operation in 1973. During the first 10 years of operations the facility was operated primarily for flood control, power generations and recreation. Beginning in 1983, the first Water Budget was determined and a CPO developed. During the period 1983 - 1993 the operations expanded to include flow augmentation releases. Reservoir operations were determined on a forecasted runoff basis that generally required only limited releases for flow augmentation during the flood control period. In 1993, with the implementation of that year's CPO, the manner of quantifying storage releases attributable to flow augmentation was based upon Equation 3.4. We felt that this method included flows which historically have been released for flood control purpose, but were now being credited as flow augmentation. The reservoir operations were carefully analyzed to identify typical operational patterns, based on a variety of runoff conditions which resulted from various system demands. These historic operations are shown in Figures 3-2 through 3-5. A typical operational scheme was determined from pre 199 1 operations and applied to the water years of 199 l- 1995 to establish a base flow that would have occurred, provided no operational changes to produce augmentation flows would have been made. **This base flow was then compared to the actual 1991- 1995 recorded** flows to determine how much flow augmentation could actually be attributed toward augmentation due to controlled operational changes.

When the HDR model is compared to volumes reported by the FPC, IDWR, and BPA a noticeable difference occurs in years 199 1 and 1993. A close examination of these years shows that both experienced a higher than normal runoff (see figure 3-5). The HDR model accounts for

this by not crediting the increased flow toward augmentation because, based on historic operations, this flow would have been released to prevent a premature fill date (see figure 3-5). Therefore this flow was not released specifically for augmentation purposes and should not by attributed toward augmentation credit.

A further analysis of daily pool elevations for 199 1 and 1993 showed that large augmentation flows were credited using other methods for periods when Dworshak Reservoir was historically at full pool, historically around June 1 (see spreadsheets 1991 & 1993 in Section 7 and figure 3-5). Again the HDR model does not credit these flows because historically (pre augmentation) these flows would have naturally occurred due historic operations and were not specific to augmentation purposes.

Our investigation of the augmentation accounting methods used for Dworshak reservoir determined the other methods used to account for augmentation flows, do not consider historic reservoir operations or water year conditions. Therefore it was concluded that the HDR model should be used to evaluate flow augmentation releases from Dworshak Reservoir.

We have taken several steps to analyze the 1991- 1995 operation of Dworshak Reservoir to estimate the amount of water released to meet fish migration demands. These steps are as follows:

1. Start refilling the reservoir on April 1 of each year.

2. Fill the reservoir by June 1 or June 15, depending upon the volume of expected runoff.

3. Once the reservoir is full, keep it full as long as possible.

4. Assume a minimum release below the dam of 1,200 cfs.

5. In years when it appears that the reservoir will begin to encroach on the flood control pool, maintain the reservoir at its March 1 level until April 1 and then let it begin to fill steadily.

The difference between the actual releases from Dworshak in the 1991 to 1995 period and the calculated or estimated releases based upon the historical operations are the estimated fish releases. These flows are then subtracted from the recorded flows on the Clearwater River at Peck to determine the base flows for the period.

SECTION 4

STUDY RESULTS

SECTION 4 - STUDY RESULTS

The initial question to be answered by this study focused upon the amount and timing of the water released from the upper Snake River. The following describes the results of our evaluation.

FLOW AUGMENTATION FROM UPPER SNAKE RIVER

Using methods described in Section 3 we determined the following volumes were delivered to the Lower Granite Project in the time frame shown.

TABLE 4-l
FLOW AUGMENTATION FROM UPPER SNAKE RIVER
(KAF)

YEAR	APRl-AUG31	SEPT 1 - SEPT 30	TOTAL
1991	246.4	200.1	446.5
1992	248.6	**0**	248.6
1993	526.8	**0**	526.8
1994	755.9	**0**	755.9
1995	428.4	89.0	517.4

In three of the five years, at least 427,000 af was delivered at Lower Granite Dam during salmon migration period. The augmentation flows for 1991 and I992 were short of the desired 427.0 KAF from the Upper Snake River. Flows for 1993 - 1995 were greater than 427.0 KAF.

The releases made during September were beyond the defined migration season, but were made to lower the river temperatures and therefore enhance survival rates. In 1991 the total of 446.4 KAF was released during the calendar year, but beyond the migration period. Using our definition of flow augmentation they could be considered as such, however since they fell outside of the migration period they were not included.

The second aspect of our study quantified the volume of augmentation flows arriving at the Lower Granite Project coinciding with the target flow period.

FLOW AUGMENTATION FROM CLEARWATER RIVER

Using the HDR approach as the preferred method of quantifying augmentation flows from the Dworshak Project, the following table shows the resulting flows and associated time frame in which they occurred.

TABLE 4-2
FLOW AUGMENTATION FROM DWORSHAK DAM
(KAF)

YEAR	APRl-AUG31	SEPT 1 - SEPT 30
1991	711.3	520.1
1992	1099.9	200.0
1993	1471.1	0
1994	1804.4	0
1995	1961.2	0

The releases in September were made primarily for temperature enhancement in the Snake River and the Lower Granite pool.

FLOW AUGMENTATION AT LOWER GRANITE DAM

Augmentation flows at the Lower Granite Project consist of the summation of augmentation flows from the upper Snake River and the Clearwater River (Dworshak releases). The following table shows the augmentation flows resulting from this analysis.

TABLE 4-3
FLOW AUGMENTATION AT LOWER GRANITE
(KAF)

YEAR	APRl-AUG31	SEPT 1 - SEPT 30
1991	957.7	720.20
1992	1348.5	200.0
1993	1997.9	0
1994	2560.3	0
1995	23 89.6	89.0

The volumes released during September are the flows from the Snake River and the quantities released from Dworshak under direction of BPA. These quantities are shown as BPA fish flows on the spreadsheets.

COMPARISON OF RESULTS

We made a comparison of our computed augmentation flows at Lower Granite with those of the Fish Passage Center (FPC). During 199 1 and 1992 the Water Budget Coordinated Plan of Operation (CPO) served as the basis of the operations on the Snake and Columbia Rivers. During the subsequent years the recommendations of the TMT was the basis for the operations. The following flow augmentation volumes are reported by the FPC.

TABLE 4-4
FISH PASSAGE CENTER FLOW AUGMENTATION VALUES
AT LOWER GRANITE
(KAF)

YEAR	APRl-AUG31		SEPT 1 - SEPT 30	
	FROM SNAKE	FROM CLEARWATER	FROM SNAKE	FROM CLEARWATER
1991	241	1145	200	100
1992	247	1163		
1993	540	1040		
1994	786	1901		
1995				

FPC did not quantify any augmentation flows for 1995 so a comparison for that year could not be made.

Combining the data from the Upper Snake River with the annual values of flow augmentation from the Clearwater River, the following comparison between the HDR method and FPC can be made.

TABLE 4-5
COMPARISON OF AUGMENTATION FLOWS
AT LOWER GRANITE DAM
APRl-AUG31
(KAF)

YEAR	HDR	FPC	DIFF
1991	957.7	1386	-428.3
1992	1348.5	1410	-61.5
1993	1997.9	1580	417.9
1994	2560.3	2687	-126.7
1995	2389.6		-

In this table the FPC numbers were subtracted from the HDR numbers. All negative numbers shown indicate FPC values were larger than HDR estimates.

To determine which river system produced the largest differences, a comparison was made for both the Upper Snake River and the Clearwater River. The following table compares the HDR method with the FPC values from the Upper Snake River.

TABLE 4-6
COMPARISON OF
UPPER SNAKE AUGMENTATION FLOWS
APRl-AUG31
(KAF)

YEAR	HDR	FPC	DIFF
1991	246.4	241	5.4
1992	248.6	247	1.6
1993	526.8	540	-13.2
1994	755.9	786	-30.2
1995	428.4		

The largest difference occurred in 1994. In that year FPC claimed 30.4 KAF additional water was released than what our analysis showed. This small difference represented only 3.9 percent of the total flows for the period April 1 through August 3 1.

Because different methods were used to determine the annual values and since the resulting differences were relatively small, we have concluded that our method and associated results for the Upper Snake River are accurate and reasonable.

A comparison was made of augmentation flows originating from the Clearwater River (Dworshak). The following table compares the HDR method with the FPC method of computing augmentation flows from Dworshak reservoir.

TABLE 4-7
COMPARISON OF
CLEARWATER RIVER AUGMENTATION FLOWS
APRl-AUG31
(KAF)

YEAR	HDR	FPC	DIFF
1991	711.3	1145	-433.7
1992	1099.9	1163	-63.1
1993	1471.1	1040	431.1
1994	1804.4	1901	-96.6
1995	1961.2		

In this table the FPC values were subtracted from the HDR numbers; therefore, the negative numbers merely indicate FPC values are larger than HDR values.

There were significantly more differences in quantifying augmentation flows from the Clearwater River. The maximum difference occurred in 1991. The difference of 433.7 KAF represents a 6 1 percent difference between the FPC values for 199 1 and the HDR volumes. A similar volume difference was experienced in 1993. However that was the only year where the HDR method produced larger values than the FPC method.

These erratic differences do not show any pattern from which conclusions may be drawn. It is apparent that the method of determining augmentation flows from the Clear-water River needs to be refined to properly account for storage releases. As stated in earlier sections, the HDR method did not include, as augmentation flows, releases made specifically for flood control which explains part of the differences shown.

A method of flow segregation similar to the Upper Snake River accounting system would eliminate these differences and produce results similar to those shown in Table 4-5. We would gladly outline the parameters that should be included in that system upon request.

SECTION 5

CONCLUSIONS

SECTION 5 - CONCLUSIONS

The (1991 - 1995) evaluation of augmentation flows for the upper Snake River has shown that it failed to provide 427,000 acre feet of water in 1991 and 1992. It is understandable why these years did not provide the entire quantities because that was not one of the objectives of the operating criteria. During these years the storage releases were generally governed by the releases IPC made from Brownlee in May and the quantities of rental pool water BPA could obtain during July and September. The releases made during September were associated with temperature control in the lower river reaches.

In 1993 - 1995, the upper Snake's contribution to flow augmentation volume exceeded the required level. It appears that this level can be achieved regularly, if similar runoff volumes continue in the future. If the migration periods were extended by one month, 1991 would have also provided the desired levels.

This study did not include an evaluation of the percentage of time during each year when target flows at lower Granite Dam were met. This study quantified the augmentation flows that were produced at the Lower Granite Project as a result of the operations of the upper Snake River and Dworshak reservoirs. The volumes produced, and their timing are shown on Table 4-3.

Providing these volumes has required modification of the historic reservoir operations on both the Snake and Clearwater Rivers. In order to determine the compounding impacts on the storage system, from providing augmentation flows, a complete analysis including water supply, affects of competing uses, and carryover operations must be made. A critical condition that should be examined are dry year series events. These successive years of low runoff will reduce the volume of annual storage carryover and will produce the greatest requirement on storage utilization. The impacts on other users during these extreme conditions will provide an indication of total impacts of these new reservoir operations.

The current Dworshak reservoir operations should be examined in a future study to identify a method for segregating releases into their various components, including flow augmentation. Once accomplished, this would refine the process of computing augmentation flows and tend to reduce confusion among various agencies with varying opinions. We have concluded that a system similar to the Upper Snake water district's would provide a comprehensive picture of storage usage.

The flow segregation method currently in place on the upper Snake River is an accurate representation of storage utilization. This system should be continued and refined as needed to effectively manage the water resource between competing uses.

SECTION 6

REFERENCES

SECTION 6 - REFERENCES

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SECTION 7

TABLES

SECTION 7 - TABLES

The daily data base was developed using data provided by IPC, USBR, IDWR, COE, BPA and FPC. A spreadsheet was developed for each year of the study. The spreadsheet shows the computed values of base, fish augmentation and total flows at the desired locations. The results of the analysis were plotted in graphs for each location. The spreadsheets and graphs are included following the description of the spreadsheets.

UNDERSTANDING THE SPREADSHEETS

The locations of interest include: (1) Snake River below Hells Canyon Dam, (2) Clearwater **River at** Peck, Idaho and (3) Inflow into Lower Granite Dam. At each of these locations both fish augmentation flows and base flows were determined. Fish augmentation flows were determined from existing records on the Snake River, with only a minor amount of adjustments, and from estimation methods from Dworshak Reservoir.

The first (1) column of each spreadsheet shows the date for which the flow segregation was completed. In columns 2 through 4 the analysis for the Snake River is shown. The units are thousands (1,000) of cfs (cubic feet per second).

Snake River

Column 2 - Recorded @ Hells. The second (2) column of the spreadsheet contains the historic (recorded) flows at the Hells Canyon gaging station on the Snake River. This gage is located downstream of Brownlee Reservoir, the facility used by IPC to release water to meet target flow levels. Brownlee reservoir has an active storage capacity of 1,420,000 acre-feet. There are no significant tributary inflows that enter the river between Brownlee and the gaging station. There are however two other storage reservoirs (Oxbow and Hells Canyon) located between Brownlee Dam and the gaging station. Both of these reservoirs are, however, operated on a "run-of-the-river" basis, without any significant storage capabilities. Basically what "runs-in, runs-out" is the operational mode for these two interim facilities. These two facilities, as well as Brownlee Dam are owned and operated by IPC. All three dams are equipped with hydroelectric generators and have historically been operated to maximize that function prior to 1991. Each daily value represents the mean daily flow at that gaging location.

It was concluded that the Hells Canyon gage was representative of the releases from Brownlee Dam. In this study the travel times were not adjusted, since the adjustments would involve hourly adjustment rather than days.

Column 3 - Fish Flows @ Brownlee This column represents fish augmentation flows that were computed using information from IPC, USBR, IDWR and the Water Districts and were representative of the flows released from Brownlee Reservoir for fish augmentation purposes. The fish augmentation values were provided by IPC for the period April 1 through August 3 1. These values were compared with values computed by IDWR using flow data from the Watermaster records and storage release records from USBR.

During 199 1 and 1992 fish augmentation flows were made outside of the normal release period (April-August). The fish augmentation flows were computed by distributing the volumes recorded by BPA in a linear fashion.

Column 4 - Computed Base. The values shown in this column are representative of the base flows that were computed at Brownlee Dam. These numbers were computed by subtracting the fish augmentation flows (column 3) from the total flows (column 2) at the gaging station. See Equation 2.2. Base flows are those flows which would have normally existed, had the fish augmentation flows not been released.

Clearwater River

Column 5 - Recorded @ Peck. The fifth (5) column of the spreadsheet contains the historic (recorded) flows at the Clear-water River near Peck, Idaho gaging station. This gaging station is located about three (3) miles downstream of the confluence of the North Fork Clear-water River and the mainstem Clear-water River. Dworshak Dam is located on the North Fork Clearwater River about 1.5 miles upstream of the confluence with the mainstem Clear-water River. Releases from Dworshak Dam combine with the mainstem flows and are measured at the Peck gaging station.

The flows recorded at the Peck gaging station include the natural (uncontrolled flows) of the mainstem Clearwater River and the releases and spills from Dworshak Dam. Each daily value represents the mean daily flow at that gaging location.

Column 6 - HDR Fish Flows @ Dwsk. This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for HDR. Using the HDR model, fish augmentation flows were computed using flow information supplied by the COE.

Column 7 - HDR Computed Base. The values shown in this column are representative of the base flows that were computed at the Clearwater River near Peck, Idaho gaging station. These numbers were computed by subtracting the fish augmentation flows (column 6) from the total flows (column 5) at the gaging station. See Equation 3.2.

Column 8 - IDWR Fish Flows @ Dwsk. This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for IDWR. This simplistic method merely subtracted the minimum flow value of 1,200 cfs from the Dworshak Dam discharge (outlet), excluding spillway spills, as the fish augmentation flows. The Dworshak discharge numbers were provided from the COE records.

Column 9 - IDWR Computed Base. The values shown in this column are representative of the base flows that were computed at the Clearwater River near Peck, Idaho gaging station. These numbers were computed by subtracting the fish augmentation flows (column 8) from the total flows (column 5) at the gaging station. See Equation 3.2.

Column 10 - BPA Fish Flows This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for BPA. This method produced different results than the IDWR method in only two years (91 - 92).

Column 11 - BPA Computed Base. The values shown in this column are representative of the base flows that were computed at the Clear-water River near Peck, Idaho gaging station. These numbers were computed by subtracting the fish augmentation flows (column 10) from the total flows (column 5) at the gaging station. See Equation 3.2.

The analysis of the inflow into Lower Granite Dam are shown in columns 12 through 18. The units are also in thousands (1,000) of cfs.

Inflow to Lower Granite Dam

Column 12 - Recorded @ LWGT. The 12th column of the spreadsheet contains computed inflows into Lower Granite Dam. No gaging station is located here so the values were computed using reservoir gages which record changes in Lower Granite Reservoir storage and the recorded outflow from Lower Granite Dam. The inflow is computed using Equation 3.1. The daily data at both locations are collected by the COE. Each daily value represents the mean daily flow at that gaging location.

Column 13 - HDR Fish Flows @ LWGT. This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for HDR for Dworshak, plus the fish augmentation flows that were computed at the Hells Canyon gaging station. These two values were added together to represent the total fish augmentation flows at Lower Granite Dam. The fish augmentation values for Dworshak and Hells Canyon translate directly to Lower Granite inflow since there are no other storage facilities that make fish augmentation releases in the intervening reach.

Column 14 - HDR Computed Base. The values shown in this column are representative of the base flows that were computed as inflow into Lower Granite Reservoir. These numbers were computed by subtracting the fish augmentation flows (column 13) from the total computed inflows (column 12). See Equation 3.2.

Column 15 - IDWR Fish Flows @ LWGT. This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for IDWR for Dworshak, plus the fish augmentation flows that were computed at the Hells Canyon gaging station. These two values were added together representing the total fish augmentation flows at Lower Granite Dam.

Column 16 - IDWR Computed Base. The values shown in this column are representative of the base flows that were computed as inflow into Lower Granite Reservoir. These numbers were computed by subtracting the fish augmentation flows (column 15) from the total computed inflows (column 12). See Equation 3.2.

Column 17 - BPA Fish Flows @ LWGT. This column represents fish augmentation flows that were computed using the method described in Section 3 - Analysis Method for BPA for Dworshak, plus the fish augmentation flows that were computed at the Hells Canyon gaging station. These two values were added together representing the total fish augmentation flows as inflows into Lower Granite Dam. You will notice that the numbers for all years except 199 1 and 1992 are the same for this column and column 15.

Column 18 - BPA Computed Base. The values shown in this column are representative of the base flows that were computed as inflow into Lower Granite Reservoir. These numbers were computed by subtracting the fish augmentation flows (column 17) from the total computed inflows (column 12). See Equation 3.2.

BASE FLOW AND FISH AUGMENTATION FLOW DETERMINATION

1991

HDR ENGINEERING, INC

COMPUTED BASE FLOW AT VARIOUS LOCATIONS

APR 1 - SEPT 30, 1991

*REVISED 1-3-97

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
1-Apr-91	9.5	0.0	9.5	5.7	0.0	5.7	0.0	5.7	0.0	5.7	21.6	0.0	21.6	0.0	21.6	0.0	21.6
2-Apr-91	9.3	0.0	9.3	7.6	0.0	7.6	0.0	7.6	0.0	7.6	25.0	0.0	25.0	0.0	25.0	0.0	25.0
3-Apr-91	8.7	0.0	8.7	11.2	0.2	11.0	1.6	9.6	0.0	11.2	27.4	0.2	27.2	1.6	25.8	0.0	27.4
4-Apr-91	8.1	0.0	8.1	11.8	0.0	11.8	1.9	9.9	0.0	11.8	30.6	0.0	30.6	1.9	28.7	0.0	30.6
5-Apr-91	7.4	0.0	7.4	11.5	0.0	11.5	0.3	11.2	0.0	11.5	32.0	0.0	32.0	0.3	31.7	0.0	32.0
6-Apr-91	6.6	0.0	6.6	15.2	0.0	15.2	0.0	15.2	0.0	15.2	34.9	0.0	34.9	0.0	34.9	0.0	34.9
7-Apr-91	6.6	0.0	6.6	15.7	0.0	15.7	0.0	15.7	0.0	15.7	36.2	0.0	36.2	0.0	36.2	0.0	36.2
8-Apr-91	6.7	0.0	6.7	14.4	0.0	14.4	0.0	14.4	0.0	14.4	36.3	0.0	36.3	0.0	36.3	0.0	36.3
9-Apr-91	6.8	0.0	6.8	13.5	0.0	13.5	0.0	13.5	0.0	13.5	32.9	0.0	32.9	0.0	32.9	0.0	32.9
10-Apr-91	6.6	0.0	6.6	13.5	0.0	13.5	0.1	13.4	0.0	13.5	33.9	0.0	33.9	0.1	33.8	0.0	33.9
11-Apr-91	6.9	0.0	6.9	12.3	0.0	12.3	0.1	12.2	0.0	12.3	31.6	0.0	31.6	0.1	31.5	0.0	31.6
12-Apr-91	7.4	0.0	7.4	11.3	0.0	11.3	0.1	11.2	0.0	11.3	30.6	0.0	30.6	0.1	30.5	0.0	30.6
13-Apr-91	7.7	0.0	7.7	10.5	0.0	10.5	0.0	10.5	0.0	10.5	29.3	0.0	29.3	0.0	29.3	0.0	29.3
14-Apr-91	7.9	0.0	7.9	10.2	0.0	10.2	0.0	10.2	0.0	10.2	29.7	0.0	29.7	0.0	29.7	0.0	29.7
15-Apr-91	7.9	0.0	7.9	10.6	0.0	10.6	0.3	10.3	0.0	10.6	28.3	0.0	28.3	0.3	28.0	0.0	28.3
16-Apr-91	7.9	0.0	7.9	10.4	0.0	10.4	0.1	10.3	0.0	10.4	29.1	0.0	29.1	0.1	29.0	0.0	29.1
17-Apr-91	7.9	0.0	7.9	10.0	0.0	10.0	0.0	10.0	0.0	10.0	28.1	0.0	28.1	0.0	28.1	0.0	28.1
18-Apr-91	7.9	0.0	7.9	9.9	0.0	9.9	0.1	9.8	0.0	9.9	28.8	0.0	28.8	0.1	28.7	0.0	28.8
19-Apr-91	7.9	0.0	7.9	9.9	0.0	9.9	0.1	9.8	0.0	9.9	28.6	0.0	28.6	0.1	28.5	0.0	28.6
20-Apr-91	7.9	0.0	7.9	10.2	0.0	10.2	0.1	10.1	0.0	10.2	28.0	0.0	28.0	0.1	27.9	0.0	28.0
21-Apr-91	7.7	0.0	7.7	11.0	0.0	11.0	0.1	10.9	0.0	11.0	26.8	0.0	26.8	0.1	26.7	0.0	26.8
22-Apr-91	7.5	0.0	7.5	12.5	0.0	12.5	0.1	12.4	0.0	12.5	31.3	0.0	31.3	0.1	31.2	0.0	31.3
23-Apr-91	6.7	0.0	6.7	14.1	0.0	14.1	0.1	14.0	0.0	14.1	31.8	0.0	31.8	0.1	31.7	0.0	31.8
24-Apr-91	9.2	0.0	9.2	16.5	0.0	16.5	0.1	16.4	0.0	16.5	36.0	0.0	36.0	0.1	35.9	0.0	36.0
25-Apr-91	6.8	0.0	6.8	17.8	0.0	17.8	0.1	17.7	0.0	17.8	43.4	0.0	43.4	0.1	43.3	0.0	43.4
26-Apr-91	10.6	0.0	10.6	29.7	8.4	21.3	14.6	15.1	15.7	14.0	53.1	8.4	44.7	14.6	38.5	15.7	37.4
27-Apr-91	7.2	0.0	7.2	37.5	20.0	17.5	23.9	13.6	23.7	13.8	63.6	20.0	43.6	23.9	39.7	23.7	39.9
28-Apr-91	6.7	0.0	6.7	36.1	20.8	15.3	23.9	12.2	24.2	11.9	58.3	20.8	37.5	23.9	34.4	24.2	34.1
29-Apr-91	9.7	0.0	9.7	35.4	20.7	14.7	23.8	11.6	24.2	11.2	56.0	20.7	35.3	23.8	32.2	24.2	31.8
30-Apr-91	9.4	0.0	9.4	35.5	22.1	13.4	24.2	11.3	24.2	11.3	57.8	22.1	35.7	24.2	33.6	24.2	33.6
1-May-91	6.8	0.0	6.8	35.6	22.9	12.7	24.0	11.6	24.2	11.4	57.3	22.9	34.4	24.0	33.3	24.2	33.1
2-May-91	12.4	0.0	12.4	35.4	22.6	12.8	23.9	11.5	24.2	11.2	59.2	22.6	36.6	23.9	35.3	24.2	35.0
3-May-91	12.6	0.0	12.6	34.9	22.3	12.6	23.8	11.1	23.7	11.2	58.9	22.3	36.6	23.8	35.1	23.7	35.2
4-May-91	7.0	0.0	7.0	34.2	22.2	12.0	23.9	10.3	23.7	10.5	58.3	22.2	36.1	23.9	34.4	23.7	34.6
5-May-91	7.2	0.0	7.2	26.4	14.4	12.0	15.8	10.6	15.7	10.7	47.7	14.4	33.3	15.8	31.9	15.7	32.0
6-May-91	20.0	6.6	13.4	20.7	7.9	12.8	10.3	10.4	11.5	9.2	42.4	14.5	27.9	16.9	25.5	18.1	24.3
7-May-91	18.6	7.6	11.0	22.7	6.6	16.1	10.4	12.3	11.5	11.2	53.0	14.2	38.8	18.0	35.0	19.1	33.9
8-May-91	17.1	7.6	9.5	26.6	0.6	26.0	10.4	16.2	11.5	15.1	56.9	8.2	48.7	18.0	38.9	19.1	37.8
9-May-91	13.2	7.6	5.6	35.2	0.0	35.2	10.3	24.9	11.5	23.7	74.1	7.6	66.5	17.9	56.2	19.1	55.0
10-May-91	16.5	7.6	8.9	31.5	2.9	28.6	10.3	21.2	11.5	20.0	75.8	10.5	65.3	17.9	57.9	19.1	56.7
11-May-91	19.4	7.6	11.8	29.4	2.9	26.5	10.3	19.1	10.5	18.9	73.7	10.5	63.2	17.9	55.8	18.1	55.6
12-May-91	24.2	7.6	16.6	35.6	7.6	28.0	16.0	19.6	16.5	19.1	75.5	15.2	60.3	23.6	51.9	24.1	51.4
13-May-91	23.5	7.7	15.8	40.7	9.8	30.9	18.9	21.8	21.5	19.2	85.7	17.5	68.2	26.6	59.1	29.1	56.6
14-May-91	24.3	7.7	16.6	36.7	4.2	32.5	13.5	23.2	16.5	20.2	80.3	11.9	68.4	21.2	59.1	24.2	56.1
15-May-91	22.1	6.2	15.9	41.9	10.5	31.4	19.0	22.9	19.5	22.4	84.2	16.7	67.5	25.2	59.0	25.7	58.5
16-May-91	13.2	0.0	13.2	42.9	9.9	33.0	18.9	24.0	19.0	23.9	82.3	9.9	72.4	18.9	63.4	19.0	63.3
17-May-91	11.9	0.0	11.9	44.9	9.5	35.4	18.9	26.0	19.0	25.9	80.7	9.5	71.2	18.9	61.8	19.0	61.7
18-May-91	13.1	0.0	13.1	51.6	0.0	51.6	15.5	36.1	16.5	35.1	92.7	0.0	92.7	15.5	77.2	16.5	76.2
19-May-91	16.6	0.0	16.6	53.8	0.0	53.8	7.8	46.0	11.5	42.3	111.7	0.0	111.7	7.8	103.9	11.5	100.2
20-May-91	18.6	0.0	18.6	44.1	0.0	44.1	3.2	40.9	3.5	40.6	118.6	0.0	118.6	3.2	115.4	3.5	115.1
21-May-91	15.1	0.0	15.1	38.6	0.0	38.6	3.1	35.5	3.5	35.1	103.7	0.0	103.7	3.1	100.6	3.5	100.2
22-May-91	14.3	0.0	14.3	39.9	0.0	39.9	3.8	36.1	6.5	33.4	97.1	0.0	97.1	3.8	93.3	6.5	90.6
23-May-91	13.1	0.0	13.1	43.7	0.0	43.7	5.7	38.0	7.1	36.6	100.3	0.0	100.3	5.7	94.6	7.1	93.2
24-May-91	12.2	0.0	12.2	43.3	0.0	43.3	5.4	37.9	6.5	36.8	101.8	0.0	101.8	5.4	96.4	6.5	95.3
25-May-91	13.5	0.0	13.5	41.0	0.0	41.0	0.8	40.2	6.5	34.5	101.2	0.0	101.2	0.8	100.4	6.5	94.7
26-May-91	8.8	0.0	8.8	35.6	0.0	35.6	0.9	34.7	6.5	29.1	98.7	0.0	98.7	0.9	97.8	6.5	92.2
27-May-91	11.1	0.0	11.1	29.8	0.0	29.8	0.7	29.1	6.5	23.3	87.9	0.0	87.9	0.7	87.2	6.5	81.4

APR 1 - SEPT 30, 1991

*REVISED 1-3-97

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
28-May-91	14.3	0.0	14.3	28.8	0.0	28.8	3.4	25.4	6.5	22.3	81.9	0.0	81.9	3.4	78.5	6.5	75.4
29-May-91	13.7	0.0	13.7	32.1	0.6	31.5	8.4	23.7	8.5	23.6	83.4	0.6	82.8	8.4	75.0	8.5	74.9
30-May-91	13.3	0.0	13.3	33.9	0.0	33.9	8.4	25.5	8.5	25.4	83.6	0.0	83.6	8.4	75.2	8.5	75.1
31-May-91	14.1	0.0	14.1	34.6	0.6	34.0	8.4	26.2	8.5	26.1	84.0	0.6	83.4	8.4	75.6	8.5	75.5
1-Jun-91	13.2	0.0	13.2	35.4	4.7	30.7	11.9	23.5	12.0	23.4	82.8	4.7	78.1	11.9	70.9	12.0	70.8
2-Jun-91	13.9	0.0	13.9	39.5	6.7	32.8	13.7	25.8	14.1	25.4	84.0	6.7	77.3	13.7	70.3	14.1	69.9
3-Jun-91	17.8	0.0	17.8	40.8	1.2	39.6	10.2	30.6	10.1	30.7	90.1	1.2	88.9	10.2	79.9	10.1	80.0
4-Jun-91	16.2	0.0	16.2	39.5	0.0	39.5	7.7	31.8	7.6	31.9	100.3	0.0	100.3	7.7	92.6	7.6	92.7
5-Jun-91	14.5	0.0	14.5	31.4	0.0	31.4	2.7	28.7	2.6	28.8	90.8	0.0	90.8	2.7	88.1	2.6	88.2
6-Jun-91	14.0	0.0	14.0	31.4	0.0	31.4	1.0	30.4	1.1	30.3	87.7	0.0	87.7	1.0	86.7	1.1	86.6
7-Jun-91	14.2	0.0	14.2	35.5	0.0	35.5	0.9	34.6	1.1	34.4	90.1	0.0	90.1	0.9	89.2	1.1	89.0
8-Jun-91	12.1	0.0	12.1	31.1	0.0	31.1	0.9	30.2	1.1	30.0	86.3	0.0	86.3	0.9	85.4	1.1	85.2
9-Jun-91	11.3	0.0	11.3	28.6	0.0	28.6	0.7	27.9	1.1	27.5	79.4	0.0	79.4	0.7	78.7	1.1	78.3
10-Jun-91	15.5	0.0	15.5	33.9	0.0	33.9	5.8	28.1	6.1	27.8	80.8	0.0	80.8	5.8	75.0	6.1	74.7
11-Jun-91	18.1	0.0	18.1	39.6	0.0	39.6	7.6	32.0	7.6	32.0	95.6	0.0	95.6	7.6	88.0	7.6	88.0
12-Jun-91	16.5	0.0	16.5	36.0	0.0	36.0	5.2	30.8	6.1	29.9	98.3	0.0	98.3	5.2	93.1	6.1	92.2
13-Jun-91	17.0	0.0	17.0	32.7	0.0	32.7	5.2	27.5	6.1	26.6	97.4	0.0	97.4	5.2	92.2	6.1	91.3
14-Jun-91	13.7	0.0	13.7	29.3	0.0	29.3	5.2	24.1	5.6	23.7	90.4	0.0	90.4	5.2	85.2	5.6	84.8
15-Jun-91	7.1	0.0	7.1	25.8	0.0	25.8	4.5	21.3	5.6	20.2	78.4	0.0	78.4	4.5	73.9	5.6	72.8
16-Jun-91	6.8	0.0	6.8	23.9	0.0	23.9	4.5	19.4	5.6	18.3	66.9	0.0	66.9	4.5	62.4	5.6	61.3
17-Jun-91	13.4	0.0	13.4	23.4	0.0	23.4	4.5	18.9	6.1	17.3	64.6	0.0	64.6	4.5	60.1	6.1	58.5
18-Jun-91	10.6	0.0	10.6	23.1	0.0	23.1	5.4	17.7	0.0	23.1	68.0	0.0	68.0	5.4	62.6	0.0	68.0
19-Jun-91	7.0	0.0	7.0	25.8	0.0	25.8	8.1	17.7	0.0	25.8	66.5	0.0	66.5	8.1	58.4	0.0	66.5
20-Jun-91	10.0	0.0	10.0	27.9	0.0	27.9	8.2	19.7	0.0	27.9	64.4	0.0	64.4	8.2	56.2	0.0	64.4
21-Jun-91	10.6	0.0	10.6	29.5	0.0	29.5	8.2	21.3	0.0	29.5	70.6	0.0	70.6	8.2	62.4	0.0	70.6
22-Jun-91	7.1	0.0	7.1	24.5	0.0	24.5	4.8	19.7	0.0	24.5	65.3	0.0	65.3	4.8	60.5	0.0	65.3
23-Jun-91	6.9	0.0	6.9	24.2	0.0	24.2	4.8	19.4	0.0	24.2	60.4	0.0	60.4	4.8	55.6	0.0	60.4
24-Jun-91	11.9	0.0	11.9	26.1	0.0	26.1	7.5	18.6	0.0	26.1	61.1	0.0	61.1	7.5	53.6	0.0	61.1
25-Jun-91	9.5	0.0	9.5	28.6	0.0	28.6	9.0	19.6	0.0	28.6	67.2	0.0	67.2	9.0	58.2	0.0	67.2
26-Jun-91	10.8	0.0	10.8	28.9	1.9	27.0	10.8	18.1	0.0	28.9	65.6	1.9	63.7	10.8	54.8	0.0	65.6
27-Jun-91	8.9	0.0	8.9	26.4	0.4	26.0	9.1	17.3	0.0	26.4	63.6	0.4	63.2	9.1	54.5	0.0	63.6
28-Jun-91	10.2	0.0	10.2	24.5	0.1	24.4	8.2	16.3	0.0	24.5	58.8	0.1	58.7	8.2	50.6	0.0	58.8
29-Jun-91	9.3	0.0	9.3	24.9	0.2	24.7	8.2	16.7	0.0	24.9	60.9	0.2	60.7	8.2	52.7	0.0	60.9
30-Jun-91	11.4	0.0	11.4	26.6	0.0	26.6	6.4	20.2	0.0	26.6	61.5	0.0	61.5	6.4	55.1	0.0	61.5
1-Jul-91	13.9	0.0	13.9	29.3	0.2	29.1	8.2	21.1	0.0	29.3	69.9	0.2	69.7	8.2	61.7	0.0	69.9
2-Jul-91	15.4	0.0	15.4	25.5	0.7	24.8	8.2	17.3	0.0	25.5	63.9	0.7	63.2	8.2	55.7	0.0	63.9
3-Jul-91	14.7	0.0	14.7	24.1	1.0	23.1	8.2	15.9	0.0	24.1	63.8	1.0	62.8	8.2	55.6	0.0	63.8
4-Jul-91	8.6	0.0	8.6	21.7	0.0	21.7	6.3	15.4	0.0	21.7	59.0	0.0	59.0	6.3	52.7	0.0	59.0
5-Jul-91	8.1	0.0	8.1	20.7	0.0	20.7	6.2	14.5	0.0	20.7	51.2	0.0	51.2	6.2	45.0	0.0	51.2
6-Jul-91	8.1	0.0	8.1	18.2	0.0	18.2	4.9	13.3	0.0	18.2	47.7	0.0	47.7	4.9	42.8	0.0	47.7
7-Jul-91	8.0	0.0	8.0	16.7	0.0	16.7	4.7	12.0	0.0	16.7	44.3	0.0	44.3	4.7	39.6	0.0	44.3
8-Jul-91	8.3	0.0	8.3	15.8	0.1	15.7	4.9	10.9	0.0	15.8	41.6	0.1	41.5	4.9	36.7	0.0	41.6
9-Jul-91	11.5	6.3	5.2	15.2	1.1	14.1	5.8	9.4	5.2	10.0	39.7	7.4	32.3	12.1	27.6	11.5	28.2
10-Jul-91	15.3	7.3	8.0	17.6	4.2	13.4	8.2	9.4	7.7	9.9	46.8	11.5	35.3	15.5	31.3	15.0	31.8
11-Jul-91	15.4	7.3	8.1	17.2	4.7	12.5	8.2	9.0	7.2	10.0	47.4	12.0	35.4	15.5	31.9	14.5	32.9
12-Jul-91	15.5	7.3	8.2	16.6	5.2	11.4	8.2	8.4	6.7	9.9	46.7	12.5	34.2	15.5	31.2	14.0	32.7
13-Jul-91	15.5	7.3	8.2	14.1	3.7	10.4	6.0	8.1	4.7	9.4	43.0	11.0	32.0	13.3	29.7	12.0	31.0
14-Jul-91	15.4	7.3	8.1	10.8	0.0	10.8	3.1	7.7	0.7	10.1	37.0	7.3	29.7	10.4	26.6	8.0	29.0
15-Jul-91	13.6	6.3	7.3	10.8	0.0	10.8	3.0	7.8	0.7	10.1	37.8	6.3	31.5	9.3	28.5	7.0	30.8
16-Jul-91	7.6	1.3	6.3	8.3	0.0	8.3	0.9	7.4	0.0	8.3	31.4	1.3	30.1	2.2	29.2	1.3	30.1
17-Jul-91	6.7	0.0	6.7	7.3	0.0	7.3	0.4	6.9	0.0	7.3	24.8	0.0	24.8	0.4	24.4	0.0	24.8
18-Jul-91	6.9	0.0	6.9	7.1	0.0	7.1	0.4	6.7	0.0	7.1	23.8	0.0	23.8	0.4	23.4	0.0	23.8
19-Jul-91	6.6	0.0	6.6	6.8	0.0	6.8	0.4	6.4	0.0	6.8	22.6	0.0	22.6	0.4	22.2	0.0	22.6
20-Jul-91	6.6	0.0	6.6	6.4	0.0	6.4	0.4	6.0	0.0	6.4	21.4	0.0	21.4	0.4	21.0	0.0	21.4
21-Jul-91	6.7	0.0	6.7	6.1	0.0	6.1	0.4	5.7	0.0	6.1	20.8	0.0	20.8	0.4	20.4	0.0	20.8
22-Jul-91	9.1	0.0	9.1	5.9	0.0	5.9	0.6	5.3	0.0	5.9	20.7	0.0	20.7	0.6	20.1	0.0	20.7
23-Jul-91	7.7	0.0	7.7	7.4	0.3	7.1	2.3	5.1	0.0	7.4	23.2	0.3	22.9	2.3	20.9	0.0	23.2
24-Jul-91	6.9	0.0	6.9	8.0	0.8	7.2	2.9	5.1	0.0	8.0	22.8	0.8	22.0	2.9	19.9	0.0	22.8
25-Jul-91	6.9	0.0	6.9	7.7	1.3	6.4	2.6	5.1	0.0	7.7	22.1	1.3	20.8	2.6	19.5	0.0	22.1

APR 1 - SEPT 30, 1991

*REVISED 1-3-97

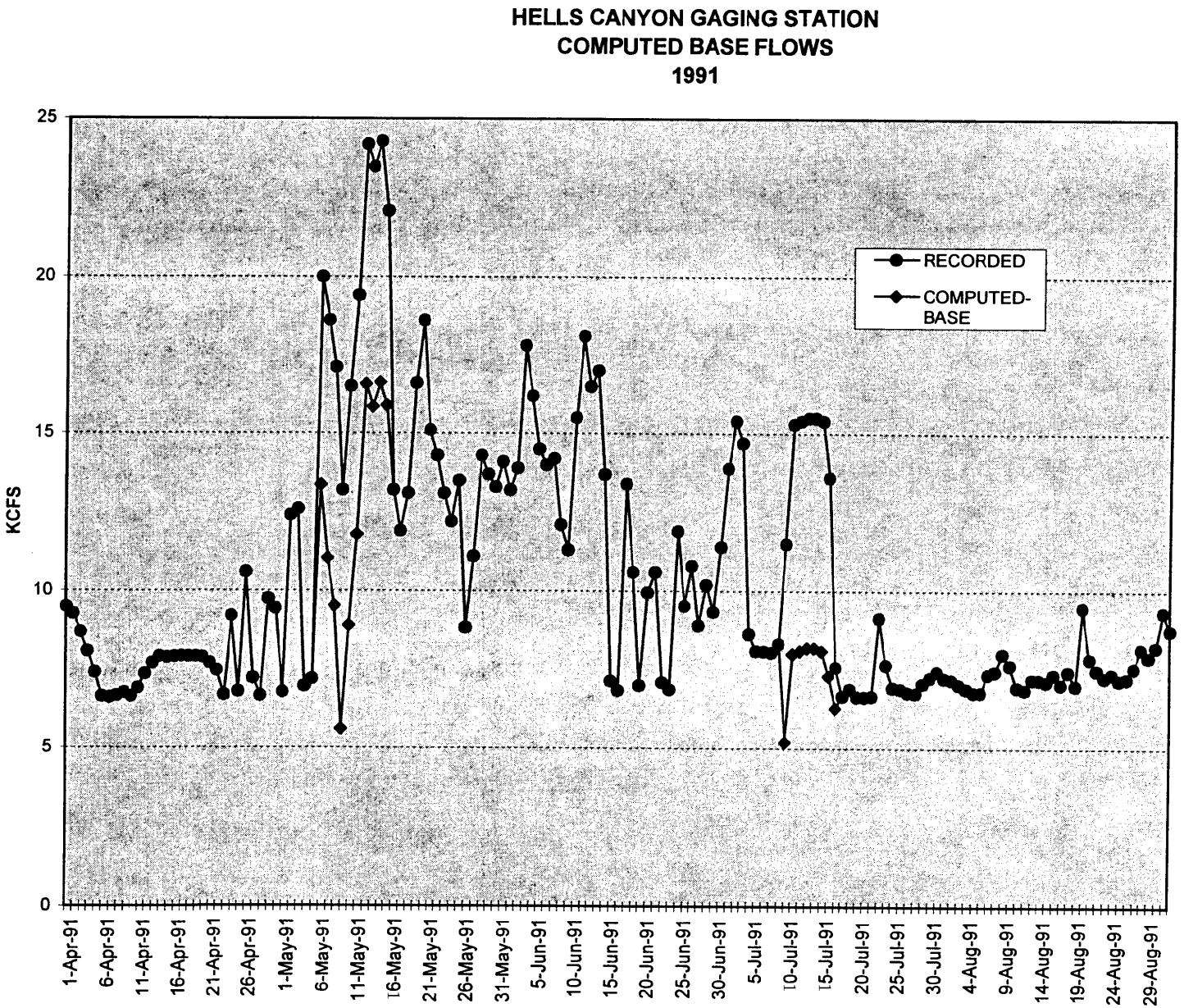
	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
26-Jul-91	6.8	0.0	6.8	6.8	0.0	6.8	1.6	5.2	0.0	6.8	21.5	0.0	21.5	1.6	19.9	0.0	21.5
27-Jul-91	6.8	0.0	6.8	4.9	0.0	4.9	0.0	4.9	0.0	4.9	19.6	0.0	19.6	0.0	19.6	0.0	19.6
28-Jul-91	7.1	0.0	7.1	4.7	0.0	4.7	0.0	4.7	0.0	4.7	18.2	0.0	18.2	0.0	18.2	0.0	18.2
29-Jul-91	7.3	0.0	7.3	6.3	0.7	5.6	1.7	4.6	0.0	6.3	19.5	0.7	18.8	1.7	17.8	0.0	19.5
30-Jul-91	7.4	0.0	7.4	4.9	0.0	4.9	0.6	4.3	0.0	4.9	18.8	0.0	18.8	0.6	18.2	0.0	18.8
31-Jul-91	7.2	0.0	7.2	4.1	0.0	4.1	0.0	4.1	0.0	4.1	17.6	0.0	17.6	0.0	17.6	0.0	17.6
1-Aug-91	7.2	0.0	7.2	5.8	0.0	5.8	1.7	4.1	0.0	5.8	17.8	0.0	17.8	1.7	16.1	0.0	17.8
2-Aug-91	7.0	0.0	7.0	6.3	1.0	5.3	2.3	4.0	0.0	6.3	18.2	1.0	17.2	2.3	15.9	0.0	18.2
3-Aug-91	6.9	0.0	6.9	4.0	0.0	4.0	0.0	4.0	0.0	4.0	17.0	0.0	17.0	0.0	17.0	0.0	17.0
4-Aug-91	6.8	0.0	6.8	3.8	0.0	3.8	0.0	3.8	0.0	3.8	15.3	0.0	15.3	0.0	15.3	0.0	15.3
5-Aug-91	6.8	0.0	6.8	5.8	1.0	4.8	2.1	3.7	0.0	5.8	15.9	1.0	14.9	2.1	13.8	0.0	15.9
6-Aug-91	7.4	0.0	7.4	5.2	0.8	4.4	1.6	3.6	0.0	5.2	17.8	0.8	17.0	1.6	16.2	0.0	17.8
7-Aug-91	7.4	0.0	7.4	4.4	0.0	4.4	0.9	3.5	0.0	4.4	16.9	0.0	16.9	0.9	16.0	0.0	16.9
8-Aug-91	8.0	0.0	8.0	5.4	1.7	3.7	1.8	3.6	0.0	5.4	17.5	1.7	15.8	1.8	15.7	0.0	17.5
9-Aug-91	7.6	0.0	7.6	3.9	0.4	3.5	0.4	3.5	0.0	3.9	16.7	0.4	16.3	0.4	16.3	0.0	16.7
10-Aug-91	6.9	0.0	6.9	3.3	0.0	3.3	0.0	3.3	0.0	3.3	16.1	0.0	16.1	0.0	16.1	0.0	16.1
11-Aug-91	6.9	0.0	6.9	3.2	0.0	3.2	0.0	3.2	0.0	3.2	14.2	0.0	14.2	0.0	14.2	0.0	14.2
12-Aug-91	7.2	0.0	7.2	3.1	0.0	3.1	0.0	3.1	0.0	3.1	14.1	0.0	14.1	0.0	14.1	0.0	14.1
13-Aug-91	7.2	0.0	7.2	3.1	0.0	3.1	0.0	3.1	0.0	3.1	15.5	0.0	15.5	0.0	15.5	0.0	15.5
14-Aug-91	7.1	0.0	7.1	3.0	0.0	3.0	0.0	3.0	0.0	3.0	14.4	0.0	14.4	0.0	14.4	0.0	14.4
15-Aug-91	7.3	0.0	7.3	3.0	0.0	3.0	0.0	3.0	0.0	3.0	13.5	0.0	13.5	0.0	13.5	0.0	13.5
16-Aug-91	7.0	0.0	7.0	7.6	4.8	2.8	5.1	2.5	4.6	3.1	15.8	4.8	11.0	5.1	10.7	4.6	11.2
17-Aug-91	7.4	0.0	7.4	11.0	8.2	2.8	8.2	2.8	8.5	2.5	21.3	8.2	13.1	8.2	13.1	8.5	12.8
18-Aug-91	7.0	0.0	7.0	11.0	8.2	2.8	8.2	2.8	8.5	2.5	21.8	8.2	13.6	8.2	13.6	8.5	13.3
19-Aug-91	9.5	0.0	9.5	11.0	8.2	2.8	8.2	2.8	8.5	2.5	21.8	8.2	13.6	8.2	13.6	8.5	13.3
20-Aug-91	7.8	0.0	7.8	10.9	8.2	2.7	8.2	2.7	8.5	2.4	23.9	8.2	15.7	8.2	15.7	8.5	15.4
21-Aug-91	7.5	0.0	7.5	9.1	5.8	3.3	5.8	3.3	5.6	3.6	22.6	5.8	16.8	5.8	16.8	5.6	17.0
22-Aug-91	7.3	0.0	7.3	2.8	0.0	2.8	0.0	2.8	0.5	2.3	14.0	0.0	14.0	0.0	14.0	0.5	13.5
23-Aug-91	7.4	0.0	7.4	2.7	0.0	2.7	0.0	2.7	0.5	2.2	17.9	0.0	17.9	0.0	17.9	0.5	17.4
24-Aug-91	7.2	0.0	7.2	2.7	0.0	2.7	0.0	2.7	0.0	2.7	13.6	0.0	13.6	0.0	13.6	0.0	13.6
25-Aug-91	7.2	0.0	7.2	2.7	0.0	2.7	0.0	2.7	0.0	2.7	12.4	0.0	12.4	0.0	12.4	0.0	12.4
26-Aug-91	7.6	0.0	7.6	2.6	0.0	2.6	0.0	2.6	0.0	2.6	13.1	0.0	13.1	0.0	13.1	0.0	13.1
27-Aug-91	8.2	0.0	8.2	2.5	0.0	2.5	0.0	2.5	0.0	2.5	13.4	0.0	13.4	0.0	13.4	0.0	13.4
28-Aug-91	7.9	0.0	7.9	2.7	0.2	2.5	0.2	2.5	0.0	2.7	14.3	0.2	14.1	0.2	14.1	0.0	14.3
29-Aug-91	8.2	0.0	8.2	3.0	0.3	2.7	0.3	2.7	0.0	3.0	14.2	0.3	13.9	0.3	13.9	0.0	14.2
30-Aug-91	9.3	0.0	9.3	3.2	0.3	2.9	0.3	2.9	0.0	3.2	14.8	0.3	14.5	0.3	14.5	0.0	14.8
31-Aug-91	8.8	0.0	8.8	2.6	0.0	2.6	0.0	2.6	0.0	2.6	14.6	0.0	14.6	0.0	14.6	0.0	14.6
SUB TOT																	
(KSFD)	1590.6	124.2	1466.4	3024.7	358.5	2666.2	825.3	2199.4	686.2	2338.5	7450.4	482.7	6967.7	949.5	6500.9	810.4	6640.0
(KAF)	3155.7	246.4	2909.3	6000.9	711.3	5289.7	1637.4	4363.6	1361.4	4639.5	14781.6	957.7	13823.9	1883.8	12897.8	1607.9	13173.7
1-Sep-91	9.0	0.0		2.5					0.0	2.5	13.4	0.0	13.4			0.0	13.4
2-Sep-91	8.8	0.0		2.5					0.0	2.5	14.3	0.0	14.3			0.0	14.3
3-Sep-91	8.9	0.0		6.3					5.0	1.3	15.0	0.0	15.0			5.0	10.0
4-Sep-91	9.8	5.9		10.6					9.5	1.1	20.9	5.9	15.0			15.5	5.4
5-Sep-91	9.9	5.9		10.6					9.5	1.1	23.2	5.9	17.3			15.5	7.7
6-Sep-91	11.8	5.9		10.6					9.5	1.1	23.6	5.9	17.7			15.5	8.1
7-Sep-91	14.0	5.9		10.6					9.5	1.1	26.7	5.9	20.8			15.5	11.2
8-Sep-91	14.1	5.9		10.6					9.5	1.1	26.9	5.9	21.0			15.5	11.4
9-Sep-91	18.8	5.9		10.6					9.5	1.1	28.8	5.9	22.9			15.5	13.3
10-Sep-91	19.2	5.9		10.6					9.5	1.1	32.2	5.9	26.3			15.5	16.7
11-Sep-91	19.3	5.9		10.6					9.5	1.1	32.3	5.9	26.4			15.5	16.8
12-Sep-91	19.3	5.9		10.6					9.5	1.1	29.4	5.9	23.5			15.5	13.9
13-Sep-91	19.3	5.9		10.7					9.5	1.2	33.0	5.9	27.1			15.5	17.5
14-Sep-91	19.3	5.9		10.7					9.5	1.2	33.8	5.9	27.9			15.5	18.3
15-Sep-91	19.4	5.9		10.8					9.5	1.3	33.3	5.9	27.4			15.5	17.8

APR 1 - SEPT 30, 1991

REVISED 1-3-97

DATE	SNAKE RIVER RECORDED @ HELLS (KCFS)	SNAKE RIVER FISH FLOWS @BRNLEE (KCFS)	SNAKE RIVER COMPUTED BASE (KCFS)	CLEARWATER RIVER RECORDED @ PECK (KCFS)	CLEARWATER RIVER HDR FISH FLOWS @DWSK (KCFS)	CLEARWATER RIVER HDR COMPUTED BASE (KCFS)	CLEARWATER RIVER IDWR FISH FLOWS @DWSK (KCFS)	CLEARWATER RIVER IDWR COMPUTED BASE (KCFS)	CLEARWATER RIVER BPA FISH FLOWS @DWSK (KCFS)	CLEARWATER RIVER BPA COMPUTED BASE (KCFS)	INFLOW TO LOWER GRANITE DAM RECORDED @LWGT (KCFS)	INFLOW TO LOWER GRANITE DAM HDR FISH FLOWS @LWGT (KCFS)	INFLOW TO LOWER GRANITE DAM HDR COMPUTED BASE (KCFS)	INFLOW TO LOWER GRANITE DAM IDWR FISH FLOWS @LWGT (KCFS)	INFLOW TO LOWER GRANITE DAM IDWR COMPUTED BASE (KCFS)	INFLOW TO LOWER GRANITE DAM BPA FISH FLOWS @LWGT (KCFS)	INFLOW TO LOWER GRANITE DAM BPA COMPUTED BASE (KCFS)
16-Sep-91	19.4	5.9		10.4					9.5	0.9	32.9	5.9	27.0			15.5	17.4
17-Sep-91	19.3	5.9		10.8					9.5	1.3	32.8	5.9	26.9			15.5	17.3
18-Sep-91	19.5	5.9		10.6					9.5	1.1	33.0	5.9	27.1			15.5	17.5
19-Sep-91	16.2	5.9		10.7					9.5	1.2	33.8	5.9	27.9			15.5	18.3
20-Sep-91	14.2	5.9		10.0					9.5	0.5	25.7	5.9	19.8			15.5	10.2
21-Sep-91	13.6	0.0		10.7					9.5	1.2	28.2	0.0	28.2			9.5	18.7
22-Sep-91	10.9	0.0		10.6					9.5	1.1	26.5	0.0	26.5			9.5	17.0
23-Sep-91	15.2	0.0		10.6					9.5	1.1	25.8	0.0	25.8			9.5	16.3
24-Sep-91	13.0	0.0		10.6					9.5	1.1	28.3	0.0	28.3			9.5	18.8
25-Sep-91	12.8	0.0		10.7					9.5	1.2	27.4	0.0	27.4			9.5	17.9
26-Sep-91	12.7	0.0		10.7					9.5	1.2	26.0	0.0	26.0			9.5	16.5
27-Sep-91	12.6	0.0		10.7					9.5	1.2	26.6	0.0	26.6			9.5	17.1
28-Sep-91	11.4	0.0		10.71					9.5	1.2	26.8	0.0	26.8			9.5	17.3
29-Sep-91	10.1	0.0		10.7					9.5	1.2	25.5	0.0	25.5			9.5	16.0
30-Sep-91	12.4	0.0		10.4					9.0	1.4	24.5	0.0	24.5			9.0	15.5
SUB TOT																	
(KSFD)	434.3	100.8		297.8					262.1	35.7	810.6	100.8	709.8			363.0	447.6
(KAF)	861.7	200.1		590.8					520.1	70.8	1608.2	200.1	1408.2			720.1	888.1
TOTALS																	
(KSFD)	2024.9	225.0	1466.4	3322.5	358.5	2666.2	825.3	2199.4	948.3	2374.1	8261.0	583.5	7677.5	1050.3	6500.9	1173.4	7087.6
(KAF)	4017.4	446.5	2909.3	6591.8	711.3	5289.7	1637.4	4363.6	1881.5	4710.3	16389.8	1157.7	15232.1	2083.9	12897.8	2328.0	14061.9

* 1 KCFS for a 24 hour flow period = 1 KSFD


HELLS CANYON GAGING STATION
COMPUTED BASE FLOWS
1991
KCFS
25
20
15
10
5
0
RECORDED
COMPUTED-BASE
1-Apr-91
6-Apr-91
11-Apr-91
16-Apr-91
21-Apr-91
26-Apr-91
1-May-91
6-May-91
11-May-91
16-May-91
21-May-91
26-May-91
31-May-91
5-Jun-91
10-Jun-91
15-Jun-91
20-Jun-91
25-Jun-91
30-Jun-91
5-Jul-91
10-Jul-91
15-Jul-91
20-Jul-91
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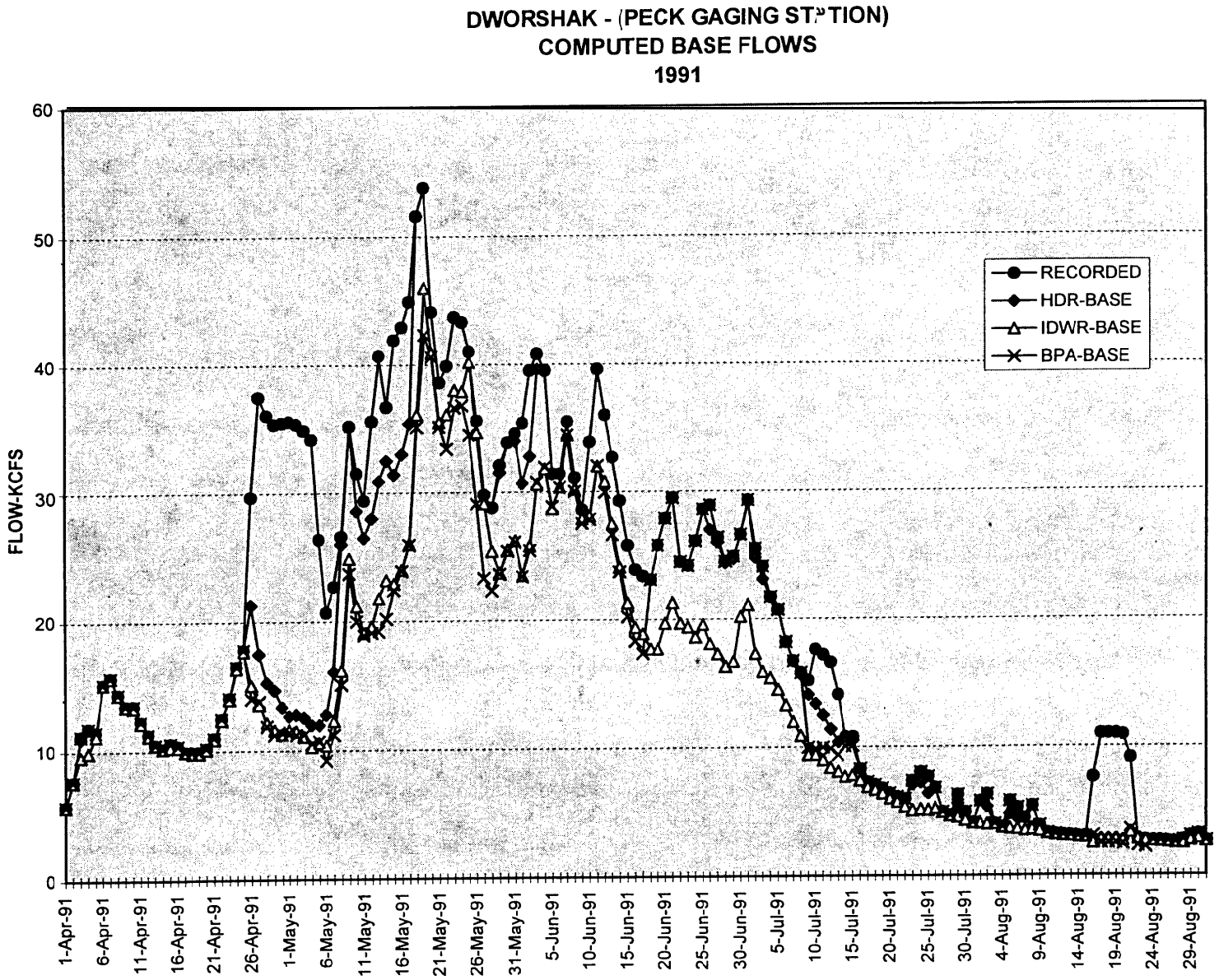
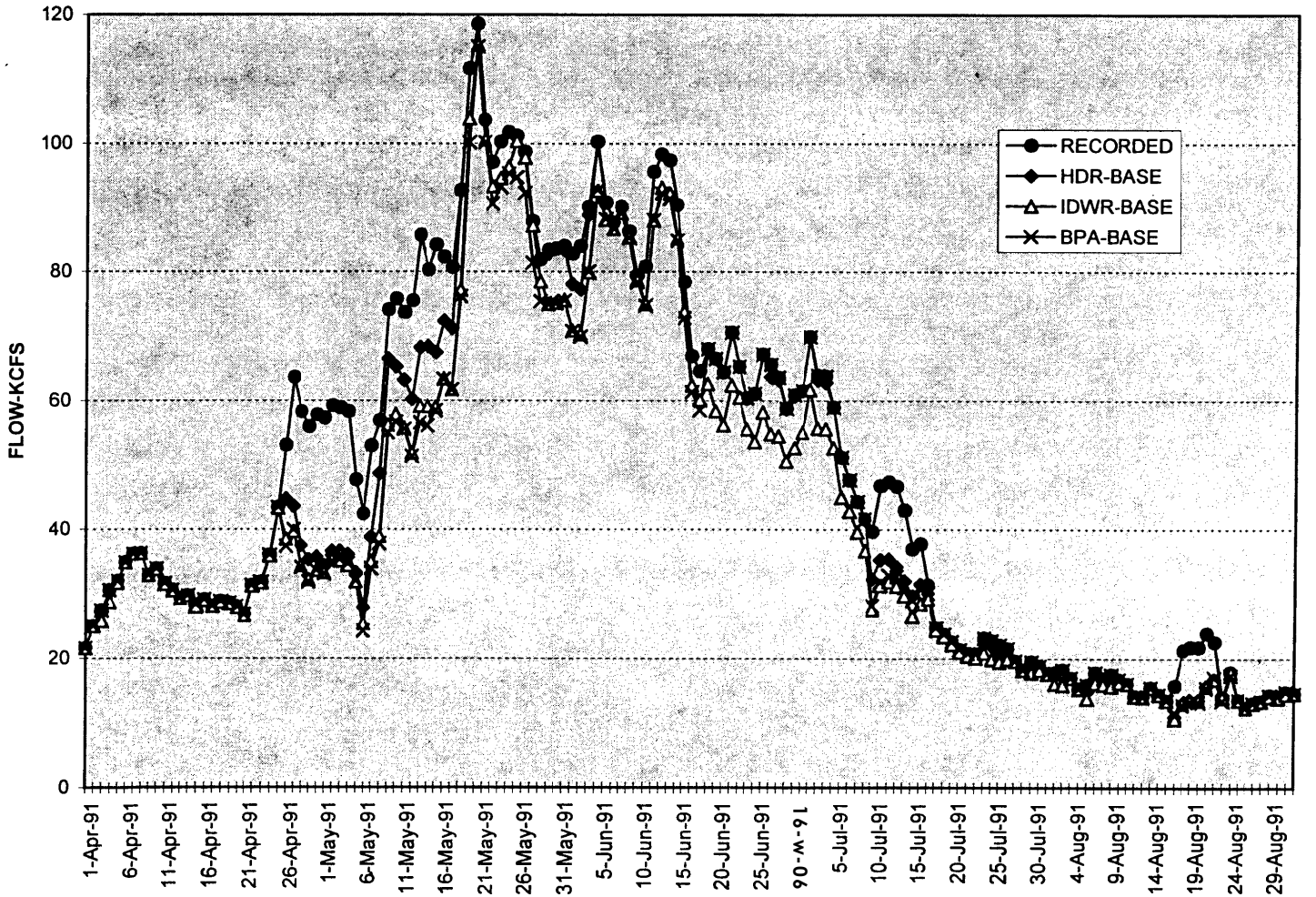
4-Aug-91
9-Aug-91
14-Aug-91
19-Aug-91
24-Aug-91
29-Aug-91


DWORSHAK - (PECK GAGING STATION)
COMPUTED BASE FLOWS
1991
FLOW-KCFS
60
50
40
30
20
10
0
RECORDED
HDR-BASE
IDWR-BASE
BPA-BASE
1-Apr-91
6-Apr-91
11-Apr-91
16-Apr-91
21-Apr-91
26-Apr-91
1-May-91
6-May-91
11-May-91
16-May-91
21-May-91
26-May-91
31-May-91
5-Jun-91
10-Jun-91
15-Jun-91
20-Jun-91
25-Jun-91
30-Jun-91
5-Jul-91
10-Jul-91
15-Jul-91
20-Jul-91
25-Jul-91
30-Jul-91
4-Aug-91
9-Aug-91
14-Aug-91
19-Aug-91
24-Aug-91
29-Aug-91

COMPUTED BASE FLOWS INTO LOWER GRANITE 1991



BASE FLOW AND FISH AUGMENTATION FLOW DETERMINATION

1992

HDR ENGINEERING, INC

COMPUTED BASE FLOW AT VARIOUS LOCATIONS

APR 1 - SEPT 30, 1992

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
1-Apr-92	9.9	0.0	9.9	8.6	0.0	8.6	0.1	8.5	0.0	8.6	25.9	0.0	25.9	0.1	25.8	0.0	25.9
2-Apr-92	9.9	0.0	9.9	9.3	0.0	9.3	0.1	9.2	0.0	9.3	27.7	0.0	27.7	0.1	27.6	0.0	27.7
3-Apr-92	10.0	0.0	10.0	10.5	0.0	10.5	0.1	10.4	0.0	10.5	28.5	0.0	28.5	0.1	28.4	0.0	28.5
4-Apr-92	9.5	0.0	9.5	12.3	0.0	12.3	0.1	12.2	0.0	12.3	31.3	0.0	31.3	0.1	31.2	0.0	31.3
5-Apr-92	8.9	0.0	8.9	13.2	0.1	13.1	0.1	13.1	0.0	13.2	34.4	0.1	34.3	0.1	34.3	0.0	34.4
6-Apr-92	8.8	0.0	8.8	11.9	0.1	11.8	0.2	11.7	0.0	11.9	32.3	0.1	32.2	0.2	32.1	0.0	32.3
7-Apr-92	8.8	0.0	8.8	10.9	0.1	10.8	0.2	10.7	0.0	10.9	30.8	0.1	30.7	0.2	30.6	0.0	30.8
8-Apr-92	8.8	0.0	8.8	10.0	0.1	9.9	0.2	9.8	0.0	10.0	29.5	0.1	29.4	0.2	29.3	0.0	29.5
9-Apr-92	8.8	0.0	8.8	9.7	0.1	9.6	0.2	9.5	0.0	9.7	27.8	0.1	27.7	0.2	27.6	0.0	27.8
10-Apr-92	8.8	0.0	8.8	12.6	0.0	12.6	0.2	12.4	0.0	12.6	31.4	0.0	31.4	0.2	31.2	0.0	31.4
11-Apr-92	8.8	0.0	8.8	14.9	0.0	14.9	0.2	14.7	0.0	14.9	36.6	0.0	36.6	0.2	36.4	0.0	36.6
12-Apr-92	8.8	0.0	8.8	13.3	0.0	13.3	0.1	13.2	0.0	13.3	35.3	0.0	35.3	0.1	35.2	0.0	35.3
13-Apr-92	8.8	0.0	8.8	13.5	0.0	13.5	0.2	13.3	0.0	13.5	35.9	0.0	35.9	0.2	35.7	0.0	35.9
14-Apr-92	8.8	0.0	8.8	14.4	0.0	14.4	0.2	14.2	0.0	14.4	39.0	0.0	39.0	0.2	38.8	0.0	39.0
15-Apr-92	8.8	0.0	8.8	15.5	0.5	15.0	1.4	14.1	0.0	15.5	42.5	0.5	42.0	1.4	41.1	0.0	42.5
16-Apr-92	8.8	0.0	8.8	15.4	0.4	15.0	1.4	14.0	0.0	15.4	39.2	0.4	38.8	1.4	37.8	0.0	39.2
17-Apr-92	8.8	0.0	8.8	15.8	0.0	15.8	0.1	15.7	0.0	15.8	39.3	0.0	39.3	0.1	39.2	0.0	39.3
18-Apr-92	8.8	0.0	8.8	19.9	0.0	19.9	0.1	19.8	0.0	19.9	46.7	0.0	46.7	0.1	46.6	0.0	46.7
19-Apr-92	8.8	0.0	8.8	18.5	0.0	18.5	0.1	18.4	0.0	18.5	47.8	0.0	47.8	0.1	47.7	0.0	47.8
20-Apr-92	8.8	0.0	8.8	17.1	0.0	17.1	0.1	17.0	0.0	17.1	44.4	0.0	44.4	0.1	44.3	0.0	44.4
21-Apr-92	8.8	0.0	8.8	16.4	0.0	16.4	0.1	16.3	1.3	15.1	42.1	0.0	42.1	0.1	42.0	1.3	40.8
22-Apr-92	11.7	0.0	11.7	25.7	5.9	19.8	9.3	16.4	10.3	15.4	50.0	5.9	44.1	9.3	40.7	10.3	39.7
23-Apr-92	9.4	0.0	9.4	26.4	9.0	17.4	10.8	15.6	11.0	15.4	55.6	9.0	46.6	10.8	44.8	11.0	44.6
24-Apr-92	8.6	0.0	8.6	25.0	10.0	15.0	10.8	14.2	11.0	14.0	50.4	10.0	40.4	10.8	39.6	11.0	39.4
25-Apr-92	8.7	0.0	8.7	24.2	10.0	14.2	10.8	13.4	11.0	13.2	48.2	10.0	38.2	10.8	37.4	11.0	37.2
26-Apr-92	9.6	0.0	9.6	24.2	10.3	13.9	10.8	13.4	11.0	13.2	47.2	10.3	36.9	10.8	36.4	11.0	36.2
27-Apr-92	13.0	0.0	13.0	17.9	0.0	17.9	2.3	15.6	2.8	15.1	44.0	0.0	44.0	2.3	41.7	2.8	41.2
28-Apr-92	11.2	0.0	11.2	18.6	0.0	18.6	0.9	17.7	1.3	17.3	48.3	0.0	48.3	0.9	47.4	1.3	47.0
29-Apr-92	8.8	0.0	8.8	21.2	0.0	21.2	0.9	20.3	1.3	19.9	48.6	0.0	48.6	0.9	47.7	1.3	47.3
30-Apr-92	8.6	0.0	8.6	26.9	0.0	26.9	1.7	25.2	2.0	24.9	55.6	0.0	55.6	1.7	53.9	2.0	53.6
1-May-92	18.5	9.4	9.1	39.8	3.7	36.1	10.8	29.0	11.0	28.8	78.2	13.1	65.1	20.2	58.0	20.4	57.8
2-May-92	20.4	10.9	9.5	34.4	5.6	28.8	10.8	23.6	11.0	23.4	80.1	16.5	63.6	21.7	58.4	21.9	58.2
3-May-92	20.3	10.9	9.4	32.1	7.0	25.1	10.8	21.3	11.0	21.1	74.8	17.9	56.9	21.7	53.1	21.9	52.9
4-May-92	20.4	11.0	9.5	31.8	7.1	24.7	10.8	21.0	11.0	20.8	73.7	18.1	55.7	21.8	52.0	22.0	51.7
5-May-92	20.4	11.0	9.4	32.7	6.7	26.0	10.8	21.9	11.0	21.7	74.2	17.7	56.5	21.8	52.4	22.0	52.2
6-May-92	11.4	2.0	9.4	33.0	3.3	29.7	8.8	24.2	9.0	24.0	73.8	5.3	68.5	10.8	63.0	11.0	62.8
7-May-92	8.7	0.0	8.7	35.8	2.0	33.8	8.6	27.2	8.8	27.0	70.1	2.0	68.1	8.6	61.5	8.8	61.3
8-May-92	8.6	0.0	8.6	36.4	1.3	35.1	8.2	28.2	10.3	26.1	75.0	1.3	73.7	8.2	66.8	10.3	64.7
9-May-92	8.6	0.0	8.6	36.4	2.1	34.3	8.2	28.2	8.5	27.9	75.2	2.1	73.1	8.2	67.0	8.5	66.7
10-May-92	8.6	0.0	8.6	32.2	3.1	29.1	8.2	24.0	8.5	23.7	71.7	3.1	68.6	8.2	63.5	8.5	63.2
11-May-92	8.7	0.0	8.7	29.6	4.4	25.2	8.0	21.6	10.3	19.3	64.6	4.4	60.2	8.0	56.6	10.3	54.3
12-May-92	8.7	0.0	8.7	20.5	0.0	20.5	0.8	19.7	1.0	19.5	53.7	0.0	53.7	0.8	52.9	1.0	52.7
13-May-92	8.7	0.0	8.7	18.6	0.0	18.6	1.7	16.9	1.8	16.8	47.4	0.0	47.4	1.7	45.7	1.8	45.6
14-May-92	8.6	0.0	8.6	38.8	21.5	17.3	23.3	15.5	23.3	15.5	61.6	21.5	40.1	23.3	38.3	23.3	38.3
15-May-92	8.1	0.0	8.1	39.3	23.1	16.2	23.1	16.2	23.8	15.5	66.6	23.1	43.5	23.1	43.5	23.8	42.8
16-May-92	7.4	0.0	7.4	39.9	22.5	17.4	22.5	17.4	23.3	16.6	66.5	22.5	44.0	22.5	44.0	23.3	43.2
17-May-92	7.2	0.0	7.2	20.7	1.8	18.9	1.8	18.9	3.3	17.4	50.6	1.8	48.8	1.8	48.8	3.3	47.3
18-May-92	6.5	0.0	6.5	18.5	0.8	17.7	0.8	17.7	1.8	16.7	44.1	0.8	43.3	0.8	43.3	1.8	42.3
19-May-92	6.6	0.0	6.6	20.3	0.0	20.3	0.8	19.5	1.9	18.4	45.5	0.0	45.5	0.8	44.7	1.9	43.6
20-May-92	5.9	0.0	5.9	22.2	0.0	22.2	0.9	21.3	1.3	20.9	49.3	0.0	49.3	0.9	48.4	1.3	48.0
21-May-92	6.0	0.0	6.0	29.5	6.1	23.4	8.2	21.3	9.3	20.2	58.1	6.1	52.0	8.2	49.9	9.3	48.8
22-May-92	5.7	0.0	5.7	26.7	7.6	19.1	8.2	18.5	9.3	17.4	54.0	7.6	46.4	8.2	45.8	9.3	44.7
23-May-92	5.5	0.0	5.5	25.4	7.9	17.5	8.2	17.2	8.3	17.1	51.2	7.9	43.3	8.2	43.0	8.3	42.9
24-May-92	5.5	0.0	5.5	25.2	7.9	17.3	8.2	17.0	8.3	16.9	49.5	7.9	41.6	8.2	41.3	8.3	41.2
25-May-92	5.5	0.0	5.5	25.6	8.2	17.4	8.2	17.4	8.3	17.3	49.3	8.2	41.1	8.2	41.1	8.3	41.0
26-May-92	5.5	0.0	5.5	29.0	9.7	19.3	10.7	18.3	11.3	17.7	54.5	9.7	44.8	10.7	43.8	11.3	43.2
27-May-92	5.5	0.0	5.5	31.7	10.0	21.7	10.7	21.0	11.5	20.2	56.9	10.0	46.9	10.7	46.2	11.5	45.4

APR 1 - SEPT 30, 1992

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
28-May-92	5.5	0.0	5.5	28.7	10.7	18.0	10.7	18.0	11.3	17.4	56.1	10.7	45.4	10.7	45.4	11.3	44.8
29-May-92	5.5	0.0	5.5	26.6	10.7	15.9	10.7	15.9	11.3	15.3	51.7	10.7	41.0	10.7	41.0	11.3	40.4
30-May-92	5.4	0.0	5.4	26.6	10.6	16.0	10.6	16.0	11.3	15.3	50.3	10.6	39.7	10.6	39.7	11.3	39.0
31-May-92	5.4	0.0	5.4	25.2	10.6	14.6	10.6	14.6	11.3	13.9	47.6	10.6	37.0	10.6	37.0	11.3	36.3
1-Jun-92	5.4	0.0	5.4	24.2	7.8	16.4	10.6	13.6	11.3	12.9	45.3	7.8	37.5	10.6	34.7	11.3	34.0
2-Jun-92	5.4	0.0	5.4	23.7	7.4	16.3	10.6	13.1	11.3	12.4	42.6	7.4	35.2	10.6	32.0	11.3	31.3
3-Jun-92	5.4	0.0	5.4	23.4	8.0	15.4	10.6	12.8	11.3	12.1	41.8	8.0	33.8	10.6	31.2	11.3	30.5
4-Jun-92	5.3	0.0	5.3	22.5	8.8	13.7	10.8	11.7	10.8	11.7	40.8	8.8	32.0	10.8	30.0	10.8	30.0
5-Jun-92	5.4	0.0	5.4	33.8	23.4	10.4	23.5	10.3	24.8	9.0	47.6	23.4	24.2	23.5	24.1	24.8	22.8
6-Jun-92	5.3	0.0	5.3	33.3	23.1	10.2	23.3	10.0	24.3	9.0	50.4	23.1	27.3	23.3	27.1	24.3	26.1
7-Jun-92	5.4	0.0	5.4	33.1	23.7	9.4	23.7	9.4	24.8	8.3	49.2	23.7	25.5	23.7	25.5	24.8	24.4
8-Jun-92	5.3	0.0	5.3	32.1	22.8	9.3	23.2	8.9	24.3	7.8	47.7	22.8	24.9	23.2	24.5	24.3	23.4
9-Jun-92	5.3	0.0	5.3	24.9	14.7	10.2	15.0	9.9	15.3	9.6	42.1	14.7	27.4	15.0	27.1	15.3	26.8
10-Jun-92	5.3	0.0	5.3	9.9	0.0	9.9	0.8	9.1	0.8	9.1	25.8	0.0	25.8	0.8	25.0	0.8	25.0
11-Jun-92	5.3	0.0	5.3	9.2	0.0	9.2	0.9	8.3	0.0	9.2	23.4	0.0	23.4	0.9	22.5	0.0	23.4
12-Jun-92	5.4	0.0	5.4	9.2	0.0	9.2	0.9	8.3	0.0	9.2	23.3	0.0	23.3	0.9	22.4	0.0	23.3
13-Jun-92	5.5	0.0	5.5	9.4	0.0	9.4	0.8	8.6	0.0	9.4	23.1	0.0	23.1	0.8	22.3	0.0	23.1
14-Jun-92	5.4	0.0	5.4	10.2	0.0	10.2	0.8	9.4	0.0	10.2	24.7	0.0	24.7	0.8	23.9	0.0	24.7
15-Jun-92	5.4	0.0	5.4	9.4	0.0	9.4	0.8	8.6	0.0	9.4	24.3	0.0	24.3	0.8	23.5	0.0	24.3
16-Jun-92	5.4	0.0	5.4	8.3	0.0	8.3	0.0	8.3	0.0	8.3	23.2	0.0	23.2	0.0	23.2	0.0	23.2
17-Jun-92	6.6	0.0	6.6	8.6	0.0	8.6	0.0	8.6	0.0	8.6	24.2	0.0	24.2	0.0	24.2	0.0	24.2
18-Jun-92	6.6	0.0	6.6	8.7	0.0	8.7	0.0	8.7	0.0	8.7	26.8	0.0	26.8	0.0	26.8	0.0	26.8
19-Jun-92	6.6	0.0	6.6	7.8	0.0	7.8	0.0	7.8	0.0	7.8	25.1	0.0	25.1	0.0	25.1	0.0	25.1
20-Jun-92	6.6	0.0	6.6	7.3	0.0	7.3	0.0	7.3	0.0	7.3	23.7	0.0	23.7	0.0	23.7	0.0	23.7
21-Jun-92	5.3	0.0	5.3	7.2	0.0	7.2	0.0	7.2	0.0	7.2	23.3	0.0	23.3	0.0	23.3	0.0	23.3
22-Jun-92	5.7	0.0	5.7	6.7	0.0	6.7	0.0	6.7	0.0	6.7	21.0	0.0	21.0	0.0	21.0	0.0	21.0
23-Jun-92	6.4	0.0	6.4	6.3	0.0	6.3	0.0	6.3	0.0	6.3	21.2	0.0	21.2	0.0	21.2	0.0	21.2
24-Jun-92	6.5	0.0	6.5	6.0	0.0	6.0	0.0	6.0	0.0	6.0	20.0	0.0	20.0	0.0	20.0	0.0	20.0
25-Jun-92	6.6	0.0	6.6	5.7	0.0	5.7	0.0	5.7	0.0	5.7	19.4	0.0	19.4	0.0	19.4	0.0	19.4
26-Jun-92	7.0	0.0	7.0	5.7	0.0	5.7	0.0	5.7	0.0	5.7	19.3	0.0	19.3	0.0	19.3	0.0	19.3
27-Jun-92	6.9	0.0	6.9	6.1	0.0	6.1	0.0	6.1	0.0	6.1	20.1	0.0	20.1	0.0	20.1	0.0	20.1
28-Jun-92	6.5	0.0	6.5	6.0	0.0	6.0	0.0	6.0	0.0	6.0	20.3	0.0	20.3	0.0	20.3	0.0	20.3
29-Jun-92	6.4	0.0	6.4	5.7	0.0	5.7	0.0	5.7	0.0	5.7	19.8	0.0	19.8	0.0	19.8	0.0	19.8
30-Jun-92	6.4	0.0	6.4	6.2	0.0	6.2	0.0	6.2	0.0	6.2	20.4	0.0	20.4	0.0	20.4	0.0	20.4
1-Jul-92	6.2	0.0	6.2	5.8	0.0	5.8	0.0	5.8	0.0	5.8	21.2	0.0	21.2	0.0	21.2	0.0	21.2
2-Jul-92	6.3	0.0	6.3	6.2	0.0	6.2	0.0	6.2	0.0	6.2	21.1	0.0	21.1	0.0	21.1	0.0	21.1
3-Jul-92	16.9	9.0	7.9	6.4	0.0	6.4	0.0	6.4	0.0	6.4	25.1	9.0	16.1	9.0	16.1	9.0	16.1
4-Jul-92	18.0	10.0	8.0	5.9	0.0	5.9	0.2	5.7	0.5	5.5	32.8	10.0	22.8	10.2	22.6	10.5	22.3
5-Jul-92	17.9	9.0	8.9	14.9	9.2	5.7	9.5	5.4	9.5	5.4	37.8	18.2	19.6	18.5	19.3	18.5	19.3
6-Jul-92	17.9	10.0	7.9	15.5	9.1	6.4	9.7	5.8	9.5	6.0	40.8	19.1	21.7	19.7	21.1	19.5	21.3
7-Jul-92	18.0	10.0	8.0	15.8	8.8	7.0	9.6	6.2	9.5	6.3	40.4	18.8	21.6	19.6	20.8	19.5	20.9
8-Jul-92	18.0	10.0	8.0	16.8	8.9	7.9	9.6	7.2	9.5	7.3	42.0	18.9	23.1	19.6	22.4	19.5	22.5
9-Jul-92	17.6	10.0	7.6	16.2	9.1	7.1	9.6	6.6	9.5	6.7	40.9	19.1	21.8	19.6	21.3	19.5	21.4
10-Jul-92	7.7	1.0	6.7	15.9	9.2	6.7	9.6	6.3	9.5	6.4	37.0	10.2	26.8	10.6	26.4	10.5	26.5
11-Jul-92	7.0	0.5	6.5	15.6	8.0	7.6	9.5	6.1	9.5	6.1	29.3	8.5	20.8	10.0	19.3	10.0	19.3
12-Jul-92	6.7	0.5	6.2	6.7	0.2	6.5	0.2	6.5	0.5	6.2	21.9	0.7	21.2	0.7	21.2	1.0	20.9
13-Jul-92	6.6	0.0	6.6	5.8	0.0	5.8	0.0	5.8	0.0	5.8	18.2	0.0	18.2	0.0	18.2	0.0	18.2
14-Jul-92	6.6	0.0	6.6	5.8	0.0	5.8	0.8	5.0	0.8	5.1	18.1	0.0	18.1	0.8	17.3	0.8	17.3
15-Jul-92	6.8	0.0	6.8	23.6	19.3	4.3	19.3	4.3	19.3	4.3	30.9	19.3	11.6	19.3	11.6	19.3	11.6
16-Jul-92	6.7	0.0	6.7	24.2	19.8	4.4	19.8	4.4	19.8	4.4	35.0	19.8	15.2	19.8	15.2	19.8	15.2
17-Jul-92	6.7	0.0	6.7	24.0	19.7	4.3	19.7	4.3	19.3	4.7	35.4	19.7	15.7	19.7	15.7	19.3	16.1
18-Jul-92	6.7	0.0	6.7	13.4	8.0	5.4	8.0	5.4	8.3	5.1	27.7	8.0	19.7	8.0	19.7	8.3	19.4
19-Jul-92	6.7	0.0	6.7	4.5	0.0	4.5	0.0	4.5	0.3	4.2	17.6	0.0	17.6	0.0	17.6	0.3	17.3
20-Jul-92	6.7	0.0	6.7	4.5	0.0	4.5	0.0	4.5	0.0	4.5	14.9	0.0	14.9	0.0	14.9	0.0	14.9
21-Jul-92	6.8	0.0	6.8	5.0	0.0	5.0	0.0	5.0	0.0	5.0	15.5	0.0	15.5	0.0	15.5	0.0	15.5
22-Jul-92	6.9	0.0	6.9	5.6	0.0	5.6	0.0	5.6	0.0	5.6	16.6	0.0	16.6	0.0	16.6	0.0	16.6
23-Jul-92	6.9	0.0	6.9	5.5	0.0	5.5	0.0	5.5	0.0	5.5	17.7	0.0	17.7	0.0	17.7	0.0	17.7
24-Jul-92	6.8	0.0	6.8	5.7	0.0	5.7	0.0	5.7	0.0	5.7	17.4	0.0	17.4	0.0	17.4	0.0	17.4
25-Jul-92	6.5	0.0	6.5	5.5	0.0	5.5	0.0	5.5	0.0	5.5	17.8	0.0	17.8	0.0	17.8	0.0	17.8

APR 1 - SEPT 30, 1992

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
	RECORDED @ HELLS	FISH FLOWS @BRNLEE	COMPUTED BASE	RECORDED @ PECK	HDR FISH FLOWS @DWSK	HDR COMPUTED BASE	IDWR FISH FLOWS @DWSK	IDWR COMPUTED BASE	BPA FISH FLOWS @DWSK	BPA COMPUTED BASE	RECORDED @LWGT	HDR FISH FLOWS @LWGT	HDR COMPUTED BASE	IDWR FISH FLOWS @LWGT	IDWR COMPUTED BASE	BPA FISH FLOWS @LWGT	BPA COMPUTED BASE
DATE	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)
26-Jul-92	6.5	0.0	6.5	4.9	0.0	4.9	0.0	4.9	0.0	4.9	16.0	0.0	16.0	0.0	16.0	0.0	16.0
27-Jul-92	6.5	0.0	6.5	4.6	0.0	4.6	0.0	4.6	0.0	4.6	15.6	0.0	15.6	0.0	15.6	0.0	15.6
28-Jul-92	6.6	0.0	6.6	4.4	0.0	4.4	0.0	4.4	0.0	4.4	14.7	0.0	14.7	0.0	14.7	0.0	14.7
29-Jul-92	6.6	0.0	6.6	4.2	0.0	4.2	0.0	4.2	0.0	4.2	14.0	0.0	14.0	0.0	14.0	0.0	14.0
30-Jul-92	6.6	0.0	6.6	4.0	0.0	4.0	0.0	4.0	0.0	4.0	14.6	0.0	14.6	0.0	14.6	0.0	14.6
31-Jul-92	6.6	0.0	6.6	4.0	0.0	4.0	0.0	4.0	0.0	4.0	13.9	0.0	13.9	0.0	13.9	0.0	13.9
1-Aug-92	6.6	0.0	6.6	3.9	0.0	3.9	0.0	3.9	0.0	3.9	13.6	0.0	13.6	0.0	13.6	0.0	13.6
2-Aug-92	6.6	0.0	6.6	3.8	0.0	3.8	0.0	3.8	0.0	3.8	13.4	0.0	13.4	0.0	13.4	0.0	13.4
3-Aug-92	6.6	0.0	6.6	3.7	0.0	3.7	0.0	3.7	0.0	3.7	13.5	0.0	13.5	0.0	13.5	0.0	13.5
4-Aug-92	6.6	0.0	6.6	3.6	0.0	3.6	0.0	3.6	0.0	3.6	12.7	0.0	12.7	0.0	12.7	0.0	12.7
5-Aug-92	6.6	0.0	6.6	3.6	0.0	3.6	0.0	3.6	0.0	3.6	13.5	0.0	13.5	0.0	13.5	0.0	13.5
6-Aug-92	6.6	0.0	6.6	3.5	0.1	3.4	0.1	3.4	0.0	3.5	12.7	0.1	12.6	0.1	12.6	0.0	12.7
7-Aug-92	6.6	0.0	6.6	3.5	0.4	3.1	0.4	3.1	0.0	3.5	12.8	0.4	12.4	0.4	12.4	0.0	12.8
8-Aug-92	6.6	0.0	6.6	3.9	0.6	3.3	0.6	3.3	0.0	3.9	13.0	0.6	12.4	0.6	12.4	0.0	13.0
9-Aug-92	6.7	0.0	6.7	3.9	0.6	3.3	0.6	3.3	0.0	3.9	13.0	0.6	12.4	0.6	12.4	0.0	13.0
10-Aug-92	6.7	0.0	6.7	3.9	0.6	3.3	0.6	3.3	0.0	3.9	12.9	0.6	12.3	0.6	12.3	0.0	12.9
11-Aug-92	6.8	0.0	6.8	3.9	0.6	3.3	0.6	3.3	0.0	3.9	13.7	0.6	13.1	0.6	13.1	0.0	13.7
12-Aug-92	6.7	0.0	6.7	3.8	0.6	3.2	0.6	3.2	0.0	3.8	12.9	0.6	12.3	0.6	12.3	0.0	12.9
13-Aug-92	6.6	0.0	6.6	3.7	0.6	3.1	0.6	3.1	0.0	3.7	12.9	0.6	12.3	0.6	12.3	0.0	12.9
14-Aug-92	6.5	0.0	6.5	3.7	0.6	3.1	0.6	3.1	0.0	3.7	12.5	0.6	11.9	0.6	11.9	0.0	12.5
15-Aug-92	6.5	0.0	6.5	3.7	0.7	3.0	0.7	3.0	0.0	3.7	12.1	0.7	11.4	0.7	11.4	0.0	12.1
16-Aug-92	6.5	0.0	6.5	3.7	0.7	3.0	0.7	3.0	0.0	3.7	12.6	0.7	11.9	0.7	11.9	0.0	12.6
17-Aug-92	6.6	0.0	6.6	3.8	0.8	3.0	0.8	3.0	0.0	3.8	12.4	0.8	11.6	0.8	11.6	0.0	12.4
18-Aug-92	6.5	0.0	6.5	4.1	1.0	3.1	1.0	3.1	0.0	4.1	12.7	1.0	11.7	1.0	11.7	0.0	12.7
19-Aug-92	6.6	0.0	6.6	4.3	1.3	3.0	1.3	3.0	0.0	4.3	13.1	1.3	11.8	1.3	11.8	0.0	13.1
20-Aug-92	6.5	0.0	6.5	4.3	1.3	3.0	1.3	3.0	0.0	4.3	13.2	1.3	11.9	1.3	11.9	0.0	13.2
21-Aug-92	6.5	0.0	6.5	4.3	1.3	3.0	1.3	3.0	0.0	4.3	13.1	1.3	11.8	1.3	11.8	0.0	13.1
22-Aug-92	6.6	0.0	6.6	4.3	1.3	3.0	1.3	3.0	0.0	4.3	13.5	1.3	12.2	1.3	12.2	0.0	13.5
23-Aug-92	6.6	0.0	6.6	4.5	1.3	3.2	1.3	3.2	0.0	4.5	13.5	1.3	12.2	1.3	12.2	0.0	13.5
24-Aug-92	6.5	0.0	6.5	5.0	1.3	3.7	1.3	3.7	0.0	5.0	13.7	1.3	12.4	1.3	12.4	0.0	13.7
25-Aug-92	6.6	0.0	6.6	4.6	1.1	3.5	1.1	3.5	0.0	4.6	13.9	1.1	12.8	1.1	12.8	0.0	13.9
26-Aug-92	6.6	0.0	6.6	4.2	1.0	3.2	1.0	3.2	0.0	4.2	13.5	1.0	12.5	1.0	12.5	0.0	13.5
27-Aug-92	6.6	0.0	6.6	4.1	1.0	3.1	1.0	3.1	0.0	4.1	13.0	1.0	12.0	1.0	12.0	0.0	13.0
28-Aug-92	6.6	0.0	6.6	4.0	1.0	3.0	1.0	3.0	0.0	4.0	12.9	1.0	11.9	1.0	11.9	0.0	12.9
29-Aug-92	6.6	0.0	6.6	3.9	1.0	2.9	1.0	2.9	0.0	3.9	12.9	1.0	11.9	1.0	11.9	0.0	12.9
30-Aug-92	6.5	0.0	6.5	3.9	1.0	2.9	1.0	2.9	0.0	3.9	12.7	1.0	11.7	1.0	11.7	0.0	12.7
31-Aug-92	6.5	0.0	6.5	3.9	1.0	2.9	1.0	2.9	0.0	3.9	12.7	1.0	11.7	1.0	11.7	0.0	12.7
SUB TOT																	
(KSFD)	1226.6	125.3	1101.3	2240.8	554.4	1686.4	662.7	1578.1	661.3	1579.4	5118.6	679.7	4438.9	788.0	4330.6	786.6	4332.0
(KAF)	2433.5	248.6	2185.0	4445.6	1099.9	3345.7	1314.8	3130.9	1312.1	3133.5	10155.3	1348.5	8806.8	1563.4	8591.9	1560.7	8594.6
1-Sep-92				3.8					0.0	3.8	12.7					0.0	12.7
2-Sep-92				3.8					0.0	3.8	12.6					0.0	12.6
3-Sep-92				3.8					0.0	3.8	12.3					0.0	12.3
4-Sep-92				4.1					0.0	4.1	12.8					0.0	12.8
5-Sep-92				4.1					0.0	4.1	12.6					0.0	12.6
6-Sep-92				4.6					0.0	4.6	13.0					0.0	13.0
7-Sep-92				4.5					1.4	3.1	13.3					1.4	11.9
8-Sep-92				4.4					1.4	3.0	13.0					1.4	11.6
9-Sep-92				4.1					1.4	2.7	13.5					1.4	12.1
10-Sep-92				10.0					7.4	2.5	15.6					7.4	8.2
11-Sep-92				13.6					11.4	2.2	22.9					11.4	11.5
12-Sep-92				13.3					11.4	1.9	21.5					11.4	10.1
13-Sep-92				13.3					11.4	1.9	22.0					11.4	10.6
14-Sep-92				13.4					11.9	1.5	21.7					11.9	9.8
15-Sep-92				13.4					11.9	1.5	22.5					11.9	10.6

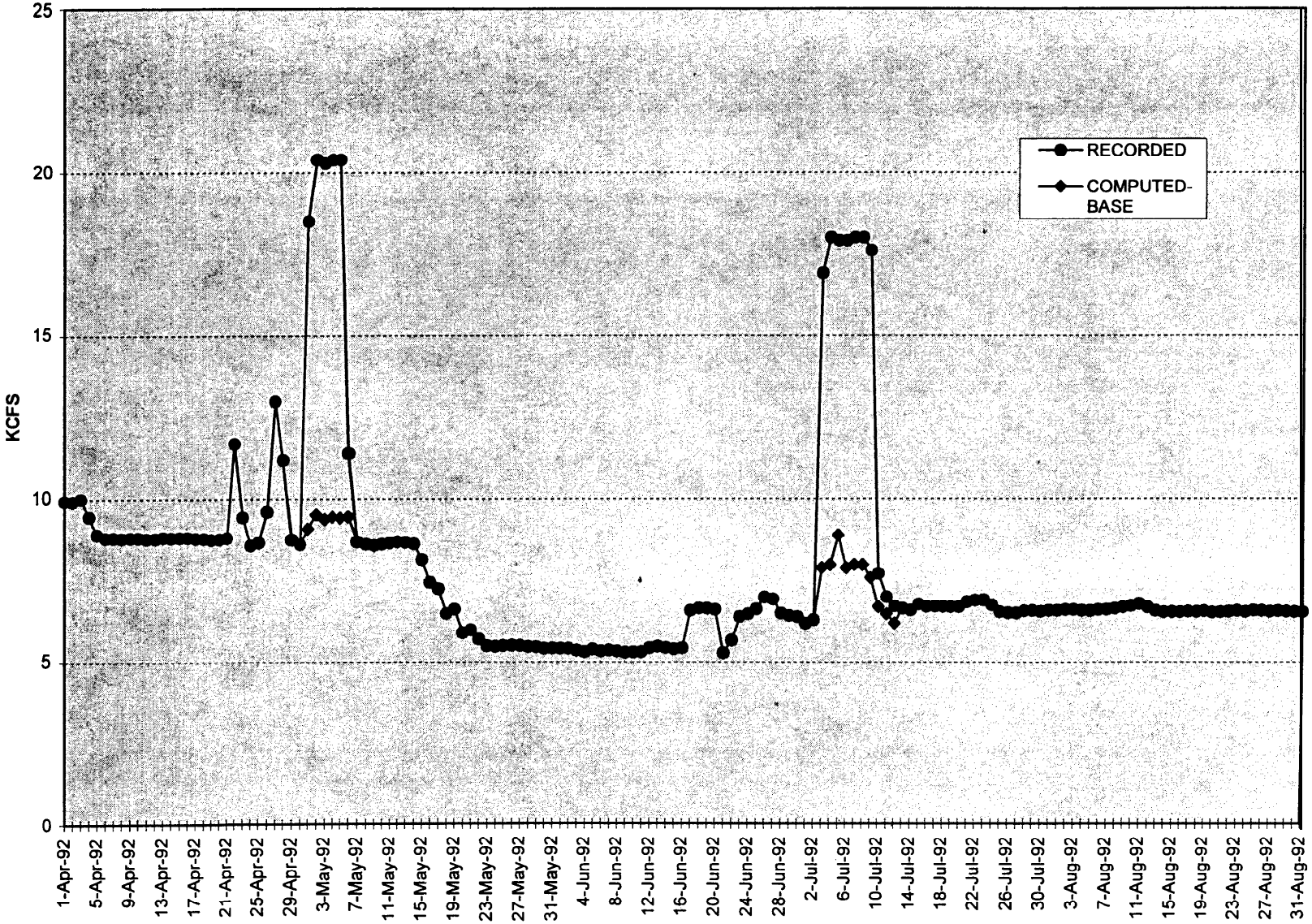
APR 1 - SEPT 30, 1992

*REVISED 8-7-96

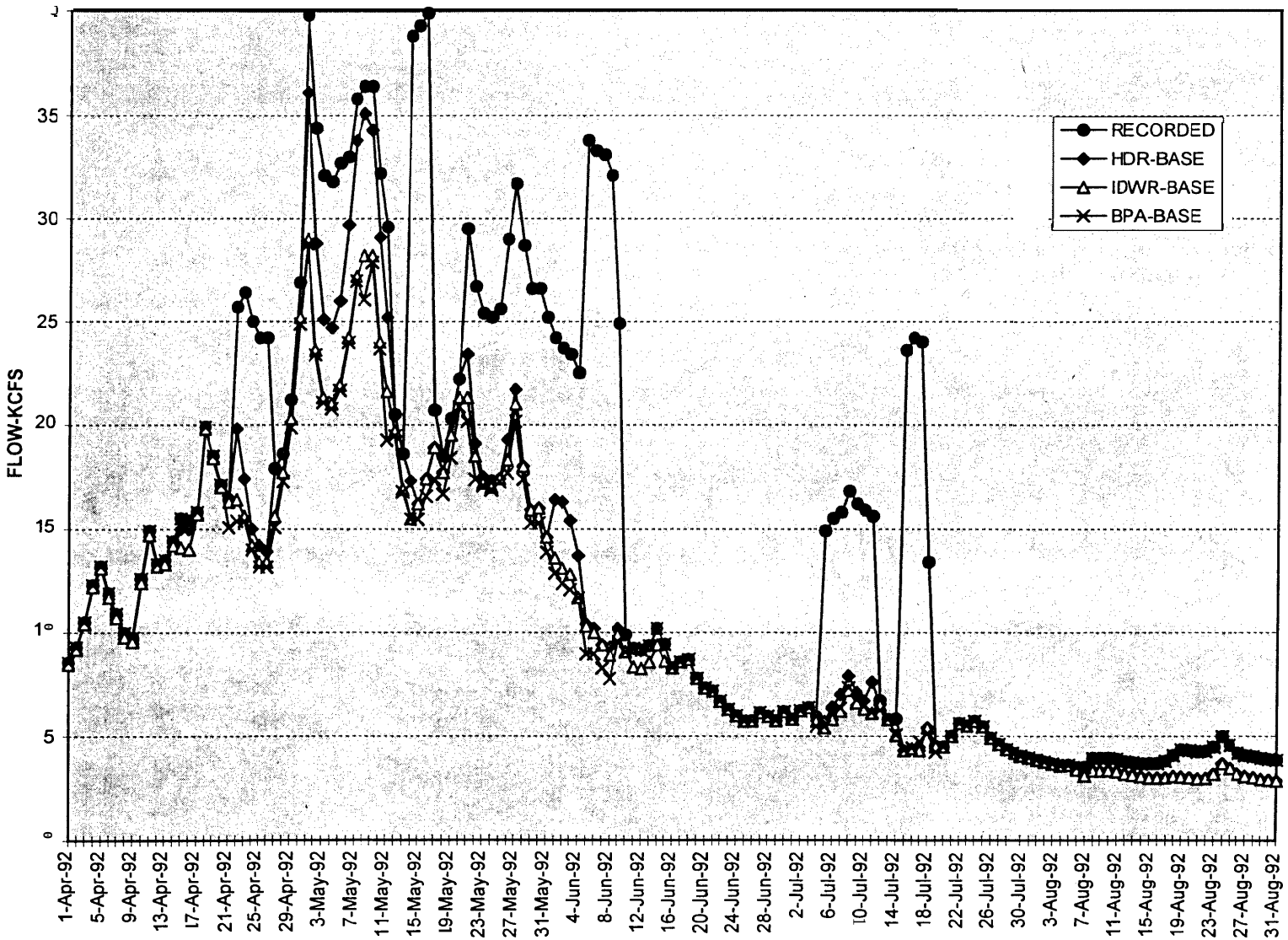
	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
					HDR	HDR	IDWR	IDWR	BPA	BPA		HDR	HDR	IDWR	IDWR	SPA	SPA
	RECORDED	FISH FLOWS	COMPUTED	RECORDED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	RECORDED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED
	@ HELLS	@BRNLEE	BASE	@ PECK	@DWSK	BASE	@DWSK	BASE	@DWSK	BASE	@LWGT	@LWGT	BASE	@LWGT	BASE	@LWGT	BASE
DATE	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)
16-Sep-92				13.3					11.4	1.9	22.6					11.4	11.4
17-Sep-92				13.2					11.4	1.8	22.5					11.4	11.1
18-Sep-92				13.2					84	4.8	22.9					8.4	14.5
19-Sep-92				13.1					0.0	13.1	22 9					0.0	22.9
20-Sep-92				7.2					0.0	7.2	19.6					00	19.6
21-Sep-92				29					0.0	2.9	12.9					0.0	12.9
22-Sep-92				2.9					0.0	2.9	13.6					0.0	13.6
23-Sep-92				2.9					0.0	2.9	12.6					0.0	12.6
24-Sep-92				3.1					0.0	3 . 1	12.9					0.0	12.9
25-Sep-92				4.9					0.0	4.9	13.3					00	133
26-Sep-92				7.3					0.0	7.3	17.3					0.0	17.3
27-Sep-92				5.4					00	5.4	18.8					0.0	16.8
28-Sep-92				4.6					00	46	15.9					00	15.9
29-Sep-92				4.4					0.0	4.4	15.2					00	15.2
30-Sep-92				4.1					0.0	4.1	15.7					0.0	15.7
SUB TOT				216.7					100.8	115.8	498.9					100.8	398.1
(KSFD)				429.9					200.0	229.7	989.8					200.0	789.8
(KAF)																	
TOTALS																	
(KSFD)	1226.6	125.3	1101.3	2457.5	554.4	1686.4	662.7	1578.1	762.1	1695.2	5617.5	879.7	4438.9	. 788.0	4330 6	887.4	4730.1
(KAF)	2433.5	248.6	2185.0	4875.6	1099.9	3345.7	1314.8	3130.9	1512.1	3363.3	11145.1	1348.5	8806.8	1563.4	6591.9	1766.7	9384.5

