SMOLT MONITORING PROGRAM

ANNUAL REPORT 1985

PART II: Migrational Characteristics of Columbia Basin Salmon and Steelhead Trout, 1985

Volume I

by

FISH PASSAGE CENTER

for

The Columbia Basin Fish and Wildlife Agencies and Tribes

Funded by

John Ferguson, Project Manager

U.S. Department of Energy

Bonneville Power Administration

Division of Fish and Wildlife

Contract No. DE-Al79-83-BP11797

Project No. 80-l

February 1, 1986

ABSTRACT

The annual Smolt Monitoring Program is the result of implementation of Section 304(d)(2) of the Northwest Power Planning Council Fish and Wildlife Program. This is the second year of the annual systemwide program conducted by the Fish Passage Center (formally Water Budget Center).

Index reaches have been established. Travel time indices are calculated for year to year comparison. Marked groups of steelhead, spring chinook, fall chinook, and summer chinook are monitored at sampling points throughout the system. Because this program is intended to be representative of the juvenile migration, marked groups represent major hatchery production stocks. Arrival time and duration of marked groups are reported. Annual travel time indices are reported from Rock Island Dam to McNary Dam, and from Lower Granite Dam to McNary Dam. Hatchery and brand release Information is reported.

TABLE OF CONTENTS

List of Figures

List of Tables

List of Tables (Continued)

Travel Time Tables — Page

List of Tables (Continued)

Travel Time Tables (continued):

Acknowledgments

We thank all the individuals, agencies and organizations who contributed to the successful completion of the 1985 program.

Fish were provided for the 1985 program by Idaho Department of Fish and Game, Washington Department of Fisheries, Washington Department of Game, and the United States Fish and Wildlife Service. We are indebted to the hatchery managers and staffs of Lyons Ferry, Wells, Winthrop, Leavenworth, Priest Rapids, Rapid River, McCall, Dworshak, Sawtooth, Hagerman, Niagara Springs, and Pahsimeroi, who assisted In the marking program. We extend thanks to hatchery managers and staffs of all other basin facilities for providing timely information on hatchery release data.

Fish marking was carried out by United States Fish and Wildlife Service and Idaho Department of Fish and Game, National Marine Fisheries Service and Washington Department of Game.

Sampling and reporting at Lower Granite, Lower Monumental, McNary and John Day Dams was carried out by NMPS. We thank Chelan Public Utility District (PUD) for sampling at Rock Island Dam. We extend appreciation to Grant County Public Utility District for sampling at Priest Rapids, and allowing us to use data collected as part of its transportation research.

We extend special thanks for loan of portable raceways to the Yakima Indian Nation, Walla Walla District Corps of Engineers. Douglas PUD, and Chelam PUD .

This report was prepared by Mlchele DeHart Jennifer Jordan, Larry Basham. and Cecilia Noyes, of the Fish Passage Center staff.

This project was funded by Bonneville Power Administration, under the Northwest Power Planning Council Fish and Wildlife Program, Section 304 (d)(2), BPA Project 80-l.

Migrational Characteristics of Columbia Basin Salmon and Steelhead Trout, 1985

1. INTRODUCTION

This report is the final product of the 1985 implementation of Measure 304 (d)(2) of the Northwest Power Planning Council's Fish and Wildlife Program. This measure requires the Bonneville Power Administration to fund a program conducted by the fishery agencies and tribes to monitor and report the migrational characteristics of Important fish stocks. In 1983, the first year of implementation of NPPC program measures, the BPA and fishery agencies and tribes agreed to Incorporate these activities into the water budget duties of the Water Budget Center (now known as the Fish Passage Center). This was done because the monitoring program is an inseparable component of in-season management of the water budget. The Water Budget Center vas established in 1983 to house the staff and activities of the water budget, smolt monitoring, spill management and adult facilities inspection. This was done for best and most efficient use of staff.

The 1985 smolt Monitoring Program Is reported in two parts. Part I describes results of survival monitoring in the mid-Columbia and lower Snake River reaches to McNary Dam. This is Part II, which describes results of travel time monitoring of marked yearling and sub-yearling chinook salmon (Oncorhynchus tshawytscha), sockeye salmon (Oncorhynchus nerka), and steelhead trout (Salmo gairdnerl). Travel time of marked groups is measured between specific sampling points in the system. Marked groups usually represent major hatchery production stocks. Arrival time and duration of migration of marked groups at sampling points are reported. A listing of hatchery release information for 1985 is also included.

Some of this information was reported In the 1985 Water Budget Managers Annual Report which was submitted to the Northwest Power Planning Council (NPPC) on November 1, 1985. At that time very limited distribution was made of Xerox copies only to the NPPC, the NPPC staff, and the Bonneville Power Administration. Broader distribution will be made upon receipt of copies being printed by BPA.

II. THE SMOLT MONITORING PROGRAM

A. Purpose

In 1985 the Smolt Monitoring Program was designed to monitor travel time and survival of specific marked groups through specific river reaches and to provide this in-season information to the Water Budget Managers for management of the water budget. Monitoring sites and Index reaches are shown in Figure 1. These in-season data also provided the basis for in-season management of spill for fish passage and nitrogen abatement.