- 1 KCFS for a 24 hour flow period = 1 KSFD

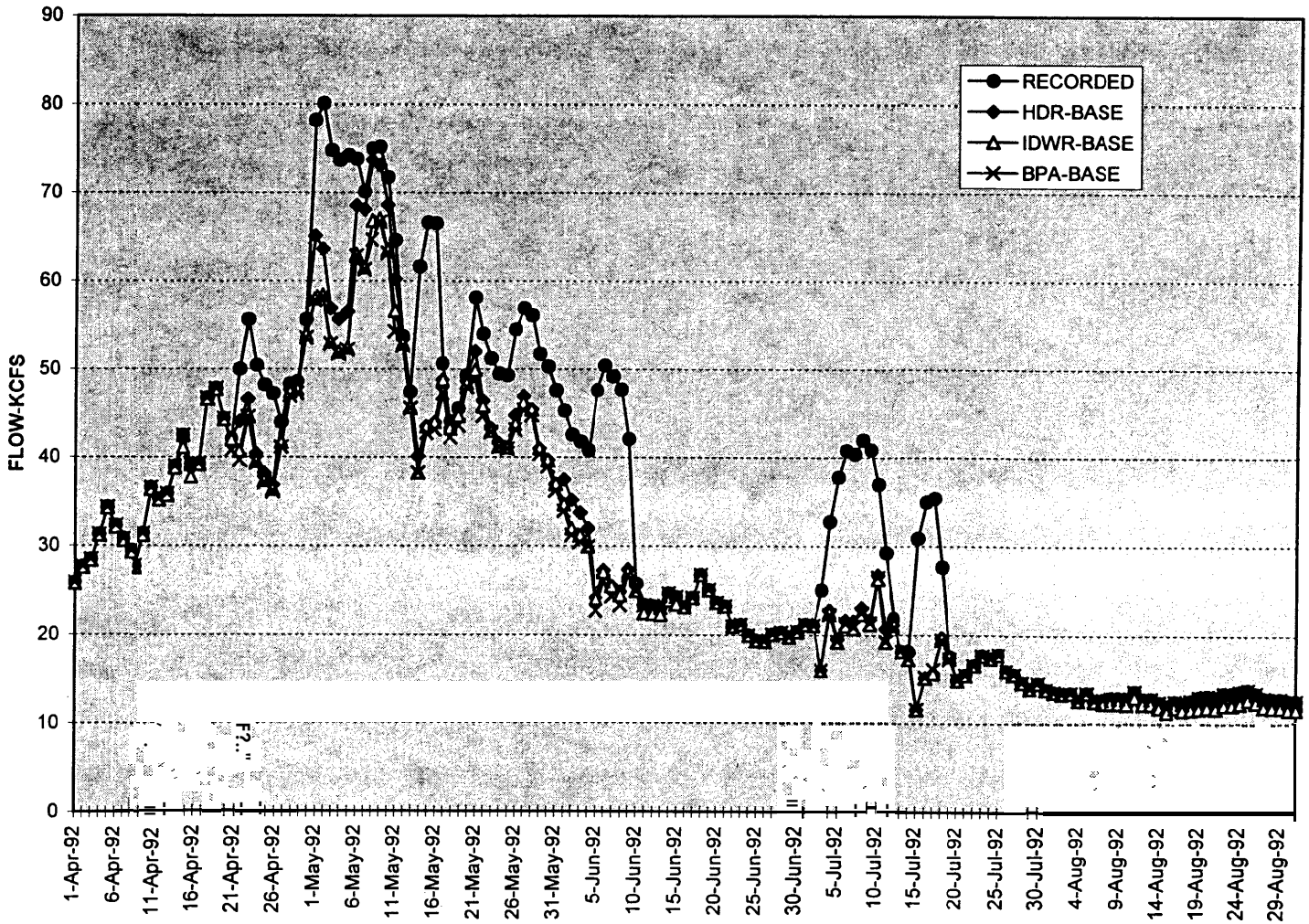
HELLS CANYON GAGING STATION
COMPUTED BASE FLOWS
1992



DWORSHAK - (PECK GAGING STATION)
COMPUTED BASE FLOWS
1992



COMPUTED BASE FLOWS INTO
LOWER GRANITE
1992



BASE FLOW AND FISH AUGMENTATION FLOW DETERMINATION

1993

HDR ENGINEERING, INC

COMPUTED BASE FLOW AT VARIOUS LOCATIONS

APR 1 - AUG 31, 1993

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
1-Apr-93	30.5	0.0	30.5	13.2	0.0	13.2	0.0	13.2	0.0	13.2	63.7	0.0	63.7	0.0	63.7	0.0	63.7
2-Apr-93	32.7	0.0	32.7	14.8	0.0	14.8	0.0	14.8	0.0	14.8	62.9	0.0	62.9	0.0	62.9	0.0	62.9
3-Apr-93	32.8	0.0	32.8	15.3	0.0	15.3	0.0	15.3	0.0	15.3	68.8	0.0	68.8	0.0	68.8	0.0	68.8
4-Apr-93	32.4	0.0	32.4	16.8	0.0	16.8	0.0	16.8	0.0	16.8	67.4	0.0	67.4	0.0	67.4	0.0	67.4
5-Apr-93	48.8	0.0	48.8	18.3	0.0	18.3	0.0	18.3	0.0	18.3	80.8	0.0	80.8	0.0	80.8	0.0	80.8
6-Apr-93	46.3	0.0	46.3	17.0	0.0	17.0	0.0	17.0	0.0	17.0	93.4	0.0	93.4	0.0	93.4	0.0	93.4
7-Apr-93	34.7	0.0	34.7	15.6	0.0	15.6	0.0	15.6	0.0	15.6	75.3	0.0	75.3	0.0	75.3	0.0	75.3
8-Apr-93	30.9	0.0	30.9	15.7	0.2	15.5	1.2	14.5	1.2	14.5	67.5	0.2	67.3	1.2	66.3	1.2	66.3
9-Apr-93	31.0	0.0	31.0	15.6	0.0	15.6	0.0	15.6	0.0	15.6	64.8	0.0	64.8	0.0	64.8	0.0	64.8
10-Apr-93	33.1	0.0	33.1	16.2	0.0	16.2	0.0	16.2	0.0	16.2	66.4	0.0	66.4	0.0	66.4	0.0	66.4
11-Apr-93	31.5	0.0	31.5	15.9	0.0	15.9	0.0	15.9	0.0	15.9	69.6	0.0	69.6	0.0	69.6	0.0	69.6
12-Apr-93	32.8	0.0	32.8	14.6	0.0	14.6	0.0	14.6	0.0	14.6	64.7	0.0	64.7	0.0	64.7	0.0	64.7
13-Apr-93	32.3	0.0	32.3	13.4	0.0	13.4	0.0	13.4	0.0	13.4	64.4	0.0	64.4	0.0	64.4	0.0	64.4
14-Apr-93	28.1	0.0	28.1	13.4	0.0	13.4	0.4	13.0	0.4	13.0	59.2	0.0	59.2	0.4	58.8	0.4	58.8
15-Apr-93	25.4	0.0	25.4	20.7	8.3	12.4	8.3	12.4	8.3	12.4	60.9	8.3	52.6	8.3	52.6	8.3	52.6
16-Apr-93	27.7	0.0	27.7	20.4	8.3	12.1	8.3	12.1	8.3	12.1	60.5	8.3	52.2	8.3	52.2	8.3	52.2
17-Apr-93	25.1	0.0	25.1	20.1	8.4	11.7	8.4	11.7	8.4	11.7	60.9	8.4	52.5	8.4	52.5	8.4	52.5
18-Apr-93	28.2	0.0	28.2	21.4	8.4	13.0	8.4	13.0	8.4	13.0	60.9	8.4	52.5	8.4	52.5	8.4	52.5
19-Apr-93	27.1	0.0	27.1	22.7	8.4	14.3	8.4	14.3	8.4	14.3	68.7	8.4	60.3	8.4	60.3	8.4	60.3
20-Apr-93	26.4	0.0	26.4	21.4	8.3	13.1	8.3	13.1	8.3	13.1	62.2	8.3	53.9	8.3	53.9	8.3	53.9
21-Apr-93	28.7	0.0	28.7	20.9	8.4	12.5	8.4	12.5	8.4	12.5	64.5	8.4	56.1	8.4	56.1	8.4	56.1
22-Apr-93	23.4	0.0	23.4	21.1	8.4	12.7	8.4	12.7	8.4	12.7	62.4	8.4	54.0	8.4	54.0	8.4	54.0
23-Apr-93	25.0	0.0	25.0	21.9	8.4	13.5	8.4	13.5	8.4	13.5	61.1	8.4	52.7	8.4	52.7	8.4	52.7
24-Apr-93	26.4	0.0	26.4	21.6	8.4	13.2	8.4	13.2	8.4	13.2	62.7	8.4	54.3	8.4	54.3	8.4	54.3
25-Apr-93	26.0	0.0	26.0	21.5	8.4	13.1	8.4	13.1	8.4	13.1	63.0	8.4	54.6	8.4	54.6	8.4	54.6
26-Apr-93	27.4	0.0	27.4	22.1	8.1	14.0	8.1	14.0	8.1	14.0	68.4	8.1	60.3	8.1	60.3	8.1	60.3
27-Apr-93	27.1	0.0	27.1	20.6	6.2	14.4	6.2	14.4	6.2	14.4	67.1	6.2	60.9	6.2	60.9	6.2	60.9
28-Apr-93	28.4	0.0	28.4	19.8	6.2	13.6	6.2	13.6	6.2	13.6	66.2	6.2	60.0	6.2	60.0	6.2	60.0
29-Apr-93	28.5	0.0	28.5	19.9	5.5	14.4	6.2	13.7	6.2	13.7	65.5	5.5	60.0	6.2	59.3	6.2	59.3
30-Apr-93	29.1	0.0	29.1	25.0	3.3	21.7	6.6	18.4	6.6	18.4	74.1	3.3	70.8	6.6	67.5	6.6	67.5
1-May-93	26.9	0.0	26.9	28.4	5.5	22.9	8.4	20.0	8.4	20.0	80.2	5.5	74.7	8.4	71.8	8.4	71.8
2-May-93	23.8	0.0	23.8	28.1	3.2	24.9	8.3	19.8	8.3	19.8	76.2	3.2	73.0	8.3	67.9	8.3	67.9
3-May-93	27.0	0.0	27.0	29.9	2.9	27.0	8.3	21.6	8.3	21.6	78.5	2.9	75.6	8.3	70.2	8.3	70.2
4-May-93	28.2	0.0	28.2	36.5	0.0	36.5	8.3	28.2	8.3	28.2	98.1	0.0	98.1	8.3	89.8	8.3	89.8
5-May-93	30.3	0.0	30.3	35.2	1.5	33.7	8.3	26.9	8.3	26.9	102.6	1.5	101.1	8.3	94.3	8.3	94.3
6-May-93	31.2	0.0	31.2	33.9	1.4	32.5	8.3	25.6	8.3	25.6	99.9	1.4	98.5	8.3	91.6	8.3	91.6
7-May-93	32.2	0.0	32.2	37.4	1.3	36.1	8.3	29.1	8.3	29.1	104.8	1.3	103.5	8.3	96.5	8.3	96.5
8-May-93	33.7	0.0	33.7	35.4	1.8	33.6	8.3	27.1	8.3	27.1	104.3	1.8	102.5	8.3	96.0	8.3	96.0
9-May-93	32.4	0.0	32.4	33.4	3.0	30.4	8.3	25.1	8.3	25.1	100.6	3.0	97.6	8.3	92.3	8.3	92.3
10-May-93	31.1	0.0	31.1	31.3	4.0	27.3	8.3	23.0	8.3	23.0	92.6	4.0	88.6	8.3	84.3	8.3	84.3
11-May-93	31.1	0.0	31.1	33.2	1.5	31.7	8.3	24.9	8.3	24.9	92.7	1.5	91.2	8.3	84.4	8.3	84.4
12-May-93	31.3	0.0	31.3	41.4	0.0	41.4	8.3	33.1	8.3	33.1	105.5	0.0	105.5	8.3	97.2	8.3	97.2
13-May-93	35.5	0.0	35.5	51.4	0.0	51.4	8.3	43.1	8.3	43.1	132.1	0.0	132.1	8.3	123.8	8.3	123.8
14-May-93	35.8	0.0	35.8	58.2	0.0	58.2	8.3	49.9	8.3	49.9	157.6	0.0	157.6	8.3	149.3	8.3	149.3
15-May-93	36.5	0.0	36.5	65.0	0.0	65.0	10.0	55.0	10.0	55.0	172.3	0.0	172.3	10.0	162.3	10.0	162.3
16-May-93	36.5	0.0	36.5	66.6	0.0	66.6	13.8	52.8	13.8	52.8	181.7	0.0	181.7	13.8	167.9	13.8	167.9
17-May-93	36.5	0.0	36.5	62.7	0.0	62.7	14.0	48.7	14.0	48.7	175.3	0.0	175.3	14.0	161.3	14.0	161.3
18-May-93	37.7	0.0	37.7	61.2	2.6	58.6	16.0	45.2	16.0	45.2	171.1	2.6	168.5	16.0	155.1	16.0	155.1
19-May-93	39.3	0.0	39.3	62.9	6.2	56.7	18.6	44.3	18.6	44.3	174.9	6.2	168.7	18.6	156.3	18.6	156.3
20-May-93	38.0	0.0	38.0	63.5	6.7	56.8	18.6	44.9	18.6	44.9	178.5	6.7	171.8	18.6	159.9	18.6	159.9
21-May-93	38.0	0.0	38.0	64.6	6.7	57.9	18.8	45.8	18.8	45.8	182.1	6.7	175.4	18.8	163.3	18.8	163.3
22-May-93	36.8	0.0	36.8	60.1	8.6	51.5	18.2	41.9	18.2	41.9	181.1	8.6	172.5	18.2	162.9	18.2	162.9
23-May-93	33.5	0.0	33.5	50.4	8.7	41.7	15.2	35.2	15.2	35.2	164.1	8.7	155.4	15.2	148.9	15.2	148.9
24-May-93	34.1	0.0	34.1	39.6	3.7	35.9	9.3	30.3	9.3	30.3	138.0	3.7	134.3	9.3	128.7	9.3	128.7
25-May-93	30.0	0.0	30.0	37.7	5.0	32.7	9.3	28.4	9.3	28.4	125.4	5.0	120.4	9.3	116.1	9.3	116.1
26-May-93	27.7	0.0	27.7	51.3	6.1	45.2	15.3	36.0	15.3	36.0	131.2	6.1	125.1	15.3	115.9	15.3	115.9

*REVISED 8-7-96

APR 1 - AUG 31, 1993

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
27-May-93	30.0	0.0	30.0	51.4	8.6	42.8	14.5	36.9	14.5	36.9	152.5	8.6	143.9	14.5	138.0	14.5	138.0
28-May-93	29.9	0.0	29.9	46.4	4.7	41.7	11.7	34.7	11.7	34.7	139.9	4.7	135.2	11.7	128.2	11.7	128.2
29-May-93	30.4	0.0	30.4	46.5	8.4	38.1	13.9	32.6	13.9	32.6	138.8	8.4	130.4	13.9	124.9	13.9	124.9
30-May-93	30.9	0.0	30.9	41.5	9.5	32.0	12.7	28.8	12.7	28.8	132.0	9.5	122.5	12.7	119.3	12.7	119.3
31-May-93	27.6	0.0	27.6	35.7	7.0	28.7	10.2	25.5	10.2	25.5	117.0	7.0	110.0	10.2	106.8	10.2	106.8
1-Jun-93	25.7	0.0	25.7	37.9	6.2	31.7	10.2	27.7	10.2	27.7	114.8	6.2	108.6	10.2	104.6	10.2	104.6
2-Jun-93	23.9	0.0	23.9	37.1	0.0	37.1	9.5	27.6	9.5	27.6	116.5	0.0	116.5	9.5	107.0	9.5	107.0
3-Jun-93	27.4	0.0	27.4	33.0	0.0	33.0	8.0	25.0	8.0	25.0	110.9	0.0	110.9	8.0	102.9	8.0	102.9
4-Jun-93	30.5	0.0	30.5	29.6	0.0	29.6	7.8	21.8	7.8	21.8	110.6	0.0	110.6	7.8	102.8	7.8	102.8
5-Jun-93	31.9	0.0	31.9	24.2	0.0	24.2	4.0	20.2	4.0	20.2	101.7	0.0	101.7	4.0	97.7	4.0	97.7
6-Jun-93	33.3	0.0	33.3	23.3	0.0	23.3	4.0	19.3	4.0	19.3	100.4	0.0	100.4	4.0	96.4	4.0	96.4
7-Jun-93	33.4	0.0	33.4	27.7	0.0	27.7	4.0	23.7	4.0	23.7	105.6	0.0	105.6	4.0	101.6	4.0	101.6
8-Jun-93	33.3	0.0	33.3	35.2	0.0	35.2	5.5	29.7	5.5	29.7	130.3	0.0	130.3	5.5	124.8	5.5	124.8
9-Jun-93	34.1	0.0	34.1	28.0	0.0	28.0	4.4	23.6	4.4	23.6	115.6	0.0	115.6	4.4	111.2	4.4	111.2
10-Jun-93	41.2	0.0	41.2	28.2	1.1	27.1	6.9	21.3	6.9	21.3	110.9	1.1	109.8	6.9	104.0	6.9	104.0
11-Jun-93	43.5	0.0	43.5	28.6	0.6	28.0	6.1	22.5	6.1	22.5	116.3	0.6	115.7	6.1	110.2	6.1	110.2
12-Jun-93	45.1	0.0	45.1	30.5	0.0	30.5	5.3	25.2	5.3	25.2	124.5	0.0	124.5	5.3	119.2	5.3	119.2
13-Jun-93	45.0	0.0	45.0	30.0	0.9	29.1	6.6	23.4	6.6	23.4	123.8	0.9	122.9	6.6	117.2	6.6	117.2
14-Jun-93	45.1	0.0	45.1	27.1	1.2	25.9	5.8	21.3	5.8	21.3	115.8	1.2	114.6	5.8	110.0	5.8	110.0
15-Jun-93	40.8	0.0	40.8	25.7	1.1	24.6	5.6	20.1	5.6	20.1	111.9	1.1	110.8	5.6	106.3	5.6	106.3
16-Jun-93	36.8	0.0	36.8	27.1	0.0	27.1	5.1	22.0	5.1	22.0	105.7	0.0	105.7	5.1	100.6	5.1	100.6
17-Jun-93	36.9	0.0	36.9	27.6	0.0	27.6	4.5	23.1	4.5	23.1	110.6	0.0	110.6	4.5	106.1	4.5	106.1
18-Jun-93	35.9	0.0	35.9	24.9	0.0	24.9	4.5	20.4	4.5	20.4	106.0	0.0	106.0	4.5	101.5	4.5	101.5
19-Jun-93	34.6	0.0	34.6	21.3	0.0	21.3	2.3	19.0	2.3	19.0	98.4	0.0	98.4	2.3	96.1	2.3	96.1
20-Jun-93	25.5	0.0	25.5	23.3	0.8	22.5	5.2	18.1	5.2	18.1	96.5	0.8	95.7	5.2	91.3	5.2	91.3
21-Jun-93	24.0	0.0	24.0	21.8	1.1	20.7	4.4	17.4	4.4	17.4	85.7	1.1	84.6	4.4	81.3	4.4	81.3
22-Jun-93	20.5	0.0	20.5	23.3	0.8	22.5	5.2	18.1	5.2	18.1	86.4	0.8	85.6	5.2	81.2	5.2	81.2
23-Jun-93	25.0	0.0	25.0	22.4	0.3	22.1	4.3	18.1	4.3	18.1	87.4	0.3	87.1	4.3	83.1	4.3	83.1
24-Jun-93	24.1	0.0	24.1	20.9	0.1	20.8	4.5	16.4	4.5	16.4	83.2	0.1	83.1	4.5	78.7	4.5	78.7
25-Jun-93	24.8	0.0	24.8	20.0	1.8	18.2	5.1	14.9	5.1	14.9	78.3	1.8	76.5	5.1	73.2	5.1	73.2
26-Jun-93	22.4	0.0	22.4	16.4	0.0	16.4	2.4	14.0	2.4	14.0	70.2	0.0	70.2	2.4	67.8	2.4	67.8
27-Jun-93	21.0	0.0	21.0	13.2	0.0	13.2	0.0	13.2	0.0	13.2	62.7	0.0	62.7	0.0	62.7	0.0	62.7
28-Jun-93	16.7	0.0	16.7	17.3	1.7	15.6	4.4	12.9	4.4	12.9	65.2	1.7	63.5	4.4	60.8	4.4	60.8
29-Jun-93	10.5	0.0	10.5	15.9	0.5	15.4	3.3	12.6	3.3	12.6	59.1	0.5	58.6	3.3	55.8	3.3	55.8
30-Jun-93	11.5	0.0	11.5	14.5	0.2	14.3	2.7	11.8	2.7	11.8	50.6	0.2	50.4	2.7	47.9	2.7	47.9
1-Jul-93	11.4	0.0	11.4	13.6	0.2	13.4	2.7	10.9	2.7	10.9	49.4	0.2	49.2	2.7	46.7	2.7	46.7
2-Jul-93	11.2	0.0	11.2	13.2	0.0	13.2	2.6	10.6	2.6	10.6	48.4	0.0	48.4	2.6	45.8	2.6	45.8
3-Jul-93	8.7	0.0	8.7	13.4	0.0	13.4	0.7	12.7	0.7	12.7	45.4	0.0	45.4	0.7	44.7	0.7	44.7
4-Jul-93	8.8	0.0	8.8	21.9	5.8	16.1	8.0	13.9	8.0	13.9	54.2	5.8	48.4	8.0	46.2	8.0	46.2
5-Jul-93	12.1	0.0	12.1	21.0	5.5	15.5	8.0	13.0	8.0	13.0	53.9	5.5	48.4	8.0	45.9	8.0	45.9
6-Jul-93	15.3	0.0	15.3	20.1	6.3	13.8	8.0	12.1	8.0	12.1	55.6	6.3	49.3	8.0	47.6	8.0	47.6
7-Jul-93	10.8	0.0	10.8	19.5	6.0	13.5	8.0	11.5	8.0	11.5	52.7	6.0	46.7	8.0	44.7	8.0	44.7
8-Jul-93	11.8	0.0	11.8	19.6	6.0	13.6	8.0	11.6	8.0	11.6	49.1	6.0	43.1	8.0	41.1	8.0	41.1
9-Jul-93	10.8	0.0	10.8	19.0	6.9	12.1	8.0	11.0	8.0	11.0	48.1	6.9	41.2	8.0	40.1	8.0	40.1
10-Jul-93	9.1	0.0	9.1	18.4	6.6	11.8	8.0	10.4	8.0	10.4	46.0	6.6	39.4	8.0	38.0	8.0	38.0
11-Jul-93	9.0	0.0	9.0	19.0	8.6	10.4	9.3	9.7	9.3	9.7	43.0	8.6	34.4	9.3	33.7	9.3	33.7
12-Jul-93	13.7	4.0	9.7	21.2	11.4	9.8	12.0	9.2	12.0	9.2	46.2	15.4	30.8	16.0	30.2	16.0	30.2
13-Jul-93	13.7	4.0	9.7	22.5	13.2	9.3	13.7	8.8	13.7	8.8	49.7	17.2	32.5	17.7	32.0	17.7	32.0
14-Jul-93	13.4	4.0	9.4	22.4	13.2	9.2	13.6	8.8	13.6	8.8	49.6	17.2	32.4	17.6	32.0	17.6	32.0
15-Jul-93	13.2	4.0	9.2	24.5	15.7	8.8	16.2	8.3	16.2	8.3	50.2	19.7	30.5	20.2	30.0	20.2	30.0
16-Jul-93	13.6	4.0	9.6	26.6	18.5	8.1	18.5	8.1	18.5	8.1	53.1	22.5	30.6	22.5	30.6	22.5	30.6
17-Jul-93	15.2	4.0	11.2	26.6	17.1	9.5	18.3	8.3	18.3	8.3	53.5	21.1	32.4	22.3	31.2	22.3	31.2
18-Jul-93	12.5	4.0	8.5	26.7	18.1	8.6	18.5	8.2	18.5	8.2	54.6	22.1	32.5	22.5	32.1	22.5	32.1
19-Jul-93	19.4	10.0	9.4	25.2	17.3	7.9	17.0	8.2	17.0	8.2	51.9	27.3	24.6	27.0	24.9	27.0	24.9
20-Jul-93	19.5	10.0	9.5	21.6	12.0	9.6	13.8	7.8	13.8	7.8	54.0	22.0	32.0	23.8	30.2	23.8	30.2
21-Jul-93	20.4	10.0	10.4	20.1	11.0	9.1	11.9	8.2	11.9	8.2	50.9	21.0	29.9	21.9	29.0	21.9	29.0
22-Jul-93	20.0	10.0	10.0	18.7	10.2	8.5	10.9	7.8	10.9	7.8	49.1	20.2	28.9	20.9	28.2	20.9	28.2
23-Jul-93	20.6	10.0	10.6	18.7	9.0	9.7	10.8	7.9	10.8	7.9	48.9	19.0	29.9	20.8	28.1	20.8	28.1

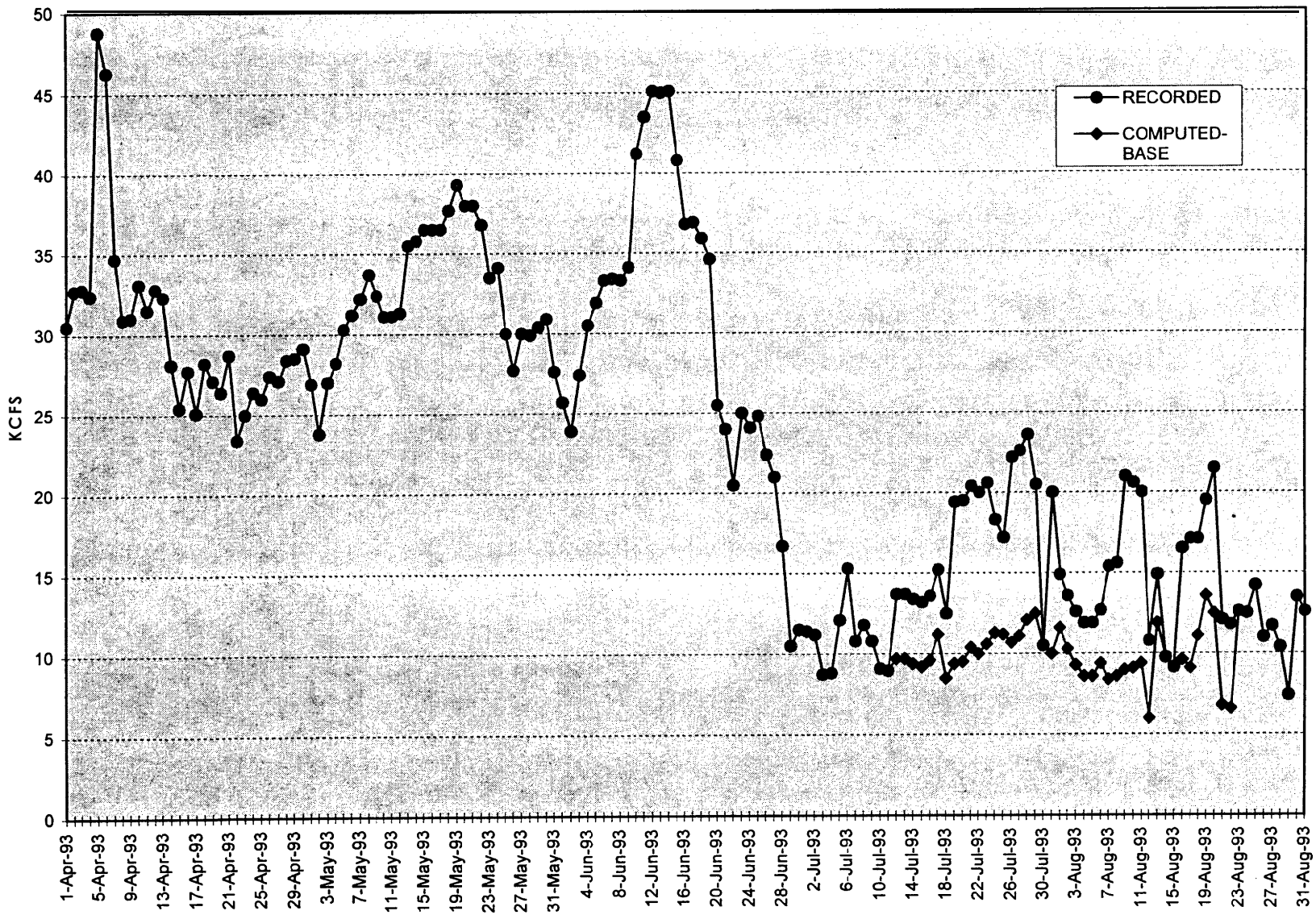
APR 1 - AUG 31, 1993

*REVISED 8-7-96

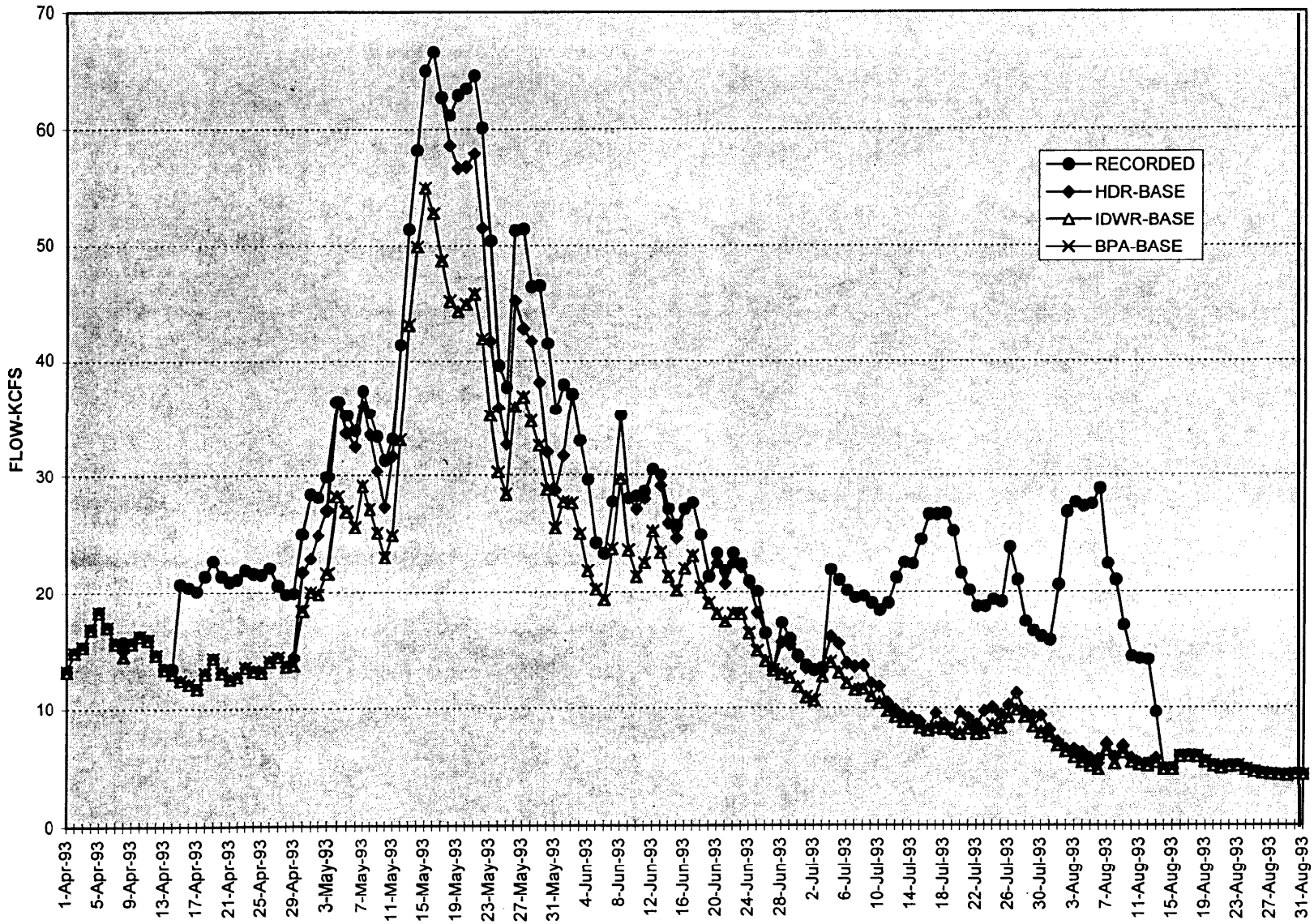
	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
					HDR	HDR	IDWR	IDWR	BPA	BPA		HDR	HDR	IDWR	IDWR	BPA	BPA
	RECORDED	FISH FLOWS	COMPUTED	RECORDED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	RECORDED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED	FISH FLOWS	COMPUTED
	@ HELLS	@BRNLEE	BASE	@ PECK	@DWSK	BASE	@DWSK	BASE	@DWSK	BASE	@LWGT	@LWGT	BASE	@LWGT	BASE	@LWGT	BASE
DATE	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)	(KCFS)
24-Jul-93	18.3	7.0	11.3	19.3	9.3	10.0	10.8	8.5	10.8	8.5	50.4	16.3	34.1	17.8	32.6	17.8	326
25-Jul-93	17.2	6.0	11.2	19.1	9.7	94	10.8	83	10.8	8.3	48.9	15.7	33.2	16.8	32.1	16.8	32.1
26-Jul-93	22.2	11.5	10.7	23.8	13.6	10.2	146	9.2	146	92	54.0	251	28.9	26.1	27.9	26.1	27.9
27-Jul-93	22.6	11.5	11.1	21.0	9.8	11.2	11.2	98	11.2	9.8	57.5	21.3	36.2	22.7	34.8	227	34.8
28-Jul-93	23.6	11.5	12.1	17.4	7.8	9.6	8.2	9.2	8.2	9.2	52.2	19.3	329	19.7	32.5	19.7	32.5
29-Jul-93	20.5	8.0	12.5	16.6	7.3	9.3	8.2	8.4	8.21	8.4	50.2	153	34.9	16.2	34.0	16.2	34.0
30-Jul-93	10.5	0.0	10.5	16.1	6.8	9.3	8.2	79	8.2	7.9	44.8	68	38.0	8.2	36.6	82	36.8
31-Jul-93	20.0	10.0	10.0	15.8	7.7	8.1	8.2	7.6	8.2	7.6	38.4	17.7	207	18.2	20.2	18.2	20.2
1-Aug-93	14.9	3.3	11.6	20.6	13.5	7.1	13.8	8.8	13.8	6.8	47.1	16.8	303	17.1	30.0	17.1	30.0
2-Aug-93	13.6	3.3	10.3	26.8	20.3	6.5	20.5	6.3	20.5	6.3	49.4	23.6	25.8	23.8	25.6	23.8	258
3Aug-93	12.6	3.3	9.3	27.6	21.1	8.5	21.8	58	21.8	5.8	50.0	24.4	25.6	25.1	24.9	251	249
4-Aug-93	11.9	3.3	8.6	27.3	21.1	6.2	21.9	54	21.9	5.4	48.3	24.4	23.9	25.2	23.1	25.2	23.1
5-Aug-93	11.9	3.3	8.6	27.5	21.8	5.7	22.4	51	224	5.1	47.1	25.1	22.0	257	21.4	25.7	21.4
6-Aug-93	12.7	33	9.4	28.8	23.2	5.6	24.0	4.8	24.0	4.8	48.1	26.5	216	27.3	20.8	27.3	20.8
7Aug-93	15.4	7.0	8.4	22.4	15.4	70	16.0	6.4	16.0	6.4	45.2	224	22.8	23.0	222	23.0	222
8-Aug-93	15.6	7.0	8.6	21.0	15.2	58	157	5.3	15.7	5.3	43.4	22.2	21.2	22.7	20.7	227	207
9-Aug-93	21 0	12.0	9.0	17.1	10.3	6.8	10.9	6.2	10.9	8.2	42.2	22.3	19.9	22.9	19.3	22.9	19.3
IO-Aug-93	20.6	11.5	9.1	14.4	8.7	5.7	9.0	5.4	9.0	5.4	42.2	20.2	22.0	20.5	21.7	205	217
11-Aug-93	20.0	10.6	9.4	14.2	8.9	53	90	5.2	9.0	5.2	41.2	19.5	21.7	19.6	21.6	19.6	21.6
12-Aug-93	10.8	4.8	6.0	14.1	8.9	52	9.0	5.1	9.0	5.1	36.0	13.7	22.3	13.8	222	13.8	22.2
13-Aug-93	14.9	3.0	11.9	9.6	3.9	5.7	4.2	5.4	4.2	54	29.8	6.9	22.9	7.2	22.6	7.2	226
14-Aug-93	9.8	0.0	9.8	4.8	0.0	4.8	00	48	0.0	4.8	28.9	00	269	0.0	269	0.0	26.9
15-Aug-93	9.2	0.0	9.2	4.8	0.0	4.8	0.0	48	0.0	48	21.1	0.0	21.1	0.0	21.1	00	21.1
16-Aug-93	16.5	6.9	9.6	5.9	0.0	5.9	0.0	5.9	0.0	5.9	23.2	69	16.3	6.9	16.3	6.9	16.3
17-Aug-93	17.1	8.0	9.1	5.9	0.0	5.9	0.0	5.9	00	5.9	30.9	8.0	22.9	8.0	22.9	8.0	22.9
18-Aug-93	17.1	6.0	11.1	5.9	0.0	5.9	0.0	5.9	00	5.9	32.2	6.0	262	6.0	262	60	262
19-Aug-93	19.5	5.9	13.6	5.4	0.0	5.4	0.0	5.4	00	5.4	31.4	59	25.6	5.9	25.5	5.9	255
20-Aug-93	21.5	9.0	12.5	5.1	00	5.1	0.0	51	0.0	5.1	33.9	9.0	249	90	249	9.0	249
21-Aug-93	12.1	5.3	68	4.9	0.0	4.9	00	4.9	0.0	4.9	31.5	5.3	26.2	5.3	26.2	5.3	262
22-Aug-93	11.8	5.2	6.6	5.1	00	5.1	0.0	5.1	00	5.1	24.0	5.2	18.8	5.2	18.8	5.2	18.8
23-Aug-93	12.6	0.0	12.8	5.1	0.0	5.1	00	5.1	0.0	5.1	24.4	0.0	244	00	244	00	244
24-Aug-93	12.5	0.0	125	4.8	0.0	4.8	0.0	48	0.0	4.8	25.4	0.0	254	00	25.4	00	254
25-Aug-93	14.2	0.0	14.2	4.6	0.0	4.6	00	46	00	46	24.1	0.0	24.1	00	241	00	241
26Aug-93	11.0	0.0	11.0	4.4	0.0	4.4	0.0	4.4	0.0	4.4	24.8	0.0	24.8	0.0	248	0.0	248
27-Aug-93	11.7	0.0	11.7	4.3	0.0	4.3	0.0	4.3	00	4.3	24.8	0.0	248	0.0	24 8	0.0	248
28-Aug-93	10.4	0.0	10.4	4.3	00	4 . 3	0.0	4.3	00	4.3	232	00	232	00	23.2	0.0	232
29-Aug-93	7.4	0.0	7.4	43	0.0	4.3	0.0	4.3	0.0	4.3	20.2	0.0	202	0.0	202	00	202
30Aug-93	13.5	0.0	13.5	4.3	00	4.3	0.0	4.3	00	4.3	18.4	0.0	18.4	0.0	18.4	00	18.4
31-Aug-93	12.6	0.0	12.6	4.3	0.0	4.3	0.0	4.3	0.0	4.3	24.3	0.0	24.3	00	24.3	0.0	24.3
TOTALS																	
(KSFD)	3721.5	265.5	3456.0	3715.8	741.5	2974.3	1159.9	2555.9	1159.9	2555.9	11623.8	1007.0	10616.8	1425.4	10198.4	1425.4	10198.4
(KAF)	7383.5	526.8	6856.8	7372.1	1471.1	5901.0	2301.2	5070.9	2301.2	5070.9	23061.6	1997.9	210637	2828.0	20233.6	2828.0	202336

● 1KCFSfora24hourflowpenod=1KSFD

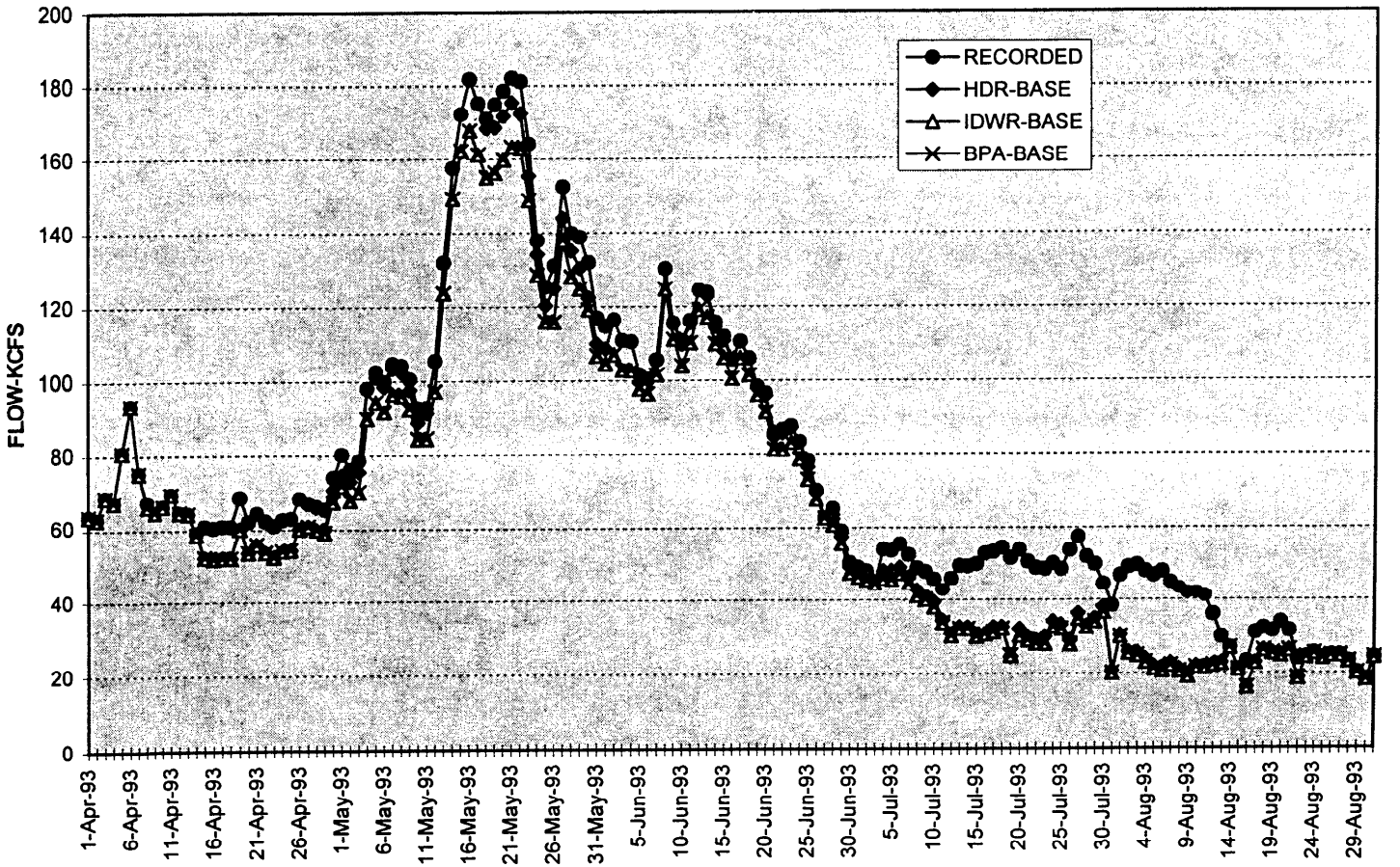
_ELLS CANYON GAGING STATION
COMPUTED BASE FLOWS
1993



DWORSHAK - (PECK GAGING STATION)
COMPUTED BASE FLOWS
1993



COMPUTED BASE FLOWS INTO
LOWER GRANITE
1993



BASE FLOW AND FISH AUGMENTATION FLOW DETERMINATION

1 9 9 4

HDR ENGINEERING, INC

COMPUTED BASE FLOW AT VARIOUS LOCATIONS

APR 1 - AUG 31, 1994

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
1-Apr-94	9.4	0.0	9.4	7.7	0.1	7.6	0.1	7.6	0.1	7.6	26.7	0.1	26.6	0.1	26.6	0.1	26.6
2-Apr-94	9.4	0.0	9.4	8.3	0.1	8.2	0.1	8.2	0.1	8.2	27.5	0.1	27.4	0.1	27.4	0.1	27.4
3-Apr-94	9.4	0.0	9.4	10.0	0.0	10.0	0.1	9.9	0.1	9.9	29.2	0.0	29.2	0.1	29.1	0.1	29.1
4-Apr-94	9.3	0.0	9.3	12.7	0.0	12.7	0.0	12.7	0.0	12.7	34.9	0.0	34.9	0.0	34.9	0.0	34.9
5-Apr-94	9.4	0.0	9.4	11.8	0.1	11.7	0.1	11.7	0.1	11.7	35.1	0.1	35.0	0.1	35.0	0.1	35.0
6-Apr-94	11.0	0.0	11.0	11.1	0.2	10.9	0.2	10.9	0.2	10.9	32.8	0.2	32.6	0.2	32.6	0.2	32.6
7-Apr-94	12.7	0.0	12.7	12.0	0.1	11.9	0.1	11.9	0.1	11.9	35.9	0.1	35.8	0.1	35.8	0.1	35.8
8-Apr-94	13.1	0.0	13.1	11.3	0.1	11.2	0.1	11.2	0.1	11.2	35.9	0.1	35.8	0.1	35.8	0.1	35.8
9-Apr-94	12.0	0.0	12.0	10.5	0.1	10.4	0.1	10.4	0.1	10.4	33.7	0.1	33.6	0.1	33.6	0.1	33.6
10-Apr-94	15.1	0.0	15.1	10.3	0.1	10.2	0.1	10.2	0.1	10.2	34.4	0.1	34.3	0.1	34.3	0.1	34.3
11-Apr-94	14.2	0.0	14.2	10.2	0.1	10.1	0.1	10.1	0.1	10.1	35.6	0.1	35.5	0.1	35.5	0.1	35.5
12-Apr-94	17.4	0.0	17.4	10.4	0.0	10.4	0.1	10.3	0.1	10.3	35.1	0.0	35.1	0.1	35.0	0.1	35.0
13-Apr-94	12.1	0.0	12.1	11.9	0.0	11.9	0.1	11.8	0.1	11.8	38.7	0.0	38.7	0.1	38.6	0.1	38.6
14-Apr-94	13.6	0.0	13.6	12.7	0.6	12.1	0.9	11.8	0.9	11.8	35.2	0.6	34.6	0.9	34.3	0.9	34.3
15-Apr-94	13.3	0.0	13.3	12.2	0.9	11.3	0.9	11.3	0.9	11.3	36.6	0.9	35.7	0.9	35.7	0.9	35.7
16-Apr-94	11.3	0.0	11.3	10.8	0.1	10.7	0.1	10.7	0.1	10.7	33.5	0.1	33.4	0.1	33.4	0.1	33.4
17-Apr-94	9.6	0.0	9.6	12.3	0.0	12.3	0.1	12.2	0.1	12.2	34.2	0.0	34.2	0.1	34.1	0.1	34.1
18-Apr-94	13.3	0.0	13.3	17.0	0.0	17.0	0.1	16.9	0.1	16.9	39.5	0.0	39.5	0.1	39.4	0.1	39.4
19-Apr-94	9.8	0.0	9.8	22.8	0.0	22.8	0.1	22.7	0.1	22.7	52.1	0.0	52.1	0.1	52.0	0.1	52.0
20-Apr-94	10.2	0.9	9.3	28.1	0.0	28.1	0.1	28.0	0.1	28.0	58.6	0.9	57.7	1.0	57.6	1.0	57.6
21-Apr-94	9.7	1.6	8.1	30.7	0.0	30.7	0.1	30.6	0.1	30.6	66.3	1.9	64.8	1.7	64.6	1.7	64.6
22-Apr-94	11.7	1.9	9.8	34.5	0.0	34.5	0.1	34.4	0.1	34.4	71.5	1.9	69.6	2.0	69.5	2.0	69.5
23-Apr-94	16.2	1.9	14.3	36.1	0.0	36.1	0.1	36.0	0.1	36.0	80.1	1.9	78.2	2.0	78.1	2.0	78.1
24-Apr-94	13.9	1.6	12.3	31.3	0.0	31.3	0.1	31.2	0.1	31.2	79.9	1.6	78.3	1.7	78.2	1.7	78.2
25-Apr-94	11.8	1.5	10.3	30.1	0.0	30.1	0.0	30.1	0.0	30.1	74.0	1.5	72.5	1.5	72.5	1.5	72.5
26-Apr-94	14.2	1.5	12.7	27.0	0.0	27.0	0.0	27.0	0.0	27.0	67.8	1.5	66.3	1.5	66.3	1.5	66.3
27-Apr-94	19.4	1.4	18.0	22.6	0.0	22.6	0.0	22.6	0.0	22.6	65.7	1.4	64.3	1.4	64.3	1.4	64.3
28-Apr-94	17.0	3.1	13.9	25.8	2.5	23.3	5.9	19.9	5.9	19.9	64.7	5.6	59.1	9.0	55.7	9.0	55.7
29-Apr-94	24.1	11.5	12.6	35.6	16.4	19.2	17.8	17.8	17.8	17.8	74.6	27.9	46.7	29.3	45.3	29.3	45.3
30-Apr-94	24.3	6.1	18.2	35.4	17.8	17.6	18.6	16.8	18.6	16.8	78.2	23.9	54.3	24.7	53.5	24.7	53.5
1-May-94	24.3	15.5	8.8	35.0	17.8	17.2	18.4	16.6	18.4	16.6	76.2	33.3	42.9	33.9	42.3	33.9	42.3
2-May-94	22.7	7.3	15.4	34.2	17.8	16.4	18.2	16.0	18.2	16.0	74.6	25.1	49.5	25.5	49.1	25.5	49.1
3-May-94	23.1	8.1	15.0	34.0	18.3	15.7	18.5	15.5	18.5	15.5	71.5	26.4	45.1	26.6	44.9	26.6	44.9
4-May-94	23.3	9.9	13.4	34.4	18.4	16.0	18.8	15.6	18.8	15.6	72.9	28.3	44.6	28.7	44.2	28.7	44.2
5-May-94	24.4	10.4	14.0	35.8	18.2	17.6	18.7	17.1	18.7	17.1	76.7	28.6	48.1	29.1	47.6	29.1	47.6
6-May-94	24.9	13.7	11.2	35.3	15.3	20.0	15.6	19.7	15.6	19.7	79.4	29.0	50.4	29.3	50.1	29.3	50.1
7-May-94	24.8	7.2	17.6	29.6	6.1	23.5	8.5	21.1	8.5	21.1	72.9	13.3	59.6	15.7	57.2	15.7	57.2
8-May-94	24.4	15.4	9.0	32.8	4.5	28.3	8.5	24.3	8.5	24.3	80.0	19.9	60.1	23.9	56.1	23.9	56.1
9-May-94	25.3	10.2	15.1	33.9	0.0	33.9	5.1	28.8	5.1	28.8	87.8	10.2	77.6	15.3	72.5	15.3	72.5
10-May-94	25.1	10.6	14.5	30.8	0.0	30.8	0.0	30.8	0.0	30.8	88.7	10.6	78.1	10.6	78.1	10.6	78.1
11-May-94	23.3	10.0	13.3	29.5	0.0	29.5	0.0	29.5	0.0	29.5	92.8	10.0	82.8	10.0	82.8	10.0	82.8
12-May-94	10.7	0.0	10.7	33.4	0.0	33.4	3.7	29.7	3.7	29.7	88.7	0.0	88.7	3.7	85.0	3.7	85.0
13-May-94	9.6	0.0	9.6	38.0	3.4	34.6	8.5	29.5	8.5	29.5	91.0	3.4	87.6	8.5	82.5	8.5	82.5
14-May-94	9.6	0.0	9.6	33.5	5.2	28.3	8.5	25.0	8.5	25.0	85.2	5.2	80.0	8.5	76.7	8.5	76.7
15-May-94	11.3	0.0	11.3	35.5	11.5	24.0	14.1	21.4	14.1	21.4	80.9	11.5	69.4	14.1	66.8	14.1	66.8
16-May-94	9.6	0.0	9.6	39.3	17.7	21.6	18.8	20.5	18.8	20.5	84.8	17.7	67.1	18.8	66.0	18.8	66.0
17-May-94	9.6	0.0	9.6	37.4	17.9	19.5	18.6	18.8	18.6	18.8	78.2	17.9	60.3	18.6	59.6	18.6	59.6
18-May-94	9.6	0.0	9.6	38.1	18.0	20.1	18.9	19.2	18.9	19.2	78.4	18.0	60.4	18.9	59.5	18.9	59.5
19-May-94	10.4	0.0	10.4	36.2	18.1	18.1	18.6	17.6	18.6	17.6	75.1	18.1	57.0	18.6	56.5	18.6	56.5
20-May-94	9.6	0.0	9.6	35.9	17.2	18.7	18.8	17.1	18.8	17.1	74.5	17.2	57.3	18.8	55.7	18.8	55.7
21-May-94	9.5	0.0	9.5	36.1	17.8	18.3	19.1	17.0	19.1	17.0	73.7	17.8	55.9	19.1	54.6	19.1	54.6
22-May-94	9.5	0.0	9.5	35.7	18.0	17.7	19.1	16.6	19.1	16.6	73.7	18.0	55.7	19.1	54.6	19.1	54.6
23-May-94	11.3	0.0	11.3	34.9	18.8	16.1	19.0	15.9	19.0	15.9	73.6	18.8	54.8	19.0	54.6	19.0	54.6
24-May-94	17.0	0.3	16.7	34.4	18.7	15.7	19.0	15.4	19.0	15.4	74.3	19.0	55.3	19.3	55.0	19.3	55.0
25-May-94	14.7	1.0	13.7	34.6	19.0	15.6	19.0	15.6	19.0	15.6	78.6	20.0	58.6	20.0	58.6	20.0	58.6
26-May-94	13.8	1.2	12.6	34.9	19.9	15.0	19.0	15.9	19.0	15.9	76.6	20.1	56.4	20.2	56.3	20.2	56.3

APR 1 - AUG 31, 1994

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
27-May-94	14.6	0.0	14.6	34.2	16.1	18.1	16.1	18.1	16.1	18.1	77.7	16.1	61.6	16.1	61.6	16.1	61.6
28-May-94	13.7	4.6	9.1	25.0	5.7	19.3	5.7	19.3	5.7	19.3	68.7	10.3	58.4	10.3	58.4	10.3	58.4
29-May-94	13.8	2.8	11.0	20.5	4.3	16.2	4.3	16.2	4.3	16.2	64.4	7.1	57.3	7.1	57.3	7.1	57.3
30-May-94	14.3	2.2	12.1	18.4	1.2	17.2	1.2	17.2	1.2	17.2	61.9	3.4	58.5	3.4	58.5	3.4	58.5
31-May-94	15.2	0.0	15.2	15.5	0.1	15.4	0.1	15.4	0.1	15.4	56.4	0.1	56.3	0.1	56.3	0.1	56.3
1-Jun-94	9.5	0.0	9.5	15.1	0.1	15.0	0.1	15.0	0.1	15.0	54.4	0.1	54.3	0.1	54.3	0.1	54.3
2-Jun-94	9.5	0.0	9.5	17.3	0.1	17.2	0.1	17.2	0.1	17.2	53.2	0.1	53.1	0.1	53.1	0.1	53.1
3-Jun-94	9.4	0.0	9.4	14.9	0.0	14.9	0.0	14.9	0.0	14.9	51.4	0.0	51.4	0.0	51.4	0.0	51.4
4-Jun-94	9.5	0.0	9.5	14.4	0.0	14.4	0.0	14.4	0.0	14.4	41.3	0.0	41.3	0.0	41.3	0.0	41.3
5-Jun-94	9.5	0.0	9.5	14.8	0.0	14.8	0.0	14.8	0.0	14.8	48.5	0.0	48.5	0.0	48.5	0.0	48.5
6-Jun-94	9.5	0.0	9.5	13.5	0.0	13.5	0.0	13.5	0.0	13.5	47.2	0.0	47.2	0.0	47.2	0.0	47.2
7-Jun-94	9.5	0.0	9.5	14.0	0.0	14.0	0.0	14.0	0.0	14.0	45.8	0.0	45.8	0.0	45.8	0.0	45.8
8-Jun-94	9.5	0.0	9.5	13.4	0.0	13.4	0.0	13.4	0.0	13.4	44.3	0.0	44.3	0.0	44.3	0.0	44.3
9-Jun-94	9.5	0.0	9.5	12.3	0.0	12.3	0.0	12.3	0.0	12.3	42.0	0.0	42.0	0.0	42.0	0.0	42.0
10-Jun-94	9.5	0.0	9.5	11.1	0.0	11.1	0.0	11.1	0.0	11.1	40.4	0.0	40.4	0.0	40.4	0.0	40.4
11-Jun-94	8.8	0.0	8.8	10.4	0.0	10.4	0.0	10.4	0.0	10.4	37.4	0.0	37.4	0.0	37.4	0.0	37.4
12-Jun-94	8.2	0.0	8.2	10.3	0.0	10.3	0.0	10.3	0.0	10.3	36.8	0.0	36.8	0.0	36.8	0.0	36.8
13-Jun-94	7.8	0.0	7.8	11.2	0.0	11.2	0.0	11.2	0.0	11.2	35.8	0.0	35.8	0.0	35.8	0.0	35.8
14-Jun-94	7.6	0.0	7.6	23.2	0.0	23.2	0.0	23.2	0.0	23.2	47.2	0.0	47.2	0.0	47.2	0.0	47.2
15-Jun-94	7.3	0.0	7.3	18.9	0.0	18.9	0.0	18.9	0.0	18.9	45.1	0.0	45.1	0.0	45.1	0.0	45.1
16-Jun-94	6.9	0.0	6.9	17.4	0.0	17.4	0.0	17.4	0.0	17.4	39.6	0.0	39.6	0.0	39.6	0.0	39.6
17-Jun-94	6.9	0.0	6.9	18.4	0.0	18.4	0.0	18.4	0.0	18.4	41.0	0.0	41.0	0.0	41.0	0.0	41.0
18-Jun-94	6.4	0.0	6.4	16.1	0.0	16.1	0.0	16.1	0.0	16.1	37.9	0.0	37.9	0.0	37.9	0.0	37.9
19-Jun-94	6.3	0.0	6.3	14.7	0.0	14.7	0.0	14.7	0.0	14.7	34.8	0.0	34.8	0.0	34.8	0.0	34.8
20-Jun-94	6.6	0.0	6.6	13.7	0.0	13.7	0.1	13.6	0.1	13.6	33.0	0.0	33.0	0.1	32.9	0.1	32.9
21-Jun-94	6.7	0.0	6.7	13.0	0.0	13.0	0.1	12.9	0.1	12.9	32.3	0.0	32.3	0.1	32.2	0.1	32.2
22-Jun-94	6.8	0.0	6.8	12.4	0.0	12.4	0.1	12.3	0.1	12.3	31.1	0.0	31.1	0.1	31.0	0.1	31.0
23-Jun-94	8.2	0.0	8.2	11.8	0.0	11.8	0.1	11.7	0.1	11.7	29.9	0.0	29.9	0.1	29.8	0.1	29.8
24-Jun-94	7.7	0.0	7.7	11.0	0.0	11.0	0.1	10.9	0.1	10.9	31.4	0.0	31.4	0.1	31.3	0.1	31.3
25-Jun-94	6.4	0.0	6.4	10.3	0.0	10.3	0.1	10.2	0.1	10.2	28.2	0.0	28.2	0.1	28.1	0.1	28.1
26-Jun-94	6.4	0.0	6.4	9.7	0.0	9.7	0.1	9.6	0.1	9.6	26.5	0.0	26.5	0.1	26.4	0.1	26.4
27-Jun-94	6.3	0.5	5.9	9.8	0.0	9.8	0.1	9.7	0.1	9.7	25.0	0.5	24.5	0.6	24.4	0.6	24.4
28-Jun-94	6.3	1.5	4.7	9.1	0.0	9.1	0.1	9.0	0.1	9.0	24.6	1.5	23.1	1.6	23.0	1.6	23.0
29-Jun-94	6.2	0.9	5.3	8.4	0.0	8.4	0.1	8.3	0.1	8.3	23.4	0.9	22.5	1.0	22.4	1.0	22.4
30-Jun-94	6.7	0.3	6.3	8.0	0.0	8.0	0.1	7.9	0.1	7.9	22.2	0.3	21.9	0.4	21.8	0.4	21.8
1-Jul-94	12.0	6.7	5.3	7.6	0.0	7.6	0.1	7.5	0.1	7.5	22.3	6.7	15.6	6.8	15.5	6.8	15.5
2-Jul-94	11.9	7.8	4.1	7.3	0.0	7.3	0.1	7.2	0.1	7.2	26.7	7.8	18.9	7.9	18.8	7.9	18.8
3-Jul-94	12.4	7.4	5.0	7.2	0.0	7.2	0.1	7.1	0.1	7.1	25.3	7.4	17.9	7.5	17.8	7.5	17.8
4-Jul-94	12.6	6.6	6.0	6.9	0.0	6.9	0.1	6.8	0.1	6.8	26.1	6.6	19.5	6.7	19.4	6.7	19.4
5-Jul-94	17.2	11.4	5.8	6.6	0.0	6.6	0.1	6.5	0.1	6.5	25.7	11.4	14.3	11.5	14.2	11.5	14.2
6-Jul-94	17.3	10.8	6.5	11.1	3.0	8.1	4.4	6.7	4.4	6.7	32.5	13.8	18.7	15.2	17.3	15.2	17.3
7-Jul-94	17.9	10.4	7.5	19.4	11.3	8.1	11.9	7.5	11.9	7.5	44.1	21.7	22.4	22.3	21.8	22.3	21.8
8-Jul-94	13.3	5.1	8.2	23.5	16.6	6.9	17.2	6.3	17.2	6.3	45.3	21.7	23.6	22.3	23.0	22.3	23.0
9-Jul-94	14.0	6.8	7.3	24.8	18.6	6.2	19.0	5.8	19.0	5.8	44.6	25.4	19.3	25.8	18.9	25.8	18.9
10-Jul-94	14.7	7.2	7.5	24.5	18.3	6.2	19.0	5.5	19.0	5.5	45.5	25.5	20.0	26.2	19.3	26.2	19.3
11-Jul-94	15.4	6.6	8.8	24.2	18.6	5.6	19.0	5.2	19.0	5.2	44.8	25.2	19.6	25.6	19.2	25.6	19.2
12-Jul-94	14.9	5.1	9.8	23.9	18.5	5.4	19.0	4.9	19.0	4.9	44.0	23.6	20.4	24.1	19.9	24.1	19.9
13-Jul-94	14.3	4.3	10.0	23.7	18.6	5.1	18.9	4.8	18.9	4.8	43.1	22.9	20.2	23.2	19.9	23.2	19.9
14-Jul-94	14.4	3.8	10.6	23.5	18.4	5.1	18.9	4.6	18.9	4.6	41.9	22.2	19.7	22.7	19.2	22.7	19.2
15-Jul-94	14.9	5.1	9.8	24.2	19.9	4.3	19.9	4.3	19.9	4.3	43.4	25.0	18.4	25.0	18.4	25.0	18.4
16-Jul-94	14.4	8.3	6.1	25.5	21.2	4.3	21.2	4.3	21.2	4.3	42.8	29.5	13.3	29.5	13.3	29.5	13.3
17-Jul-94	13.2	11.5	1.7	26.2	22.2	4.0	22.2	4.0	22.2	4.0	43.8	33.7	10.1	33.7	10.1	33.7	10.1
18-Jul-94	13.6	8.3	5.3	28.2	24.3	3.9	24.3	3.9	24.3	3.9	45.8	32.6	13.2	32.6	13.2	32.6	13.2
19-Jul-94	13.8	8.3	5.5	27.9	24.3	3.6	24.3	3.6	24.3	3.6	45.5	32.6	12.9	32.6	12.9	32.6	12.9
20-Jul-94	11.3	6.0	5.3	27.8	24.2	3.6	24.2	3.6	24.2	3.6	44.6	30.2	14.4	30.2	14.4	30.2	14.4
21-Jul-94	12.6	4.6	8.0	27.1	23.6	3.5	23.6	3.5	23.6	3.5	43.6	28.2	15.4	28.2	15.4	28.2	15.4
22-Jul-94	14.7	8.9	5.8	27.4	24.1	3.3	24.1	3.3	24.1	3.3	41.3	33.0	8.3	33.0	8.3	33.0	8.3

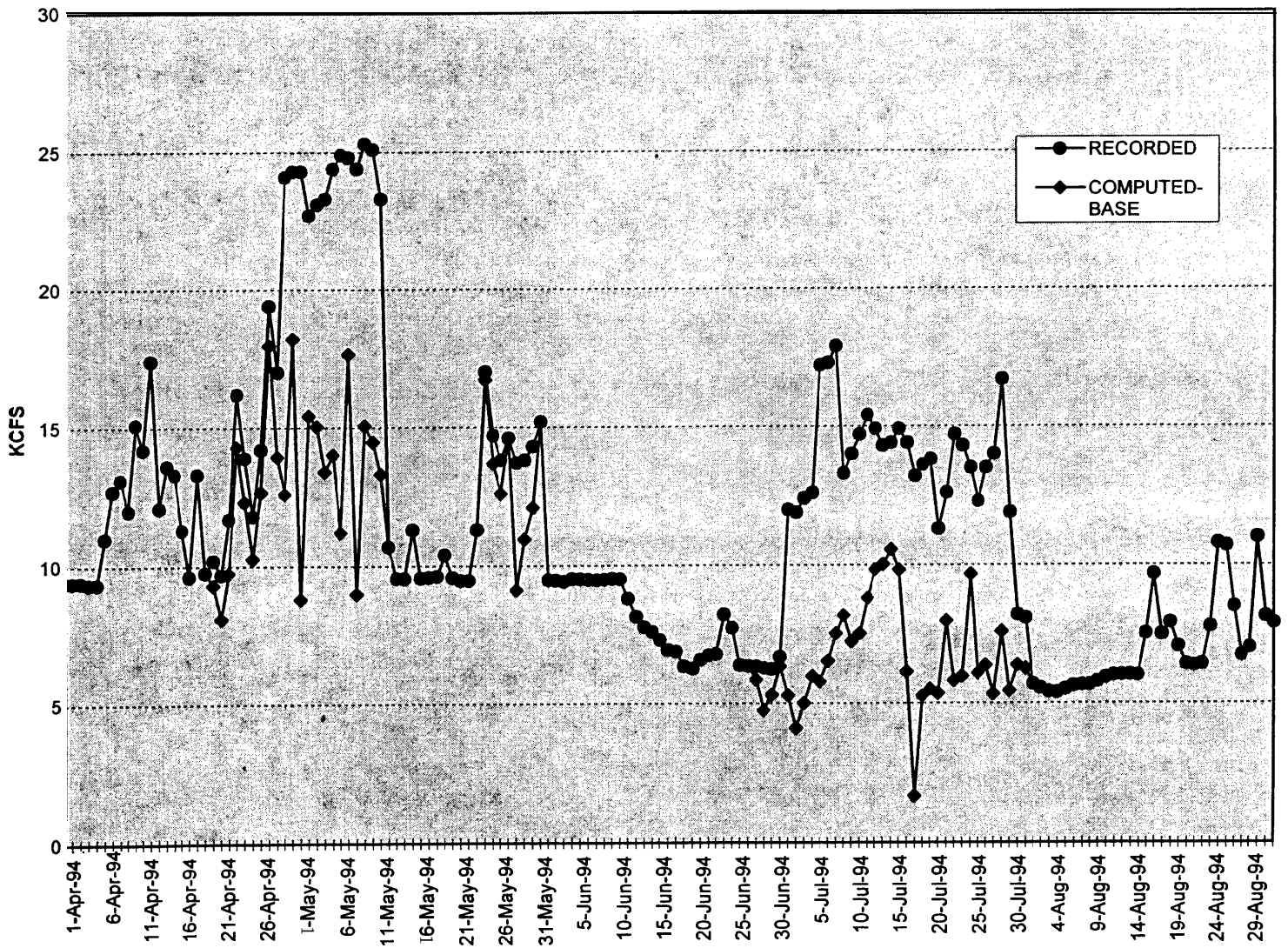
APR 1 - AUG 31, 1994

*REVISED 8-7-96

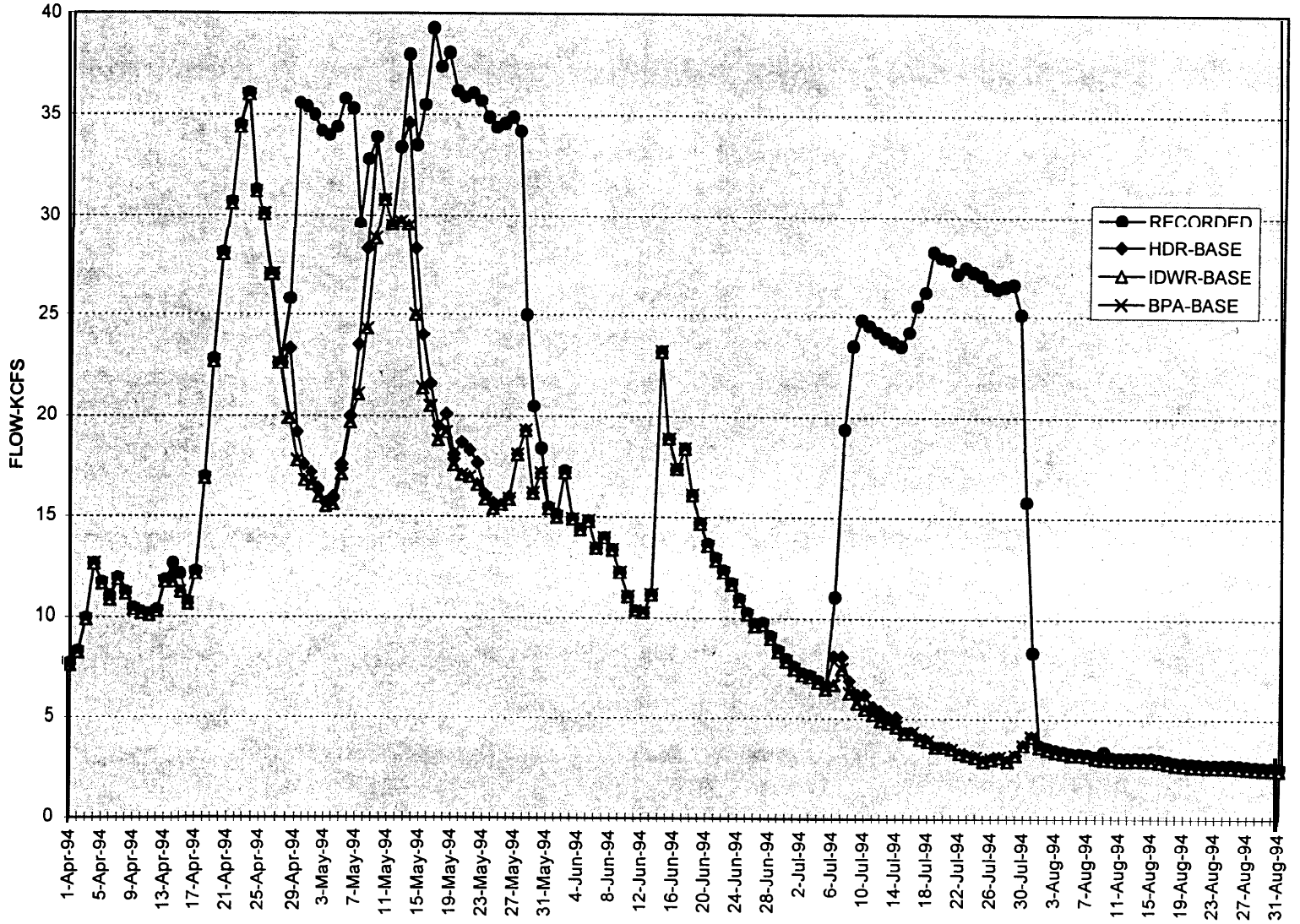
	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
24-Jul-94	13.5	3.8	9.7	27.0	23.9	3.1	23.9	3.1	23.9	3.1	44.2	27.7	16.5	27.7	16.5	27.7	16.5
25-Jul-94	12.3	6.2	6.1	26.6	23.7	2.9	23.7	2.9	23.7	2.9	42.6	29.9	12.7	29.9	12.7	29.9	12.7
26-Jul-94	13.5	7.1	6.4	26.4	23.4	3.0	23.4	3.0	23.4	3.0	41.6	30.5	11.1	30.5	11.1	30.5	11.1
27-Jul-94	14.0	8.7	5.3	26.5	23.4	3.1	23.4	3.1	23.4	3.1	42.5	32.1	10.4	32.1	10.4	32.1	10.4
28-Jul-94	16.7	9.1	7.6	26.6	23.7	2.9	23.7	2.9	23.7	2.9	44.0	32.8	11.2	32.8	11.2	32.8	11.2
29-Jul-94	11.9	6.5	5.4	25.1	21.9	3.2	21.9	3.2	21.9	3.2	44.3	28.4	15.9	28.4	15.9	28.4	15.9
30-Jul-94	8.2	1.8	6.4	15.8	12.1	3.7	12.1	3.7	12.1	3.7	32.2	13.9	18.3	13.9	18.3	13.9	18.3
31-Jul-94	8.1	1.8	6.3	8.3	4.2	4.1	4.2	4.1	4.2	4.1	21.5	6.0	15.5	6.0	15.5	6.0	15.5
1-Aug-94	5.7	0.0	5.7	3.7	0.0	3.7	0.1	3.6	0.1	3.6	15.2	0.0	15.2	0.1	15.1	0.1	15.1
2-Aug-94	5.6	0.0	5.6	3.6	0.0	3.6	0.1	3.5	0.1	3.5	12.9	0.0	12.9	0.1	12.8	0.1	12.8
3-Aug-94	5.4	0.0	5.4	3.5	0.0	3.5	0.1	3.4	0.1	3.4	13.1	0.0	13.1	0.1	13.0	0.1	13.0
4-Aug-94	5.4	0.0	5.4	3.4	0.0	3.4	0.1	3.3	0.1	3.3	12.1	0.0	12.1	0.1	12.0	0.1	12.0
5-Aug-94	5.5	0.0	5.5	3.3	0.0	3.3	0.1	3.2	0.1	3.2	12.2	0.0	12.2	0.1	12.1	0.1	12.1
6-Aug-94	5.6	0.0	5.6	3.3	0.0	3.3	0.1	3.2	0.1	3.2	12.2	0.0	12.2	0.1	12.1	0.1	12.1
7-Aug-94	5.7	0.0	5.7	3.3	0.0	3.3	0.1	3.2	0.1	3.2	12.0	0.0	12.0	0.1	11.9	0.1	11.9
8-Aug-94	5.7	0.0	5.7	3.2	0.0	3.2	0.1	3.1	0.1	3.1	12.4	0.0	12.4	0.1	12.3	0.1	12.3
9-Aug-94	5.8	0.0	5.8	3.4	0.0	3.4	0.4	3.0	0.4	3.0	12.3	0.0	12.3	0.4	11.9	0.4	11.9
10-Aug-94	5.9	0.0	5.9	3.1	0.0	3.1	0.1	3.0	0.1	3.0	12.2	0.0	12.2	0.1	12.1	0.1	12.1
11-Aug-94	6.0	0.0	6.0	3.1	0.0	3.1	0.1	3.0	0.1	3.0	11.8	0.0	11.8	0.1	11.7	0.1	11.7
12-Aug-94	6.0	0.0	6.0	3.1	0.0	3.1	0.1	3.0	0.1	3.0	12.5	0.0	12.5	0.1	12.4	0.1	12.4
13-Aug-94	6.0	0.0	6.0	3.1	0.0	3.1	0.1	3.0	0.1	3.0	11.9	0.0	11.9	0.1	11.8	0.1	11.8
14-Aug-94	6.0	0.0	6.0	3.1	0.0	3.1	0.1	3.0	0.1	3.0	11.9	0.0	11.9	0.1	11.8	0.1	11.8
15-Aug-94	7.5	0.0	7.5	3.1	0.0	3.1	0.1	3.0	0.1	3.0	12.3	0.0	12.3	0.1	12.2	0.1	12.2
16-Aug-94	9.7	0.0	9.7	3.0	0.0	3.0	0.1	2.9	0.1	2.9	13.4	0.0	13.4	0.1	13.3	0.1	13.3
17-Aug-94	7.5	0.0	7.5	2.9	0.0	2.9	0.1	2.8	0.1	2.8	15.5	0.0	15.5	0.1	15.4	0.1	15.4
18-Aug-94	7.9	0.0	7.9	2.8	0.0	2.8	0.1	2.7	0.1	2.7	12.9	0.0	12.9	0.1	12.8	0.1	12.8
19-Aug-94	7.1	0.0	7.1	2.8	0.0	2.8	0.1	2.7	0.1	2.7	13.2	0.0	13.2	0.1	13.1	0.1	13.1
20-Aug-94	6.4	0.0	6.4	2.8	0.0	2.8	0.1	2.7	0.1	2.7	12.2	0.0	12.2	0.1	12.1	0.1	12.1
21-Aug-94	6.4	0.0	6.4	2.8	0.0	2.8	0.1	2.7	0.1	2.7	11.7	0.0	11.7	0.1	11.6	0.1	11.6
22-Aug-94	6.4	0.0	6.4	2.7	0.0	2.7	0.1	2.6	0.1	2.6	12.0	0.0	12.0	0.1	11.9	0.1	11.9
23-Aug-94	7.8	0.0	7.8	2.7	0.0	2.7	0.1	2.6	0.1	2.6	10.9	0.0	10.9	0.1	10.8	0.1	10.8
24-Aug-94	10.8	0.0	10.8	2.7	0.0	2.7	0.1	2.6	0.1	2.6	14.4	0.0	14.4	0.1	14.3	0.1	14.3
25-Aug-94	10.7	0.0	10.7	2.7	0.0	2.7	0.1	2.6	0.1	2.6	15.9	0.0	15.9	0.1	15.8	0.1	15.8
26-Aug-94	8.5	0.0	8.5	2.7	0.0	2.7	0.1	2.6	0.1	2.6	15.9	0.0	15.9	0.1	15.8	0.1	15.8
27-Aug-94	6.7	0.0	6.7	2.7	0.0	2.7	0.1	2.6	0.1	2.6	13.3	0.0	13.3	0.1	13.2	0.1	13.2
28-Aug-94	7.0	0.0	7.0	2.7	0.0	2.7	0.1	2.6	0.1	2.6	11.6	0.0	11.6	0.1	11.5	0.1	11.5
29-Aug-94	11.0	0.0	11.0	2.6	0.0	2.6	0.1	2.5	0.1	2.5	12.8	0.0	12.8	0.1	12.7	0.1	12.7
30-Aug-94	8.1	0.0	8.1	2.6	0.0	2.6	0.1	2.5	0.1	2.5	15.6	0.0	15.6	0.1	15.5	0.1	15.5
31-Aug-94	7.9	0.0	7.9	2.6	0.0	2.6	0.1	2.5	0.1	2.5	13.2	0.0	13.2	0.1	13.1	0.1	13.1
TOTALS (KSFD)	1777.2	381.0	1396.3	2729.6	909.5	1820.1	963.3	1766.3	963.3	1766.3	6591.2	1290.5	5300.7	1344.3	5246.9	1344.3	5246.9
(KAF)	3526.0	755.9	2770.2	5415.4	1804.4	3611.0	1911.2	3504.3	1911.2	3504.3	13076.9	2560.3	10516.6	2667.0	10409.9	2667.0	10409.9

* 1 KCFS for a 24 hour flow period = 1 KSFD

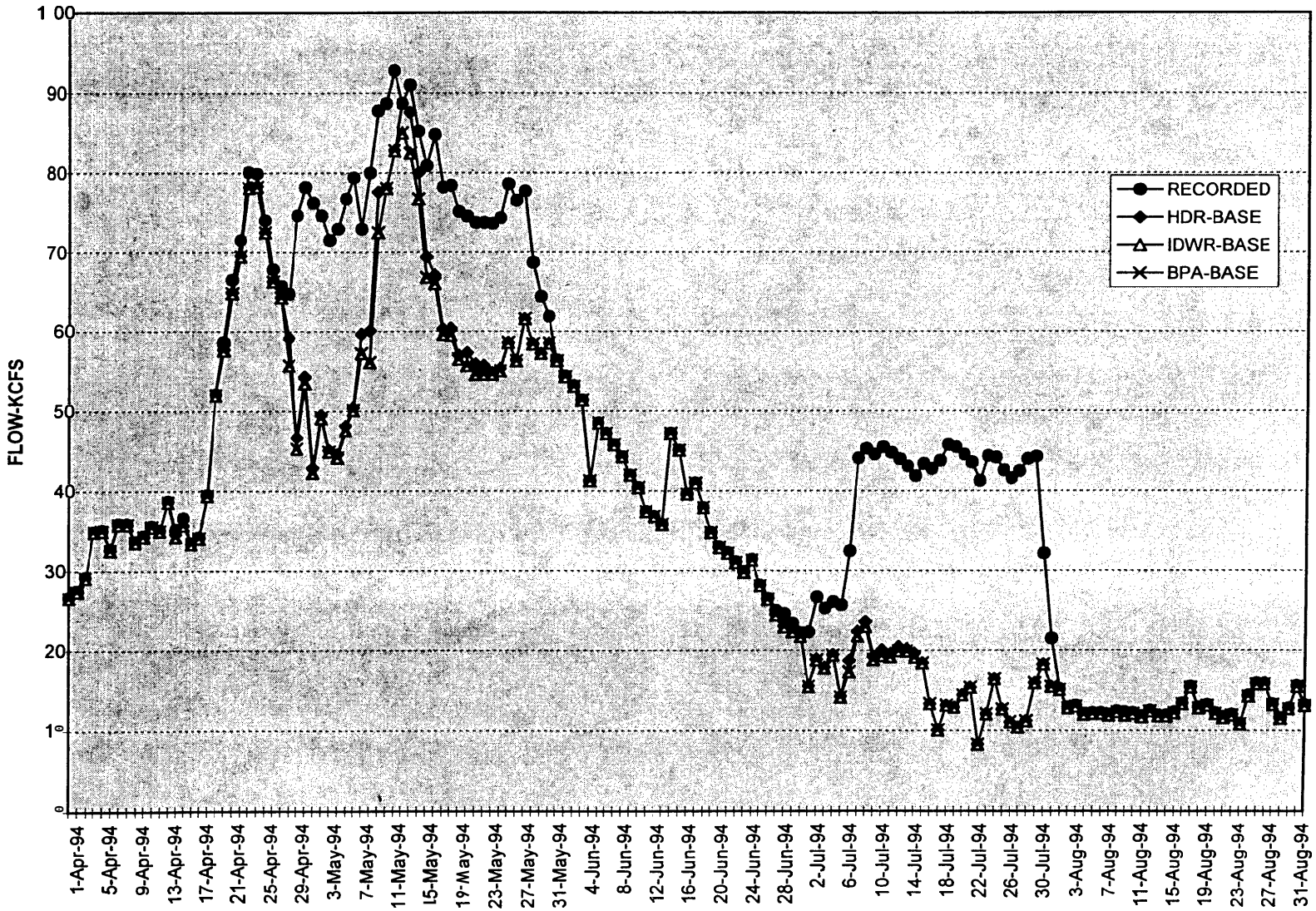
HELLS CANYON GAGING STATION
COMPUTED BASE FLOWS
1994



DWORSHAK - (PECK GAGING STATION)
COMPUTED BASE FLOWS
1994



COMPUTED BASE FLOWS INTO LOWER GRANITE 1994



BASE FLOW AND FISH AUGMENTATION FLOW DETERMINATION

1995

HDR ENGINEERING, INC

COMPUTED BASE FLOW AT VARIOUS LOCATIONS

APR 1 - AUG 31, 1995

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
1-Apr-95	20.0	0.0	20.0	8.7	0.0	8.7	0.0	8.7	0.0	8.7	40.1	0.0	40.1	0.0	40.1	0.0	40.1
2-Apr-95	16.5	0.0	16.5	9.0	0.0	9.0	0.0	9.0	0.0	9.0	39.4	0.0	39.4	0.0	39.4	0.0	39.4
3-Apr-95	21.3	0.0	21.3	8.6	0.0	8.6	0.0	8.6	0.0	8.6	38.0	0.0	38.0	0.0	38.0	0.0	38.0
4-Apr-95	20.8	0.0	20.8	8.5	0.0	8.5	0.0	8.5	0.0	8.5	40.7	0.0	40.7	0.0	40.7	0.0	40.7
5-Apr-95	20.1	0.0	20.1	9.7	0.0	9.7	0.0	9.7	0.0	9.7	39.1	0.0	39.1	0.0	39.1	0.0	39.1
6-Apr-95	20.2	0.0	20.2	11.8	0.0	11.8	0.0	11.8	0.0	11.8	43.7	0.0	43.7	0.0	43.7	0.0	43.7
7-Apr-95	23.8	0.0	23.8	12.8	0.0	12.8	0.0	12.8	0.0	12.8	51.1	0.0	51.1	0.0	51.1	0.0	51.1
8-Apr-95	24.2	0.0	24.2	17.7	0.0	17.7	0.0	17.7	0.0	17.7	61.8	0.0	61.8	0.0	61.8	0.0	61.8
9-Apr-95	24.9	0.0	24.9	17.2	0.0	17.2	0.0	17.2	0.0	17.2	68.0	0.0	68.0	0.0	68.0	0.0	68.0
10-Apr-95	25.2	0.0	25.2	15.3	0.0	15.3	0.3	15.0	0.3	15.0	66.2	0.0	66.2	0.3	65.9	0.3	65.9
11-Apr-95	27.0	0.0	27.0	18.3	4.0	14.3	4.7	13.6	4.7	13.6	64.3	4.0	60.3	4.7	59.6	4.7	59.6
12-Apr-95	28.6	0.0	28.6	21.4	7.0	14.4	8.3	13.1	8.3	13.1	68.7	7.0	61.7	8.3	60.4	8.3	60.4
13-Apr-95	28.2	0.0	28.2	21.8	5.9	15.9	8.3	13.5	8.3	13.5	73.1	5.9	67.2	8.3	64.8	8.3	64.8
14-Apr-95	27.0	0.0	27.0	24.5	6.8	17.7	8.3	16.2	8.3	16.2	72.4	6.8	65.6	8.3	64.1	8.3	64.1
15-Apr-95	27.3	0.0	27.3	22.8	7.8	15.0	8.3	14.5	8.3	14.5	69.1	7.8	61.3	8.3	60.8	8.3	60.8
16-Apr-95	28.4	0.0	28.4	21.6	8.3	13.3	8.3	13.3	8.3	13.3	68.2	8.3	59.9	8.3	59.9	8.3	59.9
17-Apr-95	27.5	0.0	27.5	20.8	8.2	12.6	8.3	12.5	8.3	12.5	66.5	8.2	58.3	8.3	58.2	8.3	58.2
18-Apr-95	28.6	0.0	28.6	20.3	7.9	12.4	8.3	12.0	8.3	12.0	64.3	7.9	56.4	8.3	56.0	8.3	56.0
19-Apr-95	27.5	0.0	27.5	21.2	9.5	11.7	9.5	11.7	9.5	11.7	65.3	9.5	55.8	9.5	55.8	9.5	55.8
20-Apr-95	25.3	0.0	25.3	23.6	12.7	10.9	12.7	10.9	12.7	10.9	64.2	12.7	51.5	12.7	51.5	12.7	51.5
21-Apr-95	23.7	0.0	23.7	24.0	13.5	10.5	13.5	10.5	13.5	10.5	62.8	13.5	49.3	13.5	49.3	13.5	49.3
22-Apr-95	18.4	0.0	18.4	23.5	13.4	10.1	13.4	10.1	13.4	10.1	58.5	13.4	45.1	13.4	45.1	13.4	45.1
23-Apr-95	16.5	0.0	16.5	23.3	13.5	9.8	13.5	9.8	13.5	9.8	53.9	13.5	40.4	13.5	40.4	13.5	40.4
24-Apr-95	23.3	0.0	23.3	23.4	13.5	9.9	13.5	9.9	13.5	9.9	54.6	13.5	41.1	13.5	41.1	13.5	41.1
25-Apr-95	22.1	0.0	22.1	24.9	14.6	10.3	14.6	10.3	14.6	10.3	59.4	14.6	44.8	14.6	44.8	14.6	44.8
26-Apr-95	25.4	0.0	25.4	30.0	19.0	11.0	19.0	11.0	19.0	11.0	67.0	19.0	48.0	19.0	48.0	19.0	48.0
27-Apr-95	24.7	0.0	24.7	32.8	21.7	11.1	21.7	11.1	21.7	11.1	73.1	21.7	51.4	21.7	51.4	21.7	51.4
28-Apr-95	26.1	0.0	26.1	34.1	21.7	12.4	21.7	12.4	21.7	12.4	74.3	21.7	52.6	21.7	52.6	21.7	52.6
29-Apr-95	23.3	0.0	23.3	35.7	21.6	14.1	21.6	14.1	21.6	14.1	80.5	21.6	58.9	21.6	58.9	21.6	58.9
30-Apr-95	18.5	0.0	18.5	35.6	21.3	14.3	21.6	14.0	21.6	14.0	81.0	21.3	59.7	21.6	59.4	21.6	59.4
1-May-95	26.2	0.0	26.2	34.9	21.3	13.6	21.6	13.3	21.6	13.3	82.6	21.3	61.3	21.6	61.0	21.6	61.0
2-May-95	27.4	0.0	27.4	35.3	20.0	15.3	21.6	13.7	21.6	13.7	88.7	20.0	68.7	21.6	67.1	21.6	67.1
3-May-95	26.2	0.0	26.2	38.0	19.6	18.4	21.5	16.5	21.5	16.5	92.5	19.6	72.9	21.5	71.0	21.5	71.0
4-May-95	28.9	0.0	28.9	38.1	18.9	19.2	21.5	16.6	21.5	16.6	95.1	18.9	76.2	21.5	73.6	21.5	73.6
5-May-95	29.9	0.0	29.9	38.3	17.8	20.5	21.0	17.3	21.0	17.3	97.4	17.8	79.6	21.0	76.4	21.0	76.4
6-May-95	27.7	0.0	27.7	40.3	16.4	23.9	20.8	19.5	20.8	19.5	99.9	16.4	83.5	20.8	79.1	20.8	79.1
7-May-95	29.6	0.0	29.6	51.5	16.0	35.5	20.8	30.7	20.8	30.7	118.4	16.0	102.4	20.8	97.6	20.8	97.6
8-May-95	28.5	0.0	28.5	46.6	13.0	33.6	17.7	28.9	17.7	28.9	127.9	13.0	114.9	17.7	110.2	17.7	110.2
9-May-95	28.7	0.0	28.7	37.2	2.4	34.8	8.1	29.1	8.1	29.1	113.7	2.4	111.3	8.1	105.6	8.1	105.6
10-May-95	31.2	0.0	31.2	37.3	2.0	35.3	8.1	29.2	8.1	29.2	114.8	2.0	112.8	8.1	106.7	8.1	106.7
11-May-95	30.9	0.0	30.9	37.9	0.0	37.9	5.8	32.1	5.8	32.1	119.5	0.0	119.5	5.8	113.7	5.8	113.7
12-May-95	31.2	0.0	31.2	34.6	0.0	34.6	0.0	34.6	0.0	34.6	119.7	0.0	119.7	0.0	119.7	0.0	119.7
13-May-95	27.1	0.0	27.1	29.7	0.0	29.7	0.0	29.7	0.0	29.7	112.1	0.0	112.1	0.0	112.1	0.0	112.1
14-May-95	29.5	0.0	29.5	25.5	0.0	25.5	0.0	25.5	0.0	25.5	101.7	0.0	101.7	0.0	101.7	0.0	101.7
15-May-95	32.7	0.0	32.7	23.8	0.0	23.8	0.0	23.8	0.0	23.8	96.7	0.0	96.7	0.0	96.7	0.0	96.7
16-May-95	35.8	0.0	35.8	25.8	0.0	25.8	2.9	22.9	2.9	22.9	100.6	0.0	100.6	2.9	97.7	2.9	97.7
17-May-95	35.8	0.0	35.8	27.2	0.0	27.2	0.7	26.5	0.7	26.5	104.7	0.0	104.7	0.7	104.0	0.7	104.0
18-May-95	35.8	0.0	35.8	27.9	0.0	27.9	0.0	27.9	0.0	27.9	109.4	0.0	109.4	0.0	109.4	0.0	109.4
19-May-95	35.8	0.0	35.8	28.6	0.0	28.6	0.0	28.6	0.0	28.6	113.4	0.0	113.4	0.0	113.4	0.0	113.4
20-May-95	35.8	0.0	35.8	27.9	0.0	27.9	0.0	27.9	0.0	27.9	114.4	0.0	114.4	0.0	114.4	0.0	114.4
21-May-95	35.9	0.0	35.9	28.3	0.0	28.3	0.0	28.3	0.0	28.3	116.4	0.0	116.4	0.0	116.4	0.0	116.4
22-May-95	35.9	0.0	35.9	28.7	0.0	28.7	0.0	28.7	0.0	28.7	118.6	0.0	118.6	0.0	118.6	0.0	118.6
23-May-95	35.9	0.0	35.9	28.2	0.0	28.2	0.0	28.2	0.0	28.2	120.0	0.0	120.0	0.0	120.0	0.0	120.0
24-May-95	35.8	0.0	35.8	26.9	0.0	26.9	0.0	26.9	0.0	26.9	118.8	0.0	118.8	0.0	118.8	0.0	118.8
25-May-95	35.8	0.0	35.8	26.2	0.0	26.2	0.0	26.2	0.0	26.2	114.8	0.0	114.8	0.0	114.8	0.0	114.8
26-May-95	35.9	0.0	35.9	25.3	0.0	25.3	0.0	25.3	0.0	25.3	112.5	0.0	112.5	0.0	112.5	0.0	112.5
27-May-95	41.6	0.0	41.6	23.9	0.0	23.9	0.0	23.9	0.0	23.9	109.2	0.0	109.2	0.0	109.2	0.0	109.2

APR 1 - AUG 31, 1995

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
28-May-95	44.1	0.0	44.1	22.6	0.0	22.6	0.0	22.6	0.0	22.6	109.8	0.0	109.8	0.0	109.8	0.0	109.8
29-May-95	43.3	0.0	43.3	24.0	0.0	24.0	0.0	24.0	0.0	24.0	111.4	0.0	111.4	0.0	111.4	0.0	111.4
30-May-95	38.2	0.0	38.2	27.6	0.0	27.6	0.0	27.6	0.0	27.6	114.4	0.0	114.4	0.0	114.4	0.0	114.4
31-May-95	41.7	0.0	41.7	31.5	0.0	31.5	0.0	31.5	0.0	31.5	120.6	0.0	120.6	0.0	120.6	0.0	120.6
1-Jun-95	44.7	0.0	44.7	32.0	0.0	32.0	0.0	32.0	0.0	32.0	133.1	0.0	133.1	0.0	133.1	0.0	133.1
2-Jun-95	40.2	0.0	40.2	31.3	0.0	31.3	0.0	31.3	0.0	31.3	131.4	0.0	131.4	0.0	131.4	0.0	131.4
3-Jun-95	38.0	0.0	38.0	32.8	0.0	32.8	0.0	32.8	0.0	32.8	135.0	0.0	135.0	0.0	135.0	0.0	135.0
4-Jun-95	36.5	0.0	36.5	34.0	0.0	34.0	0.0	34.0	0.0	34.0	141.4	0.0	141.4	0.0	141.4	0.0	141.4
5-Jun-95	39.8	0.0	39.8	32.3	0.0	32.3	0.0	32.3	0.0	32.3	145.2	0.0	145.2	0.0	145.2	0.0	145.2
6-Jun-95	34.8	0.0	34.8	32.4	0.0	32.4	0.0	32.4	0.0	32.4	148.4	0.0	148.4	0.0	148.4	0.0	148.4
7-Jun-95	37.7	0.0	37.7	28.3	0.0	28.3	1.9	26.4	1.9	26.4	136.0	0.0	136.0	1.9	134.1	1.9	134.1
8-Jun-95	41.8	0.0	41.8	27.5	1.0	26.5	3.8	23.7	3.8	23.7	129.6	1.0	128.6	3.8	125.8	3.8	125.8
9-Jun-95	38.7	0.0	38.7	24.0	1.1	22.9	3.3	20.7	3.3	20.7	118.5	1.1	117.4	3.3	115.2	3.3	115.2
10-Jun-95	37.5	0.0	37.5	22.7	3.1	19.6	4.1	18.6	4.1	18.6	106.8	3.1	103.7	4.1	102.7	4.1	102.7
11-Jun-95	40.0	0.0	40.0	20.5	0.3	20.2	2.1	18.4	2.1	18.4	102.5	0.3	102.2	2.1	100.4	2.1	100.4
12-Jun-95	44.3	0.0	44.3	24.3	3.2	21.1	4.1	20.2	4.1	20.2	112.7	3.2	109.5	4.1	108.6	4.1	108.6
13-Jun-95	44.7	0.0	44.7	27.0	4.5	22.5	5.7	21.3	5.7	21.3	120.6	4.5	116.1	5.7	114.9	5.7	114.9
14-Jun-95	43.2	0.0	43.2	27.5	5.3	22.2	5.9	21.6	5.9	21.6	124.5	5.3	119.2	5.9	118.6	5.9	118.6
15-Jun-95	41.8	0.0	41.8	26.8	0.0	26.8	5.8	21.0	5.8	21.0	125.5	0.0	125.5	5.8	119.7	5.8	119.7
16-Jun-95	37.4	0.0	37.4	26.0	0.0	26.0	5.9	20.1	5.9	20.1	121.3	0.0	121.3	5.9	115.4	5.9	115.4
17-Jun-95	35.0	0.0	35.0	20.6	0.0	20.6	0.0	20.6	0.0	20.6	114.9	0.0	114.9	0.0	114.9	0.0	114.9
18-Jun-95	34.4	0.0	34.4	21.5	0.0	21.5	0.0	21.5	0.0	21.5	116.7	0.0	116.7	0.0	116.7	0.0	116.7
19-Jun-95	31.5	0.0	31.5	25.7	0.0	25.7	5.5	20.2	5.5	20.2	117.0	0.0	117.0	5.5	111.5	5.5	111.5
20-Jun-95	31.8	0.0	31.8	27.2	2.2	25.0	7.8	19.4	7.8	19.4	116.6	2.2	114.4	7.8	108.8	7.8	108.8
21-Jun-95	33.4	0.0	33.4	23.5	2.4	21.1	6.5	17.0	6.5	17.0	111.1	2.4	108.7	6.5	104.6	6.5	104.6
22-Jun-95	28.6	0.0	28.6	21.1	0.0	21.1	4.7	16.4	4.7	16.4	97.8	0.0	97.8	4.7	93.1	4.7	93.1
23-Jun-95	29.9	0.0	29.9	19.8	0.0	19.8	3.9	15.9	3.9	15.9	92.2	0.0	92.2	3.9	88.3	3.9	88.3
24-Jun-95	30.2	0.0	30.2	16.0	0.0	16.0	0.9	15.1	0.9	15.1	88.0	0.0	88.0	0.9	87.1	0.9	87.1
25-Jun-95	30.4	0.0	30.4	16.1	0.0	16.1	0.9	15.2	0.9	15.2	88.0	0.0	88.0	0.9	87.1	0.9	87.1
26-Jun-95	30.2	0.0	30.2	16.1	0.0	16.1	0.9	15.2	0.9	15.2	89.3	0.0	89.3	0.9	88.4	0.9	88.4
27-Jun-95	29.6	0.0	29.6	19.0	0.3	18.7	4.0	15.0	4.0	15.0	93.3	0.3	93.0	4.0	89.3	4.0	89.3
28-Jun-95	30.7	0.0	30.7	20.0	3.0	17.0	5.9	14.1	5.9	14.1	98.3	3.0	95.3	5.9	92.4	5.9	92.4
29-Jun-95	30.5	0.0	30.5	18.4	3.3	15.1	5.6	12.8	5.6	12.8	96.1	3.3	92.8	5.6	90.5	5.6	90.5
30-Jun-95	30.3	0.0	30.3	17.0	2.8	14.2	5.2	11.8	5.2	11.8	90.9	2.8	88.1	5.2	85.7	5.2	85.7
1-Jul-95	29.7	0.0	29.7	11.6	0.0	11.6	0.2	11.4	0.2	11.4	83.8	0.0	83.8	0.2	83.6	0.2	83.6
2-Jul-95	25.7	0.0	25.7	11.3	0.0	11.3	0.3	11.0	0.3	11.0	79.1	0.0	79.1	0.3	78.8	0.3	78.8
3-Jul-95	26.3	0.0	26.3	18.7	0.0	18.7	2.9	15.8	2.9	15.8	77.7	0.0	77.7	2.9	74.8	2.9	74.8
4-Jul-95	25.5	0.0	25.5	22.1	0.0	22.1	2.2	19.9	2.2	19.9	91.6	0.0	91.6	2.2	89.4	2.2	89.4
5-Jul-95	24.6	0.0	24.6	18.7	0.0	18.7	3.3	15.4	3.3	15.4	82.0	0.0	82.0	3.3	78.7	3.3	78.7
6-Jul-95	20.9	0.0	20.9	17.1	1.4	15.7	3.9	13.2	3.9	13.2	74.4	1.4	73.0	3.9	70.5	3.9	70.5
7-Jul-95	20.1	0.0	20.1	17.0	2.1	14.9	4.1	12.9	4.1	12.9	70.7	2.1	68.6	4.1	66.6	4.1	66.6
8-Jul-95	21.0	1.1	19.9	16.1	1.9	14.2	4.2	11.9	4.2	11.9	68.2	3.0	65.2	5.3	62.9	5.3	62.9
9-Jul-95	20.4	1.5	18.9	15.1	2.7	12.4	4.2	10.9	4.2	10.9	67.9	4.2	63.7	5.7	62.2	5.7	62.2
10-Jul-95	19.8	1.5	18.3	13.7	0.0	13.7	2.2	11.5	2.2	11.5	67.4	1.5	65.9	3.7	63.7	3.7	63.7
11-Jul-95	21.2	1.5	19.7	12.1	0.0	12.1	1.2	10.9	1.2	10.9	63.7	1.5	62.2	2.7	61.0	2.7	61.0
12-Jul-95	21.2	1.5	19.7	14.2	1.2	13.0	3.2	11.0	3.2	11.0	67.0	2.7	64.3	4.7	62.3	4.7	62.3
13-Jul-95	19.2	1.5	17.7	14.3	0.0	14.3	1.9	12.4	1.9	12.4	66.2	1.5	64.7	3.4	62.8	3.4	62.8
14-Jul-95	22.1	1.5	20.6	12.8	0.0	12.8	0.9	11.9	0.9	11.9	64.8	1.5	63.3	2.4	62.4	2.4	62.4
15-Jul-95	19.8	1.5	18.3	10.2	0.0	10.2	0.0	10.2	0.0	10.2	58.8	1.5	57.3	1.5	57.3	1.5	57.3
16-Jul-95	16.8	1.5	15.3	9.3	0.0	9.3	0.0	9.3	0.0	9.3	52.6	1.5	51.1	1.5	51.1	1.5	51.1
17-Jul-95	17.9	1.5	16.4	14.4	4.7	9.7	6.0	8.4	6.0	8.4	51.0	6.2	44.8	7.5	43.5	7.5	43.5
18-Jul-95	19.1	1.5	17.6	16.3	7.8	8.5	8.1	8.2	8.1	8.2	55.4	9.3	46.1	9.6	45.8	9.6	45.8
19-Jul-95	14.8	1.5	13.3	15.9	8.1	7.8	8.2	7.7	8.2	7.7	52.9	9.6	43.3	9.7	43.2	9.7	43.2
20-Jul-95	12.6	1.9	10.7	17.2	9.9	7.3	10.1	7.1	10.1	7.1	48.7	11.8	36.9	12.0	36.7	12.0	36.7
21-Jul-95	10.6	1.9	8.7	19.6	12.8	6.8	12.8	6.8	12.8	6.8	49.8	14.7	35.1	14.7	35.1	14.7	35.1
22-Jul-95	11.3	1.9	9.4	19.4	12.7	6.7	12.7	6.7	12.7	6.7	48.8	14.6	34.2	14.6	34.2	14.6	34.2
23-Jul-95	9.3	1.9	7.4	19.0	12.6	6.4	12.6	6.4	12.6	6.4	46.4	14.5	31.9	14.5	31.9	14.5	31.9
24-Jul-95	16.0	5.9	10.1	18.6	12.6	6.0	12.6	6.0	12.6	6.0	45.5	18.5	27.0	18.5	27.0	18.5	27.0
25-Jul-95	20.1	11.3	8.8	18.3	12.5	5.8	12.5	5.8	12.5	5.8	49.8	23.8	26.0	23.8	26.0	23.8	26.0