Determination of smolt travel time is a major component of this program. Past experimentation and monitoring has correlated decreasing smolt travel time to increasing survival of spring migrants. This was the basis for establishing the water budget program. To this point, the goal of the smolt Monitoring Program has been to collect consistent , additional data on travel time and survival of specific groups to enlarge the data base upon which water budget measures will be evaluated. The smolt Monitoring Program is designed so that data generated on travel time and survival of marked groups may be analyzed relative to flow and other environmental factors on an annual basis.

Monitoring of the summer migration provides information to direct operational regimes to facilitate the migration. This program provides baseline data upon which research hypotheses can be based. The summer

migration Is becoming a larger component of the total annual downstream migration and this program will provide information to identify migration requirements.

smolt travel time is determined and reported in two ways. A smolt travel time index is determined. This is the travel time in days or speed in miles per day for marked groups of fish between selected recovery points. The smolt travel time or speed of marked groups of fish from the point of release to various downstream recovery points is reported. The difference between smolt travel time indices and smolt travel time is that the smolt travel time Index is designed to be a measure of travel time which can be statistically compared between years and can be related to flow or other environmental conditions. The smolt travel time index is measured between points located some distance below the point of release in order to exclude the effect of initial hatchery mortality, migration delay or other variables which might act to affect the natural migration response. Smolt travel time is measured from the release site. This information is useful from a hatchery evaluation standpoint. However, travel time from release sites is difficult to assess in terms of environmental factors because of the variable effect and magnitude of the hatchery rearing environment.

In the future when consistent sample methods are established, a lower river site at Bonneville Dam will be added to the program. Travel time Indices are established from Rock Island Dam to McNary Dam for the mid-Columbia; Lower Granite Dam to McNary Dam in the Snake River; and will be established in the future from McNary Dam to Bonneville Dam in the Lower Columbia. Some specific sites will be of individual interest for travel time, such as John Day Dam, because of the size of the John Day pool.