APR 1 - AUG 31, 1995

*REVISED 8-7-96

	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @DWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
26-Jul-95	18.9	10.5	8.4	18.0	12.4	5.6	12.4	5.6	12.4	5.6	50.9	22.9	28.0	22.9	28.0	22.9	28.0
27-Jul-95	19.4	10.2	9.2	17.9	12.5	5.4	12.5	5.4	12.5	5.4	49.7	22.7	27.0	22.7	27.0	22.7	27.0
28-Jul-95	19.6	10.9	8.7	17.9	12.7	5.2	12.7	5.2	12.7	5.2	48.9	23.6	25.3	23.6	25.3	23.6	25.3
29-Jul-95	18.4	8.9	9.5	17.6	12.6	5.0	12.6	5.0	12.6	5.0	48.5	21.5	27.0	21.5	27.0	21.5	27.0
30-Jul-95	18.2	8.4	9.8	17.5	12.6	4.9	12.6	4.9	12.6	4.9	46.8	21.0	25.8	21.0	25.8	21.0	25.8
31-Jul-95	17.4	7.2	10.2	17.2	12.2	5.0	12.2	5.0	12.2	5.0	46.6	19.4	27.2	19.4	27.2	19.4	27.2
1-Aug-95	19.6	9.4	10.2	16.0	11.5	4.5	11.5	4.5	11.5	4.5	45.0	20.9	24.1	20.9	24.1	20.9	24.1
2-Aug-95	18.7	8.9	9.8	16.1	11.8	4.3	11.8	4.3	11.8	4.3	46.6	20.7	25.9	20.7	25.9	20.7	25.9
3-Aug-95	19.7	10.7	9.0	16.1	11.9	4.2	11.9	4.2	11.9	4.2	44.7	22.6	22.1	22.6	22.1	22.6	22.1
4-Aug-95	19.1	9.7	9.4	16.0	11.9	4.1	11.9	4.1	11.9	4.1	44.5	21.6	22.9	21.6	22.9	21.6	22.9
5-Aug-95	18.3	9.9	8.4	15.9	11.9	4.0	11.9	4.0	11.9	4.0	43.1	21.8	21.3	21.8	21.3	21.8	21.3
6-Aug-95	18.9	9.6	9.3	15.8	11.9	3.9	11.9	3.9	11.9	3.9	42.2	21.5	20.7	21.5	20.7	21.5	20.7
7-Aug-95	18.2	8.8	9.4	15.8	12.0	3.8	12.0	3.8	12.0	3.8	43.6	20.8	22.8	20.8	22.8	20.8	22.8
8-Aug-95	17.0	8.0	9.0	16.2	12.0	4.2	12.0	4.2	12.0	4.2	41.8	20.0	21.8	20.0	21.8	20.0	21.8
9-Aug-95	18.1	2.7	15.4	16.1	12.0	4.1	12.0	4.1	12.0	4.1	40.7	14.7	26.0	14.7	26.0	14.7	26.0
10-Aug-95	11.6	1.9	9.7	15.9	12.0	3.9	12.0	3.9	12.0	3.9	41.5	13.9	27.6	13.9	27.6	13.9	27.6
11-Aug-95	10.2	1.9	8.3	15.8	12.0	3.8	12.0	3.8	12.0	3.8	34.4	13.9	20.5	13.9	20.5	13.9	20.5
12-Aug-95	10.8	1.9	8.9	15.6	12.0	3.6	12.0	3.6	12.0	3.6	33.5	13.9	19.6	13.9	19.6	13.9	19.6
13-Aug-95	10.1	1.9	8.2	15.6	12.0	3.6	12.0	3.6	12.0	3.6	34.1	13.9	20.2	13.9	20.2	13.9	20.2
14-Aug-95	11.4	1.9	9.5	15.7	12.0	3.7	12.0	3.7	12.0	3.7	32.9	13.9	19.0	13.9	19.0	13.9	19.0
15-Aug-95	10.1	1.9	8.2	16.0	12.5	3.5	12.5	3.5	12.5	3.5	35.7	14.4	21.3	14.4	21.3	14.4	21.3
16-Aug-95	11.0	1.9	9.1	16.2	12.6	3.6	12.6	3.6	12.6	3.6	33.0	14.5	18.5	14.5	18.5	14.5	18.5
17-Aug-95	9.4	1.9	7.5	16.4	12.4	4.0	12.4	4.0	12.4	4.0	34.7	14.3	20.4	14.3	20.4	14.3	20.4
18-Aug-95	12.2	1.9	10.3	17.6	12.4	5.2	12.4	5.2	12.4	5.2	36.7	14.3	22.4	14.3	22.4	14.3	22.4
19-Aug-95	10.8	1.9	8.9	16.9	12.4	4.5	12.4	4.5	12.4	4.5	37.6	14.3	23.3	14.3	23.3	14.3	23.3
20-Aug-95	11.4	1.9	9.5	16.4	12.4	4.0	12.4	4.0	12.4	4.0	34.5	14.3	20.2	14.3	20.2	14.3	20.2
21-Aug-95	12.0	1.9	10.1	16.2	12.4	3.8	12.4	3.8	12.4	3.8	34.4	14.3	20.1	14.3	20.1	14.3	20.1
22-Aug-95	12.6	1.9	10.7	16.0	12.5	3.5	12.5	3.5	12.5	3.5	34.7	14.4	20.3	14.4	20.3	14.4	20.3
23-Aug-95	12.7	1.5	11.2	15.9	12.4	3.5	12.4	3.5	12.4	3.5	34.1	13.9	20.2	13.9	20.2	13.9	20.2
24-Aug-95	13.2	1.5	11.7	15.9	12.5	3.4	12.5	3.4	12.5	3.4	34.7	14.0	20.7	14.0	20.7	14.0	20.7
25-Aug-95	11.6	1.6	10.0	15.8	12.4	3.4	12.4	3.4	12.4	3.4	35.1	14.0	21.1	14.0	21.1	14.0	21.1
26-Aug-95	10.9	1.8	9.1	15.7	12.4	3.3	12.4	3.3	12.4	3.3	33.3	14.2	19.1	14.2	19.1	14.2	19.1
27-Aug-95	9.6	1.9	7.7	15.6	12.4	3.2	12.4	3.2	12.4	3.2	32.5	14.3	18.2	14.3	18.2	14.3	18.2
28-Aug-95	13.9	1.6	12.3	15.5	12.5	3.0	12.5	3.0	12.5	3.0	31.8	14.1	17.7	14.1	17.7	14.1	17.7
29-Aug-95	12.4	1.5	10.9	15.5	12.5	3.0	12.5	3.0	12.5	3.0	35.1	14.0	21.1	14.0	21.1	14.0	21.1
30-Aug-95	13.1	1.5	11.6	15.5	12.5	3.0	12.5	3.0	12.5	3.0	32.6	14.0	18.6	14.0	18.6	14.0	18.6
31-Aug-95	14.8	1.5	13.3	15.5	12.6	2.9	12.6	2.9	12.6	2.9	33.8	14.1	19.7	14.1	19.7	14.1	19.7
SUB TOT																	
(KSFD)	3852.0	215.9	3636.1	3328.1	988.5	2339.6	1129.9	2198.2	1129.9	2198.2	11690.2	1204.4	10485.8	1345.8	10344.4	1345.8	10344.4
(KAF)	7642.4	428.4	7214.0	6603.0	1961.2	4641.8	2241.7	4361.2	2241.7	4361.2	23193.4	2389.6	20803.8	2670.1	20523.2	2670.1	20523.2
1-Sep-95	16.2	1.5	14.7								33.7	1.5	32.2				
2-Sep-95	15.8	1.5	14.3								29.3	1.5	27.8				
3-Sep-95	12.2	1.5	10.7								28.1	1.5	26.6				
4-Sep-95	12.3	1.5	10.8								23.7	1.5	22.2				
5-Sep-95	14.5	1.5	13.0								24.9	1.5	23.4				
6-Sep-95	15.0	1.5	13.5								27.2	1.5	25.7				
7-Sep-95	16.8	1.5	15.3								28.1	1.5	26.6				
8-Sep-95	14.1	1.5	12.6								29.4	1.5	27.9				
9-Sep-95	15.1	1.5	13.6								26.7	1.5	25.2				
10-Sep-95	12.4	1.5	10.9								28.0	1.5	26.5				
11-Sep-95	14.0	1.5	12.5								25.3	1.5	23.8				
12-Sep-95	16.1	1.5	14.6								27.5	1.5	26.0				
13-Sep-95	16.7	1.5	15.2								28.5	1.5	27.0				
14-Sep-95	17.4	1.5	15.9								29.1	1.5	27.6				
15-Sep-95	14.9	1.6	13.3								29.2	1.6	27.6				

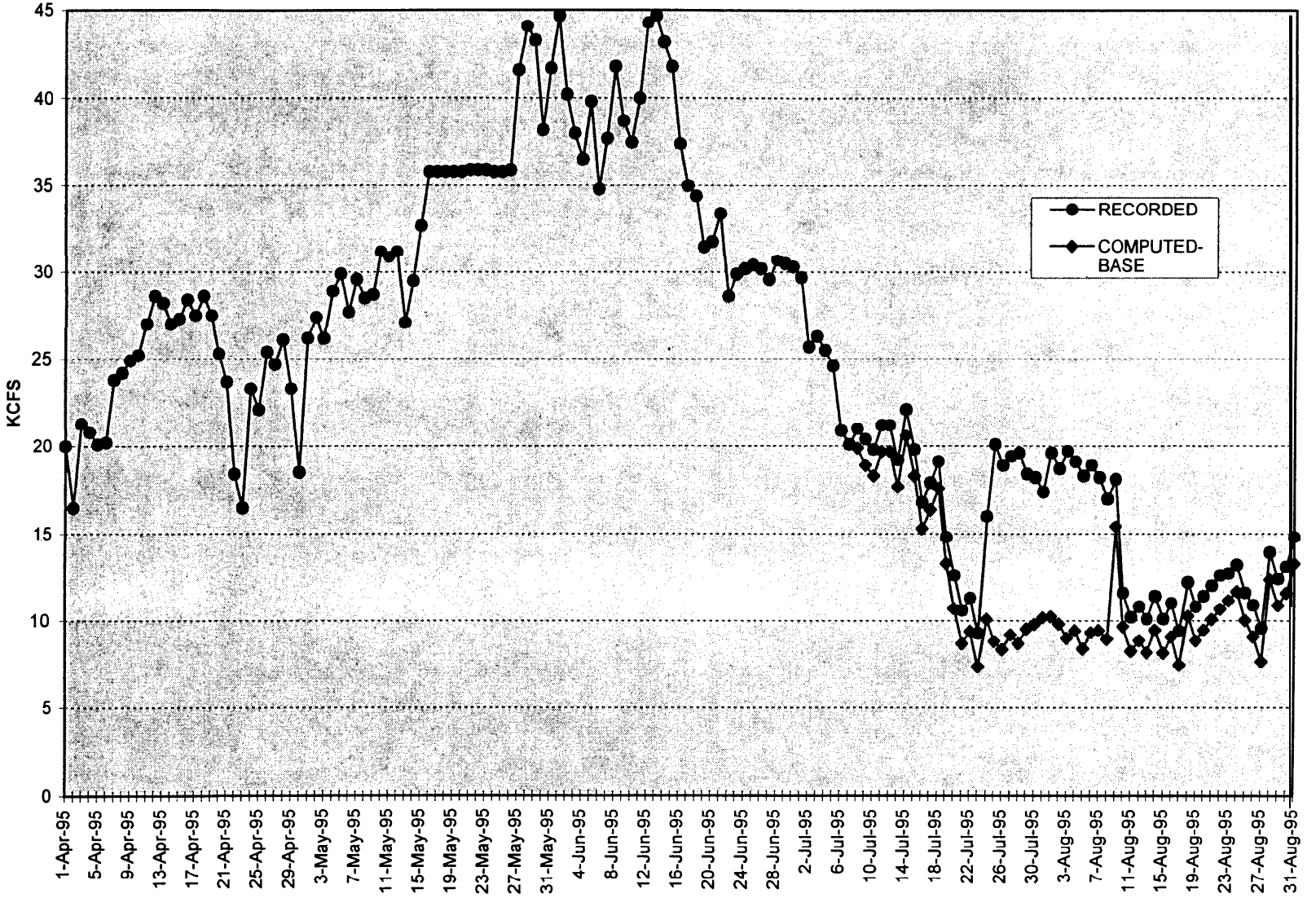
APR 1 - AUG 31, 1995

*REVISED 8-7-96

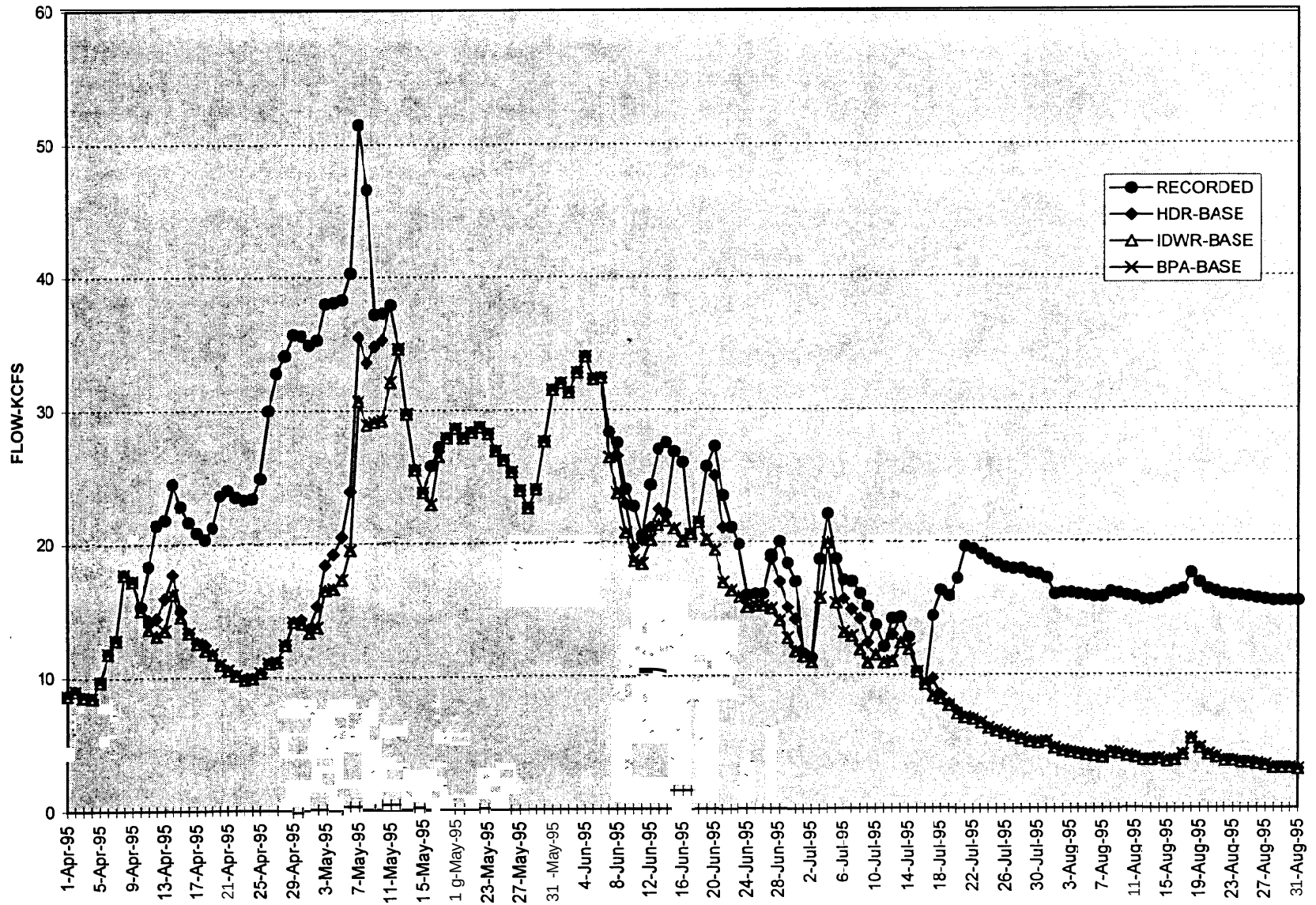
	SNAKE RIVER			CLEARWATER RIVER							INFLOW TO LOWER GRANITE DAM						
DATE	RECORDED @ HELLS (KCFS)	FISH FLOWS @BRNLEE (KCFS)	COMPUTED BASE (KCFS)	RECORDED @ PECK (KCFS)	HDR FISH FLOWS @OWSK (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @DWSK (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @DWSK (KCFS)	BPA COMPUTED BASE (KCFS)	RECORDED @LWGT (KCFS)	HDR FISH FLOWS @LWGT (KCFS)	HDR COMPUTED BASE (KCFS)	IDWR FISH FLOWS @LWGT (KCFS)	IDWR COMPUTED BASE (KCFS)	BPA FISH FLOWS @LWGT (KCFS)	BPA COMPUTED BASE (KCFS)
16-Sep-95	12.9	1.6	11.3								26.6	1.6	25.0				
17-Sep-95	11.5	1.6	9.9								24.7	1.6	23.1				
18-Sep-95	14.9	1.6	13.3								23.7	1.6	22.1				
19-Sep-95	18.0	1.6	16.4								26.4	1.6	24.8				
20-Sep-95	15.4	1.6	13.8								29.4	1.6	27.8				
21-Sep-95	15.0	1.6	13.4								26.9	1.6	25.3				
22-Sep-95	14.2	1.5	12.7								27.7	1.5	26.2				
23-Sep-95	14.9	1.4	13.6								24.6	1.4	23.3				
24-Sep-95	15.8	1.3	14.5								28.1	1.3	26.8				
25-Sep-95	15.4	1.2	14.2								26.6	1.2	25.4				
26-Sep-95	16.2	1.1	15.1								26.5	1.1	25.4				
27-Sep-95	17.6	1.1	16.5								26.8	1.1	25.7				
28-Sep-95	16.7	1.0	15.7								27.1	1.0	26.1				
29-Sep-95	18.1	0.9	17.2								26.9	0.9	26.0				
30-Sep-95	14.7	0.8	13.9								26.9	0.8	26.1				
1-Oct-95	15.5	0.7	14.8								25.6	0.7	24.9				
2-Oct-95	18.2	0.6	17.6								26.6	0.6	26.0				
3-Oct-95	16.1	0.5	15.6								27.2	0.5	26.7				
4-Oct-95	17.0	0.4	16.6								25.9	0.4	25.5				
5-Oct-95	15.9	0.1	15.8								31.5	0.1	31.4				
* October data is provisional																	
SUB TOT																	
(KSFD)	537.5	44.8	492.7								954.4	44.8	909.6				
(KAF)	1066.4	89.0	977.4								1893.5	89.0	1804.6				
TOTALS																	
(KSFD)	4389.5	260.8	4128.8	3328.1	988.5	2339.6	1129.9	2198.2	1129.9	2198.2	12644.6	1249.3	11395.3	1345.8	10344.4	1345.8	10344.4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25086.0	2478.6	22608.3	2670.1	20523.2	2670.1	20523.2

* 1 KCFS for a 24 hour flow period = 1 KSFD

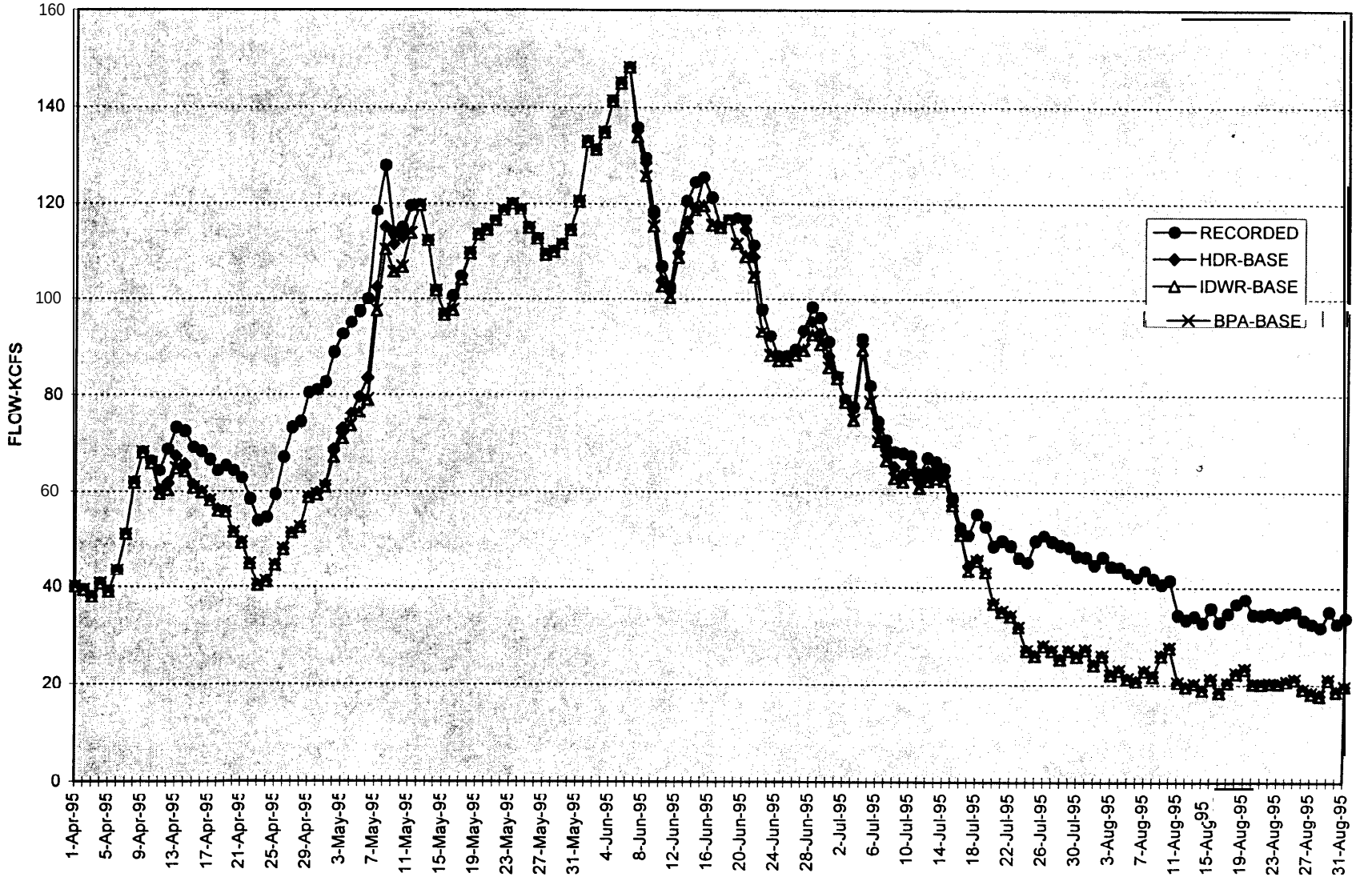
HELLS CANYON GAGING STATION
COMPUTED BASE FLOWS
1995



DWORSHAK - (PECK GAGING STATION)
COMPUTED BASE FLOWS
1995

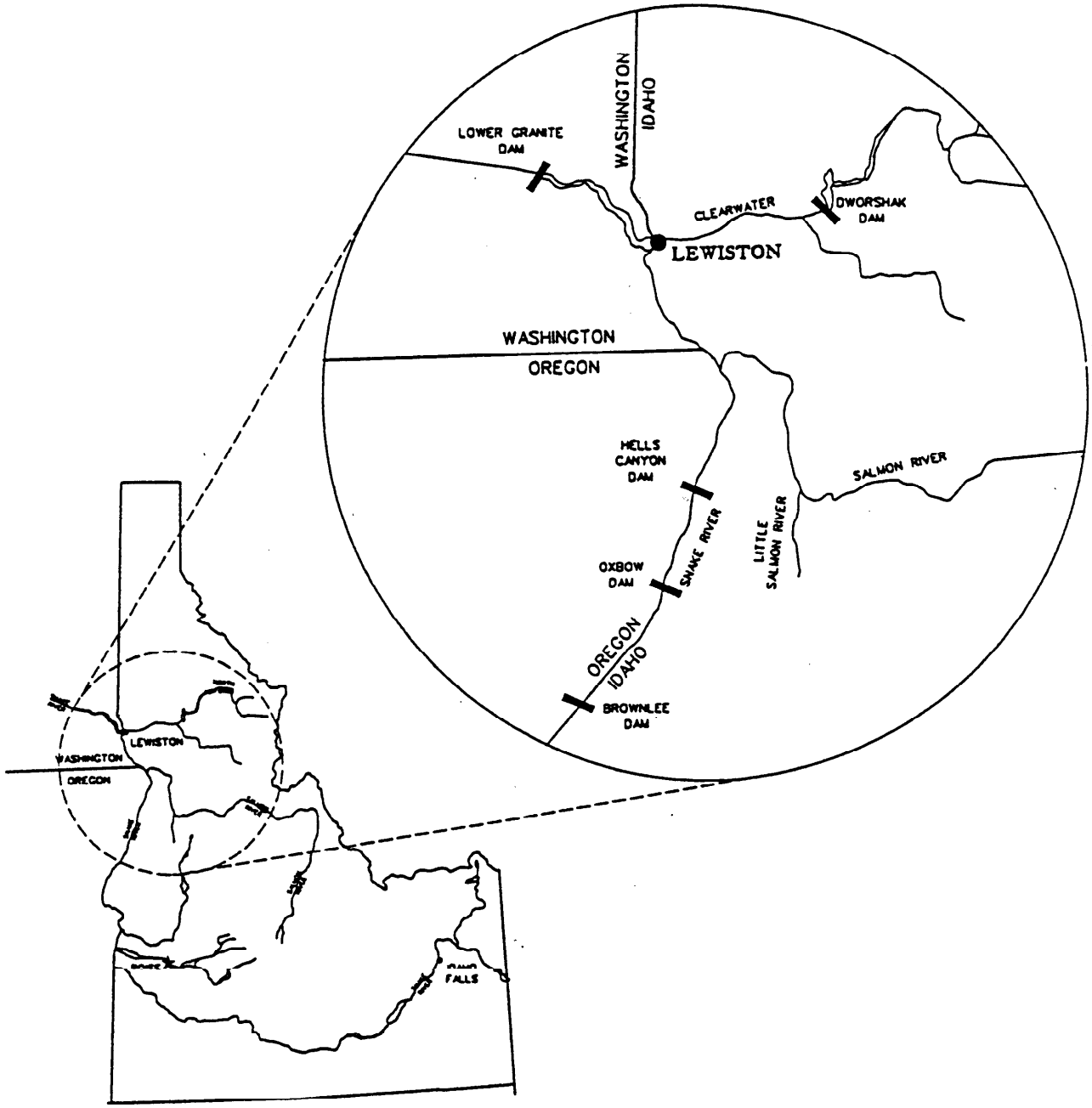


COMPUTED BASE FLOWS INTO
LOWER GRANITE
1995



SECTION 8

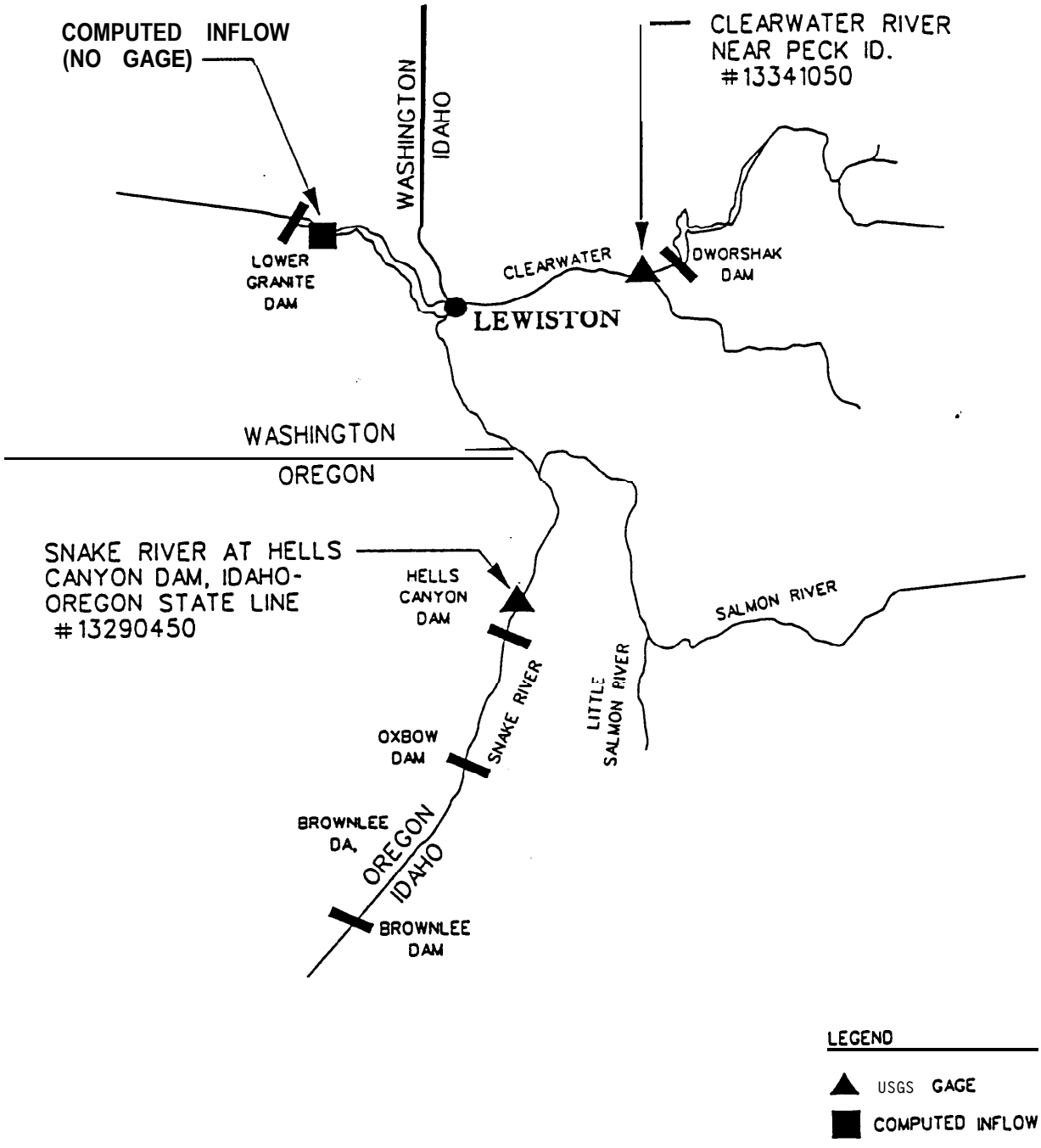
FIGURES



HDR Engineering, Inc.
SALT LAKE CITY, UTAH

LOCATION MAP

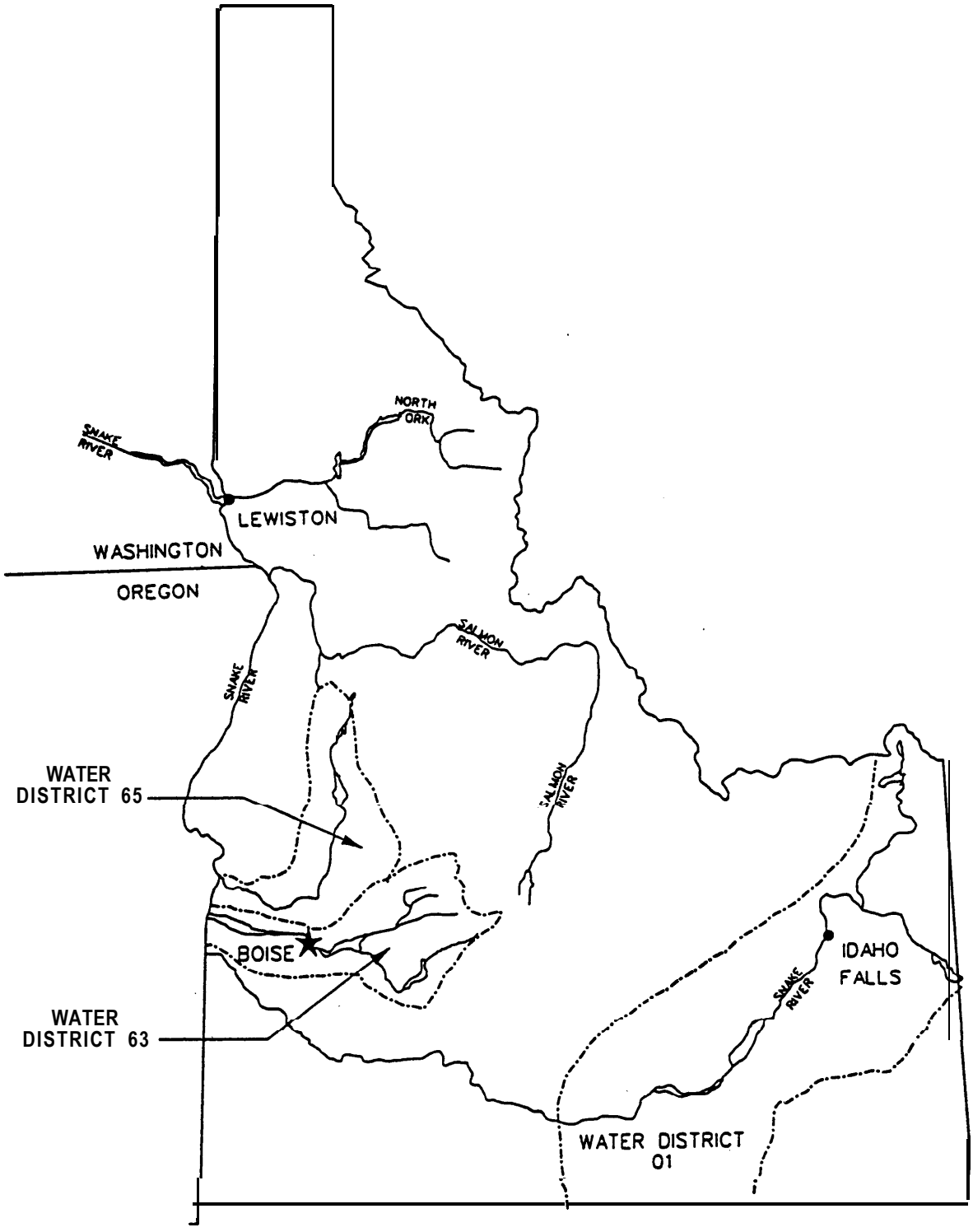
FIGURE 2-1



HDR Engineering, Inc.
SALT LAKE CITY, UTAH

STREAM GAGE LOCATIONS

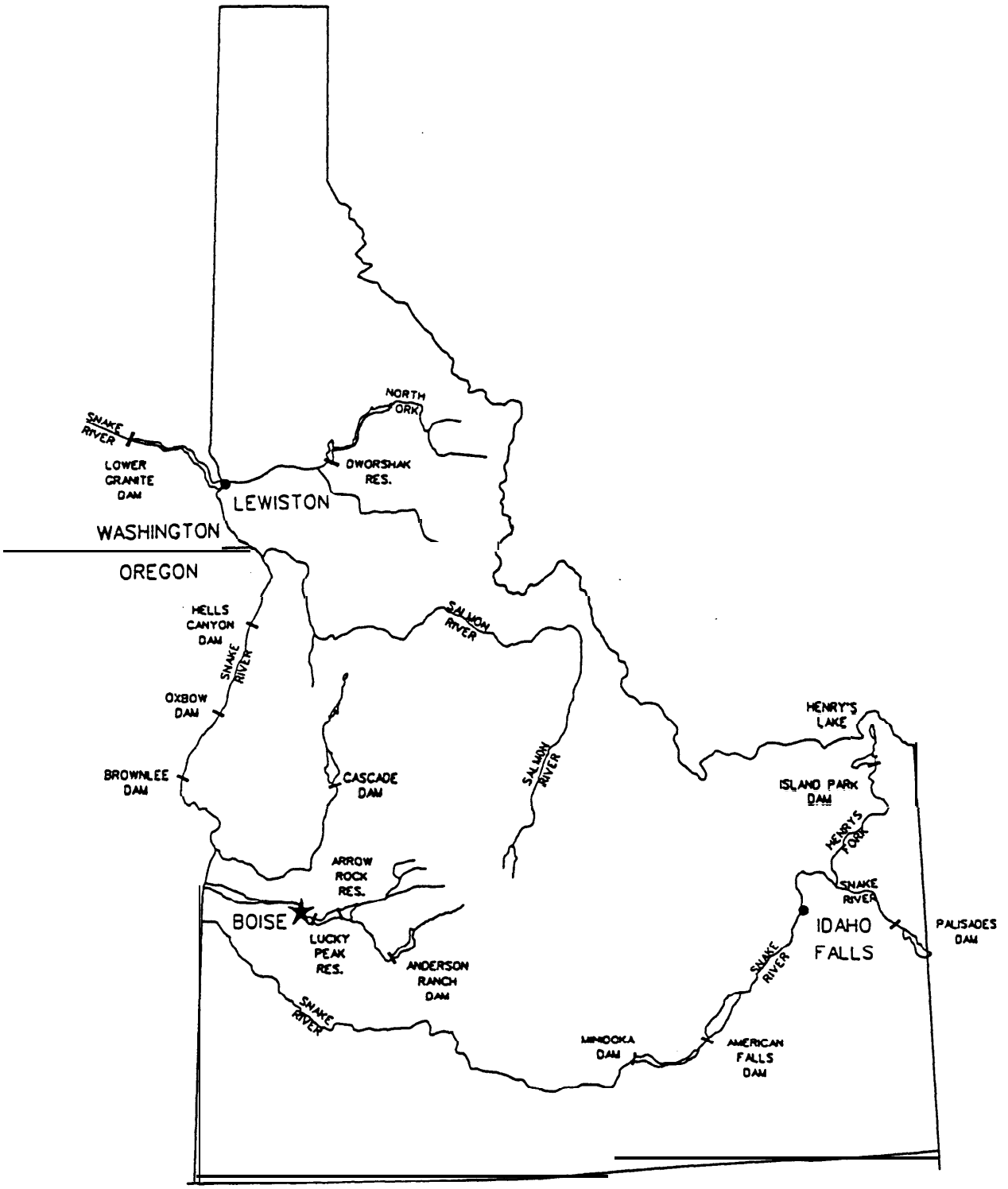
FIGURE 2-2



HDR Engineering, Inc.
SALT LAKE CITY, UTAH

WATER DISTRICT LOCATIONS - IDAHO

FIGURE 2-3



HDR Engineering, Inc.
SALT LAKE CITY, UTAH

STORAGE RESERVOIR LOCATION MAP

FIGURE 3-1

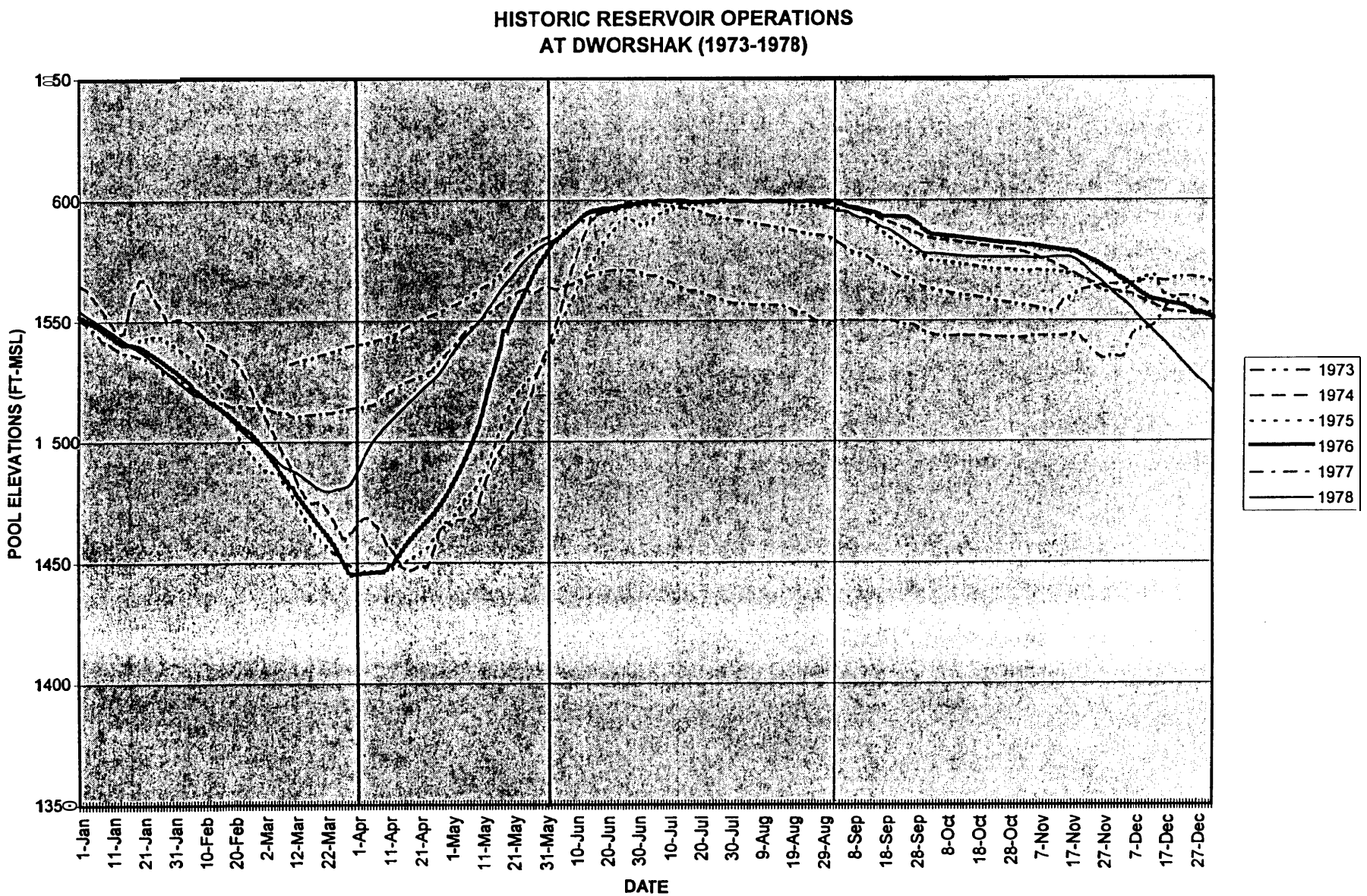

HISTORIC RESERVOIR OPERATIONS
AT DWORSHAK (1973-1978)
POOL ELEVATIONS (FT-MSL)
1650
1600
1550
1500
1450
1400
1350
DATE
1-Jan
11-Jan
21-Jan
31-Jan
10-Feb
20-Feb
2-Mar
12-Mar
22-Mar
1-Apr
11-Apr
21-Apr
1-May
11-May
21-May
31-May
10-Jun
20-Jun
30-Jun
10-Jul
20-Jul
30-Jul
9-Aug
19-Aug
29-Aug
8-Sep
18-Sep
28-Sep
8-Oct
18-Oct
28-Oct
7-Nov
17-Nov
27-Nov
7-Dec
17-Dec
27-Dec
1973
1974
1975
1976
1977
1978

Figure 3-2

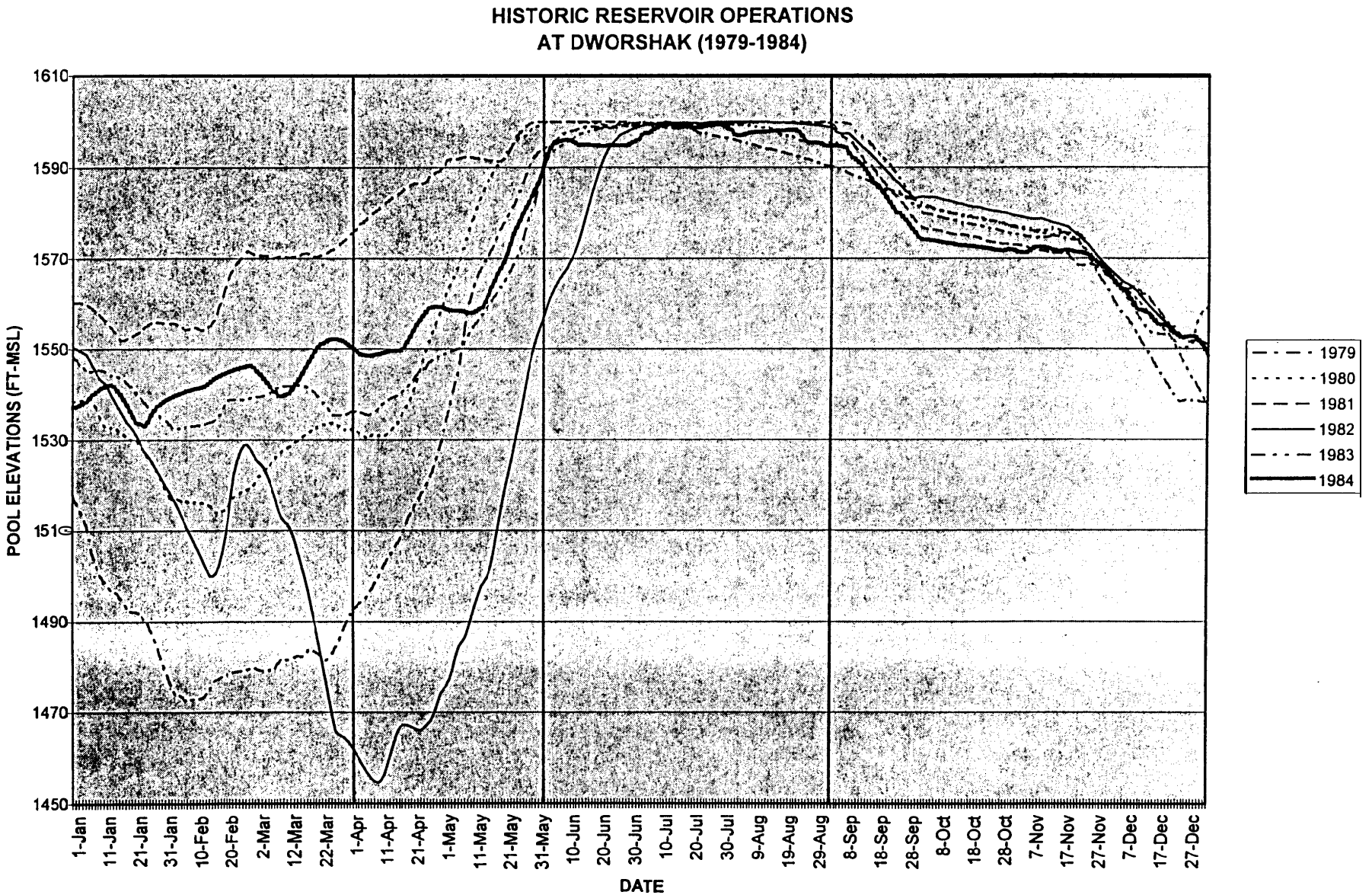

HISTORIC RESERVOIR OPERATIONS
AT DWORSHAK (1979-1984)
POOL ELEVATIONS (FT-MSL)
1610
1590
1570
1550
1530
1510
1490
1470
1450
DATE
1-Jan
11-Jan
21-Jan
31-Jan
10-Feb
20-Feb
2-Mar
12-Mar
22-Mar
1-Apr
11-Apr
21-Apr
1-May
11-May
21-May
31-May
10-Jun
20-Jun
30-Jun
10-Jul
20-Jul
30-Jul
9-Aug
19-Aug
29-Aug
8-Sep
18-Sep
28-Sep
8-Oct
18-Oct
28-Oct
7-Nov
17-Nov
27-Nov
7-Dec
17-Dec
27-Dec
1979
1980
1981
1982
1983
1984

Figure 3-3

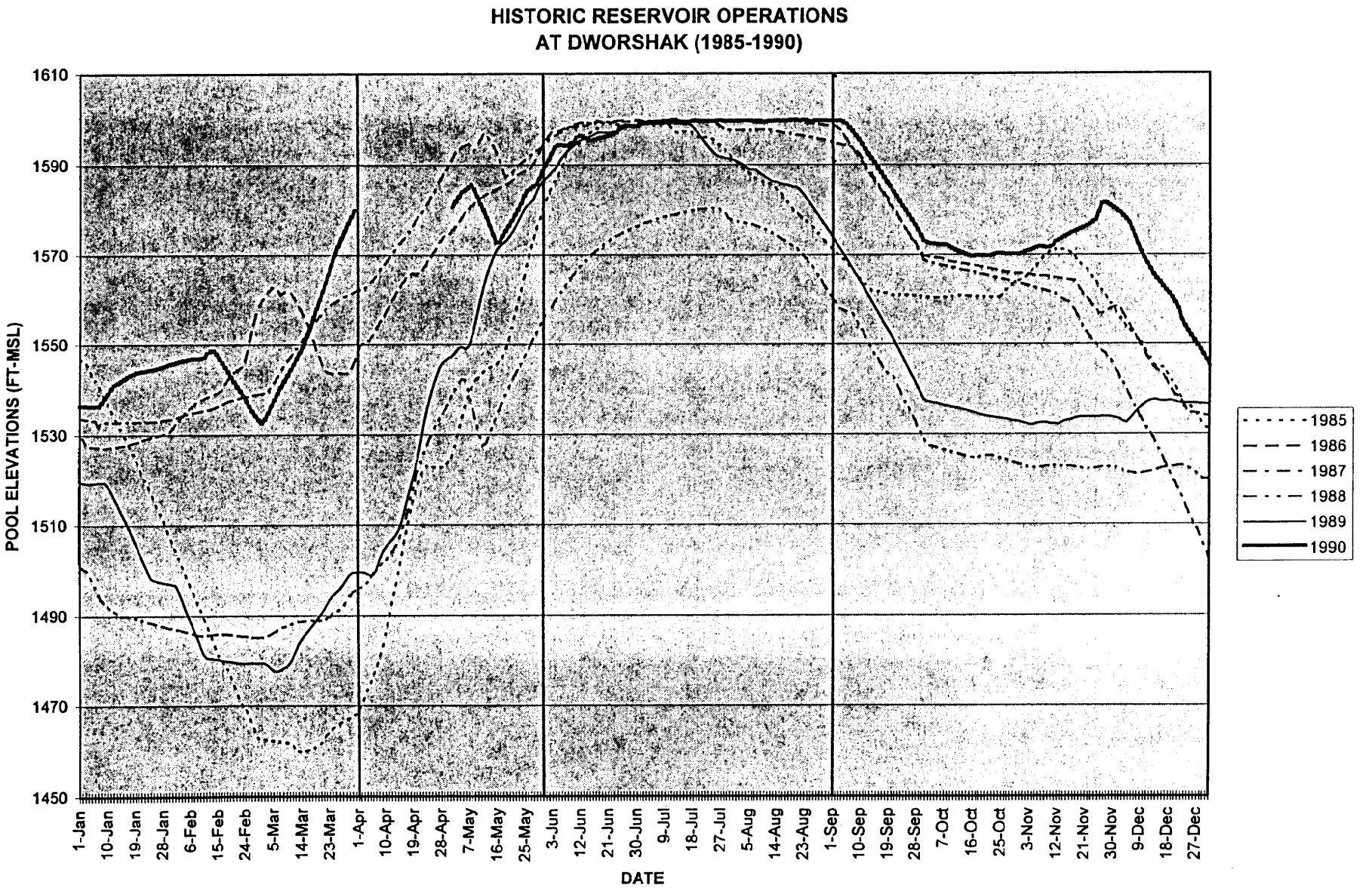

HISTORIC RESERVOIR OPERATIONS
AT DWORSHAK (1985-1990)
POOL ELEVATIONS (FT-MSL)
1610
1590
1570
1550
1530
1510
1490
1470
1450
1-Jan
10-Jan
19-Jan
28-Jan
6-Feb
15-Feb
24-Feb
5-Mar
14-Mar
23-Mar
1-Apr
10-Apr
19-Apr
28-Apr
7-May
16-May
25-May
3-Jun
12-Jun
21-Jun
30-Jun
9-Jul
18-Jul
27-Jul
5-Aug
14-Aug
23-Aug
1-Sep
10-Sep
19-Sep
28-Sep
7-Oct
16-Oct
25-Oct
3-Nov
12-Nov
21-Nov
30-Nov
9-Dec
18-Dec
27-Dec
DATE
1985
1986
1987
1988
1989
1990

Figure 3-4

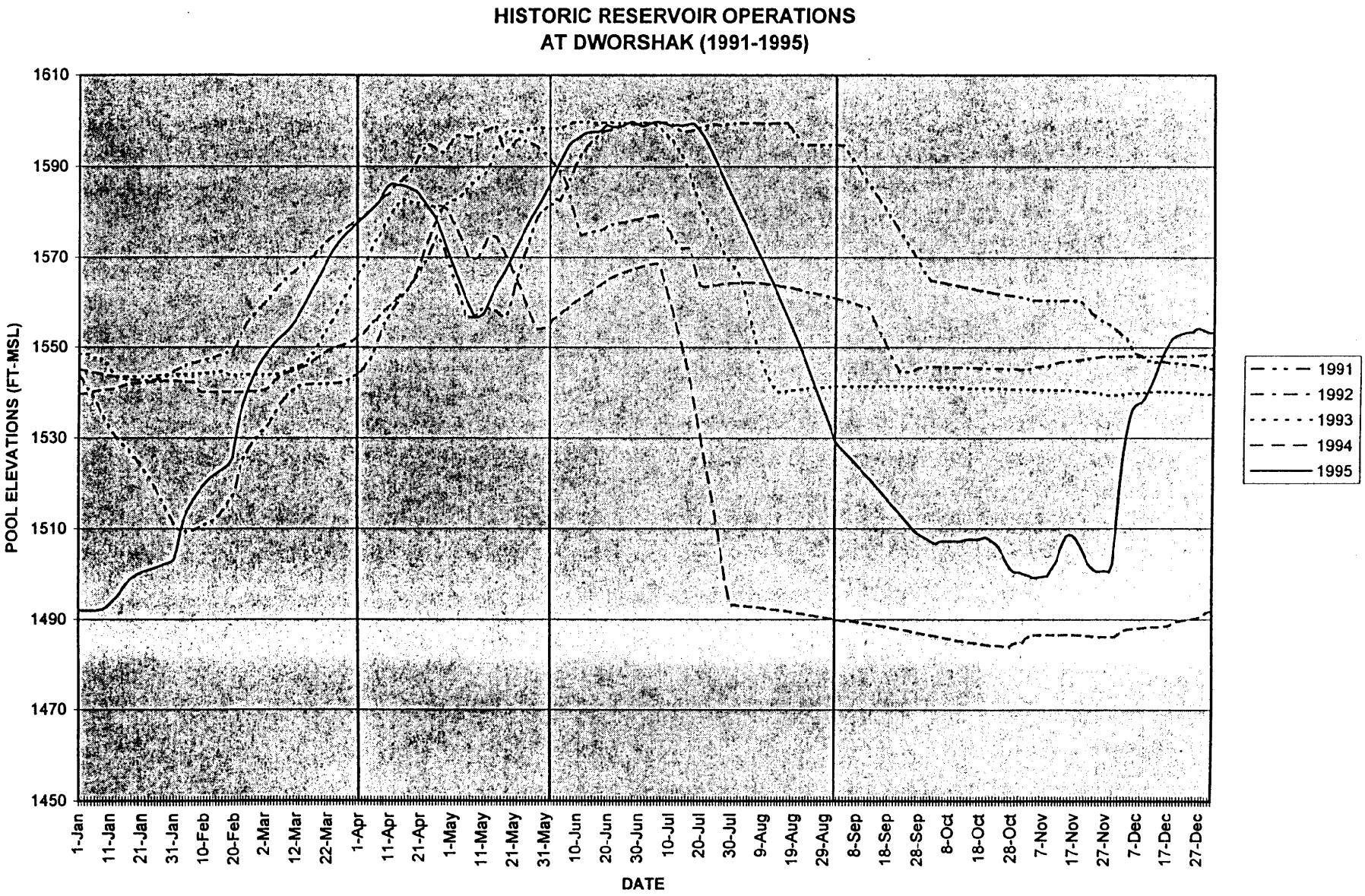

HISTORIC RESERVOIR OPERATIONS
AT DWORSHAK (1991-1995)
POOL ELEVATIONS (FT-MSL)
1610
1590
1570
1550
1530
1510
1490
1470
1450
1-Jan
11-Jan
21-Jan
31-Jan
10-Feb
20-Feb
2-Mar
12-Mar
22-Mar
1-Apr
11-Apr
21-Apr
1-May
11-May
21-May
31-May
10-Jun
20-Jun
30-Jun
10-Jul
20-Jul
30-Jul
9-Aug
19-Aug
29-Aug
8-Sep
18-Sep
28-Sep
8-Oct
18-Oct
28-Oct
7-Nov
17-Nov
27-Nov
7-Dec
17-Dec
27-Dec
DATE
1991
1992
1993
1994
1995

Figure 3-5

APPENDIX A

APPENDIX A

USGS DATA

CLEARWATER RIVER BASIN

13341050 CLEARWATER RIVER NEAR PECK, ID

LOCATION.--Lat 46°30'00", long 116°23'30", in NE¼NE¼ sec.1, T.36 N., R.1 W., Nez Perce County, Hydrologic Unit 17060306, on left bank, 2 mi upstream from Big Canyon Creek, 2.2 mi northeast of Peck, 3 mi downstream from North Fork Clearwater River, and at mile 37.4.

DRAINAGE AREA.--8,040 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by Dworshak Reservoir (station 13340950) 5.1 mi upstream beginning September 1971.

AVERAGE DISCHARGE.--27 years, 14,710 ft^3/s, 10,657,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 127,200 ft^3/s June 16, 1974, gage height, 23.66 ft; maximum gage height, 25.00 ft, Dec. 28, 1967 (ice jam); minimum discharge, 1,260 ft^3/s Oct. 31, 1971, gage height, 2.24 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 23.95 ft, from floodmark, discharge, 118,000 ft^3/s, from rating extended above 89,100 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62,300 ft^3/s May 19, gage height, 16.43 ft; minimum, 2,430 ft^3/s Sept. 3, gage height, 3.36 ft.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

3.0	1920	8.0	14300
4.0	3460	11.0	27400
6.0	7940	16.0	59000

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3720	4680	13400	12000	9630	8570	5740	35600	35400	29300	5780	2520
2	3220	4980	12800	12300	7600	8130	7640	35400	39500	25500	6310	2460
3	3380	4260	12800	12300	7690	8190	11200	34900	40800	24100	4000	6310
4	3620	4060	12800	12300	7250	8660	11800	34200	39500	21700	3750	10600
5	4220	7310	15100	12200	6900	10400	11500	26400	31400	20700	5770	10600
6	4330	8400	18800	12100	7490	10200	15200	20700	31400	18200	5230	10600
7	4570	7370	18300	12100	7650	9320	15700	22700	35500	16700	4430	10600
8	5350	6840	17800	12300	7270	8540	14400	26600	31100	13800	5380	10600
9	5160	6840	17700	12400	5870	8380	13500	35200	28600	15200	3870	10600
10	5120	5280	18100	12500	5860	7930	13500	31500	33900	17600	3280	10600
11	5130	5190	20400	12500	7260	8090	12300	29400	39600	17200	3180	10600
12	5180	5230	20300	12600	6020	8980	11300	35600	36000	16600	3130	10600
13	5200	5110	16900	13300	6210	9210	10500	40700	32700	14100	3060	10700
14	5430	5020	13400	14400	6790	9680	10200	36700	29300	10800	3020	10700
15	4780	5450	13000	15700	7840	9360	10600	41900	25800	10800	2970	10800
16	4380	5140	12400	16900	9120	9160	10400	42900	23900	8290	7630	10400
17	5300	4690	12400	15900	11800	8990	9950	44900	23400	7280	11000	10800
18	4880	4530	12500	15700	11000	8870	9920	51600	23100	7050	11000	10600
19	4840	4590	12700	15400	9990	8790	9910	53800	25800	6770	11000	10700
20	5240	4610	11300	14600	10800	8910	10200	44100	27900	6380	10900	10000
21	4700	4490	17000	14000	13500	9040	11000	38600	29500	6110	9130	10700
22	5900	4410	17200	13500	13000	8890	12500	39900	24500	5940	2810	10600
23	6680	4640	10700	13400	11900	8890	14100	43700	24200	7360	2700	10600
24	5550	4790	11200	13500	10900	8890	16500	43300	26100	8030	2680	10600
25	4860	5820	11800	13300	10100	8860	17800	41000	28600	7690	2660	10700
26	4710	15100	12300	12800	9550	8780	29700	35600	28900	6820	2580	10700
27	5050	15400	12600	12700	9170	6440	37500	29800	26400	4940	2530	10700
28	5230	14200	12600	13100	8570	5370	36100	28800	24500	4660	2710	10700
29	5000	13700	12200	12600	---	5290	35400	32100	24900	6260	3010	10700
30	4150	13500	11800	12300	---	5230	35500	33900	26600	4910	3160	10400
31	3690	---	11700	11200	---	5300	---	34600	---	4100	2640	---
TOTAL	148570	205630	444000	411900	246730	259340	471560	1126100	898800	376890	151320	297790
MEAN	4793	6854	14320	13290	8812	8366	15720	36330	29960	12160	4881	9926
MAX	6680	15400	20400	16900	13500	10400	37500	53800	40800	29300	11000	10800
MIN	3220	4060	10700	11200	5860	5230	5740	20700	23100	4100	2530	2460
AC-FT	294700	407900	880700	817000	489400	514400	935300	2234000	1783000	747600	300100	590700

CAL YR 1990 TOTAL 5004780 MEAN 13710 MAX 53400 MIN 2530 AC-FT 9927000
WTR YR 1991 TOTAL 5038630 MEAN 13800 MAX 53800 MIN 2460 AC-FT 9994000

SNAKE RIVER MAIN STEM

13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE¼SE¼ sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Hydrologic Unit 17050201, Wallowa-Whitman National Forest, on left bank 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73,300 mi^2, approximately.

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76, WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929 (levels by Idaho Power Company).

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by many reservoirs above station, with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 38 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant. Diversions above station for irrigation of about 3,820,000 acres, of which 742,000 acres are irigated by withdrawals from ground water (1966 determination).

AVERAGE DISCHARGE.--26 years, 20,810 ft^3/s, 15,077,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,800 ft^3/s Feb. 23, 1982, gage height, 84.05 ft; minimum, 1,580 ft^3/s Mar. 19, 1967, gage height, 59.9 ft; minimum daily, 4,360 ft^3/s May 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29,700 ft^3/s Dec. 20, gage height, 72.04 ft; minimum, 4,540 ft^3/s Apr. 4, gage height, 62.50 ft; minimum daily, 6,600 ft^3/s Apr. 7.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

63.0	5660	67.0	13700
64.0	7280	70.0	22500
		75.0	41500

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10400	8670	9620	11000	12600	14800	9490	6770	13200	13900	7180	8950
2	10400	10900	9640	14500	11300	11300	9260	12400	13900	15400	7030	8760
3	10400	8920	13000	15400	10500	9200	8690	12600	17800	14700	6900	8910
4	11300	8890	9970	15000	10500	15200	8070	6960	16200	8640	6780	9810
5	11800	13300	9880	12100	10500	17400	7400	7200	14500	8090	6780	9890
6	11300	13700	12800	12300	11400	11500	6630	20000	14000	8080	7350	11800
7	14800	13800	12300	13500	10800	17700	6600	18600	14200	8040	7440	14000
8	16700	10300	12500	11400	13100	15100	6660	17100	12100	8320	8000	14100
9	10100	10400	10500	11400	11100	9570	6750	13200	11300	11500	7640	18800
10	9470	11100	10300	11400	10100	8990	6630	16500	15500	15300	6940	19200
11	10500	8890	11000	10900	11800	8970	6900	19400	18100	15400	6870	19300
12	9660	8870	12100	10100	13300	9000	7350	24200	16500	15500	7190	19300
13	9340	13200	12700	9660	10300	9010	7690	23500	17000	15500	7180	19300
14	9490	11700	12900	9660	10200	9020	7900	24300	13700	15400	7120	19300
15	9620	13600	10500	10700	10500	10800	7870	22100	7130	13600	7340	19400
16	10100	11500	10400	11900	10500	9110	7890	13200	6830	7580	7030	19400
17	11500	9050	15800	10200	12500	9090	7910	11900	13400	6660	7430	19300
18	9250	10100	11200	10100	14300	9890	7900	13100	10600	6880	7000	19500
19	9350	13600	13000	10800	13100	9400	7900	16600	6990	6640	9470	16200
20	9420	13400	21000	10500	14700	9430	7880	18600	9950	6630	7840	14200
21	9370	14200	18400	16200	15300	9340	7690	15100	10600	6660	7480	13600
22	9380	9400	16200	16500	17900	9310	7460	14300	7090	9140	7250	10900
23	9290	9250	16300	15900	15300	9310	6680	13100	6870	7650	7360	15200
24	9070	9780	18900	15500	14300	9270	9200	12200	11900	6930	7170	13000
25	9340	11400	14700	14800	15300	9720	6790	13500	9520	6890	7220	12800
26	9270	9350	14400	17600	11400	10200	10600	8830	10800	6780	7550	12700
27	9210	13300	10800	13300	11900	9390	7220	11100	8900	6760	8160	12800
28	9370	10400	11600	14300	16500	9360	6660	14300	10200	7060	7900	11400
29	9660	9640	14200	13700	---	9350	9740	13700	9340	7250	8220	10100
30	9580	9620	15800	13000	---	9370	9430	13300	11400	7440	9330	12400
31	9260	---	13900	13000	---	9420	---	14100	---	7230	8760	---
TOTAL	317700	330230	406310	398320	351000	328520	234840	461760	359520	301550	232910	434320
MEAN	10250	11010	13110	12850	12540	10600	7828	14900	11980	9727	7513	14480
MAX	16700	14200	21000	17600	17900	17700	10600	24300	18100	15500	9470	19500
MIN	9070	8670	9620	9660	10100	8970	6600	6770	6830	6630	6780	8760
AC-FT	630200	655000	805900	790100	696200	651600	465800	915900	713100	598100	462000	861500

CAL YR 1990 TOTAL 4301880 MEAN 11790 MAX 27300 MIN 6540 AC-FT 8533000
WTR YR 1991 TOTAL 4156980 MEAN 11390 MAX 24300 MIN 6600 AC-FT 8245000

13341050 CLEARWATER RIVER NEAR PECK, ID

LOCATION.--Lat 46°30'00", long 116°23'30", in NE¼NE¼ sec.1, T.36 N., R.1 W., Nez Perce County, Hydrologic Unit 17060306, on left bank, 2 mi upstream from Big Canyon Creek, 2.2 mi northeast of Peck, 3 mi downstream from North Fork Clearwater River, and at mile 37.4.

DRAINAGE AREA.--8,040 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by Dworshak Reservoir (station 13340950) 5.1 mi upstream beginning September 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 23.95 ft, from floodmark, discharge, 118,000 ft^3/s, from rating extended above 89,100 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3410	3100	7800	4400	5060	7840	8550	39800	24200	5820	3850	3820
2	3130	3170	7630	4300	5140	8200	9280	34400	23700	6220	3760	3810
3	3070	3090	11000	4060	5110	8800	10500	32100	23400	6360	3660	3800
4	3040	2900	12400	4130	4840	9420	12300	31800	22500	5930	3570	4090
5	3060	3470	12300	4200	4540	9940	13200	32700	33800	14900	3600	4110
6	3040	5250	12900	4250	4310	9590	11900	33000	33300	15500	3480	4570
7	3080	5480	13800	4280	4240	9170	10900	35800	33100	15800	3490	4530
8	3060	4510	13200	4220	4240	9100	9970	36400	32100	16800	3920	4360
9	3030	4090	13100	4100	4210	8850	9740	36400	24900	16200	3920	4120
10	3030	4750	8180	4110	4180	8440	12600	32200	9880	15900	3940	9950
11	3020	4520	6450	4100	4120	8060	14900	29600	9230	15600	3890	13600
12	3050	4070	8710	4130	4250	7840	13300	20500	9150	6700	3770	13300
13	3040	5770	6070	4150	4260	7810	13500	18600	9360	5800	3720	13300
14	3010	6760	5570	4120	4450	8010	14400	38800	10200	5830	3650	13400
15	2990	5220	4830	4150	4580	8460	15500	39300	9420	23600	3680	13400
16	3010	4440	4350	4160	4610	9130	15400	39900	8290	24200	3680	13300
17	3020	4060	4110	4120	4520	10400	15800	20700	8580	24000	3800	13200
18	3030	6480	4350	3120	4390	11600	19900	18500	8700	13400	4070	13200
19	3090	9000	4910	2940	4300	10700	18500	20300	7790	4500	4340	13100
20	3070	10200	6330	2670	5000	9890	17100	22200	7320	4480	4300	7160
21	3070	10800	4780	2440	6860	9290	16400	29500	7170	4990	4250	2890
22	3090	9920	4480	2560	7890	8800	25700	26700	6670	5600	4270	2880
23	3230	8070	4510	2960	8600	8400	26400	25400	6290	5490	4470	2880
24	3280	7640	4630	3370	8830	8160	25000	25200	5970	5710	4980	3060
25	3250	7740	4560	3550	8710	7980	24200	25600	5710	5450	4560	4870
26	3250	9930	4390	3570	8380	7940	24200	29000	5730	4900	4180	7260
27	3390	9760	4230	3490	8110	8080	17900	31700	6120	4600	4070	5370
28	3530	9130	4060	3890	7820	8530	18600	28700	5950	4360	4010	4580
29	3420	8590	4080	5400	7780	8390	21200	26600	5740	4180	3940	4400
30	3290	8250	4080	5580	---	8010	26900	26600	6170	4040	3890	4130
31	3170	---	4270	5200	---	8050	---	25200	---	3950	3850	---
TOTAL	97250	190160	216060	121720	163330	272880	493740	913200	410440	300810	122560	216440
MEAN	3137	6339	6970	3926	5632	8803	16460	29460	13680	9704	3954	7215
MAX	3530	10800	13800	5580	8830	11600	26900	39900	33800	24200	4980	13600
MIN	2990	2900	4060	2440	4120	7810	8550	18500	5710	3950	3480	2880
AC-FT	192900	377200	428600	241400	324000	541300	979300	1811000	814100	596700	243100	429300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1971, BY WATER YEAR (WY) (UNREGULATED)

MEAN	4796	6642	7898	10520	12710	12550	26050	49610	40830	10530	3812	3799
MAX	8818	12510	18720	16090	21110	17630	41330	72930	54520	15670	5024	7201
(WY)	1969	1969	1965	1969	1971	1968	1965	1971	1971	1971	1965	1968
MIN	2887	3365	4174	4770	3779	10220	14200	36430	21890	6351	2704	2219
(WY)	1967	1970	1966	1966	1966	1967	1970	1968	1966	1966	1966	1966

SUMMARY STATISTICS	FOR 1970 CALENDAR YEAR		FOR 1971 WATER YEAR		[a] WATER YEARS 1965 - 1971	
ANNUAL TOTAL	5586500		7292740			
ANNUAL MEAN	15310		19980		15800	
HIGHEST ANNUAL MEAN					19980	1971
LOWEST ANNUAL MEAN					10840	1966
HIGHEST DAILY MEAN	89400	Jun 6	103000	May 13	103000	May 13 1971
LOWEST DAILY MEAN	2070	Jan 7	1860	Sep 30	1860	Sep 29 1967
ANNUAL SEVEN-DAY MINIMUM	2630	Aug 28	2360	Sep 24	1920	Sep 24 1967
INSTANTANEOUS PEAK FLOW					107000	May 13 1971
INSTANTANEOUS PEAK STAGE					[b] 25.00	Dec 28 1967
INSTANTANEOUS LOW FLOW					1630	Nov 30 1969
ANNUAL RUNOFF (AC-FT)	11080000		14470000		11440000	
10 PERCENT EXCEEDS	43000		56300		42500	
50 PERCENT EXCEEDS	8140		10100		8540	
90 PERCENT EXCEEDS	3480		3640		3140	

SNAKE RIVER MAIN STEM

13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE¼SE¼ sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Wallowa-Whitman National Forest, Hydrologic Unit 17050201, on left bank 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73.300 mi^2, approximately.

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76, WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929 (levels by Idaho Power Company).

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by many reservoirs above station, with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 38 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant. Diversions above station for irrigation of about 3,820,000 acres, of which 742,000 acres are irigated by withdrawals from ground water (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14400	9530	9820	10100	10300	12700	9940	18500	5410	6180	6580	6520
2	14400	9560	9850	14200	10100	15800	9920	20400	5410	6290	6600	6560
3	10100	9530	9810	14200	14200	12700	10000	20300	5360	16900	6600	6530
4	12700	9530	9780	12000	12700	14500	9460	20400	5310	18000	6580	6540
5	11900	9720	9770	10800	11600	13200	8910	20400	5390	17900	6570	6540
6	11800	9800	9810	11700	12100	14700	8800	11400	5330	17900	6600	6530
7	12400	9810	9830	16600	13400	12000	8800	8680	5360	18000	6610	6520
8	11800	9840	9820	17200	10500	13500	8790	8610	5330	18000	6640	6560
9	13200	9870	9830	15500	10400	12400	8800	8570	5290	17600	6680	6580
10	10700	9800	9800	16500	11700	14900	8800	8610	5300	7710	6720	6870
11	10500	9800	10300	12800	11300	13700	8770	8650	5310	6990	6790	6540
12	10600	9850	9830	14200	12500	13500	8780	8680	5430	6710	6680	6610
13	10300	9870	9870	15100	11000	15100	8820	8670	5480	6640	6570	6900
14	11900	9830	10300	15700	10100	10200	8800	8620	5440	6590	6530	6900
15	12600	9820	9800	14900	10000	9980	8810	8140	5400	6770	6540	7110
16	10400	9810	14800	12000	9990	15000	8810	7440	5430	6700	6530	7420
17	10300	9830	11400	13800	10000	12700	8790	7240	6570	6710	6550	7480
18	11200	9840	12900	12000	12100	14700	8780	6480	6640	6700	6540	7410
19	10300	9780	13500	12300	13200	12300	8750	6610	6640	6690	6560	7400
20	10200	9800	15400	16300	11800	10100	8760	5890	6600	6690	6520	7290
21	10200	9790	12100	15600	15300	9980	8800	5980	5280	6840	6530	7740
22	10100	9810	10300	13200	12100	9970	11700	5700	5660	6890	6550	7430
23	10100	9830	12300	12800	14400	13800	9430	5490	6390	6900	6570	7080
24	10000	9840	10400	13000	12500	11500	8570	5480	6470	6750	6540	7130
25	9730	9800	10100	11100	14600	9990	8660	5500	6620	6540	6580	7220
26	9600	9790	10100	9960	15300	9960	9600	5510	6980	6510	6570	7260
27	9570	9830	11500	13500	15200	9980	13000	5500	6920	6500	6550	7440
28	9580	9870	12200	15700	14200	9980	11200	5470	6490	6560	6560	7690
29	9590	9850	10100	11700	17700	9930	8750	5460	6420	6570	6550	7720
30	9590	9830	11000	12200	---	10000	8600	5410	6390	6550	6540	10400
31	9560	---	10500	11400	---	9930	---	5420	---	6580	6530	---
TOTAL	339320	293460	336820	418060	360290	378700	278400	283210	176050	284860	204060	213920
MEAN	10950	9782	10870	13490	12420	12220	9280	9136	5868	9189	6583	7131
MAX	14400	9870	15400	17200	17700	15800	13000	20400	6980	18000	6790	10400
MIN	9560	9530	9770	9960	9990	9930	8570	5410	5280	6180	6520	6520
AC-FT	673000	582100	668100	829200	714600	751200	552200	561700	349200	565000	404800	424300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1992, BY WATER YEAR (WY)

MEAN	15900	17280	19270	22530	24280	28240	29810	26560	23260	13300	10920	13850
MAX	24140	28630	30410	38230	44670	66340	61960	68840	59080	25550	17090	19120
(WY)	1972	1985	1984	1984	1971	1986	1984	1984	1984	1983	1983	1984
MIN	9962	9782	10870	12850	11570	10600	7371	6401	5868	6901	6583	6887
(WY)	1989	1992	1992	1991	1988	1991	1988	1977	1992	1977	1992	1977

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1966 - 1992	
ANNUAL TOTAL	4072340		3567150			
ANNUAL MEAN	11160		9746		20400	
HIGHEST ANNUAL MEAN					36560	1984
LOWEST ANNUAL MEAN					9746	1992
HIGHEST DAILY MEAN	24300	May 14	[a] 20400	May 2	78100	Feb 23 1982
LOWEST DAILY MEAN	6600	Apr 7	5280	Jun 21	4360	May 8 1977
ANNUAL SEVEN-DAY MINIMUM	6790	Apr 6	5330	Jun 4	5330	Jun 4 1992
INSTANTANEOUS PEAK FLOW			22200	Oct 2	87800	Feb 23 1982
INSTANTANEOUS PEAK STAGE			69.83	Oct 2	84.05	Feb 23 1982
INSTANTANEOUS LOW FLOW			[b] 3900	Jun 23	[c] 1580	Mar 19 1967
ANNUAL RUNOFF (AC-FT)	8077000		7075000		14780000	
10 PERCENT EXCEEDS	15500		14400		38500	
50 PERCENT EXCEEDS	10100		9800		16500	
90 PERCENT EXCEEDS	7180		6480		8920	

a Also occurred May 4, 5.
b Gage height, 62.21 ft.
c Gage height, 59.9 ft.

CLEARWATER RIVER BASIN

13341050 CLEARWATER RIVER NEAR PECK, ID

LOCATION.--Lat 46°30'00", long 116°23'30", in NE¼NE¼ sec.1, T.36 N., R.1 W., Nez Perce County, Hydrologic Unit 17060306, on left bank, 2 mi upstream from Big Canyon Creek, 2.2 mi northeast of Peck, 3 mi downstream from North Fork Clearwater River, and at mile 37.4.

DRAINAGE AREA.--8,040 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft above sea level, from topographic map.

REMARKS.--Records good. Station equipment includes satellite telemetry. Flow regulated by Dworshak Reservoir (station 13340950) 5.1 mi upstream beginning September 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 23.95 ft, from floodmark; discharge, 118,000 ft^3/s, from rating extended above 89,100 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3990	4020	3590	3330	3660	3350	12700	28300	37900	13100	20100	3970
2	3870	4600	3550	3190	3650	3440	14200	28000	37100	12700	26600	3850
3	3720	5020	3570	3150	3450	3450	14700	29900	33000	12900	27400	3760
4	3700	4370	3140	3120	3510	3490	16200	36500	29500	21400	27100	3710
5	4230	4080	2380	5390	3470	3850	17800	35200	23900	20600	27400	3620
6	3960	3990	2230	6670	3590	5020	16400	33900	22900	19600	28700	3580
7	3740	3940	2560	2970	3650	6130	15000	37400	27500	19000	21900	3510
8	3650	4580	e3200	2930	3650	7000	15200	35400	35200	19100	20600	3470
9	3470	4850	3730	2760	3780	7170	15000	33400	27900	18500	16600	3410
10	3390	4590	3800	4500	3920	7220	15600	31300	28100	17800	13900	3370
11	3330	4200	3780	11700	4170	6880	15300	33300	28500	18400	13700	3330
12	3280	3960	3710	11800	4310	6400	14000	41400	30400	20800	13600	3280
13	3240	3940	3550	8180	4460	5980	12800	51400	30000	22100	9210	3400
14	3480	4080	3490	3650	4430	5940	12900	58200	26900	22000	4550	3540
15	3750	4080	3470	3840	4330	6970	20300	65000	25400	24200	4560	3480
16	3550	4000	3400	3600	3770	9290	19900	66600	26900	26400	5580	3460
17	3420	3990	3330	3470	8360	9000	19600	62700	27500	26400	5620	3470
18	3390	3950	3280	3370	3130	9980	21000	61200	24600	26500	5580	3380
19	3440	4040	2910	3260	3710	12800	22400	62900	20800	24900	5170	3300
20	3390	4030	3110	4050	4160	13100	20900	63500	23000	21100	4830	3250
21	3330	3900	3380	3390	3940	14100	20400	64600	21400	19600	4690	3220
22	3320	3870	3410	3680	3770	12500	20700	60100	23000	18200	4810	3190
23	3340	4070	3460	3590	3540	12400	21500	50400	22000	18200	4850	3190
24	3270	4070	3600	3490	3580	13800	21200	39600	20500	18800	4530	3160
25	3210	3460	3540	3470	3450	14700	21000	37700	19500	18600	4360	3150
26	3150	2830	3510	3770	3260	14800	21700	51300	15900	23500	4220	3120
27	3100	2560	3480	4040	3250	16400	20100	51400	12700	20600	4140	3070
28	3080	3110	3430	4000	3290	16300	19300	46400	16800	16800	4090	3030
29	3100	4240	3440	3960	---	15500	19400	46500	15400	16000	4070	3020
30	3370	3860	3410	3880	---	14600	24700	41500	13900	15500	4160	2990
31	3720	---	3340	3730	---	13300	---	35700	---	15200	4130	---
TOTAL	107980	120280	103780	135930	109240	294860	541900	1420700	748100	608500	350750	101280
MEAN	3483	4009	3348	4385	3901	9512	18060	45830	24940	19630	11310	3376
MAX	4230	5020	3800	11800	8360	16400	24700	66600	37900	26500	28700	3970
MIN	3080	2560	2230	2760	3130	3350	12700	28000	12700	12700	4070	2990
AC-FT	214200	238600	205800	269600	216700	584900	1075000	2818000	1484000	1207000	695700	200900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1971, BY WATER YEAR (WY) (UNREGULATED)

MEAN	4796	6642	7898	10520	12710	12550	26050	49610	40830	10530	3812	3799
MAX	8818	12510	18720	16090	21110	17630	41330	72930	54520	15670	5024	7201
(WY)	1969	1969	1965	1969	1971	1968	1965	1971	1971	1971	1965	1968
MIN	2887	3365	4174	4770	3779	10220	14200	36430	21890	6351	2704	2219
(WY)	1967	1970	1966	1966	1966	1967	1970	1968	1966	1966	1966	1966

SUMMARY STATISTICS	[a] WATER YEARS 1965 - 1971	
ANNUAL MEAN	15800	
HIGHEST ANNUAL MEAN	19980	1971
LOWEST ANNUAL MEAN		1966
HIGHEST DAILY MEAN	103000	May 13 1971
LOWEST DAILY MEAN	1860	Sep 29 1967
ANNUAL SEVEN-DAY MINIMUM	1920	Sep 24 1967
INSTANTANEOUS PEAK FLOW	107000	May 13 1971
INSTANTANEOUS PEAK STAGE	[b] 25.00	Dec 28 1967
INSTANTANEOUS LOW FLOW	1630	Nov 30 1969
ANNUAL RUNOFF (AC-FT)	11440000	
10 PERCENT EXCEEDS	42500	
50 PERCENT EXCEEDS	8540	
90 PERCENT EXCEEDS	3140	

SNAKE RIVER MAIN STEM

13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE¼SE¼ sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Wallowa-Whitman National Forest, Hydrologic Unit 17050201, on left bank 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73,300 mi², approximately.

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76, WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (levels by Idaho Power Company).

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by many reservoirs above station, with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 38 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant. Diversions above station for irrigation of about 3,820,000 acres, of which 742,000 acres are irigated by withdrawals from ground water (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11300	9240	9430	9150	18700	16200	30500	26900	25700	11400	14900	14000
2	11600	9190	9420	10000	16000	16900	32700	23800	23900	11200	13600	14200
3	10600	9190	9490	13400	15500	14800	32800	27000	27400	8730	12600	13800
4	10600	9240	9340	12900	13300	11400	32400	28200	30500	8810	11900	14500
5	10400	9190	9270	11400	14900	11200	48800	30300	31900	12100	11900	12400
6	10300	9190	9270	11100	12000	11000	46300	31200	33300	15300	12700	14200
7	10100	9200	9280	11100	9360	10800	34700	32200	33400	10800	15400	15500
8	9980	9200	9230	10700	15000	12800	30900	33700	33300	11800	15600	15200
9	10000	9230	9240	9520	12400	10400	31000	32400	34100	10800	21008	16300
10	9990	9170	9260	11900	9550	10700	33100	31100	41200	9090	20600	15600
11	10100	9170	9270	12400	12000	10500	31500	31100	43500	8960	20000	13400
12	10200	9220	9290	13700	11400	14000	32800	31300	45100	13700	10800	9320
13	10200	9200	9250	14800	11000	17500	32300	35500	45000	13700	14900	5950
14	10200	9170	9220	11500	9470	14100	28100	35800	45100	13400	9770	5950
15	10400	9200	9160	11000	14200	12400	25400	36500	40800	13200	9150	5980
16	10300	9170	9160	9790	18500	10400	27700	36500	36800	13600	16500	6010
17	10200	9170	9210	12600	18600	12100	25100	36500	36900	15200	17100	6030
18	10300	9200	9170	15300	19000	16800	28200	37700	35900	12500	17100	11900
19	10300	9200	9170	11600	13300	27700	27100	39300	34600	19400	19500	9750
20	10500	9180	9200	14700	15600	37600	26400	38000	25500	19500	21500	13000
21	10500	9150	9270	14000	10100	38600	28700	38000	24000	20400	12100	12700
22	10300	9180	9250	15300	15400	37500	23400	36800	20500	20000	11800	13900
23	9900	9190	9250	14900	16400	37700	25000	33500	25000	20600	12600	18700
24	9190	9200	9230	14600	16700	48600	26400	34100	24100	18300	12500	12700
25	9320	9180	9190	13800	18100	54800	26000	30000	24800	17200	14200	14100
26	9300	9190	9240	14500	20000	53600	27400	27700	22400	22200	11000	17300
27	9340	9190	9220	15000	15100	51500	27100	30000	21000	22600	11700	17300
28	9370	9150	9210	14000	14300	47700	28400	29900	16700	23600	10400	21100
29	9300	9170	10600	15000	---	38800	28500	30400	10500	20500	7420	22400
30	9290	9260	9420	15200	---	36800	29100	30900	11500	10500	13500	19800
31	9250	---	11900	17100	---	35600	---	27600	---	20000	12600	---
TOTAL	312630	275780	291110	401960	405880	780500	907800	1003900	904400	469090	436340	402990
MEAN	10080	9193	9391	12970	14500	25180	30260	32380	30150	15130	14080	13430
MAX	11600	9260	11900	17100	20000	54800	48800	39300	45100	23600	21500	22400
MIN	9190	9150	9160	9150	9360	10400	23400	23800	10500	8730	7420	5950
AC-FT	620100	547000	577400	797300	805100	1548000	1801000	1991000	1794000	930400	865500	799300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1993, BY WATER YEAR (WY)

MEAN	15690	16990	18920	22180	23930	28130	29830	26760	23510	13370	11040	13840
MAX	24140	28630	30410	38230	44670	66340	61960	68840	59080	25550	17090	19120
(WY)	1972	1985	1984	1984	1971	1986	1984	1984	1984	1983	1983	1984
MIN	9962	9193	9391	12850	11570	10600	7371	6401	5868	6901	6583	6887
(WY)	1989	1993	1993	1991	1988	1991	1988	1977	1992	1977	1992	1977

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1966 - 1993	
ANNUAL TOTAL	3477070		6592380			
ANNUAL MEAN	9500		18060		20310	
HIGHEST ANNUAL MEAN					36560	1984
LOWEST ANNUAL MEAN					9746	1992
HIGHEST DAILY MEAN	20400	May 2	54800	Mar 25	78100	Feb 23 1982
LOWEST DAILY MEAN	5280	Jun 21	5950	Sep 13	4360	May 8 1977
ANNUAL SEVEN-DAY MINIMUM	5330	Jun 4	7310	Sep 12	5330	Jun 4 1992
INSTANTANEOUS PEAK FLOW			55400	Apr 5	87800	Feb 23 1982
INSTANTANEOUS PEAK STAGE			77.98	Apr 5	84.05	Feb 23 1982
INSTANTANEOUS LOW FLOW			[a] 5360	Sep 13	[b] 1580	Mar 19 1967
ANNUAL RUNOFF (AC-FT)	6897000		13080000		14720000	
10 PERCENT EXCEEDS	14200		34100		38200	
50 PERCENT EXCEEDS	9190		13800		16500	
90 PERCENT EXCEEDS	6480		9200		8990	

a Gage height, 62.76 ft.
b Gage height, 59.9 ft.

13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE¼SE¼ sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Wallowa-Whitman National Forest, Hydrologic Unit 17050201, on left bank 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73,300 mi², approximately.

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76, WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (levels by Idaho Power Company).

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by many reservoirs above station, with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 38 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant. Diversions above station for irrigation of about 3,820,000 acres, of which 742,000 acres are irigated by withdrawals from ground water (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22800	9450	9550	9750	10100	9560	9410	24300	9500	12000	5700	7060
2	23600	9450	9560	9520	10600	9870	9400	22700	9480	11900	5550	9210
3	15400	9450	9530	9560	11000	11700	9410	23100	9430	12400	5420	6950
4	24700	9470	9550	9610	12600	10500	9340	23300	9530	12600	5390	6760
5	19000	9510	9490	13500	12700	11900	9350	24400	9520	17200	5510	6660
6	18600	9460	9490	12400	10400	13600	11000	24900	9500	17300	5630	9110
7	19600	9450	9500	14500	14800	15300	12700	24800	9480	17900	5660	12300
8	18400	9500	9540	14200	19700	15900	13100	24400	9500	13100	5670	10800
9	15200	9580	9540	14100	22600	13600	12000	25300	9530	14000	5780	10900
10	13700	9540	9490	14000	12500	13800	15100	25100	9520	14700	5930	6680
11	18500	9520	9560	15400	12800	13100	14200	23300	8810	15400	6010	6710
12	18200	9490	9570	12700	13400	11400	17400	10700	8150	14900	6020	7190
13	17400	9500	9570	14500	11600	12900	12100	9560	7770	14300	6030	11000
14	21500	9520	9590	15700	13400	15700	13600	9550	7600	14400	6010	7470
15	22100	9600	9570	11800	14600	14300	13300	11300	7310	14900	7530	9490
16	19700	9520	9550	13700	15600	16900	11300	9570	6940	14400	9680	8330
17	16500	9450	9540	19200	14500	21100	9630	9590	6880	13200	7500	7250
18	14500	9630	10200	19400	15700	15600	13300	9630	6350	13600	7920	6780
19	11200	9610	12500	15200	16800	20800	9770	10400	6270	13800	7060	6990
20	13800	9580	14300	15500	15500	14600	10200	9580	6580	11300	6420	8730
21	11700	9560	13200	17700	14400	22100	9690	9480	6740	12600	6370	9750
22	11600	9580	12500	12100	14400	12700	11700	9480	6790	14700	6430	12100
23	9520	9590	13100	12100	16100	17900	16200	11300	8220	14300	7780	8080
24	9560	9540	11600	14200	13700	16800	13900	17000	7740	13300	10800	6680
25	9480	9480	11500	13200	11000	12800	11800	14700	6390	12300	10700	6640
26	9510	9520	11700	16400	9820	9410	14200	13800	6350	13500	8510	10000
27	9520	9530	11700	15600	9800	9360	19400	14600	6340	14000	6740	9990
28	9550	9510	12400	10100	11300	10100	17000	13700	6280	16700	7010	8190
29	9530	9500	12200	9620	---	9410	24100	13800	6240	11900	11000	6800
30	9490	9510	12200	10100	---	9380	24300	14300	6680	8200	8140	6890
31	9480	---	10600	11800	---	9380	---	15200	---	8080	7900	---
TOTAL	473140	285600	331890	417160	381420	421470	397900	502840	235420	423280	217800	251490
MEAN	15270	9520	10710	13460	13620	13600	13260	16220	7847	13650	7026	8383
MAX	24700	9630	14300	19400	22600	22100	24300	25300	9530	17900	11000	12300
MIN	9480	9450	9490	9520	9800	9360	9340	9480	6240	8080	5390	6640
AC-FT	938900	566500	658300	827400	756500	836000	789200	997400	467000	839600	432000	498800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, BY WATER YEAR (WY)

MEAN	15680	16740	18630	21880	23580	27630	29260	26400	22970	13380	10900	13650
MAX	24140	28630	30410	38230	44670	66340	61960	68840	59080	25550	17090	19120
(WY)	1972	1985	1984	1984	1971	1986	1984	1984	1984	1983	1983	1984
MIN	9962	9193	9391	12850	11570	10600	7371	6401	5868	6901	6583	6887
(WY)	1989	1993	1993	1991	1988	1991	1988	1977	1992	1977	1992	1977

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1966 - 1994	
ANNUAL TOTAL	6803690		4339610			
ANNUAL MEAN	18640		11890		20020	
HIGHEST ANNUAL MEAN					36560	1984
LOWEST ANNUAL MEAN					9746	1992
HIGHEST DAILY MEAN	54800	Mar 25	25300	May 9	78100	Feb 23 1982
LOWEST DAILY MEAN	5950	Sep 13	5390	Aug 4	4360	May 8 1977
ANNUAL SEVEN-DAY MINIMUM	7310	Sep 12	5550	Aug 2	5330	Jun 4 1992
INSTANTANEOUS PEAK FLOW			30900	Oct 4	87800	Feb 23 1982
INSTANTANEOUS PEAK STAGE			72.24	Oct 4	84.05	Feb 23 1982
INSTANTANEOUS LOW FLOW			[a] 5230	Aug 4	[b] 1580	Mar 19 1967
ANNUAL RUNOFF (AC-FT)	13500000		8608000		14510000	
10 PERCENT EXCEEDS	34100		17500		37600	
50 PERCENT EXCEEDS	14700		10700		16100	
90 PERCENT EXCEEDS	9510		6800		8910	

a Gage height, 62.82 ft.
b Gage height, 59.9 ft.

13341050 CLEARWATER RIVER NEAR PECK, ID—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.—Water years 1965 to 1984, October 1985 to current year.

PERIOD OF DAILY RECORDS.—
WATER TEMPERATURES: October 1964 to September 1984, October 1985 to current year.

INSTRUMENTATION.—Temperature recorder since October 1964.

EXTREMES FOR PERIOD OF RECORD.—
WATER TEMPERATURES: Maximum, 25.0°C Aug. 1-2, 1965; minimum, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.—
WATER TEMPERATURES: Maximum, 21.5°C Aug. 1-2; minimum, 2.5°C several days in January and February.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	14.0	12.0	8.0	7.5	3.5	3.0	3.0	3.0	2.5	2.5	5.0	4.0
2	14.0	12.5	7.5	7.0	3.5	3.0	3.0	3.0	2.5	2.5	5.0	4.5
3	14.5	12.5	8.5	7.5	3.5	3.0	3.0	3.0	2.5	2.5	5.5	4.5
4	14.5	12.5	7.5	7.0	3.5	3.5	3.5	3.0	2.5	2.5	5.0	4.5
5	14.0	13.0	7.5	7.0	3.5	3.0	3.5	3.5	2.5	2.5	4.5	4.0
6	14.0	13.0	7.5	6.5	3.5	3.0	3.5	3.0	3.0	2.5	4.0	3.5
7	13.5	12.5	7.0	6.5	3.5	3.0	3.0	3.0	3.5	3.0	4.5	3.5
8	12.5	12.0	7.0	6.0	3.5	3.5	3.5	3.0	3.5	2.5	4.5	3.5
9	12.0	11.0	6.5	5.5	4.0	3.5	3.5	3.0	2.5	2.5	5.0	3.5
10	12.0	10.0	6.5	6.0	4.0	3.5	4.0	3.5	2.5	2.5	4.5	4.0
11	12.0	11.0	6.5	5.5	4.0	4.0	4.0	3.5	2.5	2.5	5.0	4.0
12	12.5	11.0	6.0	5.5	4.0	4.0	4.0	4.0	2.5	2.5	5.5	4.0
13	12.5	11.5	5.5	5.0	4.0	3.5	4.0	4.0	2.5	2.5	6.0	4.5
14	12.0	11.5	5.5	5.0	4.0	3.5	4.0	4.0	3.0	2.5	6.5	5.0
15	12.0	11.5	6.0	5.0	4.0	3.5	4.0	4.0	3.0	2.5	7.0	5.5
16	12.0	11.5	6.0	5.5	4.0	4.0	4.0	3.5	3.0	2.5	7.0	6.0
17	11.5	11.0	6.0	6.0	4.0	4.0	4.5	4.0	3.0	3.0	6.0	5.5
18	11.5	11.0	6.0	5.5	4.0	4.0	4.0	3.5	3.5	3.0	5.5	5.5
19	11.5	11.0	5.5	5.5	4.0	3.5	3.5	3.0	3.5	3.0	5.5	5.0
20	11.0	10.0	5.5	5.0	4.0	3.5	3.0	2.5	3.5	2.5	5.5	5.0
21	10.5	10.0	5.0	5.0	4.0	3.5	3.0	2.5	3.5	3.0	5.5	5.0
22	10.5	9.5	5.5	5.0	4.0	3.5	3.0	2.5	4.0	3.5	5.5	5.0
23	10.5	9.5	5.0	3.5	3.5	3.5	3.0	2.5	4.0	3.5	6.0	5.0
24	10.5	10.0	3.5	3.0	3.5	3.0	3.0	2.5	4.0	3.0	6.0	5.0
25	10.0	9.0	4.0	3.0	3.0	3.0	3.5	3.0	3.5	3.0	6.5	4.5
26	9.5	8.5	4.0	3.0	3.5	3.0	3.5	3.0	3.5	2.5	7.0	5.0
27	9.0	8.5	4.5	3.0	3.5	3.0	4.0	3.5	4.0	3.0	7.5	5.5
28	9.0	9.0	4.5	4.0	3.0	3.0	3.5	3.5	4.0	3.5	8.0	6.0
29	9.0	8.0	4.0	3.0	3.0	3.0	3.5	3.5	---	---	8.5	6.5
30	8.5	7.5	3.5	3.5	3.0	3.0	3.5	3.0	---	---	8.5	7.0
31	8.0	7.5	---	---	3.0	3.0	3.0	2.5	---	---	8.5	7.5
MONTH	14.5	7.5	8.5	3.0	4.0	3.0	4.5	2.5	4.0	2.5	8.5	3.5

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	8.0	7.0	8.0	7.0	12.5	11.5	19.5	18.0	21.5	16.0	16.5	15.0
2	8.0	7.0	8.5	8.0	12.5	11.0	19.0	18.0	21.5	19.0	16.0	15.0
3	8.5	7.5	8.5	8.0	14.0	12.0	18.0	17.0	21.0	19.0	15.5	14.5
4	7.5	6.5	8.5	8.5	14.5	14.0	18.5	16.5	21.0	18.5	16.0	14.0
5	6.5	6.0	9.0	8.0	15.0	14.0	17.0	15.0	20.0	18.0	16.5	14.0
6	7.0	6.5	10.0	8.5	14.0	12.5	15.0	13.0	19.5	17.0	16.5	14.5
7	7.0	6.5	10.0	9.0	13.0	12.0	13.5	12.0	19.5	17.0	16.0	14.5
8	7.0	6.0	10.5	9.5	12.0	11.5	12.5	10.5	19.0	17.0	16.0	14.5
9	7.5	7.0	11.5	9.5	13.0	12.0	11.5	10.5	17.5	16.5	15.0	14.0
10	8.0	7.0	11.5	10.0	14.0	13.0	11.5	10.5	18.5	16.0	14.5	13.0
11	9.0	7.5	11.0	9.5	14.5	14.0	11.5	10.5	18.5	16.5	14.5	13.0
12	9.0	7.5	11.0	10.0	16.0	14.5	11.5	10.5	19.0	16.5	14.5	12.5
13	7.5	7.0	10.0	9.0	16.0	14.5	11.5	10.5	19.0	16.5	14.0	13.0
14	7.5	7.0	9.5	8.5	14.5	11.0	12.0	11.0	19.0	17.0	14.0	12.5
15	8.0	7.0	9.0	8.0	12.0	10.5	12.0	11.0	18.5	17.0	15.0	13.0
16	9.0	8.0	9.5	9.0	12.0	11.0	11.0	10.0	18.0	16.0	15.0	13.0
17	10.5	9.0	9.5	8.5	13.0	11.0	11.0	10.0	18.0	15.5	15.5	13.5
18	10.5	10.0	9.0	8.0	13.5	12.0	10.5	10.0	18.0	15.5	15.5	13.5
19	10.0	9.0	9.5	8.5	15.0	13.0	10.5	10.0	17.5	15.5	15.5	13.5
20	9.5	8.0	9.0	8.5	16.0	15.0	11.0	10.0	17.5	15.5	15.5	13.5
21	9.0	8.0	9.5	8.5	17.0	16.0	11.0	8.0	17.5	15.5	15.5	13.5
22	8.0	7.5	9.5	9.0	18.0	17.0	8.5	8.0	16.5	15.5	15.0	13.0
23	7.5	6.5	10.0	9.0	18.5	17.5	8.5	8.0	16.5	14.5	15.0	13.0
24	8.0	7.5	10.5	9.5	18.5	17.5	9.0	8.0	17.0	15.0	15.0	13.0
25	7.5	7.5	11.0	10.0	18.0	17.0	9.0	8.5	16.5	14.5	14.5	13.0
26	8.0	7.0	11.0	10.5	17.0	15.5	9.5	8.5	16.5	14.5	14.5	13.0
27	8.0	6.5	12.5	10.5	16.5	15.0	9.5	8.5	16.5	14.5	14.5	13.0
28	8.0	6.5	12.0	11.0	17.0	15.5	9.0	8.5	16.5	15.0	14.5	13.0
29	7.5	7.0	11.0	10.0	18.5	16.5	10.0	9.0	16.5	15.0	14.0	13.0
30	7.5	7.0	12.0	10.0	19.0	17.5	12.5	9.5	16.5	14.0	14.5	13.0
31	---	---	12.5	11.5	---	---	16.0	12.0	16.5	14.5	---	---
MONTH	10.5	6.0	12.5	7.0	19.0	10.5	19.5	8.0	21.5	14.0	16.5	12.5

CLEARWATER RIVER BASIN

13341050 CLEARWATER RIVER NEAR PECK, ID

LOCATION.--Lat 46°30'00", long 116°23'30", in NE¼NE¼ sec.1, T.36 N., R.1 W., Nez Perce County, Hydrologic Unit 17060306, on left bank, 2 mi upstream from Big Canyon Creek, 2.2 mi northeast of Peck, 3 mi downstream from North Fork Clearwater River, and at mile 37.4.

DRAINAGE AREA.--8,040 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft above sea level, from topographic map.

REMARKS.--Records good. Station equipment includes satellite telemetry. Flow regulated by Dworshak Reservoir (station 13340950) 5.1 mi upstream beginning September 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 23.95 ft, from floodmark, discharge, 118,000 ft^3/s, from rating extended above 89,100 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2380	4570	3160	3140	11300	11500	8660	34900	32000	11600	16000	11700
2	2390	e6020	4790	2390	25000	10500	9000	35300	31300	11300	16100	7890
3	2410	e4530	4790	2050	19900	9830	8560	38000	32800	18700	16100	7780
4	2430	e3750	4080	2060	15000	9660	8490	38100	34000	22100	16000	7730
5	2430	e3520	3550	2360	12500	9190	9700	38300	32300	18700	15900	7710
6	2450	3490	2870	2560	11300	8520	11800	40300	32400	17100	15800	7780
7	2480	3520	2870	3310	10500	7940	12800	51500	28300	17000	15800	8080
8	2460	e3360	3150	3370	9880	7520	17700	46600	27500	16100	16200	7830
9	2440	e3170	3330	3570	9210	7700	17200	37200	24000	15100	16100	8030
10	2430	3070	3040	4060	8560	8490	15300	37300	22700	13700	15900	8130
11	2440	3410	2710	4790	8020	9410	18300	37900	20500	12100	15800	7940
12	2500	3580	2670	5140	7230	10900	21400	34600	24300	14200	15600	7930
13	2600	3540	2810	5130	6210	11400	21800	29700	27000	14300	15600	7890
14	2570	3400	3150	6340	5730	11500	24500	25500	27500	12800	15700	7770
15	2610	3240	3030	8560	5910	12800	22800	23800	26800	10200	16000	7710
16	2790	3130	2980	8140	6010	14200	21600	25800	26000	9290	16200	7670
17	2800	3090	3160	7110	6000	12800	20800	27200	20600	14400	16400	7610
18	2710	3140	3950	6310	6660	12600	20300	27900	21500	16300	17600	7520
19	2650	2890	4370	5780	7440	15200	21200	28600	25700	15900	16900	7490
20	2630	2770	4130	5360	13400	14600	23600	27900	27200	17200	16400	7510
21	2690	3080	3820	4880	16900	14700	24000	28300	23500	19600	16200	7690
22	3250	2930	3590	4260	15900	14400	23500	28700	21100	19400	16000	7720
23	e3410	2440	3370	3840	14500	13200	23300	28200	19800	19000	15900	7600
24	e3070	2390	3130	3740	13400	13200	23400	26900	16000	18600	15900	7570
25	e2780	3030	3270	4150	13300	12300	24900	26200	16100	18300	15800	7520
26	e2670	3620	3420	4390	14100	11100	30000	25300	16100	18000	15700	6650
27	2660	3380	3950	4410	14000	10400	32800	23900	19000	17900	15600	5400
28	4050	3190	5390	4210	12700	9710	34100	22600	20000	17900	15500	5450
29	e5860	3050	5500	4030	---	9200	35700	24000	18400	17600	15500	5690
30	e4130	2900	4890	3960	---	8810	35600	27600	17000	17500	15500	6290
31	e3450	---	4180	5000	---	8640	---	31500	---	17200	15500	---
TOTAL	88620	101200	113100	138400	320560	341920	622810	979600	731400	499090	495200	227280
MEAN	2859	3373	3648	4465	11450	11030	20760	31600	24380	16100	15970	7576
MAX	5860	6020	5500	8560	25000	15200	35700	51500	34000	22100	17600	11700
MIN	2380	2390	2670	2050	5730	7520	8490	22600	16000	9290	15500	5400
AC-FT	175800	200700	224300	274500	635800	678200	1235000	1943000	1451000	989900	982200	450800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1971, BY WATER YEAR (WY) (UNREGULATED)

MEAN	4796	6642	7898	10520	12710	12550	26050	49610	40830	10530	3812	3799
MAX	8818	12510	18720	16090	21110	17630	41330	72930	54520	15670	5024	7201
(WY)	1969	1969	1965	1969	1971	1968	1965	1971	1971	1971	1965	1968
MIN	2887	3365	4174	4770	3779	10220	14200	36430	21890	6351	2704	2219
(WY)	1967	1970	1966	1966	1966	1967	1970	1968	1966	1966	1966	1966

SUMMARY STATISTICS	[a] WATER YEARS 1965 - 1971	
ANNUAL MEAN	15800	
HIGHEST ANNUAL MEAN	19980	1971
LOWEST ANNUAL MEAN		1966
HIGHEST DAILY MEAN	103000	May 13 1971
LOWEST DAILY MEAN	1860	Sep 29 1967
ANNUAL SEVEN-DAY MINIMUM	1920	Sep 24 1967
INSTANTANEOUS PEAK FLOW	107000	May 13 1971
INSTANTANEOUS PEAK STAGE	[b] 25.00	Dec 28 1967
INSTANTANEOUS LOW FLOW	1630	Nov 30 1969
ANNUAL RUNOFF (AC-FT)	11440000	
10 PERCENT EXCEEDS	42500	
50 PERCENT EXCEEDS	8540	
90 PERCENT EXCEEDS	3140	

13290450 SNAKE RIVER AT HELLS CANYON DAM, IDAHO-OREGON STATE LINE

LOCATION.--Lat 45°15'05", long 116°41'50", in SE¼SE¼ sec.33, T.3 S., R.49 E., unsurveyed (Willamette meridian), Wallowa County, Wallowa-Whitman National Forest, Hydrologic Unit 17050201, on left bank 0.2 mi upstream from Hells Canyon Creek, 0.4 mi downstream from Deep Creek, 0.6 mi downstream from Hells Canyon Dam, 15.5 mi northeast of Homestead, Oregon, and at mile 247.0.

DRAINAGE AREA.--73,300 mi^2, approximately.

PERIOD OF RECORD.--July 1965 to current year.

REVISED RECORDS.--WDR ID-78-2: 1969-70, 1972-76. WDR ID-79-2: 1972-73(m).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (levels by Idaho Power Company).

REMARKS.--No estimated daily discharges. Records good. Station equipment includes satellite telemetry. Flow regulated by many reservoirs above station, with a total usable capacity of more than 10,000,000 acre-feet, the most effective of which is Brownlee Reservoir 38 mi upstream (see sta 13289700). Diurnal fluctuations caused by Hells Canyon powerplant. Diversions above station for irrigation of about 3,820,000 acres, of which 742,000 acres are irigated by withdrawals from ground water (1966 determination).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6900	9250	9260	11500	16900	23100	20000	26200	44700	29700	19600	16200
2	6870	9310	9250	9870	21000	27000	16500	27400	40200	25700	18700	15800
3	7890	9240	9250	13600	27600	24200	21300	26200	38000	26300	19700	12200
4	8910	9230	9260	12900	19300	22700	20800	28900	36500	25500	19100	12300
5	10000	9240	9250	11900	21200	24300	20100	29900	39800	24600	18300	14500
6	10900	9200	9290	14500	21100	25100	20200	27700	34800	20900	18900	15000
7	9630	9210	9230	13000	21000	27000	23900	29600	37700	20100	18200	16800
8	10700	9230	9250	13200	21300	23200	24200	28500	41800	21000	17000	14100
9	7850	9250	9210	10200	19800	22200	24900	28700	38700	20400	18100	15100
10	12100	9270	9260	16500	20500	16300	25200	31200	37500	19800	11600	12400
11	11500	9270	9230	17800	20500	16300	27000	30900	40000	21200	10200	14000
12	14300	9260	9270	19800	24900	18200	28600	31200	44300	21200	10800	16100
13	13600	9250	9220	23400	24100	20000	28200	27100	44700	19200	10100	16700
14	18400	9210	11300	25900	25400	18000	27000	29500	43200	22100	11400	17400
15	20000	9250	10900	30400	27600	19000	27300	32700	41800	19300	10100	14900
16	19800	9260	9970	28200	25000	19200	28400	35800	37400	16800	11000	12900
17	20200	9220	9260	26300	22100	17800	27500	35800	35000	17900	9400	11500
18	19700	9210	9320	21700	18700	16900	28600	35800	34400	19100	12200	14900
19	19900	9260	9270	21900	14600	14600	27500	35800	31500	14800	10800	18000
20	19900	9280	10300	22900	18500	19400	25300	35800	31800	12600	11400	15400
21	19900	9260	9110	18000	19100	23000	23700	35900	33400	10600	12000	15000
22	10300	9270	10600	18200	16900	18900	18400	35900	28600	11300	12600	14200
23	9220	9300	9290	19400	16800	22700	16500	35900	29900	9270	12700	14900
24	9250	9280	9260	13300	18200	23700	23300	35800	30200	16000	13200	15800
25	9250	9300	9210	11500	17500	22500	22100	35800	30400	20100	11600	15400
26	9250	9330	9120	11600	18800	18600	25400	35900	30200	18900	10900	16200
27	9270	9290	9090	11100	24200	20400	24700	41600	29600	19400	9560	17600
28	9300	9240	9150	11900	23400	17700	26100	44100	30700	19600	13900	16700
29	9250	9230	9170	13200	---	17300	23300	43300	30500	18400	12400	18100
30	9240	9250	12200	15000	---	21400	18500	38200	30300	18200	13100	14700
31	9230	---	11300	15500	---	21400	---	41700	---	17400	14800	---
TOTAL	382510	277650	298050	524170	586000	642100	714400	1038800	1077600	597870	423360	454800
MEAN	12340	9255	9615	16910	20930	20710	23810	33510	35920	19290	13660	15160
MAX	20200	9330	12200	30400	27600	27000	28600	44100	44700	29700	19700	18100
MIN	6870	9200	9090	9870	14600	14600	16500	26200	28600	9270	9400	11500
AC-FT	758700	550700	591200	1040000	1162000	1274000	1417000	2060000	2137000	1186000	839700	902100

STATISTICS OF MONTHLY MEAN DATA FOR PERIOD OF RECORD, BY WATER YEAR (WY)

MEAN	15560	16490	18330	21720	23490	27400	29070	26640	23400	13580	10990	13700
MAX	24140	28630	30410	38230	44670	66340	61960	68840	59080	25550	17090	19120
(WY)	1972	1985	1984	1984	1971	1986	1984	1984	1984	1983	1983	1984
MIN	9962	9193	9391	12850	11570	10600	7371	6401	5868	6901	6583	6887
(WY)	1989	1993	1993	1991	1988	1991	1988	1977	1992	1977	1992	1977

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		PERIOD OF RECORD	
ANNUAL TOTAL	4206990		7017310		20000	
ANNUAL MEAN	11530		19230		36560	1984
HIGHEST ANNUAL MEAN					9746	1992
LOWEST ANNUAL MEAN					78100	Feb 23 1982
HIGHEST DAILY MEAN	25300	May 9	44700	Jun 1	4360	May 8 1977
LOWEST DAILY MEAN	5390	Aug 4	6870	Oct 2	5330	Jun 4 1992
ANNUAL SEVEN-DAY MINIMUM	5550	Aug 2	8730	Oct 1	87800	Feb 23 1982
INSTANTANEOUS PEAK FLOW			48800	Jun 13	84.05	Feb 23 1982
INSTANTANEOUS PEAK STAGE			76.51	Jun 13	[b] 1580	Mar 19 1967
INSTANTANEOUS LOW FLOW			[a] 6380	Oct 9		
ANNUAL RUNOFF (AC-FT)	8345000		13920000		14490000	
10 PERCENT EXCEEDS	17000		32200		37300	
50 PERCENT EXCEEDS	9970		18200		16200	
90 PERCENT EXCEEDS	6800		9250		8990	

a Gage height, 63.48 ft. Also occurred Oct. 10, Aug. 12.
b Gage height, 59.9 ft.

IDAHO POWER COMPANY

DATA

DATE	TOTAL DRAFT (CFS)
5-6-91	6643
5-7	7569
5-8	7581
5-9	7592
5-10	7601
5-11	7617
5-12	7637
5-13	7657
5-14	7678
5-15	6216
5-16	0
	73791 SFD
	146,361 AC-FT

DATE	TOTAL DRAFT (CFS)
5/1/92	9419
5/2/92	10865
5/3/92	10921
5/4/92	10950
5/5/92	10984
5/6/92	1952
	55110 SFD
	109,309 AC-FT

DATE	TOTAL DRAFT CFS
7/10/93	
7/11/93	
7/12/93	4000
7/13/93	4000
7/14/93	4000
7/15/93	4000
7/16/93	4000
7/17/93	4000
7/18/93	4000
7/19/93	10000
7/20/93	10000
7/21/93	10000
7/22/93	10000
7/23/93	10000
7/24/93	7000
7/25/93	6000
7/26/93	11500
7/27/93	11500
7/28/93	11500
7/29/93	8000
7/30/93	0
7/31/93	10000
8/1/93	3300
8/2/93	3300
8/3/93	3300
8/4/93	3300
8/5/93	3300
8/6/93	3300
8/7/93	7000
8/8/93	7000
8/9/93	12000
8/10/93	11500
8/11/93	10600
8/12/93	4800
8/13/93	3000
8/14/93	0
8/15/93	0
8/16/93	6900
8/17/93	8000
8/18/93	6000
8/19/93	5900
8/20/93	9000
8/21/93	5300
8/22/93	5200
8/23/93	0
	265500 SFD
	526,606 AC-FT

DATE	TOTAL CFS PASS/DRFT FOR BPA
4/20/94	891
4/21/94	1585
4/22/94	1946
4/23/94	1899
4/24/94	1581
4/25/94	1531
4/26/94	1538
4/27/94	1440
4/28/94	3063
4/29/94	11509
4/30/94	6097
5/1/94	15500
5/2/94	7272
5/3/94	8064
5/4/94	9896
5/5/94	10379
5/6/94	13694
5/7/94	7152
5/8/94	15407
5/9/94	10249
5/10/94	10632
5/11/94	9990
5/12/94	371
5/13/94	0
5/14/94	0
5/15/94	0
5/16/94	0
5/17/94	0
5/18/94	0
5/19/94	0
5/20/94	0
5/21/94	0
5/22/94	0
5/23/94	0
5/24/94	1474
5/25/94	1412
5/26/94	1397
5/27/94	0
5/28/94	4575
5/29/94	2646
5/30/94	2202
5/31/94	0
	165591 SFD
	328,442 AC-FT

DATE	TOTAL CFS PASS/DRFT FOR BPA
6/27/94	483
6/28/94	1533
6/29/94	946
6/30/94	338
7/1/94	6710
7/2/94	7797
7/3/94	7392
7/4/94	6612
7/5/94	11414
7/6/94	10776
7/7/94	10373
7/8/94	5117
7/9/94	6750
7/10/94	7174
7/11/94	6589
7/12/94	5066
7/13/94	4283
7/14/94	3849
7/15/94	5071
7/16/94	8260
7/17/94	11532
7/18/94	8346
7/19/94	8287
7/20/94	5955
7/21/94	4617
7/22/94	6892
7/23/94	8326
7/24/94	3835
7/25/94	6213
7/26/94	7137
7/27/94	8674
7/28/94	9101
7/29/94	6456
7/30/94	1820
7/31/94	1823
8/1/94	0
	217547 SFD
	431,493 AC-FT

Date	Payette Request from BRN (cfs)	Up. Snake plus Predraft thru BRN (cfs)	Total Pass/Drft for BPA (cfs)
7/1/95			0
7/2/95			0
7/3/95			0
7/4/95			0
7/5/95			0
7/6/95			0
7/7/95			0
7/8/95		1,116	1,116
7/9/95		1,499	1,499
7/10/95		1,510	1,510
7/11/95		1,518	1,518
7/12/95		1,511	1,511
7/13/95		1,508	1,508
7/14/95		1,509	1,509
7/15/95		1,507	1,507
7/16/95		1,508	1,508
7/17/95		1,507	1,507
7/18/95		1,504	1,504
7/19/95		1,505	1,505
7/20/95		1,504	1,504
7/21/95		1,503	1,503
7/22/95		1,504	1,504
7/23/95		1,503	1,503
7/24/95		1,503	1,503
7/25/95		6,893	6,893
7/26/95		11,327	11,327
7/27/95		12,021	12,021
7/28/95		10,390	10,390
7/29/95		7,914	7,914
7/30/95	2,174	5,146	7,320
7/31/95	7,147	1,525	8,672
8/1/95	8,183	1,522	9,705
8/2/95	6,972	1,520	8,492
8/3/95	8,761	1,520	10,281
8/4/95	8,476	1,518	9,994
8/5/95	7,095	1,436	8,531
8/6/95	6,813	1,514	8,327
8/7/95	7,874	1,520	9,394
8/8/95	5,184	1,570	6,754
8/9/95	4,426	1,554	5,980
8/10/95		1,530	1,530
8/11/95		1,543	1,543
8/12/95		1,543	1,543
8/13/95		1,524	1,524
8/14/95		1,544	1,544
8/15/95		1,545	1,545
8/16/95		1,536	1,536
8/17/95		1,534	1,534
8/18/95		1,533	1,533
8/19/95		1,539	1,539
8/20/95		1,539	1,539
8/21/95		1,530	1,530
8/22/95		1,528	1,528
8/23/95		1,531	1,531

8/24/95	1,532	1,532
8/25/95	1,582	1,582
8/26/95	1,819	1,819
8/27/95	1,902	1,902
8/28/95	1,559	1,559
8/29/95	1,523	1,523
8/30/95	1,516	1,516
8/31/95	1,521	1,521
9/1/95	0	0

201,667 SFD
399.996 AC-FT

WATER DISTRICT DATA

Table 1

Upper Snake River (District 1)
Rental Pool Activity Summary

Year	Rental Purchases	Water Used	Unused Initial Ag Rental	Reverted to Suppliers' Carryover	Excess Storage Use	Unused Rental Returned	Returned Rental
1979	88,870	88,248	13,960	11,715	60,000	2,573	832
1980	72,190	71,570	14,575	7,003	0	49,992	2,353
1981	170,107	167,718	24,039	9,721	125,000	8,958	878
1982	290,426	288,702	3,515	2,652	200,000	82,531	766
1983	540,606	540,325	3,084	4,021	350,000	183,220	775
1984	806,400	806,299	2,433	4,817	275,000	524,049	315
1985	497,302	496,049	11,689[4]	7,676	350,000	126,689	0
1986	895,642	882,215	9,735[5]	3,300	150,000	719,180	0
1987	307,833	302,669	114,606[6]	6,426	150,000	31,637	348
1988	235,524	196,984	136,054[7]	28,140	50,000	0	0[8]
1989	450,080	416,054	25,180	9,444	100,000	281,430	89
1990	401,197	295,507	61,525	94,946[9]	63,000	76,036	966
1991	229,172	201,301	05,677	3,963	99,000	12,661	1,396
1992	69,099	4,652	989	3,662	0	0	0
1993	426,642[10]	425,796[10]	38,974	1,409	271,647[10]	113,766	1,469
1994	463,171[11]	463,125[11]	75,888	9,058[12]	387,188[11]	0	0[8]
1995[13]	613,424	610,733	332,509[14]	--	255,000	--	--

. Rental purchases for ag purposes prior to, or during, the irrigation season.
. Snake River excess storage use.
. Unused initial ag rental *reverted to* suppliers' carryover.
. Includes 3,202 AF of groundwater mitigation rental.
. Includes 7,462 AF of groundwater mitigation rental,
. Includes 12,642 AF of groundwater mitigation rental.
. Includes 1,308 AF of groundwater mitigation rental,
. Returned rental used to balance excess storage use.
. Includes 60,459 AF of Henrys Pork excess storage use.
0. Includes 206,647 AF of H.O.R. water for fish flush.
1. Includes 387,188 AF of H.O.R. and City of Pocatello water for fish flush.
2. Includes 3,756 AF of Henrys Fork excess use.
3. The 1995 numbers are preliminary and are subject to change.
4. This includes the water rented from the Water Resource Board for recharge (295,313 AF). Hot all of this water has been recharged and will be a lower final number.

CHART 9. 1994 BOISE RIVER RESERVOIR STORAGE ACCOUNTS. (ACRE-FEET)

NUMBER	USER	ARROVROCK STORAGE	ANDERSON RANCH CARRYOVER	ANDERSON RANCH NEW FILL	ANDERSON RANCH STORAGE	LUCKY PEAK CARRYOVER	LUCKY PEAK NEW FILL	LUCKY PEAK STORAGE	SUBTOTAL	TRANSFERS	WTR BANK	TOTAL
13189600	TRINITY SPRINGS	0.0	800.0	0.0	800.0	0.0	0.0	0.0		0.0	0.0	800.0
13201050	LUCKY PEAK NURSERY	129.0	0.0	0.0	0.0	0.0	0.0	0.0	800.0	0.0	0.0	129.0
13201990	FISH & GAME FLOW	0.0	0.0	0.0	0.0	24447.0	10088.9	34535.9	34535.9	0.0	0.0	34535.9
13201991	USBR FLOW	0.0	0.0	0.0	0.0	37196.0	20642.0	57838.0	57838.0	0.0	-25000.0	32838.0
13203000	NEW YORK	164195.9	263718.3	0.0	263718.3	0.0	0.0	0.0	427914.2			
13203760	RIDENBAUGH	2471.6	0.0	0.0	0.0	31420.8	3579.2	35000.0	37471.6	19401.8	4753.0	0.0 413265
13204005	BURR	0.0	348.9	0.0	348.9	500.0	0.0	500.0	848.9	19900.0	0.0	848.9
13204060	ROSSI MILL	0.0	0.0	0.0	0.0	700.0	0.0	1700.0	1000.0 700.0	0.0	-502.0	198.0
13204190	BOISE CITY	0.0	0.0	0.0	0.0	867.9	132.1			0.0	0.0	15546.9 1000.0
13205515	SETTLERS	1856.3	3690.6	0.0	3690.6	10000.0	0.0	10000.0	15546.9	0.0	0.0	
13205517	DAVIS	0.0	0.0	0.0	0.0	1500.0	0.0	1500.0	1500.0	0.0	-500.0	1500.0
13205622	THURMAN MILL	0.0	950.0	0.0	0.0	800.0	0.0	800.0	800.0			300.0
13205638	BOISE WATER CORP			0.0	954.7	0.0	0.0	0.0	954.7	0.0	0.0	954.7
13205640	FARMERS UNION			0.0	3030.1	10000.0	0.0	10000.0	14883.8	0.0	-2000.0	14883.8
13205641	BOISE VALLEY	1853.7	3030.1 082.9	0.0	882.9	2500.0	0.0	2500.0	3382.9	0.0	-460.0	1382.9
13205643	CAPITOL VIEW	0.0	1276		460.0	300.0	0.0	300.0	760.0	0.0		300.0
13206090	NEW DRY CREEK	0.0		8:X	1276.8	3000.0	0.0	3000.0	4276.8	0.0	0.0	
13206092	NEW UNION	0.0	0.0	0.0	0.0	1380.9	19.1	1400.0	1400.0	0.0	0.0	4276
13206265	BALLENTYNE	0.0	371.9	0.0	371.9	1300.0	0.0	1300.0	1671.9	0.0	0.0	1671.9
13208710	MIDDLETON	0.0	0.0	0.0			895.5	11000.0	11000.0			
13209480	PHYLLIS	13556.4	16334.2	0.0	16334.2	16000.0	0.0	16000.0	45090.6		0.0	45890.6
13209482	EUREKA #1	0.0	0.0	0.0	0.0	2588.2	211.8	2800.0	2800.0	0.0	0.0	2800.0
13209630	LITTLE PIONEER		1160.1	0.0	1160.0	500.0		500.0	1660.1.	0.0	0.0	1660.1
13209990	CANYON COUNTY	0.0	0.0	0.0	0.0	4328.3	121x:;	5539.0	5539.0	0.0	-791.0	5539.0
13210992	SEBREE	790.0	0.0	0.0		0.0	0.0	0.0	791.4	0.0		0.4
99999050	ANDERSON DAM POWER	0.0	10940.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999080	ANDSN UNCONTRACTED			0.0	10949.9	0.0	0.0	0.0	10949.9	0.0	-10949.9	0.0
99999100	EAGLE IS CANALS	0.0	0.0	0.0	0.0	7265.5	384.5	7650.0	7650.0	-500.0	-500:o	6650.0
99999200	ENDANGERED SPECIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35949.9	35949.9
	TOTAL	184854.3	303978.4	0.0	303978.4	166699.1	37163.1	203862.9	692695.6	0.0	0.0	692695.6

CHART 9. 1993 BOISE RIVER RESERVOIR STORAGE ACCOUNTS. (ACRE-FEET)

NUMBER	USER	ARROWROCK STORAGE	ANDERSON RANCH CARRYOVER	ANDERSON RANCH NEW FILL	ANDERSON RANCH STORAGE	LUCKY PEAK CARRYOVER	LUCKY PEAK NEW FILL	LUCKY PEAK STORAGE	SUBTOTAL	TRANSFERS	WTR BANK	TOTAL
13189600	TRINITY SPRINGS	0.0	0.0	800.0	800.0	0.0	0.0	0.0	200.0	0.0	0.0	800.0
13201050	LUCKY PEAK NURSERY	200.0	0.0	0.0	0.0	0.0	0.0	50000.0	50000.0	0.0	0.0	200.0
13201990	FISH & GAME FLOW	0.0				645.0	49355.0			0.0	0.0	50000.0
13201991	USBR FLOW	0.0	0.0	0.0	0.0	19799.2	67129.4	06926.6	86928.6	0.0	0.0	86928.6
13203000	NEW YORK	254571.0	1203.5	358458.5	359662.0	0.0	0.0	0.0	614233.0	10450.1	0.0	624683.1
13203760	RIDENBAUGH	3832.0				2264.2	32735.8	35000.0	53969.0	0.0	0.0	53969.0
13204005	BUBB	0.0	0.0	15137.0	15137.0	0.0	500.0	500.0	1043.0	0.0	0.0	1043.0
13204060	ROSSI MILL	0.0	0.0	540.0	540.0	645.5	54.5	700.0	700.0	0.0	0.0	700.0
13204190	BOISE CITY	0.0	8:X	0.0	0.0	351.8	648.2	1000.0	1000.0	0.0	0.0	1000.0
13205515	SETTLERS	2878.0	0.0	6082.0	6082.0	290.5	9709.5	10000.0	18960.0	0.0	0.0	18960.0
13205517	DAVIS	0.0	0.0	0.0	0.0	328.4	1171.6	1500.0	1500.0	0.0	0.0	1500.0
13201622	THURMAN MILL	0.0	0.0	0.0	0.0	569.5	230.5	800.0	800.0	0.0	0.0	800.0
13205638	BOISE WATER CORP	0.0	197.3	802.7	1000.0	0.0	0.0	0.0	1000.0	0.0	0.0	1000.0
13205640	FARMERS UNION	2874.0	0.0	5727.0	5727.0	1164.6	8835.4	10000.0	18601.0	0.0	0.0	18601.0
13205641	BOISE VALLEY	0.0	0.0	961.0	961.0	0.0	2500.0	2500.0	3461.0	0.0	0.0	3461.0
13205643	CAPITOL VIEW	0.0	16.0	444.0	460.0	62.4	237.6	300.0	760.0	0.0		760.0
13206090	NEW DRY CREEK	0.0	0.0	1296.0	1296.0	890.3	2109.7	3000.0	4296.0	0.0	0.0	4296.0
13206092	NEW UNION	0.0	0.0	0.0	0.0	871.8	528.2	1400.0	1400.0	0.0	0.0	1400.0
13206265	BALLENTYNE	0.0	0.0	376.0	376.0	49.2	1250.8	1300.0	1676.0	0.0	0.0	1676.0
13208710	MIDDLETON	0.0	0.0	0.0	0.0	1287.2	9712.8	11000.0	11000.0	0.0	0.0	11000.0
13209480	PHYLLIS	21018.0	0.0	25582.0	25582.0	519.4	15480.6	16000.0	62600.0	0.0	0.0	62600.0
13209482	EUREKA #1	0.0	0.0	0.0	0.0	1367.4	1432[illegible]	2800.0	2800.0	0.0	0.0	2800.0
13209630	LITTLE PIONEER	0.0	0.0	2174.0	2170.0	18.1	481[illegible]	500.0	2674.0	0.0	0.0	2674.0
13209990	CANYON COUNTY	1227.0	0.0	0.0	0.0	1697.4	4302.6	6000.0 0.0	1227.0	0.0	0.0	601180.0
13210992	SEBREE			0.0	[illegible]	0.0	0.0			0.0	-39.0	
99999050	ANDERSON DAM POWER	0.0	328.5	3071.5	3400.0	0.0	0.0	0.0	3400.0	-400.0	-3000.0	0.0
99999080	ANDSK UNCONTRACTED	0.0	41000.0	0.0	41000.0	1756.0	5894.0	0.0	41000.0	-10050.1	-20000:o	10949.9
99999100	EAGLE IS CANALS	0.0	0.0	0.0	0.0			7650.0	7650.0	0.0	0.0	7650.0
99999200	ENDANGERED SPECIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23000.0	23000.0
99999950	BOISE R WATER BANK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	39.0
	TOTAL	286600.0	42745.3	421454.7	464200.0	34577.9	214300.7	248878.6	999678.6	0.0	0.0	999678.6

TABLE 3, 1995 BOISE RIVRVOIR STORAGE ACCOUNTS. (ACRE-FEET)

NUMBER	USER	ARROVROCK STORAGE	ANDERSON RANCH CARRYOVER	ANDERSON RANCH NEW FILL	ANDERSON RANCH STORAGE	LUCKY PEAK CARRYOVER	LUCKY PEAK NEW FILL	LUCKY PEAK STORAGE	SUBTOTAL	TRANSFERS	WTR BANK	TOTAL
							0.0			0.0		
13189600	TRINITY SPRINGS	0.0	799.B	0.2	800.0	0.0	0.0	0.0	800.0	0.0	0.0	800.0
13201050	LUCKY PEAK NURSERY	200.0	0.0	0.0	0.0	0.0	...	0.0	200.0	...	0.0	200.0
13201990	FISH & GAME FLOW	0.0	0.0	0.0	0.0	33922.9	16077.1	50000.0	50000.0	0.0	0.0	50000.0
13201991	USBR FLOW	0.0	0.0	0.0	0.0	32146.0	70154.0	102300.0	102300.0	0.0	-130001.0	614233.0
13203000	NEW YORK	254571.0	11967.9	347694.1	359662.0	0.0	0.0	0.0	614233.0	0.0		
13203760	RIDENBAUGH	3832.0	0.0	15137.0	15137.0	0.0	35000.0	35000.0	53969.0	0.0	0.0	53969.0
13204005	BUBB	0.0	0.0	543.0	543.0	213.8	286.2	500.0	1043.0	0.0	0.0	1043.0
13204060	ROSSI KILL	0.0	0.0	0.0	0.0	198.0	502.0	700.0	700.0	0.0	0.0	700.0
13204190	BOISE CITY	0.0	0.0	0.0	0.0	487.7	512.3	1000.0	1000.0	0.0	0.0	1000.0
13205515	SETTLERS	2878.0	0.0	6082.0	6082.0	359.9	9640.1	10000.0	18960.0		0.0	18960.0
13205517	DAVIS	0.0	0.0	0.0	0.0	722.9	777.1	1500.0	1500.0	0.0	0.0	1500.0
13205622	THURMAN MILL	0.0	0.0	0.0	0.0	184.6	615.4	800.0	800.0	0.0	0.0	800.0
13205638	BOISE WATER CORP	0.0	336.1	663.9	1000.0	0.0	0.0	0.0	1000.0	0.0	0.0	1000.0.
13205660	FARMERS UNION	2874.0	0.0	5727.0	5727.0	2445.9	7554.1	10000.0	18601.0	0.0	0.0	18601.0
13205641	BOISE VALLEY	0.0	0.0	961.0	961.0	566.6	1933.4	2500.0	3461.0	0.0	0.0	3461.0
13205643	CAPI TOL VIEW	0.0	0.0	460.0	460.0	300.0	0.0	300.0	760.0	0.0	0.0	760.0
13206090	NEW DRY CREEK	0.0	0.0	1296.0	1296.0	1807.6	1192.4	3000.0	4296.0	0.0	0.0	4296.0
13206092	NEW UNION	0.0	0.0	0.0	0.0	1373.0	27.0	1400.0	1400.0	0.0	0.0	1400.0
13206265	BALLENTYNE	0.0	0.0	376.0	376.0	161.1	1138.9	1300.0	1676.0	0.0		1676.0
13208710	MIDDLETON	0.0	0.0	0.0	0.0	4725.0	6275.0	11000.0	11000.0	0.0	0.0	11000.0
13209480	PHYLLIS	21018.0	0.0	25582.0	25582.0	149.3	15850.7	16000.0	62600.0	0.0	0.0	62600.0
13209482	EUREKA #1	0.0	0.0	0.0	0.0	1868.8	931.2	2800.0	2800.0	0.0	0.0	2800.0
13209630	LITTLE PIONEER	0.0	0.0	2174.0	2174.0	225.7	274.3	500.0	2674.0	0.0	0.0	267b.0
13209990	CANYON COUNTY	0.0	0.0	0.0	0.0	1639.7	4360.3	6000.0	6000.0	0.0	0.0	6000.0
13210992	SEBREE	1227.0	0.0	0.0	0.0	0.0	0.0	0.0	1227.0	0.0	.1000.0	227.0
99999050	ANDERSON DAM POWER	0.0	0.0	3400.0	3400.0	0.0	0.0	0.0	3400.0	0.0	0.0	3400.0
99999080	ANDSN UNCONTRACTED	0.0	0.0	4tooo.o	41000.0	0.0	0.0	0.0	41000.0	0.0	-13001.0	27999.0
99999100	EAGLE IS CAWALS	0.0	0.0	0.0	0.0	5427.0	2223.0	7650.0	7650.0	0.0	0.0	7650.0
99999200	ENDANGERED SPECIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27000.0	27000.0
99999950	BOISE R WATER BANK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
	TOTAL	286600.0	13103.8	451096.2	464200.0	88925.5	175324.5	264250.0	1015050.0	0.0	0.0	1015050.0

Water District No. 85
Rental Pool Summary
1990-95

Year	Water Releases Timing	Total Acre Feet
1990	*	61,175
1991	*	102,525
1992	Dec.- February	90,000
1993	July-August	130,000
1994	July-August	62,000
1995	Dec.10 - Feb 24	145,000
Totals		590,700

* Records unavailable at this time.

DWORSHAK RESERVOIR OPERATIONS

1991 - 1995

DWORSHAK OPERATIONS

1-JAN-91 TO 30-NOV-92

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
1-Jan-91	2400	10.1	0.0	1.9	1544.2			*NOTE ALL NEGITIVE	
2-Jan-91	2400	10.1	0.0	2.1	1543.1			FISH FLOWS ESTIMATE	
3-Jan-91	2400	10.2	0.0	2.1	1541.9			ARE TAKEN AS ZERO	
4-Jan-91	2400	10.2	0.0	2.0	1540.8				
5-Jan-91	2400	10.2	0.0	1.9	1539.6				
6-Jan-91	2400	10.2	0.0	1.8	1538.4				
7-Jan-91	2400	10.3	0.0	2.0	1537.2				
8-Jan-91	2400	10.3	0.0	1.7	1536.0				
9-Jan-91	2400	10.3	0.0	1.9	1534.7				
10-Jan-91	2400	10.3	0.0	2.2	1533.5				
11-Jan-91	2400	10.4	0.0	1.9	1532.3				
12-Jan-91	2400	10.4	0.0	3.2	1531.1				
13-Jan-91	2400	10.4	0.0	4.3	1530.1				
14-Jan-91	2400	10.4	0.0	5.6	1529.3				
15-Jan-91	2400	10.4	0.0	6.7	1528.7				
16-Jan-91	2400	10.4	0.0	5.8	1528.1				
17-Jan-91	2400	10.5	0.0	5.1	1527.4				
18-Jan-91	2400	10.5	0.0	4.4	1526.5				
19-Jan-91	2400	10.5	0.0	4.5	1525.6				
20-Jan-91	2400	10.5	0.0	4.1	1524.7				
21-Jan-91	2400	10.5	0.0	3.0	1523.6				
22-Jan-91	2400	10.5	0.0	2.9	1522.5				
23-Jan-91	2400	10.5	0.0	2.8	1521.3				
24-Jan-91	2400	10.5	0.0	2.8	1520.1				
25-Jan-91	2400	10.5	0.0	2.6	1519.0				
26-Jan-91	2400	10.5	0.0	2.1	1517.7				
27-Jan-91	2400	10.6	0.0	2.2	1516.4				
28-Jan-91	2400	10.6	0.0	2.3	1515.1				
29-Jan-91	2400	10.7	0.0	2.5	1513.8				
30-Jan-91	2400	10.4	0.0	1.6	1512.4				
31-Jan-91	2400	9.4	0.0	2.2	1511.2				
1-Feb-91	2400	6.9	0.0	2.6	1510.1				
2-Feb-91	2400	4.8	0.0	2.8	1509.7				
3-Feb-91	2400	4.6	0.0	2.7	1509.5				
4-Feb-91	2400	4.0	0.0	3.6	1509.4				
5-Feb-91	2400	3.3	0.0	4.3	1509.4				
6-Feb-91	2400	3.3	0.0	5.1	1509.7				
7-Feb-91	2400	3.3	0.0	4.8	1509.9				
8-Feb-91	2400	3.3	0.0	4.6	1510.2				
9-Feb-91	2400	2.0	0.0	4.5	1510.5				
10-Feb-91	2400	2.0	0.0	4.8	1510.9				
11-Feb-91	2400	3.3	0.0	4.9	1511.3				
12-Feb-91	2400	2.0	0.0	4.6	1511.6				
13-Feb-91	2400	2.0	0.0	5.0	1512.0				
14-Feb-91	2400	2.0	0.0	5.8	1512.6				
15-Feb-91	2400	2.0	0.0	6.5	1513.2				
16-Feb-91	2400	2.0	0.0	8.5	1514.1				
17-Feb-91	2400	2.0	0.0	9.2	1515.2				
18-Feb-91	2400	2.0	0.0	8.1	1516.3				
19-Feb-91	2400	2.0	0.0	8.7	1517.2				
20-Feb-91	2400	2.0	0.0	18.3	1518.9				
21-Feb-91	2400	2.0	0.0	19.1	1521.7				
22-Feb-91	2400	2.0	0.0	14.8	1523.9				
23-Feb-91	2400	2.0	0.0	12.1	1525.6				
24-Feb-91	2400	2.0	0.0	10.6	1527.0				

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
25-Feb-91	2400	2.0	0.0	8.7	1528.1				
26-Feb-91	2400	2.0	0.0	8.4	1529.1				
27-Feb-91	2400	2.0	0.0	7.9	1530.0				
28-Feb-91	2400	2.1	0.0	7.1	1530.8				
1-Mar-91	2400	2.2	0.0	7.7	1531.6				
2-Mar-91	2400	2.0	0.0	7.4	1532.4				
3-Mar-91	2400	2.0	0.0	8.2	1533.1				
4-Mar-91	2400	2.0	0.0	9.6	1534.2				
5-Mar-91	2400	2.0	0.0	11.7	1535.5				
6-Mar-91	2400	1.9	0.0	10.2	1536.7				
7-Mar-91	2400	1.9	0.0	8.1	1537.8				
8-Mar-91	2400	1.8	0.0	8.1	1538.7				
9-Mar-91	2400	1.9	0.0	6.8	1539.5				
10-Mar-91	2400	1.8	0.0	6.7	1540.2				
11-Mar-91	2400	2.2	0.0	6.3	1540.8				
12-Mar-91	2400	3.6	0.0	5.6	1541.3				
13-Mar-91	2400	4.0	0.0	5.7	1541.6				
14-Mar-91	2400	4.5	0.0	5.1	1541.7				
15-Mar-91	2400	4.5	0.0	4.9	1541.8				
16-Mar-91	2400	4.5	0.0	4.8	1541.8				
17-Mar-91	2400	4.5	0.0	4.8	1541.9				
18-Mar-91	2400	4.5	0.0	4.4	1541.9				
19-Mar-91	2400	4.5	0.0	4.4	1541.9				
20-Mar-91	2400	4.5	0.0	5.0	1541.9				
21-Mar-91	2400	4.5	0.0	4.8	1542.0				
22-Mar-91	2400	4.5	0.0	4.9	1542.0				
23-Mar-91	2400	4.5	0.0	4.6	1542.0				
24-Mar-91	2400	4.5	0.0	4.9	1542.1				
25-Mar-91	2400	4.5	0.0	4.9	1542.1				
26-Mar-91	2400	4.3	0.0	4.5	1542.2				
27-Mar-91	2400	2.2	0.0	4.5	1542.4				
28-Mar-91	2400	1.2	0.0	4.4	1542.7				
29-Mar-91	2400	1.2	0.0	4.1	1543.2				
30-Mar-91	2400	1.2	0.0	4.0	1543.6				
31-Mar-91	2400	1.2	0.0	4.6	1544.0				
1-Apr-91	2400	1.2	0.0	5.2	1544.5	2.576	1.2	0.0	2.576
2-Apr-91	2400	1.2	0.0	8.2	1545.3		2.3	-1.1	
3-Apr-91	2400	2.8	0.0	8.5	1546.3		2.6	0.2	
4-Apr-91	2400	3.1	0.0	9.5	1547.1		3.6	-0.5	
5-Apr-91	2400	1.5	0.0	14.2	1548.3		8.3	-6.8	
6-Apr-91	2400	1.2	0.0	16.5	1550.5		10.6	-9.4	
7-Apr-91	2400	1.2	0.0	13.5	1552.3		7.6	-6.4	
8-Apr-91	2400	1.2	0.0	11.6	1553.9		5.7	-4.5	
9-Apr-91	2400	1.2	0.0	11.1	1555.3		5.2	-4.0	
10-Apr-91	2400	1.3	0.0	10.2	1556.6		4.3	-3.0	
11-Apr-91	2400	1.3	0.0	9.2	1557.7		3.3	-2.0	
12-Apr-91	2400	1.3	0.0	7.1	1558.8		2.2	-0.9	
13-Apr-91	2400	1.0	0.0	8.6	1559.8		2.7	-1.7	
14-Apr-91	2400	1.0	0.0	8.5	1560.8		2.6	-1.6	
15-Apr-91	2400	1.5	0.0	8.4	1561.7		2.5	-1.0	
16-Apr-91	2400	1.3	0.0	8.3	1562.7		2.4	-1.1	
17-Apr-91	2400	1.2	0.0	8.4	1563.6		2.5	-1.3	
18-Apr-91	2400	1.3	0.0	8.9	1564.5		3.0	-1.7	
19-Apr-91	2400	1.3	0.0	8.6	1565.5		2.7	-1.4	
20-Apr-91	2400	1.3	0.0	9.8	1566.6		3.9	-2.6	
21-Apr-91	2400	1.3	0.0	11.0	1567.7		5.1	-3.8	
22-Apr-91	2400	1.3	0.0	12.1	1569.0		6.2	-4.9	
23-Apr-91	2400	1.3	0.0	13.4	1570.5		7.6	-6.3	
24-Apr-91	2400	1.3	0.0	16.5	1572.2		10.6	-9.3	

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
25-Apr-91	2400	1.3	0.0	15.0	1574.1		9.1	-7.8	
26-Apr-91	2400	15.8	8.5	13.3	1575.1		7.4	8.4	
27-Apr-91	2400	25.1	15.3	11.0	1573.6		5.1	20.0	
28-Apr-91	2400	25.1	15.3	10.2	1571.9		4.3	20.8	
29-Apr-91	2400	25.0	15.2	10.2	1570.0		4.3	20.7	
30-Apr-91	2400	25.4	15.6	9.2	1568.0		3.3	22.1	
1-May-91	2400	25.2	15.3	8.2	1565.8		2.3	22.9	
2-May-91	2400	25.1	15.2	8.4	1563.6		2.5	22.6	
3-May-91	2400	25.0	15.0	8.6	1561.4		2.7	22.3	
4-May-91	2400	25.1	15.1	8.8	1559.2		2.9	22.2	
5-May-91	2400	17.0	7.0	8.5	1557.3		2.6	14.4	
6-May-91	2400	11.5	1.6	9.5	1556.8		3.6	7.9	
7-May-91	2400	11.6	1.6	10.9	1556.6		5.0	6.6	
8-May-91	2400	11.6	1.6	16.9	1556.8		11.0	0.6	
9-May-91	2400	11.5	1.6	17.8	1557.8		11.9	-0.4	
10-May-91	2400	11.5	1.6	14.5	1558.4		8.6	2.9	
11-May-91	2400	11.5	1.6	14.5	1558.8		8.6	2.9	
12-May-91	2400	17.2	7.3	15.5	1558.9		9.6	7.6	
13-May-91	2400	20.1	10.2	16.2	1558.4		10.3	9.8	
14-May-91	2400	14.7	7.3	16.4	1558.2		10.5	4.2	
15-May-91	2400	20.2	10.2	15.6	1558.1		9.7	10.5	
16-May-91	2400	20.1	10.1	16.1	1557.5		10.2	9.9	
17-May-91	2400	20.1	10.1	16.5	1556.9		10.6	9.5	
18-May-91	2400	16.7	6.7	23.3	1557.1		17.4	-0.7	
19-May-91	2400	9.0	2.1	28.1	1558.8		22.2	-13.2	
20-May-91	2400	4.4	0.0	25.3	1561.7		19.4	-15.0	
21-May-91	2400	4.3	0.0	24.6	1564.5		18.7	-14.4	
22-May-91	2400	5.0	0.0	22.8	1566.9		16.9	-11.9	
23-May-91	2400	6.9	0.0	22.0	1569.0		16.1	-9.2	
24-May-91	2400	6.6	0.0	21.8	1571.0		15.9	-9.3	
25-May-91	2400	2.0	0.0	22.0	1573.2		16.1	-14.1	
26-May-91	2400	2.1	0.0	19.4	1575.5		13.5	-11.4	
27-May-91	2400	1.9	0.0	17.5	1577.5		11.6	-9.7	
28-May-91	2400	4.6	0.0	15.6	1579.2		9.7	-5.1	
29-May-91	2400	9.6	0.0	14.9	1580.0		9.0	0.6	
30-May-91	2400	9.6	0.0	15.9	1580.7		10.0	-0.4	
31-May-91	2400	9.6	0.0	14.9	1581.4		9.0	0.6	
1-Jun-91	2400	13.1	3.5	14.3	1581.8		8.4	4.7	
2-Jun-91	2400	14.9	5.3	14.1	1581.7		8.2	6.7	
3-Jun-91	2400	11.4	1.8	16.1	1582.8		10.2	1.2	
4-Jun-91	2400	8.9	0.0	14.9	1582.6		9.0	-0.1	
5-Jun-91	2400	3.9	0.0	16.1	1583.7		10.2	-6.3	
6-Jun-91	2400	2.2	0.0	18.0	1585.2		12.1	-9.9	
7-Jun-91	2400	2.1	0.0	18.9	1587.1		13.0	-10.9	
8-Jun-91	2400	2.1	0.0	16.5	1588.9		10.6	-8.5	
9-Jun-91	2400	1.9	0.0	16.4	1590.5		10.5	-8.6	
10-Jun-91	2400	7.0	0.0	15.2	1591.8		9.3	-2.3	
11-Jun-91	2400	8.8	0.0	17.1	1592.6		11.2	-2.4	
12-Jun-91	2400	6.4	0.0	15.6	1593.7		9.7	-3.3	
13-Jun-91	2400	6.4	0.0	14.8	1594.7		8.9	-2.5	
14-Jun-91	2400	6.4	0.0	12.9	1595.4		7.0	-0.6	
15-Jun-91	2400	5.7	0.0	11.8	1596.1	3.460	5.9	-0.2	3.398
16-Jun-91	2400	5.7	0.0	11.8	1596.8	3.460	11.8	-6.1	
17-Jun-91	2400	5.7	0.0	10.4	1597.4	3.460	10.4	-4.7	
18-Jun-91	2400	6.6	0.0	10.4	1597.8	3.460	10.4	-3.8	
19-Jun-91	2400	9.3	0.0	10.3	1597.9	3.460	10.3	-1.0	
20-Jun-91	2400	9.4	0.0	11.3	1598.0	3.460	11.3	-1.9	
21-Jun-91	2400	9.4	0.0	11.3	1598.3	3.460	11.3	-1.9	
22-Jun-91	2400	6.0	0.0	10.8	1598.6	3.460	10.8	-4.8	

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
23-Jun-91	2400	6.0	0.0	10.7	1599.1	3.460	10.7	-4.7	
24-Jun-91	2400	8.7	0.0	10.6	1599.5	3.460	10.6	-1.9	3.460
25-Jun-91	2400	10.2	0.8	11.2	1599.6	3.460	11.2	-1.0	
26-Jun-91	2400	12.0	2.6	10.1	1599.6	3.460	10.1	1.9	
27-Jun-91	2400	10.3	0.9	9.9	1599.3	3.460	9.9	0.4	
28-Jun-91	2400	9.4	0.0	9.3	1599.3	3.460	9.3	0.1	
29-Jun-91	2400	9.4	0.0	9.2	1599.3	3.460	9.2	0.2	
30-Jun-91	2400	7.6	0.0	11.4	1599.5	3.460	11.4	-3.8	
1-Jul-91	2400	9.4	0.0	9.2	1599.7	3.460	9.2	0.2	
2-Jul-91	2400	9.4	0.0	8.7	1599.7	3.460	8.7	0.7	
3-Jul-91	2400	9.4	0.0	8.4	1599.6	3.460	8.4	1.0	
4-Jul-91	2400	7.5	0.0	7.5	1599.6	3.460	7.5	0.0	
5-Jul-91	2400	7.4	0.0	7.7	1599.6	3.460	7.7	-0.3	
6-Jul-91	2400	6.1	0.0	6.8	1599.7	3.460	6.8	-0.7	
7-Jul-91	2400	5.9	0.0	6.6	1599.7	3.460	6.6	-0.7	
8-Jul-91	2400	6.1	0.0	6.0	1599.7	3.460	6.0	0.1	
9-Jul-91	2400	7.0	0.0	5.9	1599.7	3.460	5.9	1.1	
10-Jul-91	2400	9.4	0.0	5.2	1599.3	3.460	5.2	4.2	
11-Jul-91	2400	9.4	0.0	4.7	1598.9	3.460	4.7	4.7	
12-Jul-91	2400	9.4	0.0	4.2	1598.3	3.460	4.2	5.2	
13-Jul-91	2400	7.2	0.0	3.5	1597.8	3.460	3.5	3.7	
14-Jul-91	2400	4.3	0.0	4.7	1597.7	3.460	4.7	-0.4	
15-Jul-91	2400	4.2	0.0	4.2	1597.8	3.460	4.2	0.0	
16-Jul-91	2400	2.1	0.0	4.0	1597.9	3.460	4.0	-1.9	
17-Jul-91	2400	1.6	0.0	4.4	1598.1	3.460	4.4	-2.8	
18-Jul-91	2400	1.6	0.0	4.2	1598.4	3.460	4.2	-2.6	
19-Jul-91	2400	1.6	0.0	2.9	1598.6	3.460	2.9	-1.3	
20-Jul-91	2400	1.6	0.0	3.6	1598.8	3.460	3.6	-2.0	
21-Jul-91	2400	1.6	0.0	3.5	1599.0	3.460	3.5	-1.9	
22-Jul-91	2400	1.8	0.0	3.5	1599.2	3.460	3.5	-1.7	
23-Jul-91	2400	3.5	0.0	3.2	1599.3	3.460	3.2	0.3	
24-Jul-91	2400	4.1	0.0	3.3	1599.3	3.460	3.3	0.8	
25-Jul-91	2400	3.8	0.0	2.5	1599.2	3.460	2.5	1.3	
26-Jul-91	2400	2.8	0.0	3.1	1599.1	3.460	3.1	-0.3	
27-Jul-91	2400	1.1	0.0	2.9	1599.2	3.460	2.9	-1.8	
28-Jul-91	2400	1.1	0.0	2.7	1599.4	3.460	2.7	-1.6	
29-Jul-91	2400	2.9	0.0	2.2	1599.5	3.460	2.2	0.7	
30-Jul-91	2400	1.8	0.0	2.4	1599.5	3.460	2.4	-0.6	
31-Jul-91	2400	1.1	0.0	2.1	1599.6	3.460	2.1	-1.0	
1-Aug-91	2400	2.9	0.0	2.9	1599.7	3.460	2.9	0.0	
2-Aug-91	2400	3.5	0.0	2.5	1599.6	3.460	2.5	1.0	
3-Aug-91	2400	1.1	0.0	2.5	1599.5	3.460	2.5	-1.4	
4-Aug-91	2400	1.1	0.0	2.1	1599.7	3.460	2.1	-1.0	
5-Aug-91	2400	3.3	0.0	2.3	1599.7	3.460	2.3	1.0	
6-Aug-91	2400	2.8	0.0	2.0	1599.6	3.460	2.0	0.8	
7-Aug-91	2400	2.1	0.0	2.1	1599.6	3.460	2.1	0.0	
8-Aug-91	2400	3.0	0.0	1.3	1599.5	3.460	1.3	1.7	
9-Aug-91	2400	1.6	0.0	1.2	1599.4	3.460	1.2	0.4	
10-Aug-91	2400	1.1	0.0	2.1	1599.4	3.460	2.1	-1.0	
11-Aug-91	2400	1.1	0.0	2.1	1599.5	3.460	2.1	-1.0	
12-Aug-91	2400	1.1	0.0	1.2	1599.6	3.460	1.2	-0.1	
13-Aug-91	2400	1.1	0.0	1.6	1599.6	3.460	1.6	-0.5	
14-Aug-91	2400	1.1	0.0	1.8	1599.7	3.460	1.8	-0.7	
15-Aug-91	2400	1.1	0.0	1.6	1599.7	3.460	1.6	-0.5	
16-Aug-91	2400	6.3	0.0	1.5	1599.6	3.460	1.5	4.8	3.465
17-Aug-91	2400	9.4	0.0	0.8	1598.8		1.2	8.2	
18-Aug-91	2400	9.4	0.0	0.4	1597.9		1.2	8.2	
19-Aug-91	2400	9.4	0.0	0.5	1596.9		1.2	8.2	
20-Aug-91	2400	9.4	0.0	0.4	1596.0		1.2	8.2	

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
21-Aug-91	2400	7.0	0.0	0.6	1595.0		1.2	5.8	
22-Aug-91	2400	1.2	0.0	1.1	1594.8		1.2	0.0	
23-Aug-91	2400	1.2	0.0	1.2	1594.8		1.2	0.0	
24-Aug-91	2400	1.2	0.0	1.4	1594.8		1.2	0.0	
25-Aug-91	2400	1.2	0.0	1.2	1594.8		1.2	0.0	
26-Aug-91	2400	1.2	0.0	1.4	1594.9		1.2	0.0	
27-Aug-91	2400	1.2	0.0	1.3	1594.8		1.2	0.0	
28-Aug-91	2400	1.4	0.0	1.3	1594.8		1.2	0.2	
29-Aug-91	2400	1.5	0.0	1.5	1594.8		1.2	0.3	
30-Aug-91	2400	1.5	0.0	1.1	1594.8		1.2	0.3	
31-Aug-91	2400	1.2	0.0	1.1	1594.8	3.455	1.2	0.0	3.371
1-Sep-91	2400	1.2	0.0	1.2	1594.8				
2-Sep-91	2400	1.2	0.0	1.3	1594.8		FISH TOT	41.6	
3-Sep-91	2400	5.5	0.0	1.2	1594.7		(MAF)	0.083	
4-Sep-91	2400	9.4	0.0	0.1	1593.8				
5-Sep-91	2400	9.4	0.0	0.4	1592.8	Rev. Stor.	Est. Fish	Rev. Hist.	
6-Sep-91	2400	9.4	0.0	0.1	1591.7	MAF	MAF	MAF	
7-Sep-91	2400	9.4	0.0	0.1	1590.7	3.455	0.083	3.372	
8-Sep-91	2400	9.4	0.0	0.1	1589.6				
9-Sep-91	2400	9.5	0.0	0.2	1588.6				
10-Sep-91	2400	9.5	0.0	0.1	1587.6				
11-Sep-91	2400	9.5	0.0	0.3	1586.5				
12-Sep-91	2400	9.5	0.0	0.5	1585.5				
13-Sep-91	2400	9.5	0.0	0.2	1584.4				
14-Sep-91	2400	9.5	0.0	0.6	1583.4				
15-Sep-91	2400	9.5	0.0	0.7	1582.4				
16-Sep-91	2400	9.2	0.0	0.6	1581.3				
17-Sep-91	2400	9.6	0.0	0.3	1580.2				
18-Sep-91	2400	9.5	0.0	0.6	1579.2				
19-Sep-91	2400	9.4	0.0	0.3	1578.1				
20-Sep-91	2400	9.0	0.0	0.6	1577.0				
21-Sep-91	2400	9.6	0.0	0.3	1575.9				
22-Sep-91	2400	9.6	0.0	0.4	1574.8				
23-Sep-91	2400	9.6	0.0	0.4	1573.7				
24-Sep-91	2400	9.7	0.0	0.7	1572.5				
25-Sep-91	2400	9.7	0.0	0.2	1571.4				
26-Sep-91	2400	9.7	0.0	0.8	1570.2				
27-Sep-91	2400	9.7	0.0	0.4	1569.1				
28-Sep-91	2400	9.8	0.0	0.7	1567.9				
29-Sep-91	2400	9.8	0.0	0.8	1566.7				
30-Sep-91	2400	9.3	0.0	0.4	1565.6				
1-Oct-91	2400	1.9	0.0	0.7	1564.9				
2-Oct-91	2400	1.9	0.0	0.9	1564.8				
3-Oct-91	2400	1.9	0.0	0.8	1564.6				
4-Oct-91	2400	1.9	0.0	1.1	1564.5				
5-Oct-91	2400	1.9	0.0	0.8	1564.4				
6-Oct-91	2400	1.9	0.0	0.9	1564.3				
7-Oct-91	2400	1.9	0.0	0.8	1564.1				
8-Oct-91	2400	1.9	0.0	0.8	1564.0				
9-Oct-91	2400	1.9	0.0	0.8	1563.8				
10-Oct-91	2400	2.0	0.0	0.9	1563.7				
11-Oct-91	2400	2.0	0.0	0.9	1563.5				
12-Oct-91	2400	2.0	0.0	0.8	1563.4				
13-Oct-91	2400	2.0	0.0	1.1	1563.3				
14-Oct-91	2400	2.0	0.0	1.2	1563.1				
15-Oct-91	2400	2.0	0.0	0.9	1563.0				
16-Oct-91	2400	2.0	0.0	0.4	1562.8				
17-Oct-91	2400	2.0	0.0	1.5	1562.7				
18-Oct-91	2400	2.0	0.0	0.9	1562.6				

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
19-Oct-91	2400	2.0	0.0	0.9	1562.4				
20-Oct-91	2400	2.0	0.0	1.0	1562.3				
21-Oct-91	2400	2.0	0.0	0.7	1562.1				
22-Oct-91	2400	2.0	0.0	1.3	1562.0				
23-Oct-91	2400	2.0	0.0	1.1	1561.9				
24-Oct-91	2400	2.0	0.0	2.1	1367.9				
25-Oct-91	2400	2.0	0.0	1.5	1561.7				
26-Oct-91	2400	2.0	0.0	1.1	1561.6				
27-Oct-91	2400	2.0	0.0	1.5	1561.5				
28-Oct-91	2400	2.0	0.0	1.2	1561.4				
29-Oct-91	2400	2.0	0.0	0.9	1561.3				
30-Oct-91	2400	2.0	0.0	0.6	1561.1				
31-Oct-91	2400	2.0	0.0	0.9	1561.0				
1-Nov-91	2400	2.0	0.0	1.3	1560.8				
2-Nov-91	2400	2.0	0.0	0.5	1560.7				
3-Nov-91	2400	2.0	0.0	0.7	1560.5				
4-Nov-91	2400	2.0	0.0	1.3	1560.4				
5-Nov-91	2400	2.0	0.0	2.5	1560.4				
6-Nov-91	2400	2.0	0.0	2.8	1560.4				
7-Nov-91	2400	2.0	0.0	2.1	1560.5				
8-Nov-91	2400	2.0	0.0	2.0	1560.4				
9-Nov-91	2400	2.0	0.0	2.1	1560.4				
10-Nov-91	2400	2.0	0.0	1.9	1560.4				
11-Nov-91	2400	2.0	0.0	1.5	1560.4				
12-Nov-91	2400	2.0	0.0	1.8	1560.3				
13-Nov-91	2400	2.1	0.0	3.5	1560.4				
14-Nov-91	2400	2.0	0.0	2.3	1560.5				
15-Nov-91	2400	2.0	0.0	1.9	1560.6				
16-Nov-91	2400	2.0	0.0	1.4	1560.5				
17-Nov-91	2400	2.0	0.0	1.4	1560.4				
18-Nov-91	2400	4.5	0.0	2.1	1560.3				
19-Nov-91	2400	6.6	0.0	2.0	1559.8				
20-Nov-91	2400	7.7	0.0	2.4	1564.9				
21-Nov-91	2400	7.7	0.0	2.9	1558.4				
22-Nov-91	2400	6.9	0.0	1.8	1557.7				
23-Nov-91	2400	5.7	0.0	1.2	1557.1				
24-Nov-91	2400	5.7	0.0	1.7	1556.5				
25-Nov-91	2400	5.6	0.0	3.1	1556.0				
26-Nov-91	2400	5.6	0.0	3.3	1555.7				
27-Nov-91	2400	5.7	0.0	2.8	1555.4				
28-Nov-91	2400	5.5	0.0	1.8	1554.9				
29-Nov-91	2400	5.5	0.0	2.3	1554.4				
30-Nov-91	2400	5.5	0.0	1.1	1553.9				
1-Dec-91	2400	5.5	0.0	1.1	1553.3				
2-Dec-91	2400	5.6	0.0	1.7	1552.7				
3-Dec-91	2400	9.1	0.0	1.7	1552.0				
4-Dec-91	2400	10.2	0.0	1.4	1550.8				
5-Dec-91	2400	9.9	0.0	1.7	1549.6				
6-Dec-91	2400	9.9	0.0	4.7	1548.7				
7-Dec-91	2400	7.0	0.0	6.3	1548.4				
8-Dec-91	2400	6.9	0.0	4.2	1548.2				
9-Dec-91	2400	8.5	0.0	2.9	1547.6				
10-Dec-91	2400	3.6	0.0	3.0	1547.1				
11-Dec-91	2400	3.0	0.0	2.9	1547.1				
12-Dec-91	2400	4.9	0.0	2.8	1546.9				
13-Dec-91	2400	2.2	0.0	3.1	1546.8				
14-Dec-91	2400	2.2	0.0	2.3	1546.9				
15-Dec-91	2400	2.2	0.0	1.7	1546.9				
16-Dec-91	2400	2.2	0.0	1.6	1546.8				

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
17-Dec-91	2400	2.1	0.0	1.3	1546.7				
18-Dec-91	2400	2.1	0.0	1.4	1546.6				
19-Dec-91	2400	2.1	0.0	2.0	1546.6				
20-Dec-91	2400	2.3	0.0	1.8	1546.5				
21-Dec-91	2400	2.2	0.0	1.4	1546.4				
22-Dec-91	2400	2.2	0.0	1.5	1546.3				
23-Dec-91	2400	2.2	0.0	1.7	1546.2				
24-Dec-91	2400	2.2	0.0	1.5	1546.2				
25-Dec-91	2400	2.2	0.0	1.6	1546.1				
26-Dec-91	2400	2.2	0.0	1.4	1546.0				
27-Dec-91	2400	2.2	0.0	1.2	1545.8				
28-Dec-91	2400	2.2	0.0	1.1	1545.7				
29-Dec-91	2400	2.2	0.0	1.1	1545.5				
30-Dec-91	2400	2.2	0.0	1.3	1545.4				
31-Dec-91	2400	2.2	0.0	1.5	1545.3				
1-Jan-92	2400	2.2	0.0	1.3	1545.2				
2-Jan-92	2400	2.2	0.0	1.2	1545.0				
3-Jan-92	2400	2.2	0.0	1.1	1544.9				
4-Jan-92	2400	2.2	0.0	1.4	1544.7				
5-Jan-92	2400	2.2	0.0	1.0	1544.6				
6-Jan-92	2400	2.2	0.0	1.4	1544.4				
7-Jan-92	2400	2.1	0.0	1.2	1544.3				
8-Jan-92	2400	2.1	0.0	1.0	1544.2				
9-Jan-92	2400	2.2	0.0	1.1	1544.0				
10-Jan-92	2400	2.3	0.0	1.1	1543.9				
11-Jan-92	2400	2.2	0.0	1.3	1543.7				
12-Jan-92	2400	2.2	0.0	1.3	1543.6				
13-Jan-92	2400	2.2	0.0	1.1	1543.5				
14-Jan-92	2400	2.2	0.0	1.1	1543.3				
15-Jan-92	2400	2.2	0.0	1.1	1543.2				
16-Jan-92	2400	2.2	0.0	1.4	1543.0				
17-Jan-92	2400	2.0	0.0	0.9	1542.9				
18-Jan-92	2400	1.2	0.0	1.2	1542.8				
19-Jan-92	2400	1.2	0.0	1.0	1542.8				
20-Jan-92	2400	1.2	0.0	0.7	1542.8				
21-Jan-92	2400	1.2	0.0	0.7	1542.7				
22-Jan-92	2400	1.2	0.0	1.0	1542.7				
23-Jan-92	2400	1.2	0.0	1.8	1542.7				
24-Jan-92	2400	1.2	0.0	2.0	1542.8				
25-Jan-92	2400	1.2	0.0	1.9	1542.9				
26-Jan-92	2400	1.2	0.0	1.9	1543.0				
27-Jan-92	2400	1.2	0.0	2.2	1543.1				
28-Jan-92	2400	1.2	0.0	4.2	1543.3				
29-Jan-92	2400	1.2	0.0	5.2	1543.9				
30-Jan-92	2400	1.2	0.0	4.7	1544.4				
31-Jan-92	2400	1.2	0.0	3.8	1544.8				
1-Feb-92	2400	1.2	0.0	3.3	1545.1				
2-Feb-92	2400	1.2	0.0	3.6	1545.5				
3-Feb-92	2400	1.2	0.0	3.5	1545.8				
4-Feb-92	2400	1.2	0.0	3.1	1546.1				
5-Feb-92	2400	1.2	0.0	2.7	1546.3				
6-Feb-92	2400	1.2	0.0	2.7	1546.5				
7-Feb-92	2400	1.2	0.0	2.7	1546.7				
8-Feb-92	2400	1.2	0.0	2.7	1546.9				
9-Feb-92	2400	1.2	0.0	2.6	1547.1				
10-Feb-92	2400	1.2	0.0	2.4	1547.3				
11-Feb-92	2400	1.2	0.0	2.5	1547.5				
12-Feb-92	2400	1.2	0.0	2.6	1547.6				
13-Feb-92	2400	1.2	0.0	2.6	1547.8				

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
14-Feb-92	2400	1.2	0.0	3.1	1548.1				
15-Feb-92	2400	1.2	0.0	2.9	1548.3				
16-Feb-92	2400	1.2	0.0	3.1	1548.6				
17-Feb-92	2400	1.2	0.0	3.0	1548.8				
18-Feb-92	2400	1.2	0.0	2.9	1549.1				
19-Feb-92	2400	1.2	0.0	4.3	1549.4				
20-Feb-92	2400	1.2	0.0	10.0	1550.1				
21-Feb-92	2400	1.2	0.0	12.8	1551.7				
22-Feb-92	2400	1.2	0.0	11.0	1553.1				
23-Feb-92	2400	1.2	0.0	9.9	1554.4				
24-Feb-92	2400	1.2	0.0	8.8	1555.5				
25-Feb-92	2400	1.2	0.0	7.7	1556.4				
26-Feb-92	2400	1.3	0.0	7.0	1557.2				
27-Feb-92	2400	1.3	0.0	6.6	1558.0				
28-Feb-92	2400	1.3	0.0	6.5	1558.7				
29-Feb-92	2400	1.3	0.0	6.5	1559.4				
1-Mar-92	2400	1.3	0.0	7.1	1560.2	2.803	7.1	-5.8	2.803
2-Mar-92	2400	1.3	0.0	8.0	1561.0	2.803	8.0	-6.7	
3-Mar-92	2400	1.3	0.0	7.8	1561.9	2.803	7.8	-6.5	
4-Mar-92	2400	1.3	0.0	8.1	1562.8	2.803	8.1	-6.8	
5-Mar-92	2400	1.3	0.0	7.3	1563.6	2.803	7.3	-6.0	
6-Mar-92	2400	1.3	0.0	6.9	1564.4	2.803	6.9	-5.6	
7-Mar-92	2400	1.3	0.0	6.6	1565.1	2.803	6.6	-5.3	
8-Mar-92	2400	1.3	0.0	6.4	1565.8	2.803	6.4	-5.1	
9-Mar-92	2400	1.3	0.0	6.2	1566.4	2.803	6.2	-4.9	
10-Mar-92	2400	1.3	0.0	5.7	1567.0	2.803	5.7	-4.4	
11-Mar-92	2400	1.3	0.0	5.5	1567.5	2.803	5.5	-4.2	
12-Mar-92	2400	1.3	0.0	5.4	1568.1	2.803	5.4	-4.1	
13-Mar-92	2400	1.3	0.0	5.6	1568.6	2.803	5.6	-4.3	
14-Mar-92	2400	1.3	0.0	5.9	1569.2	2.803	5.9	-4.6	
15-Mar-92	2400	1.3	0.0	6.3	1569.8	2.803	6.3	-5.0	
16-Mar-92	2400	1.3	0.0	6.8	1570.4	2.803	6.8	-5.5	
17-Mar-92	2400	1.3	0.0	7.7	1571.2	2.803	7.7	-6.4	
18-Mar-92	2400	1.3	0.0	7.7	1572.0	2.803	7.7	-6.4	
19-Mar-92	2400	1.3	0.0	6.8	1572.7	2.803	6.8	-5.5	
20-Mar-92	2400	1.3	0.0	6.4	1573.4	2.803	6.4	-5.1	
21-Mar-92	2400	1.3	0.0	6.0	1574.0	2.803	6.0	-4.7	
22-Mar-92	2400	1.3	0.0	5.6	1574.5	2.803	5.6	-4.3	
23-Mar-92	2400	1.3	0.0	5.5	1575.0	2.803	5.5	-4.2	
24-Mar-92	2400	1.3	0.0	5.2	1575.5	2.803	5.2	-3.9	
25-Mar-92	2400	1.3	0.0	5.2	1576.0	2.803	5.2	-3.9	
26-Mar-92	2400	1.3	0.0	5.0	1576.4	2.803	5.0	-3.7	
27-Mar-92	2400	1.3	0.0	5.6	1576.9	2.803	5.6	-4.3	
28-Mar-92	2400	1.3	0.0	5.4	1577.4	2.803	5.4	-4.1	
29-Mar-92	2400	1.3	0.0	5.0	1577.9	2.803	5.0	-3.7	
30-Mar-92	2400	1.3	0.0	4.8	1578.3	2.803	4.8	-3.5	
31-Mar-92	2400	1.3	0.0	5.2	1578.8	2.803	5.2	-3.9	
1-Apr-92	2400	1.3	0.0	5.6	1579.2	2.803	1.3	0.0	3.102
2-Apr-92	2400	1.3	0.0	6.4	1579.8		1.3	0.0	
3-Apr-92	2400	1.3	0.0	6.7	1580.4		2.3	-1.0	
4-Apr-92	2400	1.3	0.0	7.7	1581.1		1.5	-0.2	
5-Apr-92	2400	1.3	0.0	6.9	1581.8		1.2	0.1	
6-Apr-92	2400	1.4	0.0	6.6	1582.4		1.3	0.1	
7-Apr-92	2400	1.4	0.0	5.7	1583.0		1.3	0.1	
8-Apr-92	2400	1.4	0.0	5.4	1583.5		1.3	0.1	
9-Apr-92	2400	1.4	0.0	6.6	1584.0		1.3	0.1	
10-Apr-92	2400	1.4	0.0	8.4	1584.7		3.0	-1.6	
11-Apr-92	2400	1.4	0.0	7.3	1585.5		1.9	-0.5	
12-Apr-92	2400	1.3	0.0	6.7	1586.1		1.3	0.0	

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
13-Apr-92	2400	1.4	0.0	7.7	1586.8		2.3	-0.9	
14-Apr-92	2400	1.4	0.0	7.6	1587.5		2.2	-0.8	
15-Apr-92	2400	2.6	0.0	7.5	1588.1		2.1	0.5	
16-Apr-92	2400	2.6	0.0	8.0	1588.7		2.2	0.4	
17-Apr-92	2400	1.3	0.0	12.4	1589.6		7.0	-5.7	
18-Apr-92	2400	1.3	0.0	13.6	1590.9		8.2	-6.9	
19-Apr-92	2400	1.3	0.0	12.3	1592.2		6.9	-5.6	
20-Apr-92	2400	1.3	0.0	11.2	1593.3		5.8	-4.5	
21-Apr-92	2400	1.3	0.0	11.6	1594.4		6.2	-4.9	
22-Apr-92	2400	10.5	1.8	10.0	1595.0		4.6	5.9	
23-Apr-92	2400	12.0	2.6	8.4	1594.7		3.0	9.0	
24-Apr-92	2400	12.0	2.6	7.4	1594.2		2.0	10.0	
25-Apr-92	2400	12.0	2.6	7.4	1593.7		2.0	10.0	
26-Apr-92	2400	12.0	2.6	7.1	1593.2		1.7	10.3	
27-Apr-92	2400	3.5	0.0	9.4	1593.2		4.0	-0.5	
28-Apr-92	2400	2.1	0.0	10.6	1594.0		5.2	-3.1	
29-Apr-92	2400	2.1	0.0	11.7	1595.0		6.3	-4.2	
30-Apr-92	2400	2.9	0.0	14.6	1596.2		9.2	-6.3	
1-May-92	2400	12.0	2.6	13.7	1596.9		8.3	3.7	
2-May-92	2400	12.0	2.6	11.8	1597.0		6.4	5.6	
3-May-92	2400	12.0	2.6	10.4	1596.9		5.0	7.0	
4-May-92	2400	12.0	2.6	10.3	1596.7		4.9	7.1	
5-May-92	2400	12.0	2.6	10.7	1596.5		5.3	6.7	
6-May-92	2400	10.0	0.6	12.1	1596.6		6.7	3.3	
7-May-92	2400	9.8	0.4	13.2	1596.9		7.8	2.0	
8-May-92	2400	9.4	0.0	13.5	1597.3		8.1	1.3	
9-May-92	2400	9.4	0.0	12.7	1597.7		7.3	2.1	
10-May-92	2400	9.4	0.0	11.7	1598.0		6.3	3.1	
11-May-92	2400	9.2	0.0	10.2	1598.1		4.8	4.4	
12-May-92	2400	2.0	0.0	9.4	1598.6		4.0	-2.0	
13-May-92	2400	2.9	0.2	9.0	1599.3		3.6	-0.7	3.461
14-May-92	2400	24.5	15.1	8.4	1598.6		3.0	21.5	
15-May-92	2400	24.3	14.8	4.1	1596.4		1.2	23.1	
16-May-92	2400	23.7	14.2	4.7	1594.3		1.2	22.5	
17-May-92	2400	3.0	0.2	7.4	1593.5		1.2	1.8	
18-May-92	2400	2.0	0.0	8.2	1594.2		1.2	0.8	
19-May-92	2400	2.0	0.0	8.7	1594.9		3.3	-1.3	
20-May-92	2400	2.1	0.0	10.9	1595.7		5.5	-3.4	
21-May-92	2400	9.4	0.0	8.7	1596.2		3.3	6.1	
22-May-92	2400	9.4	0.0	7.2	1596.0		1.8	7.6	
23-May-92	2400	9.4	0.0	6.9	1595.7		1.5	7.9	
24-May-92	2400	9.4	0.0	6.9	1595.5		1.5	7.9	
25-May-92	2400	9.4	0.0	6.6	1595.2		1.2	8.2	
26-May-92	2400	11.9	2.5	7.6	1594.8		2.2	9.7	
27-May-92	2400	11.9	2.5	7.3	1594.3		1.9	10.0	
28-May-92	2400	11.9	2.5	5.5	1593.7		1.2	10.7	
29-May-92	2400	11.9	2.4	5.6	1593.0		1.2	10.7	
30-May-92	2400	11.8	2.4	5.1	1592.3		1.2	10.6	
31-May-92	2400	11.8	2.4	4.8	1591.6		1.2	10.6	
1-Jun-92	2400	11.8	2.4	4.0	1590.7	3.460	4.0	7.8	3.289
2-Jun-92	2400	11.8	2.4	4.4	1589.9	3.460	4.4	7.4	
3-Jun-92	2400	11.8	2.3	3.8	1589.0	3.460	3.8	8.0	
4-Jun-92	2400	12.0	2.4	3.2	1588.1	3.460	3.2	8.8	
5-Jun-92	2400	24.7	15.1	1.3	1586.3	3.460	1.3	23.4	
6-Jun-92	2400	24.5	14.8	1.4	1583.6	3.460	1.4	23.1	
7-Jun-92	2400	24.9	15.2	1.0	1580.8	3.460	1.2	23.7	
8-Jun-92	2400	24.4	14.8	1.6	1578.1	3.460	1.6	22.8	
9-Jun-92	2400	16.2	7.1	1.5	1575.6	3.460	1.5	14.7	
10-Jun-92	2400	2.0	0.0	3.2	1575.0	3.460	3.2	-1.2	

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
11-Jun-92	2400	2.1	0.0	4.3	1575.2	3.460	4.3	-2.2	
12-Jun-92	2400	2.1	0.0	2.9	1575.4	3.460	2.9	-0.8	
13-Jun-92	2400	2.0	0.0	3.9	1575.6	3.460	3.9	-1.9	
14-Jun-92	2400	2.0	0.0	3.9	1575.9	3.460	3.9	-1.9	
15-Jun-92	2400	2.0	0.0	2.6	1576.0	3.460	2.6	-0.6	
16-Jun-92	2400	1.0	0.0	0.6	1576.0	3.460	1.2	-0.2	
17-Jun-92	2400	1.0	0.0	7.9	1576.4	3.460	7.9	-6.9	
18-Jun-92	2400	1.0	0.0	2.9	1576.9	3.460	2.9	-1.9	
19-Jun-92	2400	1.0	0.0	2.6	1577.1	3.460	2.6	-1.6	
20-Jun-92	2400	1.0	0.0	1.6	1577.3	3.460	1.6	-0.6	
21-Jun-92	2400	1.0	0.0	3.3	1577.4	3.460	3.3	-2.3	
22-Jun-92	2400	1.1	0.0	1.6	1577.6	3.460	1.6	-0.5	
23-Jun-92	2400	1.2	0.0	2.0	1577.7	3.460	2.0	-0.8	
24-Jun-92	2400	1.2	0.0	2.4	1577.8	3.460	2.4	-1.2	
25-Jun-92	2400	1.2	0.0	3.0	1578.0	3.460	3.0	-1.8	
26-Jun-92	2400	1.2	0.0	2.4	1578.2	3.460	2.4	-1.2	
27-Jun-92	2400	1.2	0.0	2.4	1578.3	3.460	2.4	-1.2	
28-Jun-92	2400	1.2	0.0	2.1	1578.4	3.460	2.1	-0.9	
29-Jun-92	2400	1.2	0.0	2.8	1578.6	3.460	2.8	-1.6	
30-Jun-92	2400	1.2	0.0	2.4	1578.8	3.460	2.4	-1.2	
1-Jul-92	2400	1.2	0.0	2.8	1578.9	3.460	2.8	-1.6	
2-Jul-92	2400	1.2	0.0	3.1	1579.1	3.460	3.1	-1.9	
3-Jul-92	2400	1.2	0.0	2.6	1579.3	3.460	2.6	-1.4	
4-Jul-92	2400	1.4	0.0	2.6	1579.5	3.460	2.6	-1.2	
5-Jul-92	2400	10.7	3.3	1.5	1579.0	3.460	1.5	9.2	
6-Jul-92	2400	10.9	3.3	1.8	1577.9	3.460	1.8	9.1	
7-Jul-92	2400	10.8	3.3	2.0	1576.8	3.460	2.0	8.8	
8-Jul-92	2400	10.8	3.3	1.9	1575.8	3.460	1.9	8.9	
9-Jul-92	2400	10.8	3.3	1.7	1574.7	3.460	1.7	9.1	
10-Jul-92	2400	10.8	3.3	1.6	1573.6	3.460	1.6	9.2	
11-Jul-92	2400	10.7	3.3	2.7	1572.5	3.460	2.7	8.0	
12-Jul-92	2400	1.4	0.0	1.2	1572.0	3.460	1.2	0.2	
13-Jul-92	2400	1.2	0.0	2.2	1572.1	3.460	2.2	-1.0	
14-Jul-92	2400	2.0	0.1	2.2	1572.1	3.460	2.2	-0.2	
15-Jul-92	2400	20.5	13.0	0.6	1570.9	3.460	1.2	19.3	
16-Jul-92	2400	21.0	13.3	1.1	1568.3	3.460	1.2	19.8	
17-Jul-92	2400	20.9	13.2	0.9	1565.8	3.460	1.2	19.7	
18-Jul-92	2400	9.2	1.9	0.9	1563.9	3.460	1.2	8.0	
19-Jul-92	2400	1.2	0.0	1.2	1563.5	3.460	1.2	0.0	
20-Jul-92	2400	1.2	0.0	2.1	1563.5	3.460	1.2	0.0	
21-Jul-92	2400	1.2	0.0	2.3	1563.6	3.460	1.9	-0.7	
22-Jul-92	2400	1.2	0.0	1.4	1563.8	3.460	1.4	-0.2	
23-Jul-92	2400	1.2	0.0	2.9	1563.8	3.460	2.9	-1.7	
24-Jul-92	2400	1.2	0.0	2.2	1563.9	3.460	2.2	-1.0	
25-Jul-92	2400	1.2	0.0	1.9	1564.1	3.460	1.9	-0.7	
26-Jul-92	2400	1.2	0.0	1.4	1564.2	3.460	1.4	-0.2	
27-Jul-92	2400	1.2	0.0	1.7	1564.3	3.460	1.7	-0.5	
28-Jul-92	2400	1.2	0.0	1.4	1564.3	3.460	1.4	-0.2	
29-Jul-92	2400	1.2	0.0	1.3	1564.3	3.460	1.3	-0.1	
30-Jul-92	2400	1.2	0.0	1.4	1564.3	3.460	1.4	-0.2	
31-Jul-92	2400	1.2	0.0	1.3	1564.4	3.460	1.3	-0.1	
1-Aug-92	2400	1.2	0.0	1.3	1564.4	3.460	1.3	-0.1	
2-Aug-92	2400	1.2	0.0	1.2	1564.4	3.460	1.2	0.0	
3-Aug-92	2400	1.2	0.0	1.1	1564.4		1.2	0.0	
4-Aug-92	2400	1.2	0.0	1.0	1564.4		1.2	0.0	
5-Aug-92	2400	1.2	0.0	0.8	1564.3		1.2	0.0	
6-Aug-92	2400	1.3	0.0	1.1	1564.3		1.2	0.1	
7-Aug-92	2400	1.6	0.0	1.3	1564.3		1.2	0.4	
8-Aug-92	2400	1.8	0.0	1.4	1564.2		1.2	0.6	

		OUTFLO	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outf.	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
9-Aug-92	2400	1.8	0.0	1.3	1564.1		1.2	0.6	
10-Aug-92	2400	1.8	0.0	1.1	1564.0		1.2	0.6	
11-Aug-92	2400	1.8	0.0	1.0	1563.9		1.2	0.6	
12-Aug-92	2400	1.8	0.0	0.8	1563.8		1.2	0.6	
13-Aug-92	2400	1.8	0.0	0.9	1563.6		1.2	0.6	
14-Aug-92	2400	1.8	0.0	1.0	1563.6		1.2	0.6	
15-Aug-92	2400	1.9	0.0	0.9	1563.4		1.2	0.7	
16-Aug-92	2400	1.9	0.0	1.0	1563.3		1.2	0.7	
17-Aug-92	2400	2.0	0.0	0.8	1563.2		1.2	0.8	
18-Aug-92	2400	2.2	0.0	1.1	1563.0		1.2	1.0	
19-Aug-92	2400	2.5	0.0	0.2	1562.9		1.2	1.3	
20-Aug-92	2400	2.5	0.0	1.5	1562.6		1.2	1.3	
21-Aug-92	2400	2.5	0.0	0.8	1562.4		1.2	1.3	
22-Aug-92	2400	2.5	0.0	2.4	1562.3		1.2	1.3	
23-Aug-92	2400	2.5	0.0	1.8	1562.2		1.2	1.3	
24-Aug-92	2400	2.5	0.0	1.5	1562.1		1.2	1.3	
25-Aug-92	2400	2.3	0.0	0.9	1561.9		1.2	1.1	
26-Aug-92	2400	2.2	0.0	0.9	1561.8		1.2	1.0	
27-Aug-92	2400	2.2	0.0	1.0	1561.6		1.2	1.0	
28-Aug-92	2400	2.2	0.0	0.7	1561.4		1.2	1.0	
29-Aug-92	2400	2.2	0.0	0.8	1561.2		1.2	1.0	
30-Aug-92	2400	2.2	0.0	0.8	1561.0		1.2	1.0	
31-Aug-92	2400	2.2	0.0	0.7	1560.9	3.452	1.2	1.0	2.800
1-Sep-92	2400	2.2	0.0	0.9	1560.7				
2-Sep-92	2400	2.2	0.0	0.9	1560.5		FISH TOT	302.4	
3-Sep-92	2400	2.2	0.0	0.6	1560.3		(MAF)	0.600	
4-Sep-92	2400	2.5	0.0	0.5	1560.1				
5-Sep-92	2400	2.4	0.0	1.2	1559.9	Rev. Stor.	Est. Fish	Rev. Hist.	
6-Sep-92	2400	2.5	0.0	0.8	1559.7	MAF	MAF	MAF	
7-Sep-92	2400	2.5	0.0	0.7	1559.4	3.452	0.600	2.852	
8-Sep-92	2400	2.5	0.0	1.2	1559.2				
9-Sep-92	2400	2.2	0.0	1.5	1559.1				
10-Sep-92	2400	7.9	4.1	0.9	1558.7				
11-Sep-92	2400	11.1	6.7	0.6	1557.4				
12-Sep-92	2400	11.2	6.7	0.5	1555.9				
13-Sep-92	2400	11.2	6.8	0.9	1554.5				
14-Sep-92	2400	11.2	6.8	1.0	1553.1				
15-Sep-92	2400	11.2	6.8	1.2	1551.7				
16-Sep-92	2400	11.2	6.8	1.2	1550.3				
17-Sep-92	2400	11.2	6.8	1.2	1548.9				
18-Sep-92	2400	11.2	6.7	0.7	1547.5				
19-Sep-92	2400	11.2	6.7	0.9	1546.0				
20-Sep-92	2400	4.9	2.2	0.6	1544.8				
21-Sep-92	2400	1.2	0.0	0.9	1544.7				
22-Sep-92	2400	1.2	0.0	1.0	1544.7				
23-Sep-92	2400	1.2	0.0	0.4	1544.6				
24-Sep-92	2400	1.2	0.0	3.6	1544.7				
25-Sep-92	2400	1.2	0.0	4.6	1545.1				
26-Sep-92	2400	1.2	0.0	3.0	1545.5				
27-Sep-92	2400	1.2	0.0	1.9	1545.6				
28-Sep-92	2400	1.2	0.0	1.4	1545.7				
29-Sep-92	2400	1.2	0.0	1.4	1545.7				
30-Sep-92	2400	1.2	0.0	1.4	1545.8				
1-Oct-92	2400	1.2	0.0	1.2	1545.8				
2-Oct-92	2400	1.2	0.0	1.1	1545.7				
3-Oct-92	2400	1.2	0.0	1.0	1545.7				
4-Oct-92	2400	1.2	0.0	1.3	1545.7				
5-Oct-92	2400	1.2	0.0	1.2	1545.7				
6-Oct-92	2400	1.2	0.0	1.1	1545.7				

DATE	HOUR	OUTFLO KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outf. KCFS	Est. Fish KCFS	Historic MAF
7-Oct-92	2400	1.2	0.0	1.1	1545.7				
8-Oct-92	2400	1.2	0.0	0.8	1545.6				
9-Oct-92	2400	1.2	0.0	1.2	1545.6				
10-Oct-92	2400	1.2	0.0	1.0	1545.6				
11-Oct-92	2400	1.2	0.0	1.1	1545.6				
12-Oct-92	2400	1.2	0.0	0.9	1545.5				
13-Oct-92	2400	1.2	0.0	0.9	1545.5				
14-Oct-92	2400	1.2	0.0	1.3	1545.5				
15-Oct-92	2400	1.2	0.0	1.2	1545.5				
16-Oct-92	2400	1.2	0.0	0.9	1545.5				
17-Oct-92	2400	1.2	0.0	1.2	1545.4				
18-Oct-92	2400	1.2	0.0	1.1	1545.4				
19-Oct-92	2400	1.2	0.0	1.2	1545.4				
20-Oct-92	2400	1.2	0.0	1.2	1545.4				
21-Oct-92	2400	1.2	0.0	0.9	1545.4				
22-Oct-92	2400	1.2	0.0	1.2	1545.4				
23-Oct-92	2400	1.2	0.0	1.2	1545.4				
24-Oct-92	2400	1.2	0.0	0.9	1545.3				
25-Oct-92	2400	1.2	0.0	1.0	1545.3				
26-Oct-92	2400	1.2	0.0	0.9	1545.3				
27-Oct-92	2400	1.2	0.0	1.1	1545.2				
28-Oct-92	2400	1.2	0.0	0.6	1545.2				
29-Oct-92	2400	1.2	0.0	1.2	1545.1				
30-Oct-92	2400	1.2	0.0	1.7	1545.2				
31-Oct-92	2400	1.2	0.0	1.7	1545.2				
1-Nov-92	2400	1.2	0.0	2.8	1545.4				
2-Nov-92	2400	1.2	0.0	2.5	1545.6				
3-Nov-92	2400	1.2	0.0	1.9	1545.7				
4-Nov-92	2400	1.2	0.0	1.9	1545.8				
5-Nov-92	2400	1.2	0.0	1.6	1545.9				
6-Nov-92	2400	1.2	0.0	1.6	1545.9				
7-Nov-92	2400	1.2	0.0	2.3	1546.0				
8-Nov-92	2400	1.2	0.0	3.3	1546.3				
9-Nov-92	2400	1.2	0.0	2.7	1546.5				
10-Nov-92	2400	1.2	0.0	2.2	1546.7				
11-Nov-92	2400	1.2	0.0	1.9	1546.8				
12-Nov-92	2400	1.2	0.0	1.9	1546.9				
13-Nov-92	2400	1.2	0.0	1.7	1547.0				
14-Nov-92	2400	1.2	0.0	1.9	1547.1				
15-Nov-92	2400	1.2	0.0	1.9	1547.2				
16-Nov-92	2400	1.2	0.0	1.7	1547.2				
17-Nov-92	2400	1.2	0.0	1.7	1547.3				
18-Nov-92	2400	1.2	0.0	2.1	1547.4				
19-Nov-92	2400	1.2	0.0	1.9	1547.5				
20-Nov-92	2400	1.2	0.0	1.9	1547.6				
21-Nov-92	2400	1.2	0.0	2.0	1547.7				
22-Nov-92	2400	1.2	0.0	1.6	1547.8				
23-Nov-92	2400	1.2	0.0	1.8	1547.9				
24-Nov-92	2400	1.2	0.0	1.5	1548.0				
25-Nov-92	2400	1.2	0.0	1.2	1548.0				
26-Nov-92	2400	1.2	0.0	1.0	1548.0				
27-Nov-92	2400	1.2	0.0	1.0	1548.0				
28-Nov-92	2400	1.2	0.0	1.2	1547.9				
29-Nov-92	2400	1.2	0.0	1.8	1548.0				
30-Nov-92	2400	1.2	0.0	1.7	1548.1				

DWORSHAK OPERATIONS

1-DEC-92 TO 30-DEC-95

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
1-Dec-92	2400	1.2	0.0	1.3	1548.2			*NOTE ALL NEGITIVE	
2-Dec-92	2400	1.2	0.0	1.2	1548.2			FISH FLOWS ESTIMATE	
3-Dec-92	2400	1.2	0.0	1.3	1548.2			ARE TAKEN AS ZERO	
4-Dec-92	2400	1.2	0.0	0.8	1548.2				
5-Dec-92	2400	1.2	0.0	0.7	1548.1				
6-Dec-92	2400	1.2	0.0	0.8	1548.0				
7-Dec-92	2400	1.2	0.0	1.0	1548.0				
8-Dec-92	2400	1.2	0.0	1.4	1548.0				
9-Dec-92	2400	1.2	0.0	1.4	1548.0				
10-Dec-92	2400	1.2	0.0	1.5	1548.0				
11-Dec-92	2400	1.2	0.0	1.4	1548.1				
12-Dec-92	2400	1.2	0.0	1.2	1548.1				
13-Dec-92	2400	1.2	0.0	1.4	1548.1				
14-Dec-92	2400	1.2	0.0	1.4	1548.1				
15-Dec-92	2400	1.2	0.0	1.3	1548.1				
16-Dec-92	2400	1.2	0.0	1.3	1548.1				
17-Dec-92	2400	1.2	0.0	1.3	1548.2				
18-Dec-92	2400	1.2	0.0	1.0	1548.1				
19-Dec-92	2400	1.2	0.0	1.4	1548.1				
20-Dec-92	2400	1.2	0.0	1.2	1548.1				
21-Dec-92	2400	1.2	0.0	1.2	1548.1				
22-Dec-92	2400	1.2	0.0	1.5	1548.2				
23-Dec-92	2400	1.2	0.0	1.6	1548.2				
24-Dec-92	2400	1.2	0.0	1.4	1548.3				
25-Dec-92	2400	1.2	0.0	1.4	1548.3				
26-Dec-92	2400	1.2	0.0	1.6	1548.3				
27-Dec-92	2400	1.2	0.0	1.7	1548.4				
28-Dec-92	2400	1.2	0.0	1.4	1548.4				
29-Dec-92	2400	1.2	0.0	1.2	1548.4				
30-Dec-92	2400	1.2	0.0	1.4	1548.4				
31-Dec-92	2400	1.2	0.0	1.5	1548.5				
1-Jan-93	2400	1.2	0.0	1.3	1548.5				
2-Jan-93	2400	1.2	0.0	1.4	1548.5				
3-Jan-93	2400	1.2	0.0	1.4	1548.5				
4-Jan-93	2400	1.2	0.0	1.2	1548.5				
5-Jan-93	2400	3.6	0.0	1.2	1547.8				
6-Jan-93	2400	4.4	0.0	0.7	1547.7				
7-Jan-93	2400	1.2	0.0	1.1	1547.6				
8-Jan-93	2400	1.5	0.0	0.8	1547.5				
9-Jan-93	2400	1.2	0.0	0.8	1547.5				
10-Jan-93	2400	3.1	0.0	1.0	1546.5				
11-Jan-93	2400	10.1	0.0	0.5	1545.2				
12-Jan-93	2400	10.1	0.0	0.6	1544.0				
13-Jan-93	2400	6.2	0.0	0.5	1543.7				
14-Jan-93	2400	1.9	0.0	0.8	1543.6				
15-Jan-93	2400	1.5	0.0	1.5	1543.6				
16-Jan-93	2400	1.2	0.0	1.2	1543.6				
17-Jan-93	2400	1.2	0.0	1.2	1543.6				
18-Jan-93	2400	1.2	0.0	1.1	1543.6				
19-Jan-93	2400	1.2	0.0	1.2	1543.5				
20-Jan-93	2400	2.0	0.0	1.2	1543.5				
21-Jan-93	2400	1.2	0.0	1.5	1543.5				
22-Jan-93	2400	1.2	0.0	1.5	1543.6				
23-Jan-93	2400	1.2	0.0	1.4	1543.6				
24-Jan-93	2400	1.2	0.0	1.8	1543.7				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
25-Jan-93	2400	1.2	0.0	1.4	1543.7				
26-Jan-93	2400	1.2	0.0	1.8	1543.8				
27-Jan-93	2400	1.2	0.0	1.8	1543.9				
28-Jan-93	2400	1.2	0.0	1.6	1543.9				
29-Jan-93	2400	1.2	0.0	1.7	1544.0				
30-Jan-93	2400	1.2	0.0	1.4	1544.0				
31-Jan-93	2400	1.2	0.0	1.6					
1-Feb-93	2400	1.2	0.0	1.4	1544.0				
2-Feb-93	2400	1.2	0.0	1.4	1544.0				
3-Feb-93	2400	1.2	0.0	1.5	1544.1				
4-Feb-93	2400	1.2	0.0	1.3	1544.1				
5-Feb-93	2400	1.2	0.0	1.4	1544.1				
6-Feb-93	2400	1.2	0.0	1.4	1544.1				
7-Feb-93	2400	1.2	0.0	1.4	1544.1				
8-Feb-93	2400	1.2	0.0	1.6	1544.2				
9-Feb-93	2400	1.2	0.0	1.4	1544.2				
10-Feb-93	2400	1.2	0.0	1.8	1544.3				
11-Feb-93	2400	1.2	0.0	1.6	1544.4				
12-Feb-93	2400	1.2	0.0	1.8	1544.4				
13-Feb-93	2400	1.2	0.0	1.8	1544.5				
14-Feb-93	2400	1.2	0.0	2.2	1544.6				
15-Feb-93	2400	1.2	0.0	1.4	1544.7				
16-Feb-93	2400	1.2	0.0	0.9	1544.7				
17-Feb-93	2400	6.4	0.0	0.5	1544.3				
18-Feb-93	2400	1.2	0.0	1.2	1543.8				
19-Feb-93	2400	1.2	0.0	1.8	1543.9				
20-Feb-93	2400	1.2	0.0	1.6	1543.9				
21-Feb-93	2400	1.2	0.0	1.4	1544.0				
22-Feb-93	2400	1.2	0.0	1.4	1544.0				
23-Feb-93	2400	1.2	0.0	1.4	1544.0				
24-Feb-93	2400	1.2	0.0	1.2	1544.0				
25-Feb-93	2400	1.2	0.0	1.2	1544.0				
26-Feb-93	2400	1.2	0.0	1.2	1544.0				
27-Feb-93	2400	1.2	0.0	1.1	1544.0				
28-Feb-93	2400	1.1	0.0	0.9	1544.0				
1-Mar-93	2400	1.1	0.0	0.9	1543.9	2.570	0.9	0.2	2.556
2-Mar-93	2400	1.2	0.0	1.4	1543.9	2.570	1.4	-0.2	
3-Mar-93	2400	1.2	0.0	1.1	1543.9	2.570	1.1	0.1	
4-Mar-93	2400	1.2	0.0	1.6	1544.0	2.570	1.6	-0.4	
5-Mar-93	2400	1.2	0.0	1.7	1544.0	2.570	1.7	-0.5	
6-Mar-93	2400	1.2	0.0	2.8	1544.2	2.570	2.8	-1.6	
7-Mar-93	2400	1.2	0.0	3.0	1544.4	2.570	3.0	-1.8	
8-Mar-93	2400	1.2	0.0	3.3	1544.7	2.570	3.3	-2.1	
9-Mar-93	2400	1.2	0.0	3.4	1545.0	2.570	3.4	-2.2	
10-Mar-93	2400	1.2	0.0	3.1	1545.3	2.570	3.1	-1.9	
11-Mar-93	2400	1.2	0.0	3.2	1545.5	2.570	3.2	-2.0	
12-Mar-93	2400	1.2	0.0	2.9	1545.8	2.570	2.9	-1.7	
13-Mar-93	2400	1.2	0.0	2.7	1546.0	2.570	2.7	-1.5	
14-Mar-93	2400	1.2	0.0	3.4	1546.3	2.570	3.4	-2.2	
15-Mar-93	2400	1.2	0.0	7.7	1546.8	2.570	7.7	-6.5	
16-Mar-93	2400	1.2	0.0	8.3	1547.8	2.570	8.3	-7.1	
17-Mar-93	2400	1.1	0.0	6.3	1548.7	2.570	6.3	-5.2	
18-Mar-93	2400	1.2	0.0	11.0	1549.6	2.570	11.0	-9.8	
19-Mar-93	2400	1.2	0.0	11.5	1551.2	2.570	11.5	-10.3	
20-Mar-93	2400	1.2	0.0	10.1	1552.4	2.570	10.1	-8.9	
21-Mar-93	2400	1.2	0.0	9.5	1553.7	2.570	9.5	-8.3	
22-Mar-93	2400	1.2	0.0	8.4	1554.7	2.570	8.4	-7.2	
23-Mar-93	2400	1.2	0.0	9.6	1555.7	2.570	9.6	-8.4	
24-Mar-93	2400	1.2	0.0	12.3	1557.1	2.570	12.3	-11.1	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
25-Mar-93	2400	1.2	0.0	11.6	1558.5	2.570	11.6	-10.4	
26-Mar-93	2400	1.2	0.0	11.5	1559.9	2.570	11.5	-10.3	
27-Mar-93	2400	1.2	0.0	11.5	1561.3	2.570	11.5	-10.3	
28-Mar-93	2400	1.2	0.0	11.4	1562.7	2.570	11.4	-10.2	
29-Mar-93	2400	1.2	0.0	10.6	1564.0	2.570	10.6	-9.4	
30-Mar-93	2400	1.3	0.0	9.4	1565.1	2.570	9.4	-8.1	
31-Mar-93	2400	1.3	0.0	9.0	1566.1	2.570	9.0	-7.7	
1-Apr-93	2400	1.2	0.0	8.8	1567.1	2.570	1.4	-0.2	2.903
2-Apr-93	2400	1.2	0.0	10.2	1568.2		2.8	-1.6	
3-Apr-93	2400	1.2	0.0	11.8	1569.4		4.4	-3.2	
4-Apr-93	2400	1.2	0.0	14.2	1570.9		6.8	-5.6	
5-Apr-93	2400	1.2	0.0	13.4	1572.5		6.0	-4.8	
6-Apr-93	2400	1.2	0.0	11.3	1573.8		3.9	-2.7	
7-Apr-93	2400	1.2	0.0	10.5	1575.0		3.1	-1.9	
8-Apr-93	2400	2.4	0.0	9.6	1576.0		2.2	0.2	
9-Apr-93	2400	1.2	0.0	12.4	1577.1		5.0	-3.8	
10-Apr-93	2400	1.2	0.0	11.6	1578.4		4.2	-3.0	
11-Apr-93	2400	1.2	0.0	10.8	1579.6		3.4	-2.2	
12-Apr-93	2400	1.2	0.0	9.9	1580.7		2.5	-1.3	
13-Apr-93	2400	1.2	0.0	8.6	1581.7		1.2	0.0	
14-Apr-93	2400	1.6	0.0	9.3	1582.5		1.9	-0.3	
15-Apr-93	2400	9.5	0.5	8.0	1582.9		1.2	8.3	
16-Apr-93	2400	9.5	0.1	7.2	1582.6		1.2	8.3	
17-Apr-93	2400	9.6	2.1	7.4	1582.4		1.2	8.4	
18-Apr-93	2400	9.6	2.1	9.2	1582.2		1.2	8.4	
19-Apr-93	2400	9.6	2.1	9.1	1582.2		1.2	8.4	
20-Apr-93	2400	9.5	2.1	7.8	1582.1		1.2	8.3	
21-Apr-93	2400	9.6	1.6	7.7	1581.8		1.2	8.4	
22-Apr-93	2400	9.6	0.0	7.9	1581.6		1.2	8.4	
23-Apr-93	2400	9.6	0.0	8.7	1581.5		1.2	8.4	
24-Apr-93	2400	9.6	0.0	8.2	1581.4		1.2	8.4	
25-Apr-93	2400	9.6	0.0	8.0	1581.2		1.2	8.4	
26-Apr-93	2400	9.3	0.0	10.7	1581.2		1.2	8.1	
27-Apr-93	2400	7.4	0.0	10.0	1581.4		1.2	6.2	
28-Apr-93	2400	7.4	0.0	9.3	1581.7		1.2	6.2	
29-Apr-93	2400	7.4	0.0	9.3	1581.9		1.9	5.5	
30-Apr-93	2400	7.8	0.0	11.9	1582.3		4.5	3.3	
1-May-93	2400	9.6	0.0	11.5	1582.6		4.1	5.5	
2-May-93	2400	9.5	0.0	13.7	1582.9		6.3	3.2	
3-May-93	2400	9.5	0.0	14.0	1583.5		6.6	2.9	
4-May-93	2400	9.5	0.0	17.7	1584.2		10.3	-0.8	
5-May-93	2400	9.5	0.0	15.4	1585.0		8.0	1.5	
6-May-93	2400	9.5	0.0	15.5	1585.7		8.1	1.4	
7-May-93	2400	9.5	0.0	15.6	1586.4		8.2	1.3	
8-May-93	2400	9.5	0.0	15.1	1587.0		7.7	1.8	
9-May-93	2400	9.5	0.0	13.9	1587.6		6.5	3.0	
10-May-93	2400	9.5	0.0	12.9	1588.0		5.5	4.0	
11-May-93	2400	9.5	0.0	15.4	1588.5		8.0	1.5	
12-May-93	2400	9.5	0.0	19.4	1589.4		12.0	-2.5	
13-May-93	2400	9.5	0.0	23.9	1590.7		16.5	-7.0	
14-May-93	2400	9.5	0.0	26.8	1592.5		19.4	-9.9	
15-May-93	2400	11.2	1.7	27.1	1594.4		19.4	-8.2	
16-May-93	2400	15.0	5.5	25.7	1595.8		18.3	-3.3	
17-May-93	2400	15.2	5.8	24.0	1596.8		16.6	-1.4	
18-May-93	2400	17.2	7.8	22.0	1597.6		14.6	2.6	
19-May-93	2400	19.8	10.5	21.0	1597.8		13.6	6.2	
20-May-93	2400	19.8	10.6	20.5	1597.9		13.1	6.7	
21-May-93	2400	20.0	10.6	20.7	1598.0		13.3	6.7	
22-May-93	2400	19.4	9.9	18.2	1597.9		10.8	8.6	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
23-May-93	2400	16.4	6.9	15.1	1597.8		7.7	8.7	
24-May-93	2400	10.5	1.3	14.2	1597.9		6.8	3.7	
25-May-93	2400	10.5	1.2	12.9	1598.3		5.5	5.0	
26-May-93	2400	16.5	7.3	17.8	1598.6		10.4	6.1	
27-May-93	2400	15.7	6.5	14.5	1598.4		7.1	8.6	
28-May-93	2400	12.9	3.9	15.6	1598.6		8.2	4.7	
29-May-93	2400	15.1	5.9	14.1	1598.7		6.7	8.4	
30-May-93	2400	13.9	4.7	11.8	1598.4		4.4	9.5	
31-May-93	2400	11.4	2.2	11.8	1598.4		4.4	7.0	
1-Jun-93	2400	11.4	2.2	12.6	1598.5	3.460	5.2	6.2	3.436
2-Jun-93	2400	10.7	1.5	11.5	1598.5	3.460	11.5	-0.8	
3-Jun-93	2400	9.2	0.0	10.2	1598.4	3.460	10.2	-1.0	
4-Jun-93	2400	9.0	0.0	9.1	1598.4	3.460	9.1	-0.1	
5-Jun-93	2400	5.2	0.0	9.2	1598.7	3.460	9.2	-4.0	
6-Jun-93	2400	5.2	0.0	8.3	1599.1	3.460	8.3	-3.1	
7-Jun-93	2400	5.2	0.0	8.9	1599.4	3.460	8.9	-3.7	3.460
8-Jun-93	2400	6.7	0.0	8.2	1599.7	3.460	8.2	-1.5	
9-Jun-93	2400	5.6	0.0	7.0	1599.8	3.460	7.0	-1.4	
10-Jun-93	2400	8.1	0.0	7.0	1599.9	3.460	7.0	1.1	
11-Jun-93	2400	7.3	0.0	6.7	1599.8	3.460	6.7	0.6	
12-Jun-93	2400	6.5	0.0	7.7	1599.9	3.460	7.7	-1.2	
13-Jun-93	2400	7.8	0.0	6.9	1599.8	3.460	6.9	0.9	
14-Jun-93	2400	7.0	0.0	5.8	1599.8	3.460	5.8	1.2	
15-Jun-93	2400	6.8	0.0	5.7	1599.6	3.460	5.7	1.1	
16-Jun-93	2400	6.3	0.0	6.8	1599.6	3.460	6.8	-0.5	
17-Jun-93	2400	5.7	0.0	6.0	1599.7	3.460	6.0	-0.3	
18-Jun-93	2400	5.7	0.0	5.7	1599.7	3.460	5.7	0.0	
19-Jun-93	2400	3.5	0.0	5.5	1599.8	3.460	5.5	-2.0	
20-Jun-93	2400	6.4	0.0	5.6	1599.8	3.460	5.6	0.8	
21-Jun-93	2400	5.6	0.0	4.5	1599.7	3.460	4.5	1.1	
22-Jun-93	2400	6.4	0.0	5.6	1599.7	3.460	5.6	0.8	
23-Jun-93	2400	5.5	0.0	5.2	1599.6	3.460	5.2	0.3	
24-Jun-93	2400	5.7	0.0	5.6	1599.6	3.460	5.6	0.1	
25-Jun-93	2400	6.3	0.0	4.5	1599.5	3.460	4.5	1.8	
26-Jun-93	2400	3.6	0.0	4.2	1599.4	3.460	4.2	-0.6	
27-Jun-93	2400	1.0	0.0	4.9	1599.6	3.460	4.9	-3.9	
28-Jun-93	2400	5.6	0.0	3.9	1599.8	3.460	3.9	1.7	
29-Jun-93	2400	4.5	0.0	4.0	1599.7	3.460	4.0	0.5	
30-Jun-93	2400	3.9	0.0	3.7	1599.6	3.460	3.7	0.2	3.460
1-Jul-93	2400	3.9	0.0	3.7	1599.6	3.460	3.7	0.2	draft
2-Jul-93	2400	3.8	0.0	4.1	1599.6	3.460	4.1	-0.3	
3-Jul-93	2400	1.9	0.0	5.6	1599.8	3.460	5.6	-3.7	
4-Jul-93	2400	9.2	0.0	3.4	1599.7	3.460	3.4	5.8	
5-Jul-93	2400	9.2	0.0	3.7	1599.1	3.460	3.7	5.5	
6-Jul-93	2400	9.2	0.0	2.9	1598.5	3.460	2.9	6.3	
7-Jul-93	2400	9.2	0.0	3.2	1597.8	3.460	3.2	6.0	
8-Jul-93	2400	9.2	0.0	3.2	1597.2	3.460	3.2	6.0	
9-Jul-93	2400	9.2	0.0	2.3	1596.5	3.460	2.3	6.9	
10-Jul-93	2400	9.2	0.0	2.6	1595.8	3.460	2.6	6.6	
11-Jul-93	2400	10.5	1.3	1.9	1595.0	3.460	1.9	8.6	
12-Jul-93	2400	13.2	3.9	1.8	1593.9	3.460	1.8	11.4	
13-Jul-93	2400	14.9	5.6	1.7	1592.5	3.460	1.7	13.2	
14-Jul-93	2400	14.8	5.5	1.6	1591.1	3.460	1.6	13.2	
15-Jul-93	2400	17.4	8.1	1.7	1589.5	3.460	1.7	15.7	
16-Jul-93	2400	19.7	10.4	1.2	1587.6	3.460	1.2	18.5	
17-Jul-93	2400	19.5	10.2	2.4	1585.5	3.460	2.4	17.1	
18-Jul-93	2400	19.7	10.4	1.6	1583.5	3.460	1.6	18.1	
19-Jul-93	2400	18.2	8.8	0.9	1581.4	3.460	0.9	17.3	
20-Jul-93	2400	15.0	5.6	3.0	1579.8	3.460	3.0	12.0	