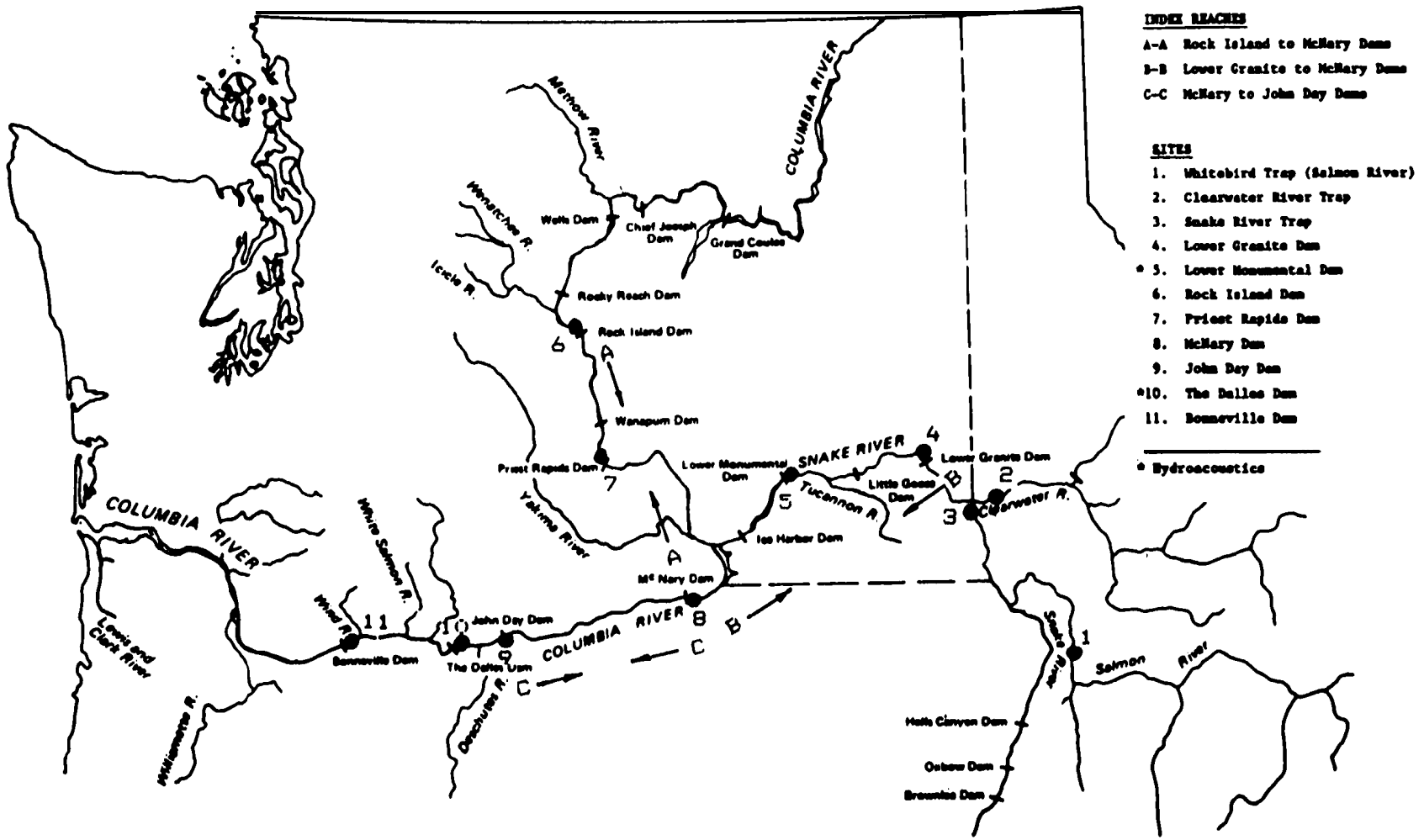


FIGURE 1 1985 SMOLT MONITORING SITES

B. 1985 Program

The 1985 program basically repeated and expanded on the 1984 Smolt Monitoring Program. Spring, summer and fall chinook and steelhead were marked at Columbia River and Snake River system hatcheries above &Nary Dam. Sockeye travel time is reported through the Hanfor reach. These fish vere marked as part of an Independent research effort by Grant County Public Utility District at Priest Rapids Dam. Marked fish were collected and sampled at Whitebird, Clearwater, and Lewiston trap sites in the Snake River system and at mainstem sites at Lover Granite, Rock Island, Priest Rapids, McNary and John Day Dams. Travel time indices are reported for Lover Granite to McNary Dam, and Rock Island to McNary Dam. Priest Rapids and John Day sites provided travel time information used only for In-season spill and passage management information. Limited information was generated regarding travel time in the McNary to John Day index area.

Hydroacoustlc monitoring was conducted at Lower Monumental Dam and The Dalles Dams. In addition, gatevell dipping vas conducted at Lover Monumental. These efforts were intended to provide baseline data for travel time information.

C. Smolt Monitoring System

Table 1 describes the type and method of data gathered at each site during 1985. The Whitebird and Clearwater trap sites were only used for in-season monitoring. The Lewiston trap was used to determine migration characteristics at the head of Lover Granite pool. Fish were then sampled at Lower Granite and McNary dam to establish the annual travel time index for that reach.

Monitoring in the Mid-Columbia consisted of the bypass trap at Rock Island Dam and McNary dam. An annual travel time Index was determined from Rock Island

TABLE 1: WATER BUDGET CENTER SMOLT MONITORING SITES
1985

Site	Method	Data Gathered (1)
Mid-Columbia		
Rock Island	Bypass Trap	Brands, Specie8
Priest Rapids	Gatewell Dip	Brands, Species
Snake River		
Whitebird Trap	Scoop Trap	Brands, Species
Snake River Trap	Dipper Trap	Brands, Species
Clear-water Trap	Scoop Trap	Brands, Species
Lower Granite	Bypass/Collection	Brands, Specie8
Lover Monumental	Hydroacoustlcs	*Baseline Migration Index (2)
	Gatewell Dip	
Lower Columbia		
McNary Dam	Bypass/Collection	Brands, Species
John Day Dam	Airlift Pump	Brands, Species
The Dalles Dam	Hydroacoustlcs	*Baseline Migration Index (2)

(1) Additional in-season data were obtained from the COE CROHMS data system. This included adult counts, flow, spill, other project operational data, John Day hydroacoustic monitoring, and Little Goose collection counts.

(2) Hydroacoustic monitoring at Lower Monumental was limited in scope, and the reliability of the data is unknown. For this reason, the Corps and BPA determined that the data would be considered first year baseline data, not appropriate or adequate for management. Subsequent monitoring at The Dalles and Lower Monumental is planned to be more complete and comprehensive and more suitable for management considerations. In season data at Lover Monumental and The Dalles was reported 72 hours after it was collected, eliminating its utility for in-season management.

to McNary Dam. Travel time estimates for limited groups of marked fish to John Day Dam were developed.

Gatevell samples were reported for Priest Rapids Dam, John Day and Lover Monumental Dam. Hydroacoustlc indices and airlift sampler catches were reported for John Day Dam. Quantitative estimates of travel time were not made for these sites. Gatevell sampling data at Priest Rapids were inconsistent due to conditions, primarily adverse weather, at the site and so cannot be standardized to provide a quantitative estimate. At John Day, 1985 was the first year in which travelllng screens were operated in unit three with the airlift sampler. Several start up problems were experienced and consistent sampling did not start until May 11. Past evaluation of the unit three sample are not applicable to the new conditions at John Day, so the sample could not be standardized or expanded. Because of these limitations, an annual index was not generated for the McNary to John Day reach.

Hydroacoustic monitoring was conducted at The Dalles and Lover Monumental Dams. However, the results of these studies are not reported in this document because neither preliminary nor final reports of this component of the Smolt Monitoring Program were provided to the Water Budget Center. Data collected at these sites were communicated to the Water Budget Center via telephone. Additional in-season data vere obtained from the Corps of Engineers CROHMS data system. These data were reported and entered into the data system daily. These daily entries were considered preliminary data, utilized primarily for in-season management decisions by all interested parties.