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
21-Jul-93	2400	13.1	3.7	2.1	1578.4	3.460	2.1	11.0	
22-Jul-93	2400	12.1	2.7	1.9	1577.1	3.460	1.9	10.2	
23-Jul-93	2400	12.0	2.7	3.0	1576.0	3.460	3.0	9.0	
24-Jul-93	2400	12.0	2.6	2.7	1574.9	3.460	2.7	9.3	
25-Jul-93	2400	12.0	2.6	2.3	1573.7	3.460	2.3	9.7	
26-Jul-93	2400	15.8	6.5	2.2	1572.3	3.460	2.2	13.6	
27-Jul-93	2400	12.4	3.0	2.6	1570.7	3.460	2.6	9.8	
28-Jul-93	2400	9.4	0.0	1.6	1569.7	3.460	1.6	7.8	
29-Jul-93	2400	9.4	0.0	2.1	1568.8	3.460	2.1	7.3	
30-Jul-93	2400	9.4	0.0	2.6	1567.9	3.460	2.6	6.8	
31-Jul-93	2400	9.4	0.0	1.7	1566.9	3.460	1.7	7.7	
1-Aug-93	2400	15.0	5.6	1.5	1565.6	3.460	1.5	13.5	
2-Aug-93	2400	21.7	12.2	1.4	1563.4	3.460	1.4	20.3	
3-Aug-93	2400	23.0	13.4	1.9	1560.6	3.460	1.9	21.1	
4-Aug-93	2400	23.1	13.1	2.0	1557.7	3.460	2.0	21.1	
5-Aug-93	2400	23.6	13.5	1.8	1554.8	3.460	1.8	21.8	
6-Aug-93	2400	25.2	15.0	2.0	1551.7	3.460	2.0	23.2	
7-Aug-93	2400	17.2	7.1	1.8	1549.1	3.460	1.8	15.4	
8-Aug-93	2400	16.9	6.8	1.7	1546.9	3.460	1.7	15.2	
9-Aug-93	2400	12.1	1.9	1.8	1545.1	3.460	1.8	10.3	
10-Aug-93	2400	10.2	0.0	1.5	1543.8	3.460	1.5	8.7	
11-Aug-93	2400	10.2	0.0	1.3	1542.6	3.460	1.3	8.9	
12-Aug-93	2400	10.2	0.0	1.3	1541.3	3.460	1.3	8.9	
13-Aug-93	2400	5.4	0.0	1.5	1540.4	3.460	1.5	3.9	
14-Aug-93	2400	1.2	0.0	1.4	1540.2	3.460	1.4	-0.2	
15-Aug-93	2400	1.2	0.0	2.0	1540.2	3.460	2.0	-0.8	
16-Aug-93	2400	1.2	0.0	2.1	1540.3	3.460	2.1	-0.9	
17-Aug-93	2400	1.2	0.0	2.3	1540.5	3.460	2.3	-1.1	
18-Aug-93	2400	1.2	0.0	1.6	1540.6	3.460	1.6	-0.4	
19-Aug-93	2400	1.2	0.0	1.6	1540.6	3.460	1.6	-0.4	
20-Aug-93	2400	1.2	0.0	2.4	1540.8	3.460	2.4	-1.2	
21-Aug-93	2400	1.2	0.0	1.7	1540.8	3.460	1.7	-0.5	
22-Aug-93	2400	1.2	0.0	1.9	1540.9	3.460	1.9	-0.7	
23-Aug-93	2400	1.2	0.0	1.7	1541.0	3.460	1.7	-0.5	
24-Aug-93	2400	1.2	0.0	1.4	1541.0	3.460	1.4	-0.2	
25-Aug-93	2400	1.2	0.0	1.4	1541.1	3.460	1.4	-0.2	
26-Aug-93	2400	1.2	0.0	1.7	1541.1	3.460	1.7	-0.5	
27-Aug-93	2400	1.2	0.0	1.3	1541.1	3.460	1.3	-0.1	
28-Aug-93	2400	1.2	0.0	1.7	1541.2	3.460	1.7	-0.5	
29-Aug-93	2400	1.2	0.0	1.7	1541.3	3.460	1.7	-0.5	
30-Aug-93	2400	1.2	0.0	1.6	1541.3	3.460	1.6	-0.4	
31-Aug-93	2400	1.2	0.0	1.4	1541.4	3.460	1.4	-0.2	2.526
1-Sep-93	2400	1.2	0.0	1.4	1541.4				
2-Sep-93	2400	1.2	0.0	1.4	1541.4		FISH TOT	473.4	
3-Sep-93	2400	1.2	0.0	1.2	1541.4		(MAF)	0.939	
4-Sep-93	2400	1.2	0.0	1.3	1541.4				
5-Sep-93	2400	1.2	0.0	1.2	1541.4	Rev. Stor.	Est. Fish	Rev. Hist.	
6-Sep-93	2400	1.2	0.0	1.2	1541.4	MAF	MAF	MAF	
7-Sep-93	2400	1.2	0.0	1.2	1541.4	3.460	0.939	2.521	
8-Sep-93	2400	1.2	0.0	1.2	1541.4				
9-Sep-93	2400	1.2	0.0	1.2	1541.4				
10-Sep-93	2400	1.2	0.0	1.2	1541.4				
11-Sep-93	2400	1.2	0.0	0.9	1541.4				
12-Sep-93	2400	1.2	0.0	1.1	1541.4				
13-Sep-93	2400	1.2	0.0	1.2	1541.4				
14-Sep-93	2400	1.2	0.0	1.4	1541.4				
15-Sep-93	2400	1.2	0.0	1.6	1541.4				
16-Sep-93	2400	1.2	0.0	1.6	1541.5				
17-Sep-93	2400	1.2	0.0	1.2	1541.5				

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
18-Sep-93	2400	1.2	0.0	1.2	1541.5				
19-Sep-93	2400	1.2	0.0	1.2	1541.5				
20-Sep-93	2400	1.2	0.0	1.1	1541.5				
21-Sep-93	2400	1.2	0.0	1.2	1541.5				
22-Sep-93	2400	1.2	0.0	1.1	1541.5				
23-Sep-93	2400	1.2	0.0	1.1	1541.4				
24-Sep-93	2400	1.2	0.0	1.2	1541.4				
25-Sep-93	2400	1.2	0.0	0.9	1541.4				
26-Sep-93	2400	1.2	0.0	1.2	1541.4				
27-Sep-93	2400	1.2	0.0	1.0	1541.3				
28-Sep-93	2400	1.2	0.0	0.9	1541.3				
29-Sep-93	2400	1.2	0.0	2.4	1541.4				
30-Sep-93	2400	1.2	0.0	0.7	1541.4				
1-Oct-93	2400	1.2	0.0	1.1	1541.4				
2-Oct-93	2400	1.2	0.0	1.1	1541.4				
3-Oct-93	2400	1.2	0.0	1.0	1541.3				
4-Oct-93	2400	1.2	0.0	1.0	1541.3				
5-Oct-93	2400	1.2	0.0	0.8	1541.3				
6-Oct-93	2400	1.2	0.0	0.8	1541.2				
7-Oct-93	2400	1.2	0.0	1.5	1541.2				
8-Oct-93	2400	1.2	0.0	1.9	1541.3				
9-Oct-93	2400	1.2	0.0	1.2	1541.3				
10-Oct-93	2400	1.2	0.0	1.2	1541.3				
11-Oct-93	2400	1.2	0.0	1.0	1541.3				
12-Oct-93	2400	1.2	0.0	1.1	1541.3				
13-Oct-93	2400	1.2	0.0	1.2	1541.0				
14-Oct-93	2400	1.2	0.0	1.2	1540.9				
15-Oct-93	2400	1.2	0.0	1.7	1540.9				
16-Oct-93	2400	1.2	0.0	1.5	1541.0				
17-Oct-93	2400	1.2	0.0	1.4	1541.0				
18-Oct-93	2400	1.2	0.0	1.3	1541.0				
19-Oct-93	2400	1.2	0.0	1.2	1541.1				
20-Oct-93	2400	1.2	0.0	1.2	1541.1				
21-Oct-93	2400	1.2	0.0	1.1	1541.0				
22-Oct-93	2400	1.2	0.0	1.1	1541.0				
23-Oct-93	2400	1.2	0.0	1.0	1541.0				
24-Oct-93	2400	1.2	0.0	1.0	1540.9				
25-Oct-93	2400	1.2	0.0	0.9	1540.9				
26-Oct-93	2400	1.2	0.0	1.0	1540.9				
27-Oct-93	2400	1.2	0.0	0.7	1540.8				
28-Oct-93	2400	1.2	0.0	1.1	1540.8				
29-Oct-93	2400	1.2	0.0	1.2	1540.8				
30-Oct-93	2400	1.2	0.0	1.1	1540.8				
31-Oct-93	2400	1.2	0.0	0.8	1540.7				
1-Nov-93	2400	1.2	0.0	1.2	1540.7				
2-Nov-93	2400	1.2	0.0	1.2	1540.7				
3-Nov-93	2400	1.5	0.0	1.1	1540.7				
4-Nov-93	2400	1.2	0.0	1.3	1540.7				
5-Nov-93	2400	1.2	0.0	1.2	1540.7				
6-Nov-93	2400	1.2	0.0	1.2	1540.7				
7-Nov-93	2400	1.2	0.0	1.2	1540.7				
8-Nov-93	2400	1.3	0.0	1.3	1540.6				
9-Nov-93	2400	1.2	0.0	1.1	1540.6				
10-Nov-93	2400	1.2	0.0	1.2	1540.6				
11-Nov-93	2400	1.2	0.0	1.2	1540.6				
12-Nov-93	2400	1.2	0.0	1.1	1540.6				
13-Nov-93	2400	1.2	0.0	1.2	1540.6				
14-Nov-93	2400	1.2	0.0	1.2	1540.6				
15-Nov-93	2400	1.2	0.0	1.2	1540.6				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
16-Nov-93	2400	1.2	0.0	0.7	1540.5				
17-Nov-93	2400	1.2	0.0	1.2	1540.5				
18-Nov-93	2400	1.2	0.0	0.1	1540.4				
19-Nov-93	2400	1.2	0.0	1.2	1540.3				
20-Nov-93	2400	1.2	0.0	0.8	1540.2				
21-Nov-93	2400	1.2	0.0	0.7	1540.2				
22-Nov-93	2400	1.2	0.0	1.2	1540.1				
23-Nov-93	2400	1.2	0.0	0.3	1540.1				
24-Nov-93	2400	1.2	0.0	0.6	1539.9				
25-Nov-93	2400	1.2	0.0	0.4	1539.8				
26-Nov-93	2400	1.2	0.0	0.2	1539.7				
27-Nov-93	2400	1.2	0.0	0.3	1539.6				
28-Nov-93	2400	1.2	0.0	0.8	1539.5				
29-Nov-93	2400	1.2	0.0	1.5	1539.5				
30-Nov-93	2400	1.2	0.0	1.7	1539.5				
1-Dec-93	2400	1.2	0.0	2.0	1539.6				
2-Dec-93	2400	1.2	0.0	1.9	1539.7				
3-Dec-93	2400	1.2	0.0	1.7	1539.8				
4-Dec-93	2400	1.2	0.0	1.5	1539.8				
5-Dec-93	2400	1.2	0.0	1.8	1539.9				
6-Dec-93	2400	1.2	0.0	1.2	1539.9				
7-Dec-93	2400	1.2	0.0	1.3	1539.9				
8-Dec-93	2400	1.2	0.0	1.5	1540.0				
9-Dec-93	2400	1.2	0.0	2.0	1540.0				
10-Dec-93	2400	1.2	0.0	1.7	1540.1				
11-Dec-93	2400	1.2	0.0	1.3	1540.2				
12-Dec-93	2400	1.2	0.0	1.6	1540.2				
13-Dec-93	2400	1.2	0.0	1.4	1540.2				
14-Dec-93	2400	1.1	0.0	1.1	1540.2				
15-Dec-93	2400	1.2	0.0	1.3	1540.2				
16-Dec-93	2400	1.2	0.0	1.2	1540.2				
17-Dec-93	2400	1.2	0.0	1.2	1540.2				
18-Dec-93	2400	1.2	0.0	1.0	1540.2				
19-Dec-93	2400	1.2	0.0	1.0	1540.2				
20-Dec-93	2400	1.2	0.0	1.1	1540.1				
21-Dec-93	2400	1.2	0.0	1.0	1540.1				
22-Dec-93	2400	1.2	0.0	1.0	1540.1				
23-Dec-93	2400	1.2	0.0	1.2	1540.1				
24-Dec-93	2400	1.2	0.0	0.8	1540.0				
25-Dec-93	2400	1.2	0.0	0.5	1539.9				
26-Dec-93	2400	1.2	0.0	0.5	1539.8				
27-Dec-93	2400	1.2	0.0	1.0	1539.8				
28-Dec-93	2400	1.2	0.0	0.9	1539.7				
29-Dec-93	2400	1.2	0.0	0.8	1539.7				
30-Dec-93	2400	1.2	0.0	1.2	1539.6				
31-Dec-93	2400	1.2	0.0	1.2	1539.6				
1-Jan-94	2400	1.2	0.0	1.8	1539.7				
2-Jan-94	2400	1.2	0.0	1.5	1539.7				
3-Jan-94	2400	1.2	0.0	1.9	1539.8				
4-Jan-94	2400	1.2	0.0	2.2	1539.9				
5-Jan-94	2400	1.2	0.0	3.0	1540.1				
6-Jan-94	2400	1.2	0.0	2.2	1540.3				
7-Jan-94	2400	1.2	0.0	1.9	1540.4				
8-Jan-94	2400	1.2	0.0	1.7	1540.5				
9-Jan-94	2400	1.2	0.0	1.6	1540.6				
10-Jan-94	2400	1.2	0.0	1.8	1540.6				
11-Jan-94	2400	1.2	0.0	2.0	1540.7				
12-Jan-94	2400	1.2	0.0	2.4	1540.9				
13-Jan-94	2400	1.2	0.0	2.5	1541.1				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
14-Jan-94	2400	1.2	0.0	3.0	1541.3				
15-Jan-94	2400	1.2	0.0	2.8	1541.5				
16-Jan-94	2400	1.2	0.0	2.7	1541.7				
17-Jan-94	2400	1.2	0.0	2.2	1541.9				
18-Jan-94	2400	1.2	0.0	2.0	1542.0				
19-Jan-94	2400	1.2	0.0	1.9	1542.1				
20-Jan-94	2400	1.2	0.0	1.7	1542.2				
21-Jan-94	2400	1.2	0.0	1.7	1542.3				
22-Jan-94	2400	1.2	0.0	1.6	1542.3				
23-Jan-94	2400	1.2	0.0	1.6	1542.4				
24-Jan-94	2400	1.2	0.0	1.6	1542.4				
25-Jan-94	2400	1.2	0.0	1.4	1542.5				
26-Jan-94	2400	1.2	0.0	1.4	1542.5				
27-Jan-94	2400	1.2	0.0	1.6	1542.5				
28-Jan-94	2400	1.2	0.0	1.4	1542.6				
29-Jan-94	2400	1.2	0.0	1.2	1542.6				
30-Jan-94	2400	1.2	0.0	1.4	1542.6				
31-Jan-94	2400	1.2	0.0	1.1	1542.6				
1-Feb-94	2400	1.2	0.0	0.8	1542.6				
2-Feb-94	2400	1.2	0.0	0.7	1542.5				
3-Feb-94	2400	1.2	0.0	0.7	1542.4				
4-Feb-94	2400	1.2	0.0	1.0	1542.4				
5-Feb-94	2400	1.2	0.0	1.2	1542.4				
6-Feb-94	2400	2.2	0.0	0.8	1542.3				
7-Feb-94	2400	9.1	0.0	1.5	1541.7				
8-Feb-94	2400	6.4	0.0	0.4	1540.5				
9-Feb-94	2400	1.2	0.0	1.0	1540.2				
10-Feb-94	2400	1.2	0.0	1.0	1540.2				
11-Feb-94	2400	1.2	0.0	1.2	1540.1				
12-Feb-94	2400	1.2	0.0	1.2	1540.1				
13-Feb-94	2400	1.2	0.0	1.2	1540.1				
14-Feb-94	2400	1.2	0.0	1.4	1540.1				
15-Feb-94	2400	1.2	0.0	1.2	1540.1				
16-Feb-94	2400	1.2	0.0	1.2	1540.1				
17-Feb-94	2400	1.2	0.0	0.9	1540.1				
18-Feb-94	2400	1.2	0.0	1.4	1540.1				
19-Feb-94	2400	1.2	0.0	1.4	1540.1				
20-Feb-94	2400	1.2	0.0	1.1	1540.1				
21-Feb-94	2400	1.2	0.0	1.0	1540.1				
22-Feb-94	2400	1.2	0.0	1.4	1540.1				
23-Feb-94	2400	1.2	0.0	2.0	1540.2				
24-Feb-94	2400	1.2	0.0	1.3	1540.3				
25-Feb-94	2400	1.2	0.0	1.7	1540.3				
26-Feb-94	2400	1.2	0.0	1.1	1540.3				
27-Feb-94	2400	1.2	0.0	1.4	1540.3				
28-Feb-94	2400	1.2	0.0	2.0	1540.4				
1-Mar-94	2400	1.2	0.0	2.4	1540.5				
2-Mar-94	2400	1.2	0.0	3.1	1540.7				
3-Mar-94	2400	1.2	0.0	4.8	1541.1				
4-Mar-94	2400	1.2	0.0	7.0	1541.8				
5-Mar-94	2400	1.2	0.0	6.9	1542.6				
6-Mar-94	2400	1.2	0.0	5.3	1543.3				
7-Mar-94	2400	1.2	0.0	4.0	1543.8				
8-Mar-94	2400	1.2	0.0	3.8	1544.1				
9-Mar-94	2400	1.2	0.0	3.3	1544.5				
10-Mar-94	2400	1.2	0.0	3.1	1544.7				
11-Mar-94	2400	1.2	0.0	3.0	1545.0				
12-Mar-94	2400	1.2	0.0	2.9	1545.2				
13-Mar-94	2400	1.2	0.0	3.0	1545.5				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
14-Mar-94	2400	1.2	0.0	3.1	1545.7				
15-Mar-94	2400	1.2	0.0	3.8	1546.0				
16-Mar-94	2400	1.2	0.0	4.9	1546.5				
17-Mar-94	2400	1.2	0.0	4.7	1547.0				
18-Mar-94	2400	1.2	0.0	5.0	1547.5				
19-Mar-94	2400	1.2	0.0	5.2	1548.0				
20-Mar-94	2400	1.2	0.0	4.5	1548.6				
21-Mar-94	2400	1.3	0.0	4.1	1549.0				
22-Mar-94	2400	1.3	0.0	3.7	1549.3				
23-Mar-94	2400	1.3	0.0	3.6	1549.7				
24-Mar-94	2400	1.3	0.0	3.1	1549.9				
25-Mar-94	2400	1.3	0.0	3.1	1550.2				
26-Mar-94	2400	1.3	0.0	2.9	1550.4				
27-Mar-94	2400	1.3	0.0	3.2	1550.7				
28-Mar-94	2400	1.3	0.0	3.4	1551.0				
29-Mar-94	2400	1.3	0.0	3.7	1551.3				
30-Mar-94	2400	1.3	0.0	4.2	1551.7				
31-Mar-94	2400	1.3	0.0	4.8	1552.1				
1-Apr-94	2400	1.3	0.0	5.5	1552.6	2.650	1.2	0.1	2.691
2-Apr-94	2400	1.3	0.0	5.4	1553.2		1.2	0.1	
3-Apr-94	2400	1.3	0.0	7.0	1553.9		1.6	-0.3	
4-Apr-94	2400	1.2	0.0	7.5	1554.7		2.1	-0.9	
5-Apr-94	2400	1.3	0.0	6.6	1555.5		1.2	0.1	
6-Apr-94	2400	1.4	0.0	6.5	1556.2		1.2	0.2	
7-Apr-94	2400	1.3	0.0	6.5	1556.9		1.2	0.1	
8-Apr-94	2400	1.3	0.0	5.9	1557.6		1.2	0.1	
9-Apr-94	2400	1.3	0.0	5.7	1558.2		1.2	0.1	
10-Apr-94	2400	1.3	0.0	6.0	1558.8		1.2	0.1	
11-Apr-94	2400	1.3	0.0	6.2	1559.5		1.2	0.1	
12-Apr-94	2400	1.3	0.0	6.7	1560.2		1.3	0.0	
13-Apr-94	2400	1.3	0.0	6.9	1560.9		1.5	-0.2	
14-Apr-94	2400	2.1	0.0	6.9	1561.6		1.5	0.6	
15-Apr-94	2400	2.1	0.0	5.9	1562.2		1.2	0.9	
16-Apr-94	2400	1.3	0.0	6.6	1562.8		1.2	0.1	
17-Apr-94	2400	1.3	0.0	8.4	1563.6		3.0	-1.7	
18-Apr-94	2400	1.3	0.0	11.3	1564.7		5.9	-4.6	
19-Apr-94	2400	1.3	0.0	13.8	1566.2		8.4	-7.1	
20-Apr-94	2400	1.3	0.0	15.9	1567.9		10.5	-9.2	
21-Apr-94	2400	1.3	0.0	17.1	1569.8		11.7	-10.4	
22-Apr-94	2400	1.3	0.0	18.1	1571.9		12.7	-11.4	
23-Apr-94	2400	1.3	0.0	16.5	1573.9		11.1	-9.8	
24-Apr-94	2400	1.3	0.0	16.8	1575.7		11.4	-10.1	
25-Apr-94	2400	1.1	0.0	15.5	1577.5		10.1	-9.0	
26-Apr-94	2400	1.0	0.0	13.1	1579.1		7.7	-6.7	
27-Apr-94	2400	1.0	0.0	11.4	1580.4		6.0	-5.0	
28-Apr-94	2400	7.1	0.2	10.0	1581.3		4.6	2.5	
29-Apr-94	2400	19.0	9.4	8.0	1580.7		2.6	16.4	
30-Apr-94	2400	19.8	10.1	7.4	1579.3		2.0	17.8	
1-May-94	2400	19.6	9.9	7.2	1577.8		1.8	17.8	
2-May-94	2400	19.4	9.6	7.0	1576.4		1.6	17.8	
3-May-94	2400	19.7	9.9	6.8	1574.8		1.4	18.3	
4-May-94	2400	20.0	10.3	7.0	1573.2		1.6	18.4	
5-May-94	2400	19.9	10.1	7.1	1571.6		1.7	18.2	
6-May-94	2400	16.8	7.0	7.9	1570.2		1.5	15.3	
7-May-94	2400	9.7	0.0	9.0	1569.7		3.6	6.1	
8-May-94	2400	9.7	0.0	10.6	1569.7		5.2	4.5	
9-May-94	2400	6.3	0.0	12.1	1570.0		6.7	-0.4	
10-May-94	2400	1.2	0.0	13.1	1571.3		7.7	-6.5	
11-May-94	2400	1.1	0.0	12.6	1572.7		7.2	-6.1	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
12-May-94	2400	4.9	0.0	13.5	1574.1		8.1	-3.2	
13-May-94	2400	9.7	0.0	11.7	1574.6		6.3	3.4	
14-May-94	2400	9.7	0.0	9.9	1574.7		4.5	5.2	
15-May-94	2400	15.3	5.6	9.2	1574.5		3.8	11.5	
16-May-94	2400	20.0	10.3	7.7	1573.2		2.3	17.7	
17-May-94	2400	19.8	10.1	7.3	1571.7		1.9	17.9	
18-May-94	2400	20.1	10.3	7.5	1570.1		2.1	18.0	
19-May-94	2400	19.8	9.9	7.1	1568.5		1.7	18.1	
20-May-94	2400	20.0	10.2	8.2	1567.0		2.8	17.2	
21-May-94	2400	20.3	10.4	7.9	1565.4		2.5	17.8	
22-May-94	2400	20.3	10.3	7.7	1563.8		2.3	18.0	
23-May-94	2400	20.2	10.3	6.8	1562.1		1.4	18.8	
24-May-94	2400	20.2	10.2	6.9	1560.3		1.5	18.7	
25-May-94	2400	20.2	10.2	6.5	1558.5		1.2	19.0	
26-May-94	2400	20.2	10.1	6.7	1556.6		1.3	18.9	
27-May-94	2400	17.3	7.2	6.5	1554.8		1.2	16.1	
28-May-94	2400	6.9	0.0	5.6	1554.1		1.2	5.7	
29-May-94	2400	5.5	0.0	6.2	1554.1		1.2	4.3	
30-May-94	2400	2.4	0.0	5.9	1554.4		1.2	1.2	
31-May-94	2400	1.3	0.0	5.2	1554.9		1.2	0.1	
1-Jun-94	2400	1.3	0.0	6.2	1555.5		1.2	0.1	
2-Jun-94	2400	1.3	0.0	5.9	1556.2		1.2	0.1	
3-Jun-94	2400	1.2	0.0	5.3	1556.8		1.2	0.0	
4-Jun-94	2400	1.2	0.0	5.7	1557.4		1.2	0.0	
5-Jun-94	2400	1.2	0.0	5.3	1557.9		1.2	0.0	
6-Jun-94	2400	1.2	0.0	5.8	1558.5		1.2	0.0	
7-Jun-94	2400	1.2	0.0	5.4	1559.1		1.2	0.0	
8-Jun-94	2400	1.2	0.0	5.3	1559.7		1.2	0.0	
9-Jun-94	2400	1.2	0.0	4.8	1560.2		1.2	0.0	
10-Jun-94	2400	1.2	0.0	4.3	1560.6		1.2	0.0	
11-Jun-94	2400	1.2	0.0	4.2	1561.0		1.2	0.0	
12-Jun-94	2400	1.2	0.0	4.4	1561.4		1.2	0.0	
13-Jun-94	2400	1.2	0.0	4.3	1561.9		1.2	0.0	
14-Jun-94	2400	1.2	0.0	5.6	1562.4		1.2	0.0	
15-Jun-94	2400	1.2	0.0	5.1	1562.9	3.460	1.2	0.0	2.842
16-Jun-94	2400	1.2	0.0	5.4	1563.4	3.460	5.4	-4.2	
17-Jun-94	2400	1.2	0.0	5.1	1564.0	3.460	5.1	-3.9	
18-Jun-94	2400	1.2	0.0	4.7	1564.5	3.460	4.7	-3.5	
19-Jun-94	2400	1.2	0.0	4.4	1564.9	3.460	4.4	-3.2	
20-Jun-94	2400	1.3	0.0	4.2	1565.3	3.460	4.2	-2.9	
21-Jun-94	2400	1.3	0.0	3.7	1565.7	3.460	3.7	-2.4	
22-Jun-94	2400	1.3	0.0	3.9	1566.0	3.460	3.9	-2.6	
23-Jun-94	2400	1.3	0.0	3.2	1566.3	3.460	3.2	-1.9	
24-Jun-94	2400	1.3	0.0	3.4	1566.5	3.460	3.4	-2.1	
25-Jun-94	2400	1.3	0.0	2.8	1566.8	3.460	2.8	-1.5	
26-Jun-94	2400	1.3	0.0	3.6	1567.0	3.460	3.6	-2.3	
27-Jun-94	2400	1.3	0.0	3.2	1567.3	3.460	3.2	-1.9	
28-Jun-94	2400	1.3	0.0	2.7	1567.5	3.460	2.7	-1.4	
29-Jun-94	2400	1.3	0.0	2.8	1567.7	3.460	2.8	-1.5	
30-Jun-94	2400	1.3	0.0	2.5	1567.9	3.460	2.5	-1.2	
1-Jul-94	2400	1.3	0.0	2.3	1568.2	3.460	2.3	-1.0	
2-Jul-94	2400	1.3	0.0	2.9	1568.3	3.460	2.9	-1.6	
3-Jul-94	2400	1.3	0.0	2.5	1568.5	3.460	2.5	-1.2	
4-Jul-94	2400	1.3	0.0	2.4	1568.6	3.460	2.4	-1.1	
5-Jul-94	2400	1.3	0.0	2.2	1568.6	3.460	2.2	-0.9	
6-Jul-94	2400	5.6	0.0	2.6	1567.6	3.460	2.6	3.0	
7-Jul-94	2400	13.1	3.3	1.8	1565.8	3.460	1.8	11.3	
8-Jul-94	2400	18.4	8.5	1.8	1563.4	3.460	1.8	16.6	
9-Jul-94	2400	20.2	10.3	1.6	1561.0	3.460	1.6	18.6	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
10-Jul-94	2400	20.2	10.3	1.9	1558.5	3.460	1.9	18.3	
11-Jul-94	2400	20.2	10.2	1.6	1556.0	3.460	1.6	18.6	
12-Jul-94	2400	20.2	10.1	1.7	1553.5	3.460	1.7	18.5	
13-Jul-94	2400	20.1	10.1	1.5	1550.9	3.460	1.5	18.6	
14-Jul-94	2400	20.1	10.0	1.7	1548.3	3.460	1.7	18.4	
15-Jul-94	2400	21.1	10.9	1.2	1545.4	3.460	1.2	19.9	
16-Jul-94	2400	22.4	12.2	1.2	1542.3	3.460	1.2	21.2	2.603
17-Jul-94	2400	23.4	13.1	1.0	1538.9		1.2	22.2	
18-Jul-94	2400	25.5	15.1	0.8	1535.4		1.2	24.3	
19-Jul-94	2400	25.5	15.0	0.9	1531.8		1.2	24.3	
20-Jul-94	2400	25.4	14.8	0.7	1528.2		1.2	24.2	
21-Jul-94	2400	24.8	14.7	1.0	1524.6		1.2	23.6	
22-Jul-94	2400	25.3	14.5	0.6	1520.8		1.2	24.1	
23-Jul-94	2400	25.2	14.4	0.5	1517.1		1.2	24.0	
24-Jul-94	2400	25.1	14.2	0.3	1513.3		1.2	23.9	
25-Jul-94	2400	24.9	14.1	0.5	1509.5		1.2	23.7	
26-Jul-94	2400	24.6	13.9	1.3	1505.6		1.2	23.4	
27-Jul-94	2400	24.6	14.1	1.2	1501.6		1.2	23.4	
28-Jul-94	2400	24.9	14.4	1.4	1497.6		1.2	23.7	
29-Jul-94	2400	23.1	12.7	1.5	1494.6		1.2	21.9	
30-Jul-94	2400	13.3	3.1	1.4	1493.2		1.2	12.1	
31-Jul-94	2400	5.4	0.0	2.2	1493.2		1.2	4.2	
1-Aug-94	2400	1.3	0.0	1.2	1493.1	3.455	1.3	0.0	1.914
2-Aug-94	2400	1.3	0.0	1.2	1493.1		1.3	0.0	
3-Aug-94	2400	1.3	0.0	0.9	1493.0		1.3	0.0	
4-Aug-94	2400	1.3	0.0	1.0	1492.9		1.3	0.0	
5-Aug-94	2400	1.3	0.0	1.0	1492.9		1.3	0.0	
6-Aug-94	2400	1.3	0.0	1.0	1492.8		1.3	0.0	
7-Aug-94	2400	1.3	0.0	0.8	1492.8		1.3	0.0	
8-Aug-94	2400	1.3	0.0	0.8	1492.7		1.3	0.0	
9-Aug-94	2400	1.6	0.0	1.1	1492.6		1.6	0.0	
10-Aug-94	2400	1.3	0.0	0.7	1492.5		1.3	0.0	
11-Aug-94	2400	1.3	0.0	0.8	1492.4		1.3	0.0	
12-Aug-94	2400	1.3	0.0	0.9	1492.3		1.3	0.0	
13-Aug-94	2400	1.3	0.0	0.9	1492.2		1.3	0.0	
14-Aug-94	2400	1.3	0.0	0.7	1492.1		1.3	0.0	
15-Aug-94	2400	1.3	0.0	1.0	1492.0		1.3	0.0	
16-Aug-94	2400	1.3	0.0	0.6	1491.9		1.3	0.0	
17-Aug-94	2400	1.3	0.0	0.7	1491.8		1.3	0.0	
18-Aug-94	2400	1.3	0.0	0.7	1491.7		1.3	0.0	
19-Aug-94	2400	1.3	0.0	0.6	1491.6		1.3	0.0	
20-Aug-94	2400	1.3	0.0	0.7	1491.5		1.3	0.0	
21-Aug-94	2400	1.3	0.0	0.7	1491.4		1.3	0.0	
22-Aug-94	2400	1.3	0.0	0.8	1491.2		1.3	0.0	
23-Aug-94	2400	1.3	0.0	0.7	1491.1		1.3	0.0	
24-Aug-94	2400	1.3	0.0	0.8	1491.0		1.3	0.0	
25-Aug-94	2400	1.3	0.0	0.6	1490.9		1.3	0.0	
26-Aug-94	2400	1.3	0.0	0.7	1490.8		1.3	0.0	
27-Aug-94	2400	1.3	0.0	0.8	1490.7		1.3	0.0	
28-Aug-94	2400	1.3	0.0	0.5	1490.5		1.3	0.0	
29-Aug-94	2400	1.3	0.0	0.9	1490.4		1.3	0.0	
30-Aug-94	2400	1.3	0.0	0.6	1490.3		1.3	0.0	
31-Aug-94	2400	1.3	0.0	0.7	1490.2	3.427	1.3	0.0	1.883
1-Sep-94	2400	1.3	0.0	0.5	1490.1				
2-Sep-94	2400	1.3	0.0	0.5	1489.9		FISH TOT	764.6	
3-Sep-94	2400	1.3	0.0	0.8	1489.8		(MAF)	1.517	
4-Sep-94	2400	1.3	0.0	1.3	1489.7				
5-Sep-94	2400	1.3	0.0	1.3	1489.8	Rev. Stor.	Est. Fish	Rev. Hist.	
6-Sep-94	2400	1.3	0.0	0.8	1489.7	MAF	MAF	MAF	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
7-Sep-94	2400	1.3	0.0	0.7	1489.6	3.427	1.517	1.910	
8-Sep-94	2400	1.3	0.0	0.6	1489.5				
9-Sep-94	2400	1.3	0.0	0.8	1489.4				
10-Sep-94	2400	1.3	0.0	0.7	1489.3				
11-Sep-94	2400	1.3	0.0	0.8	1489.1				
12-Sep-94	2400	1.3	0.0	0.8	1489.0				
13-Sep-94	2400	1.3	0.0	0.6	1488.9				
14-Sep-94	2400	1.3	0.0	0.7	1488.8				
15-Sep-94	2400	1.3	0.0	0.9	1488.7				
16-Sep-94	2400	1.3	0.0	0.7	1488.6				
17-Sep-94	2400	1.3	0.0	0.6	1488.5				
18-Sep-94	2400	1.3	0.0	0.8	1488.4				
19-Sep-94	2400	1.3	0.0	0.8	1488.2				
20-Sep-94	2400	1.3	0.0	0.6	1488.1				
21-Sep-94	2400	1.3	0.0	0.7	1488.0				
22-Sep-94	2400	1.3	0.0	0.6	1487.9				
23-Sep-94	2400	1.3	0.0	0.6	1487.7				
24-Sep-94	2400	1.3	0.0	0.6	1487.6				
25-Sep-94	2400	1.3	0.0	0.6	1487.5				
26-Sep-94	2400	1.3	0.0	0.6	1487.3				
27-Sep-94	2400	1.3	0.0	0.7	1487.2				
28-Sep-94	2400	1.3	0.0	0.6	1487.1				
29-Sep-94	2400	1.3	0.0	0.6	1486.9				
30-Sep-94	2400	1.3	0.0	0.7	1486.8				
1-Oct-94	2400	1.3	0.0	0.5	1486.7				
2-Oct-94	2400	1.3	0.0	0.8	1486.5				
3-Oct-94	2400	1.3	0.0	0.6	1486.4				
4-Oct-94	2400	1.3	0.0	0.7	1486.3				
5-Oct-94	2400	1.3	0.0	0.6	1486.1				
6-Oct-94	2400	1.3	0.0	0.7	1486.0				
7-Oct-94	2400	1.3	0.0	0.7	1485.9				
8-Oct-94	2400	1.3	0.0	0.6	1485.7				
9-Oct-94	2400	1.3	0.0	0.7	1485.6				
10-Oct-94	2400	1.3	0.0	0.6	1485.4				
11-Oct-94	2400	1.3	0.0	1.0	1485.3				
12-Oct-94	2400	1.3	0.0	0.8	1485.2				
13-Oct-94	2400	1.3	0.0	0.7	1485.1				
14-Oct-94	2400	1.3	0.0	0.8	1485.0				
15-Oct-94	2400	1.3	0.0	1.0	1484.9				
16-Oct-94	2400	1.3	0.0	0.9	1484.9				
17-Oct-94	2400	1.3	0.0	0.7	1484.8				
18-Oct-94	2400	1.3	0.0	0.8	1484.6				
19-Oct-94	2400	1.3	0.0	0.6	1484.5				
20-Oct-94	2400	1.3	0.0	0.8	1484.4				
21-Oct-94	2400	1.3	0.0	1.0	1484.3				
22-Oct-94	2400	1.3	0.0	1.4	1484.3				
23-Oct-94	2400	1.3	0.0	1.1	1484.3				
24-Oct-94	2400	1.3	0.0	0.9	1484.2				
25-Oct-94	2400	1.3	0.0	0.7	1484.1				
26-Oct-94	2400	1.3	0.0	0.8	1484.0				
27-Oct-94	2400	1.3	0.0	3.1	1484.1				
28-Oct-94	2400	1.3	0.0	4.1	1484.6				
29-Oct-94	2400	1.3	0.0	2.1	1484.9				
30-Oct-94	2400	1.3	0.0	1.3	1485.0				
31-Oct-94	2400	1.3	0.0	2.7	1485.0				
1-Nov-94	2400	1.3	0.0	6.2	1485.8				
2-Nov-94	2400	1.3	0.0	2.7	1486.3				
3-Nov-94	2400	1.3	0.0	1.9	1486.5				
4-Nov-94	2400	1.3	0.0	1.8	1486.6				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
5-Nov-94	2400	1.3	0.0	1.4	1486.6				
6-Nov-94	2400	1.3	0.0	1.4	1486.7				
7-Nov-94	2400	1.3	0.0	1.3	1486.7				
8-Nov-94	2400	1.3	0.0	1.4	1486.7				
9-Nov-94	2400	1.3	0.0	1.3	1486.7				
10-Nov-94	2400	1.3	0.0	1.2	1486.6				
11-Nov-94	2400	1.3	0.0	1.3	1486.6				
12-Nov-94	2400	1.3	0.0	1.5	1486.7				
13-Nov-94	2400	1.3	0.0	1.4	1486.7				
14-Nov-94	2400	1.3	0.0	1.4	1486.7				
15-Nov-94	2400	1.3	0.0	1.2	1486.7				
16-Nov-94	2400	1.3	0.0	1.2	1486.7				
17-Nov-94	2400	1.3	0.0	1.3	1486.7				
18-Nov-94	2400	1.3	0.0	1.1	1486.6				
19-Nov-94	2400	1.3	0.0	1.0	1486.6				
20-Nov-94	2400	1.3	0.0	1.1	1486.5				
21-Nov-94	2400	1.3	0.0	1.2	1486.5				
22-Nov-94	2400	1.3	0.0	0.9	1486.4				
23-Nov-94	2400	1.3	0.0	0.5	1486.3				
24-Nov-94	2400	1.3	0.0	1.0	1486.2				
25-Nov-94	2400	1.3	0.0	1.4	1486.2				
26-Nov-94	2400	1.3	0.0	1.3	1486.2				
27-Nov-94	2400	1.3	0.0	1.4	1486.2				
28-Nov-94	2400	1.3	0.0	1.3	1486.2				
29-Nov-94	2400	1.2	0.0	1.5	1486.2				
30-Nov-94	2400	1.0	0.0	1.8	1486.3				
1-Dec-94	2400	1.0	0.0	4.1	1486.7				
2-Dec-94	2400	1.0	0.0	3.4	1487.3				
3-Dec-94	2400	1.0	0.0	2.5	1487.6				
4-Dec-94	2400	1.0	0.0	1.9	1487.8				
5-Dec-94	2400	1.0	0.0	1.3	1488.0				
6-Dec-94	2400	1.0	0.0	1.1	1488.0				
7-Dec-94	2400	1.0	0.0	1.4	1488.0				
8-Dec-94	2400	1.0	0.0	1.5	1488.1				
9-Dec-94	2400	1.0	0.0	1.4	1488.2				
10-Dec-94	2400	1.0	0.0	1.3	1488.3				
11-Dec-94	2400	1.0	0.0	1.2	1488.3				
12-Dec-94	2400	1.0	0.0	1.0	1488.4				
13-Dec-94	2400	1.0	0.0	1.1	1488.4				
14-Dec-94	2400	1.0	0.0	1.2	1488.4				
15-Dec-94	2400	1.0	0.0	1.3	1488.4				
16-Dec-94	2400	1.0	0.0	1.5	1488.5				
17-Dec-94	2400	1.0	0.0	2.1	1488.6				
18-Dec-94	2400	1.0	0.0	2.7	1488.9				
19-Dec-94	2400	1.0	0.0	2.9	1489.3				
20-Dec-94	2400	1.0	0.0	2.3	1489.6				
21-Dec-94	2400	1.0	0.0	1.7	1489.8				
22-Dec-94	2400	1.0	0.0	1.7	1489.9				
23-Dec-94	2400	1.0	0.0	1.5	1490.0				
24-Dec-94	2400	1.0	0.0	1.4	1490.1				
25-Dec-94	2400	1.0	0.0	1.7	1490.2				
26-Dec-94	2400	1.0	0.0	1.9	1490.4				
27-Dec-94	2400	1.0	0.0	3.2	1490.6				
28-Dec-94	2400	1.0	0.0	3.3	1491.1				
29-Dec-94	2400	1.0	0.0	2.9	1491.5				
30-Dec-94	2400	1.0	0.0	2.4	1491.8				
31-Dec-94	2400	1.0	0.0	1.7	1492.0				
1-Jan-95	2400	1.0	0.0	1.1	1492.0				
2-Jan-95	2400	1.0	0.0	0.9	1492.0				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
3-Jan-95	2400	1.0	0.0	0.9	1492.0				
4-Jan-95	2400	1.0	0.0	0.9	1492.0				
5-Jan-95	2400	1.0	0.0	1.0	1492.0				
6-Jan-95	2400	1.0	0.0	1.3	1492.0				
7-Jan-95	2400	1.0	0.0	1.6	1492.1				
8-Jan-95	2400	1.0	0.0	1.8	1492.2				
9-Jan-95	2400	1.0	0.0	1.5	1492.3				
10-Jan-95	2400	1.0	0.0	4.5	1492.7				
11-Jan-95	2400	1.0	0.0	5.1	1493.5				
12-Jan-95	2400	1.0	0.0	4.9	1494.2				
13-Jan-95	2400	1.0	0.0	4.9	1494.9				
14-Jan-95	2400	1.0	0.0	6.6	1495.7				
15-Jan-95	2400	1.0	0.0	7.3	1496.8				
16-Jan-95	2400	1.0	0.0	5.8	1497.8				
17-Jan-95	2400	1.0	0.0	4.6	1498.6				
18-Jan-95	2400	1.0	0.0	4.3	1499.2				
19-Jan-95	2400	1.0	0.0	3.7	1499.7				
20-Jan-95	2400	1.0	0.0	3.3	1500.1				
21-Jan-95	2400	1.0	0.0	2.7	1500.5				
22-Jan-95	2400	1.0	0.0	2.4	1500.8				
23-Jan-95	2400	1.0	0.0	2.2	1501.0				
24-Jan-95	2400	1.0	0.0	2.1	1501.2				
25-Jan-95	2400	1.0	0.0	2.5	1501.4				
26-Jan-95	2400	1.0	0.0	2.7	1501.7				
27-Jan-95	2400	1.0	0.0	2.3	1502.0				
28-Jan-95	2400	1.0	0.0	2.6	1502.2				
29-Jan-95	2400	1.0	0.0	2.2	1502.4				
30-Jan-95	2400	1.0	0.0	2.7	1502.7				
31-Jan-95	2400	1.0	0.0	7.5	1503.2				
1-Feb-95	2400	1.0	0.0	20.5	1505.5				
2-Feb-95	2400	1.0	0.0	20.8	1509.0				
3-Feb-95	2400	1.0	0.0	14.6	1511.7				
4-Feb-95	2400	1.0	0.0	11.0	1513.5				
5-Feb-95	2400	1.0	0.0	9.1	1514.9				
6-Feb-95	2400	1.0	0.0	8.4	1516.1				
7-Feb-95	2400	1.0	0.0	7.7	1517.2				
8-Feb-95	2400	1.0	0.0	7.2	1518.2				
9-Feb-95	2400	1.0	0.0	6.6	1519.1				
10-Feb-95	2400	1.0	0.0	6.1	1519.9				
11-Feb-95	2400	1.0	0.0	5.7	1520.7				
12-Feb-95	2400	1.0	0.0	4.7	1521.3				
13-Feb-95	2400	1.0	0.0	3.5	1521.8				
14-Feb-95	2400	1.0	0.0	4.2	1522.2				
15-Feb-95	2400	1.0	0.0	4.0	1522.7				
16-Feb-95	2400	1.0	0.0	4.1	1523.2				
17-Feb-95	2400	1.0	0.0	5.2	1523.7				
18-Feb-95	2400	1.0	0.0	5.8	1524.4				
19-Feb-95	2400	1.0	0.0	16.6	1525.6				
20-Feb-95	2400	1.0	0.0	30.6	1529.4				
21-Feb-95	2400	1.0	0.0	23.1	1533.2				
22-Feb-95	2400	1.0	0.0	18.4	1536.0				
23-Feb-95	2400	1.0	0.0	15.2	1538.3				
24-Feb-95	2400	1.0	0.0	13.4	1540.1				
25-Feb-95	2400	1.0	0.0	12.8	1541.8				
26-Feb-95	2400	1.0	0.0	12.3	1543.5				
27-Feb-95	2400	1.0	0.0	11.1	1545.0				
28-Feb-95	2400	1.0	0.0	9.9	1546.3				
1-Mar-95	2400	1.0	0.0	8.8	1547.5	2.615			2.620
2-Mar-95	2400	1.0	0.0	7.9	1548.5		7.9	-6.9	

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
3-Mar-95	2400	1.0	0.0	7.2	1549.4		7.2	-6.2	
4-Mar-95	2400	1.0	0.0	7.2	1550.3		7.2	-6.2	
5-Mar-95	2400	1.0	0.0	6.5	1551.1		6.5	-5.5	
6-Mar-95	2400	1.0	0.0	5.9	1551.8		5.9	-4.9	
7-Mar-95	2400	1.0	0.0	5.3	1552.4		5.3	-4.3	
8-Mar-95	2400	1.0	0.0	5.6	1553.0		5.6	-4.6	
9-Mar-95	2400	1.0	0.0	7.4	1553.7		7.4	-6.4	
10-Mar-95	2400	1.0	0.0	8.2	1554.7		8.2	-7.2	
11-Mar-95	2400	1.0	0.0	8.9	1555.7		8.9	-7.9	
12-Mar-95	2400	1.0	0.0	9.7	1556.8		9.7	-8.7	
13-Mar-95	2400	1.0	0.0	9.8	1558.0		9.8	-8.8	
14-Mar-95	2400	1.0	0.0	9.7	1559.2		9.7	-8.7	
15-Mar-95	2400	1.0	0.0	12.1	1560.5		12.1	-11.1	
16-Mar-95	2400	1.0	0.0	11.3	1562.0		11.3	-10.3	
17-Mar-95	2400	1.0	0.0	10.5	1563.3		10.5	-9.5	
18-Mar-95	2400	1.0	0.0	10.8	1564.5		10.8	-9.8	
19-Mar-95	2400	1.0	0.0	12.7	1565.9		12.7	-11.7	
20-Mar-95	2400	1.0	0.0	11.5	1567.4		11.5	-10.5	
21-Mar-95	2400	1.0	0.0	12.2	1568.8		12.2	-11.2	
22-Mar-95	2400	1.0	0.0	10.9	1570.1		10.9	-9.9	
23-Mar-95	2400	1.0	0.0	10.2	1571.3		10.2	-9.2	
24-Mar-95	2400	1.0	0.0	9.5	1572.4		9.5	-8.5	
25-Mar-95	2400	1.0	0.0	8.7	1573.4		8.7	-7.7	
26-Mar-95	2400	1.0	0.0	7.5	1574.2		7.5	-6.5	
27-Mar-95	2400	1.0	0.0	7.5	1575.0		7.5	-6.5	
28-Mar-95	2400	1.0	0.0	6.4	1575.7		6.4	-5.4	
29-Mar-95	2400	1.0	0.0	6.6	1576.4		6.6	-5.6	
30-Mar-95	2400	1.0	0.0	6.4	1577.1		6.4	-5.4	
31-Mar-95	2400	1.0	0.0	6.1	1577.7		6.1	-5.1	
1-Apr-95	2400	1.0	0.0	6.6	1578.3	2.615	1.2	-0.2	3.090
2-Apr-95	2400	1.0	0.0	6.2	1579.0		1.2	-0.2	
3-Apr-95	2400	1.0	0.0	6.5	1579.6		1.2	-0.2	
4-Apr-95	2400	1.0	0.0	6.4	1580.2		1.2	-0.2	
5-Apr-95	2400	1.0	0.0	7.2	1580.9		1.2	-0.2	
6-Apr-95	2400	1.0	0.0	7.6	1581.7		3.8	-2.8	
7-Apr-95	2400	1.0	0.0	9.4	1582.5		5.6	-4.6	
8-Apr-95	2400	1.0	0.0	11.2	1583.7		4.4	-3.4	
9-Apr-95	2400	1.0	0.0	10.0	1584.8		3.0	-2.0	
10-Apr-95	2400	1.5	0.0	8.6	1585.7		2.8	-1.3	
11-Apr-95	2400	5.9	0.0	8.4	1586.2		1.9	4.0	
12-Apr-95	2400	9.5	0.0	7.5	1586.2		2.5	7.0	
13-Apr-95	2400	9.5	0.0	8.1	1586.0		3.6	5.9	
14-Apr-95	2400	9.5	0.0	9.2	1585.9		2.7	6.8	
15-Apr-95	2400	9.5	0.0	8.3	1585.8		1.7	7.8	
16-Apr-95	2400	9.5	0.0	7.3	1585.6		1.2	8.3	
17-Apr-95	2400	9.5	0.0	6.8	1585.4		1.3	8.2	
18-Apr-95	2400	9.5	0.0	6.9	1585.1		1.6	7.9	
19-Apr-95	2400	10.7	1.2	7.2	1584.7		1.2	9.5	
20-Apr-95	2400	13.9	4.3	6.3	1584.1		1.2	12.7	
21-Apr-95	2400	14.7	5.1	6.1	1583.1		1.2	13.5	
22-Apr-95	2400	14.6	5.0	5.9	1582.1		1.2	13.4	
23-Apr-95	2400	14.7	5.0	5.9	1581.1		1.2	13.5	
24-Apr-95	2400	14.7	5.0	6.2	1580.1		1.2	13.5	
25-Apr-95	2400	15.8	6.2	7.2	1579.1		1.2	14.6	
26-Apr-95	2400	20.2	10.6	6.8	1577.8		1.2	19.0	
27-Apr-95	2400	22.9	13.2	7.1	1575.9		1.2	21.7	
28-Apr-95	2400	22.9	13.1	7.2	1574.0		1.2	21.7	
29-Apr-95	2400	22.8	13.0	7.2	1572.1		1.2	21.6	
30-Apr-95	2400	22.8	13.0	7.1	1570.1		1.5	21.3	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
1-May-95	2400	22.8	12.9	7.1	1568.2		1.5	21.3	
2-May-95	2400	22.8	12.9	8.4	1566.2		2.8	20.0	
3-May-95	2400	22.7	12.8	9.7	1564.5		3.1	19.6	
4-May-95	2400	22.7	12.8	9.4	1562.7		3.8	18.9	
5-May-95	2400	22.2	12.7	10.0	1561.0		4.4	17.8	
6-May-95	2400	22.0	12.6	11.2	1559.5		5.6	16.4	
7-May-95	2400	22.0	12.6	11.6	1558.1		6.0	16.0	
8-May-95	2400	18.9	9.5	11.5	1556.8		5.9	13.0	
9-May-95	2400	9.3	0.0	12.5	1556.6		6.9	2.4	
10-May-95	2400	9.3	0.0	12.9	1557.1		7.3	2.0	
11-May-95	2400	7.0	0.0	14.1	1557.7		8.5	-1.5	
12-May-95	2400	1.0	0.0	14.0	1559.2		8.4	-7.4	
13-May-95	2400	1.0	0.0	12.9	1560.9		7.3	-6.3	
14-May-95	2400	1.0	0.0	11.6	1562.4		6.0	-5.0	
15-May-95	2400	1.0	0.0	11.6	1563.8		6.0	-5.0	
16-May-95	2400	4.1	0.0	11.5	1565.0		5.9	-1.8	
17-May-95	2400	1.9	0.0	12.9	1566.1		7.3	-5.4	
18-May-95	2400	1.0	0.0	12.9	1567.6		7.3	-6.3	
19-May-95	2400	1.0	0.0	12.7	1569.1		7.1	-6.1	
20-May-95	2400	1.0	0.0	12.6	1570.6		7.0	-6.0	
21-May-95	2400	1.0	0.0	12.8	1572.0		7.2	-6.2	
22-May-95	2400	1.0	0.0	12.8	1573.5		7.2	-6.2	
23-May-95	2400	1.0	0.0	12.5	1574.9		6.9	-5.9	
24-May-95	2400	1.0	0.0	12.2	1576.3		6.6	-5.6	
25-May-95	2400	1.0	0.0	12.0	1577.6		6.4	-5.4	
26-May-95	2400	1.0	0.0	11.7	1578.9		6.1	-5.1	
27-May-95	2400	1.0	0.0	10.9	1580.2		5.3	-4.3	
28-May-95	2400	1.0	0.0	10.8	1581.3		5.2	-4.2	
29-May-95	2400	1.0	0.0	11.9	1582.5		6.3	-5.3	
30-May-95	2400	1.1	0.0	13.0	1583.8		7.4	-6.3	
31-May-95	2400	1.2	0.0	13.6	1585.2		8.0	-6.8	
1-Jun-95	2400	1.1	0.0	13.5	1586.7		7.9	-6.8	
2-Jun-95	2400	1.0	0.0	13.3	1588.0		7.7	-6.7	
3-Jun-95	2400	1.0	0.0	14.0	1589.5		8.4	-7.4	
4-Jun-95	2400	1.0	0.0	12.7	1590.9		7.1	-6.1	
5-Jun-95	2400	1.0	0.0	15.0	1592.3		9.4	-8.4	
6-Jun-95	2400	1.0	0.0	14.4	1593.7		8.8	-7.8	
7-Jun-95	2400	3.1	0.0	11.4	1595.0		5.8	-2.7	
8-Jun-95	2400	5.0	0.0	9.6	1595.6		4.0	1.0	
9-Jun-95	2400	4.5	0.8	9.0	1596.0		3.4	1.1	
10-Jun-95	2400	5.3	0.0	7.8	1596.5		2.2	3.1	
11-Jun-95	2400	3.3	0.0	8.6	1596.9		3.0	0.3	
12-Jun-95	2400	5.3	0.0	7.7	1597.3		2.1	3.2	
13-Jun-95	2400	6.9	0.0	8.0	1597.5		2.4	4.5	
14-Jun-95	2400	7.1	0.0	7.4	1597.6	3.460	1.8	5.3	3.420
15-Jun-95	2400	7.0	0.0	7.0	1597.6	3.460	7.0	0.0	
16-Jun-95	2400	7.1	0.0	7.2	1597.6	3.460	7.2	-0.1	
17-Jun-95	2400	1.0	0.0	8.0	1598.0	3.460	8.0	-7.0	
18-Jun-95	2400	1.0	0.0	8.2	1598.7	3.460	8.2	-7.2	
19-Jun-95	2400	6.7	0.0	7.2	1599.2	3.460	7.2	-0.5	
20-Jun-95	2400	9.0	0.0	6.8	1599.0	3.460	6.8	2.2	
21-Jun-95	2400	7.7	0.0	5.3	1598.7	3.460	5.3	2.4	
22-Jun-95	2400	5.9	0.0	6.2	1598.7	3.460	6.2	-0.3	
23-Jun-95	2400	5.1	0.0	5.7	1598.8	3.460	5.7	-0.6	
24-Jun-95	2400	2.1	0.0	5.8	1598.9	3.460	5.8	-3.7	
25-Jun-95	2400	2.1	0.0	5.7	1599.3	3.460	5.7	-3.6	3.460
26-Jun-95	2400	2.1	0.0	5.3	1599.7	3.460	5.3	-3.2	
27-Jun-95	2400	5.2	0.0	4.9	1599.9	3.460	4.9	0.3	
28-Jun-95	2400	7.1	0.0	4.1	1599.7	3.460	4.1	3.0	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
29-Jun-95	2400	6.8	0.0	3.5	1599.4	3.460	3.5	3.3	
30-Jun-95	2400	6.4	0.0	3.6	1599.1	3.460	3.6	2.8	
1-Jul-95	2400	1.4	0.0	3.6	1599.0	3.460	3.6	-2.2	
2-Jul-95	2400	1.5	0.0	4.7	1599.2	3.460	4.7	-3.2	
3-Jul-95	2400	4.1	0.0	6.5	1599.6	3.460	6.5	-2.4	
4-Jul-95	2400	3.4	0.0	5.3	1599.8	3.460	5.3	-1.9	
5-Jul-95	2400	4.5	0.0	4.6	1599.9	3.460	4.6	-0.1	
6-Jul-95	2400	5.1	0.0	3.7	1599.8	3.460	3.7	1.4	
7-Jul-95	2400	5.3	0.0	3.2	1599.6	3.460	3.2	2.1	
8-Jul-95	2400	5.4	0.0	3.5	1599.4	3.460	3.5	1.9	
9-Jul-95	2400	5.4	0.0	2.7	1599.2	3.460	2.7	2.7	
10-Jul-95	2400	3.4	0.0	3.5	1599.0	3.460	3.5	-0.1	
11-Jul-95	2400	2.4	0.0	3.8	1599.1	3.460	3.8	-1.4	
12-Jul-95	2400	4.4	0.0	3.2	1599.1	3.460	3.2	1.2	
13-Jul-95	2400	3.1	0.0	3.7	1599.1	3.460	3.7	-0.6	
14-Jul-95	2400	2.1	0.0	3.0	1599.2	3.460	3.0	-0.9	
15-Jul-95	2400	1.1	0.0	3.2	1599.3	3.460	3.2	-2.1	
16-Jul-95	2400	1.1	0.0	2.8	1599.5	3.460	2.8	-1.7	
17-Jul-95	2400	7.2	0.0	2.5	1599.5	3.460	2.5	4.7	
18-Jul-95	2400	9.3	0.0	1.5	1598.7	3.460	1.5	7.8	
19-Jul-95	2400	9.4	0.0	1.3	1597.9	3.460	1.3	8.1	
20-Jul-95	2400	11.3	1.9	1.4	1597.0	3.460	1.4	9.9	3.400
21-Jul-95	2400	14.0	4.6	0.7	1595.7		1.2	12.8	
22-Jul-95	2400	13.9	4.5	1.0	1594.2		1.2	12.7	
23-Jul-95	2400	13.8	4.4	0.8	1592.8		1.2	12.6	
24-Jul-95	2400	13.8	4.3	0.6	1591.4		1.2	12.6	
25-Jul-95	2400	13.7	4.2	0.7	1590.0		1.2	12.5	
26-Jul-95	2400	13.6	4.1	0.7	1588.5		1.2	12.4	
27-Jul-95	2400	13.7	4.2	0.8	1587.1		1.2	12.5	
28-Jul-95	2400	13.9	4.3	0.3	1585.6		1.2	12.7	
29-Jul-95	2400	13.8	4.3	0.8	1584.0		1.2	12.6	
30-Jul-95	2400	13.8	4.3	1.3	1582.6		1.2	12.6	
31-Jul-95	2400	13.4	3.9	1.0	1581.1		1.2	12.2	
1-Aug-95	2400	12.7	3.1	0.9	1579.7	3.451	1.2	11.5	3.090
2-Aug-95	2400	13.0	3.3	1.1	1578.3		1.2	11.8	
3-Aug-95	2400	13.1	3.5	1.1	1576.9		1.2	11.9	
4-Aug-95	2400	13.1	3.5	1.2	1575.4		1.2	11.9	
5-Aug-95	2400	13.1	3.4	1.0	1574.0		1.2	11.9	
6-Aug-95	2400	13.1	3.4	1.1	1572.5		1.2	11.9	
7-Aug-95	2400	13.2	3.4	2.3	1571.0		1.2	12.0	
8-Aug-95	2400	13.2	3.4	1.7	1569.6		1.2	12.0	
9-Aug-95	2400	13.2	3.4	1.6	1568.2		1.2	12.0	
10-Aug-95	2400	13.2	3.4	1.2	1566.7		1.2	12.0	
11-Aug-95	2400	13.2	3.4	1.9	1565.2		1.2	12.0	
12-Aug-95	2400	13.2	3.4	1.2	1563.7		1.2	12.0	
13-Aug-95	2400	13.2	3.3	2.0	1562.1		1.2	12.0	
14-Aug-95	2400	13.2	3.3	1.3	1560.6		1.2	12.0	
15-Aug-95	2400	13.7	3.8	1.9	1559.0		1.2	12.5	
16-Aug-95	2400	13.8	3.8	1.6	1557.4		1.2	12.6	
17-Aug-95	2400	13.6	3.6	2.1	1555.8		1.2	12.4	
18-Aug-95	2400	13.6	3.6	1.9	1554.2		1.2	12.4	
19-Aug-95	2400	13.6	3.6	1.6	1552.6		1.2	12.4	
20-Aug-95	2400	13.6	3.6	1.1	1550.9		1.2	12.4	
21-Aug-95	2400	13.6	3.5	1.3	1549.2		1.2	12.4	
22-Aug-95	2400	13.7	3.5	1.0	1547.4		1.2	12.5	
23-Aug-95	2400	13.6	3.5	0.9	1545.6		1.2	12.4	
24-Aug-95	2400	13.7	3.5	1.3	1543.9		1.2	12.5	
25-Aug-95	2400	13.6	3.4	0.9	1542.1		1.2	12.4	
26-Aug-95	2400	13.6	3.4	0.9	1540.3		1.2	12.4	

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
27-Aug-95	2400	13.6	3.4	0.8	1538.4		1.2	12.4	
28-Aug-95	2400	13.7	3.4	0.7	1536.6		1.2	12.5	
29-Aug-95	2400	13.7	3.4	0.9	1534.7		1.2	12.5	
30-Aug-95	2400	13.7	3.4	0.8	1532.8		1.2	12.5	
31-Aug-95	2400	13.8	3.4	0.5	1530.9	3.446	1.2	12.6	2.370
1-Sep-95	2400	9.4	0.0	0.4	1529.3				
2-Sep-95	2400	5.7	0.0	0.9	1528.3		FISH TOT	542.4	
3-Sep-95	2400	5.8	0.0	0.5	1527.5		(MAF)	1.076	
4-Sep-95	2400	5.8	0.0	0.6	1526.8				
5-Sep-95	2400	5.8	0.0	0.9	1526.0	Rev. Stor.	Est. Fish	Rev. Hist.	
6-Sep-95	2400	5.8	0.0	0.3	1525.3	MAF	MAF	MAF	
7-Sep-95	2400	5.9	0.0	1.1	1524.5	3.446	1.076	2.370	
8-Sep-95	2400	5.9	0.0	1.1	1523.8				
9-Sep-95	2400	5.8	0.0	0.8	1523.0				
10-Sep-95	2400	5.8	0.0	0.8	1522.3				
11-Sep-95	2400	5.8	0.0	0.8	1521.5				
12-Sep-95	2400	5.8	0.0	0.9	1520.8				
13-Sep-95	2400	5.8	0.0	0.6	1520.0				
14-Sep-95	2400	5.8	0.0	0.6	1519.2				
15-Sep-95	2400	5.8	0.0	0.6	1518.4				
16-Sep-95	2400	5.8	0.0	0.6	1517.6				
17-Sep-95	2400	5.8	0.0	0.5	1516.8				
18-Sep-95	2400	5.8	0.0	0.7	1516.0				
19-Sep-95	2400	5.8	0.0	0.8	1515.2				
20-Sep-95	2400	5.8	0.0	0.8	1514.4				
21-Sep-95	2400	5.8	0.0	0.6	1513.6				
22-Sep-95	2400	5.8	0.0	0.9	1512.8				
23-Sep-95	2400	5.8	0.0	0.5	1511.9				
24-Sep-95	2400	5.8	0.0	0.6	1511.1				
25-Sep-95	2400	5.8	0.0	0.6	1510.3				
26-Sep-95	2400	4.9	0.0	0.8	1509.5				
27-Sep-95	2400	3.8	0.0	1.0	1509.0				
28-Sep-95	2400	3.8	0.0	1.3	1508.5				
29-Sep-95	2400	3.8	0.0	1.7	1508.2				
30-Sep-95	2400	3.8	0.0	1.1	1507.8				
1-Oct-95	2400	3.8	0.0	1.6	1507.4				
2-Oct-95	2400	3.8	0.0	1.1	1507.0				
3-Oct-95	2400	2.7	0.0	3.1	1506.7				
4-Oct-95	2400	1.7	0.0	4.0	1507.1				
5-Oct-95	2400	2.0	0.0	2.0	1507.2				
6-Oct-95	2400	1.5	0.0	1.5	1507.2				
7-Oct-95	2400	1.5	0.0	1.6	1507.2				
8-Oct-95	2400	1.5	0.0	1.4	1507.2				
9-Oct-95	2400	1.5	0.0	1.6	1507.2				
10-Oct-95	2400	1.5	0.0	1.4	1507.2				
11-Oct-95	2400	1.7	0.0	2.1	1507.2				
12-Oct-95	2400	1.8	0.0	3.3	1507.4				
13-Oct-95	2400	1.8	0.0	2.6	1507.6				
14-Oct-95	2400	1.9	0.0	2.0	1507.7				
15-Oct-95	2400	2.0	0.0	1.8	1507.6				
16-Oct-95	2400	2.0	0.0	1.8	1507.6				
17-Oct-95	2400	2.7	0.0	3.5	1507.6				
18-Oct-95	2400	3.4	0.0	5.6	1507.9				
19-Oct-95	2400	4.1	0.0	4.0	1508.1				
20-Oct-95	2400	5.8	0.0	2.8	1507.8				
21-Oct-95	2400	5.8	0.0	2.8	1507.3				
22-Oct-95	2400	5.8	0.0	2.9	1506.8				
23-Oct-95	2400	8.7	0.0	2.2	1506.0				
24-Oct-95	2400	9.3	0.0	2.2	1504.9				

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
25-Oct-95	2400	10.6	0.0	2.3	1503.5				
26-Oct-95	2400	10.7	0.0	5.4	1502.4				
27-Oct-95	2400	10.7	0.0	4.0	1501.4				
28-Oct-95	2400	5.1	0.0	3.0	1500.6				
29-Oct-95	2400	2.3	0.0	2.5	1500.4				
30-Oct-95	2400	3.7	0.0	2.9	1500.4				
31-Oct-95	2400	4.2	0.0	2.2	1500.1				
1-Nov-95	2400	2.9	0.0	2.2	1499.9				
2-Nov-95	2400	3.5	0.0	1.7	1499.7				
3-Nov-95	2400	3.5	0.0	1.6	1499.3				
4-Nov-95	2400	1.3	0.0	1.6	1499.2				
5-Nov-95	2400	1.4	0.0	2.2	1499.3				
6-Nov-95	2400	1.5	0.0	2.1	1499.4				
7-Nov-95	2400	2.5	0.0	2.7	1499.5				
8-Nov-95	2400	2.4	0.0	5.0	1499.6				
9-Nov-95	2400	1.5	0.0	11.1	1500.9				
10-Nov-95	2400	1.5	0.0	6.5	1502.0				
11-Nov-95	2400	1.5	0.0	10.0	1503.1				
12-Nov-95	2400	1.5	0.0	13.7	1505.1				
13-Nov-95	2400	1.5	0.0	10.7	1506.8				
14-Nov-95	2400	3.8	0.0	11.1	1508.3				
15-Nov-95	2400	10.7	0.0	9.9	1508.7				
16-Nov-95	2400	11.7	1.0	10.1	1508.5				
17-Nov-95	2400	15.2	4.5	9.2	1507.9				
18-Nov-95	2400	16.1	5.3	8.8	1506.7				
19-Nov-95	2400	15.9	5.1	8.0	1505.5				
20-Nov-95	2400	15.9	5.1	7.3	1504.1				
21-Nov-95	2400	13.1	2.2	6.2	1502.6				
22-Nov-95	2400	10.8	0.0	6.5	1501.8				
23-Nov-95	2400	10.8	0.0	7.0	1501.1				
24-Nov-95	2400	10.8	0.0	9.2	1500.6				
25-Nov-95	2400	12.6	2.0	13.7	1500.6				
26-Nov-95	2400	14.1	3.4	14.4	1500.8				
27-Nov-95	2400	14.1	3.4	13.2	1500.7				
28-Nov-95	2400	14.8	4.2	15.7	1500.6				
29-Nov-95	2400	9.7	2.7	34.6	1502.3				
30-Nov-95	2400	1.4	0.0	57.8	1509.9				
1-Dec-95	2400	1.1	0.0	53.9	1518.6				
2-Dec-95	2400	1.0	0.0	38.5	1525.4				
3-Dec-95	2400	1.0	0.0	27.6	1530.1				
4-Dec-95	2400	1.0	0.0	22.5	1533.5				
5-Dec-95	2400	4.3	0.0	17.5	1536.2				
6-Dec-95	2400	10.3	0.0	14.6	1537.2				
7-Dec-95	2400	10.3	0.0	12.6	1537.7				
8-Dec-95	2400	9.3	0.0	10.7	1537.9				
9-Dec-95	2400	1.0	0.0	10.1	1538.7				
10-Dec-95	2400	1.0	0.0	11.1	1540.1				
11-Dec-95	2400	4.5	0.0	15.0	1541.6				
12-Dec-95	2400	9.1	0.0	21.0	1543.1				
13-Dec-95	2400	6.1	0.0	20.6	1544.9				
14-Dec-95	2400	5.5	0.0	17.9	1547.0				
15-Dec-95	2400	5.5	0.0	16.7	1548.6				
16-Dec-95	2400	5.5	0.0	14.6	1550.0				
17-Dec-95	2400	5.5	0.0	13.1	1551.1				
18-Dec-95	2400	6.5	0.0	11.6	1552.1				
19-Dec-95	2400	7.6	0.0	10.3	1552.6				
20-Dec-95	2400	7.6	0.0	9.5	1552.9				
21-Dec-95	2400	7.7	0.0	8.8	1553.1				
22-Dec-95	2400	5.7	0.0	8.2	1553.3				

		OUTFLOW	SPILL	INFLOW	WS Elev	Rev. Stor.	Rev. Outfl	Est. Fish	Historic
DATE	HOUR	KCFS	KCFS	KCFS	MSL-ft	MAF	KCFS	KCFS	MAF
23-Dec-95	2400	8.3	0.0	7.1	1553.4				
24-Dec-95	2400	2.3	0.0	6.4	1553.5				
25-Dec-95	2400	2.2	0.0	6.2	1554.1				
26-Dec-95	2400	7.6	0.0	6.2	1554.3				
27-Dec-95	2400	7.7	0.0	5.3	1554.1				
28-Dec-95	2400	7.7	0.0	5.6	1553.7				
29-Dec-95	2400	7.7	0.0	5.9	1553.5				
30-Dec-95	2400	7.7	0.0	6.5	1553.3				
31-Dec-95	2400	2.4	0.0	6.1	1553.4				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
29-Jun-95	2400	6.8	0.0	3.5	1599.4	3.460	3.5	3.3	
30-Jun-95	2400	6.4	0.0	3.6	1599.1	3.460	3.6	2.8	
1-Jul-95	2400	1.4	0.0	3.6	1599.0	3.460	3.6	-2.2	
2-Jul-95	2400	1.5	0.0	4.7	1599.2	3.460	4.7	-3.2	
3-Jul-95	2400	4.1	0.0	6.5	1599.6	3.460	6.5	-2.4	
4-Jul-95	2400	3.4	0.0	5.3	1599.8	3.460	5.3	-1.9	
5-Jul-95	2400	4.5	0.0	4.6	1599.9	3.460	4.6	-0.1	
6-Jul-95	2400	5.1	0.0	3.7	1599.8	3.460	3.7	1.4	
7-Jul-95	2400	5.3	0.0	3.2	1599.6	3.460	3.2	2.1	
8-Jul-95	2400	5.4	0.0	3.5	1599.4	3.460	3.5	1.9	
9-Jul-95	2400	5.4	0.0	2.7	1599.2	3.460	2.7	2.7	
10-Jul-95	2400	3.4	0.0	3.5	1599.0	3.460	3.5	-0.1	
11-Jul-95	2400	2.4	0.0	3.8	1599.1	3.460	3.8	-1.4	
12-Jul-95	2400	4.4	0.0	3.2	1599.1	3.460	3.2	1.2	
13-Jul-95	2400	3.1	0.0	3.7	1599.1	3.460	3.7	-0.6	
14-Jul-95	2400	2.1	0.0	3.0	1599.2	3.460	3.0	-0.9	
15-Jul-95	2400	1.1	0.0	3.2	1599.3	3.460	3.2	-2.1	
16-Jul-95	2400	1.1	0.0	2.8	1599.5	3.460	2.8	-1.7	
17-Jul-95	2400	7.2	0.0	2.5	1599.5	3.460	2.5	4.7	
18-Jul-95	2400	9.3	0.0	1.5	1598.7	3.460	1.5	7.8	
19-Jul-95	2400	9.4	0.0	1.3	1597.9	3.460	1.3	8.1	
20-Jul-95	2400	11.3	1.9	1.4	1597.0	3.460	1.4	9.9	3.400
21-Jul-95	2400	14.0	4.6	0.7	1595.7		1.2	12.8	
22-Jul-95	2400	13.9	4.5	1.0	1594.2		1.2	12.7	
23-Jul-95	2400	13.8	4.4	0.8	1592.8		1.2	12.6	
24-Jul-95	2400	13.8	4.3	0.6	1591.4		1.2	12.6	
25-Jul-95	2400	13.7	4.2	0.7	1590.0		1.2	12.5	
26-Jul-95	2400	13.6	4.1	0.7	1588.5		1.2	12.4	
27-Jul-95	2400	13.7	4.2	0.8	1587.1		1.2	12.5	
28-Jul-95	2400	13.9	4.3	0.3	1585.6		1.2	12.7	
29-Jul-95	2400	13.8	4.3	0.8	1584.0		1.2	12.6	
30-Jul-95	2400	13.8	4.3	1.3	1582.6		1.2	12.6	
31-Jul-95	2400	13.4	3.9	1.0	1581.1		1.2	12.2	
1-Aug-95	2400	12.7	3.1	0.9	1579.7	3.451	1.2	11.5	3.090
2-Aug-95	2400	13.0	3.3	1.1	1578.3		1.2	11.8	
3-Aug-95	2400	13.1	3.5	1.1	1576.9		1.2	11.9	
4-Aug-95	2400	13.1	3.5	1.2	1575.4		1.2	11.9	
5-Aug-95	2400	13.1	3.4	1.0	1574.0		1.2	11.9	
6-Aug-95	2400	13.1	3.4	1.1	1572.5		1.2	11.9	
7-Aug-95	2400	13.2	3.4	2.3	1571.0		1.2	12.0	
8-Aug-95	2400	13.2	3.4	1.7	1569.6		1.2	12.0	
9-Aug-95	2400	13.2	3.4	1.6	1568.2		1.2	12.0	
10-Aug-95	2400	13.2	3.4	1.2	1566.7		1.2	12.0	
11-Aug-95	2400	13.2	3.4	1.9	1565.2		1.2	12.0	
12-Aug-95	2400	13.2	3.4	1.2	1563.7		1.2	12.0	
13-Aug-95	2400	13.2	3.3	2.0	1562.1		1.2	12.0	
14-Aug-95	2400	13.2	3.3	1.3	1560.6		1.2	12.0	
15-Aug-95	2400	13.7	3.8	1.9	1559.0		1.2	12.5	
16-Aug-95	2400	13.8	3.8	1.6	1557.4		1.2	12.6	
17-Aug-95	2400	13.6	3.6	2.1	1555.8		1.2	12.4	
18-Aug-95	2400	13.6	3.6	1.9	1554.2		1.2	12.4	
19-Aug-95	2400	13.6	3.6	1.6	1552.6		1.2	12.4	
20-Aug-95	2400	13.6	3.6	1.1	1550.9		1.2	12.4	
21-Aug-95	2400	13.6	3.5	1.3	1549.2		1.2	12.4	
22-Aug-95	2400	13.7	3.5	1.0	1547.4		1.2	12.5	
23-Aug-95	2400	13.6	3.5	0.9	1545.6		1.2	12.4	
24-Aug-95	2400	13.7	3.5	1.3	1543.9		1.2	12.5	
25-Aug-95	2400	13.6	3.4	0.9	1542.1		1.2	12.4	
26-Aug-95	2400	13.6	3.4	0.9	1540.3		1.2	12.4	

OATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
27-Aug-95	2400	13.6	3.4	0.8	1538.4		1.2	12.4	
28-Aug-95	2400	13.7	3.4	0.7	1536.6.		1.2	125	
29-Aug-95	2400.	13.7	3.4	0.9	1534.7		1.2	12.5	
30-Aug-95	2400	13.7'	3.4	0.8	15328		1.2	12.5	
31-Aug-95	2400	13.8	3.4	0.5	1530.9	3.446.	1.2	126	2.370
1-Sep-95	2400	9.4	0.0	0.4	1529.3				
2-Sep-95	2400	5.7	0.0,	0.9	1528.3	FISH	TOT	5424	
3-Sep-95	2400'	5.8	0.0:	0.5	1527.5	(MAF)		1.076	
4-Sep-95	2400	5.8:	0.0	0.6	1526.8				
5-Sep-95	2400	5.8	0.0	0.9	1526.0	Rev.	Stor. Est.	Fish	Rev. Hist.
6-Sep-95	2400	5.8'	0.0	0.3,	1525.3	MAF	MAF		MAF
7-Sep-95	2400	5.9:	0.0;	1.1,	1524.5	3.4461	1.076	2.370	
8-Sep-95	2400	5.9'	0.0	1.1	1523.8				
9-Sep-95	2400	5.8	0.0	0.8	1523.0				
10-Sep-95	2400	5.81	0.01	0.8	1522.31	I			
11-Sep-95	2400	5.8,	0.01	0.8	1521.5;	I			
12-Sep-95	2400	5.8	0.0	0.9	1520.8				
13-Sep-95	2400	5.8	0.01	0.6	1520.0		I		
14-Sep-95	2400	5.8	0.01	0.61	1519.2				
15-Sep-95	2400	5.8	0.0	0.6	1518.4			I	
16-Sep-95	2400	5.81	0.0	0.61	1517.6;				
17-Sep-95	2400	5.8	0.0	0.51	1516.8'				
18-Sep-95	2400	5.8	0.01	0.7	1516.0		I	I	
19-Sep-95	2400	5.8:	0.0	0.8	1515.2				
20-Sep-95	2400	5.8	0.0	0.8	1514.4			I	
21-Sep-95	2400	5.8	0.01	0.61	1513.61				
22-Sep-95	2400	5.8	0.0	0.9	1512.8				
23-Sep-95	2400	5.8	0.01	0.5	1511.91	I			
24-Sep-95	2400	5.8	0.01	0.6	1511.1	I			
25-Sep-95	2400	5.8	0.0	0.6	1510.3			2405.8	01
26-Sep-95	2400	4.91	0.0	0.8	1509.5				
27-Sep-95	2400	3.8	0.01	1.01	1509.01				
28-Sep-95	2400	3.8	0.01	1.31	1508.5				
29-Sep-95	2400	3.8	0.0	1.7	1508.2				
30-Sep-95	2400	3.8	0.0	1.1	1507.8			I	
1-Oct-95	2400	3.8	0.0	1.6	1507.4			I	
2-Oct-95	2400	3.81	0.01	1.1	1507.0				
3-Oct-95	2400	2.7	0.0	3.1	1506.71				
4-Oct-95	2400	1.7	0.01'	4.0	1507.1				
5-Oct-95	2400	2.01	0.0	20	1507.21				
6-Oct-95	2400	1.5	0.0	1.5	1507.2				
7-Oct-95	2400	1.5	0.0	1.6	1507.2				
8-Oct-95	2400	1.5	0.0	1.4	1507.2				
9-Oct-95	2400	1.51	0.0;	1.6	1507.2			I	
10-Oct-95	2400	1.5	0.0	1.4	1507.2				
11-Oct-95	2400	1.71	0.0	2.1	1507.2				
12-Oct-95	2400	1.8	0.0	3.31	1507.4				
13-Oct-95	2400	1.8	0.01	2.6	1507.6				
14-Oct-95	2400	1.9	0.0	2.0	1507.7			I	
15-Oct-95	2400	2.0	0.0	1.8	1507.6				
16-Oct-95	2400	2.0	0.0	1.8	1507.6				
17-Oct-95	2400	2.7	0.01	3.5	1507.6			I	
18-Oct-95	2400	3.4	0.01	5.6	1507.9				
19-Oct-95	2400	4.1	0.0	4.0	1508.1				
20-Oct-95	2400	5.81	0.0	2.8	1507.8				
21-Oct-95	2400	5.8	0.0	2.8	1507.3				
22-Oct-95	2400	5.81	0.0	2.9	1506.8				
23-Oct-95	2400	8.7	0.0	22;	1506.0				
24-Oct-95	2400	9.3	0.0	2.2	1504.9			I	

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. MAF	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
25-Oct-95	2400	10.6	0.0	2.3	1503.5				
26-Oct-95	2400	10.7	0.0	5.4,	15024				
27-Oct-95	2400	10.7	0.0	4.0	1501.4				
28-Oct-95	2400	5.1	0.0	3.0	1500.61				
294x-95	2400	2.3	0.0	25	1500.4				
30-Oct-95	2400	3.7	0.0	2.9	1500.4				
31-Oct-95	2400	4.2	0.0.	2.2	1500.1				
1-Nov-95	2400	2.9	0.0	2.2	1499.9;				
2-Nov-95	2400	3.5	0.01	1.7	1499.7'				
3-Nov-95	24001	3.5	0.0	1.6	1499.3,				
4-Nov-95	2400	1.3	0.0	1.6	1499.2				
5-Nov-95	24001	1.4	0.0	2.21	1499.3				
6-Nov-95	2400	1.5	0.0;	2.1	1499.4				
7-Nov-95	2400	25;	0.0	27i	1499.5				
8-Nov-95	24001	2.4	0.0	5.0	1499.6				
9-Nov-95	2400	1.5	0.01	11.1	1500.9				
10-Nov-95	2400	1.51	0.01	6.51	1502.0				
11-Nov-95	2400	1.5	0.01	10.0	1503.1;				
12-Nov-95	2400	1.5	0.0	13.7	1505.1				
13-Nov-95	24001	1.51	0.0	10.7	1506.8				
14-Nov-95	2400	3.8	0.0	11.1	1508.31				
15-Nov-95	2400	10.7	0.01	9.9	1508.71				
16-Nov-95	2400	11.71	1.01	10.1	1508.5				
17-Nov-95	2400;	15.2:	4.5:	9.21	1507.9				
18-Nov-95	2400	16.1	5.3;	8.81	1506.7				
19-Nov-95	2400	15.9	5.1	8.0	1505.5				
20-Nov-95	2400	15.91	5.1	7.31	1504.1				
21-Nov-95	2400	13.11	2.2	6.2	1502.6				
22-Nov-95	2400	10.81	0.01	6.5	1501.8				
23-Nov-95	24001	10.8	0.0	7.0	1501.1;				
24-Nov-95	2400	10.8	0.01	9.2	1500.6				
25-Nov-95	2400	12.6	2.0	13.71	1500.6				
26-Nov-95	2400	14.11	3.41	14.4	1500.81				
27-Nov-95	2400	14.11	3.4	13.2	1500.71				
28-Nov-95	2400	14.8	4.2	15.7	1500.61				
29-Nov-95	2400	9.7	2.7	34.6	1502.3				
30-Nov-95	2400	1.4	0.0	57.81	1509.9				
1-Dec-95	2400	1.1'	0.01	53.91	1518.6;				
2-Dec-95	2400	1.0	0.0	38.5	1525.4				
3-Dec-95	2400	1.01	0.0	27.61	1530.1				
4-Dec-95	2400	1.0	0.0	22.5	1533.5				
5-Dec-95	2400	4.3	0.0	17.5	1536.2				
6-Dec-95	2400	10.31	0.0	14.6	1537.2				
7-Dec-95	2400	10.3	0.0	126	1537.71				
8-Dec-95	2400	9.3	0.0	10.7	1537.9				
9-Dec-95	2400	1.01	0.0	10.1	1538.7				
10-Dec-95	2400	1.01	0.0	11.11	1540.1				
11-Dec-95	2400	4.51	0.0	15.0	1541.61				
12-Dec-95	2400	9.11	0.0	21.0)	1543.1				
13-Dec-95	2400	6.11	0.01	20.6	1544.9				
14-Dec-95	2400	5.5	0.01	17.9	1547.0				
15-Dec-95	2400	5.5	0.01	16.71	1548.6				
16-Dec-95	2400	5.51	0.0	14.6	1550.01				
17-Dec-95	2400	5.5	0.01	13.1	1551.1				
18-Dec-95	2400	6.5	0.0	11.6;	1552.1				
19-Dec-95	24001	7.6	0.0	10.3	1552.6				
20-Dec-95	2400	7.61	0.0	9.51	1552.9				
21-Dec-95	2400	7.71	0.01	8.81	1553.1				
22-Dec-95	2400	5.7	0.0	8.2	1553.31				

DATE	HOUR	OUTFLOW KCFS	SPILL KCFS	INFLOW KCFS	WS Elev MSL-ft	Rev. Stor. M A F	Rev. Outfl KCFS	Est. Fish KCFS	Historic MAF
23-Dec-95	2400	8.3	0.0	7.1	1553.4				
24-Dec-95	2400	2.3	0.0	6.4	1553.5				
25-Dec-95	2400	2 2	0.0	6.2	1554.1				
26-Dec-95	2400	7.6	0.0	6.2	1554.3				
27-Dec-95	2400	7.7	0.0	5.3	1554.1				
28-Dec-95	2400	7.7	0.0	5.6	1553.7				
29-Dec-95	2400	7.7	0.0	5.9	1553.5				
30-Dec-95	2400	7.7	0.0	6.5	1553.3				
31-Dec-95	2400	2.4	0.0	6.1	1553.4				

APPENDIX B

ANOVA Tables for the Multiple Regression
ANOVA Tables for the Autoregressive Analysis
Regression Coefficients for the Autoregressive Analysis

Results of Multiple Regression Fitting at Peck

Source	df	s s	MS	F	P(F)
Year	4	141.76	35.44	16.20	3.78E-13
Spring FA	1	0.52	0 52	0.24	0.62
Summer FA	1	2965.21	2965.21	1355.73	0
Year*Spring FA	4	10.97	2.74	1.25	0.29
Year* Summer FA	4	137.79	34.45	15.75	8.92E-13
Residual	3362	7353.25	2.19		

Results of Multiple Regression at Lower Granite Dam

Source	df	s s	MS	F	P(F)
Year	4	651.95	162.99	78.73	**0.000**
Spring FA	1	9.99	9.99	4.82	0.028
Summer FA	1	488.11	488.11	235.78	0.000
Year*Spring FA	4	133.64	33.41	16.14	4.09E-13
Year* Summer FA	4	57.99	14.50	7.00	1.30E-5
Residual	3860	7991.12	2.07		

Results of Multiple Regression at Anatone

Source	df	s s	MS	F	P(F)
Year	4	649.53	162.38	93.34	0.000
Spring FA	1	0.45	0.45	0.26	0.606
Summer FA	1	7.71	7.71	4.43	0.035
Year*Spring FA	2	11.58	5.79	3.33	0.036
Year*Summer FA	4	54.66	13.67	7.86	2.69E-6
Residual	3133	5450.47	1.74		

Results of Autoregressive Fitting at Peck

Source	df	s s	MS	F	P(F)
Y_{t-1}	1	9216.60	9216.60	23274.20	0
Year	4	0.95	0.24	0.60	0.662
Summer FA	1	43.92	43.92	110.91	0
Year*Summe FA	4	16.94	4.24	10.71	1.27E-8
Residual	3365	1331.03	0.40		

Results of Autoregressive Fitting at Lower Granite Dam

Source	df	s s	MS	F	P(F)
Y_{t-1}	1	823 1.07	823 1.07	29121.98	0.000
Year	4	2.94	0.73	2.60	0.034
Summer FA	1	5.25	5.25	18.56	1.7E-5
Year* Summer FA	4	1.97	0.49	1.74	**0.140**
Residual	3862	1091.56	0.28		

Results of Autoregressive Fitting at Anatone

Source	df	s s	MS	F	P(F)
Y_{t-1}	1	5344.18	5344.18	20320.00	0.000
Year	4	3.20	0.80	3.04	0.016
Spring FA	1	**0.03**	**0.03**	0.11	**0.736**
Summer FA	1	0.13	0.13	0.50	0.480
Year* Spring FA	2	0.51	0.25	0.96	0.382
Year* Summer FA	**4**	**0.38**	0.10	**0.37**	**0.834**
Residual	3130	822.38	0.26		

Regression Coefficients for autoregressive fitting at Peck

1991: y(t) = -0.0071 + 0.889 * y(t-1) - O.l333*(Summer FA)

1992: y(t) = 0.0329 + 0.889 * y(t-1) - O.l373*(Summer FA)

1993: y(t) = 0.0693 + 0.889 * y(t-1) - O.O423*(Summer FA)

1994: y(t) = 0.1453 + 0.889 * y(t-1) - O.O483*(Summer FA)

1995: y(t) = 0.0301 + 0.889 * y(t-1) - O.O353*(Summer FA)

Regression Coefficients for autoregressive fitting at Lower Granite Dam

1991: y(t) = 0.0007 + 0.9284 * y(t-1) - O.O114*(Summer FA)

1992: y(t) = 0.0681 + 0.9284 * y(t-1) - 0.0114*(Summer FA)

1993: y(t) = -0.0034 + 0.9284 * y(t-1) - O.O114*(Summer FA)

1994 y(t) = 0.1474 + 0.9284 * y(t-1) - O.O114*(Summer FA)

1995: y(t) = 0.0028 + 0.9284 * y(t-1) - O.O114*(Summer FA)

APPENDIX C

Tables of Data Used in Figures

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1991 Data

GIVEN

Date	Percentage	Flow(KCFS)
1-Apr	0.0	26
4-Apr	0.0	32
7-Apr	0.0	38
10-Apr	0.0	30.5
13-Apr	0.3	28.3
16-Apr	1.2	29.2
19-Apr	4.4	27.5
22-Apr	6.1	36.9
25-Apr	5.2	53.7
28-Apr	2.2	57.1
1 -May	2.8	58.1
4-May	3.7	50
7-May	5.6	61.2
1 0-May	6.1	74.8
13-May	6.4	83.9
16-May	9.5	84.5
19-May	14.1	111.6
22-May	5.3	100.1
25-May	2.3	9.2
28-May	1.6	82.3
3 1 -May	1.9	83.7
3-Jun	2.2	93.9
6-Jun	3.3	87.8
9-Jun	3.1	85.1
12-Jun	3.4	95.7
15-Jun	2.3	70.2
18-Jun	2.5	65.6
21-Jun	0.9	65.8
24-Jun	1.4	64
27-Jun	0.9	61.4
30-Jun	0.2	65.5
3-Jul	0.2	57.4
-6-Jul	0.0	44.9
9-Jul	0.2	44.3
12-Jul	0.3	42.3
15-Jul	0.0	31.5
18-Jul	0.3	23.9
21-Jul	0.0	21.3
24-Jul	0.0	
27-Jul	0.0	
30-Jul	0.0	
2-Aug	0.0	
5-Aug	0.0	
a-Aug	0.0	
11-Aug	0.0	
14-Aug	0.0	
17-Aug	0.0	
20-Aug	0.0	
23-Aug	0.0	
26-Aug	0.0	
29-Aug	0.0	
1-Sep	0.0	

CREATED

Date	Percentage	Perc/3	CumProb
1-Apr	0.00	0.00	0.00
2-Apr	0.00	0.00	0.00
3-Apr	0.00	0.00	0.00
4-Apr	0.00	0.00	0.00
5-Apr	0.00	0.00	0.00
6-Apr	0.00	0.00	0.00
7-Apr	0.00	0.00	0.00
8-Apr	0.00	0.00	0.00
9- Apr	0.00	0.00	0.00
IO-Apr	0.00	0.00	0.00
11-Apr	0.10	0.03	0.03
12-Apr	0.20	0.07	0.10
13-Apr	0.30	0.10	0.20
14-Apr	0.60	0.20	0.40
15-Apr	0.90	0.30	0.70
16-Apr	1.20	0.40	1.10
17-Apr	2.27	0.76	1.86
18-Apr	3.33	1.11	2.97
19-Apr	4.40	1.47	4.43
20-Apr	4.97	1.66	6.09
21-Apr	5.53	1.84	7.93
22-Apr	6.10	2.03	9.97
23-Apr	5.80	1.93	11.90
24-Apr	5.50	1.83	13.73
25-Apr	5.20	1.73	15.47
26-Apr	4.20	1.40	16.87
27-Apr	3.20	1.07	17.93
28-Apr	2.20	0.73	18.67
29-Apr	2.40	0.80	19.47
30-Apr	2.60	0.87	20.33
1 -May	2.80	0.93	21.27
2-May	3.10	1.03	22.30
3-May	3.40	1.13	23.43
4-May	3.70	1.23	24.67
S-May	4.33	1.44	26.11
6-May	4.97	1.66	27.77
7-May	5.60	1.87	29.63
8-May	5.77	1.92	31.56
9-May	5.93	1.98	33.53
1 0-May	6.10	2.03	35.57
1 1-May	6.20	2.07	37.63
12-May	6.30	2.10	39.73
13-May	6.40	2.13	41.87
14-May	7.43	2.48	44.34
15-May	a.47	2.82	47.17
16-May	9.50	3.17	50.33
17-May	11.03	3.68	54.01
18-May	12.57	4.19	58.20
19-May	14.10	4.70	62.90
20-May	11.17	3.72	66.62
21-May	8.23	2.74	69.37
22-May	5.30	1.77	71.13
23-May	4.30	1.43	72.57
24-May	3.30	1.10	73.67
25-May	2.30	0.77	74.43
26-May	2.07	0.69	75.12
27-May	1.83	0.61	75.73
28-May	1.60	0.53	76.27

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1991 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			29-May	1.70	0.57	76.83
			30-May	1.80	0.60	77.43
			3 l-May	1.90	0.63	78.07
			I-Jun	2.00	0.67	78.73
			2-Jun	2.10	0.70	79.43
			3-Jun	2.20	0.73	80.17
			4-Jun	2.57	0.86	81.02
			5-Jun	2.93	0.98	82.00
			6-Jun	3.30	1.10	83.10
			7-Jun	3.23	1.08	84.18
			a-Jun	3.17	1.06	85.23
			9-Jun	3.10	1.03	86.27
			10-Jun	3.20	1.07	87.33
			11-Jun	3.30	1.10	88.43
			12-Jun	3.40	1.13	89.57
			13-Jun	3.03	1.01	90.58
			14-Jun	2.67	0.89	91.47
			15-Jun	2.30	0.77	92.23
			16-Jun	2.37	0.79	93.02
			17-Jun	2.43	0.81	93.83
			18-Jun	2.50	0.83	94.67
			19-Jun	1.97	0.66	95.32
			20-Jun	1.43	0.48	95.80
			21-Jun	0.90	0.30	96.10
			22-Jun	1.07	0.36	96.46
			23-Jun	1.23	0.41	96.87
			24-Jun	1.40	0.47	97.33
			25-Jun	1.23	0.41	97.74
			26-Jun	1.07	0.36	98.10
			27-Jun	0.90	0.30	98.40
			28-Jun	0.67	0.22	98.62
			29-Jun	0.43	0.14	98.77
			30-Jun	0.20	0.07	98.83
			1-Jul	0.20	0.07	98.90
			2-Jul	0.20	0.07	98.97
			3-Jul	0.20	0.07	99.03
			4-Jul	0.13	0.04	99.08
			5-Jul	0.07	0.02	99.10
			6-Jul	0.00	0.00	99.10
			7-Jul	0.07	0.02	99.12
			8-Jul	0.13	0.04	99.17
			9-Jul	0.20	0.07	99.23
			10-Jul	0.23	0.08	99.31
			11-Jul	0.27	0.09	99.40
			12-Jul	0.30	0.10	99.50
			13-Jul	0.20	0.07	99.57
			14-Jul	0.10	0.03	99.60
			15-Jul	0.00	0.00	99.60
			16-Jul	0.10	0.03	99.63
			17-Jul	0.20	0.07	99.70
			1 a-Jul	0.30	0.10	99.80
			19-Jul	0.20	0.07	99.87
			20-Jul	0.10	0.03	99.90
			21-Jul	0.00	0.00	99.90
			22-Jul	0.00	0.00	99.90
			23-Jul	0.00	0.00	99.90
			24-Jul	0.00	0.00	99.90
			25-Jul	0.00	0.00	99.90

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1991 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date .	Percentage	Perc/3	CumProb
			26-Jul	0.00	0.00	99.90
			27-Jul	0.00	0.00	99.90
			28-Jul	0.00	0.00	99.90
			29-Jul	0.00	0.00	99.90
			30-Jul	0.00	0.00	99.90
			31-Jul	0.00	0.00	99.90
			I-Aug	0.00	0.00	99.90
			2-Aug	0.00	0.00	99.90
			3-Aug	0.00	0.00	99.90
			4-Aug	0.00	0.00	99.90
			5-Aug	0.00	0.00	99.90
			6-Aug	0.00	0.00	99.90
			7-Aug	0.00	0.00	99.90
			a-Aug	0.00	0.00	99.90
			9-Aug	0.00	0.00	99.90
			1 0-Aug	0.00	0.00	99.90
			11-Aug	0.00	0.00	99.90
			12-Aug	0.00	0.00	99.90
			13-Aug	0.00	0.00	99.90
			14-Aug	0.00	0.00	99.90
			15-Aug	0.00	0.00	99.90
			16-Aug	0.00	0.00	99.90
			17-Aug	0.00	0.00	99.90
			1 a-Aug	0.00	0.00	99.90
			19-Aug	0.00	0.00	99.90
			20-Aug	0.00	0.00	99.90
			21-Aug	0.00	0.00	99.90
			22-Aug	0.00	0.00	99.90
			23-Aug	0.00	0.00	99.90
			24-Aug	0.00	0.00	99.90
			25-Aug	0.00	0.00	99.90
			26-Aug	0.00	0.00	99.90
			27-Aug	0.00	0.00	99.90
			28-Aug	0.00	0.00	99.90
			29-Aug	0.00	0.00	99.90
			30-Aug	0.00	0.00	99.90
			31-Aug	0.00	0.00	99.90
				299.70	99.90	

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al. 1996)

1992 **Data**

GIVEN		
Date	Percentage	Flow(KCFS)
1-Apr	0.0	23.4
4-Apr	0.8	33.2
7-Apr	1.3	31.5
10- Apr	4.3	31.4
13-Apr	7.8	38.5
16-Apr	9.5	45.5
19-Apr	5.9	44.9
22-Apr	7.3	51.4
25-Apr	4.9	46.5
28-Apr	9.2	50.8
1 -May	9.8	77
4-May	4.4	74.1
7-May	9.5	72.6
1 O-May	5.5	63.3
13-May	3.8	58.6
1 B-May	1.3	53.5
19-May	1.6	51.2
22-May	1.6	47.3
25-May	3.1	57.3
28-May	2.3	50.7
31-May	1.7	44.2
3-Jun	1.3	47.2
6-Jun	0.9	49.4
9-Jun	0.4	30.5
12-Jun	0.0	23.1
15-Jun	0.4	24.1
18-Jun	0.0	25.3
21-Jun	0.4	21.7
24-Jun	0.4	19.5
27-Jun	0.3	20.6
30-Jun	0.1	20.6
3-Jul	0.1	32
6-Jul	0.0	41.2
9-Jul	0.0	35.6
12-Jul	0.1	19.3
15-Jul	0.0	33.7
18-Jul	0.0	19.9
21-Jul	0.0	
24-Jul	0.0	
27-Jul	0.1	
30-Jul	0.0	
2-Aug	0.0	
5-Aug	0.0	
a-Aug	0.0	
11-Aug	0.0	
14-Aug	0.0	
17-Aug	0.0	
20-Aug	0.0	
23-Aug	0.0	
26-Aug	0.0	
29-Aug	0.0	
1-Sep	0.0	

CREATED			
Date	Percentage	Perc/3	CumProb
1-Apr	0.00	0.00	0.00
2-Apr	0.27	0.09	0.09
3-Apr	0.53	0.18	0.27
4-Apr	0.80	0.27	0.53
5-Apr	0.97	0.32	0.86
6-Apr	1.13	0.38	1.23
7-Apr	1.30	0.43	1.67
a-Apr	2.30	0.77	2.43
9-Apr	3.30	1.10	3.53
10-Apr	4.30	1.43	4.97
11-Apr	5.47	1.82	6.79
12-Apr	6.63	2.21	9.00
13-Apr	7.80	2.60	11.60
14-Apr	a.37	2.79	14.39
15-Apr	a.93	2.98	17.37
16-Apr	9.50	3.17	20.53
17-Apr	a.30	2.77	23.30
18-Apr	7.10	2.37	25.67
19-Apr	5.90	1.97	27.63
20-Apr	6.37	2.12	29.76
21-Apr	6.83	2.28	32.03
22-Apr	7.30	2.43	34.47
23-Apr	6.50	2.17	36.63
24-Apr	5.70	1.90	38.53
25-Apr	4.90	1.63	40.17
26-Apr	6.33	3.11	42.28
27-Apr	7.77	2.59	44.87
28-Apr	9.20	3.07	47.93
29-Apr	9.40	3.13	51.07
30-Apr	9.60	3.20	54.27
l-May	9.80	3.27	57.53
2-May	a.00	2.67	60.20
3-May	6.20	2.07	62.27
4-May	4.40	1.47	63.73
5-May	6.10	2.03	65.77
6-May	7.80	2.60	68.37
7-May	9.50	3.17	71.53
a-May	8.17	2.72	74.26
9-May	6.83	2.28	76.53
lo-May	5.50	1.83	78.37
11-May	4.93	1.64	80.01
12-May	4.37	1.46	81.47
13-May	3.80	1.27	82.73
14-May	2.97	0.99	83.72
15-May	2.13	0.71	84.43
16-May	1.30	0.43	84.87
17-May	1.40	0.47	85.33
1 a-May	1.50	0.50	85.83
19-May	1.60	0.53	86.37
20-May	1.60	0.53	86.90
21-May	1.60	0.53	87.43
22-May	1.60	0.53	87.97
23-May	2.10	0.70	88.67
24-May	2.60	0.87	89.53
25-May	3.10	1.03	90.57
26-May	2.83	0.94	91.51
27-May	2.57	0.86	92.37
28-May	2.30	0.77	93.13

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1992 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			29-May	2.10	0.70	93.83
			30-May	1.90	0.63	94.47
			3 l-May	1.70	0.57	95.03
			1-Jun	1.57	0.52	95.56
			2-Jun	1.43	0.48	96.03
			3-Jun	1.30	0.43	96.47
			4-Jun	1.17	0.39	96.86
			5-Jun	1.03	0.34	97.20
			6-Jun	0.90	0.30	97.50
			7-Jun	0.73	0.24	97.74
			8-Jun	0.57	0.19	97.93
			9-Jun	0.40	0.13	98.07
			1 0-Jun	0.27	0.09	98.16
			11-Jun	0.13	0.04	98.20
			12-Jun	0.00	0.00	98.20
			13-Jun	0.13	0.04	98.24
			14-Jun	0.27	0.09	98.33
			15-Jun	0.40	0.13	98.47
			16-Jun	0.27	0.09	98.56
			17-Jun	0.13	0.04	98.60
			18-Jun	0.00	0.00	98.60
			19-Jun	0.13	0.04	98.64
			20-Jun	0.27	0.09	98.73
			21-Jun	0.40	0.13	9a.87
			22-Jun	0.40	0.13	99.00
			23-Jun	0.40	0.13	99.13
			24-Jun	0.40	0.13	99.27
			25-Jun	0.37	0.12	99.39
			26-Jun	0.33	0.11	99.50
			27-Jun	0.30	0.10	99.60
			28-Jun	0.23	0.08	99.68
			29-Jun	0.17	0.06	99.73
			30-Jun	0.10	0.03	99.77
			1-Jul	0.10	0.03	99.80
			2-Jul	0.10	0.03	99.83
			3-Jul	0.10	0.03	99.87
			4-Jul	0.07	0.02	99.89
			5-Jul	0.03	0.01	99.90
			6-Jul	0.00	0.00	99.90
			7-Jul	0.00	0.00	99.90
			a-Jul	0.00	0.00	99.90
			9-Jul	0.00	0.00	99.90
			10-Jul	0.03	0.01	99.91
			11-Jul	0.07	0.02	99.93
			12-Jul	0.10	0.03	99.97
			13-Jul	0.07	0.02	99.99
			14-Jul	0.03	0.01	100.00
			15-Jul	0.00	0.00	100.00
			16-Jul	0.00	0.00	100.00
			17-Jul	0.00	0.00	100.00
			1 a-Jul	0.00	0.00	100.00
			19-Jul	0.00	0.00	loo.00
			20-Jul	0.00	0.00	100.00
			21-Jul	0.00	0.00	100.00
			22-Jul	0.00	0.00	100.00
			23-Jul	0.00	0.00	100.00
			24-Jul	0.00	0.00	100.00
			25-Jul	0.03	0.01	100.01

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1992 Data

GNEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			26-Jul	0.07	0.02	100.03
			27-Jul	0.10	0.03	100.07
			28-Jul	0.07	0.02	100.09
			29-Jul	0.03	0.01	100.10
			30-Jul	0.00	0.00	100.10
			31-Jul	0.00	0.00	100.10
			1-Aug	0.00	0.00	100.10
			2-Aug	0.00	0.00	100.10
			3-Aug	0.00	0.00	100.10
			4-Aug	0.00	0.00	100.10
			5-Aug	0.00	0.00	100.10
			6-Aug	0.00	0.00	100.10
			7-Aug	0.00	0.00	100.10
			a-Aug	0.00	0.00	100.10
			9-Aug	0.00	0.00	100.10
			10-Aug	0.00	0.00	100.10
			11-Aug	0.00	0.00	100.10
			12-Aug	0.00.	0.00	100.10
			13-Aug	0.00	0.00	100.10
			14-Aug	0.00	0.00	100.10
			15-Aug	0.00	0.00	100.10
			16-Aug	0.00	0.00	100.10
			17-Aug	0.00	0.00	100.10
			1 a-Aug	0.00	0.00	100.10
			19-Aug	0.00	0.00	100.10
			20-Aug	0.00	0.00	100.10
			21-Aug	0.00	0.00	100.10
			22-Aug	0.00	0.00	100.10
			23-Aug	0.00	0.00	100.10
			24-Aug	0.00	0.00	100.10
			25-Aug	0.00	0.00	100.10
			26-Aug	0.00	0.00	100.10
			27-Aug	0.00	0.00	100.10
			28-Aug	0.00	0.00	100.10
			29-Aug	0.00	0.00	100.10
			30-Aug	0.00	0.00	100.10
			31-Aug	0.00	0.00	100.10
					100.10	

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al. 1996)

1993 **Data**

GIVEN

Date	Percentage	Flow(KCFS)
1-Apr	0.0	63.8
4-Apr	0.0	81.6
7-Apr	0.0	72.5
IO-Apr	0.0	67.9
13-Apr	0.1	61.8
16-Apr	0.3	60.8
19-Apr	1.0	65.4
22-Apr	4.4	61.9
25-Apr	7.5	66.2
28-Apr	8.6	67.6
l-May	6.2	79.3
4-May	6.9	100.1
7-May	7.6	103.2
10-May	4.0	96.1
13-May	11.1	154.7
16-May	17.2	175.5
19-May	6.0	178.7
22-May	4.0	161.2
25-May	3.0	132
28-May	2.0	139
31-May	2.1	118.3
3-Jun	1.1	107.8
6-Jun	0.9	112.3
9-Jun	0.8	114
12-Jun	0.5	121.3
15-Jun	0.6	108.9
18-Jun	1.0	100.8
21-Jun	1.3	86.4
24-Jun	0.8	75
27-Jun	0.5	64.6
30-Jun	0.1	49.7
3-Jul	0.1	51.1
6-Jul	0.0	55.9
9-Jul	0.1	45.6
12-Jul	0.0	48.4
15-Jul	0.1	52.5
18-Jul	0.0	53.3
21-Jul	0.1	49.5
24-Jul	0.0	50.7
27-Jul	0.1	54
30-Jul	0.0	43.5
2-Aug	0.0	
5-Aug	0.0	
8-Aug	0.0	
11-Aug	0.0	
14-Aug	0.0	
17-Aug	0.0	
20-Aug	0.0	
23-Aug	0.0	
26-Aug	0.0	
29-Aug	0.0	
1-Sep	0.0	

CREATED

Date	Percentage	Perc/3	CumProb
1-Apr	0.00	0.00	0.00
2-Apr	0.00	0.00	0.00
3-Apr	0.00	0.00	0.00
4-Apr	0.00	0.00	0.00
5-Apr	0.00	0.00	0.00
6-Apr	0.00	0.00	0.00
7-Apr	0.00	0.00	0.00
8-Apr	0.00	0.00	0.00
9-Apr	0.00	0.00	0.00
1 0-Apr	0.00	0.00	0.00
11-Apr	0.03	0.01	0.01
12-Apr	0.07	0.02	0.03
13-Apr	0.10	0.03	0.07
14-Apr	0.17	0.06	0.12
15-Apr	0.23	0.08	0.20
16-Apr	0.30	0.10	0.30
17-Apr	0.53	0.18	0.48
18-Apr	0.77	0.26	0.73
19-Apr	1.00	0.33	1.07
20-Apr	2.13	0.71	1.78
21-Apr	3.27	1.09	2.87
22-Apr	4.40	1.47	4.33
23-Apr	5.43	1.81	6.14
24-Apr	6.47	2.16	8.30
25-Apr	7.50	2.50	10.80
26-Apr	7.87	2.62	13.42
27-Apr	8.23	2.74	16.17
28-Apr	8.60	2.87	19.03
29-Apr	7.80	2.60	21.63
30-Apr	7.00	2.33	23.97
1 -May	6.20	2.07	26.03
2-May	6.43	2.14	28.18
3-May	6.67	2.22	30.40
4-May	6.90	2.30	32.70
5-May	7.13	2.38	35.08
6-May	7.37	2.46	37.53
7-May	7.60	2.53	40.07
8-May	6.40	2.13	42.20
9-May	5.20	1.73	43.93
1 O-May	4.00	1.33	45.27
11 -May	6.37	2.12	47.39
12-May	8.73	2.91	50.30
13-May	11.10	3.70	54.00
14-May	13.13	4.38	58.38
15-May	15.17	5.06	63.43
16-May	17.20	5.73	69.17
17-May	13.47	4.49	73.66
18-May	9.73	3.24	76.90
19-May	6.00	2.00	78.90
20-May	5.33	1.78	80.68
21-May	4.67	1.56	82.23
22-May	4.00	1.33	83.57
23-May	3.67	1.22	84.79
24-May	3.33	1.11	85.90
25-May	3.00	1.00	86.90
26-May	2.67	0.89	87.79
27-May	2.33	0.78	88.57
28-May	2.00	0.67	89.23

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al. 1996)

1993 Data

GIVEN		CREATED			
Date	Percentage Flow(KCFS)	Date	Percentage	Perc/3	CumProb
		29-May	2.03	0.68	89.91
		30-May	2.07	0.69	90.60
		31-May	2.10	0.70	91.30
		1-Jun	1.77	0.59	91.89
		2-Jun	1.43	0.48	92.37
		3-Jun	1.10	0.37	92.73
		4-Jun	1.03	0.34	93.08
		5-Jun	0.97	0.32	93.40
		6-Jun	0.90	0.30	93.70
		7-Jun	0.87	0.29	93.99
		8-Jun	0.83	0.28	94.27
		9-Jun	0.80	0.27	94.53
		1 0-Jun	0.70	0.23	94.77
		1 1-Jun	0.60	0.20	94.97
		12-Jun	0.50	0.17	95.13
		13-Jun	0.53	0.18	95.31
		14-Jun	0.57	0.19	95.50
		15-Jun	0.60	0.20	95.70
		16-Jun	0.73	0.24	95.94
		17-Jun	0.87	0.29	96.23
		18-Jun	1.00	0.33	96.57
		19-Jun	1.10	0.37	96.93
		20-Jun	1.20	0.40	97.33
		21-Jun	1.30	0.43	97.77
		22-Jun	1.13	0.38	98.14
		23-Jun	0.97	0.32	98.47
		24-Jun	0.80	0.27	98.73
		25-Jun	0.70	0.23	98.97
		26-Jun	0.60	0.20	99.17
		27-Jun	0.50	0.17	99.33
		28-Jun	0.37	0.12	99.46
		29-Jun	0.23	0.08	99.53
		30-Jun	0.10	0.03	99.57
		1-Jul	0.10	0.03	99.60
		2-Jul	0.10	0.03	99.63
		3-Jul	0.10	0.03	99.67
		4-Jul	0.07	0.02	99.69
		5-Jul	0.03	0.01	99.70
		6-Jul	0.00	0.00	99.70
		7-Jul	0.03	0.01	99.71
		8-Jul	0.07	0.02	99.73
		9-Jul	0.10	0.03	99.77
		10-Jul	0.07	0.02	99.79
		11-Jul	0.03	0.01	99.80
		12-Jul	0.00	0.00	99.80
		13-Jul	0.03	0.01	99.81
		14-Jul	0.07	0.02	99.83
		15-Jul	0.10	0.03	99.87
		16-Jul	0.07	0.02	99.89
		17-Jul	0.03	0.01	99.90
		18-Jul	0.00	0.00	99.90
		19-Jul	0.03	0.01	99.91
		20-Jul	0.07	0.02	99.93
		21-Jul	0.10	0.03	99.97
		22-Jul	0.07	0.02	99.99
		23-Jul	0.03	0.01	100.00
		24-Jul	0.00	0.00	100.00
		25-Jul	0.03	0.01	100.01

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1993 **Data**

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			26-Jul	0.07	0.02	100.03
			27-Jul	0.10	0.03	100.07
			28-Jul	0.07	0.02	100.09
			29-Jul	0.03	0.01	100.10
			30-Jul	0.00	0.00	100.10
			31-Jul	0.00	0.00	100.10
			1-Aug	0.00	0.00	100.10
			2-Aug	0.00	0.00	100.10
			3-Aug	0.00	0.00	100.10
			4-Aug	0.00	0.00	100.10
			5-Aug	0.00	0.00	100.10
			6-Aug	0.00	0.00	100.10
			7-Aug	0.00	0.00	100.10
			8-Aug	0.00	0.00	100.10
			9-Aug	0.00	0.00	100.10
			1 0-Aug	0.00	0.00	100.10
			11-Aug	0.00	0.00	100.10
			12-Aug	0.00	0.00	100.10
			13-Aug	0.00	0.00	100.10
			14-Aug	0.00	0.00	100.10
			15-Aug	0.00	0.00	100.10
			16-Aug	0.00	0.00	100.10
			17-Aug	0.00	0.00	100.10
			18-Aug	0.00	0.00	100.10
			19-Aug	0.00	0.00	100.10
			20-Aug	0.00	0.00	100.10
			21-Aug	0.00	0.00	100.10
			22-Aug	0.00	0.00	100.10
			23-Aug	0.00	0.00	100.10
			24-Aug	0.00	0.00	100.10
			25-Aug	0.00	0.00	100.10
			26-Aug	0.00	0.00	100.10
			27-Aug	0.00	0.00	100.10
			28-Aug	0.00	0.00	100.10
			29-Aug	0.00	0.00	100.10
			30-Aug	0.00	0.00	100.10
			31-Aug	0.00	0.00	100.10
					100.10	

NMFS PIT-tag Data for Spring/Summer Yearling Chinook **(Achord et al, 1996)**

1994 Data

GIVEN		
Date	**Percentage**	**Flow(KCFS)**
1-Apr	0.0	27.1
4-Apr	0.0	34.6
7-Apr	0.0	35.7
10-Apr	0.0	35.3
13-Apr	0.1	40.1
16-Apr	0.8	35.6
19-Apr	5.0	59
22-Apr	14.7	77.7
25-Apr	13.2	68.6
28-Apr	9.1	72.8
1 -May	6.3	73.7
4-May	5.2	76
7-May	7.9	80.7
1 O-May	11.6	89.5
13-May	5.7	86
16-May	3.8	80.4
19-May	2.8	74.3
22-May	1.5	74.1
25-May	1.6	77.7
28-May	1.1	64.3
3 l-May	1.6	54.7
3-Jun	1.5	50.5
6-Jun	1.0	45.7
9-Jun	0.6	39.4
12-Jun	0.4	40.3
15-Jun	0.5	42
18-Jun	0.4	35.2
21-Jun	0.2	31.4
24-Jun	0.2	28.5
27-Jun	0.1	24.3
30-Jun	0.2	23.8
3-Jul	0.2	25.6
6-Jul	0.3	40.7
9-Jul	1.1	44.7
12-Jul	0.3	43.3
15-Jul	0.5	43.2
18-Jul	0.3	45
21-Jul	0.2	43.2
24-Jul	0.2	42.8
27-Jul	0.0	43.6
30-Jul	0.0	22.2
2-Aug	0.0	
5-Aug	0.0	
8-Aug	0.0	
11-Aug	0.0	
14-Aug	0.0	
17-Aug	0.0	
20-Aug	0.0	
23-Aug	0.0	
26-Aug	0.0	
29-Aug	0.0	
1-Sep	0.0	

CREATED			
Date	**Percentage**	**Perc/3**	**CumProb**
1-Apr	0.00	0.00	0.00
2-Apr	0.00	0.00	0.00
3-Apr	0.00	0.00	0.00
4-Apr	0.00	0.00	0.00
5-Apr	0.00	0.00	0.00
6-Apr	0.00	0.00	0.00
7-Apr	0.00	0.00	0.00
8-Apr	0.00	0.00	0.00
9-Apr	0.00	0.00	0.00
10-Apr	0.00	0.00	0.00
11-Apr	0.03	0.01	0.01
12-Apr	0.07	0.02	0.03
13-Apr	0.10	0.03	0.07
14-Apr	0.33	0.11	0.18
15-Apr	0.57	0.19	0.37
16-Apr	0.80	0.27	0.63
17-Apr	2.20	0.73	1.37
18-Apr	3.60	1.20	2.57
19-Apr	5.00	1.67	4.23
20-Apr	8.23	2.74	6.98
21-Apr	11.47	3.82	10.80
22-Apr	14.70	4.90	15.70
23-Apr	14.20	4.73	20.43
24-Apr	13.70	4.57	25.00
25-Apr	13.20	4.40	29.40
26-Apr	11.83	3.94	33.34
27-Apr	10.47	3.49	36.83
28-Apr	9.10	3.03	39.87
29-Apr	8.17	2.72	42.59
30-Apr	7.23	2.41	45.00
1 -May	6.30	2.10	47.10
2-May	5.93	1.98	49.08
3-May	5.57	1.86	50.93
4-May	5.20	1.73	52.67
5-May	6.10	2.03	54.70
6-May	7.00	2.33	57.03
7-May	7.90	2.63	59.67
8-May	9.13	3.04	62.71
Y-May	10.37	3.46	66.17
1 O-May	11.60	3.87	70.03
11 -May	9.63	3.21	73.24
12-May	7.67	2.56	75.80
13-May	5.70	1.90	77.70
14-May	5.07	1.69	79.39
15-May	4.43	1.48	80.87
16-May	3.80	1.27	82.13
17-May	3.47	1.16	83.29
18-May	3.13	1.04	84.33
1 Y-May	2.80	0.93	85.27
20-May	2.37	0.79	86.06
21-May	1.93	0.64	86.70
22-May	1.50	0.50	87.20
23-May	1.53	0.51	87.71
24-May	1.57	0.52	88.23
25-May	1.60	0.53	88.77
26-May	1.43	0.48	89.24
27-May	1.27	0.42	89.67
28-May	1.10	0.37	90.03

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1994 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			29-May	1.27	0.42	90.46
			30-May	1.43	0.48	90.93
			31-May	1.60	0.53	91.47
			1-Jun	1.57	0.52	91.99
			2-Jun	1.53	0.51	92.50
			3-Jun	1.50	0.50	93.00
			4-Jun	1.33	0.44	93.44
			5-Jun	1.17	0.39	93.83
			6-Jun	1.00	0.33	94.17
			7-Jun	0.87	0.29	94.46
			8-Jun	0.73	0.24	94.70
			9-Jun	0.60	0.20	94.90
			10-Jun	0.53	0.18	95.08
			1 1-Jun	0.47	0.16	95.23
			12-Jun	0.40	0.13	95.37
			13-Jun	0.43	0.14	95.51
			14-Jun	0.47	0.16	95.67
			15-Jun	0.50	0.17	95.83
			16-Jun	0.47	0.16	95.99
			17-Jun	0.43	0.14	96.13
			18-Jun	0.40	0.13	96.27
			19-Jun	0.33	0.11	96.38
			20-Jun	0.27	0.09	96.47
			21-Jun	0.20	0.07	96.53
			22-Jun	0.20	0.07	96.60
			23-Jun	0.20	0.07	96.67
			24-Jun	0.20	0.07	96.73
			25-Jun	0.17	0.06	96.79
			26-Jun	0.13	0.04	96.83
			27-Jun	0.10	0.03	96.87
			28-Jun	0.13	0.04	96.91
			29-Jun	0.17	0.06	96.97
			30-Jun	0.20	0.07	97.03
			1-Jul	0.20	0.07	97.10
			2-Jul	0.20	0.07	97.17
			3-Jul	0.20	0.07	97.23
			4-Jul	0.23	0.08	97.31
			5-Jul	0.27	0.09	97.40
			6-Jul	0.30	0.10	97.50
			7-Jul	0.57	0.19	97.69
			8-Jul	0.83	0.28	97.97
			9-Jul	1.10	0.37	98.33
			10-Jul	0.83	0.28	98.61
			11-Jul	0.57	0.19	98.80
			12-Jul	0.30	0.10	98.90
			13-Jul	0.37	0.12	99.02
			14-Jul	0.43	0.14	99.17
			15-Jul	0.50	0.17	99.33
			16-Jul	0.43	0.14	99.48
			17-Jul	0.37	0.12	99.60
			18-Jul	0.30	0.10	99.70
			19-Jul	0.27	0.09	99.79
			20-Jul	0.23	0.08	99.87
			21-Jul	0.20	0.07	99.93
			22-Jul	0.20	0.07	100.00
			23-Jul	0.20	0.07	100.07
			24-Jul	0.20	0.07	100.13
			25-Jul	0.13	0.04	100.18

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1994 Data

GIVES			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			26-Jul	0.07	0.02	100.20
			27-Jul	0.00	0.00	100.20
			28-Jul	0.00	0.00	100.20
			29-Jul	0.00	0.00	100.20
			30-Jul	0.00	0.00	100.20
			31-Jul	0.00	0.00	100.20
			1-Aug	0.00	0.00	100.20
			2-Aug	0.00	0.00	100.20
			3-Aug	0.00	0.00	100.20
			4-Aug	0.00	0.00	100.20
			5-Aug	0.00	0.00	100.20
			6-Aug	0.00	0.00	100.20
			7-Aug	0.00	0.00	100.20
			8-Aug	0.00	0.00	100.20
			9-Aug	0.00	0.00	100.20
			10-Aug	0.00	0.00	100.20
			11-Aug	0.00	0.00	100.20
			12-Aug	0.00	0.00	100.20
			13-Aug	0.00	0.00	100.20
			14-Aug	0.00	0.00	100.20
			15-Aug	0.00	0.00	100.20
			16-Aug	0.00	0.00	100.20
			17-Aug	0.00	0.00	100.20
			18-Aug	0.00	0.00	100.20
			19-Aug	0.00	0.00	100.20
			20-Aug	0.00	0.00	100.20
			21-Aug	0.00	0.00	100.20
			22-Aug	0.00	0.00	100.20
			23-Aug	0.00	0.00	100.20
			24-Aug	0.00	0.00	100.20
			25-Aug	0.00	0.00	100.20
			26-Aug	0.00	0.00	100.20
			27-Aug	0.00	0.00	100.20
			28-Aug	0.00	0.00	100.20
			29-Aug	0.00	0.00	100.20
			30-Aug	0.00	0.00	100.20
			31-Aug	0.00	0.00	100.20
					100.20	

NMFS PIT-tag Data for Spring/Summer Yearling Chinook **(Achord** et al, 1996)

1995 Data

GIVEN

Date	Percentage	Flow(KCFS)
1-Apr	0.0	41.2
4-Apr	0.0	41
7-Apr	0.2	59.4
10-Apr	3.0	65.8
13-Apr	4.4	71
16-Apr	4.8	62.1
19-Apr	4.1	64.1
22-Apr	1.7	55.2
25-Apr	4.0	66.6
28-Apr	5.5	79.1
1 -May	9.0	87.5
4-May	6.2	96.8
7-May	9.4	120.6
1 0-May	8.5	117.6
13-May	6.2	103.3
16-May	2.2	105.7
19-May	3.4	114.5
22-May	3.6	118.8
25-May	3.4	112.2
28-May	4.2	107.3
31-May	3.3	129.7
3-Jun	3.3	139.9
6-Jun	2.3	141.8
9-Jun	1.9	114.4
12-Jun	0.5	116.4
15-Jun	0.3	118.8
18-Jun	1.0	118.1
21-Jun	1.0	100.1
24-Jun	0.2	89.2
27-Jun	0.2	94.1
30-Jun	0.4	85.7
3-Jul	0.3	83.5
6-Jul	0.5	71
9-Jul	0.3	68.7
12-Jul	0.2	67.1
15-Jul	0.1	54.2
18-Jul	0.2	52.1
21-Jul	0.1	47.7
24-Jul	0.0	49.5
27-Jul	0.1	49.3
30-Jul	0.0	46.5
2-Aug	0.0	
5-Aug	0.0	
8-Aug	0.0	
1 1-Aug	0.0	
14-Aug	0.0	
17-Aug	0.0	
20-Aug	0.0	
23-Aug	0.0	
26-Aug	0.0	
29-Aug	0.0	
1-Sep	0.0	

CREATED

Date	Percentage	Perc/3	CumProb
1-Apr	0.00	0.00	0.00
2-Apr	0.00	0.00	0.00
3-Apr	0.00	0.00	0.00
4-Apr	0.00	0.00	0.00
5-Apr	0.07	0.02	0.02
6-Apr	0.13	0.04	0.07
7-Apr	0.20	0.07	0.13
8-Apr	1.13	0.38	0.51
9-Apr	2.07	0.69	1.20
10-Apr	3.00	1.00	2.20
11-Apr	3.47	1.16	3.36
12-Apr	3.93	1.31	4.67
13-Apr	4.40	1.47	6.13
14-Apr	4.53	1.51	7.64
15-Apr	4.67	1.56	9.20
16-Apr	4.80	1.60	10.80
17-Apr	4.57	1.52	12.32
18-Apr	4.33	1.44	13.77
19-Apr	4.10	1.37	15.13
20-Apr	3.30	1.10	16.23
21-Apr	2.50	0.83	17.07
22-Apr	1.70	0.57	17.63
23-Apr	2.47	0.82	18.46
24-Apr	3.23	1.08	19.53
25-Apr	4.00	1.33	20.87
26-Apr	4.50	1.50	22.37
27-Apr	5.00	1.67	24.03
28-Apr	5.50	1.83	25.87
29-Apr	6.67	2.22	28.09
30-Apr	7.83	2.61	30.70
1 -May	9.00	3.00	33.70
2-May	8.07	2.69	36.39
3-May	7.13	2.38	38.77
4-May	6.20	2.07	40.83
5-May	7.27	2.42	43.26
6-May	8.33	2.78	46.03
7-May	9.40	3.13	49.17
8-May	9.10	3.03	52.20
9-May	8.80	2.93	55.13
1 0-May	8.50	2.83	57.97
11 -May	7.73	2.58	60.54
12-May	6.97	2.32	62.87
13-May	6.20	2.07	64.93
14-May	4.87	1.62	66.56
15-May	3.53	1.18	67.73
16-May	2.20	0.73	68.47
17-May	2.60	0.87	69.33
18-May	3.00	1.00	70.33
19-May	3.40	1.13	71.47
20-May	3.47	1.16	72.62
21-May	3.53	1.18	73.80
22-May	3.60	1.20	75.00
23-May	3.53	1.18	76.18
24-May	3.47	1.16	77.33
25-May	3.40	1.13	78.47
26-May	3.67	1.22	79.69
27-May	3.93	1.31	81.00
28-May	4.20	1.40	82.40

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1995 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			29-May	3.90	1.30	83.70
			30-May	3.60	1.20	84.90
			3 l-May	3.30	1.10	86.00
			1-Jun	3.30	1.10	87.10
			2-Jun	3.30	1.10	88.20
			3-Jun	3.30	1.10	89.30
			4-Jun	2.97	0.99	90.29
			5-Jun	2.63	0.88	91.17
			6-Jun	2.30	0.77	91.93
			7-Jun	2.17	0.72	92.66
			8-Jun	2.03	0.68	93.33
			9-Jun	1.90	0.63	93.97
			10-Jun	1.43	0.48	94.44
			11-Jun	0.97	0.32	94.77
			12-Jun	0.50	0.17	94.93
			13-Jun	0.43	0.14	95.08
			14-Jun	0.37	0.12	95.20
			15-Jun	0.30	0.10	95.30
			16-Jun	0.53	0.18	95.48
			17-Jun	0.77	0.26	95.73
			18-Jun	1.00	0.33	96.07
			19-Jun	1.00	0.33	96.40
			20-Jun	1.00	0.33	96.73
			21-Jun	1.00	0.33	97.07
			22-Jun	0.73	0.24	97.31
			23-Jun	0.47	0.16	97.47
			24-Jun	0.20	0.07	97.53
			25-Jun	0.20	0.07	97.60
			26-Jun	0.20	0.07	97.67
			27-Jun	0.20	0.07	97.73
			28-Jun	0.27	0.09	97.82
			29-Jun	0.33	0.11	97.93
			30-Jun	0.40	0.13	98.07
			1-Jul	0.37	0.12	98.19
			2-Jul	0.33	0.11	98.30
			3-Jul	0.30	0.10	98.40
			4-Jul	0.37	0.12	98.52
			5-Jul	0.43	0.14	98.67
			6-Jul	0.50	0.17	98.83
			7-Jul	0.43	0.14	98.98
			8-Jul	0.37	0.12	99.10
			9-Jul	0.30	0.10	99.20
			1 0-Jul	0.27	0.09	99.29
			1 1-Jul	0.23	0.08	99.37
			12-Jul	0.20	0.07	99.43
			13-Jul	0.17	0.06	99.49
			14-Jul	0.13	0.04	99.53
			15-Jul	0.10	0.03	99.57
			16-Jul	0.13	0.04	99.61
			17-Jul	0.17	0.06	99.67
			18-Jul	0.20	0.07	99.73
			19-Jul	0.17	0.06	99.79
			20-Jul	0.13	0.04	99.83
			21-Jul	0.10	0.03	99.87
			22-Jul	0.07	0.02	99.89
			23-Jul	0.03	0.01	99.90
			24-Jul	0.00	0.00	99.90
			25-Jul	0.03	0.01	99.91

NMFS PIT-tag Data for Spring/Summer Yearling Chinook (Achord et al, 1996)

1995 Data

GIVEN			CREATED			
Date	Percentage	Flow(KCFS)	Date	Percentage	Perc/3	CumProb
			26-Jul	0.07	0.02	99.93
			27-Jul	0.10	0.03	99.97
			28-Jul	0.07	0.02	99.99
			29-Jul	0.03	0.01	100.00
			30-Jul	0.00	0.00	100.00
			3 1-Jul	0.00	0.00	100.00
			1-Aug	0.00	0.00	100.00
			2-Aug	0.00	0.00	100.00
			3-Aug	0.00	0.00	100.00
			4-Aug	0.00	0.00	100.00
			5-Aug	0.00	0.00	100.00
			6-Aug	0.00	0.00	100.00
			7-Aug	0.00	0.00	100.00
			8-Aug	0.00	0.00	100.00
			9-Aug	0.00	0.00	100.00
			10-Aug	0.00	0.00	100.00
			11-Aug	0.00	0.00	100.00
			12-Aug	0.00	0.00	100.00
			13-Aug	0.00	0.00	100.00
			14-Aug	0.00	0.00	100.00
			15-Aug	0.00	0.00	100.00
			16-Aug	0.00	0.00	100.00
			17-Aug	0.00	0.00	100.00
			18-Aug	0.00	0.00	100.00
			19-Aug	0.00	0.00	100.00
			20-Aug	0.00	0.00	100.00
			21-Aug	0.00	0.00	100.00
			22-Aug	0.00	0.00	100.00
			23-Aug	0.00	0.00	100.00
			24-Aug	0.00	0.00	100.00
			25-Aug	0.00	0.00	100.00
			26-Aug	0.00	0.00	100.00
			27-Aug	0.00	0.00	100.00
			28-Aug	0.00	0.00	100.00
			29-Aug	0.00	0.00	100.00
			30-Aug	0.00	0.00	100.00
			31-Aug	0.00	0.00	100.00
					100.00	

Wild PIT-tagged Sockeye detected at Lower Granite hydrounit

	pper Snake River Releases 1991			Upper Snake River: 1992			Upper Snake River: 1993			Upper Snake River: 1994			Upper Snake River: 1995		
Date	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc
1-Apr			0.00			0.00			0.00			0.00			0.00
2-Apr			0.00			0.00			0.00			0.00			0.00
3-Apr			0.00			0.00			0.00			0.00			0.00
4-Apr			0.00			0.00			0.00			0.00			0.00
5-Apr			0.00			0.00			0.00			0.00			0.00
6-Apr			0.00			0.00			0.00			0.00			0.00
7-Apr			0.00			0.00			0.00			0.00			0.00
8-Apr			0.00			0.00			0.00			0.00			0.00
9-Apr			0.00			0.00			0.00			0.00			0.00
10-Apr			0.00			0.00			0.00			0.00			0.00
11-Apr			0.00			0.00			0.00			0.00			0.00
12-Apr			0.00			0.00			0.00			0.00			0.00
13-Apr			0.00			0.00			0.00			0.00			0.00
14-Apr			0.00			0.00			0.00			0.00			0.00
15-Apr			0.00			0.00			0.00			0.00			0.00
16-Apr			0.00			0.00			0.00			0.00			0.00
17-Apr			0.00			0.00			0.00			0.00			0.00
18-Apr			0.00			0.00			0.00			0.00			0.00
19-Apr			0.00			0.00			0.00			0.00			0.00
20-Apr			0.00			0.00			0.00			0.00			0.00
21-Apr			0.00			0.00			0.00			0.00			0.00
22-Apr			0.00			0.00			0.00			0.00			0.00
23-Apr			0.00			0.00			0.00			0.00			0.00
24-Apr			0.00			0.00			0.00			0.00			0.00
25-Apr			0.00			0.00			0.00			0.00			0.00
26-Apr			0 0 0			0.00			0.00			0.00			0.00
27-Apr			0 0 0			0.00			0.00			0.00			0.00
28-Apr			0 0 0			0.00			0.00			0.00			0.00
29-Apr			0.00			0.00			0.00			0.00			0.00
30-Apr			0.00			0.00			0.00			0.00			0.00
1-May			0.00			0.00			0.00			0.00			0.00
2-May			0 0 0			0.00			0.00			0.00			0.00
3-May			0.00			0.00			0.00			0.00			0.00
4-May			0.00			0.00			0.00			0.00			0.00
5-May			0.00			0.00			0.00			0.00			0.00
6-May			0.00			0.00			0.00			0.00			0.00
7-May			0.00			0.00			0.00		0.03	0.03			0.00
8-May			0.00		0.09	0.09			0.00		0.03	0.05			0.00
9-May			0.00		0.09	0.18			0.00	2	0.05	0.10			0.00
10-May			0.00		0.09	0.27			0.00	2	0.05	0.15			0.00
11-May			0 0 0			0.27			0.00	2	0.05	0.21			0.00
12-May			0.00			0.27			0.00		0.03	0.23		0.11	0.11
13-May			0 0 0			0.27			0.00	2	0.05	0.28			0.11

Wild PIT-tagged Sockeye detected at Lower Granite hydrounit

	pper Snake River Releases 199 1			Upper Snake River: 1992			Upper Snake River: 1993			Upper Snake River: 1994			Upper Snake River: 1995		
Date	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc
14-May			0.00	1	0.09	0.36		0.17	0.17	2	0.05	0.33			0.11
15-May			000			0.36			0.17	2	0.05	0.38			0.11
16-May			0.00			0.36			0.17	5	0.13	0.51	1	0.11	0.22
17-May			0.00			0.36			0.17	1	0.03	0.54			0.22
18-May			0.00			0.36			0.17	3	0.08	0.62			0.22
19-May			0.00			0.36			0.17	7	0.18	0.79			0.22
20-May			0.00		0.09	0.45	1	0.17	0.33			0.79	1	0.11	0.33
21-May			0.00			0.45			0.33			0.79			0.33
22-May	1	0.10	0.10			0.45	1	0.17	0.50			0.79			0.33
23-May	1	0.10	0.20			0.45	1	0.17	0.67	1	0.03	0.82	1	0.11	0.44
24-May			0.20		0.09	0.55			0.67			0.82			0.44
25-May			0.20		0.09	0.64			0.67			0.82	1	0.11	0.56
26-May			0.20		0.09	0.73	1	0.17	0.83			0.82			0.56
27-May	1	0.10	0.30		0.09	0.82			0.83	1	0.03	0.85			0.56
28-May	1	0.10	0.40			0.82			0.83	2	0.05	0.90			0.56
29-May	1	0.10	0.50			0.82			0.83	1	0.03	0.92			0.56
30-May			0.50		0.09	0.91			0.83	1	0.03	0.95			0.56
31-May	1	0.10	0.60			0.91			0.83			0.95			0.56
1-Jun			0.60			0.91			0.83			0.95	2	0.22	0.78
2-Jun			0.60			0.91			0.83			0.95	1	0.11	0.89
3-Jun	1	0.10	0.70			0.91			0.83			0.95			0.89
4-Jun			0.70			0.91	1	0.17	1.00			0.95			0.89
5-Jun			0.70			0.91			1.00			0.95			0.89
6-Jun			0.70			0.91			1.00			0.95			0.89
7-Jun			0.70			0.91			1.00			0.95			0.89
8 Jun	1	0.10	0.80			0.91			1.00			0.95			0.89
9-Jun	1	0.10	0.90			0.91			1.00			0.95	1	0.11	1.00
10-Jun			0.90			0.91			1.00			0.95			1.00
11-Jun			0.90			0.91			1.00			0.95			1.00
12-Jun			0.90			0.91			1.00			0.95			1.00
13-Jun			0.90			0.91			1.00			0.95			1.00
14-Jun			0.90			0.91			1.00			0.95			1.00
15-Jun	1	0.10	1.00			0.91			1.00			0.95			1.00
16-Jun			1.00			0.91			1.00			0.95			1.00
17-Jun			1.00			0.91			1.00			0.95			1.00
18-Jun			1.00			0.91			1.00			0.95			1.00
19-Jun			1.00			0.91			1.00	1	0.03	0.97			1.00
20-Jun			1.00			0.91			1.00			0.97			1.00
21-Jun			1.00			0.91			1.00			0.97			1.00
22-Jun			1.00			0.91			1.00			0.97			1.00
23-Jun			1.00			0.91			1.00			0.97			1.00
24-Jun			1.00			0.91			1.00			0.97			1.00
25-Jun			1.00			0.91			1.00			0.97			1.00

Wild PIT-tagged Sockeye detected at Lower Granite hydrounit

	pper Snake River Releases 1991			Upper Snake River: 1992			Upper Snake River: 1993			Upper Snake River: 1994			Upper Snake River: 1995		
Date	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc
26-Jun			1.00			0 91			1.00			0.97			1.00
27-Jun			1.00			0.91			1.00			0 97			1.00
28-Jun			1.00			0.91			1.00			0.97			1.00
29-Jun			1.00			0.91			1.00		0.03	1.00			1.00
30-Jun			1.00			0.91			1.00			1.00			1.00
1-Jul			1.00			0.91			1.00			1.00			1.00
2-Jul			1.00			0.91			1.00			1.00			1.00
3-Jul			1.00			0.91			1.00			1.00			1.00
4-Jul			1.00			0.91			1.00			1.00			1.00
5-Jul			1.00			0.91			1.00			1.00			1.00
6-Jul			1.00			0.91			1.00			1.00			1.00
7-Jul			1.00			0.91			1.00			1.00			1.00
8-Jul			1.00			0.91			1.00			1.00			1.00
9-Jul			1.00			0.91			1.00			1.00			1.00
10-Jul			1.00			0.91			1.00			1.00			1.00
11-Jul			1.00			0.91			1.00			1.00			1.00
12-Jul			1.00			0.91			1.00			1.00			1.00
13-Jul			1.00			0.91			1.00			1.00			1.00
14-Jul			1.00			0.91			1.00			1.00			1.00
15 Jul			1 00			0.91			1.00			1 00			1.00
16-Jul			1.00			0.91			1.00			1.00			1.00
17-Jul			1.00			0.91			1.00			1.00			1.00
18-Jul			1.00			0.91			1.00			1.00			1.00
19-Jul			1.00	1	0.09	1.00			1.00			1.00			1.00
20-Jul			1.00			1.00			1.00			1.00			1.00
21-Jul			1.00			1.00			1.00			1.00			1.00
22-Jul			1.00			1.00			1.00			1.00			1.00
23-Jul			1.00			1.00			1.00			1.00			1.00
24-Jul			1.00			1.00			1.00			1.00			1.00
25-Jul			1.00			1.00			1.00			1.00			1.00
26-Jul			1.00			1.00			1.00			1.00			1.00
27-Jul			1.00			1.00			1.00			1.00			1.00
28-Jul			1.00			1.00			1.00			1.00			1.00
29-Jul			1.00			1.00			1.00			1.00			1.00
30-Jul			1.00			1.00			1.00			1.00			1.00
31-Jul			1.00			1.00			1.00			1.00			1.00
1-Aug			1.00			1.00			1.00			1.00			1.00
2-Aug			1 00			1 00			1 00			1 00			1.00
3-Aug			1 00			1.00			1.00			1 00			1 00
4-Aug			1 00			1.00			1.00			1.00			1.00
5-Aug			1.00			1.00			1.00			1.00			1.00
6-Aug			1.00			1.00			1.00			1.00			1.00
7-Aug			1.00			1.00			1.00			1.00			1.00

Wild PIT-tagged Sockeye detected at Lower Granite hydrounit

	pper Snake River Releases 1991			Upper Snake River: 1992			Upper Snake River: 1993			Upper Snake River: 1994			Upper Snake River: 1995		
Date	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc	pitcount	% Detect	CumPerc
8-Aug			1.00			1.00			1.00			1.00			1.00
9-Aug			1.00			1.00			1.00			1.00			1.00
10-Aug			1.00			1.00			1.00			1.00			1.00
11-Aug			1.00			1.00			1.00			1.00			1.00
12-Aug			1.00			1.00			1.00			1.00			1.00
13-Aug			1.00			1.00			1.00			1.00			1.00
14-Aug			1.00			1.00			1.00			1.00			1.00
15-Aug			1.00			1.00			1.00			1.00			1.00
16-Aug			1.00			1.00			1.00			1.00			1.00
17-Aug			1.00			1.00			1.00			1.00			1.00
18-Aug			1.00			1.00			1.00			1.00			1.00
19-Aug			1.00			1.00			1.00			1.00			1.00
20-Aug			1.00			1.00			1.00			1.00			1.00
21-Aug			1.00			1.00			1.00			1.00			1.00
22-Aug			1.00			1.00			1.00			1.00			1.00
23-Aug			1.00			1.00			1.00			1.00			1.00
24-Aug			1.00			1.00			1.00			1.00			1.00
25-Aug			1.00			1.00			1.00			1.00			1.00
26-Aug			1.00			1.00			1.00			1.00			1.00
27-Aug			1.00			1.00			1.00			1.00			1.00
28-Aug			1.00			1.00			1.00			1.00			1.00
29-Aug			1.00			1.00			1.00			1.00			1.00
30-Aug			1.00			1.00			1.00			1.00			1.00
31-Aug			1.00			1.00			1.00			1.00			1.00

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	SNK_1991	SNK_1992	SNK_1993	SNK_1994	SNK_1995	CLW 9	s	SUMMED	SUMMED w/o CWR
4-May		1						1	1
5-May		0						0	0
6-May		0						0	0
7-May		0						0	0
8-May		0						0	0
9-May		0						0	0
10-May		0						0	0
11-May		0						0	0
12-May		0						0	0
13-May		0						0	0
14-May		0						0	0
15-May		0						0	0
16-May		0						0	0
17-May		0						0	0
18-May		0						0	0
19-May		0						0	0
20-May		0						0	0
21-May		0						0	0
22-May		0						0	0
23-May		0						0	0
24-May		0						0	0
25-May		0						0	0
26-May		0						0	0
27-May		0						0	0
28-May		0						0	0
29-May		0						0	0
30-May		0						0	0
31-May		0						0	0
1-Jun		0						1	1
2-Jun		0						1	1
3-Jun		0			0			0	0
4-Jun		0			2			2	2
5-Jun		0			0			0	0
6-Jun		2						3	3
7-Jun		1			0			1	1
8-Jun		1						2	2
9-Jun		1						2	2
10-Jun		1			0			1	1
11-Jun		0			0			0	0
12-Jun		0			1			1	1
13-Jun		1			0			1	1
14-Jun	1	0			0			1	1
15-Jun	0	1						2	2
16-Jun	0	3						4	4
17-Jun	0	2						3	3
18-Jun	0	0			2			2	2
19-Jun	0	1			3			4	4
20-Jun	0	1			4			5	5
21-Jun	0	0			5			5	5
22-Jun	0	2			6			8	8
23-Jun	0	5			4			9	9
24-Jun	0	0			0			1	1
25-Jun	0	0	1	1	3			5	5
26-Jun	0	1	0	0	2			3	3
27-Jun	0	1	0	1	0			2	2
28-Jun	2	1	0	2	0			5	5
29-Jun	1	2	0	2				6	6
30-Jun	2	2	1	0	2			7	7
1-Jul	0	0	1	0	3			4	4
2-Jul	0	0	0	3	3		1	7	6
3-Jul	0	1	1	4			0	13	13
4-Jul	0	0	3	3	2		0	8	8

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	SNK 1991	SNK 1992	SNK 1993	SNK 1994	SNK 1995	CLW 95	SUMMED	SUMMED w/o CWR
5-Jul	0	0	2	5	4	0	11	11
6-Jul	0	0	2	1	3	0	6	6
7-Jul	1	1	0	8	8	0	18	18
8-Jul	1	0	0	4	3	0	8	8
9-Jul	2	0	3	3	14	0	22	22
10-Jul	1	0	1	8	14	0	24	24
11-Jul	1	0	1	7	9	0	18	18
12-Jul	0	0	0	3	5	0	8	8
13-Jul	2	0	0	2	7	0	11	11
14-Jul	0	0	4	2	3	1	10	9
15-Jul	3	0	3	3	2	1	12	11
16-Jul	0	0	0	2	10	0	12	12
17-Jul	1	0	1	1	9	0	12	12
18-Jul	3	0	0	4	10	0	17	17
19-Jul	1	0	0	0	15	1	17	16
20-Jul	5	0	5	0	9	0	19	19
21-Jul	2	1	3	0	4	0	10	10
22-Jul	2		1	1	12	0	16	16
23-Jul	2		1	0	7	0	10	10
24-Jul	6		2	2	3	0	13	13
25-Jul	9		2	1	5	0	17	17
26-Jul	0		1	0	4	0	5	5
27-Jul	1		3	0	5	0	9	9
28-Jul	1		2	2	13	2	20	18
29-Jul	0		2	0	9	0	11	11
30-Jul	1		1	1	13	0	16	16
31-Jul	1		0	0	9	0	10	10
1-Aug	1		0	0	7	0	8	8
2-Aug	2		0	0	6	0	8	8
3-Aug	3		0	0	4	0	7	7
4-Aug	0		0	1	6	0	7	7
5-Aug	0		0	1	10	0	11	11
6-Aug	1		0	3	11	1	16	15
7-Aug	0		0	3	10	1	14	13
8-Aug	0		0	0	5	0	5	5
9-Aug	0		0	0	5	0	5	5
10-Aug	1		0	0	5	0	6	6
11-Aug	1		0	1	4	0	6	6
12-Aug	0		0	0	3	0	3	3
13-Aug	0		0	1	1	1	3	2
14-Aug	0		0	0	0	0	0	0
15-Aug	0		0	0	5	1	6	5
16-Aug	0		0	0	3	1	4	3
17-Aug	0		0	0	0	0	0	0
18-Aug	0		0	0	6	0	6	6
19-Aug	0		0	0	2	1	3	2
20-Aug	0		0	0	1	0	1	1
21-Aug	0		0	0	1	0	1	1
22-Aug	1		0	0	0	0	1	1
23-Aug	0		0	0	0	0	0	0
24-Aug	0		0	0	2	0	2	2
25-Aug	0		1	0	0	0	1	1
26-Aug	0		0	0	1	0	1	1
27-Aug	0		0	0	1	0	1	1
28-Aug	1		0	0	1	0	2	2
29-Aug	0		0	1	1	0	2	2
30-Aug	0		0	0	0	0	0	0
31-Aug	0		0	0	1	0	1	1
1-Sep	0		0	0	0	0	0	0
2-Sep	0		1	0	1	0	2	2
3-Sep	0			0	0	0	0	0
4-Sep	0			0	2	1	3	2

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	SNK_1991	SNK_1992	SNK_1993	SNK_1994	SNK_1995	CLW_95	SUMMED	SUMMED w/o CWR
5-Sep	1			0	0	0	1	1
6-Sep				0	0	0	0	0
7-Sep				0	0	0	0	0
8-Sep				0	0	0	0	0
9-Sep				1	0	0	1	1
10-Sep				0	1	0	1	1
11-Sep				1	2	0	3	3
12-Sep				1	1	2	4	2
13-Sep				0	0	0	0	0
14-Sep				0	3	1	4	3
15-Sep				0	0	0	0	0
16-Sep				0	1	0	1	1
17-Sep				0	0	0	0	0
18-Sep				0	5	1	6	5
19-Sep				0	2	1	3	2
20-Sep				0	0	1	1	0
21-Sep				0	1	0	1	1
22-Sep				0	0	1	1	0
23-Sep				0	1	0	1	1
24-Sep				1	0	0	1	1
25-Sep					0	0	0	0
26-Sep					0	0	0	0
27-Sep					1	0	1	1
28-Sep					0	1	1	0
29-Sep					0	0	0	0
30-Sep					0	0	0	0
1-Oct					0	0	0	0
2-Oct					1	0	1	1
3-Oct					0	0	0	0
4-Oct					0	0	0	0
5-Oct					2	0	2	2
6-Oct					2	0	2	2
7-Oct					0	0	0	0
8-Oct					0	0	0	0
9-Oct					0	0	0	0
10-Oct					0	0	0	0
11-Oct					0	0	0	0
12-Oct					0	0	0	0
13-Oct					0	0	0	0
14-Oct					0	1	1	0
15-Oct					0	0	0	0
16-Oct					1	0	1	1
17-Oct					1	2	3	1
18-Oct					1	0	1	1
19-Oct					0	1	1	0
20-Oct					0	0	0	0
21-Oct					1	1	2	1
22-Oct					0	0	0	0
23-Oct					1	0	1	1
24-Oct					1	1	2	1
25-Oct						0	0	0
26-Oct						1	1	0
27-Oct						0	0	0
28-Oct						0	0	0
29-Oct						0	0	0
30-Oct						1		0

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Percent SNK_1991	Percent SNK_1992	Percent SNK 1993	Percent SNK 1994	Percent SNK 1995	Percent CLW_95	Percent SUMMED	Percent SUMMED w/o CWR
4-May		0.03					0.00	0.00
5-May		0.00					0.00	0.00
6-May		0.00					0.00	0.00
7-May		0.00					0.00	0.00
8-May		0.00					0.00	0.00
9-May		0.00					0.00	0.00
10-May		0.00					0.00	0.00
11-May		0.00					0.00	0.00
12-May		0.00					0.00	0.00
13-May		0.00					0.00	0.00
14-May		0.00					0.00	0.00
15-May		0.00					0.00	0.00
16-May		0.00					0.00	0.00
17-May		0.00					0.00	0.00
18-May		0.00					0.00	0.00
19-May		0.00					0.00	0.00
20-May		0.00					0.00	0.00
21-May		0.00					0.00	0.00
22-May		0.00					0.00	0.00
23-May		0.00					0.00	0.00
24-May		0.00					0.00	0.00
25-May		0.00					0.00	0.00
26-May		0.00					0.00	0.00
27-May		0.00					0.00	0.00
28-May		0.00					0.00	0.00
29-May		0.00					0.00	0.00
30-May		0.00					0.00	0.00
31-May		0.00					0.00	0.00
1-Jun		0.00			0.00		0.00	0.00
2-Jun		0.00			0.00		0.00	0.00
3-Jun		0.00			0.00		0.00	0.00
4-Jun		0.00			0.00		0.00	0.00
5-Jun		0.00			0.00		0.00	0.00
6-Jun		0.06			0.00		0.00	0.00
7-Jun		0.03			0.00		0.00	0.00
8-Jun		0.03			0.00		0.00	0.00
9-Jun		0.03			0.00		0.00	0.00
10-Jun		0.03			0.00		0.00	0.00
11-Jun		0.00			0.00		0.00	0.00
12-Jun		0.00			0.00		0.00	0.00
13-Jun		0.03			0.00		0.00	0.00
14-Jun	0.02	0.00			0.00		0.00	0.00
15-Jun	0.00	0.03			0.00		0.00	0.00
16-Jun	0.00	0.09			0.00		0.01	0.01
17-Jun	0.00	0.06			0.00		0.00	0.00
18-Jun	0.00	0.00			0.00		0.00	0.00
19-Jun	0.00	0.03			0.01		0.01	0.01
20-Jun	0.00	0.03			0.01		0.01	0.01
21-Jun	0.00	0.00			0.01		0.01	0.01
22-Jun	0.00	0.06			0.01		0.01	0.01
23-Jun	0.00	0.15			0.01		0.01	0.01
24-Jun	0.00	0.00		0.01	0.00		0.00	0.00
25-Jun	0.00	0.00	0.02	0.01	0.01		0.01	0.01
26-Jun	0.00	0.03	0.00	0.00	0.00		0.00	0.00
27-Jun	0.00	0.03	0.00	0.01	0.00		0.00	0.00
28-Jun	0.03	0.03	0.00	0.02	0.00		0.01	0.01
29-Jun	0.02	0.06	0.00	0.02	0.00		0.01	0.01
30-Jun	0.03	0.06	0.02	0.00	0.00		0.01	0.01
1-Jul	0.00	0.00	0.02	0.00	0.01		0.01	0.01
2-Jul	0.00	0.00	0.00	0.03	0.01	0.03	0.01	0.01
3-Jul	0.00	0.03	0.02	0.04	0.02	0.00	0.02	0.02
4-Jul	0.00	0.00	0.06	0.03	0.00	0.00	0.01	0.01

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Percent SNK_1991	Percent SNK_1992	Percent SNK_1993	Percent SNK_1994	Percent SNK_1995	Percent CLW_95	Percent SUMMED	Percent SUMMED w/o CWR
5-Jul	0.00	0.00	0.04	0.05	0.01	0.00	0.02	0.02
6-Jul	0.00	0.00	0.04	0.01	0.01	0.00	0.01	0.01
7-Jul	0.02	0.03	0.00	0.09	0.02	0.00	0.03	0.03
8-Jul	0.02	0.00	0.00	0.04	0.01	0.00	0.01	0.01
9-Jul	0.03	0.00	0.06	0.03	0.03	0.00	0.03	0.03
10-Jul	0.02	0.00	0.02	0.09	0.03	0.00	0.04	0.04
11-Jul	0.02	0.00	0.02	0.08	0.02	0.00	0.03	0.03
12-Jul	0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.01
13-Jul	0.03	0.00	0.00	0.02	0.02	0.00	0.02	0.02
14-Jul	0.00	0.00	0.08	0.02	0.01	0.03	0.01	0.01
15-Jul	0.05	0.00	0.06	0.03	0.00	0.03	0.02	0.02
16-Jul	0.00	0.00	0.00	0.02	0.02	0.00	0.02	0.02
17-Jul	0.02	0.00	0.02	0.01	0.02	0.00	0.02	0.02
18-Jul	0.05	0.00	0.00	0.04	0.02	0.00	0.03	0.03
19-Jul	0.02	0.00	0.00	0.00	0.04	0.03	0.03	0.03
20-Jul	0.08	0.00	0.10	0.00	0.02	0.00	0.03	0.03
21-Jul	0.03	0.03	0.06	0.00	0.01	0.00	0.01	0.02
22-Jul	0.03		0.02	0.01	0.03	0.00	0.02	0.03
23-Jul	0.03		0.02	0.00	0.02	0.00	0.01	0.02
24-Jul	0.09		0.04	0.02	0.01	0.00	0.02	0.02
25-Jul	0.14		0.04	0.01	0.01	0.00	0.03	0.03
26-Jul	0.00		0.02	0.00	0.01	0.00	0.01	0.01
27-Jul	0.02		0.06	0.00	0.01	0.00	0.01	0.01
28-Jul	0.02		0.04	0.02	0.03	0.07	0.03	0.03
29-Jul	0.00		0.04	0.00	0.02	0.00	0.02	0.02
30-Jul	0.02		0.02	0.01	0.03	0.00	0.02	0.03
31-Jul	0.02		0.00	0.00	0.02	0.00	0.01	0.02
1-Aug	0.02		0.00	0.00	0.02	0.00	0.01	0.01
2-Aug	0.03		0.00	0.00	0.01	0.00	0.01	0.01
3-Aug	0.05		0.00	0.00	0.01	0.00	0.01	0.01
4-Aug	0.00		0.00	0.01	0.01	0.00	0.01	0.01
5-Aug	0.00		0.00	0.01	0.02	0.00	0.02	0.02
6-Aug	0.02		0.00	0.03	0.03	0.03	0.02	0.02
7-Aug	0.00		0.00	0.03	0.02	0.03	0.02	0.02
8-Aug	0.00		0.00	0.00	0.01	0.00	0.01	0.01
9-Aug	0.00		0.00	0.00	0.01	0.00	0.01	0.01
10-Aug	0.02		0.00	0.00	0.01	0.00	0.01	0.01
11-Aug	0.02		0.00	0.01	0.01	0.00	0.01	0.01
12-Aug	0.00		0.00	0.00	0.01	0.00	0.00	0.00
13-Aug	0.00		0.00	0.01	0.00	0.03	0.00	0.00
14-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
15-Aug	0.00		0.00	0.00	0.01	0.03	0.01	0.01
16-Aug	0.00		0.00	0.00	0.01	0.03	0.01	0.00
17-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
18-Aug	0.00		0.00	0.00	0.01	0.00	0.01	0.01
19-Aug	0.00		0.00	0.00	0.00	0.03	0.00	0.00
20-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
21-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
22-Aug	0.02		0.00	0.00	0.00	0.00	0.00	0.00
23-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
24-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
25-Aug	0.00		0.02	0.00	0.00	0.00	0.00	0.00
26-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
27-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
28-Aug	0.02		0.00	0.00	0.00	0.00	0.00	0.00
29-Aug	0.00		0.00	0.01	0.00	0.00	0.00	0.00
30-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
31-Aug	0.00		0.00	0.00	0.00	0.00	0.00	0.00
1-Sep	0.00		0.00	0.00	0.00	0.00	0.00	0.00
2-Sep	0.00		0.02	0.00	0.00	0.00	0.00	0.00
3-Sep	0.00			0.00	0.00	0.00	0.00	0.00
4-Sep	0.00			0.00	0.00	0.03	0.00	0.00

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Percent SNK_1991	Percent SNK_1992	Percent SNK_1993	Percent SNK_1994	Percent SNK_1995	Percent CLW_95	Percent SUMMED	Percent SUMMED w/o CWR
5-Sep	0.02			0.00	0.00	0.00	0.00	0.00
6-Sep				0.00	0.00	0.00	0.00	0.00
7-Sep				0.00	0.00	0.00	0.00	0.00
8-Sep				0.00	0.00	0.00	0.00	0.00
9-Sep				0.01	0.00	0.00	0.00	0.00
10-Sep				0.00	0.00	0.00	0.00	0.00
11-Sep				0.01	0.00	0.00	0.00	0.00
12-Sep				0.01	0.00	0.07	0.01	0.00
13-Sep				0.00	0.00	0.00	0.00	0.00
14-Sep				0.00	0.01	0.03	0.01	0.00
15-Sep				0.00	0.00	0.00	0.00	0.00
16-Sep				0.00	0.00	0.00	0.00	0.00
17-Sep				0.00	0.00	0.00	0.00	0.00
18-Sep				0.00	0.01	0.03	0.01	0.01
19-Sep				0.00	0.00	0.03	0.00	0.00
20-Sep				0.00	0.00	0.03	0.00	0.00
21-Sep				0.00	0.00	0.00	0.00	0.00
22-Sep				0.00	0.00	0.03	0.00	0.00
23-Sep				0.00	0.00	0.00	0.00	0.00
24-Sep				0.01	0.00	0.00	0.00	0.00
25-Sep					0.00	0.00	0.00	0.00
26-Sep					0.00	0.00	0.00	0.00
27-Sep					0.00	0.00	0.00	0.00
28-Sep					0.00	0.03	0.00	0.00
29-Sep					0.00	0.00	0.00	0.00
30-Sep					0.00	0.00	0.00	0.00
1-Oct					0.00	0.00	0.00	0.00
2-Oct					0.00	0.00	0.00	0.00
3-Oct					0.00	0.00	0.00	0.00
4-Oct					0.00	0.00	0.00	0.00
5-Oct					0.00	0.00	0.00	0.00
6-Oct					0.00	0.00	0.00	0.00
7-Oct					0.00	0.00	0.00	0.00
8-Oct					0.00	0.00	0.00	0.00
9-Oct					0.00	0.00	0.00	0.00
10-Oct					0.00	0.00	0.00	0.00
11-Oct					0.00	0.00	0.00	0.00
12-Oct					0.00	0.00	0.00	0.00
13-Oct					0.00	0.00	0.00	0.00
14-Oct					0.00	0.03	0.00	0.00
15-Oct					0.00	0.00	0.00	0.00
16-Oct					0.00	0.00	0.00	0.00
17-Oct					0.00	0.07	0.00	0.00
18-Oct					0.00	0.00	0.00	0.00
19-Oct					0.00	0.03	0.00	0.00
20-Oct					0.00	0.00	0.00	0.00
21-Oct					0.00	0.03	0.00	0.00
22-Oct					0.00	0.00	0.00	0.00
23-Oct					0.00	0.00	0.00	0.00
24-Oct					0.00	0.03	0.00	0.00
25-Oct						0.00	0.00	0.00
26-Oct						0.03	0.00	0.00
27-Oct						0.00	0.00	0.00
28-Oct						0.00	0.00	0.00
29-Oct						0.00	0.00	0.00
30-Oct						0.03	0.00	0.00

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Cum Percent SNK 1991	Cum Percent SNK 1992	Cum Percent SNK 1993	Cum Percent SNK 1994	Cum Percent SNK 1995	Cum Percent CLW_95	Cum Percent SUMMED	Cum Percent SUMMED w/o CWR
4-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
5-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
6-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
7-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
8-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
9-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
10-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
11-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
13-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
14-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
15-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
16-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
17-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
18-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
19-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
20-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
21-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
22-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
23-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
24-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
25-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
26-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
27-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
28-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
29-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
30-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
31-May	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
1-Jun	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
2-Jun	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
3-Jun	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
4-Jun	0.00	0.03	0.00	0.00	0.01	0.00	0.01	0.01
5-Jun	0.00	0.03	0.00	0.00	0.01	0.00	0.01	0.01
6-Jun	0.00	0.09	0.00	0.00	0.01	0.00	0.01	0.01
7-Jun	0.00	0.12	0.00	0.00	0.01	0.00	0.01	0.01
8-Jun	0.00	0.15	0.00	0.00	0.01	0.00	0.02	0.02
9-Jun	0.00	0.18	0.00	0.00	0.02	0.00	0.02	0.02
10-Jun	0.00	0.21	0.00	0.00	0.02	0.00	0.02	0.02
11-Jun	0.00	0.21	0.00	0.00	0.02	0.00	0.02	0.02
12-Jun	0.00	0.21	0.00	0.00	0.02	0.00	0.02	0.02
13-Jun	0.00	0.24	0.00	0.00	0.02	0.00	0.02	0.03
14-Jun	0.02	0.24	0.00	0.00	0.02	0.00	0.03	0.03
15-Jun	0.02	0.27	0.00	0.00	0.02	0.00	0.03	0.03
16-Jun	0.02	0.36	0.00	0.00	0.02	0.00	0.03	0.04
17-Jun	0.02	0.42	0.00	0.00	0.03	0.00	0.04	0.04
18-Jun	0.02	0.42	0.00	0.00	0.03	0.00	0.04	0.04
19-Jun	0.02	0.45	0.00	0.00	0.04	0.00	0.05	0.05
20-Jun	0.02	0.48	0.00	0.00	0.05	0.00	0.06	0.06
21-Jun	0.02	0.48	0.00	0.00	0.06	0.00	0.06	0.07
22-Jun	0.02	0.55	0.00	0.00	0.08	0.00	0.07	0.08
23-Jun	0.02	0.70	0.00	0.00	0.09	0.00	0.09	0.09
24-Jun	0.02	0.70	0.00	0.01	0.09	0.00	0.09	0.09
25-Jun	0.02	0.70	0.02	0.02	0.09	0.00	0.10	0.10
26-Jun	0.02	0.73	0.02	0.02	0.10	0.00	0.10	0.11
27-Jun	0.02	0.76	0.02	0.03	0.10	0.00	0.10	0.11
28-Jun	0.05	0.79	0.02	0.05	0.10	0.00	0.11	0.12
29-Jun	0.06	0.85	0.02	0.08	0.10	0.00	0.12	0.13
30-Jun	0.09	0.91	0.04	0.08	0.11	0.00	0.13	0.14
1-Jul	0.09	0.91	0.06	0.08	0.11	0.00	0.14	0.14
2-Jul	0.09	0.91	0.06	0.11	0.12	0.03	0.15	0.15
3-Jul	0.09	0.94	0.08	0.15	0.14	0.03	0.17	0.17
4-Jul	0.09	0.94	0.14	0.18	0.14	0.03	0.18	0.19

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Cum Percent SNK_1991	Cum Percent SNK_1992	Cum Percent SNK_1993	Cum Percent SNK_1994	Cum Percent SNK_1995	Cum Percent CLW_95	Cum Percent SUMMED	Cum Percent SUMMED w/o CWR
5-Jul	0.09	0.94	0.18	0.24	0.15	0.03	0.20	0.20
6-Jul	0.09	0.94	0.22	0.25	0.16	0.03	0.21	0.21
7-Jul	0.11	0.97	0.22	0.34	0.18	0.03	0.23	0.24
8-Jul	0.13	0.97	0.22	0.38	0.19	0.03	0.24	0.25
9-Jul	0.16	0.97	0.29	0.41	0.22	0.03	0.28	0.29
10-Jul	0.17	0.97	0.31	0.50	0.26	0.03	0.31	0.33
11-Jul	0.19	0.97	0.33	0.58	0.28	0.03	0.34	0.35
12-Jul	0.19	0.97	0.33	0.61	0.29	0.03	0.35	0.37
13-Jul	0.22	0.97	0.33	0.63	0.31	0.03	0.37	0.38
14-Jul	0.22	0.97	0.41	0.65	0.32	0.07	0.38	0.40
15-Jul	0.27	0.97	0.47	0.68	0.32	0.10	0.40	0.41
16-Jul	0.27	0.97	0.47	0.71	0.35	0.10	0.42	0.43
17-Jul	0.28	0.97	0.49	0.72	0.37	0.10	0.44	0.45
18-Jul	0.33	0.97	0.49	0.76	0.40	0.10	0.46	0.48
19-Jul	0.34	0.97	0.49	0.76	0.43	0.14	0.49	0.50
20-Jul	0.42	0.97	0.59	0.76	0.46	0.14	0.52	0.53
21-Jul	0.45	1.00	0.65	0.76	0.47	0.14	0.53	0.55
22-Jul	0.48	1.00	0.67	0.77	0.50	0.14	0.56	0.57
23-Jul	0.52	1.00	0.69	0.77	0.51	0.14	0.57	0.59
24-Jul	0.61	1.00	0.73	0.79	0.52	0.14	0.59	0.61
25-Jul	0.75	1.00	0.78	0.80	0.53	0.14	0.62	0.64
26-Jul	0.75	1.00	0.80	0.80	0.54	0.14	0.62	0.64
27-Jul	0.77	1.00	0.86	0.80	0.56	0.14	0.64	0.66
28-Jul	0.78	1.00	0.90	0.83	0.59	0.21	0.67	0.69
29-Jul	0.78	1.00	0.94	0.83	0.61	0.21	0.68	0.70
30-Jul	0.80	1.00	0.96	0.84	0.64	0.21	0.71	0.73
31-Jul	0.81	1.00	0.96	0.84	0.67	0.21	0.72	0.74
1-Aug	0.83	1.00	0.96	0.84	0.68	0.21	0.73	0.76
2-Aug	0.86	1.00	0.96	0.84	0.70	0.21	0.75	0.77
3-Aug	0.91	1.00	0.96	0.84	0.71	0.21	0.76	0.78
4-Aug	0.91	1.00	0.96	0.85	0.72	0.21	0.77	0.79
5-Aug	0.91	1.00	0.96	0.86	0.75	0.21	0.78	0.81
6-Aug	0.92	1.00	0.96	0.89	0.78	0.24	0.81	0.83
7-Aug	0.92	1.00	0.96	0.92	0.80	0.28	0.83	0.85
8-Aug	0.92	1.00	0.96	0.92	0.81	0.28	0.84	0.86
9-Aug	0.92	1.00	0.96	0.92	0.83	0.28	0.84	0.87
10-Aug	0.94	1.00	0.96	0.92	0.84	0.28	0.85	0.88
11-Aug	0.95	1.00	0.96	0.93	0.85	0.28	0.86	0.89
12-Aug	0.95	1.00	0.96	0.93	0.86	0.28	0.87	0.89
13-Aug	0.95	1.00	0.96	0.95	0.86	0.31	0.87	0.90
14-Aug	0.95	1.00	0.96	0.95	0.86	0.31	0.87	0.90
15-Aug	0.95	1.00	0.96	0.95	0.87	0.34	0.88	0.90
16-Aug	0.95	1.00	0.96	0.95	0.88	0.38	0.88	0.91
17-Aug	0.95	1.00	0.96	0.95	0.88	0.38	0.88	0.91
18-Aug	0.95	1.00	0.96	0.95	0.89	0.38	0.89	0.92
19-Aug	0.95	1.00	0.96	0.95	0.90	0.41	0.90	0.92
20-Aug	0.95	1.00	0.96	0.95	0.90	0.41	0.90	0.92
21-Aug	0.95	1.00	0.96	0.95	0.90	0.41	0.90	0.92
22-Aug	0.97	1.00	0.96	0.95	0.90	0.41	0.90	0.92
23-Aug	0.97	1.00	0.96	0.95	0.90	0.41	0.90	0.92
24-Aug	0.97	1.00	0.96	0.95	0.91	0.41	0.91	0.93
25-Aug	0.97	1.00	0.98	0.95	0.91	0.41	0.91	0.93
26-Aug	0.97	1.00	0.98	0.95	0.91	0.41	0.91	0.93
27-Aug	0.97	1.00	0.98	0.95	0.91	0.41	0.91	0.93
28-Aug	0.98	1.00	0.98	0.95	0.92	0.41	0.91	0.94
29-Aug	0.98	1.00	0.98	0.96	0.92	0.41	0.92	0.94
30-Aug	0.98	1.00	0.98	0.96	0.92	0.41	0.92	0.94
31-Aug	0.98	1.00	0.98	0.96	0.92	0.41	0.92	0.94
1-Sep	0.98	1.00	0.98	0.96	0.92	0.41	0.92	0.94
2-Sep	0.98	1.00	1.00	0.96	0.92	0.41	0.92	0.94
3-Sep	0.98	1.00	1.00	0.96	0.92	0.41	0.92	0.94
4-Sep	0.98	1.00	1.00	0.96	0.93	0.45	0.93	0.95

PIT-tagged Fall Subyearling Chinook Tagged

and Released by Billy Connor

DATE	Cum Percent SNK_1991	Cum Percent SNK_1992	Cum Percent SNK_1993	Cum Percent SNK_1994	Cum Percent SNK_1995	Cum Percent CLW_95	Cum Percent SUMMED	Cum Percent SUMMED w/o CWR
5-Sep	1.00	1.00	1.00	0.96	0.93	0.45	0.93	0.95
6-Sep	1.00	1.00	1.00	0.96	0.93	0.45	0.93	0.95
7-Sep	1.00	1.00	1.00	0.96	0.93	0.45	0.93	0.95
8-Sep	1.00	1.00	1.00	0.96	0.93	0.45	0.93	0.95
9-Sep	1.00	1.00	1.00	0.97	0.93	0.45	0.93	0.95
10-Sep	1.00	1.00	1.00	0.97	0.93	0.45	0.93	0.95
11-Sep	1.00	1.00	1.00	0.98	0.94	0.45	0.93	0.96
12-Sep	1.00	1.00	1.00	0.99	0.94	0.52	0.94	0.96
13-Sep	1.00	1.00	1.00	0.99	0.94	0.52	0.94	0.96
14-Sep	1.00	1.00	1.00	0.99	0.95	0.55	0.95	0.96
15-Sep	1.00	1.00	1.00	0.99	0.95	0.55	0.95	0.96
16-Sep	1.00	1.00	1.00	0.99	0.95	0.55	0.95	0.97
17-Sep	1.00	1.00	1.00	0.99	0.95	0.55	0.95	0.97
18-Sep	1.00	1.00	1.00	0.99	0.96	0.59	0.96	0.97
19-Sep	1.00	1.00	1.00	0.99	0.97	0.62	0.96	0.98
20-Sep	1.00	1.00	1.00	0.99	0.97	0.66	0.96	0.98
21-Sep	1.00	1.00	1.00	0.99	0.97	0.66	0.96	0.98
22-Sep	1.00	1.00	1.00	0.99	0.97	0.69	0.97	0.98
23-Sep	1.00	1.00	1.00	0.99	0.97	0.69	0.97	0.98
24-Sep	1.00	1.00	1.00	1.00	0.97	0.69	0.97	0.98
25-Sep	1.00	1.00	1.00	1.00	0.97	0.69	0.97	0.98
26-Sep	1.00	1.00	1.00	1.00	0.97	0.69	0.97	0.98
27-Sep	1.00	1.00	1.00	1.00	0.97	0.69	0.97	0.98
28-Sep	1.00	1.00	1.00	1.00	0.97	0.72	0.97	0.98
29-Sep	1.00	1.00	1.00	1.00	0.97	0.72	0.97	0.98
30-Sep	1.00	1.00	1.00	1.00	0.97	0.72	0.97	0.98
1-Oct	1.00	1.00	1.00	1.00	0.97	0.72	0.97	0.98
2-Oct	1.00	1.00	1.00	1.00	0.98	0.72	0.97	0.98
3-Oct	1.00	1.00	1.00	1.00	0.98	0.72	0.97	0.98
4-Oct	1.00	1.00	1.00	1.00	0.98	0.72	0.97	0.98
5-Oct	1.00	1.00	1.00	1.00	0.98	0.72	0.98	0.99
6-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
7-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
8-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
9-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
10-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
11-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
12-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
13-Oct	1.00	1.00	1.00	1.00	0.99	0.72	0.98	0.99
14-Oct	1.00	1.00	1.00	1.00	0.99	0.76	0.98	0.99
15-Oct	1.00	1.00	1.00	1.00	0.99	0.76	0.98	0.99
16-Oct	1.00	1.00	1.00	1.00	0.99	0.76	0.98	0.99
17-Oct	1.00	1.00	1.00	1.00	0.99	0.83	0.99	0.99
18-Oct	1.00	1.00	1.00	1.00	0.99	0.83	0.99	1.00
19-Oct	1.00	1.00	1.00	1.00	0.99	0.86	0.99	1.00
20-Oct	1.00	1.00	1.00	1.00	0.99	0.86	0.99	1.00
21-Oct	1.00	1.00	1.00	1.00	1.00	0.90	0.99	1.00
22-Oct	1.00	1.00	1.00	1.00	1.00	0.90	0.99	1.00
23-Oct	1.00	1.00	1.00	1.00	1.00	0.90	0.99	1.00
24-Oct	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00
25-Oct	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00
26-Oct	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
27-Oct	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
28-Oct	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
29-Oct	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
30-Oct	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

1991 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	6256	13853	13874			
3/28/91	0	0	0	0.000	0	0.00%
3/29/91	0	0	0	0.000	0	0.00%
3/30/91	0	0	0	0.000	0	0.00%
3/31/91	0	0	0	0.000	0	0.00%
4/1/91	0	0	0	0.000	0	0.00%
4/2/91	0	0	0	0.000	0	0.00%
4/3/91	0	0	0	0.000	0	0.00%
4/4/91	0	0	0	0.000	0	0.00%
4/5/91	0	0	0	0.000	0	0.00%
4/6/91	0	0	0	0.000	0	0.00%
4/7/91	0	0	0	0.000	0	0.00%
4/8/91	0	0	0	0.000	0	0.00%
4/9/91	0	0	0	0.000	0	0.00%
4/10/91	0	0	0	0.000	0	0.00%
4/11/91	0	0	0	0.000	0	0.00%
4/12/91	0	0	0	0.000	0	0.00%
4/13/91	0	0	0	0.000	0	0.00%
4/14/91	1	10	10	0.072	10	0.07%
4/15/91	0	0	0	0.000	10	0.07%
4/16/91	0	0	0	0.000	10	0.07%
4/17/91	0	0	0	0.000	10	0.07%
4/18/91	0	0	0	0.000	10	0.07%
4/19/91	1	12	12	0.086	22	0.16%
4/20/91	0	0	0	0.000	22	0.16%
4/21/91	0	0	0	0.000	22	0.16%
4/22/91	0	0	0	0.000	22	0.16%
4/23/91	0	0	0	0.000	22	0.16%
4/24/91	0	0	0	0.000	22	0.16%
4/25/91	1	20	20	0.144	42	0.30%
4/26/91	0	0	0	0.000	42	0.30%
4/27/91	2	60	60	0.432	102	0.74%
4/28/91	0	0	0	0.000	102	0.74%
4/29/91	0	0	0	0.000	102	0.74%
4/30/91	0	0	0	0.000	102	0.74%
5/1/91	0	0	0	0.000	102	0.74%
5/2/91	0	0	0	0.000	102	0.74%
5/3/91	0	0	0	0.000	102	0.74%
5/4/91	0	0	0	0.000	102	0.74%
5/5/91	0	0	0	0.000	102	0.74%
5/6/91	0	0	0	0.000	102	0.74%
5/7/91	0	0	0	0.000	102	0.74%
5/8/91	0	0	0	0.000	102	0.74%
5/9/91	0	0	0	0.000	102	0.74%
5/10/91	0	0	0	0.000	102	0.74%
5/11/91	0	0	0	0.000	102	0.74%
5/12/91	0	0	0	0.000	102	0.74%
5/13/91	0	0	0	0.000	102	0.74%
5/14/91	0	0	0	0.000	102	0.74%
5/15/91	0	0	0	0.000	102	0.74%
5/16/91	0	0	0	0.000	102	0.74%
5/17/91	1	100	100	0.721	202	1.46%
5/18/91	0	0	0	0.000	202	1.46%
5/19/91	0	0	0	0.000	202	1.46%
5/20/91	0	0	0	0.000	202	1.46%
5/21/91	0	0	0	0.000	202	1.46%
5/22/91	0	0	0	0.000	202	1.46%
5/23/91	0	0	0	0.000	202	1.46%

1991 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
5/24/91	0	0	0	0.000	202	1.46%
5/25/91	0	0	0	0.000	202	1.46%
5/26/91	0	0	0	0.000	202	1.46%
5/27/91	0	0	0	0.000	202	1.46%
5/28/91	0	0	0	0.000	202	1.46%
5/29/91	0	0	0	0.000	202	1.46%
5/30/91	0	0	0	0.000	202	1.46%
5/31/91	0	0	0	0.000	202	1.46%
6/1/91	0	0	0	0.000	202	1.46%
6/2/91	0	0	0	0.000	202	1.46%
6/3/91	0	0	0	0.000	202	1.46%
6/4/91	0	0	0	0.000	202	1.46%
6/5/91	0	0	0	0.000	202	1.46%
6/6/91	0	0	0	0.000	202	1.46%
6/7/91	0	0	0	0.000	202	1.46%
6/8/91	0	0	0	0.000	202	1.46%
6/9/91	0	0	0	0.000	202	1.46%
6/10/91	34	510	510	3.676	712	5.13%
6/11/91	38	570	570	4.108	1282	9.24%
6/12/91	29	435	435	3.135	1717	12.38%
6/13/91	42	630	630	4.541	2347	16.92%
6/14/91	55	660	660	4.757	3007	21.67%
6/15/91	39	468	468	3.373	3475	25.05%
6/16/91	24	288	288	2.076	3763	27.12%
6/17/91	23	276	276	1.989	4039	29.11%
6/18/91	10	120	120	0.865	4159	29.98%
6/19/91	10	100	100	0.721	4259	30.70%
6/20/91	6	60	67	0.483	4326	31.18%
6/21/91	17	170	170	1.225	4496	32.41%
6/22/91	6	60	60	0.432	4556	32.84%
6/23/91	7	70	70	0.505	4626	33.34%
6/24/91	3	30	30	0.216	4656	33.56%
6/25/91	7	70	70	0.505	4726	34.06%
6/26/91	4	40	40	0.288	4766	34.35%
6/27/91	16	160	160	1.153	4926	35.51%
6/28/91	12	120	120	0.865	5046	36.37%
6/29/91	3	30	30	0.216	5076	36.59%
6/30/91	2	20	20	0.144	5096	36.73%
7/1/91	5	50	50	0.360	5 146	37.09%
7/2/91	7	70	70	0.505	5216	37.60%
7/3/91	15	150	150	1.081	5366	38.68%
7/4/91	8	80	80	0.577	5446	39.25%
7/5/91	11	110	110	0.793	5556	40.05%
7/6/91	5	50	50	0.360	5606	40.41%
7/7/91	4	40	40	0.288	5646	40.69%
7/8/91	15	150	150	1.081	5796	41.78%
7/9/91	12	120	120	0.865	5916	42.64%
7/10/91	9	90	90	0.649	6006	43.29%
7/11/91	6	60	60	0.432	6066	43.72%
7/12/91	19	190	190	1.369	6256	45.09%
7/13/91	15	150	150	1.081	6406	46.17%
7/14/91	19	190	190	1.369	6596	47.54%
7/15/91	24	240	240	1.730	6836	49.27%
7/16/91	31	310	310	2.234	7146	51.51%
7/17/91	21	210	210	1.514	7356	53.02%
7/18/91	35	350	350	2.523	7706	55.54%
7/19/91	71	355	355	2.559	8061	58.10%
7/20/91	45	225	225	1.622	8286	59.72%
7/21/91	22	110	110	0.793	8396	60.52%

1991 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
7/22/91	267	267	267	1.924	8663	62.44%
7/23/91	341	341	341	2.458	9004	64.90%
7/24/91	501	501	501	3.611	9505	68.51%
7/25/91	1022	1022	1022	7.366	10527	75.88%
7/26/91	766	766	766	5.521	11293	81.40%
7/27/91	318	318	318	2.292	11611	83.69%
7/28/91	261	261	261	1.881	11872	85.57%
7/29/91	147	147	147	1.060	12019	86.63%
7/30/91	169	169	169	1.218	12188	87.85%
7/31/91	154	154	154	1.110	12342	88.96%
8/1/91	85	85	85	0.613	12427	89.57%
8/2/91	122	122	122	0.879	12549	90.45%
8/3/91	171	171	171	1.233	12720	91.68%
8/4/91	199	199	199	1.434	12919	93.12%
8/5/91	84	84	84	0.605	13003	93.72%
8/6/91	60	60	60	0.432	13063	94.15%
8/7/91	71	71	71	0.512	13134	94.67%
8/8/91	58	58	58	0.418	13192	95.08%
8/9/91	50	50	50	0.360	13242	95.44%
8/10/91	29	29	29	0.209	13271	95.65%
8/11/91	53	53	53	0.382	13324	96.04%
8/12/91	24	24	24	0.173	13348	96.21%
8/13/91	18	18	18	0.130	13366	96.34%
8/14/91	18	18	26	0.187	13392	96.53%
8/15/91	17	17	23	0.166	13415	96.69%
8/16/91	9	9	9	0.065	13424	96.76%
8/17/91	8	8	8	0.058	13432	96.81%
8/18/91	32	32	32	0.231	13464	97.04%
8/19/91	22	22	22	0.159	13486	97.20%
8/20/91	10	10	10	0.072	13496	97.28%
8/21/91	15	15	15	0.108	13511	97.38%
8/22/91	31	31	31	0.223	13542	97.61%
8/23/91	21	21	21	0.151	13563	97.76%
8/24/91	18	18	18	0.130	13581	97.89%
8/25/91	9	9	9	0.065	13590	97.95%
8/26/91	10	10	10	0.072	13600	98.03 %
8/27/91	24	24	24	0.173	13624	98.20%
8/28/91	7	7	7	0.050	13631	98.25%
8/29/91	5	5	5	0.036	13636	98.28%
8/30/91	5	5	5	0.036	13641	98.32%
8/31/91	3	3	3	0.022	13644	98.34%
9/1/91	0	0	0	0.000	13644	98.34%
9/2/91	0	0	0	0.000	13644	98.34%
9/3/91	0	0	0	0.000	13644	98.34%
9/4/91	0	0	0	0.000	13644	98.34%
9/5/91	1	1	1	0.007	13645	98.35%
9/6/91	1	1	1	0.007	13646	98.36%
9/7/91	2	2	2	0.014	13648	98.37%
9/8/91	1	1	1	0.007	13649	98.38%
9/9/91	4	4	4	0.029	13653	98.41%
9/10/91	7	7	7	0.050	13660	98.46%
9/11/91	1	1	1	0.007	13661	98.46%
9/12/91	1	1	1	0.007	13662	98.47%
9/13/91	3	3	3	0.022	13665	98.49%
9/14/91	2	2	2	0.014	13667	98.51%
9/15/91	0	0	0	0.000	13667	98.51%
9/16/91	2	2	2	0.014	13669	98.52%
9/17/91	1	1	1	0.007	13670	98.53%
9/18/91	2	2	2	0.014	13672	98.54%

1991 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
9/19/91	2	2	2	0.014	13674	98.56%
9/20/91	2	2	2	0.014	13676	98.57%
9/21/91	4	4	4	0.029	13680	98.60%
9/22/91	9	9	9	0.065	13689	98.67%
9/23/91	2	2	2	0.014	13691	98.68%
9/24/91	1	1	1	0.007	13692	98.69%
9/25/91	4	4	4	0.029	13696	98.72%
9/26/91	2	2	2	0.014	13698	98.73%
9/27/91	2	2	2	0.014	13700	98.75%
9/28/91	2	2	2	0.014	13702	98.76%
9/29/91	2	2	2	0.014	13704	98.77%
9/30/91	6	6	6	0.043	13710	98.82%
10/1/91	3	3	3	0.022	13713	98.84%
10/2/91	4	4	4	0.029	13717	98.87%
10/3/91	0	0	0	0.000	13717	98.87%
10/4/91	9	9	9	0.065	13726	98.93%
10/5/91	3	3	3	0.022	13729	98.95%
10/6/91	2	2	2	0.014	13731	98.97%
10/7/91	3	3	3	0.022	13734	98.99%
10/8/91	1	1	1	0.007	13735	99.00%
10/9/91	4	4	4	0.029	13739	99.03 %
10/10/91	3	3	3	0.022	13742	99.05%
10/11/91	2	2	2	0.014	13744	99.06%
10/12/91	3	3	3	0.022	13747	99.08%
10/13/91	4	4	4	0.029	13751	99.11%
10/14/91	1	1	1	0.007	13752	99.12%
10/15/91	1	1	1	0.007	13753	99.13%
10/16/91	4	4	4	0.029	13757	99.16%
10/17/91	1	1	1	0.007	13758	99.16%
10/18/91	0	0	0	0.000	13758	99.16%
10/19/91	0	0	0	0.000	13758	99.16%
10/20/91	1	1	1	0.007	13759	99.17%
10/21/91	0	0	0	0.000	13759	99.17%
10/22/91	0	0	0	0.000	13759	99.17%
10/23/91	1	1	1	0.007	13760	99.18%
10/24/91	1	1	1	0.007	13761	99.19%
10/25/91	3	3	3	0.022	13764	99.21%
10/26/91	1	1	1	0.007	13765	99.21%
10/27/91	3	3	3	0.022	13768	99.24%
10/28/91	0	0	0	0.000	13768	99.24%
10/29/91	1	1	1	0.007	13769	99.24%
10/30/91	1	1	1	0.007	13770	99.25%
10/31/91	2	2	2	0.014	13772	99.26%
11/1/91	1	1	1	0.007	13773	99.27%
11/2/91	0	0	0	0.000	13773	99.27%
11/3/91	2	2	2	0.014	13775	99.29%
11/4/91	0	0	0	0.000	13775	99.29%
11/5/91	0	0	0	0.000	13775	99.29%
11/6/91	1	1	1	0.007	13776	99.29%
11/7/91	1	1	1	0.007	13777	99.30%
11/8/91	3	3	3	0.022	13780	99.32%
11/9/91	0	0	0	0.000	13780	99.32%
11/10/91	3	3	3	0.022	13783	99.34%
11/11/91	0	0	0	0.000	13783	99.34%
11/12/91	3	3	3	0.022	13786	99.37%
11/13/91	1	1	1	0.007	13787	99.37%
11/14/91	2	2	2	0.014	13789	99.39%
11/15/91	5	5	5	0.036	13794	99.42%
11/16/91	6	6	6	0.043	13800	99.47%

1991 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
11/17/91	5	5	5	0.036	13805	99.50%
11/18/91	4	4	4	0.029	13809	99.53%
11/19/91	2	2	2	0.014	13811	99.55%
11/20/91	7	7	7	0.050	13818	99.60%
11/21/91	0	0	0	0.000	13818	99.60%
11/22/91	0	0	0	0.000	13818	99.60%
11/23/91	2	2	2	0.014	13820	99.61%
11/24/91	8	8	8	0.058	13828	99.67%
11/25/91	6	6	6	0.043	13834	99.71%
11/26/91	10	10	10	0.072	13844	99.78%
11/27/91	30	30	30	0.216	13874	100.00%
				100.000		

1992 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	667	5966	5966			
		-	-			- -
3/28/92						
3/29/92						
3/30/92						
3/31/92						
4/1/92						
4/2/92	0	0	0	0.000	0	0.00%
4/3/92	0	0	0	0.000	0	0.00%
4/4/92	0	0	0	0.000	0	0.00%
4/5/92	0	0	0	0.000	0	0.00%
4/6/92	0	0	0	0.000	0	0.00%
4/7/92	0	0	0	0.000	0	0.00%
4/8/92	0	0	0	0.000	0	0.00%
4/9/92	0	0	0	0.000	0	0.00%
4/10/92	0	0	0	0.000	0	0.00%
4/11/92	0	0	0	0.000	0	0.00%
4/12/92	0	0	0	0.000	0	0.00%
4/13/92	0	0	0	0.000	0	0.00%
4/14/92	0	0	0	0.000	0	0.00%
4/15/92	0	0	0	0.000	0	0.00%
4/16/92	0	0	0	0.000	0	0.00%
4/17/92	0	0	0	0.000	0	0.00%
4/18/92	0	0	0	0.000	0	0.00%
4/19/92	0	0	0	0.000	0	0.00%
4/20/92	0	0	0	0.000	0	0.00%
4/2 1/92	0	0	0	0.000	0	0.00%
4/22/92	0	0	0	0.000	0	0.00%
4/23/92	0	0	0	0.000	0	0.00%
4/24/92	0	0	0	0.000	0	0.00%
4/25/92	0	0	0	0.000	0	0.00%
4/26/92	0	0	0	0.000	0	0.00%
4/27/92	0	0	0	0.000	0	0.00%
4/28/92	0	0	0	0.000	0	0.00%
4/29/92	1	25	25	0.419	25	0.42%
4/30/92	0	0	0	0.000	25	0.42%
5/1/92	0	0	0	0.000	25	0.42%
5/2/92	0	0	0	0.000	25	0.42%
5/3/92	0	0	0	0.000	25	0.42%
5/4/92	0	0	0	0.000	25	0.42%
5/5/92	0	0	0	0.000	25	0.42%
5/6/92	0	0	0	0.000	25	0.42%
5/7/92	0	0	0	0.000	25	0.42%
5/8/92	1	60	60	1.006	85	1.42%
5/9/92	0	0	0	0.000	85	1.42%
5/10/92	0	0	0	0.000	85	1.42%
5/11/92	0	0	0	0.000	85	1.42%
5/12/92	0	0	0	0.000	85	1.42%
5/13/92	0	0	0	0.000	85	1.42%
5/14/92	0	0	0	0.000	85	1.42%
5/15/92	0	0	0	0.000	85	1.42%
5/16/92	0	0	0	0.000	85	1.42%

1992 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
5/17/92	0	0	0	0.000	85	1.42%
5/18/92	0	0	0	0.000	85	1.42%
5/19/92	0	0	0	0.000	85	1.42%
5/20/92	0	0	0	0.000	85	1.42%
5/21/92	0	0	0	0.000	85	1.42%
5/22/92	1	15	15	0.251	100	1.68%
5/23/92	0	0	0	0.000	100	1.68%
5/24/92	0	0	0	0.000	100	1.68%
5/25/92	0	0	0	0.000	100	1.68%
5/26/92	0	0	0	0.000	100	1.68%
5/27/92	0	0	0	0.000	100	1.68%
5/28/92	3	75	75	1.257	175	2.93%
5/29/92	1	17	17	0.285	192	3.22%
5/30/92	0	0	0	0.000	192	3.22%
5/31/92	3	30	30	0.503	222	3.72%
6/1/92	1	10	10	0.168	232	3.89%
6/2/92	2	27	27	0.453	259	4.34%
6/3/92	6	120	120	2.011	379	6.35%
6/4/92	5	100	100	1.676	479	8.03%
6/5/92	6	60	60	1.006	539	9.03 %
6/6/92	9	90	90	1.509	629	10.54%
6/7/92	12	120	120	2.011	749	12.55%
6/8/92	16	160	160	2.682	909	15.24%
6/9/92	9	90	90	1.509	999	16.74%
6/10/92	5	50	50	0.838	1049	17.58%
6/11/92	7	70	70	1.173	1119	18.76%
6/12/92	1	10	10	0.168	1129	18.92%
6/13/92	1	10	10	0.168	1139	19.09%
6/14/92	1	10	10	0.168	1149	19.26%
6/15/92	2	20	20	0.335	1169	19.59%
6/16/92	12	120	120	2.011	1289	21.61%
6/17/92	15	150	150	2.514	1439	24.12%
6/18/92	12	120	120	2.011	1559	26.13%
6/19/92	9	127	127	2.129	1686	28.26%
6/20/92	7	70	70	1.173	1756	29.43 %
6/21/92	16	160	160	2.682	1916	32.12%
6/22/92	4	40	40	0.670	1956	32.79%
6/23/92	32	320	320	5.364	2276	38.15%
6/24/92	62	744	744	12.471	3020	50.62%
6/25/92	17	340	340	5.699	3360	56.32%
6/26/92	16	320	320	5.364	3680	61.68%
6/27/92	21	420	420	7.040	4100	68.72%
6/28/92	8	160	160	2.682	4260	71.40%
6/29/92	5	100	100	1.676	4360	73.08%
6/30/92	12	240	240	4.023	4600	77.10%
7/1/92	5	100	100	1.676	4700	78.78%
7/2/92	7	140	140	2.347	4840	81.13%
7/3/92	2	40	40	0.670	4880	81.80%
7/4/92	3	60	60	1.006	4940	82.80%
7/5/92	3	60	60	1.006	5000	83.81%
7/6/92	2	40	40	0.670	5040	84.48%
7/7/92	2	40	40	0.670	5080	85.15%

1992 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
7/8/92	3	60	60	1.006	5140	86.15%
7/9/92	0	0	0	0.000	5140	86.15%
7/10/92	5	100	100	1.676	5240	87.83%
7/11/92	0	0	0	0.000	5240	87.83%
7/12/92	2	20	20	0.335	5260	88.17%
7/13/92	0	0	0	0.000	5260	88.17%
7/14/92	0	0	0	0.000	5260	88.17%
7/15/92	2	20	20	0.335	5280	88.50%
7/16/92	3	30	30	0.503	5310	89.00%
7/17/92	8	80	80	1.341	5390	90.35%
7/18/92	9	90	90	1.509	5480	91.85%
7/19/92	4	40	40	0.670	5520	92.52%
7/20/92	2	20	20	0.335	5540	92.86%
7/2 1/92	2	20	20	0.335	5560	93.19%
7/22/92	2	20	20	0.335	5580	93.53%
7/23/92	1	10	10	0.168	5590	93.70%
7/24/92	4	40	40	0.670	5630	94.37%
7/25/92	5	50	50	0.838	5680	95.21%
7/26/92	2	20	20	0.335	5700	95.54%
7/27/92	1	10	10	0.168	5710	95.71%
7/28/92	0	0	0	0.000	5710	95.71%
7/29/92	1	10	10	0.168	5720	95.88%
7/30/92	0	0	0	0.000	5720	95.88%
7/31/92	0	0	0	0.000	5720	95.88%
8/1/92	3	3	3	0.050	5723	95.93%
8/2/92	4	4	4	0.067	5727	95.99%
8/3/92	6	6	6	0.101	5733	96.09%
8/4/92	4	4	4	0.067	5737	96.16%
8/5/92	8	8	8	0.134	5745	96.30%
8/6/92	5	5	5	0.084	5750	96.38%
8/7/92	3	3	3	0.050	5753	96.43%
8/8/92	13	13	13	0.218	5766	96.65%
8/9/92	18	18	18	0.302	5784	96.95%
8/10/92	17	17	17	0.285	5801	97.23%
8/11/92	3	3	3	0.050	5804	97.28%
8/12/92	7	7	7	0.117	5811	97.40%
8/13/92	0	0	0	0.000	5811	97.40%
8/14/92	15	15	15	0.251	5826	97.65%
8/15/92	1	1	1	0.017	5827	97.67%
8/16/92	8	8	8	0.134	5835	97.80%
8/17/92	1	1	1	0.017	5836	97.82%
8/18/92	2	2	2	0.034	5838	97.85%
8/19/92	2	2	2	0.034	5840	97.89%
8/20/92	2	2	2	0.034	5842	97.92%
8/21/92	3	3	3	0.050	5845	97.97%
8/22/92	3	3	3	0.050	5848	98.02%
8/23/92	3	3	3	0.050	5851	98.07 %
8/24/92	2	2	2	0.034	5853	98.11%
8/25/92	12	12	12	0.201	5865	98.31%
8/26/92	6	6	6	0.101	5871	98.41%
8/27/92	5	5	5	0.084	5876	98.49%
8/28/92	5	5	5	0.084	5881	98.58%

1992 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
8/29/92	3	3	3	0.050	5884	98.63%
8/30/92	3	3	3	0.050	5887	98.68%
8/31/92	2	2	2	0.034	5889	98.71%
9/1/92	1	1	1	0.017	5890	98.73 %
9/2/92	2	2	2	0.034	5892	98.76%
9/3/92	0	0	0	0.000	5892	98.76%
9/4/92	0	0	0	0.000	5892	98.76%
9/5/92	1	1	1	0.017	5893	98.78%
9/6/92	1	1	1	0.017	5894	98.79%
9/7/92	0	0	0	0.000	5894	98.79%
9/8/92	0	0	0	0.000	5894	98.19%
9/9/92	0	0	0	0.000	5894	98.79%
9/10/92	0	0	0	0.000	5894	98.79%
9/11/92	0	0	0	0.000	5894	98.79%
9/12/92	1	1	1	0.017	5895	98.81%
9/13/92	1	1	1	0.017	5896	98.83%
9/14/92	1	1	1	0.017	5897	98.84%
9/15/92	2	2	2	0.034	5899	98.88%
9/16/92	5	5	5	0.084	5904	98.96%
9/17/92	4	4	4	0.067	5908	99.03 %
9/18/92	4	4	4	0.067	5912	99.09%
9/19/92	2	2	2	0.034	5914	99.13%
9/20/92	3	3	3	0.050	5917	99.18%
9/21/92	3	3	3	0.050	5920	99.23 %
9/22/92	0	0	0	0.000	5920	99.23 %
9/23/92	5	5	5	0.084	5925	99.31%
9/24/92	4	4	4	0.067	5929	99.38%
9/25/92	1	1	1	0.017	5930	99.40%
9/26/92	5	5	5	0.084	5935	99.48%
9/27/92	4	4	4	0.067	5939	99.55%
9/28/92	2	2	2	0.034	5941	99.58%
9/29/92	0	0	0	0.000	5941	99.58%
9/30/92	2	2	2	0.034	5943	99.61%
10/1/92	3	3	3	0.050	5946	99.66%
10/2/92	1	1	1	0.017	5947	99.68%
10/3/92	1	1	1	0.017	5948	99.70%
10/4/92	0	0	0	0.000	5948	99.70%
10/5/92	0	0	0	0.000	5948	99.70%
10/6/92	1	1	1	0.017	5949	99.72%
10/7/92	0	0	0	0.000	5949	99.72%
10/8/92	0	0	0	0.000	5949	99.72%
10/9/92	4	4	4	0.067	5953	99.78%
10/10/92	0	0	0	0.000	5953	99.78%
10/11/92	1	1	1	0.017	5954	99.80%
10/12/92	0	0	0	0.000	5954	99.80%
10/13/92	4	4	4	0.067	5958	99.87%
10/14/92	2	2	2	0.034	5960	99.90%
10/15/92	1	1	1	0.017	5961	99.92%
10/16/92	1	1	1	0.017	5962	99.93%
10/17/92	1	1	1	0.017	5963	99.95%
10/18/92	0	0	0	0.000	5963	99.95%
10/19/92	0	0	0	0.000	5963	99.95%

1992 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
10/20/92	0	0	0	0.000	5963	99.95%
10/21/92	1		1	0.017	5964	99.97%
10/22/92	1		1	0.017	5965	99.98%
10/23/92			1	0.017	5966	100.00%
10/24/92	0	0	0	0.000	5966	100.00%
10/25/92	0	0	0	0.000	5966	100.00%
10/26/92	0	0	0	0.000	5966	100.00%
10/27/92	0	0	0	0.000	5966	100.00%
10/28/92	0	0	0	0.000	5966	100.00%
10/29/92	0	0	0	0.000	5966	100.00%
10/30/92	0	0	0	0.000	5966	100.00%
10/31/92	0	0	0	0.000	5966	100.00%
11/1/92						
11/2/92						
11/3/92						
11/4/92						
11/5/92						
11/6/92						
11/7/92						
11/8/92						
11/9/92						
11/10/92						
11/11/92						
11/12/92						
11/13/92						
11/14/92						
11/15/92						
11/16/92						
11/17/92						
11/18/92						
11/19/92						
11/20/92						
11/21/92						
11/22/92						
11/23/92						
11/24/92						
11/25/92						
11/26/92						
11/27/92						
11/28/92						
				100.000		

1993 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	WILD PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	11900	16485	16553			
3/28/93						
3/29/93						
3/30/93						
3/31/93						
4/1/93						
4/2/93						
4/3/93						
4/4/93						
4/5/93						
4/6/93						
4/7/93						
4/8/93						
4/9/93						
4/10/93						
4/11/93						
4/12/93						
4/13/93						
4/14/93						
4/15/93	0	0	0	0.000	0	0.00%
4/16/93	0	0	0	0.000	0	0.00%
4/17/93	0	0	0	0.000	0	0.00%
4/18/93	0	0	0	0.000	0	0.00%
4/19/93	0		0	0.000	0	0.00%
4/20/93	0	0	0	0.000	0	0.00%
4/21/93	0	0	0	0.000	0	0.00%
4/22/93	0	0	0	0.000	0	0.00%
4/23/93	0	0		0.000	0	0.00%
4/24/93	0	0	0	0.000	0	0.00%
4/25/93	0	0		0.000		0.00%
4/26/93	0	0	0	0.000	0	0.00%
4/27/93	0	0	0	0.000	0	0.00%
4/28/93	0	0	0	0.000	0	0.00%
4/29/93	0	0	0	0.000	0	0.00%
4/30/93	0	0	0	0.000	0	0.00%
5/1/93	0	0	0	0.000	0	0.00%
5/2/93	0	0	0	0.000	0	0.00%
5/3/93	0	0	0	0.000	0	0.00%
5/4/93	0	0		0.000		0.00%
5/5/93	0	0	0	0.000	0	0.00%
5/6/93	0	0		0.000	0	0.00%
5/7/93	0	0	0	0.000		0.00%
5/8/93	0	0	0	0.000		0.00%
5/9/93	0	0	0	0.000	0	0.00%
5/10/93	0	0	0	0.000	0	0.00%
5/11/93	1	100	100	0.604	100	0.60%
5/12/93	0	0	0	0.000	100	0.60%
5/13/93	0	0	0	0.000	100	0.60%
5/14/93	0	0	0	0.000	100	0.60%
5/15/93	0	0	0	0.000	100	0.60%