Preliminary data were compiled into weekly reports and distributed every Friday to all parties expressing Interest. After the data collection and migration season was completed, data were verified and edited, if necessary.

All of these data were reported and compiled daily for use by the Water

Budget Managers. These data were also provided to anyone upon request. These data were summarized in a weekly report which was distributed to a mailing list of 175, comprised of public and private utilities, federal and state agencies, Indian tribes, and private Individuals.

The final verified data for 1985 mark recoveries at Lower Granite, Lower Monumental, Rock Island, McNary and John Day Dams are provided in a separate volume available upon request. Daily sample and collection data are reported for Lover Granite, Little Goose, and McNary in the 1985 Fish Transportation and Oversight Team (FROT) report (Koski, et al., 1986, unpublished).

III. METHODS

A. Marking Procedures

1. Fish were marked for travel time evaluation at hatcheries in the Snake and mid-Columbia River. All marking was accomplished using freeze branding techniques (Mighell, 1969) which employ silver tipped brass branding rods cooled in a canister containing liquid nitrogen. The brand symbols were transferred to the fish after exposure to the brand tool for about ½ to 1 second. The nitrogen level was serviced every two hours to assure that the brand tool was at a constant temperature. Study fish were marked by U.S. Fish and Wildlife Service and Idaho Department of Fish and Game personnel.

The branding procedure at Lyons Ferry, Priest Rapids, and Wells fish hatcheries took place out of doors using portable marking equipment. At other hatcheries, marking trailers described by Ambrogetti 1976 and Duke 1980, were employed. As a general rule, the following procedures were followed: Fish to be branded were brailed into a holding tank and then supplied to the individual markers as they were needed. In some cases, an intermediate trough buffered with tricaine methanesulfonate (MS-222) was used to reduce problems and stress of handling created by large steelhead (Lyons Ferry and Wells hatcheries).

Fish were handled and marked in a consistent manner to assure that fish were exposed to anesthetic for a minimal time period. The anesthetic solution was constantly diluted due to the activity and number of fish being handled. Following each two hours of operation, all anesthetic solution was discarded and a fresh solution placed into each container. The fish were freeze branded and diverted through a watered conduit to a holding area prior to release. Undersized fish or precocious males were removed from the lots and were not marked.

Personnel selected to do the branding were generally from the local area of the fish hatchery and marking experience varied. All branders received a brief demonstration and critique of methodology by experienced supervisors. In order to randomize branding of survival groups, branders rotated among the branding stations to prevent marking bias.

Hatcheries were chosen to represent major production releases, and to be representative of the migration as a whole. Fish were marked in sufficient numbers to provide for an adequate number of recoveries, as well as a good pattern of recoveries at the sampling sites under the established sampling rates. Release data for marked hatchery groups are provided in the brand release report, included in Appendix I.

2. Fish and Brand Quality Observations

After branding the fish, individual groups were sampled at the fish hatchery to collect information on brand and fish quality. Generally the branded fish were examined folloving at least a 7-day lapse after branding to assure that brands were fully developed. Marking dates are noted in Table 2. Some of the groups were marked well in advance of their release dates and brands were very readable. About 100 to 200 fish samples were observed from a representative cross section of the marked fish. These fish were anesthetized

TABLE 2: Dates of Freeze Branding Juvenile Salmonids at Hatcheries in the Columbia River Basin in 1984/1985.

Washington

Hatchery	Species	Brand	Date Branded
Lyons Ferry	Steelhead	RA-7N-1,RA-7N-3 LA-7S-1,LA-7S-3 LD-7S-1,LD-7S-3 RA-7S-1,RD-7S-1 RA-17-1,RA-17-3 LA-S-1,LA-S-2 RA-H-1,RD-H-1 RA-H-2,RD-H-2	4/23-25/85 3/1-12 85
Wells	Steelhead	RA-7U-1,RA-7U-3 LA-7U-1,LA-7K-1 LA-7K-3,LD-7K-1 LD-7K-3,LD-7K-1 RD-7K-1,LD-7T-1 LD-7T-3,RD-7T-3	5/3-11/85
Wells	Summer Chk	LA-T-3,LA-T-1	5/8,9/85
Priest Rpds	Fall Chk	RA-T-1	5/8,9/85
Leavenworth	Spring Chk	LA-7U-1,RA-1R-1	10/3,4/84
Winthrop	Spring Chk	LA-7K-1,LA-7C-1 LA-7C-3,LA-7F-1 LA-7T-1,LA-7T-3 RA-7T-1,RA-7T-3	10 8-12 84

Idaho

Hatchery	Species	Brand	Date Branded
Rapid River	Spring Chinook	LD-R-1	3/7/85
	Spring Chinook	LD-R-3	3/8/85
Sawtooth	Spring Chinook	RD-R-1	10/30,31 84
Dworshak	Spring Chinook	RD-R-2	3/27 85
McCall	Summer Chinook	RD-R-3	11/1,2/1984
Hagerman	Fall Chinook	LD-R-4	5/29,31 85
	Steelhead	RD-Y-1	3/19/85
	Steelhead	RD-Y-3	3/20/85
Niagara Sprgs	Steelhead	LD-Y-1	3/21,22/85
Dworshak	Steelhead	LD-Y-2	3/29/85

with a MS-222 solution and observations were made and recorded. The sample was obtained without replacing previously inspected fish into the unsampled population. Each fish was used to collect information on:

(1.) Brand Quality: Fish were individually inspected and rated for brand quality using the categories shown in Table 3. The following categories were developed subjectively and used by USFWS and IDFG throughout marking programs in 1985.

TABLE 3: FREEZE BRAND QUALITY CRITERIA

Category	Definition
1.	Brand is complete and legible.
2.	Brand is legible but defective in some manner. For example, a non-critical part of the brand is missing or the brand is not well developed and light.
3.	The brand is not legible.
4.	The brand rotation is wrong.
5.	No brand.
6.	The brand caused burning of the fish or has become ulcered This category was extended to include three levels: light, moderate and excessive.

(2.) Length Frequency: During brand quality assessment, each fish's fork length was measured to the nearest 5mm. To assess if the branding operation was biased for fish length, the unbranded source population was also sampled and measured for fork length.

B. Analytical Procedures

1. Travel Time Determination

Travel time was expressed as the number of days that elapse for a fish to travel a specific river reach. Travel time for specific hatchery groups was determined by freeze branding a portion of the production release, and recovering these marks at dovnstream sampling sites. Release sites in 1985 were similar to 1984's, so comparison between years is possible for analysis. The accuracy of travel time estimates from release sites to downstream recovery points is reduced because release dates are not exact. When groups were released volitionally or over a period of days, the median release date was used in estimating travel time. Travel time was calculated as the number of days between release date and median date (the date on which 50% of the marked group had passed the project) of passage at a downstream site. In determining travel time, the mark recovery data were examined for a continuous pattern of recoveries over a period of time at each of the projects between which travel time vas indexed. This was a subjective determination which involved deciding vhether the pattern of mark recoveries was representative of the passage past the recovery point. Rejection of groups was primarily due to small sample sizes.

The travel time index was determined as the number of days between the median dates of passage at selected recovery points.

Travel speeds of the marked groups between release and recovery points were also obtained. Migration speed eliminates the effect of varying distances marked groups travel and allows comparison between groups and areas. Speed was calculated by dividing the median travel time in days into the distance traveled in miles (Appendix II).

Annual travel time index is calculated by dividing distance of the index area by the average of the median travel times of marked groups. In computing travel time index, the median was used as the statistic of location rather than the average because the median is less sensitive to extended tails (late mark arrivals) that occur in mark recovery data (Sokol and Rohlf, 1981). Variance terms for individual medians could not be determined. However, variance could be assessed by calculating a standard error on the average of the travel times of the marked groups. Within the Indexing area, the various marked groups were treated as replicates. A standard error was calculated for the averages to provide an estimate of the variation in travel time and speed within the population. The standard error was calculated using the formula from Sokal and Rohlf (1981) as follows:

$$s_{med} = (1.2533)\frac{s}{\sqrt{n}} \quad \text{where}$$

s_{med} = standard error of the median
s = standard deviation of the mean
n = sample size, i.e. number brand groups used to calculate the annual Index

As developed in 1984, the migration index is the basic data used for travel time analysis at Lower Granite and McNary Dam. The migration index represents the daily estimated collection of fish at a project, divided by the proportion of water passing through the powerhouse on that day. At Rock Island, the second powerhouse flow was used; at John Day, unit 3 flow was used to estimate migration index. this procedure was used to correct daily collection totals for changes in powerhouse operations. This approach is dependent upon the assumption that collection efficiency of these sampling systems is related in a linear fashion to the proportion of river flow through the powerhouse.

At Idaho trap sites, no migration indices were calculated. Information on collection efficiencies and mark recaptures at these sites are published in annual reports by IDFG submitted to BPA.

At John Day Dam, significant modifications of the bypass and sampling system did not allow for computing migration indices on the basis of efficiency information developed by Sims et.a1.(1981) for past years. Because sampling was inconsistent until May 11, it was possible to analyze only a portion of mark group recaptures for travel time determination. Marked groups were selected for analysis only if the first recapture of the group have occurred at McNary Dam after May 10.

Travel time determination for steelhead groups from points of release above Lover Granite to McNary and John Day was limited because of the large number of fish removed from the river in the transportation program.

C. Smolt Arrival Timing and Duration

The migration of each species past Rock Island, Lover Granite, and McNary Dams was characterized by the date that 105, 50%, and 90% of the population had passed the project. The median point was used for comparison between species while the 10 and 90 percent dates illustrate when the bulk of the fish migrate through that project. These dates are computed by using the migration index a8 the basic statistic. The duration of the migration was computed as the number of days between the 10% and 90% dates of passage at a project.