1993 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	WILD PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
6/93				0.000	100	0.60%
5/17/93	0	0	0	0.000	100	0.60%
5/18/93	0	0	0	0.000	100	0.60%
5/19/93	1	50	90	0.544	190	1.15%
5/20/93	1	50	77	0.465	267	1.61%
5/21/93	0	0	0	0.000	267	1.61%
5/22/93	0	0	0	0.000	267	1.61%
5/23/93	0	0	0	0.000	267	1.61%
5/24/93	0	0	0	0.000	267	1.61%
5/25/93	0	0	0	0.000	267	1.61%
5/26/93	0	0	0	0.000	267	1.61%
5/27/93	0	0	0	0.000	267	1.61%
5/28/93	0	0	0	0.000	267	1.61%
5/29/93	0	0	0	0.000	267	1.61%
5/30/93	1	20	21	0.127	288	1.74%
5/31/93	0	0	0	0.000	288	1.74%
6/1/93	0	0	0	0.000	288	1.74%
6/2/93	0	0	0	0.000	288	1.74%
6/3/93	0	0	0	0.000	288	1.74%
6/4/93	0	0	0	0.000	288	1.74%
6/5/93		10	10	0.060	298	1.80%
6/6/93	0	0	0	0.000	298	1.80%
6/7/93	1	10	10	0.060	308	1.86%
6/8/93	0	0	0	0.000	308	1.86%
6/9/93	0	0	0	0.000	308	1.86%
6/10/93	1	10	10	0.060	318	1.92%
6/11/93	0	0	0	0.000	318	1.92%
6/12/93	0	0	0	0.000	318	1.92%
6/13/93	0	0	0	0.000	318	1.92%
6/14/93	1	10	10	0.060	328	1.98%
6/15/93	0	0	0	0.000	328	1.98%
6/16/93	1	10	10	0.060	338	2.04%
6/17/93	1	10	10	0.060	348	2.10%
6/18/93	0	0	0	0.000	348	2.10%
6/19/93	2	20	20	0.121	368	2.22%
6/20/93		10	10	0.060	378	2.28%
6/21/93	2	20	20	0.121	398	2.40%
6/22/93	11	110	110	0.665	508	3.07%
6/23/93	23	230	230	1.389	738	4.46%
6/24/93	24	160	160	0.967	898	5.42%
6/25/93	26	173	173	1.045	1071	6.47%
6/26/93	25	167	167	1.009	1238	7.48%
6/27/93	73	306	306	1.849	1544	9.33%
6/28/93	44	176	176	1.063	1720	10.39%
6/29/93	79	316	316	1.909	2036	12.30%
6/30/93	41	164	164	0.991	2200	13.29%
7/1/93	63	252	252	1.522	2452	14.81%
7/2/93	51	204	204	1.232	2656	16.05%
7/3/93	67	268	268	1.619	2924	17.66%
7/4/93	104	416	416	2.513	3340	20.18%
7/5/93	83	332	332	2.006	3672	22.18%

1993 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	WILD PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
7/6/93	76	304	304	1.837	3976	24.02%
7/7/93	49	196	196	1.184	4172	25.20%
7/8/93	51	204	204	1.232	4376	26.44%
7/9/93	56	224	224	1.353	4600	27.79%
7/10/93	61	244	244	1.474	4844	29.26%
7/11/93	62	248	248	1.498	5092	30.76%
7/12/93	69	276	276	1.667	5368	32.43 %
7/13/93	52	208	208	1.257	5576	33.69%
7/14/93	94	376	376	2.271	5952	35.96%
7/15/93	294	294	294	1.776	6246	37.73 %
7/16/93	316	316	316	1.909	6562	39.64%
7/17/93	266	266	266	1.607	6828	41.25%
7/18/93	59	59	59	0.356	6887	41.61%
7/19/93	599	599	599	3.619	7486	45.22%
7/20/93	240	240	240	1.450	7726	46.67%
7/21/93	270	270	270	1.631	7996	48.31%
7/22/93	268	268	268	1.619	8264	49.92%
7/23/93	302	302	302	1.824	8566	51.75%
7/24/93	427	427	427	2.580	8993	54.33%
7/25/93	257	257	257	1.553	9250	55.88%
7/26/93	168	168	168	1.015	9418	56.90%
7/27/93	115	115	115	0.695	9533	57.59%
7/28/93	138	138	138	0.834	9671	58.42%
7/29/93	323	323	323	1.951	9994	60.38%
7/30/93	156	156	156	0.942	10150	61.32%
7/31/93	181	181	181	1.093	10331	62.41%
8/1/93	120	120	120	0.725	10451	63.14%
8/2/93	91	91	91	0.550	10542	63.69%
8/3/93	78	78	78	0.471	10620	64.16%
8/4/93	174	174	174	1.051	10794	65.21%
8/5/93	137	137	137	0.828	10931	66.04%
8/6/93	106	106	106	0.640	11037	66.68%
8/7/93	173	173	173	1.045	11210	67.72%
8/8/93	193	193	193	1.166	11403	68.89%
8/9/93	157	157	157	0.948	11560	69.84%
8/10/93	163	163	163	0.985	11723	70.82%
8/11/93	197	197	197	1.190	11920	72.01%
8/12/93	186	186	186	1.124	12106	73.13%
8/13/93	206	206	206	1.244	12312	74.38%
8/14/93	267	267	267	1.613	12579	75.99%
8/15/93	110	110	110	0.665	12689	76.66%
8/16/93	145	145	145	0.876	12834	77.53%
8/17/93	199	199	199	1.202	13033	78.73 %
8/18/93	281	281	281	1.698	13314	80.43 %
8/19/93	267	267	267	1.613	13581	82.05 %
8/20/93	293	293	293	1.770	13874	83.82%
8/21/93	198	198	198	1.196	14072	85.01%
8/22/93	209	209	209	1.263	14281	86.27%
8/23/93	137	137	137	0.828	14418	87.10%
8/24/93	157	157	157	0.948	14575	88.05 %
8/25/93	157	157	157	0.948	14732	89.00%

1993 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	WILD PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
8/26/93	249	249	249	1.504	14981	90.50%
8/27/93	129	129	129	0.779	15110	91.28%
8/28/93	68	68	68	0.411	15178	91.69%
8/29/93	48	48	48	0.290	15226	91.98%
8/30/93	53	53	53	0.320	15279	92.30%
8/31/93	49	49	49	0.296	15328	92.60%
9/1/93	45	45	45	0.272	15373	92.87%
9/2/93	29	29	29	0.175	15402	93.05 %
9/3/93	19	19	19	0.115	15421	93.16%
9/4/93	17	17	17	0.103	15438	93.26%
9/5/93	19	19	19	0.115	15457	93.38%
9/6/93	19	19	19	0.115	15476	93.49%
9/7/93	19	19	19	0.115	15495	93.61%
9/8/93	26	26	26	0.157	15521	93.77%
9/9/93	21	21	21	0.127	15542	93.89%
9/10/93	11	11	11	0.066	15553	93.96%
9/11/93	1	1	1	0.006	15554	93.96%
9/12/93	7	7	7	0.042	15561	94.01%
9/13/93	5	5	5	0.030	15566	94.04%
9/14/93	2	2	2	0.012	15568	94.05%
9/15/93	5	5	5	0.030	15573	94.08%
9/16/93	3	3	3	0.018	15576	94.10%
9/17/93	8	8	8	0.048	15584	94.15%
9/18/93	16	16	16	0.097	15600	94.24%
9/19/93	23	23	23	0.139	15623	94.38%
9/20/93	22	22	22	0.133	15645	94.51%
9/21/93	5	5	5	0.030	15650	94.54%
9/22/93	9	9	9	0.054	15659	94.60%
9/23/93	43	43	43	0.260	15702	94.86%
9/24/93	42	42	42	0.254	15744	95.11%
9/25/93	30	30	30	0.181	15774	95.29%
9/26/93	56	56	56	0.338	15830	95.63%
9/27/93	22	22	22	0.133	15852	95.77%
9/28/93	36	36	36	0.217	15888	95.98%
9/29/93	47	47	47	0.284	15935	96.27 %
9/30/93	45	45	45	0.272	15980	96.54%
10/1/93	12	12	12	0.072	15992	96.61%
10/2/93	65	65	65	0.393	16057	97.00%
10/3/93	43	43	43	0.260	16100	97.26%
10/4/93	44	44	44	0.266	16144	97.53%
10/5/93	74	74	74	0.447	16218	97.98%
10/6/93	50	50	50	0.302	16268	98.28%
10/7/93	27	27	27	0.163	16295	98.44%
10/8/93	27	27	27	0.163	16322	98.60%
10/9/93	15	15	15	0.091	16337	98.70%
10/10/93	27	27	27	0.163	16364	98.86%
10/11/93	12	12	12	0.072	16376	98.93%
10/12/93	17	17	17	0.103	16393	99.03%
10/13/93	21	21	21	0.127	16414	99.16%
10/14/93	5	5	5	0.030	16419	99.19%
10/15/93	6	6	6	0.036	16425	99.23 %

1993 Smolt Passage Index for Subyearling Fall Chinook
PassingLowerGranite
From The Fish Passage Center

NO. DATE	NO. SAMPLED	WILD COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
10/16/93	3	3	3	0.018	16428	99.24%
10/17/93	17	17	17	0.103	16445	99.35%
10/18/93		7		0.042	16452	99-39%
10/19/93	8	8	8	0.048	16460	99.44%
10/20/93	14	Id	14	0.085	16474	99.52%
10/21/93	3	3	3	0.018	16477	99.54%
10/22/93	13	13	13	0.079	16490	99.62%
10/23/93	2	2	2	0.012	16492	99.63%
10/24/93	9	9	9	0.054	16501	99.69%
10/25/93	12	12	12	0.072	16513	99.76%
10/26/93	6	6	6	0.036	16519	99.79%
10/27/93				0.042	16526	99.84%
10/28/93	4	4	4	0.024	16530	99.86%
10/29/93	6	6	6	0.036	16536	99.90%
10/30/93	5	5	5	0.0JO	16541	99.93%
10/31/93	4	4	4	0.024	16545	99 95%
11/1/93	8	8	8	0.048	16553	100.00%
11/2/93						
11/3/93						
11/4/93						
11/5/93						
11/6/93						
11/7/93						
11/8/93						
11/9/93						
11/10/93						
11/11/93						
11/12/93						
11/13/93						
11/14/93						
11/15/93						
11/16/93						
11/17/93						
11/18/93						
11/19/93						
11/20/93						
11/21/93						
11/22/93						
11/23/93						
11/24/93						
11/25/93						
11/26/93						
11/27/93						

1994 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	2468	6778	6866			
3/29/94						
3/30/94						
3/31/94						
4/1/94						
4/2/94						
4/3/94						
4/4/94						
4/5/94						
4/6/94						
4/7/94						
4/8/94						
4/9/94						
4/10/94						
4/11/94						
4/12/94						
4/13/94						
4/14/94						
4/15/94	0	0	0	0.000	0	0.00%
4/16/94	0	0		0.000	0	0.00%
4/17/94	0	0	0	0.000	0	0.00%
4/18/94	0	0	0	0.000	0	0.00%
4/19/94	0	0		0.000	0	0.00%
4/20/94	0	0	0	0.000		0.00%
4/21/94	0	0	0	0.000	0	0.00%
4/22/94	0	0		0.000	0	0.00%
4/23/94	0	0		0.000	0	0.00%
4/24/94	0	0	0	0.000		0.00%
4/25/94	0	0	0	0.000	0	0.00%
4/26/94	0	0	0	0.000	0	0.00%
4/27/94	0	0	0	0.000	0	0.00%
4/28/94	0	0		0.000	0	0.00%
4/29/94	0	0	0	0.000		0.00%
4/30/94	0	0	0	0.000	0	0.00%
5/1/94	0	0	0	0.000	0	0.00%
5/2/94	0	0	0	0.000	0	0.00%
5/3/94	0	0	0	0.000	0	0.00%
5/4/94	0	0		0.000	0	0.00%
5/5/94	0	0	0	0.000	0	0.00%
5/6/94	0	0		0.000	0	0.00%
5/7/94	0	0		0.000	0	0.00%
5/8/94	0	0		0.000	0	0.00%
5/9/94	0	0	0	0.000	0	0.00%
5/10/94	0	0		0.000	0	0.00%
5/11/94	0	0		0.000	0	0.00%
5/12/94	0	0	0	0.000	0	0.00%
5/13/94	0	0		0.000	0	0.00%
5/14/94	0	0	0	0.000	0	0.00%
5/15/94	0	0	0	0.000	0	0.00%

1994 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
5/16/94	0	0	0	0.000	0	0.00%
5/17/94	0	0	0	0.000	0	0.00%
5/18/94	0	0	0	0.000	0	0.00%
5/19/94	0	0	0	0.000	0	0.00%
5/20/94	0	0	0	0.000	0	0.00%
5/21/94	0	0	0	0.000	0	0.00%
5/22/94	0	0	0	0.000	0	0.00%
5/23/94	1	20	31	0.452	31	0.45%
5/24/94	1	10	16	0.233	47	0.68%
5/25/94	0	0	0	0.000	47	0.68%
5/26/94	0	0	0	0.000	47	0.68%
5/27/94	0	0	0	0.000	47	0.68%
5/28/94	0	0	0	0.000	47	0.68%
5/29/94	0	0	0	0.000	47	0.68%
5/30/94	0	0	0	0.000	47	0.68%
5/31/94	0	0	0	0.000	47	0.68%
6/1/94	0	0	0	0.000	47	0.68%
6/2/94	0	0	0	0.000	47	0.68%
6/3/94	0	0	0	0.000	47	0.68%
6/4/94	0	0	0	0.000	47	0.68%
6/5/94	0	0	0	0.000	47	0.68%
6/6/94	1	10	15	0.218	62	0.90%
6/7/94	0	0	0	0.000	62	0.90%
6/8/94	0	0	0	0.000	62	0.90%
6/9/94	0	0	0	0.000	62	0.90%
6/10/94	1	10	16	0.233	78	1.14%
6/11/94	0	0	0	0.000	78	1.14%
6/12/94	0	0	0	0.000	78	1.14%
6/13/94	0	0	0	0.000	78	1.14%
6/14/94	1	4	7	0.102	85	1.24%
6/15/94	1	4	6	0.087	91	1.33%
6/16/94	1	4	4	0.058	95	1.38%
6/17/94	2	8	8	0.117	103	1.50%
6/18/94	0	0	0	0.000	103	1.50%
6/19/94	2	4	4	0.058	107	1.56%
6/20/94	5	5	5	0.073	112	1.63%
6/21/94	3	3	3	0.044	115	1.67%
6/22/94	3	3	3	0.044	118	1.72%
6/23/94	0	0	0	0.000	118	1.72%
6/24/94	4	47	47	0.685	165	2.40%
6/25/94	23	50	50	0.728	215	3.13%
6/26/94	62	62	62	0.903	277	4.03%
6/27/94	60	60	60	0.874	337	4.91%
6/28/94	48	48	48	0.699	385	5.61%
6/29/94	73	125	125	1.821	510	7.43%
6/30/94	11	110	110	1.602	620	9.03%
7/1/94	2	20	20	0.291	640	9.32%
7/2/94	5	50	50	0.728	690	10.05%
7/3/94	8	80	80	1.165	770	11.21%
7/4/94	26	104	104	1.515	874	12.73%
7/5/94	21	84	84	1.223	958	13.95%

1994 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
7/6/94	28	112	112	1.631	1070	15.58%
7/7/94	48	192	192	2.796	1262	18.38%
7/8/94	34	340	340	4.952	1602	23.33%
7/9/94	47	470	470	6.845	2072	30.18%
7/10/94	20	250	250	3.641	2322	33.82%
7/11/94	30	375	375	5.462	2697	39.28%
7/12/94	20	250	250	3.641	2947	42.92%
7/13/94	10	125	125	1.821	3072	44.74%
7/14/94	22	220	220	3.204	3292	47.95%
7/15/94	13	130	130	1.893	3422	49.84%
7/16/94	14	140	140	2.039	3562	51.88%
7/17/94	15	150	150	2.185	3712	54.06%
7/18/94	13	130	130	1.893	3842	55.96%
7/19/94	2	20	20	0.291	3862	56.25%
7/20/94	5	50	50	0.728	3912	56.98%
7/21/94	9	90	90	1.311	4002	58.29%
7/22/94	4	40	40	0.583	4042	58.877;
7/23/94	3	30	30	0.437	4072	59.31%
7/24/94	2	20	20	0.291	4092	59.60%
7/25/94	5	50	50	0.728	4142	60.33%
7/26/94	2	20	20	0.291	4162	60.62%
7/27/94	2	20	20	0.291	4182	60.91%
7/28/94	11	48	48	0.699	4230	61.61%
7/29/94	12	48	48	0.699	4278	62.31%
7/30/94	12	48	48	0.699	4326	63.01%
7/31/94	12	48	48	0.699	4374	63.71%
8/1/94	10	40	40	0.583	4414	64.29%
8/2/94	1	4	4	0.058	4418	64.35%
8/3/94	6	24	24	0.350	4442	64.70%
8/4/94	9	36	36	0.524	4478	65.22%
8/5/94	5	20	20	0.291	4498	65.51%
8/6/94	83	83	83	1.209	4581	66.72%
8/7/94	181	181	181	2.636	4762	69.36%
8/8/94	159	159	159	2.316	492 1	71.67%
8/9/94	182	182	182	2.651	5103	74.32%
8/10/94	41	164	164	2.389	5267	76.71%
8/11/94	30	120	120	1.748	5387	78.46%
8/12/94	32	128	128	1.864	5515	80.32%
8/13/94	22	88	88	1.282	5603	81.61%
8/14/94	11	44	44	0.641	5647	82.25%
8/15/94	8	32	32	0.466	5679	82.71%
8/16/94	12	48	48	0.699	5727	83.41%
8/17/94	10	40	40	0.583	5767	83.99%
8/18/94	22	88	88	1.282	5855	85.28%
8/19/94	24	96	96	1.398	5951	86.67%
8/20/94	80	80	80	1.165	6031	87.84%
8/21/94	58	58	58	0.845	6089	88.68%
8/22/94	52	52	52	0.757	6141	89.44%
8/23/94	69	69	69	1.005	6210	90.45%
8/24/94	51	51	82	1.194	6292	91.64%
8/25/94	32	32	44	0.641	6336	92.28%

1994 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
8/26/94	25	25	37	0.539	6377	92.82%
8/27/94	17	17	17	0.248	6390	93.07%
8/28/94	22	22	22	0.320	6412	93.39%
8/29/94	21	21	21	0.306	6433	93.69%
8/30/94	12	12	12	0.175	6445	93.87%
8/31/94	18	18	18	0.262	6463	94.13%
9/1/94	18	18	18	0.262	6481	94.39%
9/2/94	12	12	12	0.175	6493	94.57%
9/3/94	12	12	12	0.175	6505	94.74%
9/4/94	13	13	13	0.189	6518	94.93%
9/5/94	4	4	4	0.058	6522	94.99%
9/6/94	5	5	5	0.073	6527	95.06%
9/7/94	6	6	6	0.087	6533	95.15%
9/8/94	32	32	32	0.466	6565	95.62%
9/9/94	33	33	33	0.481	6598	96.10%
9/10/94	25	25	25	0.364	6623	96.46%
9/11/94	23	23	23	0.335	6646	96.80%
9/12/94	21	21	21	0.306	6667	97.10%
9/13/94	14	14	14	0.204	6681	97.31%
9/14/94	7	7	7	0.102	6688	97.41%
9/15/94	4	4	4	0.058	6692	97.47%
9/16/94	13	13	13	0.189	6705	97.66%
9/17/94	9	9	9	0.131	6714	97.79%
9/18/94	5	5	5	0.073	6719	97.86%
9/19/94	3	3	3	0.044	6722	97.90%
9/20/94	6	6	6	0.087	6728	97.99%
9/21/94	2	2	2	0.029	6730	98.02%
9/22/94	0	0	0	0.000	6730	98.02%
9/23/94	1	1	1	0.015	6731	98.03%
9/24/94	9	9	9	0.131	6740	98.16%
9/25/94	2	2	2	0.029	6742	98.19%
9/26/94	14	14	14	0.204	6756	98.40%
9/27/94	11	11	11	0.160	6767	98.56%
9/28/94	6	6	6	0.087	6773	98.65%
9/29/94	5	5	5	0.073	6778	98.72%
9/30/94	6	6	6	0.087	6784	98.81%
10/1/94	5	5	5	0.073	6789	98.88%
10/2/94	0	0	0	0.000	6789	98.88%
10/3/94	2	2	2	0.029	6791	98.91%
10/4/94	0	0	0	0.000	6791	98.91%
10/5/94	3	3	3	0.044	6794	98.95%
10/6/94	0	0	0	0.000	6794	98.95%
10/7/94	1	1	1	0.015	6795	98.97%
10/8/94	0	0	0	0.000	6795	98.97%
10/9/94	2	2	2	0.029	6797	99.00%
10/10/94	1	1	1	0.015	6798	99.01%
10/11/94	1	1	1	0.015	6799	99.02%
10/12/94	2	2	2	0.029	6801	99.05%
10/13/94	0	0	0	0.000	6801	99.05%
10/14/94	6	6	6	0.087	6807	99.14%
10/15/94	0	0	0	0.000	6807	99.14%

1994 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
10/16/94	3	3	3	0.044	6810	99.18%
10/17/94	3	3	3	0.044	6813	99.23%
10/18/94	2	2	2	0.029	6815	99.26%
10/19/94	0	0	0	0.000	6815	99.26%
10/20/94		1	1	0.015	6816	99.27%
10/21/94	2	2	2	0.029	6818	99.30%
10/22/94				0.015	6819	99.32%
10/23/94				0.015	6820	99.33%
10/24/94	2	2	2	0.029	6822	99.36%
10/25/94	3	3	3	0.044	6825	99.40%
10/26/94	2	2	2	0.029	6827	99.43%
10/27/94				0.015	6828	99.45%
10/28/94	6	6	6	0.087	6834	99.53%
10/29/94	15	15	15	0.218	6849	99.75%
10/30/94	4	4	4	0.058	6853	99.81%
10/31/94	13	13	13	0.189	6866	100.00%
11/1/94						
11/2/94						
11/3/94						
11/4/94						
11/5/94						
11/6/94						
11/7/94						
11/8/94						
11/9/94						
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11/24/94						
11/25/94						
11/26/94						
11/27/94						

1995 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	7260	26558	26768			
3/28/95						
3/29/95	0	0	0	0.000	0	0.00%
3/30/95	0	0	0	0.000	0	0.00%
3/31/95	0	0	0	0.000	0	0.00%
4/1/95	0	0	0	0.000	0	0.00%
4/2/95	0	0	0	0.000	0	0.00%
4/3/95	0	0	0	0.000	0	0.00%
4/4/95	0	0	0	0.000	0	0.00%
4/5/95	0	0	0	0.000	0	0.00%
4/6/95	0	0	0	0.000	0	0.00%
4/7/95	0	0	0	0.000	0	0.00%
4/8/95	0	0	0	0.000	0	0.00%
4/9/95	0	0	0	0.000	0	0.00%
4/10/95	3	33	33	0.123	33	0.12%
4/11/95	0	0	0	0.000	33	0.12%
4/12/95	0	0	0	0.000	33	0.12%
4/13/95	1	11	11	0.041	44	0.16%
4/14/95	0	0	0	0.000	44	0.16%
4/15/95	1	50	50	0.187	94	0.35%
4/16/95	0	0	0	0.000	94	0.35%
4/17/95	0	0	0	0.000	94	0.35%
4/18/95	0	0	0	0.000	94	0.35%
4/19/95	0	0	0	0.000	94	0.35%
4/20/95	0	0	0	0.000	94	0.35%
4/21/95	0	0	0	0.000	94	0.35%
4/22/95	0	0	0	0.000	94	0.35%
4/23/95	0	0	0	0.000	94	0.35%
4/24/95	0	0	0	0.000	94	0.35%
4/25/95	0	0	0	0.000	94	0.35%
4/26/95	0	0	0	0.000	94	0.35%
4/27/95	0	0	0	0.000	94	0.35%
4/28/95	0	0	0	0.000	94	0.35%
4/29/95	0	0	0	0.000	94	0.35%
4/30/95	0	0	0	0.000	94	0.35%
5/1/95	0	0	0	0.000	94	0.35%
5/2/95	0	0	0	0.000	94	0.35%
5/3/95	0	0	0	0.000	94	0.35%
5/4/95	0	0	0	0.000	94	0.35%
5/5/95	0	0	0	0.000	94	0.35%
5/6/95	0	0	0	0.000	94	0.35%
5/7/95	0	0	0	0.000	94	0.35%
5/8/95	0	0	0	0.000	94	0.35%
5/9/95	0	0	0	0.000	94	0.35%
5/10/95	0	0	0	0.000	94	0.35%
5/11/95	1	150	187	0.699	281	1.05%
5/12/95	0	0	0	0.000	281	1.05%
5/13/95	0	0	0	0.000	281	1.05%
5/14/95	1	150	188	0.702	469	1.75%
5/15/95	0	0	0	0.000	469	1.75%

1995 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
5/16/95	0	0	0	0.000	469	1.75%
5/17/95	0	0	0	0.000	469	1.75%
5/18/95	0	0	0	0.000	469	1.75%
5/19/95	0	0	0	0.000	469	1.75%
5/20/95	1	100	132	0.493	601	2.25%
5/21/95	0	0	0	0.000	601	2.25%
5/22/95	0	0	0	0.000	601	2.25%
5/23/95	0	0	0	0.000	601	2.25%
5/24/95	0	0	0	0.000	601	2.25%
5/25/95	0	0	0	0.000	601	2.25%
5/26/95	0	0	0	0.000	601	2.25%
5/27/95	0	0	0	0.000	601	2.25%
5/28/95	0	0	0	0.000	601	2.25 %
5/29/95	0	0	0	0.000	601	2.25%
5/30/95	0	0	0	0.000	601	2.25%
5/31/95	0	0	0	0.000	601	2.25%
6/1/95	0	0	0	0.000	601	2.25%
6/2/95	0	0	0	0.000	601	2.25%
6/3/95	2	29	31	0.116	632	2.36%
6/4/95	2	33	36	0.134	668	2.50%
6/5/95	0	0	0	0.000	668	2.50%
6/6/95	0	0	0	0.000	668	2.50%
6/7/95	0	0	0	0.000	668	2.50%
6/8/95	2	33	37	0.138	705	2.63%
6/9/95	0	0	0	0.000	705	2.63%
6/10/95	4	57	61	0.228	766	2.86%
6/11/95	6	67	71	0.265	837	3.13%
6/12/95	5	56	60	0.224	897	3.35%
6/13/95	2	22	23	0.086	920	3.44%
6/14/95	0	0	0	0.000	920	3.44%
6/15/95	1	11	12	0.045	932	3.48%
6/16/95	3	33	37	0.138	969	3.62%
6/17/95	2	22	25	0.093	994	3.71%
6/18/95	2	22	25	0.093	1019	3.81%
6/19/95	4	44	49	0.183	1068	3.99%
6/20/95	2	22	27	0.101	1095	4.09%
6/21/95	7	78	97	0.362	1192	4.45%
6/22/95	14	156	197	0.736	1389	5.19%
6/23/95	4	44	44	0.164	1433	5.35%
6/24/95	4	44	44	0.164	1477	5.52%
6/25/95	7	78	78	0.291	1555	5.81%
6/26/95	0	0	0	0.000	1555	5.81%
6/27/95	2	22	22	0.082	1577	5.89%
6/28/95	1	11	11	0.041	1588	5.93%
6/29/95	4	44	44	0.164	1632	6.10%
6/30/95	0	0	0	0.000	1632	6.10%
7/1/95	7	70	70	0.262	1702	6.36%
7/2/95	15	150	150	0.560	1852	6.92%
7/3/95	24	240	240	0.897	2092	7.82%
7/4/95	32	320	320	1.195	2412	9.01%
7/5/95	10	100	100	0.374	2512	9.38%

1995 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
716195	24	240	240	0.897	2752	10.28%
7/7/95	24	240	240	0.897	2992	11.18%
7/8/95	29	290	290	1.083	3282	12.26%
7/9/95	48	480	480	1.793	3762	14.05%
7/10/95	45	450	450	1.681	4212	15.74%
7/11/95	48	480	480	1.793	4692	17.53%
7/12/95	39	390	390	1.457	5082	18.99%
7/13/95	20	200	200	0.747	5282	19.73%
7/14/95	30	300	300	1.121	5582	20.85%
7/15/95	36	360	360	1.345	5942	22.20%
7/16/95	31	310	310	1.158	6252	23.36%
7/17/95	26	260	260	0.971	6512	24.33%
7/18/95	37	370	370	1.382	6882	25.71%
7/19/95	51	510	510	1.905	7392	27.62%
7/20/95	40	400	400	1.494	7792	29.11%
7/21/95	42	420	420	1.569	8212	30.68%
7/22/95	48	480	480	1.793	8692	32.47%
7/23/95	56	560	560	2.092	9252	34.56%
7/24/95	47	470	470	1.756	9722	36.32%
7/25/95	49	490	490	1.831	10212	38.15%
7/26/95	32	320	320	1.195	10532	39.35%
7/27/95	55	550	550	2.055	11082	41.40%
7/28/95	96	960	960	3.586	12042	44.99%
7/29/95	61	610	610	2.279	12652	47.27%
7/30/95	66	660	660	2.466	13312	49.73%
7/31/95	58	580	580	2.167	13892	51.90%
8/1/95	51	510	510	1.905	14402	53.80%
8/2/95	63	630	630	2.354	15032	56.16%
8/3/95	62	620	620	2.316	15652	58.47%
8/4/95	26	260	260	0.971	15912	59.44%
8/5/95	61	610	610	2.279	16522	61.72%
8/6/95	70	700	700	2.615	17222	64.34%
8/7/95	67	670	670	2.503	17892	66.84%
8/8/95	36	360	360	1.345	18252	68.19%
8/9/95	27	270	270	1.009	18522	69.19%
8/10/95	37	370	370	1.382	18892	70.58%
8/11/95	39	390	390	1.457	19282	72.03%
8/12/95	39	390	390	1.457	19672	73.49%
8/13/95	13	130	130	0.486	19802	73.98%
8/14/95	13	130	130	0.486	19932	74.46%
8/15/95	16	160	160	0.598	20092	75.06%
8/16/95	29	290	290	1.083	20382	76.14%
8/17/95	21	210	210	0.785	20592	76.93%
8/18/95	19	190	190	0.710	20782	77.64%
8/19/95	24	240	240	0.897	21022	78.53%
8/20/95	25	250	250	0.934	21272	79.47%
8/21/95	9	90	90	0.336	21362	79.80%
8/22/95	23	230	230	0.859	21592	80.66%
8/23/95	96	96	96	0.359	21688	81.02%
8/24/95	65	65	65	0.243	21753	81.26%
8/25/95	90	90	90	0.336	21843	81.60%

1995 Smolt Passage Index for Subyearling Fall Chinook Passing Lower Granite Dam. From The Fish Passage Center

	WILD					
	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
8/26/95	74	74	74	0.276	21917	81.88%
8/27/95	78	78	78	0.291	21995	82.17%
8/28/95	57	57	57	0.213	22052	82.38%
8/29/95	56	56	56	0.209	22108	82.59%
8/30/95	61	61	61	0.228	22169	82.82%
8/31/95	128	128	128	0.478	22297	83.30%
9/1/95	77	77	77	0.288	22374	83.58%
9/2/95	74	74	74	0.276	22448	83.86%
9/3/95	76	76	76	0.284	22524	84.15%
9/4/95	72	72	72	0.269	22596	84.41%
9/5/95	48	48	48	0.179	22644	84.59%
9/6/95	55	55	55	0.205	22699	84.80%
9/7/95	41	41	41	0.153	22740	84.95%
9/8/95	56	56	56	0.209	22796	85.16%
9/9/95	97	97	97	0.362	22893	85.52%
9/10/95	92	92	92	0.344	22985	85.87%
9/11/95	129	129	129	0.482	23114	86.35%
9/12/95	99	99	99	0.370	23213	86.72%
9/13/95	86	86	86	0.321	23299	87.04%
9/14/95	58	58	58	0.217	23357	87.26%
9/15/95	63	63	63	0.235	23420	87.49%
9/16/95	77	77	77	0.288	23497	87.78%
9/17/95	120	120	120	0.448	23617	88.23 %
9/18/95	97	97	97	0.362	23714	88.59%
9/19/95	125	125	125	0.467	23839	89.06%
9/20/95	148	148	148	0.553	23987	89.61%
9/21/95	147	147	147	0.549	24134	90.16%
9/22/95	98	98	98	0.366	24232	90.53%
9/23/95	161	161	161	0.601	24393	91.13%
9/24/95	93	93	93	0.347	24486	91.47%
9/25/95	82	82	82	0.306	24568	91.78%
9/26/95	83	83	83	0.310	2465 1	92.09%
9/27/95	85	85	85	0.318	24736	92.41%
9/28/95	87	87	87	0.325	24823	92.73 %
9/29/95	65	65	65	0.243	24888	92.98%
9/30/95	65	65	65	0.243	24953	93.22%
10/1/95	75	75	75	0.280	25028	93.50%
10/2/95	45	45	45	0.168	25073	93.67%
10/3/95	53	53	53	0.198	25126	93.87%
10/4/95	59	59	59	0.220	25185	94.09%
10/5/95	64	64	64	0.239	25249	94.33%
10/6/95	66	66	66	0.247	25315	94.57%
10/7/95	43	43	43	0.161	25358	94.73 %
10/8/95	18	18	18	0.067	25376	94.80%
10/9/95	29	29	29	0.108	25405	94.91%
)/10/95	46	46	46	0.172	2545 1	95.08%
'11/95	37	37	37	0.138	25488	95.22%
[illegible]/95	39	39	39	0.146	25527	95.36%
10/13/95	18	18	18	0.067	25545	95.43 %
10/14/95	62	62	62	0.232	25607	95.66%
10/15/95	71	71	71	0.265	25678	95.93%

1995 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
10/16/95	53	53	53	0.198	25731	96.13%
10/17/95	52	52	52	0.194	25783	96.32%
10/18/95	86	86	86	0.321	25869	96.64%
10/19/95	94	94	94	0.351	25963	96.99%
10/20/95	111	111	111	0.415	26074	97.41%
10/21/95	84	84	84	0.314	26158	97.72%
10/22/95	110	110	110	0.411	26268	98.13%
10/23/95	79	79	79	0.295	26347	98.43%
10/24/95	72	72	72	0.269	26419	98.70%
10/25/95	42	42	42	0.157	26461	98.85%
10/26/95	45	45	45	0.168	26506	99.02%
10/27/95	47	47	47	0.176	26553	99.20%
10/28/95	34	34	34	0.127	26587	99.32%
10/29/95	52	52	52	0.194	26639	99.52%
10/30/95	35	35	35	0.131	26674	99.65%
10/31/95	16	16	16	0.060	26690	99.71%
11/1/95	78	78	78	0.291	26768	100.00%
11/2/95						
11/3/95						
11/4/95						
11/5/95						
11/6/95						
11/7/95						
11/8/95						
11/9/95						
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11/21/95						
11/22/95						
11/23/95						
11/24/95						
11/25/95						
11/26/95						
11/27/95						

1991 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
TOTALS:	12021	625946	628771				
3/28/91	0	0	0	0	0.00%	0.00%	0.000
3/29/91	1	10	10	10	0.00%	0.00%	0.002
3/30/91	3	30	30	40	0.01%	0.00%	0.005
3/31/91	0	0	0	40	0.01%	0.00%	0.000
4/1/91	0	0	0	40	0.01%	0.00%	0.000
4/2/91	0	0	0	40	0.01%	0.00%	0.000
4/3/91	1	10	10	50	0.01%	0.00%	0.002
4/4/91	1	10	10	60	0.01%	0.00%	0.002
4/5/91	1	10	10	70	0.01%	0.00%	0.002
4/6/91	1	10	10	80	0.01%	0.00%	0.002
4/7/91	1	10	10	90	0.01%	0.00%	0.002
4/8/91	2	28	28	118	0.02%	0.00%	0.004
4/9/91	7	70	70	188	0.03%	0.01%	0.011
4/10/91	15	150	150	338	0.05%	0.02%	0.024
4/11/91	26	260	260	598	0.10%	0.04%	0.041
4/12/91	70	700	700	1298	0.21%	0.11%	0.111
4/13/91	4	40	40	1338	0.21%	0.01%	0.006
4/14/91	54	540	540	1878	0.30%	0.09%	0.086
4/15/91	86	860	860	2738	0.44%	0.14%	0.137
4/16/91	86	1032	1032	3770	0.60%	0.16%	0.164
4/17/91	74	888	888	4658	0.74%	0.14%	0.141
4/18/91	60	720	720	5378	0.86%	0.11%	0.115
4/19/91	93	1116	1116	6494	1.03%	0.18%	0.177
4/20/91	78	1170	1170	7664	1.22%	0.19%	0.186
4/21/91	80	1198	1198	8862	1.41%	0.19%	0.191
4/22/91	64	960	960	9822	1.56%	0.15%	0.153
4/23/91	78	1170	1170	10992	1.75%	0.19%	0.186
4/24/91	114	1710	1710	12702	2.02%	0.27%	0.272
4/25/91	88	1760	1760	14462	2.30%	0.28%	0.280
4/26/91	31	1860	1860	16322	2.60%	0.30%	0.296
4/27/91	132	3960	3960	20282	3.23%	0.63%	0.630
4/28/91	101	6060	6060	26342	4.19%	0.96%	0.964
4/29/91	176	10560	10560	36902	5.87%	1.68%	1.679
4/30/91	203	11835	11835	48737	7.75%	1.88%	1.882
5/1/91	154	9240	9240	57977	9.22%	1.47%	1.470
5/2/91	146	8760	8760	66737	10.61%	1.39%	1.393
5/3/91	184	11040	11040	77777	12.37%	1.76%	1.756
5/4/91	147	8820	8820	86597	13.77%	1.40%	1.403
5/5/91	105	6300	6300	92897	14.77%	1.00%	1.002
5/6/91	75	4500	4500	97397	15.49%	0.72%	0.716
5/7/91	62	3720	3720	101117	16.08%	0.59%	0.592
5/8/91	91	5460	5460	106577	16.95%	0.87%	0.868
5/9/91	110	6600	6600	113177	18.00%	1.05%	1.050
5/10/91	93	5580	5580	118757	18.89%	0.89%	0.887
5/11/91	441	26460	26460	145217	23.10%	4.21%	4.208
5/12/91	344	26922	26922	172139	27.38%	4.28%	4.282
5/13/91	648	64800	64800	236939	37.68%	10.31%	10.306
5/14/91	455	45500	45500	282439	44.92%	7.24%	7.236
5/15/91	421	42100	42100	324539	51.61%	6.70%	6.696
5/16/91	265	26500	26500	35 1039	55.83%	4.21%	4.215

1991 Smolt Passage Index for Wild Steelhead
Passing Lower Granite ♋ ♁ ●
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
5/17/91	199	19900	19900	370939	58.99%	3.16%	3.165
5/18/91	151	15100	15100	386039	61.40%	2.40%	2.402
5/19/91	139	13900	13900	399939	63.61%	2.21%	2.211
5/20/91	355	21300	21300	421239	66.99 %	3.39%	3.388
5/21/91	490	49000	49000	470239	74.79%	7.79%	7.793
5/22/91	347	34700	34700	504939	80.31%	5.52%	5.519
5/23/91	146	14600	14600	519539	82.63%	2.32%	2.322
5/24/91	145	14500	14500	534039	84.93%	2.31%	2.306
5/25/91	128	7680	7680	541719	86.16%	1.22%	1.221
5/26/91	179	7170	7170	548889	87.30%	1.14%	1.140
5/27/91	364	10920	12245	561134	89.24%	1.95%	1.947
5/28/91	293	8790	8969	570103	90.67%	1.43%	1.426
5/29/91	249	7470	7470	577573	91.86%	1.19%	1.188
5/30/91	198	5940	5940	583513	92.80%	0.94%	0.945
5/31/91	138	4140	4140	587653	93.46%	0.66%	0.658
6/1/91	89	5340	5340	592993	94.31%	0.85%	0.849
6/2/91	70	4200	5481	598474	95.18%	0.87%	0.872
6/3/91	105	2100	2100	600574	95.52%	0.33%	0.334
6/4/91	133	1995	1995	602569	95.83%	0.32%	0.317
6/5/91	178	2670	2670	605239	96.26%	0.42%	0.425
6/6/91	189	2835	2835	608079	96.71%	0.45%	0.451
6/7/91	136	2040	2040	610114	97.03%	0.32%	0.324
6/8/91	161	2415	2415	612529	97.42%	0.38%	0.384
6/9/91	161	2415	2415	614944	97.80%	0.38%	0.384
6/10/91	116	1740	1740	616684	98.08%	0.28%	0.277
6/11/91	105	1575	1575	618259	98.33%	0.25%	0.250
6/12/91	85	1275	1275	619534	98.53%	0.20%	0.203
6/13/91	81	1215	1215	620749	98.72%	0.19%	0.193
6/14/91	94	1128	1128	621877	98.90%	0.18%	0.179
6/15/91	91	1092	1092	622969	99.08%	0.17%	0.174
6/16/91	74	888	888	623857	99.22%	0.14%	0.141
6/17/91	37	444	444	624301	99.29%	0.07%	0.071
6/18/91	35	420	420	624721	99.36%	0.07%	0.067
6/19/91	47	470	470	625191	99.43%	0.07%	0.075
6/20/91	32	320	348	625549	99.49%	0.06%	0.057
6/21/91	26	260	260	625809	99.53%	0.04%	0.041
6/22/91	22	220	220	626029	99.56%	0.03%	0.035
6/23/91	43	430	430	626459	99.63%	0.07%	0.068
6/24/91	23	230	230	626689	99.67%	0.04%	0.037
6/25/91	25	250	250	626939	99.71%	0.04%	0.040
6/26/91	23	230	230	627169	99.75%	0.04%	0.037
6/27/91	11	110	110	627279	99.76%	0.02%	0.017
6/28/91	8	80	80	627359	99.78%	0.01%	0.013
6/29/91	13	130	130	627489	99.80%	0.02%	0.021
6/30/91	9	90	90	627579	99.81 %	0.01%	0.014
7/1/91	3	30	30	627609	99.82%	0.00%	0.005
7/2/91	7	70	70	627679	99.83%	0.01%	0.011
7/3/91	15	150	150	627829	99.85%	0.02%	0.024
7/4/91	9	90	90	627919	99.86%	0.01%	0.014
7/5/91	2	20	20	627939	99.87%	0.00%	0.003
7/6/91	1	10	10	627949	99.87%	0.00%	0.002
7/7/91	0	0	0	627949	99.87%	0.00%	0.000

1991 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
7/8/91	1	10	10	627959	99.87%	0.00%	0.002
7/9/91	1	10	10	627969	99.87%	0.00%	0.002
7/10/91	0	0	0	627969	99.87%	0.00%	0.000
7/11/91	1	10	10	627979	99.87%	0.00%	0.002
7/12/91	0	0	0	627979	99.87%	0.00%	0.000
7/13/91	0	0	0	627979	99.87%	0.00%	0.000
7/14/91	2	20	20	627999	99.88%	0.00%	0.003
7/15/91	2	20	20	628019	99.88%	0.00%	0.003
7/16/91	2	20	20	628039	99.88%	0.00%	0.003
7/17/91	1	10	10	628049	99.89%	0.00%	0.002
7/18/91	1	10	10	628059	99.89%	0.00%	0.002
7/19/91	2	10	10	628069	99.89%	0.00%	0.002
7/20/91	1	5	5	628074	99.89%	0.00%	0.001
7/21/91	0	0	0	628074	99.89%	0.00%	0.000
7/22/91	1	1	1	628075	99.89%	0.00%	0.000
7/23/91	1	1	1	628076	99.89%	0.00%	0.000
7/24/91	3	3	3	628079	99.89%	0.00%	0.000
7/25/91	495	495	495	628574	99.97%	0.08%	0.079
7/26/91	6	6	6	628580	99.97%	0.00%	0.001
7/27/91	6	6	6	628586	99.97%	0.00%	0.001
7/28/91	1	1	1	628587	99.97%	0.00%	0.000
7/29/91	3	3	3	628590	99.97%	0.00%	0.000
7/30/91	4	4	4	628594	99.97%	0.00%	0.001
7/31/91	4	4	4	628598	99.97%	0.00%	0.001
8/1/91	3	3	3	628601	99.97%	0.00%	0.000
8/2/91	4	4	4	628605	99.97%	0.00%	0.001
8/3/91	2	2	2	628607	99.97%	0.00%	0.000
8/4/91	6	6	6	628613	99.97%	0.00%	0.001
8/5/91	4	4	4	628617	99.98%	0.00%	0.001
8/6/91	5	5	5	628622	99.98%	0.00%	0.001
8/7/91	5	5	5	628627	99.98%	0.00%	0.001
8/8/91	6	6	6	628633	99.98%	0.00%	0.001
8/9/91	3	3	3	628636	99.98%	0.00%	0.000
8/10/91	1	1	1	628637	99.98%	0.00%	0.000
8/11/91	6	6	6	628643	99.98%	0.00%	0.001
8/12/91	1	1	1	628644	99.98%	0.00%	0.000
8/13/91	3	3	3	628647	99.98%	0.00%	0.000
8/14/91	3	3	4	628651	99.98%	0.00%	0.001
8/15/91	2	2	3	628654	99.98%	0.00%	0.000
8/16/91	5	5	5	628659	99.98%	0.00%	0.001
8/17/91	0	0	0	628659	99.98%	0.00%	0.000
8/18/91	3	3	3	628662	99.98%	0.00%	0.000
8/19/91	5	5	5	628667	99.98%	0.00%	0.001
8/20/91	3	3	3	628670	99.98%	0.00%	0.000
8/21/91	1	1	1	628671	99.98%	0.00%	0.000
8/22/91	7	7	7	628678	99.99%	0.00%	0.001
8/23/91	3	3	3	628681	99.99%	0.00%	0.000
8/24/91	3	3	3	628684	99.99%	0.00%	0.000
8/25/91	3	3	3	628687	99.99%	0.00%	0.000
8/26/91	2	2	2	628689	99.99%	0.00%	0.000
8/27/91	12	12	12	628701	99.99%	0.00%	0.002
8/28/91	1	1	1	628702	99.99%	0.00%	0.000

1991 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
8/29/91	0	0	0	628702	99.99%	0.00%	0.000
8/30/91	I	1	1	628703	99.99%	0.00%	0.000
8/31/91	1	1	I	628704	99.99%	0.00%	0.000
9/1/91	0	0	0	628704	99.99%	0.00%	0.000
9/2/91	2	2	2	628706	99.99 %	0.00%	0.000
9/3/91	1	1	1	628707	99.99%	0.00%	0.000
9/4/91	2	2	2	628709	99.99%	0.00%	0.000
9/5/91	0	0	0	628709	99.99%	0.00%	0.000
9/6/91	0	0	0	628709	99.99 %	0.00%	0.000
9/7/91	1	1	1	628710	99.99%	0.00%	0.000
9/8/91	0	0	0	628710	99.99 %	0.00%	0.000
9/9/91	2	2	2	628712	99.99%	0.00%	0.000
9/10/91	1	1	1	628713	99.99%	0.00%	0.000
9/11/91	0	0	0	628713	99 99 %	0.00%	0.000
9/12/91	0	0	0	628713	99.99%	0.00%	0.000
9/13/91	0	0	0	628713	99.99%	0.00%	0.000
9/14/91	0	0	0	628713	99.99%	0.00%	0.000
9/15/91	0	0	0	628713	99.99%	0.00%	0.000
9/16/91	1	1	1	628714	99.99%	0.00%	0.000
9/17/91	3	3	3	628717	99 99 %	0.00%	0.000
9/18/91	7	7	7	628724	99.99%	0.00%	0.001
9/19/91	1	1	I	628725	99.99%	0.00%	0.000
9/20/91	0	0	0	628725	99.99%	0.00%	0.000
9/21/91	0	0	0	628725	99.99%	0.00%	0.000
9/22/91	0	0	0	628725	99.99%	0.00%	0.000
9/23/91	0	0	0	628725	99 99 %	0.00%	0.000
9/24/91	1	1	1	628726	99.99%	0.00%	0.000
9/25/91	0	0	0	628726	99.99%	0.00%	0.000
9/26/91	0	0	0	628726	99.99%	0.00%	0.000
9/27/91	0	0	0	628726	99.99%	0.00%	0.000
9/28/91	0	0	0	628726	99 99 %	0.00%	0.000
9/29/91	0	0	0	628726	99.99%	0.00 %	0.000
9/30/91	0	0	0	628726	99 99 %	0.00%	0.000
10/1/91	0	0	0	628726	99.99%	0.00%	0.000
10/2/91	1	1	1	628727	99 99 %	0.00%	0.000
10/3/91	0	0	0	628727	99.99%	0.00%	0.000
10/4/91	0	0	0	628727	99 99 %	0.00%	0.000
10/5/91	0	0	0	628727	99.99%	0.00%	0.000
10/6/91	1	1	1	628728	99.99%	0.00%	0.000
10/7/91	0	0	0	628728	99 99 %	0.00%	0.000
10/8/91	0	0	0	628728	99.99%	0.00%	0.000
10/9/91	0	0	0	628728	99.99%	0.00%	0.000
10/10/91	0	0	0	628728	99.99 %	0.00%	0.000
10/11/91	0	0	0	628728	99.99%	0.00%	0.000
10/12/91	0	0	0	628728	99 99 %	0.00%	0.000
10/13/91	0	0	0	628728	99 99 %	0.00%	0.000
10/14/91	0	0	0	628728	99.99%	0.00%	0.000
10/15/91	0	0	0	628728	99.99%	0.00%	0.000
10/16/91	0	0	0	628728	99.99%	0.00%	0.000
10/17/91	0	0	0	628728	99 99 %	0.00%	0.000
10/18/91	0	0	0	628728	99.99%	0.00%	0.000
10/19/91	1	1	1	628729	99.99%	0.00%	0.000

1991 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
10/20/91	0	0	0	628729	99.99%	0.00%	0.000
10/21/91	0	0	0	628729	99.99%	0.00%	0.000
10/22/91	1		1	628730	99.99%	0.00%	0.000
10/23/91	0	0	0	628730	99.99%	0.00%	0.000
10/24/91	1		1	628731	99.99%	0.00%	0.000
10/25/91			1	628732	99.99%	0.00%	0.000
10/26/91	0	0	0	628732	99.99%	0.00%	0.000
10/27/91			1	628733	99.99%	0.00%	0.000
10/28/91	0	0	0	628733	99.99%	0.00%	0.000
10/29/91	0	0	0	628733	99.99%	0.00%	0.000
10/30/91			1	628734	99.99%	0.00%	0.000
10/31/91	3		3	628737	99.99%	0.00%	0.000
11/1/91	0	0	0	628737	99.99%	0.00%	0.000
11/2/91	2	2	2	628739	99.99%	0.00%	0.000
11/3/91	0	0	0	628739	99.99%	0.00%	0.000
11/4/91	0	0	0	628739	99.99%	0.00%	0.000
11/5/91			1	628740	100.00%	0.00%	0.000
11/6/91	0		0	628740	100.00%	0.00%	0.000
11/7/91	0	0	0	628740	100.00%	0.00%	0.000
11/8/91	3	3	3	628743	100.00%	0.00%	0.000
11/9/91	0	0	0	628743	100.00%	0.00%	0.000
11/10/91	1		1	628744	100.00%	0.00%	0.000
11/11/91	0	0	0	628744	100.00%	0.00%	0.000
11/12/91			1	628745	100.00%	0.00%	0.000
11/13/91	2	2	2	628747	100.00%	0.00%	0.000
11/14/91			1	628748	100.00%	0.00%	0.000
11/15/91	2	2	2	628750	100.00%	0.00%	0.000
11/16/91	4	4	4	628754	100.00%	0.00%	0.001
11/17/91	4		4	628758	100.00%	0.00%	0.001
11/18/91			1	628759	100.00%	0.00%	0.000
11/19/91	0	0	0	628759	100.00%	0.00%	0.000
11/20/91	2	2	2	628761	100.00%	0.00%	0.000
11/21/91			1	628762	100.00%	0.00%	0.000
11/22/91			1	628763	100.00%	0.00%	0.000
11/23/91			1	628764	100.00%	0.00%	0.000
11/24/91			1	628765	100.00%	0.00%	0.000
11/25/91	0	0	0	628765	100.00%	0.00%	0.000
11/26/91	0	0	0	628765	100.00%	0.00%	0.000
11/27/91	6	6	6	628771	100.00%	0.00%	0.001
						100.00%	100.000

1992 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
TOTALS:	20903	583739	583740				
3/28/92						0.00%	0.000
3/29/92						0.00%	0.000
3/30/92						0.00%	0.000
3/31/92						0.00%	0.000
4/1/92						0.00%	0.000
4/2/92	0	0	0	0	0.00%	0.00%	0.000
4/3/92	5	50	50	50	0.01%	0.01%	0.009
4/4/92	5	50	50	100	0.02%	0.01%	0.009
4/5/92	3	30	30	130	0.02%	0.01%	0.005
4/6/92	13	130	130	260	0.04%	0.02%	0.022
4/7/92	23	230	230	490	0.08%	0.04%	0.039
4/8/92	32	320	320	810	0.14%	0.05%	0.055
4/9/92	98	980	980	1790	0.31%	0.17%	0.168
4/10/92	84	840	840	2630	0.45%	0.14%	0.144
4/11/92	121	1210	1210	3840	0.66%	0.21%	0.207
4/12/92	200	2000	2000	5840	1.00%	0.34%	0.343
4/13/92	214	2140	2140	7980	1.37%	0.37%	0.367
4/14/92	246	2460	2460	10440	1.79%	0.42%	0.421
4/15/92	330	3881	3881	14321	2.45%	0.66%	0.665
4/16/92	334	5567	5567	19888	3.41%	0.95%	0.954
4/17/92	303	5050	5050	24938	4.27%	0.87%	0.865
4/18/92	286	5281	5281	30219	5.18%	0.90%	0.905
4/19/92	314	6280	6280	36499	6.25%	1.08%	1.076
4/20/92	406	8120	8120	44619	7.64%	1.39%	1.391
4/21/92	429	8580	8580	53199	9.11%	1.47%	1.470
4/22/92	401	8020	8020	61219	10.49%	1.37%	1.374
4/23/92	592	11840	11840	73059	12.52%	2.03%	2.028
4/24/92	852	21300	21300	94359	16.16%	3.65%	3.649
4/25/92	841	21025	21025	115384	19.77%	3.60%	3.602
4/26/92	557	13925	13925	129309	22.15%	2.39%	2.385
4/27/92	474	11850	11850	141159	24.18%	2.03%	2.030
4/28/92	540	13500	13500	154659	26.49%	2.31%	2.313
4/29/92	583	14575	14575	169234	28.99%	2.50%	2.497
4/30/92	433	14433	14433	183667	31.46%	2.47%	2.473
5/1/92	463	20622	20622	204289	35.00%	3.53%	3.533
5/2/92	556	27800	27800	232089	39.76%	4.76%	4.762
5/3/92	715	42900	42900	274989	47.11%	7.35%	7.349
5/4/92	616	36960	36960	311949	53.44%	6.33%	6.332
5/5/92	683	40980	40980	352929	60.46%	7.02%	7.020
5/6/92	504	30240	30240	383169	65.64%	5.18%	5.180
5/7/92	382	22920	22920	406089	69.57%	3.93%	3.926
5/8/92	312	18720	18720	424809	72.77%	3.21%	3.207
5/9/92	155	9300	9300	434109	74.37%	1.59%	1.593
5/10/92	242	14520	14520	448629	76.85%	2.49%	2.487
5/11/92	224	13440	13440	462069	79.16%	2.30%	2.302
5/12/92	187	11220	11220	473289	81.08%	1.92%	1.922
5/13/92	212	7067	7067	480356	82.29%	1.21%	1.211
5/14/92	256	5120	5120	485476	83.17%	0.88%	0.877
5/15/92	501	10020	loo20	495496	84.88%	1.72%	1.717
5/16/92	223	6777	6777	502273	86.04%	1.16%	1.161

1992 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
5/17/92	133	4433	4433	506706	86.80%	0.76%	0.759
5/18/92	137	3427	3427	510133	87.39%	0.59%	0.587
5/19/92	87	1740	1740	511873	87.69%	0.30%	0.298
5/20/92	85	1194	1194	513067	87.89%	0.20%	0.205
5/21/92	203	2538	2538	515605	88.33%	0.43%	0.435
5/22/92	566	8317	8317	523922	89.75%	1.42%	1.425
5/23/92	197	7122	7122	531044	90.97%	1.22%	1.220
5/24/92	143	4767	4767	535811	91.79%	0.82%	0.817
5/25/92	173	3460	3460	53927 1	92.38%	0.59%	0.593
5/26/92	189	2363	2363	541634	92.79%	0.40%	0.405
5/27/92	188	3542	3542	545176	93.39%	0.61%	0.607
5/28/92	174	4350	4350	549526	94.14%	0.75%	0.745
5/29/92	176	2933	2933	552459	94.64%	0.50%	0.502
5/30/92	134	1675	1675	554134	94.93%	0.29%	0.287
5/31/92	64	645	645	554779	95.04%	0.11%	0.110
6/1/92	289	2890	2890	557669	95.53 %	0.50%	0.495
6/2/92	165	2209	2209	559878	95.91%	0.38%	0.378
6/3/92	143	2860	2860	562738	96.40%	0.49%	0.490
6/4/92	81	1620	1621	564359	96.68%	0.28%	0.278
6/5/92	68	680	680	565039	96.80%	0.12%	0.116
6/6/92	28	280	280	565319	96.84%	0.05%	0.048
6/7/92	52	520	520	565839	96.93%	0.09%	0.089
6/8/92	123	1230	1230	567069	97.14%	0.21%	0.211
6/9/92	118	1180	1180	568249	97.35 %	0.20%	0.202
,10/92	137	1370	1370	569619	97.58%	0.23%	0.235
6/11/92	55	550	550	570169	97.68%	0.09%	0.094
6/12/92	28	280	280	570449	97.72 %	0.05%	0.048
6/13/92	26	260	260	570709	97.77%	0.04%	0.045
6/14/92	13	130	130	570839	97.79%	0.02%	0.022
6/15/92	14	140	140	570979	97.81%	0.02%	0.024
6/16/92	24	240	240	571219	97.86%	0.04%	0.041
6/17/92	26	260	260	571479	97.90%	0.04%	0.045
6/18/92	23	230	230	571709	97.94%	0.04%	0.039
6/19/92	6	85	85	571794	97.95%	0.01%	0.015
6/20/92	25	250	250	572044	98.00%	0.04%	0.043
6/2 1192	22	220	220	572264	98.03 %	0.04%	0.038
6/22/92	9	90	90	572354	98.05 %	0.02%	0.015
6/23/92	34	340	340	572694	98.11%	0.06%	0.058
6/24/92	88	1056	1056	573750	98.29%	0.18%	0.181
6/25/92	35	700	700	574450	98.41%	0.12%	0.120
6/26/92	32	640	640	575090	98.52%	0.11%	0.110
6/27/92	40	800	800	575890	98.66%	0.14%	0.137
6/28/92	43	860	860	576750	98.80%	0.15%	0.147
6/29/92	35	700	700	577450	98.92%	0.12%	0.120
6/30/92	29	580	580	578030	99.02%	0.10%	0.099
7/1/92	26	520	520	578550	99.11%	0.09%	0.089
7/2/92	27	540	540	579090	99.20%	0.09%	0.093
7/3/92	14	280	280	579370	99.25%	0.05%	0.048
7/4/92	13	260	260	579630	99.30%	0.04%	0.045
7/5/92	17	340	340	579970	99.35%	0.06%	0.058
7/6/92	18	360	360	580330	99.42%	0.06%	0.062
7/7/92	22	440	440	580770	99.49%	0.08%	0.075

1992 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO, COLLECTED - I - * -	PASSAGE INDEX " -	CUM PASS INDEX	CUM PASS PERCENT - - - -	P A S S Percent	Index PASS Index Percent*100
7/8/92	16	320	320	581090	99.55%	0.05%	0.055
7/9/92	17	340	340	581430	99.60%	0.06%	0.058
7/10/92	4	80	80	581510	99.62%	0.01%	0.014
7/11/92	2	40	40	581550	99.62%	0.01%	0.007
7/12/92	5	50	50	581600	99.63%	0.01%	0.009
7/13/92	4	40	40	581640	99.64%	0.01%	0.007
7/14/92	4	40	40	581680	99.65%	0.01%	0.007
7/15/92	4	40	40	581720	99.65%	0.01%	0.007
7/16/92	3	30	30	581750	99.66%	0.01%	0.005
7/17/92	9	90	90	581840	99.67%	0.02%	0.015
7/18/92	20	200	200	582040	99.71%	0.03%	0.034
7/19/92	13	130	130	582170	99.73%	0.02%	0.022
7/20/92	9	90	90	582260	99.75%	0.02%	0.015
7/21/92	3	30	30	582290	99.75%	0.01%	0.005
7/22/92	2	20	20	582310	99.76%	0.00%	0.003
7/23/92	2	20	20	582330	99.76%	0.00%	0.003
7/24/92	5	50	50	582380	99.77%	0.01%	0.009
7/25/92	1	10	10	582390	99.77%	0.00%	0.002
7/26/92	6	60	60	582450	99.78%	0.01%	0.010
7/27/92	1	10	10	582460	99.78%	0.00%	0.002
7/28/92	1	10	10	582470	99.78%	0.00%	0.002
7/29/92	3	30	30	582500	99.79%	0.01%	0.005
7/30/92	0	0	0	582500	99.79%	0.00%	0.000
7/31/92	2	20	20	582520	99.79%	0.00%	0.003
8/1/92	22	22	22	582542	99.79%	0.00%	0.004
8/2/92	48	48	48	582590	99.80%	0.01%	0.008
8/3/92	54	54	54	582644	99.81%	0.01 %	0.009
8/4/92	42	42	42	582686	99.82%	0.01%	0.007
8/5/92	34	34	34	582720	99.83%	0.01%	0.006
8/6/92	32	32	32	582752	99.83%	0.01%	0.005
8/7/92	32	32	32	582784	99.84%	0.01%	0.005
8/8/92	17	17	17	582801	99.84%	0.00%	0.003
8/9/92	13	13	13	582814	99.84%	0.00%	0.002
8/10/92	4	4	4	582818	99.84%	0.00%	0.001
8/11/92	8	8	8	582826	99.84%	0.00%	0.001
8/12/92	22	22	22	582848	99.85%	0.00%	0.004
8/13/92	17	17	17	582865	99.85%	0.00%	0.003
8/14/92	55	55	55	582920	99.86%	0.01%	0.009
8/15/92	44	44	44	582964	99.87%	0.01%	0.008
8/16/92	75	75	75	583039	99.88%	0.01%	0.013
8/17/92	62	62	62	583101	99.89%	0.01%	0.011
8/18/92	50	50	50	583151	99.90%	0.01%	0.009
8/19/92	49	49	49	583200	99.91%	0.01%	0.008
8/20/92	67	67	67	583267	99.92%	0.01%	0.011
8/21/92	57	57	57	583324	99.93%	0.01%	0.010
8/22/92	63	63	63	583387	99.94%	0.01%	0.011
8/23/92	42	42	42	583429	99.95%	0.01%	0.007
8/24/92	22	22	22	58345 1	99.95%	0.00%	0.004
8/25/92	17	17	17	583468	99.95%	0.00%	0.003
8/26/92	20	20	20	583488	99.96%	0.00%	0.003
8/27/92	18	18	18	583506	99.96%	0.00%	0.003
8/28/92	11	11	11	583517	99.96%	0.00%	0.002

1992 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO, SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
8/29/92	7	7	7	583524	99.96%	0.00%	0.001
8/30/92	7	7	7	583531	99.96%	0.00%	0.001
8/31/92	14	14	14	583545	99.97%	0.00%	0.002
9/1/92	4	4	4	583549	99.97%	0.00%	0.001
9/2/92	9	9	9	583558	99.97%	0.00%	0.002
9/3/92	13	13	13	583571	99.97%	0.00%	0.002
9/4/92	4	4	4	583575	99.97%	0.00%	0.001
9/5/92	11	11	11	583586	99.97%	0.00%	0.002
9/6/92	4	4	4	583590	99.97%	0.00%	0.001
9/7/92	9	9	9	583599	99.98%	0.00%	0.002
9/8/92	3	3	3	583602	99.98%	0.00%	0.001
9/9/92	3	3	3	583605	99.98%	0.00%	0.001
10/92	3	3	3	583608	99.98%	0.00%	0.001
9/11/92	0	0	0	583608	99.98%	0.00%	0.000
9/12/92	3	3	3	583611	99.98%	0.00%	0.001
9/13/92	3	3	3	583614	99.98%	0.00%	0.001
9/14/92	1	1	1	583615	99.98%	0.00%	0.000
9/15/92	3	3	3	583618	99.98%	0.00%	0.001
9/16/92	0	0	0	583618	99.98%	0.00%	0.000
9/17/92	5	5	5	583623	99.98%	0.00%	0.001
9118/92	4	4	4	583627	99.98%	0.00%	0.001
9/19/92	1	1	1	583628	99.98%	0.00%	0.000
9/20/92	3	3	3	58363 1	99.98%	0.00%	0.001
9/21/92	2	2	2	583633	99.98%	0.00%	0.000
9/22/92	1	1	1	583634	99.98%	0.00%	0.000
9/23/92	1	1	1	583635	99.98%	0.00%	0.000
9/24/92	1	1	1	583636	99.98%	0.00%	0.000
9/25/92	1	1	1	583637	99.98%	0.00%	0.000
9/26/92	2	2	2	583639	99.98%	0.00%	0.000
9/27/92	1	1	1	583640	99.98%	0.00%	0.000
9/28/92	2	2	2	583642	99.98%	0.00%	0.000
9/29/92	1	1	1	583643	99.98%	0.00%	0.000
9/30/92	11	11	11	583654	99.99%	0.00%	0.002
10/1/92	9	9	9	583663	99.99%	0.00%	0.002
10/2/92	7	7	7	583670	99.99%	0.00%	0.001
10/3/92	7	7	7	583677	99.99%	0.00%	0.001
10/4/92	6	6	6	583683	99.99%	0.00%	0.001
10/5/92	3	3	3	583686	99.99%	0.00%	0.001
10/6/92	2	2	2	583688	99.99%	0.00%	0.000
10/7/92	1	1	1	583689	99.99%	0.00%	0.000
10/8/92	4	4	4	583693	99.99%	0.00%	0.001
10/9/92	6	6	6	583699	99.99%	0.00%	0.001
10/10/92	2	2	2	583701	99.99%	0.00%	0.000
10/11/92	3	3	3	583704	99.99%	0.00%	0.001
10/12/92	4	4	4	583708	99.99%	0.00%	0.001
10/13/92	5	5	5	583713	100.00%	0.00%	0.001
10/14/92	4	4	4	583717	100.00%	0.00%	0.001
10/15/92	4	4	4	58372 1	100.00%	0.00%	0.001
10/16/92	1	1	1	583722	100.00%	0.00%	0.000
10/17/92	1	1	1	583723	100.00%	0.00%	0.000
10/18/92	1	1	1	583724	100.00%	0.00%	0.000
10/19/92	1	1	1	583725	100.00%	0.00%	0.000

1992 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	CUM PASS INDEX	CUM PASS PERCENT	PASS Index Percent	PASS Index Percent*100
10/20/92	2	2	2	583727	100.00%	0.00%	0.000
10/21/92	0	0	0	583727	100.00%	0.00%	0.000
10/22/92	1	1		583728	100.00%	0.00%	0.000
10/23/92	2	2	2	583730	100.00%	0.00%	0.000
10/24/92	1	1		58373 1	100.00%	0.00%	0.000
10/25/92	0	0	0	58373 1	100.00%	0.00%	0.000
10/26/92	2	2	2	583733	100.00%	0.00%	0.000
10/27/92	0	0	0	583733	100.00%	0.00%	0.000
10/28/92	1	1		583734	100.00%	0.00%	0.000
10/29/92	1	1	1	583735	100.00%	0.00%	0.000
10/30/92	4	4	4	583739	100.00%	0.00%	0.001
10/31/92	1	1	1	583740	100.00%	0.00%	0.000
11/1/92						0.00%	0.000
11/2/92						0.00%	0.000
11/3/92						0.00%	0.000
11/4/92						0.00%	0.000
11/5/92						0.00%	0.000
11/6/92						0.00%	0.000
11/7/92						0.00%	0.000
11/8/92						0.00%	0.000
11/9/92						0.00%	0.000
11/10/92						0.00%	0.000
11/11/92						0.00%	0.000
11/12/92						0.00%	0.000
11/13/92						0.00%	0.000
11/14/92						0.00%	0.000
11/15/92						0.00%	0.000
11/16/92						0.00%	0.000
11/17/92						0.00%	0.000
11/18/92						0.00%	0.000
11/19/92						0.00%	0.000
11/20/92						0.00%	0.000
11/21/92						0.00%	0.000
11/22/92						0.00%	0.000
11/23/92						0.00%	0.000
11/24/92						0.00%	0.000
11/25/92						0.00%	0.000
11/26/92						0.00%	0.000
11/27/92						0.00%	0.000

1993 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTE	WILD PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
TOTALS:	10,094	501,014	583,451		
3/28/93				0.000	
3/29/93				0.000	
3/30/93				0.000	
3/31/93				0.000	
4/1/93				0.000	
4/2/93				0.000	
4/3/93				0.000	
4/4/93				0.000	
4/5/93				0.000	
4/6/93				0.000	
4/7/93				0.000	
4/8/93				0.000	
4/9/93				0.000	
4/10/93				0.000	
4/11/93				0.000	
4/12/93				0.000	
4/13/93				0.000	
4/14/93				0.000	
4/15/93	104	1040	1040	0.178	0.18%
4/16/93	186	1860	1860	0.319	0.50%
4/17/93	179	1790	1790	0.307	0.80%
4/18/93	133	1330	1330	0.228	1.03%
4/19/93	242	2420	2420	0.415	1.45%
4/20/93	94	3133	3133	0.537	1.98%
4/21/93	57	1900	1900	0.326	2.31%
4/22/93	64	2133	2133	0.366	2.67%
4/23/93	220	4400	4400	0.754	3.43%
4/24/93	190	3800	3800	0.651	4.08%
4/25/93	250	6250	6250	1.071	5.15%
4/26/93	86	4300	4300	0.737	5.89%
4/27/93	149	7450	7450	1.277	7.17%
4/28/93	103	6180	6180	1.059	8.22%
4/29/93	136	8160	8160	1.399	9.62%
4/30/93	76	7600	7600	1.303	10.93%
5/1/93	94	9400	9400	1.611	12.54%
5/2/93	52	5200	5200	0.891	13.43%
5/3/93	116	11600	11600	1.988	15.42%
5/4/93	209	20900	20900	3.582	19.00%
5/5/93	244	24400	24400	4.182	23.18%
5/6/93	226	22600	22600	3.874	27.05%
5/7/93	538	53800	53800	9.221	36.27%
5/8/93	340	34000	34000	5.827	42.10%
5/9/93	316	31600	31600	5.416	47.52%
5/10/93	298	29800	29800	5.108	52.63%
5/11/93	119	11900	11900	2.040	54.67%
5/12/93	123	12300	12300	2.108	56.77%
5/13/93	273	13650	14343	2.458	59.23%
5/14/93	269	13450	16667	2.857	62.09%
5/15/93	434	21700	32001	5.485	67.57%

1993 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

	WILD				
DATE	NO. SAMPLED	NO. COLLECTE	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
5/16/93	178	17800	28232	4.839	72.41%
5/17/93	232	23200	48063	8.238	80.65%
5/18/93	95	9500	17615	3.019	83.67%
5/19/93	167	8350	15045	2.579	86.25 %
5/20/93	134	6700	10355	1.775	88.02%
5/21/93	238	5950	9364	1.605	89.63%
5/22/93	199	4975	7534	1.291	90.92%
5/23/93	200	5000	8372	1.435	92.35%
5/24/93	186	4650	6921	1.186	93.54%
5/25/93	123	2460	2578	0.442	93.98%
5/26/93	246	4116	4137	0.709	94.69%
5/27/93	86	3440	3975	0.681	95.37%
5/28/93	121	2546	3580	0.614	95.99%
5/29/93	138	2760	3126	0.536	96.52%
5/30/93	129	2580	2755	0.472	96.99%
5/31/93	97	1940	2036	0.349	97.34%
6/1/93	121	1729	1729	0.296	97.64%
6/2/93	109	1557	1644	0.282	97.92%
6/3/93	170	1700	2010	0.345	98.26%
6/4/93	97	1386	1434	0.246	98.51%
6/5/93	49	490	490	0.084	98.59%
6/6/93	53	530	530	0.091	98.69%
6/7/93	72	720	720	0.123	98.81%
6/8/93	88	880	916	0.157	98.97%
6/9/93	59	590	611	0.105	99.07 %
6/10/93	101	1010	1010	0.173	99.24%
6/11/93	39	390	390	0.067	99.31%
6/12/93	67	670	670	0.115	99.43%
6/13/93	36	360	360	0.062	99.49%
6/14/93	32	320	320	0.055	99.54%
6/15/93	28	280	280	0.048	99.59%
6/16/93	31	310	313	0.054	99.64%
6/17/93	28	280	280	0.048	99.69%
6/18/93	20	200	200	0.034	99.73 %
6/19/93	21	210	210	0.036	99.76%
6/20/93	20	200	200	0.034	99.80%
6/21/93	20	200	200	0.034	99.83 %
6/22/93	7	70	70	0.012	99.84%
6/23/93	14	140	140	0.024	99.87%
6/24/93	14	93	93	0.016	99.88%
6/25/93	14	93	93	0.016	99.90%
6/26/93	9	60	60	0.010	99.91%
6/27/93	22	92	92	0.016	99.92%
6/28/93	16	64	64	0.011	99.94%
6/29/93	9	36	36	0.006	99.94%
6/30/93	7	28	28	0.005	99.95 %
7/1/93	7	28	28	0.005	99.95 %
7/2/93	7	28	28	0.005	99.96%
7/3/93	2	8	8	0.001	99.96%
7/4/93	3	12	12	0.002	99.96%
7/5/93	0	0	0	0.000	99.96%

1993 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTE	WILD PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
7/6/93	3	12	12	0.002	99.96%
7/7/93	2	a	8	0.001	99.96%
7/8/93	1	4	4	0.001	99.96%
7/9/93	0	0	0	0.000	99.96%
7/10/93	0	0	0	0.000	99.96%
7/11/93	0	0	0	0.000	99.96%
7/12/93	2	a	8	0.001	99.96%
7/13/93	0	Ø	0	0.000	99.96%
7/14/93	0	Ø	0	0.000	99.96%
7/15/93	4	4	4	0.001	99.97%
7/16/93	2	2	2	0.000	99.97%
7/17/93	5	5	5	0.001	99.97%
7/18/93	2	2	2	0.000	99.97%
7/19/93	11	11	11	0.002	99.97%
7/20/93	5	5	5	0.001	99.97%
7/21/93	3	3	3	0.001	99.97%
7/22/93	5	5	5	0.001	99.97%
7/23/93	7	7	7	0.001	99.97%
7/24/93	10	10	10	0.002	99.97%
7/25/93	10	10	10	0.002	99.98%
7/26/93	3	3	3	0.001	99.98%
7/27/93	4	4	4	0.001	99.98%
7/28/93	2	2	2	0.000	99.98%
7/29/93	7	7	7	0.001	99.98%
7/30/93	2	2	2	0.000	99.98%
7/31/93	4	4	4	0.001	99.98%
8/1/93	6	6	6	0.001	99.98%
8/2/93	3	3	3	0.001	99.98%
8/3/93	2	2	2	0.000	99.98%
8/4/93	2	2	2	0.000	99.98%
8/5/93	3	3	3	0.001	99.98%
8/6/93	4	4	4	0.001	99.98%
8/7/93	3	3	3	0.001	99.98%
8/8/93	10	10	10	0.002	99.99%
8/9/93	1	1	1	0.000	99.99%
8/10/93	4	4	4	0.001	99.99%
8/11/93	4	4	4	0.001	99.99%
8/12/93	2	2	2	0.000	99.99%
8/13/93	2	2	2	0.000	99.99%
8/14/93	2	2	2	0.000	99.99%
8/15/93	2	2	2	0.000	99.99%
8/16/93	0	0	0	0.000	99.99%
8/17/93	1	1	1	0.000	99.99%
8/18/93	1	1	1	0.000	99.99%
8/19/93	0	0	0	0.000	99.99%
8/20/93	1	1	1	0.000	99.99%
8/21/93	0	0	0	0.000	99.99%
8/22/93	2	2	2	0.000	99.99%
8/23/93	4	4	4	0.001	99.99%
8/24/93	0	0	0	0.000	99.99%
8/25/93	1	1	1	0.000	99.99%

1993 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTE	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
8/26/93	0	0	0	0.000	99.99%
8/27/93	1	1	1	0.000	99.99%
8/28/93	1	1	1	0.000	99.99%
8/29/93	1	1	1	0.000	99.99%
8/30/93	2	2	2	0.000	99.99%
8/31/93	2	2	2	0.000	99.99%
9/1/93	1	1	1	0.000	99.99%
9/2/93	3	3	3	0.001	99.99%
9/3/93	0	0	0	0.000	99.99%
9/4/93	0	0	0	0.000	99.99%
9/5/93	1	1	1	0.000	99.99%
9/6/93	0	0	0	0.000	99.99%
9/7/93	1	1	1	0.000	99.99%
9/8/93	0	0	0	0.000	99.99%
9/9/93	3	3	3	0.001	99.99%
9/10/93	1	1	1	0.000	99.99%
9/11/93	1	1	1	0.000	99.99%
9/12/93	1	1	1	0.000	99.99%
9/13/93	1	1	1	0.000	99.99%
9/14/93	0	0	0	0.000	99.99%
9/15/93	0	0	0	0.000	99.99%
9/16/93	0	0	0	0.000	99.99%
9/17/93	0	0	0	0.000	99.99%
9/18/93	0	0	0	0.000	99.99%
9/19/93	0	0	0	0.000	99.99%
9/20/93	2	2	2	0.000	99.99%
9/21/93	2	2	2	0.000	99.99%
9/22/93	1	1	1	0.000	99.99%
9/23/93	0	0	0	0.000	99.99%
9/24/93	0	0	0	0.000	99.99%
9/25/93	2	2	2	0.000	99.99%
9/26/93	0	0	0	0.000	99.99%
9/27/93	0	0	0	0.000	99.99%
9/28/93	0	0	0	0.000	99.99%
9/29/93	0	0	0	0.000	99.99%
9/30/93	0	0	0	0.000	99.99%
10/1/93	1	1	1	0.000	99.99%
10/2/93	1	1	1	0.000	99.99%
10/3/93	2	2	2	0.000	100.00%
10/4/93	2	2	2	0.000	100.00%
10/5/93	0	0	0	0.000	100.00%
10/6/93	0	0	0	0.000	100.00%
10/7/93	0	0	0	0.000	100.00%
10/8/93	1	1	1	0.000	100.00%
10/9/93	1	1	1	0.000	100.00%
10/10/93	1	1	1	0.000	100.00%
10/11/93	1	1	1	0.000	100.00%
10/12/93	1	1	1	0.000	100.00%
10/13/93	2	2	2	0.000	100.00%
10/14/93	0	0	0	0.000	100.00%
10/15/93	0	0	0	0.000	100.00%

1993 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTE	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
10/16/93	2	2	2	0.000	100.00%
10/17/93	3	3	3	0.001	100.00%
10/18/93	0	0	0	0.000	100.00%
10/19/93				0.000	100.00%
10/20/93		1		0.000	100.00%
10/21/93	0	0	0	0.000	100.00%
10/22/93	0	0	0	0.000	100.00%
10/23/93	0	0	0	0.000	100.00%
10/24/93	0	0	0	0.000	100.00%
10/25/93	0	0	0	0.000	100.00%
10/26/93				0.000	100.00%
10/27/93	0	0	0	0.000	100.00%
10/28/93	0	0	0	0.000	100.00%
10/29/93	0	0	0	0.000	100.00%
10/30/93				0.000	100.00%
10/31/93	2	2	2	0.000	100.00%
11/1/93	8	8	8	0.001	100.00%
11/2/93				0.000	
11/3/93				0.000	
11/4/93				0.000	
11/5/93				0.000	
11/6/93				0.000	
11/7/93				0.000	
11/8/93				0.000	
11/9/93				0.000	
11/10/93				0.000	
11/11/93				0.000	
11/12/93				0.000	
11/13/93				0.000	
11/14/93				0.000	
11/15/93				0.000	
11/16/93				0.000	
11/17/93				0.000	
11/18/93				0.000	
11/19/93				0.000	
11/20/93				0.000	
11/21/93				0.000	
11/22/93				0.000	
11/23/93				0.000	
11/24/93				0.000	
11/25/93				0.000	
11/26/93				0.000	
11/27/93				0.000	
				100.000	

1994 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTED	WILD PASSAGE INDEX	PASS Index Percent*100	CUM PASS PERCENT
TOTALS:	9,978	475,693	514,897		
3/28/94				0.000	
3/29/94				0.000	
3/30/94				0.000	
3/31/94				0.000	
4/1/94				0.000	
4/2/94				0.000	
4/3/94				0.000	
4/4/94				0.000	
4/5/94				0.000	
4/6/94				0.000	
4/7/94				0.000	
4/8/94				0.000	
4/9/94				0.000	
4/10/94				0.000	
4/11/94				0.000	
4/12/94				0.000	
4/13/94				0.000	
4/14/94				0.000	
4/15/94	90	900	900	0.175	0.17%
4/16/94	81	810	810	0.157	0.33%
4/17/94	83	830	830	0.161	0.49%
4/18/94	97	970	970	0.188	0.68%
4/19/94	151	1510	1510	0.293	0.97%
4/20/94	141	2820	2820	0.548	1.52%
4/21/94	354	7080	7080	1.375	2.90%
4/22/94	559	13975	13975	2.714	5.61%
4/23/94	522	26100	26100	5.069	10.68%
4/24/94	397	39700	39700	7.710	18.39%
4/25/94	371	37100	37100	7.205	25.60%
4/26/94	384	38400	38400	7.458	33.05%
4/27/94	293	29300	29300	5.690	38.74%
4/28/94	265	26500	26500	5.147	43.89%
4/29/94	214	21400	21400	4.156	48.05 %
4/30/94	193	19300	19300	3.748	51.80%
5/1/94	127	12700	12700	2.467	54.26 %
5/2/94	99	9900	9900	1.923	56.19%
5/3/94	109	10900	10900	2.117	58.30%
5/4/94	63	6300	6300	1.224	59.53%
5/5/94	133	6650	6650	1.292	60.82%
5/6/94	104	6240	6240	1.212	62.03 %
5/7/94	100	7500	7500	1.457	63.49%
5/8/94	107	10700	10700	2.078	65.56%
5/9/94	120	12000	12000	2.331	67.89%
5/10/94	177	17700	17700	3.438	71.33%
5/11/94	204	20400	22996	4.466	75.80%
5/12/94	129	12900	15793	3.067	78.87%
5/13/94	143	14300	21388	4.154	83.02%
5/14/94	110	11000	15550	3.020	86.04%
5/15/94	135	6750	10418	2.023	88.06%

1994 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

	WILD				
DATE	NO. SAMPLED	NO. COLLECTED	PASSAGE INDEX	PASS Index Percent*100	CUM PASS PERCENT
5/16/94	94	4700	7404	1.438	89.50%
5/17/94	77	3850	6023	1.170	90.67%
5/18/94	103	2575	3934	0.764	91.43%
5/19/94	128	2560	4152	0.806	92.24%
5/20/94	119	2380	3603	0.700	92.94%
5/21/94	93	1860	2861	0.556	93.50%
5/22/94	46	920	1429	0.278	93.77%
5/23/94	58	1160	1799	0.349	94.12%
5/24/94	142	1420	2203	0.428	94.55%
5/25/94	145	1450	2206	0.428	94.98%
5/26/94	90	2131	3210	0.623	95.60%
5/27/94	45	1500	2246	0.436	96.04%
5/28/94	46	1533	1988	0.386	96.42%
5/29/94	26	867	1113	0.216	96.64%
5/30/94	45	1500	2063	0.401	97.04%
5/31/94	50	1667	2348	0.456	97.50%
6/1/94	30	1000	1453	0.282	97.78%
6/2/94	7	233	349	0.068	97.85%
6/3/94	10	200	296	0.057	97.91%
6/4/94	51	510	781	0.152	98.06%
6/5/94	52	520	796	0.155	98.21%
6/6/94	24	240	349	0.068	98.28%
6/7/94	15	150	234	0.045	98.32%
6/8/94	29	290	463	0.090	98.41%
6/9/94	25	250	409	0.079	98.49%
6/10/94	7	70	109	0.021	98.52%
6/11/94	4	40	62	0.012	98.53%
6/12/94	5	50	77	0.015	98.54%
6/13/94	5	20	32	0.006	98.55%
6/14/94	2	8	14	0.003	98.55%
6/15/94	24	96	142	0.028	98.58%
6/16/94	51	204	204	0.040	98.62%
6/17/94	133	532	532	0.103	98.72%
6/18/94	58	232	232	0.045	98.77 %
6/19/94	40	82	82	0.016	98.78%
6/20/94	80	80	80	0.016	98.80%
6/21/94	90	90	90	0.017	98.82%
6/22/94	93	93	93	0.018	98.83%
6/23/94	295	895	895	0.174	99.01%
6/24/94	61	716	716	0.139	99.15%
6/25/94	170	366	366	0.071	99.22%
6/26/94	98	98	98	0.019	99.24%
6/27/94	51	51	51	0.010	99.25%
6/28/94	84	84	84	0.016	99.26 %
6/29/94	80	137	137	0.027	99.29%
6/30/94	8	80	80	0.016	99.30%
7/1/94	4	40	40	0.008	99.31%
7/2/94	4	40	40	0.008	99.32%
7/3/94	1	10	10	0.002	99.32%
7/4/94	8	32	32	0.006	99.33%
7/5/94	3	12	12	0.002	99.33%

1994 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	PASS Index Percent*100	CUM PASS PERCENT
7/6/94	4	16	16	0.003	99.33%
7/7/94	13	52	52	0.010	99.34%
7/8/94	7	70	70	0.014	99.36%
7/9/94	11	110	110	0.021	99.38%
7/10/94	9	113	113	0.022	99.40%
7/11/94	5	63	63	0.012	99.41%
7/12/94	4	50	50	0.010	99.42%
7/13/94	5	63	63	0.012	99.44%
7/14/94	5	50	50	0.010	99.44%
7/15/94	8	80	80	0.016	99.46%
7/16/94	6	60	60	0.012	99.47%
7/17/94	9	90	90	0.017	99.49%
7/18/94	28	280	280	0.054	99.54%
7/19/94	19	190	190	0.037	99.58%
7/20/94	14	140	140	0.027	99.61%
7/21/94	13	130	130	0.025	99.63%
7/22/94	11	110	110	0.021	99.65%
7/23/94	13	130	130	0.025	99.68%
7/24/94	7	70	70	0.014	99.69%
7/25/94	8	80	80	0.016	99.71%
7/26/94	9	90	90	0.017	99.73%
7/27/94	7	70	70	0.014	99.74%
7/28/94	11	48	48	0.009	99.75 %
7/29/94	22	88	88	0.017	99.77 %
7/30/94	31	124	124	0.024	99.79%
7/31/94	12	48	48	0.009	99.80%
8/1/94	6	24	24	0.005	99.80%
8/2/94	5	20	20	0.004	99.81%
8/3/94	5	20	20	0.004	99.81%
8/4/94	0	0	0	0.000	99.81%
8/5/94	3	12	12	0.002	99.81%
8/6/94	2	2	2	0.000	99.82%
8/7/94	3	3	3	0.001	99.82%
8/8/94	11	11	11	0.002	99.82%
8/9/94	6	6	6	0.001	99.82%
8/10/94	8	32	32	0.006	99.83%
8/11/94	6	24	24	0.005	99.83%
8/12/94	14	56	56	0.011	99.84%
8/13/94	17	68	68	0.013	99.85 %
8/14/94	15	60	60	0.012	99.87%
8/15/94	24	96	96	0.019	99.88%
8/16/94	13	52	52	0.010	99.89%
8/17/94	9	36	36	0.007	99.90%
8/18/94	2	8	8	0.002	99.90%
8/19/94	5	20	20	0.004	99.91%
8/20/94	28	28	28	0.005	99.91%
8/21/94	19	19	19	0.004	99.92%
8/22/94	18	18	18	0.003	99.92%
8/23/94	3	3	3	0.001	99.92%
8/24/94	2	2	3	0.001	99.92%
8/25/94	8	8	11	0.002	99.92%

1994 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO, COLLECTED	PASSAGE INDEX	PASS Index Percent*100	CUM PASS PERCENT
8/26/94	15	15	22	0.004	99.93%
8/27/94	13	13	13	0.003	99.93%
8/28/94	5	5	5	0.001	99.93%
8/29/94	12	12	12	0.002	99.93%
8/30/94	4	4	4	0.001	99.93%
8/31/94	6	6	6	0.001	99.93%
9/1/94	15	15	15	0.003	99.94%
9/2/94	16	16	16	0.003	99.94%
9/3/94	16	16	16	0.003	99.94%
9/4/94	2	2	2	0.000	99.94%
9/5/94	2	2	2	0.000	99.94%
9/6/94	2	2	2	0.000	99.95%
9/7/94	4	4	4	0.001	99.95%
9/8/94	9	9	9	0.002	99.95 %
9/9/94	12	12	12	0.002	99.95%
9/10/94	8	8	8	0.002	99.95%
9/11/94	4	4	4	0.001	99.95%
9/12/94	3	3	3	0.001	99.95%
9/13/94	1	1	1	0.000	99.95%
9/14/94	2	2	2	0.000	99.95%
9115194	4	4	4	0.001	99.95%
9/16/94	7	7	7	0.001	99.96%
9/17/94	4	4	4	0.001	99.96%
9/18/94	2	2	2	0.000	99.96%
9/19/94	8	8	8	0.002	99.96%
9/20/94	13	13	13	0.003	99.96%
9/21/94	8	8	8	0.002	99.96%
9/22/94	5	5	5	0.001	99.96%
9/23/94	10	10	10	0.002	99.97%
9/24/94	22	22	22	0.004	99.97%
9125194	6	6	6	0.001	99.97%
9/26/94	19	19	19	0.004	99.97%
9/27/94	19	19	19	0.004	99.98%
9/28/94	10	10	10	0.002	99.98%
9/29/94	20	20	20	0.004	99.98%
9/30/94	10	10	10	0.002	99.99%
10/1/94	11	11	11	0.002	99.99%
10/2/94	8	8	8	0.002	99.99%
10/3/94	1	1	1	0.000	99.99%
10/4/94	1	1	1	0.000	99.99%
10/5/94	1	1	1	0.000	99.99%
10/6/94	2	2	2	0.000	99.99%
10/7/94	0	0	0	0.000	99.99%
10/8/94	3	3	3	0.001	99.99%
10/9/94	0	0	0	0.000	99.99%
10/10/94	4	4	4	0.001	99.99%
10/11/94	0	0	0	0.000	99.99%
10/12/94	1	1	1	0.000	99.99%
10/13/94	1	1	1	0.000	99.99%
10/14/94	0	0	0	0.000	99.99%
10/15/94	0	0	0	0.000	99.99%

1994 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED -Iv--	WILD NO. COLLECTED - -	PASSAGE INDEX	PASS Index Percent*100	CUM PASS PERCENT
10/16/94	1	1	1	0.000	99.99%
10/17/94	2	2	2	0.000	99.99%
10/18/94		0	0	0.000	99.99%
10/19/94	2	2	2	0.000	99.99%
10/20/94			1	0.000	99.99%
10/21/94			1	0.000	99.99%
10/22/94	0	0	0	0.000	99.99%
10/23/94	2	2	2	0.000	99.99%
10/24/94		0	0	0.000	99.99%
10/25/94	5		5	0.001	99.99%
10/26/94	2	2	2	0.000	100.00%
10/27/94			1	0.000	100.00%
10/28/94	2	2	2	0.000	100.00%
10/29/94	8	8	8	0.002	100.00%
10/30/94	5	5	5	0.001	100.00%
10/31/94	8	8	8	0.002	100.00%
11/1/94				0.000	
11/2/94				0.000	
11/3/94				0.000	
11/4/94				0.000	
11/5/94				0.000	
11/6/94				0.000	
11/7/94				0.000	
11/8/94				0.000	
11/9/94				0.000	
11/10/94				0.000	
11/11/94				0.000	
11/12/94				0.000	
11/13/94				0.000	
11/14/94				0.000	
11/15/94				0.000	
11/16/94				0.000	
11/17/94				0.000	
11/18/94				0.000	
11/19/94				0.000	
11/20/94				0.000	
11/21/94				0.000	
11/22/94				0.000	
11/23/94				0.000	
11/24/94				0.000	
11/25/94				0.000	
11/26/94				0.000	
11/27/94				0.000	
				100.000	

1995 Smolt Passage Index for Subyearling Fall Chinook
Passing Lower Granite Dam.
From The Fish Passage Center

DATE	WILD NO. SAMPLED	WILD NO. COLLECTED	PASSAGE INDEX	Percent Pass Index*100	CUM PASS INDEX	CUM PASS PERCENT
TOTALS:	7260	26558	26768			
3/28/95						
3/29/95	0	0	0	0.000	0	0.00%
3/30/95	0	0	0	0.000	0	0.00%
3/31/95	0	0	0	0.000	0	0.00%
4/1/95	0	0	0	0.000	0	0.00%
4/2/95	0	0	0	0.000	0	0.00%
4/3/95	0	0	0	0.000	0	0.00%
4/4/95	0	0	0	0.000	0	0.00%
4/5/95	0	0	0	0.000	0	0.00%
4/6/95	0	0	0	0.000	0	0.00%
4/7/95	0	0	0	0.000	0	0.00%
4/8/95	0	0	0	0.000	0	0.00%
4/9/95	0	0	0	0.000	0	0.00%
4/10/95	3	33	33	0.123	33	0.12%
4/11/95	0	0	0	0.000	33	0.12%
4/12/95	0	0	0	0.000	33	0.12%
4/13/95	1	11	11	0.041	44	0.16%
4/14/95	0	0	0	0.000	44	0.16%
4/15/95	1	50	50	0.187	94	0.35%
4/16/95	0	0	0	0.000	94	0.35%
4/17/95	0	0	0	0.000	94	0.35%
4/18/95	0	0	0	0.000	94	0.35%
4/19/95	0	0	0	0.000	94	0.35%
4/20/95	0	0	0	0.000	94	0.35%
4/21/95	0	0	0	0.000	94	0.35%
4/22/95	0	0	0	0.000	94	0.35%
4/23/95	0	0	0	0.000	94	0.35%
4/24/95	0	0	0	0.000	94	0.35%
4/25/95	0	0	0	0.000	94	0.35%
4/26/95	0	0	0	0.000	94	0.35%
4/27/95	0	0	0	0.000	94	0.35%
4/28/95	0	0	0	0.000	94	0.35%
4/29/95	0	0	0	0.000	94	0.35%
4/30/95	0	0	0	0.000	94	0.35%
5/1/95	0	0	0	0.000	94	0.35%
5/2/95	0	0	0	0.000	94	0.35%
5/3/95	0	0	0	0.000	94	0.35%
5/4/95	0	0	0	0.000	94	0.35%
5/5/95	0	0	0	0.000	94	0.35%
5/6/95	0	0	0	0.000	94	0.35%
5/7/95	0	0	0	0.000	94	0.35%
5/8/95	0	0	0	0.000	94	0.35%
5/9/95	0	0	0	0.000	94	0.35%
5/10/95	0	0	0	0.000	94	0.35%
5/11/95	1	150	187	0.699	281	1.05%
5/12/95	0	0	0	0.000	281	1.05%
5/13/95	0	0	0	0.000	281	1.05%
5/14/95	1	150	188	0.702	469	1.75%
5/15/95	0	0	0	0.000	469	1.75%

1995 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

	WILD				
DATE	NO. SAMPLED	NO. COLLECTED	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
5/16/95	37	5550	7208	1.483	80.07 %
5/17/95	29	4350	5513	1.134	81.20%
5/18/95	35	5250	6611	1.360	82.56%
5/19/95	57	5700	7127	1.467	84.03 %
5/20/95	59	5900	7790	1.603	85.63%
5/21/95	55	5500	7202	1.482	87.11%
5/22/95	59	5900	7729	1.590	88.71%
5/23/95	61	6100	7917	1.629	90.33%
5/24/95	49	4900	6352	1.307	91.64%
5/25/95	28	2800	3671	0.755	92.40%
5/26/95	37	3700	4188	0.862	93.26%
5/27/95	21	2100	2452	0.505	93.76%
5/28/95	23	2300	2441	0.502	94.27%
5/29/95	20	2000	2126	0.437	94.70%
5/30/95	79	3160	3383	0.696	95.40%
5/31/95	35	1400	1484	0.305	95.70%
6/1/95	126	2191	2318	0.477	96.18%
6/2/95	81	2314	2520	0.519	96.70%
6/3/95	161	2300	2490	0.512	97.21%
6/4/95	172	2867	3142	0.647	97.86%
6/5/95	87	1450	1598	0.329	98.19%
6/6/95	85	1417	1678	0.345	98.53%
6/7/95	56	933	1091	0.224	98.76%
6/8/95	41	683	765	0.157	98.91%
6/9/95	35	500	550	0.113	99.03 %
6/10/95	21	300	321	0.066	99.09%
6/11/95	19	211	224	0.046	99.14%
6/12/95	18	200	214	0.044	99.18%
6/13/95	23	256	271	0.056	99.24%
6/14/95	23	256	271	0.056	99.30%
6/15/95	26	289	307	0.063	99.36%
6/16/95	27	300	335	0.069	99.43 %
6/17/95	20	222	248	0.051	99.48%
6/18/95	13	144	163	0.034	99.51%
6/19/95	28	311	349	0.072	99.58%
6/20/95	24	267	329	0.068	99.65%
6/21/95	21	233	289	0.059	99.71%
6/22/95	19	211	266	0.055	99.77%
6/23/95	4	44	44	0.009	99.78%
6/24/95	10	111	111	0.023	99.80%
6/25/95	4	44	44	0.009	99.81%
6/26/95	10	111	111	0.023	99.83%
6/27/95	5	56	56	0.012	99.84%
6/28/95	7	78	78	0.016	99.86%
6/29/95	5	56	56	0.012	99.87%
6/30/95	1	11	11	0.002	99.87%
7/1/95	7	70	70	0.014	99.89%
7/2/95	3	30	30	0.006	99.89%
7/3/95	0	0	0	0.000	99.89%
7/4/95	3	30	30	0.006	99.90%
7/5/95	3	30	30	0.006	99.90%

1995 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTED	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
7/6/95	2	20	20	0.004	99.91%
7/7/95	5	50	50	0.010	99.92%
7/8/95	1	10	10	0.002	99:92%
7/9/95	4	40	40	0.008	99.93%
7/10/95	2	20	20	0.004	99.93%
7/11/95	4	40	40	0.008	99.94%
7/12/95	5	50	50	0.010	99.95%
7/13/95	0	0	0	0.000	99.95%
7/14/95	2	20	20	0.004	99.96%
7/15/95	0	0	0	0.000	99.96%
7/16/95	2	20	20	0.004	99.96%
7/17/95	0	0	0	0.000	99.96%
7/18/95	0	0	0	0.000	99.96%
7/19/95	1	10	10	0.002	99.96%
7/20/95	2	20	20	0.004	99.97%
7/21/95	0	0	0	0.000	99.97%
7/22/95	0	0	0	0.000	99.97%
7/23/95	2	20	20	0.004	99.97%
7/24/95	0	0	0	0.000	99.97%
7/25/95	0	0	0	0.000	99.97%
7/26/95	1	10	10	0.002	99.97%
7/27/95	1	10	10	0.002	99.97%
7/28/95	1	10	10	0.002	99.98%
7/29/95	0	0	0	0.000	99.98%
7/30/95	1	10	10	0.002	99.98%
7/31/95	0	0	0	0.000	99.98%
8/1/95	0	0	0	0.000	99.98%
8/2/95	0	0	0	0.000	99.98%
8/3/95	0	0	0	0.000	99.98%
8/4/95	0	0	0	0.000	99.98%
8/5/95	0	0	0	0.000	99.98%
8/6/95	1	10	10	0.002	99.98%
8/7/95	0	0	0	0.000	99.98%
8/8/95	0	0	0	0.000	99.98%
8/9/95	0	0	0	0.000	99.98%
8/10/95	0	0	0	0.000	99.98%
8/11/95	0	0	0	0.000	99.98%
8/12/95	0	0	0	0.000	99.98%
8/13/95	0	0	0	0.000	99.98%
8/14/95	1	10	10	0.002	99.98%
8/15/95	0	0	0	0.000	99.98%
8/16/95	0	0	0	0.000	99.98%
8/17/95	0	0	0	0.000	99.98%
8/18/95	0	0	0	0.000	99.98%
8/19/95	0	0	0	0.000	99.98%
8/20/95	0	0	0	0.000	99.98%
8/21/95	0	0	0	0.000	99.98%
8/22/95	0	0	0	0.000	99.98%
8/23/95	3	3	3	0.001	99.98%
8/24/95	3	3	3	0.001	99.98%
8/25/95	0	0	0	0.000	99.98%

1995 Smolt Passage Index for Wild Steelhead Passing Lower Granite Dam. From the Fish Passage Center

DATE	HO-SAMPLED	WILD W * COLLECTED	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
8/26/95	0	0	0	0.000	99.98%
8/27/95	0	0	0	0.000	99.98%
8/28/95	0	0	0	0.000	99.98%
8/29/95	0	0	0	0.000	99.98%
8/30/95	1	1	1	0.000	99.98%
8/31/95	0	0	0	0.000	99.98%
9/1/95	1	1	1	0.000	99.98%
9/2/95	2	2	2	0.000	99.98%
9/3/95	0	0	0	0.000	99.98%
9/4/95	0	0	0	0.000	99.98%
9/5/95	1	1	1	0.000	99.98%
9/6/95	0	0	0	0.000	99.98%
9/7/95	0	0	0	0.000	99.98%
9/8/95	1	1	1	0.000	99.98%
9/9/95	0	0	0	0.000	99.98%
9/10/95	1	1	1	0.000	99.99%
9/11/95	0	0	0	0.000	99.99%
9/12/95	3	3	3	0.001	99.99%
9/13/95	3	3	3	0.001	99.99%
9/14/95	0	0	0	0.000	99.99%
9/15/95	2	2	2	0.000	99.99%
9/16/95	0	0	0	0.000	99.99%
9/17/95	1	1	1	0.000	99.99%
9/18/95	0	0	0	0.000	99.99%
9/19/95	0	0	0	0.000	99.99%
9/20/95	0	0	0	0.000	99.99%
9/21/95	2	2	2	0.000	99.99%
9/22/95	1	1	1	0.000	99.99%
9/23/95	3	3	3	0.001	99.99%
9/24/95	0	0	0	0.000	99.99%
9/25/95	0	0	0	0.000	99.99%
9/26/95	2	2	2	0.000	99.99%
9/27/95	1	1	1	0.000	99.99%
9/28/95	1	1	1	0.000	99.99%
9/29/95	0	0	0	0.000	99.99%
9/30/95	0	0	0	0.000	99.99%
10/1/95	0	0	0	0.000	99.99%
10/2/95	1	1	1	0.000	99.99%
10/3/95	1	1	1	0.000	93.99%
10/4/95	0	0	0	0.000	99.99%
10/5/95	1	1	1	0.000	99.99%
10/6/95	0	0	0	0.000	99.99%
10/7/95	1	1	1	0.000	99.99%
10/8/95	0	0	0	0.000	99.99%
10/9/95	0	0	0	0.000	99.99%
10/10/95	1	1	1	0.000	99.99%
10/11/95	2	2	2	0.000	99.99%
10/12/95	1	1	1	0.000	99.99%
10/13/95	0	0	0	0.000	99.99%
10/14/95	1	1	1	0.000	99.99%
10/15/95	1	1	1	0.000	99.99%