D. Magnitude of the Migration

At McNary and Lover Granite and Rock Island Dams, annual migration indices are established. At McNary and Lover Granite Dams they can be compared with 1984's total. These indices are the annual sums of the daily migration indices for a species. These annual indices are not estimates of total passage, nor

are they comparable between projects or species within a year. These indices will allow for comparing the size of the outmigration between years within a species at individual projects.

XV. RESULTS

A. 1985 Runoff

1. Columbia River Basin

The 20 year period of 1961 through 1980 has been adopted by the Columbia Basin Water Management Group as the basis for determining the average January through July seasonal runoff. The average January through July runoff for the 1961 through 1980 period at The Dalles is 107.0 million acre feet (MAF). The actual observed runoff at The Dalles in 1985 was 87.7 MAF, or 82% of the twenty year average. This compares to observed runoff of 119.1 MAF, or 111% of the twenty year average, which occurred in 1984.

2. Snake River Basin

The 1985 runoff above Lover Granite contributing to the 1985 January - July total vas 25.2 MAF; 83.8% of the twenty year average. As indexed at Lover Granite flows vere substantially lover than those which occurred in 1984. (Figure 2). During the 60 day period from April 15 through June 15, flows at Lower Granite were below the 85 kcfs level for 22 days.

3. Mid-Columbia

Runoff above Grand Coulee contributing to the January - July runoff total was 52.1 MAF, 80% of the 20-year average. Flovs at Priest Rapids averaged 120 kcfs from April 11 to May 1. On May 1 average flows were increased to 130 kcfs and maintained at that level until May 6, when they were increased to 140 kcfs. On May 15, average flows were reduced to 130 kcfs. On June 7, flows dropped to 67 kcfs. Record low flows occurred at Priest Rapids after June 15. Flows through August were lower than the record low flow year 1932. This made 1985 one of the lowest summer flow years which has occurred in 50 years. Figure 3 shows 1985 versus 1984 flows at Rock Island Dam.

4. Lover Columbia

Figure 4 shows the 1984 versus 1985 flovs which occurred at McNary Dam. flows at McNary were consistently lover than in 1984. Average river flow was below the fishery minumum of 220 kcfs for several periods during the spring migration.

5. Spill and Passage Conditions

Spill was reduced at federal projects in 1985, compared to that which occurred in 1984. This was particularly true at Snake River projects. Spill did not occur for the majority of the summer migration.

Spill and passage conditions were in general less favorable in 1985 than in 1984. On the Snake River, flows were below the water budget minimum of 85 kcfs for 22 days during the April 15 through June 15 water budget period. No spill for fish passage occurred at Lover Granite or Little Goose Dams.

In the Lover Columbia, flows at McNary were below or at minimum for most of the 1985 migration. Record low flows occurred after June 15, and record high water temperatures occurred in the latter half of July (Figure 5).

FIGURE 2

AVERAGE RIVER FLOW: LOWER GRANITE DAM
1984 AND 1985

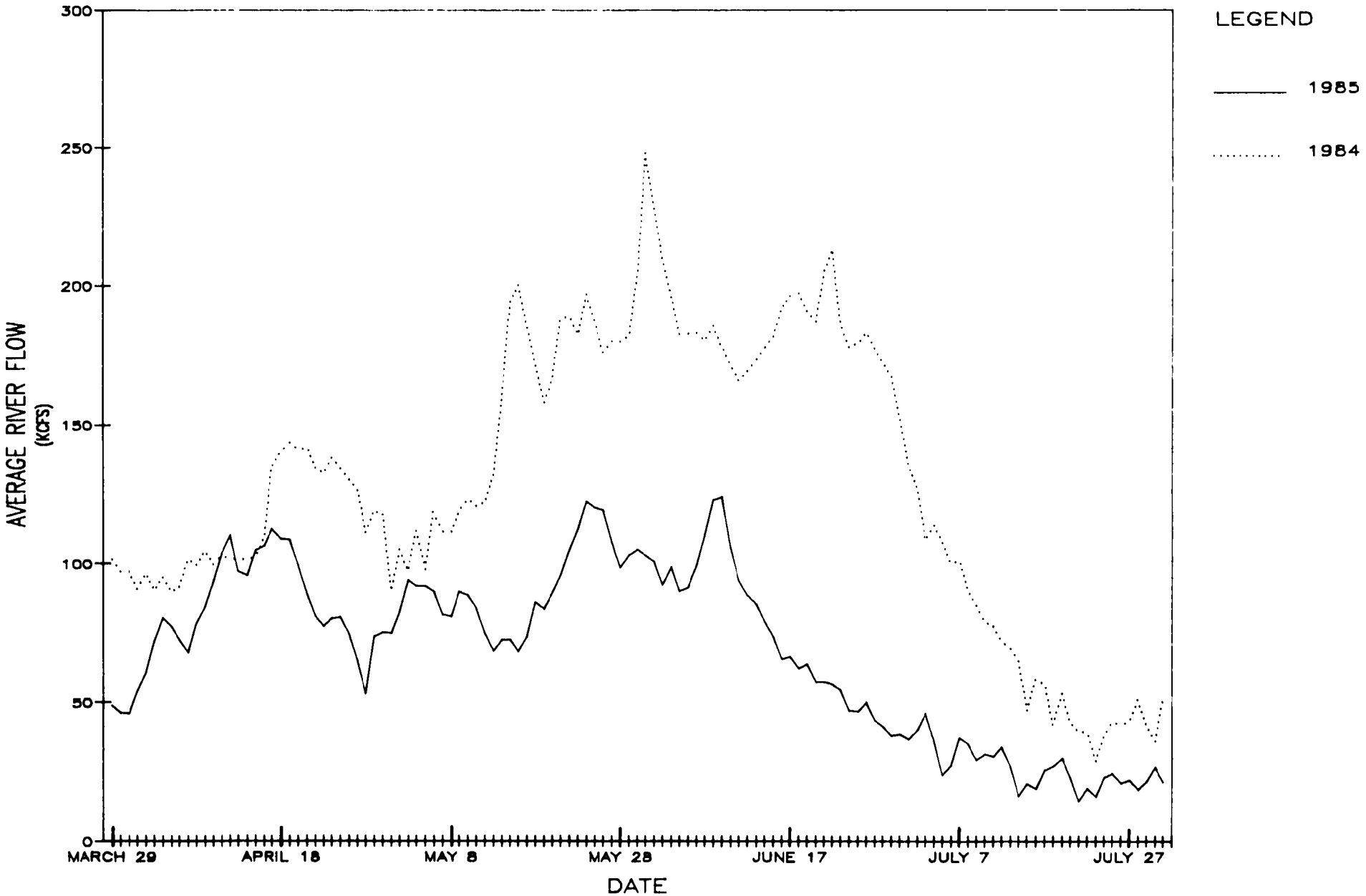


FIGURE 3

AVERAGE RIVER FLOW: ROCK SLAND DAM