1995 Smolt Passage Index for Wild Steelhead
Passing Lower Granite Dam.
From the Fish Passage Center

DATE	NO. SAMPLED	WILD NO. COLLECTED	PASSAG INDEX	PASS Index Percent*100	CUM PASS PERCENT
10/16/95	3	3	3	0.001	99.99%
10/17/95	3	3	3	0.001	99.99%
10/18/95	2	2	2	0.000	99.99%
10/19/95	3	3	3	0.001	99.99%
10/20/95	4	4	4	0.001	99‘99%
10/21/95		3	3	0.001	99.99%
10/22/95		1	1	0.000	100.00%
10/23/95		1	1	0.000	100.00%
10/24/95		1	1	0.000	100.00%
10/25/95	0	0	0	0.000	100.00%
10/26/95		1	1	0.000	100.00%
10/27/95		1	1	0.000	100.00%
10/28/95	2	2	2	0.000	100.00%
10/29/95		1	1	0.000	100.00%
10/30/95	3	3	3	0.001	100.00%
10/31/95		1	1	0.000	100.00%
11/1/95	13	13	13	0.003	100.00%
11/2/95				0.000	
11/3/95				0.000	
11/4/95				0.000	
11/5/95				0.000	
11/6/95				0.000	
11/7/95				0.000	
11/8/95				0.000	
11/9/95				0.000	
11/10/95				0.000	
11/11/95				0.000	
11/12/95				0.000	
11/13/95				0.000	
11/14/95				0.000	
11/15/95				0.000	
11/16/95				0.000	
11/17/95				0.000	
11/18/95				0.000	
11/19/95				0.000	
11/20/95				0.000	
11/21/95				0.000	
11/22/95				0.000	
11/23/95				0.000	
11/24/95				0.000	
11/25/95				0.000	
11/26/95				0.000	
11/27/95				0.000	

Proportion of the Fish that Passed Lower Granite Dam Coincident with a Specific Level of Flow Augmentation

Flow Aug. (KCFS)	Spring/Summer Yearling Chinook	Steelhead	Fall Subyearling Chinook	Sockeye
1991				
0-5	0.089	0.053	0.731	1.000
5-10	0.297	0.172	0.154	0.000
10-15	0.273	0.241	0.103	0.000
15-20	0.162	0.350	0.000	0.000
20-25	0.179	0.184	0.013	0.000
25-30	0.000	0.000	0.000	0.000
30-35	0.000	0.000	0.000	0.000
1992				
0-5	0.366	0.217	0.127	0.333
5-10	0.230	0.195	0.229	0.333
10-15	0.212	0.201	0.212	0.222
15-20	0.138	0.331	0.188	0.000
20-25	0.054	0.054	0.245	0.111
25-30	0.000	0.000	0.000	0.000
30-35	0.000	0.000	0.000	0.000
1993				
0-5	0.444	0.659	0.134	0.000
5-10	0.552	0.341	0.334	1.000
10-15	0.000	0.000	0.014	0.000
15-20	0.002	0.000	0.240	0.000
20-25	0.002	0.000	0.199	0.000
25-30	0.000	0.000	0.078	0.000
30-35	0.000	0.000	0.000	0.000
1994				
0-5	0.416	0.460	0.083	0.108
5-10	0.060	0.089	0.073	0.081
10-15	0.170	0.149	0.059	0.297
15-20	0.121	0.095	0.011	0.514
20-25	0.047	0.051	0.272	0.000
25-30	0.156	0.128	0.380	0.000
30-35	0.029	0.028	0.123	0.000
1995				
0-5	0.187	0.288	0.207	1.000
5-10	0.199	0.080	0.059	0.000
10-15	0.146	0.108	0.291	0.000
15-20	0.235	0.353	0.052	0.000
20-25	0.233	0.172	0.392	0.000
25-30	0.000	0.000	0.000	0.000
30-35	0.000	0.000	0.000	0.000

Effect of the Flow Augmentation on the Water Velocity and the Water Particle Travel Time through Lower Granite Pool

Spring **April 10 - June 20**

		1991	1992	1993	1994	1995
Obs. Mean Water Velocity		9.10	6.46	14.19	8.17	13.36
Percentage from fish flow	**HDR**	7.278	13.156	3.289	12.785	5.771
	BPA	13.900	16.681	7.792	13.822	6.956
	IDWR	13.106	16.015	7.792	13.822	6.956

Summer **June 21- August 31**

		1991	1992	1993	1994	1995
Obs. Mean Water Velocity		4.24	2.56	6.20	3.56	7.52
Percentage from fish flow	**HDR**	5.475	15.889	22.658	37.837	18.959
	BPA	5.541	14.859	24.832	38.266	20.546
	IDWR	13.082	16.323	24.832	38.266	20.546

Spring **April 10 - June 20**

		1991	1992	1993	1994	1995
Mean Water Vdocity (miles/day)	**Observed**	9.10	6.46	14.19	8.17	13.36
	HDR	8.44	5.61	13.72	7.13	12.59
	BPA	7.84	5.38	13.08	7.04	12.43
	IDWR	7.91	5.43	13.08	7.04	12.43
Water Particle Travel Time (days)	**Observed**	3.43	4.83	2.20	3.82	2.34
	HDR	3.70	5.56	2.27	4.38	2.48
	BPA	3.98	5.80	2.39	4.43	2.51
	IDWR	3.95	5.75	2.39	4.43	2.51

Summer **June 21 - August 31**

		1991	1992	1993	1994	1995
Mean Water Velocity (miles/day)	**Observed**	4.24	2.56	6.20	3.56	7.52
	HDR	4.00	2.15	4 79	2.21	6.10
	BPA	4.00	2.18	4.66	2.20	5.98
	IDWR	3.68	2.14	4.66	2.20	5.98
Water Particle Travel Time (days)	**Observed**	7.37	12.19	5.04	8.77	4.15
	HDR	7.79	14.49	6.51	14.12	5.12
	BPA	7.80	14.31	6.70	14.21	5.22
	IDWR	8.48	14.56	6.70	14.21	5.22

Median Travel lime from Lower Granite Dam to McNary Dam as Estimated Using CRiSP for Summer/Spring Yearling Chinook and Steelhead

Data file	ris.	site	Chinook 1 TT	Steelhead TT
91.dat	early	LGR-MCN	13	20.5
	mid.	LGR-MCN	10.5	9.5
	late	LGRMCA	9	9.5
91.bpa.dat	early	LGRMCA	13.5	21.5
	mid.	LGR-MCA	11.5	10
	late	LGRMCN	9.5	9.5
91.idw.dat	early	LGR-MCA	13.5	21.5
	mid.	LCRMCN	11.5	10
	late	LGRMCN	9.5	9.5
91.hdr.dat	early	LGRMCN	13.5	21.5
	mid.	LGR-MCN	10.5	9.5
	late	LGRMCN	9	9.5
92.dat	early	LGRMCA	13.5	20
	mid.	LGRMCA	11	11.5
	late	LGR-MCA	11.5	13.5
92.bpa.dat	early	LGRMCA	14	20.5
	mid.	LGR-MCN	11.5	13.5
	late	LGRMCN	13	15
92.idw.dat	early	LGR-MCN	14	20.5
	mid.	LGR-MCN	11.5	13.5
	late	LGR-MCN	12.5	14.5
92.hdr.dat	early	LGR-MCN	14	20
	mid.	LGR-MCN	11.5	13
	late	LGR-MCN	12.5	14.5
93.dat	early	LGR-MCN	13	19.5
	mid.	LGR-MCN	9	7
	late	LGRMCN	8	8.5
93.bpa.dat	early	LGR-MCA	13	19.5
	mid.	LCRMCN	9	7
	late	LGRMCA	8.5	9
93.idw.dat	early	LGR-MCN	13	19.5
	mid.	LGRMCN	9	7
	late	LGR-MCA	8.5	9
93.hdr.dat	early	LGR-MCN	13	19.5
	mid.	LGRMCA	9	7
	late	LGR-MCN	8	8.5
94.dat	early	LGR-MCN	12.5	19
	mid.	LGR-MCN	10	10
	late	LGR-MCN	II	13
94.bpa.dat	early	LGR-MCA	12.5	20
	mid.	LGR-MCN	10.5	11.5
	late	LGR-MCA	11	13
94.idw.dat	early	LGRMCA	12.5	20
	mid.	LGR-MCA	10.5	11.5
	late	LGRMCA	11	13
94.hdr.dat	early	LGRMCN	12.5	20
	mid.	LGR-MCN	10.5	11.5
	late	LGR-MCN	II	13
95.dat	early	LGRMCN	13	19
	mid.	LGRMCA	9	8.5
	late	LCRMCN	8	7.5
95.bpa.dat	early	LGRMCN	13.5	20
	mid.	LGRMCN	9	9
	late	LGR-MCN	8	1.5
95.idw.dat	early	LGR-MCA	13.5	20
	mid.	LGR-MCN	9	9
	late	LGR-MCA	8	7.5
95.hdr.dat	early	LGR-MCN	13.5	20
	mid.	LCRMCN	9	8.5
	late	LGR-MCN	8	7.5

Mean TT Chinook_1: CRiSP

Years	BASE	BPA	IDW	HDR
1991	10.83	11.50	11.50	11.00
1992	12.00	12.83	12.67	12.67
1993	10.00	10.17	10.17	10.00
1994	11.17	11.33	11.33	11.33
1995	10.00	10.17	10.17	10.17

Mean TT Steelhead: CRiSP

Years	BASE	BPA	IDW	HDR
1991	13.17	13.67	13.67	13.50
1992	15.00	16.33	16.17	15.83
1993	11.67	il.83	11.83	11.67
1994	14.00	14.83	14.83	14.83
1995	11.67	12.17	12.17	12.00

Percent Change due to Augmentation

Years	BASE	BPA	IDW	HDR
1991	0.00	5.80	5.80	1.52
1992	0.00	6.49	5.26	5.26
1993	0.00	1.64	1.64	0.00
1994	0.00	1.47	1.47	1.47
1995	0.00	1.64	1.64	1.64

Percent Change due to Augmentation

Years	BASE	BPA	IDW	HDR
1991	0.00	3.66	3.66	2.41
1992	0.00	8.16	7.22	5.26
1993	0.00	1.41	1.41	0.00
1994	0.00	5.62	5.62	5.62
1995	0.00	4.11	4.11	2.78

Absolute Change due to Augmentation

Years	BASE	BPA	IDW	HDR
1991	0.00	0.67	0.67	0.17
1992	0.00	0.83	0.67	0.67
1993	0.00	0.17	0.17	0.00
1994	0.00	0.17	0.17	0.17
1995	0.00	0.17	0.17	0.17

Absolute Change due to Augmentati

Years	BASE	BPA	IDW	HDR
1991	0.00	0.50	0.50	0.33
1992	0.00	1.33	1.17	0.83
1993	0.00	0.17	0.17	0.00
1994	0.00	0.83	0.83	0.83
1995	0.00	0.50	0.50	0.33

Estimated Travel Time between Lower Granite Dam and McNary Dam using the Berggren and Filardo (1993) model for Yearling Chinook (Using CRiSP-Estimated flow(kcfs) metric)

			1991	1992	1993	1994	1995
Early	Avg-Flow	TT	17.850	16.251	13.716	14.014	14.096
	Avg HDR	TT	21.063	18.968	15.462	14.600	17.695
	Avg-BPA	TT	22.255	19.356	15.483	14.627	17.727
	Ave IDWR	TT	22.105	19.238	15.483	14.627	17.727
Mid	Avg Flow	TT	13.390	14.889	9.927	12.245	10.612
	Ave HDR	TT	14.346	16.125	9.981	13.922	10.925
	Ave BPA	TT	15.221	16.894	10.326	14.204	11.116
	Avg IDWR	TT	15.043	16.736	10.326	14.204	11.116
Late	Avg Flow	TT	11.810	20.259	10.006	17.401	9.755
	Avg HDR	TT	11.8%	25.958	10.160	17.953	9.755
	Avg BPA	TT	12.392	26.684	10.417	17.953	9.755
	AvgIDWR	TT	12.311	26.525	10.417	17.953	9.755
Average Travel Time (in Days)			1991	1992	1993	1994	1995
	Ave ObsFlow	TT	14.350	17.133	11.216	14.554	11.488
	Avg HDR	TT	15.768	20.350	11.867	15.492	12.792
	Avg BPA	TT	16.623	20.978	12.075	15.595	12.866
	AvgIDWR	TT	16.486	20.833	12.075	15.595	12.866
Percent Decrease due to Augmentation			1991	1992	1993	1994	1995
	Avg-ObsFlow	TT	0.000	0.000	0.000	0.000	0.000
	Avg HDR	TT	8.993	‘5.809	5.487	6.056	10.195
	Avg-BPA	TT	13.671	18.329	7.116	6.677	10.711
	Avg IDWR	TT	12.956	17.760	7.116	6.677	10.711
Absolute Decrease due to Augmentation			1991	1992	1993	1994	1995
	Avg ObsFlow	TT	0.000	0.000	0.000	0.000	0.000
	Avg HDR	TT	1.418	3.217	0.651	0.938	1.304
	Avg-BPA	TT	2.273	3.845	0.859	1.041	1.378
	Avg IDWR	TT	1.136	3.700	0.859	1.041	1.378

Estimated Travel Time between Lower Granite Dam and McNary Dam using the Berggren and Filardo (1993) model for Steelhead (Using CRiSP-Estimated flow(kcfs) metric)

			1991	1992	1993	1994	1995
Early	**Avg-Flow**	**TT**	18.991	15.776	13.205	13.290	14.259
	Avg_HDR	**TT**	22.511	17.621	15.024	13.616	18.871
	Avg_BPA	**TT**	24.039	18.372	15.070	13.719	18.895
	Avg_IDWR	**TT**	23.838	18.432	15.070	13.719	18.895
Mid	**Avg_Flow**	**TT**	9.501	16.563	5.564	11.071	8.085
	Avg_HDR	**TT**	10.519	20.362	5.591	13.932	8.085
	Avg_BPA	**TT**	11.416	21.170	6.071	14.274	8.175
	Avg_IDWR	**TT**	11.491	20.876	6.071	14.274	8.175
Late	**Avg_Flow**	**TT**	9.627	31.700	7.599	23.194	6.121
	Avg_HDR	**TT**	9.708	39.116	7.620	23.194	6.126
	Avg_BPA	**TT**	10.288	39.780	8.044	23.512	6.163
	Avg_IDWR	**TT**	10.235	39.753	8.044	23.512	6.163
Average Travel			**1991**	**1992**	**1993**	**1994**	**1995**
Time (in Days)	**Avg-ObsFlow**	**TT**	12.706	21.347	8.789	15.852	9.488
	Avg-HDR	**TT**	14.246	25.700	9.412	16.914	11.027
	Avg-BPA	**TT**	15.247	26.441	9.728	17.168	11.077
	Avg_IDWR	**TT**	15.188	26.354	9.728	17.168	11.077
Percent Decrease due to			**1991**	**1992**	**1993**	**1994**	**1995**
Augmentation	**Avg-ObsFlow**	**TT**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
	Avg-HDR	**TT**	10.808	16.938	6.613	6.281	13.955
	Avg-BPA	**TT**	16.665	19.266	9.654	7.669	14.345
	Avg IDWR	**TT**	16.340	18.999	9.654	7.669	14.345

Estimated Travel Time Through Lower Granite Pool Using the Connor et al (1994) model for Sub-Yearling Chinook (Using CRiSP-Estimated flow(kcfs) metric)

			1991	1992	1993	1994	1995
Early	Avg Flow	**TT**	4.555	18.078	2.737	10.023	2.447
	Avg-HDR	**TT**	4.555	19.272	2.745	10.023	2.447
	Avg BPA	**TT**	4.782	19.305	2.877	10.043	2.534
	Avg IDWR	**TT**	5.041	19.339	2.877	10.043	2.534
Mid	**Avg_Flow**	**TT**	10.522	19.407	6.658	7.569	4.832
	Avg_HDR	**TT**	13.954	34.014	11.290	42.212	4.979
	Avg-BPA	**TT**	14.589	33.895	11.721	43.222	5.104
	Avg_IDWR	TT	15.903	34.339	11.721	43.222	5.104
Late	**Avg Flow**	TT	30.487	48.354	8.418	49.375	8.800
	Avg HDR	TT	37.917	56.708	18.083	49.375	19.727
	Avg BPA	TT	37.368	48.354	18.328	50.372	19.727
	Avg IDWR	TT	38.542	56.708	18.328	50.372	19.727

TT-day Am-ages			1991	1992	1993	1994	1995
	Avg ObsFlow	**TT**	15.188	28.613	5.938	22.322	5.359
	Avg HDR	**TT**	18.809	36.664	10.706	33.870	9.051
	Avg BPA	**TT**	18.913	33.851	10.975	34.545	9.122
	Avg IDWR	TT	19.829	36.795	10.975	34.545	9.122

Percent Decrease due to Augmentation			1991	1992	1993	1994	1995
	Avg ObsFlow	TT	-0.000	0.000	0.000	0.000	0.000
	Avg HDR	TT	19.249	21.961	44.538	34.094	40.786
	Avg BPA	**TT**	19.695	15.476	45.901	35.382	41.245
	Avg IDWR	**TT**	23.403	22.238	45.901	35.382	41.245

Median Travel Time for Spring/Summer Yearling Chinook, Fall Subyearling Chinook and Steelhead as Estimated using CRiSP. Fish were released at Lewiston and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

Data file	rls.	site	SpringlSummer Yearling Chiik	Fall Subyearling Chinook	Steelhead
91.dat	early	LGR	8.0	3.5	4.0
		LGRt	9.0	4.0	5.0
		IHR	19.5	20.0	22.0
		MCN	22.0	27.5	25.5
	mid.	LGR	5.5	3.5	2.0
		LGRt	6.0	4.0	2.5
		IHR	14.0	20.5	9.5
		MCN	16.5	28.5	12.0
	late	LGR	3.0	3.5	2.0
		LGRt	3.5	5.0	2.5
		IHR	10.5	24.0	9.5
		MCN	12.5	32.0	12.0
91.bpa.dat	early	LGR	8.0	3.5	3.5
		LGRt	9.0	4.c	5.0
		IHR	19.5	20.0	22.5
		MCN	22.5	27.5	26.5
	mid.	LGR	6.5	3.5	2.5
		LGRt	7.0	4.5	3.0
		IHR	16.0	21.0	10.5
		MCN	18.5	29.C	13.0
	late	LGR	3.0	3.5	2.0
		LGRt	3.5	5.3	2.5
		IHR	11.0	25.	9.5
		MCN	13.0	33.0	12.0
91.ldw.dat	early	LGR	8.0	3.5	3.5
		LGRt	9.0	4.03	5.0
		IHR	19.5	20.0	22.5
		MCN	22.5	27.5	26.5
	mid.	LGR	6.5	3.5	2.5
		LGRt	7.0	4.5	3.0
		IHR	16.0	21.0	10.5
		MCN	18.5	29.03	13.0
	late	LGR	3.0	0.5	2.0
		LGRt	3.5	5.5	2.5
		IHR	11.0	25.03	9.5
		MCN	13.0	33.03	12.0
91.hdr.dat	early	LGR	8.0	3.5	3.5
		LGRt	9.0	4.0	50.
		IHR	19.5	20.00	22.5
		MCN	22.5	27.5	26.5
	mid.	LGR	6.0	3.5	2.5
		LGRt	7.0	4.0	3.0
		IHR	15.0	21.00	10.0
		MCN	17.5	29.0	12.5
	late	LGR	3.0	3.5	2.0
		LGRt	3.5	5.5	2.5
		IHR	10.5	25.0	9.5
		MCN	12.5	33.0	12.0

Median Travel Time for Spring/Summer Yearling Chinook, Fall Subyearling Chinook and Steelhead as Estimated using CRiSP. Fish were released at Lewiston and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

Data tile	rls.	site	Spring/Summer Yearling Chinook	Fall Subyearling Chinook	Steelhead
92.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.0	4.5	4.5
		IHR	18.5	22.5	20.5
		MCN	21.5	30.0	24.5
	mid.	LGR	4.5	3.5	2.5
		LGRt	5.0	5.0	3.0
		IHR	13.5	21.5	12.0
		MCN	16.0	29.5	14.5
	late	LGR	4.0	3.5	2.5
		LGRt	4.5	5.5	3.0
		IHR	13.0	26.0	13.0
		MCN	16.0	35.0	16.5
92.bpa.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.0	4.5	4.5
		IHR	19.0	22.5	21.0
		MCN	22.0	30.5	25.0
	mid.	LGR	5.0	3.5	2.5
		LGRt	5.5	5.0	3.0
		IHR	14.5	22.5	13.0
		MCN	17.0	30.0	16.5
	late	LGR	4.5	3.5	2.5
		LGRt	5.0	5.5	3.5
		IHR	15.0	26.0	15.0
		MCN	18.0	34.5	18.5
92.idw.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.0	4.5	4.5
		IHR	19.0	22.5	21.0
		MCN	22.0	30.5	25.0
	mid.	LGR	5.0	3.5	2.5
		LGRt	5.5	5.0	3.0
		IHR	14.5	22.5	13.0
		MCN	17.0	30.0	16.5
	late	LGR	4.5	3.5	2.5
		LGRt	5.0	5.5	3.5
		IHR	15.0	26.5	15.0
		MCN	17.5	35.5	18.0
92.hdr.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.0	4.5	4.5
		IHR	19.0	22.5	21.0
		MCN	22.0	30.5	24.5
	mid.	LGR	5.0	3.5	2.5
		LGRt	5.5	5.0	3.0
		IHR	14.0	22.5	13.0
		MCN	17.0	30.0	16.0
	late	LGR	4.[illegible]	3.5	2.5
		LGRt	5.0	5.5	3.5
		IHR	14.5	26.5	15.0
		MCN	17.5	35.5	18.0

Median Travel Time for Spring/Summer Yearling Chinook, Fall Subyearling Chinook and Steelhead as Estimated using CRiSP. Fish were released at Lewiston and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

Data file	rls.	site	Spring/Summer YearlingChinook	F'all Subyearling Chinook	Steelhead
93.dat	early	LGR	7.5	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	18.0	21.0	20.5
		MCN	21.0	28.5	24.0
	mid.	LGR	4.0	3.5	2.0
		LGRt	4.5	4.0	2.0
		IHR	11.5	20.5	6.5
		MCN	13.5	26.5	9.0
	late	LGR	2.5	3.5	2.0
		LGRt	2.5	4.0	2.0
		IHR	8.0	20.5	8.0
		MCN	10.5	27.5	10.5
93.bpa.dat	early	LGR	7.5	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	18.5	21.0	20.5
		MCN	21.0	28.5	24.0
	mid.	LGR	4.5	3.5	3.0
		LGRt	5.0	4.5	2.0
		IHR	12.0	21.5	7.0
		MCN	14.0	28.0	9.0
	late	LGR	2.5	3.5	2.0
		LGRt	2.5	5.0	2.0
		IHR	9.0	22.0	8.5
		MCN	11.0	29.0	11.0
93.hdr.dat	early	LGR	7.5	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	18.5	21.0	20.5
		MCN	21.0	28.5	24.0
	mid,	LGR	4.0	3.5	2.0
		LGRt	4.5	4.5	2.0
		IHR	11.5	21.5	6.5
		MCN	13.5	28.0	9.0
	late	LGR	2.5	3.5	2.0
		LGRt	2.5	5.0	2.0
		IHR	8.5	22.0	8.0
		MCN	10.5	29.0	10.5

Median Travel Time for Spring/Summer Yearling Chinook, Fall Subyearling Chinook and Steelhead as Estimated using CRiSP. Fish were released at Lewiston and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

Data file	rls.	site	Spring/Summer Yearling Chinook	Fall Subyearling Chinook	Steelhead
94.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.0	4.0	4.5
		IHR	18.0	21.5	20.0
		MCN	20.5	29.0	23.5
	mid.	LGR	4.5	3.5	2.0
		LGRt	5.0	4.0	2.5
		IHR	12.5	19.0	9.5
		MCN	15.0	25.0	12.5
	late	LGR	3.5	3.5	2.5
		LGRt	4.0	5.5	3.0
		IHR	12.5	25.5	12.5
		MCN	15.0	34.0	16.0
94.bpa.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.5	4.0	4.5
		IHR	18.0	21.5	20.5
		MCN	21.0	29.5	24.5
	mid.	LGR	5.5	3.5	2.0
		LGRt	6.0	5.0	2.5
		IHR	14.0	22.5	10.5
		MCN	16.5	29.5	14.0
	late	LGR	4.0	3.5	2.5
		LGRt	4.5	5.5	3.0
		IHR	13.0	25.5	12.5
		MCN	15.5	34.5	16.0
94.hdr.dat	early	LGR	7.5	3.5	3.5
		LGRt	8.5	4.0	4.5
		IHR	18.0	21.5	20.5
		MCN	21.0	29.0	24.5
	mid.	LGR	5.5	3.5	2.0
		LGRt	6.0	5.0	2.5
		IHR	14.0	22.5	10.5
		MCN	16.5	29.5	14.0
	late	LGR	4.0	3.5	2.5
		LGRt	4.5	5.5	3.0
		IHR	13.0	25.5	12.5
		MCN	15.5	34.5	16.0

Median Travel Time for Spring/Summer Yearling Chinook, Fall Subyearling Chinook and Steelhead as Estimated using CRiSP. Fish were released at Lewiston and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

Data file	rls.	site	Spring/Summer YearlingChinook	Fall Subyearling Chinook	Steelhead
9S.dat	early	LGR	7.5	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	18.0	20.0	20.5
		MCN	21.0	27.0	23.5
	mid.	LGR	4.0	3.5	2.0
		LGRt	4.5	4.0	2.0
		IHR	11.5	20.0	8.0
		MCN	13.5	26.5	10.5
	late	LGR	3.0	3.5	1.5
		LGRt	3.0	4.0	2.0
		IHR	9.0	20.5	7.0
		MCN	11.0	27.0	9.5
9S.bpa.dat	early	LGR	7.5	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	19.0	20.0	21.0
		MCN	21.5	27.0	24.5
	mid.	LGR	4.5	3.5	2.0
		LGRt	5.0	4.0	2.0
		IHR	12.0	20.5	8.0
		MCN	14.0	27.0	11.0
	late	LGR	3.0	3.5	1.5
		LGRt	3.0	5.0	2.0
		IHR	9.0	22.5	7.0
		MCN	11.0	29.5	9.5
9S.hdr.dat	early	LGR	7.[illegible]	3.5	4.0
		LGRt	8.0	4.0	4.5
		IHR	19.0	20.0	21.0
		MCN	21.[illegible]	27.0	24.5
	mid.	LGR	4.[illegible]	3.5	2.0
		LGRt	5.0	4.0	2.0
		IHR	12.0	20.5	8.0
		MCN	14.0	27.0	10.5
	late	LGR	3.[illegible]	3.5	1.[illegible]
		LGRt	3.[illegible]	5.0	2.0
		IHR	9.[illegible]	22.5	7.0
		MCN	11.0	29.5	9.[illegible]

Decrease in Median Travel Time (in days) Attributable to Flow Augmentation Using the CRiSP model. Fish were released at Lewiston, ID and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

			Absolute Change in Travel Time with Flow Augmentation			Percentage change in Travel Time with Flow Augmentation		
Data file	rls.	site	Yearling Chinook	Subyearling Chinook	Steelhead	Yearling Chinook	Subyearling Chinook	Steelhead
91.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
91.bpa.dat	early	LGR	0.00	0.00	0.50	0.00	0.00	0.14
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	-0.50	0.00	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-1.00	0.00	-0.50	-0.15	0.00	-0.20
		LGRt	-1.00	-0.50	-0.50	-0.14	-0.11	-0.17
		IHR	-2.00	-0.50	-1.00	-0.13	-0.02	-0.10
		MCN	-2.00	-0.50	-1.00	-0.11	-0.02	-0.08
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-0.50	-1.00	0.00	-0.05	-0.04	0.00
		MCN	-0.50	-1.00	0.00	-0.04	-0.03	0.00
91.idw.dat	early	LGR	0.00	0.00	0.50	0.00	0.00	0.14
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	-0.50	0.00	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-1.00	0.00	-0.50	-0.15	0.00	-0.20
		LGRt	-1.00	-0.50	-0.50	-0.14	-0.11	-0.17
		IHR	-2.00	-0.50	-1.00	-0.13	-0.02	-0.10
		MCN	-2.00	-0.50	-1.00	-0.11	-0.02	-0.08
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-0.50	0.00	0.00	-0.09	0.00
		IHR	-0.50	-1.00	0.00	-0.05	-0.04	0.00
		MCN	-0.50	-1.00	0.00	-0.04	-0.03	0.00
91.hdr.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.14
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	-0.50	0.00	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-0.50	0.00	-0.50	-0.08	0.00	-0.20
		LGRt	-1.00	0.00	-0.50	-0.14	0.00	-0.17
		IHR	-1.00	-0.50	-0.50	-0.07	-0.02	-0.05
		MCN	-1.00	-0.50	-0.50	-0.06	-0.02	-0.04
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-0.50	0.00	0.00	-0.05	0.00
		IHR	0.00	-1.00	0.00	0.00	-0.04	0.00
		MCN	0.00	-1.00	0.00	0.00	-0.03	0.00

Decrease in Median Travel Time (in days)Attributable to Flow Augmentation Using the CRiSP model. Fish were released at Lewiston, ID and tracked through Lower Granite Darn (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

			Absolute Change in Travel Time with Flow Augmentation			Percentage change in Travel Time with Flow Augmentation		
92.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
92.bpa.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-0.50	0.00	-0.50	-0.03	0.00	-0.02
		MCN	-0.50	-0.50	-0.50	-0.02	-0.02	-0.02
	mid.	LGR	-0.50	0.00	0.00	-0.10	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.05	0.00	0.00
		IHR	-1.00	-1.00	-1.00	-0.07	-0.04	-0.08
		MCN	-1.00	-0.50	-2.00	-0.06	-0.02	-0.12
	late	LGR	-0.50	0.00	0.00	-0.11	0.00	0.00
		LGRt	4.X	0.00	-0.50	-0.10	0.00	-0.14
		IHR	-2.00	0.00	-2.00	-0.13	0.00	-0.13
		MCN	-2.00	0.X	-2.00	-0.11	0.01	-0.11
92.idw.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-0.50	0.00	-0.50	-0.02	0.00	-0.02
		MCN	-0.50	-0.50	-0.50	-0.02	-0.02	-0.02
	mid.	LGR	-0.50	0.00	0.00	-0.10	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.09	0.00	0.00
		IHR	-1.00	-1.00	-1.00	-0.07	-0.04	-0.08
		MCN	-1.00	-0.50	-2.00	-0.06	-0.02	-0.12
	late	LGR	-0.50	0.00	0.00	-0.1	0.00	0.00
		LGRt	-0.50	0.00	-0.50	-0.10	0.00	-0.14
		IHR	-2.00	-0.50	-2.00	-0.12	-0.02	-0.13
		MCN	-1.50	-0.50	-1.50	-0.09	4.01	-0.08
92.hdr.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-0.50	0.00	-0.50	-0.02	0.00	-0.02
		MCN	-0.50	-0.50	0.00	-0.02	-0.02	0.00
	mid.	LGR	-0.50	0.00	0.00	-0.10	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.09	0.00	0.00
		IHR	-0.50	-1.00	-1.00	-0.04	-0.04	-0.08
		MCN	-1.00	-0.50	-1.50	-0.06	-0.02	-0.05
	late	LGR	-0.50	0.00	0.00	-0.1	0.00	0.00
		LGRt	-0.50	0.00	-0.50	-0.10	0.00	-0.14
		IHR	-1.50	-0.50	-2.0	-0.10	-0.02	-0.12
		MCN	-1.50	-0.50	-1.50	-0.0	-0.0	-0.08

Decrease in Median Travel Time (in days)Attributable to Flow Augmentation Using the CRiSP model. Fish were released at Lewiston, ID and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

			Absolute Change in Travel Time with Flow Augmentation			Percentage change in Travel Time with Flow Augmentation		
93.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
93.bpa.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-0.50	0.00	0.00	-0.03	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	-0.50	0.00	0.00	-0.11	0.00	0.00
		LGRt	-0.50	-0.50	0.00	-0.10	-0.11	0.00
		IHR	-0.50	-1.a	-0.50	-0.04	-0.05	-0.07
		MCN	-0.50	-1.50	0.00	-0.04	-0.05	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-1.a	0.00	0.00	-0.20	0.00
		IHR	-1.a	-1.50	-0.50	-0.11	-0.07	-0.00
		MCN	-0.50	-1.50	-0.50	-0.05	-0.05	-0.05
93.hdr.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	4.x	0.00	0.00	-0.03	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-0.50	0.00	0.00	-0.1	0.00
		IHR	0.00	-1.00	0.00	0.00	-0.0	0.00
		MCN	0.00	-1.50	0.00	0.00	-0.0	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-1.00	0.00	0.00	-0.20	0.00
		IHR	-0.50	-1.50	0.00	-0.06	-0.0	0.00
		MCN	0.00	-1.50	0.00	0.00	-0.0	0.00

Decrease in Median Travel Time (in days)Attributable to Flow Augmentation Using the CRiSP model. Fish were released at Lewiston, ID and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

			Absolute Change in Travel Time with Flow Augmeutation			Percentage change in Travel Time with Flow Augmentatiou		
94.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
94.bpa.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.06	0.00	0.00
		IHR	0.00	0.00	-0.50	0.00	0.00	-0.02
		MCN	-0.50	-0.50	-1.00	-0.02	-0.02	-0.04
	mid.	LGR	-1.00	0.00	0.00	-0.18	0.00	0.00
		LGRt	-1.00	-1.00	0.00	-0.17	-0.20	0.00
		IHR	-1.50	-3.50	-1.00	-0.11	-0.16	-0.10
		MCN	-1.50	-4.50	-1.50	-0.09	-0.15	-0.11
	late	LGR	-0.50	0.00	0.00	-0.13	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.11	0.00	0.00
		IHR	-0.50	0.00	0.00	-0.04	0.00	0.00
		MCN	-0.50	-0.50	0.00	-0.03	-0.01	0.00
94.hdr.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.06	0.00	0.00
		IHR	0.00	0.00	-0.50	0.00	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-1.00	0.00	0.00	-0.18	0.00	0.00
		LGRt	-1.00	-1.00	0.00	-0.17	-0.20	0.0
		IHR	-1.50	-3.50	-1.00	-0.1	-0.16	-0.1
		MCN	-1.50	-4.50	-1.50	-0.09	-0.15	-0.1
	late	LGR	-0.50	0.00	0.00	-0.1	0.00	0.0
		LGRt	-0.50	0.00	0.00	-0.1	0.00	0.0
		IHR	-0.50	0.00	0.00	-0.0	0.00	0.0
		MCN	-0.50	-0.50	0.00	-0.0	-0.0	0.0

Decrease in Median Travel Time (in days)Attributable to Flow Augmentation Using the CRiSP model. Fish were released at Lewiston, ID and tracked through Lower Granite Dam (LGR), Lower Granite Tailrace (LGRt), Ice Harbor Dam (IHR) and McNary Dam (MCN).

			Absolute Change in Travel Time with Flow Augmentation			Percentage change in **Travel Time with Flow Augmentation**		
95.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	mid.	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	0.00	0.00	0.00	0.00	0.00	0.00
		MCN	0.00	0.00	0.00	0.00	0.00	0.00
95.bpa.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-1.00	0.00	-0.50	-0.05	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-0.50	0.00	0.00	-0.11	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.10	0.00	0.00
		IHR	-0.50	-0.50	0.00	-0.04	-0.02	0.00
		MCN	-0.50	-0.50	-0.50	-0.04	-0.02	-0.05
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-1.00	0.00	0.00	-0.20	0.00
		IHR	0.00	-2.00	0.00	0.00	-0.0	0.00
		MCN	0.00	-2.50	0.00	0.00	-0.08	0.00
95.hdr.dat	early	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	0.00	0.00	0.00	0.00	0.00
		IHR	-1.a	0.00	-0.50	-0.05	0.00	-0.02
		MCN	-0.50	0.00	-1.00	-0.02	0.00	-0.04
	mid.	LGR	-0.50	0.00	0.00	-0.11	0.00	0.00
		LGRt	-0.50	0.00	0.00	-0.10	0.00	0.00
		IHR	-0.50	-0.50	0.00	-0.04	-0.02	0.00
		MCN	-0.50	-0.50	0.00	-0.04	-0.02	0.00
	late	LGR	0.00	0.00	0.00	0.00	0.00	0.00
		LGRt	0.00	-1.00	0.00	0.00	-0 20	0.00
		IHR	0.00	-2.0	0.00	0.00	-0.0	0.00
		MCN	0.00	-2.50	0.00	0.00	-0.08	0.00

Average Percent and Average Absolute Decrease in Median Travel Time between Lewiston, ID and Lower Granite Tailrace for Subyearling Chinook. Comparison uses data from all 3 release groups (i.e., Early, Mid and Late) and contrasts Observed Flow to HDR-base flow.

Percent	LGRt: HDR	1991	1992	1993	1994	1995
	Mean %	-0.030	0.000	-0.104	-0.067	-0.067
	Mean % Dcr	0.030	0.000	0.104	0.067	0.067
	Mean %*100	3.030	0.000	10.370	6.667	6.667
Absolute	LGRt: HDR	1991	1992	1993	1994	1995
	Mean %	-0.167	0.000	-0.500	-0.333	-0.333
	Mean % Dcr	0.167	0.000	0.500	0.333	0.333
	Mean %*100	16.667	0.000	50.000	33.333	33.333

The mean difference in survival, over the three releases, between the gaged flow and the HDR-computed flow (gaged - augmentation)

Actual Flows

Yearling Chinook CRiSP	LGR	LGR Tail	IH
1991	85.10	79.93	61.23
1992	78.30	72.37	49.07
1993	88.73	84.17	65.23
1994	83.53	77.80	53.03
1995	88.87	84.33	65.50

HDR-Base

Yearling Chinook CRiSP	LGR	LGR Tail	IH
1991	84.60	79.30	60.40
1992	76.43	70.10	46.20
1993	88.73	84.13	64.80
1994	80.30	74.50	50.20
1995	88.37	83.73	64.37

Actual - HDR Base

Yearling Chinook CRiSP	LGR	LGR Tail	IH
1991	0.50	0.63	0.83
1992	1.87	2.27	2.87
1993	0.00	0.03	0.43
1994	3.23	3.30	2.83
1995	0.50	0.60	1.13

Steelhead CRiSP	LGR	LGR Tail	IH
1991	88.97	84.37	58.00
1992	82.03	76.37	37.70
1993	90.47	86.50	57.90
1994	84.60	79.33	39.07
1995	91.47	87.57	55.67

Steelhead CRiSP	LGR	LGR Tail	IH
1991	88.43	83.73	56.87
1992	80.67	74.23	34.17
1993	90.47	86.43	57.67
1994	84.37	79.07	38.17
1995	91.47	87.47	55.33

Steelhead CRiSP	LGR	LGR Tail	IH
1991	0.53	0.63	1.13
1992	1.37	2.13	3.53
1993	0.00	0.07	0.23
1994	0.23	0.27	0.90
1995	0.00	0.10	0.33

Subyearling Chinook CRiSP	LGR	LGR Tail	IH
1991	85.73	78.47	41.33
1992	82.83	73.50	33.00
1993	88.87	82.87	48.30
1994	83.67	74.90	33.37
1995	88.13	82.27	46.90

Subyearling Chinook CRiSP	LGR	LGR Tail	IH
1991	85.73	78.23	40.83
1992	82.83	73.00	32.37
1993	88.83	82.07	46.93
1994	83.67	73.90	31.03
1995	88.13	81.67	45.57

Subyearling Chinook CRiSP	LGR	LGR Tail	IH
1991	0.08	0.23	0.50
1992	0.08	0.50	0.63
1993	0.05	0.80	1.37
1994	0.08	1.00	2.33
1995	0.08	0.60	1.33

Mean Daily Mean Temperatures at Peck, Anatone
and Lower Granite Dam for 1981-1990

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-Jan	2.944	3.719	4.440
2-Jan	2.861	3.500	4.440
3-Jan	2.917	3.594	4.440
4-Jan	2.556	3.438	4.440
5-Jan	2.417	3.375	4.440
6-Jan	2.306	3.188	4.440
7-Jan	2.333	3.313	4.440
8-Jan	2.194	3.250	3.890
9-Jan	2.250	3.094	3.890
10-Jan	2.444	3.000	3.890
11-Jan	2.389	2.906	3.330
12-Jan	2.444	2.906	3.330
13-Jan	2.444	2.813	3.330
14-Jan	2.417	2.781	3.330
15-Jan	2.333	2.625	3.330
16-Jan	2.222	2.594	3.330
17-Jan	2.250	2.625	2.780
18-Jan	2.250	2.594	2.780
19-Jan	2.222	2.906	2.780
20-Jan	2.306	2.750	2.780
21-Jan	2.389	2.656	2.780
22-Jan	2.194	2.531	2.220
23-Jan	2.389	2.625	2.220
24-Jan	2.222	2.500	2.220
25-Jan	2.111	2.469	2.220
26-Jan	2.056	2.563	2.220
27-Jan	2.222	2.625	2.220
28-Jan	2.306	2.464	1.670
29-Jan	2.417	2.643	1.670
30-Jan	2.500	2.786	1.670
31-Jan	2.444	2.750	1.670
1-Feb	2.250	2.607	1.670
2-Feb	2.361	2.393	1.670
3-Feb	2.306	2.250	1.670
4-Feb	2.333	2.071	1.670
5-Feb	2.278	1.929	1.110
6-Feb	2.361	1.857	0.560
7-Feb	2.361	1.857	0.000
8-Feb	2.306	1.964	0.000
9-Feb	2.278	2.071	0.000
10-Feb	2.250	2.214	0.000
11-Feb	2.222	2.393	0.000
12-Feb	2.194	2.464	0.000
13-Feb	2.278	2.464	0.000
14-Feb	2.194	2.607	0.000
15-Feb	2.056	2.821	0.000
16-Feb	2.406	3.071	0.000
17-Feb	2.639	3.179	0.000
18-Feb	2.722	3.143	0.000
19-Feb	2.861	3.214	0.000
20-Feb	2.861	3.286	0.000
21-Feb	3.000	3.321	0.000
22-Feb	3.028	3.786	0.000
23-Feb	3.167	3.571	0.000
24-Feb	3.167	3.536	0.560
25-Feb	3.250	3.607	0.560
26-Feb	3.444	3.714	1.110
27-Feb	3.389	3.821	1.110
28-Feb	3.444	4.000	2.220

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-Mar	3.556	4.286	3.945
2-Mar	3.667	4.500	4.056
3-Mar	3.944	4.643	4.112
4-Mar	3.861	4.714	4.167
5-Mar	4.000	4.821	4.279
6-Mar	4.000	5.071	4.611
7-Mar	4.111	5.286	4.611
8-Mar	4.222	5.393	4.666
9-Mar	4.333	5.643	4.833
10-Mar	4.444	6.063	5.112
11-Mar	4.500	6.375	5.312
12-Mar	4.444	6.031	5.391
13-Mar	4.472	6.094	5.563
14-Mar	4.500	6.188	5.612
15-Mar	4 528	6.250	5.667
16-Mar	4.667	6.656	5.778
17-Mar	4.667	6.344	5.889
18-Mar	4 750	6.625	5.889
19-Mar	4.694	6.906	5.833
20-Mar	4.972	7.125	6.111
21-Mar	5.139	7.375	6.390
22-Mar	5.139	7.406	6.502
23-Mar	5.083	7.406	6.502
24-Mar	4.972	7.313	6.496
25-Mar	5.111	7.375	6.613
26-Mar	5.306	7.531	6.757
27-Mar	5.278	7.688	6.945
28-Mar	5.278	7.406	6.944
29-Mar	5.167	7.438	7.277
30-Mar	5.167	7.406	7.222
31-Mar	5.250	7.781	7.445
1-Apr	5.472	8.361	7.520
2-Apr	5.694	8.583	7.722
3-Apr	5.833	8.472	7.954
4-Apr	5.778	8.583	7.795
5-Apr	5.778	8.667	8.112
6-Apr	6.028	9.028	8.066
7-Apr	6.194	9.306	8.250
8-Apr	6.111	9.194	8.455
9-Apr	6.194	9.139	8.688
10-Apr	6 361	9.278	8.830
11-Apr	6.500	9.472	8.897
12-Apr	6.444	9.611	9.069
13-Apr	6.528	9.611	9.197
14-Apr	6 750	10.056	9.164
15-Apr	6.833	10.417	9.436
16-Apr	7.250	10.694	9.363
17-Apr	7 250	10.722	9.515
18-Apr	7.028	10.583	9.669
19-Apr	6.889	10.639	9.968
20-Apr	6.917	10.861	10.121
21-Apr	7 083	10.861	10.109
22-Apr	7.417	10.917	10.076
23-Apr	7 611	10.972	10.085
24-Apr	7.500	10.889	10.159
25-Apr	6.889	10.528	10.065
26-Apr	6.722	10.333	10.017
27-Apr	6.889	10.583	10.028
28-Apr	7.083	10.750	10.031
29-Apr	7.028	10.889	10.114
30-Apr	7 250	11.167	10.167

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1981-1190

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-May	7.306	11.278	10.149
2-May	7.417	11.111	10.422
3-May	7.528	11.444	10.181
4-May	7.361	11.500	10.834
5-May	7.444	11.639	11.065
6-May	7.472	11.861	10.880
7-May	7.500	11.611	10.958
8-May	7.972	11.694	11.016
9-May	7.833	11.833	10.994
10-May	8.056	12.083	10.702
11-May	8.167	12.111	10.941
12-May	8.222	12.444	11.212
13-May	8.250	12.583	11.398
14-May	8.333	12.694	11.530
15-May	8.083	12.500	11.633
16-May	7.944	12.611	11.632
17-May	8.250	12.722	11.714
18-May	8.778	12.889	11.786
19-May	8.972	12.833	12.027
20-May	9.222	12.861	12.255
21-May	9.306	12.806	12.326
22-May	9.333	12.917	12.446
23-May	9.528	13.250	12.405
24-May	9.500	13.222	12.578
25-May	9.250	13.194	12.617
26-May	9.472	13.361	12.739
27-May	9.528	13 250	12.835
28-May	9.611	13.111	12.908
29-May	9.694	13.028	12.844
30-May	9.694	13.156	13.037
31-May	9.500	13.188	12.902
1-Jun	9.222	13.250	12.748
2-Jun	9.583	13.469	12.472
3-Jun	9.917	13.906	12.548
4-Jun	10.472	14.313	12.849
5-Jun	10.556	14.406	13.168
6-Jun	10.944	14.781	13.370
7-Jun	11.083	14.750	13.593
8-Jun	11.028	14.781	13.828
9-Jun	11.167	15.000	13.764
10-Jun	11.556	15.344	13.877
11-Jun	11.500	15.188	13.953
12-Jun	11.583	15.313	14.087
13-Jun	11.833	15.500	14.284
14-Jun	12.111	15.719	14.785
15-Jun	12.139	15.969	14.856
16-Jun	12.444	16.031	15.009
17-Jun	12.444	16.125	15.139
18-Jun	12.500	16.156	15.268
19-Jun	12.583	16.344	15.533
20-Jun	12.694	16.406	15.579
21-Jun	12.806	16.531	15.883
22-Jun	13.028	16.844	16.033
23-Jun	13.583	17.156	16.077
24-Jun	14.083	17.563	16.396
25-Jun	14.472	17.938	16.899
26-Jun	14.667	18.344	17.160
27-Jun	14.889	18.469	17.379
28-Jun	14.944	18.406	17.336
29-Jun	14.694	18.344	17.771
30-Jun	14.917	18.719	17.958

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-Jul	15.333	18.906	18.175
2-Jul	15.167	18.719	18.255
3-Jul	15.278	18.656	18.526
4-Jul	15.528	18.906	18.694
5-Jul	15.694	19.000	18.811
6-Jul	16.139	19.125	18.939
7-Jul	16.222	19.250	19.215
8-Jul	16.056	19.188	19.235
9-Jul	15.972	19.250	19.503
10-Jul	16.000	19.500	19.646
11-Jul	16.028	19.750	19.760
12-Jul	16.167	19.844	20.015
13-Jul	16.083	20.125	20.034
14-Jul	16.556	20.344	20.147
15-Jul	16.833	20.531	20.294
16-Jul	16.444	20.125	20.180
17-Jul	16.333	20.000	20.226
18-Jul	16.528	20.219	20.580
19-Jul	16.861	20.625	20.751
20-Jul	16.861	21.125	20.944
21-Jul	17.056	21.250	21.015
22-Jul	17.278	21.250	21.166
23-Jul	17.194	21.313	21.105
24-Jul	17.250	21.250	21.283
25-Jul	16.944	21.281	21.618
26-Jul	16.861	21.375	21.882
27-Jul	16.611	21.438	21.940
28-Jul	16.722	21.906	21.899
29-Jul	17.056	21.844	21.972
30-Jul	17.306	22.031	22.050
31-Jul	17.194	21.906	21.884
1-Aug	17.639	21.813	21.910
2-Aug	18.000	21.719	22.009
3-Aug	17.861	21.750	22.164
4-Aug	17.778	22.000	22.344
5-Aug	17.833	22.250	22.336
6-Aug	17.694	22.375	22.291
7-Aug	17.472	22.406	22.466
8-Aug	17.611	22.375	22.700
9-Aug	17.972	22.500	22.850
10-Aug	17.694	22.688	22.799
11-Aug	17.444	22.531	22.561
12-Aug	17.111	22.313	22.790
13-Aug	17.000	22.406	22.779
14-Aug	16.750	22.344	22.733
15-Aug	16.972	22.188	22.580
16-Aug	17.306	22.000	22.472
17-Aug	17.139	22.000	22.654
18-Aug	16.722	21.875	22.493
19-Aug	16.472	21.875	22.435
20-Aug	15.889	21.813	22.316
21-Aug	15.250	21.656	22.386
22-Aug	15.194	21.688	22.298
23-Aug	14.972	21.656	22.216
24-Aug	14.889	21.375	22.024
25-Aug	15.000	21.313	21.931
26-Aug	15.361	21.438	22.022
27-Aug	15.500	21.406	22.263
28-Aug	15.361	21.531	21.996
29-Aug	14.944	21.438	21.971
30-Aug	14.944	21.406	21.565
31-Aug	14.583	21.281	21.452

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1981-1990

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-Sep	14.778	21.313	21.504
2-Sep	14.500	21.250	21.349
3-Sep	14.528	21.219	21.293
4-Sep	14.333	21.219	21.240
5-Sep	13.750	21.281	21.222
6-Sep	13.139	21.219	21.021
7-Sep	12.722	21.125	20.948
8-Sep	12.278	20.969	20.732
9-Sep	12.333	20.938	20.605
10-Sep	12.250	20.656	20.333
11-Sep	12.000	20.281	20.143
12-Sep	11.944	20.031	19.822
13-Sep	11.972	19.875	19.714
14-Sep	12.000	19.938	19.514
15-Sep	11.972	19.688	19.386
16-Sep	11.917	19.563	18.984
17-Sep	11.861	19.406	19.184
18-Sep	11.861	19.281	18.308
19-Sep	12.028	18.875	18.066
20-Sep	11.972	18.656	17.752
21-Sep	11.972	18.469	17.820
22-Sep	12.000	18.531	17.769
23-Sep	11.917	18.500	17.929
24-Sep	11.722	18.531	17.970
25-Sep	11.694	18.406	17.837
26-Sep	11.611	18.250	17.524
27-Sep	11.611	18.143	17.344
28-Sep	11.583	17.714	17.233
29-Sep	11.556	17.500	17.162
30-Sep	11.611	17.429	17.079
1-Oct	NA#	NA#	17.066
2-Oct	NA#	NA#	16.882
3-Oct	NA#	NA#	16.653
4-Oct	NA#	NA#	16.536
5-Oct	NA#	NA#	16.187
6-Oct	NA#	NA#	15.756
7-Oct	NA#	NA#	15.710
8-Oct	NA#	NA#	15.574
9-Oct	NA#	NA#	15.501
10-Oct	NA#	NA#	15.353
11-Oct	NA#	NA#	15.223
12-Oct	NA#	NA#	15.167
13-Oct	NA#	NA#	15.269
14-Oct	NA#	NA#	15.072
15-Oct	NA#	NA#	15.121
16-Oct	NA#	NA#	15.025
17-Oct	NA#	NA#	14.717
18-Oct	NA#	NA#	14.599
19-Oct	NA#	NA#	14.218
20-Oct	NA#	NA#	14.153
21-Oct	NA#	NA#	14.080
22-Oct	NA#	NA#	13.904
23-Oct	NA#	NA#	13.629
24-Oct	NA#	NA#	13.641
25-Oct	NA#	NA#	13.596
26-Oct	NA#	NA#	13.378
27-Oct	NA#	NA#	13.161
28-Oct	NA#	NA#	13.152
29-Oct	NA#	NA#	13.173
30-Oct	NA#	NA#	12.983
31-Oct	NA#	NA#	12.971

Date	Peck Avg.Temp	Anatone Avg.Temp	Lower Granite Avg.Temp
1-Nov	NA#	NA#	12.442
2-Nov	NA#	NA#	12.236
3-Nov	NA#	NA#	12.107
4-Nov	NA#	NA#	11.795
5-Nov	NA#	NA#	11.345
6-Nov	NA#	NA#	11.095
7-Nov	NA#	NA#	11.046
8-Nov	NA#	NA#	10.998
9-Nov	NA#	NA#	10.713
10-Nov	NA#	NA#	10.541
11-Nov	NA#	NA#	10.330
12-Nov	NA#	NA#	10.252
13-Nov	NA#	NA#	10.377
14-Nov	NA#	NA#	10.286
15-Nov	NA#	NA#	10.120
16-Nov	NA#	NA#	9.891
17-Nov	NA#	NA#	9 643
18-Nov	NA#	NA#	9.448
19-Nov	NA#	NA#	9 255
20-Nov	NA#	NA#	9 050
21-Nov	NA#	NA#	9 019
22-Nov	NA#	NA#	8.797
23-Nov	NA#	NA#	8.563
24-Nov	NA#	NA#	8.360
25-Nov	NA#	NA#	8.309
26-Nov	NA#	NA#	8.175
27-Nov	NA#	NA#	7 989
28-Nov	NA#	NA#	7.844
29-Nov	NA#	NA#	7 695
30-Nov	NA#	NA#	7 495
1-Dec	NA#	NA#	7.279
2-Dec	NA#	NA#	7.057
3-Dec	NA#	NA#	6.946
4-Dec	NA#	NA#	6 778
5-Dec	NA#	NA#	6 778
6-Dec	NA#	NA#	6 556
7-Dec	NA#	NA#	6 334
8-Dec	NA#	NA#	6 224
9-Dec	NA#	NA#	6 112
10-Dec	NA#	NA#	5.889
11-Dec	NA#	NA#	5.834
12-Dec	NA#	NA#	5.723
13-Dec	NA#	NA#	5 611
14-Dec	NA#	NA#	5.667
15-Dec	NA#	NA#	5 370
16-Dec	NA#	NA#	5.000
17-Dec	NA#	NA#	5.000
18-Dec	NA#	NA#	5.000
19-Dec	NA#	NA#	5.000
20-Dec	NA#	NA#	NA#
21-Dec	NA#	NA#	NA#
22-Dec	NA#	NA#	NA#
23-Dec	NA#	NA#	NA#
24-Dec	NA#	NA#	NA#
25-Dec	NA#	NA#	NA#
26-Dec	NA#	NA#	NA#
27-Dec	NA#	NA#	NA#
28-Dec	NA#	NA#	NA#
29-Dec	NA#	NA#	NA#
30-Dec	NA#	NA#	NA#
31-Dec	NA#	NA#	NA#

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PEC K					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
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l-Jan	3.00	2.50	2.00	3.00		2.00	4.30	3.50	3.30	1.30					
2-Jan	3.00	2.30	2.00	3.00		2.00	4.00	2.80	3.30	1.30		6.11			
3-Jan	3.00	2.30	2.00	3.00		2.00	4.00	2.80	3.50	1.50		6.11			
4-Jan	3.00	2.00	2.00	3.30		2.00	4.00	3.30	3.80	1.50		6.11			
5-Jan	3.00	2.30	2.50	3.50		1.70	4.00	3.00	4.30	1.50		6.11			
6-Jan	3.00	2.30	2.50	3.30		1.70	4.30	2.80	4.30	1.50		6.11			
7-Jan	3.00	2.30	2.00	3.00		2.30	4.50	3.00	3.80	1.80					
8-Jan	3.00	2.30	2.00	3.30		2.50	4.30	2.80	3.80	2.30					
9-Jan	3.00	2.30	2.00	3.30		2.50	4.00	2.30	3.80	2.30					
1 O-Jan	3.00	2.30	2.50	3.80		2.50	3.80	1.80	4.30	2.30					
11 -Jan	3.00	2.30	3.00	3.80		2.70	4.00	1.80	4.30	2.30					
12-Jan	3.00	2.30	3.00	4.00		2.70	4.00	1.80	4.30	3.00					
13-Jan	2.80	2.30	2.50	4.00		3.00	4.00	2.00	4.80	3.80					
14-Jan	2.30	2.50		4.00		1.70	4.00	2.30	4.50	4.00					
15Jan	2.00	2.50		4.00		1.50	4.00	2.50	4.30	4.30					
16-Jan	2.00	2.50		3.80		1.50	4.00	2.80	4.00	4.00					
17-Jan	2.00	2.80		4.30		2.50	4.00	2.50	3.80	3.80					
18-Jan	2.00	2.30		3.80		3.30	4.00	2.50	3.80	3.80					
19-Jan	2.30	2.00		3.30		2.70	3.80	2.30	3.30	3.80					
20-Jan	2.30	1.50		2.80		1.80	3.30	2.30	3.00	3.30					
21-Jan	2.30	1.30		2.80		1.50	3.30	2.80	2.80	3.00					
22-Jan	2.30	1.30		2.80		1.80	3.50	2.50	3.30	2.30					
23-Jan	2.00	1.30		2.80		1.80	3.50	2.30	3.30	1.80					
24-Jan	2.00	1.30		2.80		1.80	4.00	2.30	3.30	2.30					
25Jan	2.30	1.30		3.30		1.80	4.30	2.50	3.30	2.30					
26-Jan	2.30	1.30		3.30		1.80	4.30	2.80	3.80	3.00					
27-Jan	2.30	1.30		3.80	1.80	1.80	4.00	2.80	3.80	3.50					
28-Jan	2.00	1.30		3.50	2.50	1.00	4.30	2.50	3.80	3.80					
29-Jan	2.00	1.30		3.50	2.80	1.00	4.80	2.80	3.30	3.80					
30-Jan	2.00	1.80		3.30	2.80	1.00	5.00	2.30	2.80	3.80					
3 l -Jan	1.80	1.80		2.80	3 00	1.30	9.50	2.30	2.30	4.50					

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
I-Feb	1.30	2.00		2.50	3.00	1.50	4.50	1.80	2.30	5.30					
2-Feb	1.00	2.30		2.50	2.80	1.80	4.80	1.80	2.00	5.30					
3-Feb	1.30	2.30		2.50	3.30	2.30	4.30	1.80	1.80	4.80					
4-Feb	0.80	1.80		2.50	3.50	2.80	3.80	2.00	1.80	5.00					
5Feb	0.80	1.00		2.50	4.00	3.30	3.50	2.00	2.00	5.30					
6-Feb	1.00	0.50		2.80	4.30	2.70	3.30	2.30	1.80	5.00					
7-Feb	1.00	0.50	2.30	3.30	4.00	2.70	3.50	2.50	1.80	5.00					
8-Feb	1.00	0.80	2.30	3.00	4.50	2.70	3.80	2.30	1.80	4.80					
9-Feb	0.80	1.50	2.30	2.50	4 00	3.30	4.50	2.80	1.80	4.50					
IO-Feb	0.80	2.00	2.50	2.50	4.00	3.30	4.80	3.00	1 80	4.30					
1I-Feb	1.00	2.30	2.80	2.50	3.50	3.30	4.80	3.30	1.80	4.30					
12-Feb	0.80	2.50	2.80	2.50	2.50	3.50	4.80	3.50	2.30	3.50					
13-Feb	1.30	3.00	3.00	2.50	1.30	3.80	5.30	3.80	2.30	2.80					
14-Feb	1.30	3.30	3.30	2.80	0.80	4.50	5.50	3.80	2.50	2.30					
15-Feb	1.80	2.80	2.50	2.80	1.00	5.00	5.30	3.00	3.00	2.50					
16-Feb	2.30	2.80	2.30	2.80	1.00	4.80	5 00	2.00	3.30	3.00					
17-Feb	2.30	2.50	2.80	3.00	1.30	4.50	5.30	1.30	3.80	3.50					
18-Feb	2.80	2.30	2.50	3.30	1.80	4.30	4.80	1.50	3.80	3.80					
19-Feb	3.00	2.50	2.00	3.30	2.30	4.30	5.30	1.80	3.80	4.80					
20-Feb	3.30	3.30	2.00	3.00	3.30	5.00	6.00	2.00	3.50	6.00					
21-Feb	3.30	3.30	2.30	3.30	3.80	5.50	6.30	2.50	3 30	6.30					
22-Feb	3.30	3.50	2.50	3.80	4.30	5.50	6.50	2.50	3 50	6.30					
23-Feb	3.30	3.80	2.50	3.80	4.30	5.30	6.50	2.30	3.50	5.80					
24-Feb	3.00	3.80	2.50	3.50	4.30	4.50	6.80	2.30	3.30	6.30					
25-Feb	3.30	3.80	2.50	3.30	4.30	4.50	7.30	2.00	2.80	6.80					
26-Feb	3.00	4 30	2.50	3.00	4.80	4.50	7.00	2.00	3.50	7.00					
27-Feb	2.80	4.50	2.50	3.50	4.80	4.50	6.80	2.30	4.00	6.00					
28-Feb	2.80	4.50	2.50	3.80	3.80	4.50	6.80	2.50	4.50	5.30					

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Darn for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	I991	1992	1993	1994	1995
1 -Mar	3.00	4.30	2.80	4.50	2.80	4.80	7.00	2.50	5.50	4.50	4.44	6.67	1.67	4.44	
2-Mar	2.80	4.30	3.30	4.80	2.30	5.00	7.30	3.00	6.00	4.50	4.44	6.11	1.67	4.44	
3-Mar	2.80	4.80	3.50	5.00	2.30	5.30	7.50	3.00	6.30	4.80	4.44	6.67	1.67	5	
4-Mar	3.50	4.80	3.30	4.80	2.50	5.50	7.80	2.80	6.30	5.30	3.89	6.67	1.67	5	
5-Mar	3.80	5.30	3.80	4.30	3.00	5.50	7.00	3.50	5.50	5.30	3.89	6.67	1.67	5	
6-Mar	3.30	4.80	4.50	3.80	3.30	4.80	7.00	4.30	5.00	5.30	3.89	7.22	1.67	5	
7-Mar	2.80	4.30	4.80	4.00	3.50	4.30	7.50	4.80	4.50	5.30	3.89	7.78	1.67	6.11	
g-Mar	2.80	4.30	4.30	4.00	3.30	4.50	7.80	4.80	4.80	5.50	4.44	7.78	2.22	6.11	
9-Mar	3.00	4.50	4.50	4.30	3.30	4.80		5.30	4.80	5.80	5	7.78	2.22	6.67	
1 O-Mar	3.30	5.00	4.50	4.30	3.80	5.30		5.00	5.50	6.30	5	7.78	2.78	6.67	
11 -Mar	2.80	4.50	4.00	4.50	4.50	5.30		4.50	6.00	7.00	5	7.78	3.33	6.67	6.67
12-Mar	3.00	4.30	4.00	4.80	5.30	5.50		4.00	6.30	7.30	5	7.78	3.33	6.1 1	6.67
13-Mar	3.30	4.50	4.30	5.30	5.30	5.50		4.50	6.30	6.80	5		3.33	6.11	6.67
14-Mar	3.50	4.50	4.50	5.80	5.00	6.00		5.00	6.30	7.00	5		3.33	5.56	6.67
15-Mar	3.80	5.00	4.80	5.80	5.30	5.80		5.50	6.80	7.30	5		5	5.56	6.67
16-Mar	3.80	5.50	4.50	6.50	5.30	5.50		5.30	7.00	7.00	5		5	6.11	7.22
17-Mar	3.80	5.00	5.00	5.80	5.80	6.00		5.80	6.50	7.00	5		5	6.67	7.22
1g-Mar	3.80	5.00	5.80	5.50	5.50	6.30		6.30	6.30	7.50	5.56		5	6.67	7.78
19-Mar	3.80	4.80	5.50	5.30	5.30	6.30		6.00	5.80	7.80	5.56		5	6.67	7.78
20-Mar	4.50	4.50	5.30	5.30	5.30	7.30		6.30	5.50	7.80	5.56		5	6.67	7.78
21 Mar	4.50	5.00	5.00	5.30	5.80	7.00		6.30	6.00	7.80	5.56		5.56	6.67	7.78
22 Mar	4.30	5.00	5.50	5.30	5.80	6.80		6.50	5.80	7.30	5.56		6. I 1	6.67	7.78
23-Mat	4.00	5.00	6.00	5.50	5.50	6.50		6.80	5.50	7.00	5.56		6.67	7.22	7.78
24-Mar	3.80	5.00	5.80	5.50	5.30	6.80		6.30	6.00	7.30	6.11		5.56	7.22	8.33
25-Mar	3.80	5.00	6.00	5.50	4.80	6.30		6.30	6.80	6.80	6.11		5	7.22	8.33
26-Mar	3.80	5.50	6.30	6.00	4.80	6.00		6.50	7.30	7.00	6.11		6.11	7.22	8.33
27-Mar	4.00	5.80	6.50	6.50	4.80	6.80		7.30	8.00	7.30	6.11		6.67	7.22	8.33
28-Mar	4.00	5.50	6.50	7.00	5.00	6.80		7.80	8.80	7.80	6.11		6.67	7.22	7.78
29-Mar	4.00	5.80	6.80	7.50	5.50	7.00		7.80	9.30	7.80	6.67		6.11	7.22	8.33
30-Mar	5.00	5.50	6.80	7.80	5.50	7.80		7.50	9.00	8.00	6.67		6.11	7.22	8.33
3 1 -Mar	6.00	5.80	6.80	8.00	6.00	8.80		8.00	9.00	8.50	6.67	6.67	7.78	7.78	8.33

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	I993	1994	1995	1991	1992	1993	1994	199s
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1-Apr	7.00	6.30	7.00	7.50	6.30	9.50		8.30	9.00	9.30	7.78	10	7.78	8.75	7.95
2-Apr	7.50	7.00	6.80	7.50	6.00	9.80		8.50	9.80	9.00	7.78	10	7.78	9.44	8.11
3-Apr	6.50	7.50	7.30	8.00	6.50	9.30		8.80	10.00	9.00	8.89	10.56	8.33	9.44	8.66
4-Apr	5.80	7.80	7.00	7.00	6.80	9.00		8.00	8.80	9.50	8.33	10.56	8.33	9.55	8.93
5-Apr	6.00	7.50	6.30	6.30	7.50	9.00		7.50	8.30	9.50	8.89	10	8.33	9.88	9.38
6-Apr	6.30	6.30	6.50	6.80	8.00	9.30		8.00	8.80	10.00	8.89	10.56	8.33	10.36	9.52
7-Apr	5.50	5.00	7.30	6.80	7.80	8.00		8.50	8.50	9.80	9.44	10.56	7.78	10.2	9.63
8-Apr	4.80	4.00	7.30	6.50	7.30	8.30		9.00	8.30	9.50	9.44	11.11	7.78	10.5	9.47
9-Apr	5.30	3.80	7.30	7.30	6.50	8.50		8.80	8.80	9.00	9.44	11.11	8.95	10.2	9.91
IO-Apr	4.80	3.80	6.80	7.50	6.00	8.00		8.30	9.00	8.50	9.44	11.11	9.37	9.91	10.23
11-Apr	5.00	4.50	6.50	8.30	6.30	7.80		8.50	9.30	9.30	9.44	11.11	9.37	10.46	10.03
12-Apr	5.00	4.80	6.80	8.30	6.00	9.00		8.50	9.80	9.30	10	10	9.38	10.89	9.64
13-Apr	6.00	5.50	7.00	7.30	6.00	9.30		8.50	9.00	9.00	10	9.44	9.24	10.02	9.23
14-Apr	6.30	6.30	7.50	7.30	6.00	9.50		9.30	9.30	9.00	11.11		9.41	9.8	9.03
15-Apr	6.30	6.80	6.80	7.50	5.80	9.30		9.30	10.00	8.50	11.11	9.44	9.38	10.83	8.96
16-Apr	6.50	7.30	7.00	8.50	6.00	9.00		9.30	11.00	8.80	11.11	10.52	9.78	11.32	8.8
I7-Apr	6.50	7.30	7.30	9.80	6.30	9.30		9.80	12.00	9.00	10.15	10.71	10.06	11.59	8.74
18. Apr	7.00	7.50	7.30	10.30	6.50	10.00		10.00	12.80	9.30	9.77	11 21	9.78	12.47	8.67
19-Apr	7.50	6.50	7.00	9.50	6.30	11.30		9.80	12.50	9.30	10.47	12.64	9.94	11.81	8.83
20-Apr	8.00	5.80	7.30	8.80	6.00	11.30		10.00	12.50	8.80	9.95	12.67	10.18	13.01	9
21-Apr	8.30	6.50	7.30	8.50	6.30	11.80		10.00	12.30	9.30	9.84	12.25	10.36	13.3	
22-Apr	8.80	6.50	7.00	7.80	6.30	12.30		10.00	11.30	9.80	10.08	11.96	10.31	13.32	9.14
23-Apr	8.30	5.80	6.80	7.00	6.80	12.30		10.30	10.80	10.80	11.2	11.61	10.4	13.05	9.41
24-Apr	7.80	4.80	7.30	7.80	6.80	11.50		10.50	11.00	11.30	11.43	11.93	10.47	11.95	9.72
25-Apr	6.50	4.80	7.30	7.50	7.00	10.50		11.00	10.30	11.50	11.22	12.05	10.82	10.95	9.8
26-Apr	5.50	5.30	7.50	7.50	6.80	9.80		11.00	10.50	11.50	11.48	11.3	10.44	10.76	10.46
27-Apr	5.00	5.80	7.30	7.30	6.50	9.80		10.50	10.30	11.80	11.33	10.85	10.66	11.29	10.77
28-Apr	5.00	7.30	7.30	7.30	6.80	10.00	13.50	10.30	10.80	11.80	10.75	11.9	11.02	11.07	10.82
29-Apr	5.50	8.30	7.30	7.30	6.80	10.30	14.00	10.50	10.80	11.00	9.85	11.68	10.82	11.29	10.54
30-Apr	5.50	8.00	7.80	7.30	6.80	10.00	13.50	10.80	11.30	10.30	10.04	11.97	10.79	11.09	10.45

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PEC K					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
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l-May	6.30	7.80	7.50	7.50	6.80	11.50	12.50	10.50	10.80	10.30	8.27	13.03	10.99	11.01	10.43
2-May	6.80	6.50	8.50	8.30	6.50	11.80	12.50	11.00	11.50	10.50	8.28	13.54	11	10.95	10.14
3-May	6.80	6.50	8.00	8.30	6.80	11.80	13.00	10.50	11.80	10.50	8.63	13.17	10.99	10.93	10.19
4-May	6.50	7.00	7.30	8.50	7.30	12.00	13.50	10.00	12.50	10.50	9.38	12.55	10.81	11.48	10.08
5-May	6.80	7.50	7.50	8.50	7.30	12.50	13.50	10.00	12.80	10.50	10.02	12.5	11.06	12.25	10.08
6-May	7.00	8.00	8.30	9.30	7.00	12.50	14.30	10.80	13.30	10.30	9.88	13.21	10.28	12.41	10.17
7-May	7.50	8.50	7.80	9.50	7.00	12.50	14.80	10.30	14.00	10.30	9.97	13.44	10.4	12.8	10.19
8-May	7.80	8.00	7.30	10.00	7.80	12.50	14.30	10.50	14.50	10.50	9.9	13.46	10.93	13.15	10.13
9-May	6.80	7.80	7.30	10.50	8.50	11.30	13.00	10.80	14.80	11.30	9.87	13.7	11.01	13.93	10.31
1 O-May	5.80	7.50	8.50	10.80	8.30	10.30	12.80	12.00	14.50	11.80	10.76	13.6	11.28	14.35	10.62
11 -May	6.00	6.80	9.50	10.30	8.30	9.30	12.50	13.30	14.00	11.30	10.9	13.17	11.82	14.73	11.32
12-May	6.30	7.00	9.50	10.50	8.30	10.00	12.50	13.50	14.30	10.80	10.22	12.89	12.76	14.88	11.38
13-May	6.50	7.50	9.30	9.50	7.80	11.00	12.80	13.30	13.30	10.80	9.46	12.6	13.26	14.72	11.53
14-May	6.80	7.00	9.00	9.00	8.30	11.30	13.30	12.80	13.00	10.80	9.7	13.1	13.4	14.77	11.67
15-May	6.50	7.50	8.80	8.50	8.80	11.80	14.30	12.80	12.80	11.50	9.88	12.69	13.11	14.01	11.51
16-May	7.30	8.30	8.80	9.30	9.00	13.00	14.50	12.80	12.50	12.30	10	12.89	12.62	13.33	11.53
17-May	7.00	8.30	8.80	9.00	9.80	12.50	14.80	12.50	12.30	12.50	10.1	13.32	12.35	12.85	11.93
18-May	6.80	9.30	9.00	8.50	9.50	12.00	15.30	12.80	12.00	12.50	10.28	13.36	12.38	12.53	12.44
19-May	6.50	9.80	9.30	9.00	9.50	11.30	15.50	13.00	12.50	12.50	10.33	13.93	12.42	12.39	12.91
20-May	7.50	10.50	9.30	8.80	9.50	11.30	15.50	12.80	12.80	13.00	10.3	14.59	12.6	11.94	13.15
21-May	7.50	10.50	9.00	9.00	10.00	12.30	14.50	12.80	12.80	13.00	10.32	15.22	12.62	12.32	13.21
22-May	8.80	9.30	8.80	9.30	9.80	13.00	14.30	12.30	13.50	13.00	10.73	15.99	12.48	12.45	13.25
23-May	8.50	9.00	9.00	9.50	9.80	13.50	15.50	12.50	14.30	13.00	11.25	15.91	12.26	12.8	13.57
24-May	8.00	9.50	9.30	10.00	9.80	13.50	16.30	13.30	15.30	13.00	11.83	15.47	12.59	13.58	13.6
25-May	8.30	10.00	9.80	10.50	9.80	13.00	17.00	14.00	16.00	12.80	12.02	16.45	12.84	14.22	13.37
26-May	7.00	10.50	10.80	10.80	9.50	12.30	17.50	14.50	16.30	12.50	11.98	15.03	13.7	14	13.39
27-May	7.30	10.50	10.50	11.50	9.30	12.00	16.80	14.30	15.80	12.80	12.08	15.45	13.97	14.62	13.47
28-May	7.00	10.00	10.50	11.50	10.50	12.30	16.50	14.30	14.50	13.50	11.95	16.04	13.95	14.84	13.4
29-May	8.00	10.00	10.50	10.50	11.30	13.00	16.80	13.80	13.50	14.00	11.58	15.85	14.19	14.75	13.87
30-May	8.00	10.30	10.30	11.00	11.30	12.80	16.80	13.80	13.80	14.50	11.22	16	14.01	14.9	14.27
3 1 -May	7.80	10.50	9.80	12.00	11.30	13.00	17.30	13.80	14.50	14.50	11.75	16.55	13.84	15.04	14.96

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	**1991**	1992	**1993**	**1994**	**1995**	**1991**	**1992**	**1993**	1994	**1995**	**1991**	1992	1993	1994	**1995**

1-Jun	8.30	10.50	10.80	11.80	11.00	14.00	17.80	14.00	14.50	14.30	12	16.8	13.81	14.67	15.33
2-Jun	9.80	10.80	10.30	13.00	10.80	15.00	18.30	13.80	14.80	13.80	11.92	15.95	i3.92	15.46	15.01
3Jun	9.80	11.30	10.00	14.30	11.00	15.80	17.80	13.30	15.50	13.80	12.3	i6.55	14.19	15.97	14.75
4-Jun	8.50	11.30	10.00	14.50	10.30	13.80	17.30	13.30	16.30	13.50	12.43	16.88	14.12	16.03	14.51
5-Jun	7.30	10.80	10.80	13.30	10.50	12.30	17.30	13.50	16.00	13.00	12.9	16.77	14.1	16.54	14.12
6-Jun	7.50	9.80	11.00	12.50	9.00	12.50	17.50	14.00	15.50	12.00	10.95	17.36	13.88	16.16	13.32
7-Jun	8.50	9.80	10.30	11.80	7.80	12.80	17.80	13.50	15.00	11.50	12	17.22	14.13	16.39	12.78
8-Jun	8.80	10.30	10.00	12.50	8.50	13.50	18.00	12.80	14.80	12.00	11.67	16.16	14.39	17.04	12.1
9-Jun	9.00	10.30	9.80	13.50	9.30	14.30	18.80	13.30	16.00	12.80	12.22	15.68	13.88	17.33	12.32
1 0-Jun	9.80	11.50	10.30	14.30	10.30	15.30	19.30	13.80	17.00	13.80	12	15.79	13.31	18.12	12.81
11-Jun	10.00	14.00	10.80	14.30	12.00	16.00	18.80	14.30	17.50	14.50	13.33	16.62	13.38	18.4	13.46
12-Jun	9.30	15.00	9.50	15.30	12.50	15.00	18.30	13.50	17.80	15.00	12.7	15.84	13.89	17.24	14.34
13-Jun	9.30	14.30	9.80	15.30	12.50	14.30	17.00	13.80	17.50	15.30	12.1	16.15	14.31	17.52	15.13
14-Jun	8.80	12.80	11.00	12.50	11.80	13.80	15.80	14.80	16.00	14.80	12.9	16.71	13.8	17.57	15.61
15-Jun	9.00	12.00	11.80	11.30	11.30	13.80	15.30	15.00	15.30	14.50	13.33	17.19	14.2	17.67	15.61
16-Jun	9.00	11.50	12.00	11.50	11.00	14.00	15.30	15.00	15.00	14.30	13.33	17.27	14.95	18.15	15.34
17-Jun	9.80	10.50	12.00	12.00	11.30	14.30	15.30	15.00	15.00	14.00	12.9	17.36	15.65	18.61	15.04
18-Jun	10.30	11.30	13.00	12.80	11.50	15.00	17.30	15.80	15.80	13.50	12.2	17.95	16.04	17.55	14.78
19-Jun	10.00	12.80	14.50	14.00	10.30	15.00	18.50	16.30	17.00	12.80	13.38	19.12	16.02	17.5	14.57
20-Jun	10.30	14.50	14.50	15.50	10.00	14.00	19.50	17.30	18.00	12.80	13.58	19.04	16.43	17.2	14.1
21-Jun	10.30	15.80	14.80	16.50	10.80	15.00	20.50	17.00	19.50	12.80	14.18	18.78	17.02	17.03	13.54
22-Jun	11.00	17.00	13.50	17.50	11.00	16.00	21.00	15.80	20.50	13.50	14	21.14	17.19	17.39	13.62
23-Jun	11.30	18.00	11.80	18.00	12.50	16.00	21.80	14.50	20.30	14.50	14.15	20.65	17.07	19.71	14.31
24-Jun	10.80	18.80	10.80	18.00	14.00	16.00	22.00	14.80	20.00	15.80	14.98	22.73	16.62	19.18	15.19
25-Jun	9.00	19.30	11.80	17.50	15.00	16.00	22.30	15.80	19.80	16.30	15.52	23.64	16.24	19.85	15.83
26Jun	10.30	19.00	13.50	16.30	15.50	15.50	22.00	16.80	19.00	16.50	15.8	16.67	16.51	20.1	16.48
27-Jun	10.50	19.30	15.30	15.80	15.30	15.80	22.30	17.30	18.50	16.50	15.45	17.22	15.88	20.49	17.05
28-Jun	11.30	19.00	14.00	16.30	15.50	17.50	21.50	17.00	19.80	16.00	16.23	17.22	16.12	21.5	17.74
29-Jun	1 1.80	19.00	13.00	17.50	15.00	16.50	20.50	16.50	20.80	16.00	15.33	18.33	16.74	21.11	18.1
30-Jun	11.50	17.50	12.80	18.30	15.00	15.80	20.00	16.80	21 .00	16.50	14.92	18.33	17.46	20.88	17.95

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	199s
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1-Jul	11.50	17.30	13.30	18.80	16.00	16.00	19.00	17.00	21 .00	17.00	16.04	21.67	17.64	20.63	17.77
2-Jul	12.00	15.80	13.00	18.50	15.80	17.00	19.00	17.00	20.50	16.50	16.8	20	17.65	20.76	17.66
3-Jul	13.00	15.30	12.80	17.50	14.30	18.00	19 00	16.00	19.80	15.80	17.24	20	17.41	21.1	17.61
4-Jul	13.80	15.30	11.00	17.50	13.30	19.00	18.80	16.00	19.80	16.00	16.67	20	17.49	21.22	17.82
5-Jul	14.50	15.50	10.80	16.00	14.50	19.30	18.50	16.00	19.30	16.50	17.13	20	17.44	21.06	17.54
6-Jul	14.80	11.80	11.80	14.00	15.30	18.80	18.00	16.80	18.50	17.30	17.7		17.34	21.39	17.63
7-Jul	14.30	9.30	12.80	12.80	16.00	18.80	18.50	17.50	19.50	17.50	18.76	19.44	17.06	22.03	17.8
8-JUI	14.00	9.50	12.80	11.50	16.30	19.30	19.00	17.50	20.80	18.50	19.53	19.62	18.25	21.97	18.61
9-Jul	14.30	10.00	13.00	11.00	17.00	19.50	18.80	18.30	21.30	19.00	19.62	19.55	17.22	20.96	19.4
1 0-Jul	13.80	10.00	13.30	11.00	17.50	19.00	20.00	18.30	21.00	18.80	19.22	20.21	17.12	20.38	19.35
11-Jul	14.00	10.00	13.50	11.00	17.30	19.50	20.00	18.00	21.00	18.50	19.52	19.68	17.37	20.76	19.98
12-Jul	14.50	9.80	13.00	11.00	17.00	19.00	20.30	18.50	21 .00	18.30	20.83	19.6	17.68	20.23	20.21
13-Jul	15.30	12.80	13.00	11.00	16.30	20.80	21.00	18.00	21.50	18.30	19.73	18.57	17.81	19.39	20.07
14-Jul	16.00	16.50	13.00	11.50	16.30	20.50	21.30	18.30	21.50	18.00	19.25	17.9	17.92	19.02	20.26
15-Jul	15.50	14.30	13.30	11.50	17.00	20.50	21.30	18.00	21.80	18.80	19.7	17.97	17.67	18.61	20.18
16-Jul	17.00	8.30	13.30	10.50	17.80	20.80	21.00	18.00	22.30	19.00	20	19.48	17.49	20.92	21.25
17-Jul	16.80	8.00	13.30	10.50	16.50	20.50	22.00	18.00	22.50	19.80	20.3	20.83	17.6	20.72	21.19
18-Jul	16.30	8.30	13.50	10.30	15.50	20.00	21.80	18.50	22.30	20.30	20.53	21.3	17.68	19.23	21.73
19-Jul	17.50	10.50	14.00	10.30	15.50	20.80	22.80	18.80	22.30	20.50	20.27	20.01	17.48	19.48	21.8
20-Jul	17.50	15.50	13.50	10.50	15.30	21.50	22.30	19.00	22.50	20.80	20.35	19.66	17.15	19.44	21.35
21-Jul	17.80	17.00	13.50	9.50	14.50	21.80	22.00	19.30	22.80	20.80	20.6	21.27	17.55	16.67	21.34
22-Jul	18.30	17.50	13.30	8.30	14.80	22.00	21.30	19.00	23.00	20.80	21.8	20.62	18.08	16.67	21.44
23-Jul	17.30	17.30	13.30	8.30	15.00	22.30	20.30	18.30	23.00	20.80	22.86	20.57	18.07	19.24	21.38
24-Jul	16.80	15.80	13.30	8.50	15.00	23.00	19.80	18.50	22.80	20.80	24.6	20.3	18.15	19.33	21.18
25-Jul	17.50	16.00	13.50	8.80	15.00	22.80	21.00	18.50	23.50	21.30	23.68	20.66	18.26	19.93	21.34
26-Jul	17.30	16.50	13.50	9.00	14.80	22.50	22.00	18.30	23.30	21 .00	22.53	21.13	18.32	18.61	20.9
27-Jul	19.00	17.00	13.80	9.00	14.00	22.30	22.50	18.80	23.30	20.80	23.03	20.54	19.05	18.96	20.84
28-Jul	19.30	17.50	14.00	8.80	14.00	22.50	22.30	19.80	23.30	21.30	23.02	20.21	18.92	19.2	21.24
29-Jul	17.80	17.00	14.00	9.50	13.30	22.50	22.50	20.00	23.30	21.30	22.8	20.68	18.05	18.92	20.52
30-Jul	18.80	16.50	14.80	11.00	12.30	22.80	22.80	19.80	23.30	20.50	22.96	21.8	18.57	18.41	20.47
31-Jul	19.80	17.00	15.00	14.00	12.80	22.50	23.00	20.00	23.30	21.50	23.82	22.56	19.42	19.25	20.82

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995

1-Aug	17.50	17.30	15.50	18.80	12.80	22.50	23.30	20 50	24.00	22.00	24.38	21.83	20.02	20.86	20.97
2-Aug	17.30	17.50	15.00	20.50	12.50	20.50	23.50	21.00	24.50	22.30	24.42	22.07	20.11	20.16	20.17
3-Aug	18.30	17.30	13.00	20.00	12.50	20.50	23.30	21.50	24.80	21.80	24.76	22.14	20.49	20.55	20.13
4-Aug	19.00	17.50	12.80	19.80	13.00	20.50	22.80	21.80	24.50	22.00	25.02	22.51	20.06	22.65	20.52
5-Aug	17.80	17.30	13.30	19.00	13.00	20.80	22.00	21.80	24.30	22.30	24.63	22.27	20.01	20.97	21.01
6-Aug	17.30	16.30	11.80	18.30	13.00	21.00	21.80	21.80	23.80	22.50	24.42	22.15	21.09	21.13	20.51
7-Aug	18.00	15.30	11.30	18.30	13.00	21.50	21.80	22.00	23.50	22.00	23.75	22.09	19.7	22.85	20.77
8-Aug	16.30	15.50	12.00	18.00	12.80	21.00	21.80	21.80	23.00	22.00	24.22	21.86	19.39	22.64	20.67
9-Aug	17.30	15.30	12.50	17.00	12.50	20.30	22.00	21.50	23.00	22.30	24.4	20.97	19.2	22.82	20.77
10-Aug	18.30	15.50	13.50	17.30	12.00	20.50	22.00	21.50	23.00	22.50	23.12	21.2	19.32	23.6	20.77
11-Aug	17.50	15.30	13.30	17.50	11.80	20.50	22.50	21.50	23.00	22.30	23.32	21.24	19.29	24.19	20.33
12-Aug	17.50	16.50	13.30	17.80	12.00	20.50		21.50	23.30	21.80	23.47	23.29	20.24	24.37	19.91
13-Aug	17.50	17.80	14.50	17.80	11.80	20.30	23 00	21.50	23.50	21.50	23.58	21.92	20.3	24.39	19.87
14-Aug	17.50	18.00	17.30	18.00	12.00	19.80		21.50	23.50	21.80	23.48	20.53	20.35	24.32	20.09
15-Aug	17.00	18.30	17.80	17.80	11.80	19.80	23.80	20.80	23.30	21.80	23.48	21	20.54	23.67	20.02
16-Aug	13.00	18.00	17.00	17.00	11.80	19.80	23.50	20.30	22.80	21.30	23.77	21.77	20.8	23.67	19.74
17-Aug	9.50	17.80	17.30	16.80	12.00	19.80	23.00	20.50	22.30	21.00	24.55	21.38	21	23.99	19.1
18-Aug	9.80	17.30	17.80	16.80	12.30	19.80	23.00	20.80	22.30	20.80	25.22	19.87	21.52	24.16	19.22
19-Aug	9.80	16.80	18.50	16.50	11.80	19.80	23.30	21.30	22.30	21.80	25.03	23.89	21.85	24.23	19.23
20-Aug	9.80	14.80	18.50	16.50	11.80	19.80	22.80	21.30	22.30	21.30	24.27	23.62	21.53	24.14	19.44
21-Aug	10.80	14.00	17.50	16.50	12.00	19.30	22.50	21.30	22.30	20.80	24.03	23.19	21.18	23.87	19.23
22-Aug	15.00	15.30	17.80	16.00	12.00	18.30	20.80	20.80	21.80	21.30	24.57	22.49	21.55	23.64	18.71
23-Aug	16.50	11.30	18.00	15.50	11.80	18.00	20.00	21.00	21.50	21.50	23.68	22.39	21.82	23.88	18.5
24-Aug	16.00	11.00	16.80	16.00	11.80	18.50	19.30	20.30	21.80	21.00	23.3	22.27	21.73	23.77	18.36
25-Aug	15.80	12.00	15.50	15.50	12.50	19.00	19.30	19.50	22.00	20.50	22.83	22.39	21.53	23.73	19.2
26-Aug	15.00	13.00	15.80	15.50	13.30	19.00	19.30	19.30	22.00	20.80	22.33	22.25	21.5	23.6	18.93
27-Aug	14.80	13.00	15.80	15.50	13.50	19.00	20.00	19.50	22.00	20.80	23.2	22.08	21.53	23.55	19
28-Aug	14.30	13.00	15.50	15.80	13.50	19.00	20.50	19.00	22.30	20.80	23.05	21.85	21.25	23.41	18.94
29-Aug	14.50	13.00	15.30	15.80	13.30	19.00	20.30	19.00	22.30	21.00	23.9	21.68	21.34	23.09	18.75
30-Aug	15.50	12.50	15.50	15.30	13.50	19.00	20.30	18.80	21.80	20.80	24.3	21.73	21.53	23.25	19.44
31-Aug	16.00	12.60	15.50	15.50	13.50		19.80	19.30	21.80	20.80	23.57	21.73	21.29	23.49	19.76

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	I992	I993	1994	1995	1991	1992	1993	1994	1995	1991	1992	I993	1994	I995
1-Sep	15.50	12.80	16.30	15.80	14.30	21.50	20.30	19.30	21.80	21.30	22.62	21.61	20.99	23.39	19.52
2-Sep	14.00	13.30	16.00	15.80	15.30	20.50	20.30	20.30	21.80	21.50	21.11	21.18	20.98	22.96	19.99
3-Sep	11.30	13.30	16.80	15.00	15.50	20.50	20.30	20.50	21.50	21.30	23.4	21.1	21.47	22.69	20.38
4-Sep	8.80	13.30	17.00	15.00	15.50	20.50	20.30	20.80	21.30	21.00	22.62	20.37	21.03	22.5	19.74
5-Sep	8.80		17.00	15.30	15.00	20.80	19.50	20.80	21.00	21.00	22.58	19.98	20.89	22.63	19.49
6-Sep	8.80		17.00	15.50	14.30	21.00	18.50	20.50	21.30	21.00	22.9	19.97	20.91	22.85	19.83
7-Sep	8.80		17.00	15.30	13.50	21.50	18.00	20.50	21.30	20.50	22.35	19.88	21.05	22.78	19.95
8-Sep	8.80		17.00	15.30	13.80	20.80	18.00	20.80	21.50	20.00	21.27	19.81	21.73	22.61	20.06
9-Sep	8.80		17.00	14.50	14.00	20.30	18.30	20.80	21.00	20.00	21.2	19.63	21.64	22.2	20.67
1 0-Sep	8.80		17.00	13.80	14.30	21.50	18.50	20.80	20.30	20.50	21.25	19.84	21.72	22.09	20.71
1l-Sep	9.30		16.80	13.80	14.30	21.50	18.80	20.50	19.50	20.80	21	19.71	21.2	21.99	20.69
12-Sep	9.80		15.30	13.50	14.50	21.50	19.00	19.50	19.30	20.80	21.23	19.22	20.89	21.83	20.88
13-Sep	9.80		14.50	13.50	14.50	20.30	18.00	18.50	19.00	20.80	20.73	18.82	20.78	21.57	20.81
14-Sep	9.80		14.00	13.30	14.00	19.80	17.50	18.00	19.00	20.50	19.88	18.55	20.54	21.43	20.91
I5 scp	9.80		14.50	14.00	14.00	19.80	17.00	17.50	19.30	20.80	20.02	18.35	20.4	21.43	20.65
I6-Sep	9.80		14.50	14.00	14.30	19.80	17.30	17.50	19.80	20.50	20	18.31	20.3	21.6	20.57
I7-Sep	9.50		14.30	14.50	14.30	20.00	17.80	17.50	20.00	20.50	19.25	17.78	20.27	21.58	20.3
18-Sep	9.50		13.50	14.50	14.00	20.00	17.80	17.30	20.30	20.50	19.38	17.61	20.21	21.52	20.2
19-Sep	10.50		13.30	14.50	13.80	20.00	17.80	17.80	20.30	20.30	18.9	17.64	20.01	21.6	20.32
20-Sep	11.50		13.00	14.50	14.00	20.00	18.00	17.50	20.00	19.80	18.27	16.88	19.68	21.55	20.26
21-Sep	12.00		12.50	14.50	13.80	19.30	18.80	17.00	20.00	19.00	17.67	16.56	19.55	21.23	20.1
22-Sep	12.00		12.00	14.00	13.00	18.30	19.30	17.00	20.00	18.50	17.76	17.81	19.43	21.23	19.93
23-Sep	12.00		12.00	14.00	13.00	18.00	19.50	17.00	20.00	18.50	17.63	17.04	19.29	21.36	19.81
24-Sep	11.80		11.80	14.00	13.00	18.50	19.00	17.30	20.00	18.50	17.7	16.53	19.15	21.24	19.54
25-Sep	12.00		12.30	13.80	13.00	19.00	18.00	17.00	19.80	18.30	17.67	15.56	18.83	21.11	19.26
26-Sep	11.80		12.00	13.80	12.30	19.00	17.30	17.30	19.50	18.50	17.62	15.56	18.7	21.07	19.02
27-Sep	11.80		12.50	13.80	12.30	19.00	17.50	17.50	19.80	18.50	17.7	16.11	18.64	21	19.01
28-Sep	12.00		12.50	13.80	12.50	19.00	17.50	17.50	19.50	18.00	17.33	16.11	18.58	20.94	18.63
29-Sep	12.80		12.80	13.50	12.50	19.00	17.50	17.80	19.30	18.00	17.5	16.67	16.11	20.86	18.02
30-Sep	13.30		13.00	13.80	12.30	19.00	18.00	18.00	19.30	17.50	17.72	16.67	16.11	18.89	17.99

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995

1-Oct	13.30	14.00	13.00	13.50		18.80	18.30	17.50	19.00		17.48	16.67	16.11		
2-Oct	12.50	13.80	13.30	13.00		18.80	18.30	17.80	18.30		17.37	17.22	16.11		
3-Oct	11.80	13.80	13.50	12.50		17.50	18.00	17.50	17.00		17.08	16.67	16.11		
4-Oct	11.50	13.30	13.50	12.30		17.30	17.80	17.00	16.30		17.23	16.11	16.11		
5-Oct	11.80	13.30	13.50	12.50		16.80	17.30	17.30	16.00		17.1	16.11	16.11		
6-Oct	11.80	12.50	13.50	12.00		16.80	16.80	17.30	16.50		16.95	16.11	17.22		
7-Oct	11.80	12.30	13.00	11.80		16.80	16.30	16.80	16.50		16.8	16.11	16.67		
8-Oct	11.50	12.00	12.30	11.50		16.80	15.80	16.50	16.50		16.7	16.11	16.67		
9-Oct	11.50	11.50	11.50	12.00		16.50	16.00	16.00	16.50		16.27	16.11	16.67		
10-Oct	11.80	11.80	11.00	12.00		16.50	16.00	15.50	16.00		16.85	15.56	16.67		
11-Oct	11.80	11.80	11.50	12.00		16.30	16.00	15.50	16.50		16.97	16.11	16.67		
12-Oct	11.50	11.80	11.80	11.50		16.30	16.30	16.00	16.30		16.72	16.11	16.67		
13-Oct	11.30	11.80	12.00	11.50		16.00	15.80	15.80	16.00		16.7	15.56	16.67		
14-Oct	11.50	11.00	11.80	11.80		15.80	15.50	15.80	15.80		16.58	15.56	16.67		
15-Oct	11.30	10.50	11.80	11.30		15.80	14.80	15.80	15.80		16.67	15	16.67		
16-Oct	11.00	10.00	11.80	10.80		15.80	14.30	15.50	15.80		16.23	15	16.67		
17-Oct	10.00	10.50	11.30	10.80		15.00	14.30	15.30	15.80		15.95	15	15		
18-Oct	10.50	10.50	11.30	11.30		14.30	14.80	15.00	15.80		15.7	15	15		
19-Oct	10.50	11.00	11.30	11.00		14.30	15.30	14.50	15.30		15.7	15	15		
20-Oct	10.50	10.80	10.50	11.30		14.30	15.30	14.00	15.30		15.6	15	15		
21-Oct	10.80	10.80	10.30	11.30		14.30	14.80	13.80	15.30		15.42	15	15		
22-Oct	10.00	11.00	10.00	10.50		13.80	14.80	13.50	14.50		15.22		14.44		
23-Oct	9.80	11.00	10.00	10.50		13.50	14.80	13.50	13.80		14.27	14.44	14.44		
24-Oct	9.50	10.80	10.30	10.30		13.30	14.30	13.30	13.30		14.8		15		
25-Oct	9.50	10.80	9.50	10.00		11.80	14.30	12.80	13.30		14.55		15		
26-Oct	9.80	10.30	9.00	10.30		12.50	14.00	12.00	13.30		14.18	14.44	15		
27-Oct	8.80	10.00	8.80	10.30		12.30	13.80	11.30	13.30		13.95	14.44	13.89		
28-Oct	8.30	9.50	9.00	9.50		11.50	13.30	11.80	13.00		13.73	14.44	13.89		
29-Oct	7.80	9.80	8.50	8.30		10.80	13.30	11.50	12.00		13.4	14.44	13.33		
30-Oct	7.80	9.30	8.00	7.80		10.30	13.00	11.30	11.50		12.98	14.44	13.33		
31-Oct	8.00	9.30	7.80	7.80		10.30	12.80	10.80	11.00		12.68	13.33	13.33		

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	**1991**	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
1Nov	7.80	9.30	7.80	7.50		9.80	12.80	10.50	10.50		12.78	12 78	12.22		
2-Nov	7.30	9.00	7.30	6.50		9.30	12.30	10.30	10.30		12.78	13.33	12.22		
3-Nov	7.00	8.30	8.00	6.30		9.00	11.80	10.50	10.30		11.67	13.33	12.22		
4-Nov	7.50	8.00	7.30	6.30		9.30	11.30	10.30	9.80		11.67	12.22	11.67		
5-Nov	6.80	7.80	7.30	6.50		9.30	11.30	9.80	9.80		11.11	12.22	11.67		
6-Nov	5.50	7.80	7.00	6.50		9 30	10.80	9.30	9.30		11.11	12.22	11.11		
7-Nov	5.50	7.80	6.80	6.30		8.80	11.00	8.80	9.30		11.11	12.22	11.11		
8-Nov	5.80	7.80	6.50	6.00		8.80	11.00	8.80	9.00		11.11	12.22	11.11		
9-Nov	6.50	7.50	6.00	6.00		9.00	10.80	8.30	9.00		11.11	12.22	10		
IO-Nov	7.00	7.30	6.30	6.30		9.30	10.00	8.30	9.00		11.11	11.67	10		
1 1-Nov	7.30	6.80	6.00	6.30		9.30	9.50	8.30	9.30		11.11	11.11	10		
12-Nov	7.30	6.80	5.80	6.30		9.30	9.80	7.80	9.30		11.11	11.11	9.44		
13-Nov	6.80	7.30	5.30	6.00		9.30	9.80	7.30	8.80		9.44	11.11	8.89		
14-Nov	6.50	7.30	5.30	5.80		9.30	9.80	7.30	8.30		8.89	10	8.89		
15-Nov	6.50	7.00	5.50	5.80		8.50	9.80	7.30	8.00		8.89	10	8.89		
16-Nov	6.30	7.00	5.80	6.00		8.00	9.30	7.30	8.30		8.89	10.56	8.89		
17-Nov	6.30	7.30	6.00	5.50		8.30	9.30	7.30	7.80		8.89	10.56	8.89		
18-Nov	6.00	7.50	5.80	5.00		8.30	9.30	7.30	7.30		8.89	10.56	8.33		
19-Nov	6.80	7.30	5.50	5.30		8.30	9.00	7.00	7.00		8.89	10.56	8.33		
20. Nov	6.30	6.80	5.30	5.30		8.30	8.80	6.30	7.30		8.89	8.89	7.78		
21-Nov	6.30	6.30	5.00	4.50		7.80	8.30	6.30	6.80		8.89	8.89	7.78		
22-Nov	6.00	6.50	5.30	3.80		7.30	7.80	6.30	6.00		8.89	8.89	7.22		
23-Nov	6.00	6.30	4.30	4.00		7.00	7.80	5.50	5.80		8.89	8.89	7.22		
24-Nov	6.00	5.50	3.30	5.00		7.00	7.30	5.00	5.80		8.89	8.33	7.22		
25-Nov	5.80	4.80	3.50	4.30		7.00	6.80	4.30	5.80		7.78	8.89	6.11		
26-NW	5.00	4.50	3.50	3.50		6.80	6.30	3.80	5.80		7.22	8.89	6.11		
27-Nov	5.00	4.50	3.80	3.50		6.30	6.30	3.80	5.80		7.22	8.89	6.11		
28-Nov	4.80	4.30	4.30	3.80		6.00	6.30	4.30	5.30		7.22	7.22	6.11		
29-Nov	3.50	3.50	3.50	3.80		5.80	6.30	4.30	5.30		7.22	7.22	6.11		
30-Nov	4.50	3.30	3.50	3.80		5.30	6.30	4.50	5.30		6.67	7.78	6.11		

Mean Daily Mean Temperatures at Peck, Anatone and Lower Granite Dam for 1991-1995

(empty cells represent missing data)

	PECK					ANATONE					LOWER GRANITE DAM				
Date	**1991**	1992	1993	1994	1995	1991	1992	1993	1994	1995	**1991**	**1992**	**1993**	**1994**	1995
1-Dee	4.80	3.50	3.30	3.80		5.30	5.80	4.30	5.80		6.67	7.78	6.11		
2-Dee	4.80	3.50	3.30	3.30		5.80	5.50	4.30	5.80		6.67	7.78	6.11		
3-Dee	4.80	3.50	3.30			6.00	5.50	4.30	5.30		6.67	7.78	5.56		
4-Dee	5.00	3.30	3.50			6.30	5.00	4.80	4.50		6.67	7.78	5.56		
5-Dee	5.00	3.50	3.30			6.30	4.80	4.30	3.50		6.11	6.11	5		
6-Dee	4.80	3.50	3.30			9.30	4.50	4.00	3.30		6.11	5.56	4.44		
7-Dee	4.30	3.50	3.30			8.80	3.80	3.80	3.30		6.11	5.56	5		
8-Dee	3.80	3.00	3.50			8.80	3.00	4.30	3.50		5.56	5.56	3.89		
9-Dee	4.30	3.00	3.80			9.00	4.30	4.50	3.80		5.56	5	3.89		
10-Dee	4.00	2.80	3.80			9.30	4.50	4.80	3.50		6.11	5	5		
11-Dee	3.50	3.00	4.00			9.30	4.50	5.30	3.80		6.11	5	5		
12-Dee	3.80	2.80	4.00			9.30	4.30	5.30	3.80		6.11	5	5		
I3-Dee	3.00	3.00	3.80			9.30	4.30	4.80	3.80		6.11	5	5		
14-Dee	2.30	3.00	3.80			9.30	4.30	4.30	3.80		6.11	4.44	5		
15-Dee	2.30	3.00	3.80			8.50	4.30	4.30	4.30		6.1 I	4.44	5		
16-Dee	2.30	2.80	4.00			8.00	4.00	4.50	4.30		6.11	4.44			
17-Dee	2.30	2.80	4.00			8.30	4.30	4.50	4.30		6.11	4.44			
18-Dee	2.30	2.50	4.00			8.30	3.80	4.30	4.50						
19-Dee	2.00	2.50	3.80			8.30	3.50	3.80	4.30						
20-Dee	2.00	2.80	3.80			8.30	3.80	4.00	4.30						
21-Dee	1.80	2.50	3.80			7.80	3.80	4.30	4.30						
22-Dee	2.00	2.50	3.80			7.30	4.30	4.00	3.80						
23-Dee	2.00	2.80	3.50			7.00	4.80	4.00	3.30						
24-Dee	2.30	2.50	3.30			7.00	4.80	3.80	3.30						
25-Dee	2.80	2.50	3.00			7.00	4.30	3.30	3.50						
26-Dee	2.80	2.50	3.30			6.80	4.00	3.00	3.80						
27-Dee	2.30	2.50	3.30			6.30	3.80	3.00	4.30						
28-Dee	2.30	2.30	3.00			6.00	4.30	2.80	4.30						
29-Dee	2.30	2.30	3.00			5.80	4.30	2.80	3.50						
30-Dee	2.30	2.30	3.00			5.30	4.30	3.00	2.50						
31-Dee	2.30	2.30	3.00				4.00	3.00	2.00						