1984 AND 1985

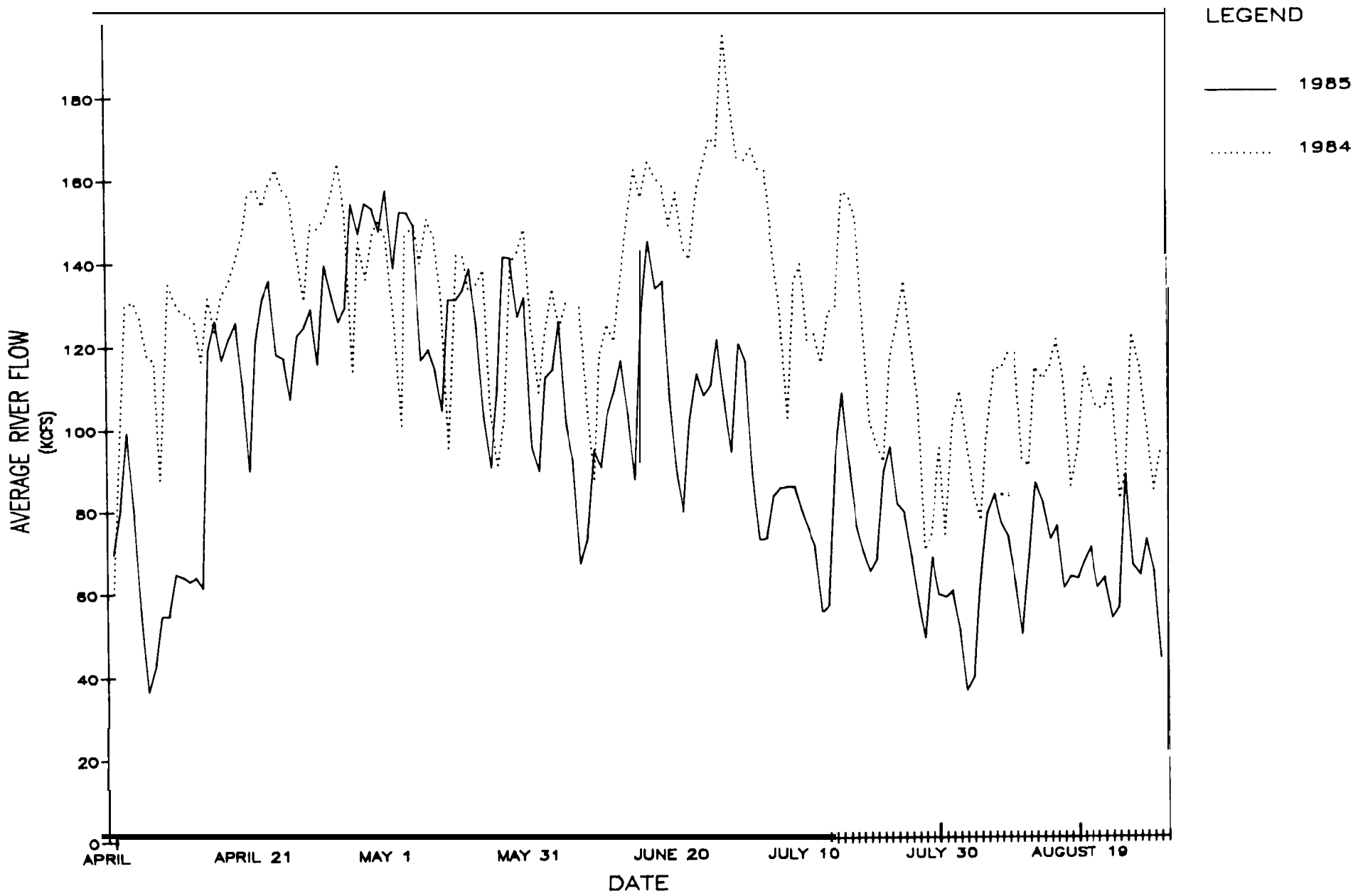


FIGURE 4

AVERAGE RIVER FLOW: MCNARY DAM
1984 AND 1985

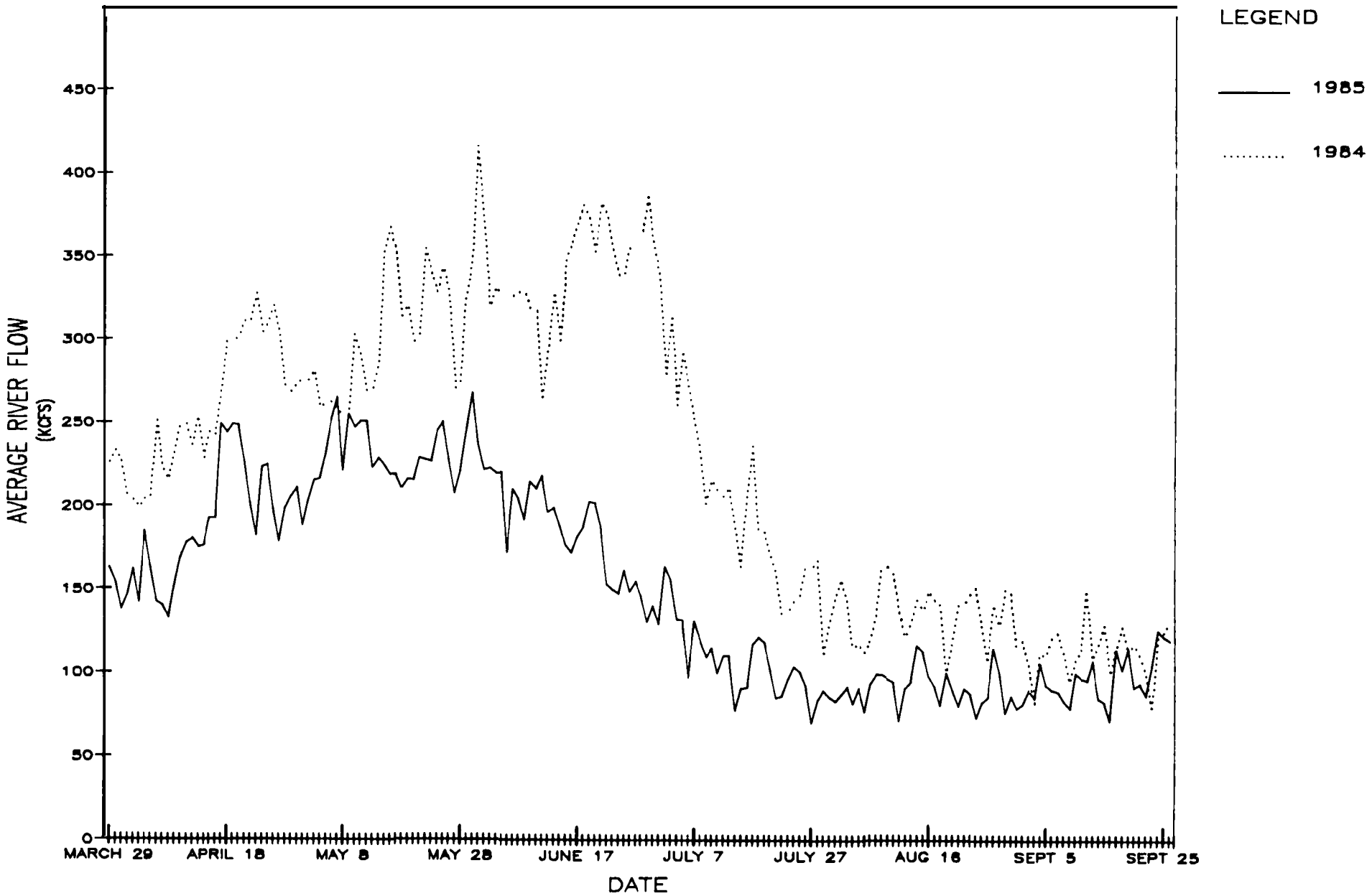
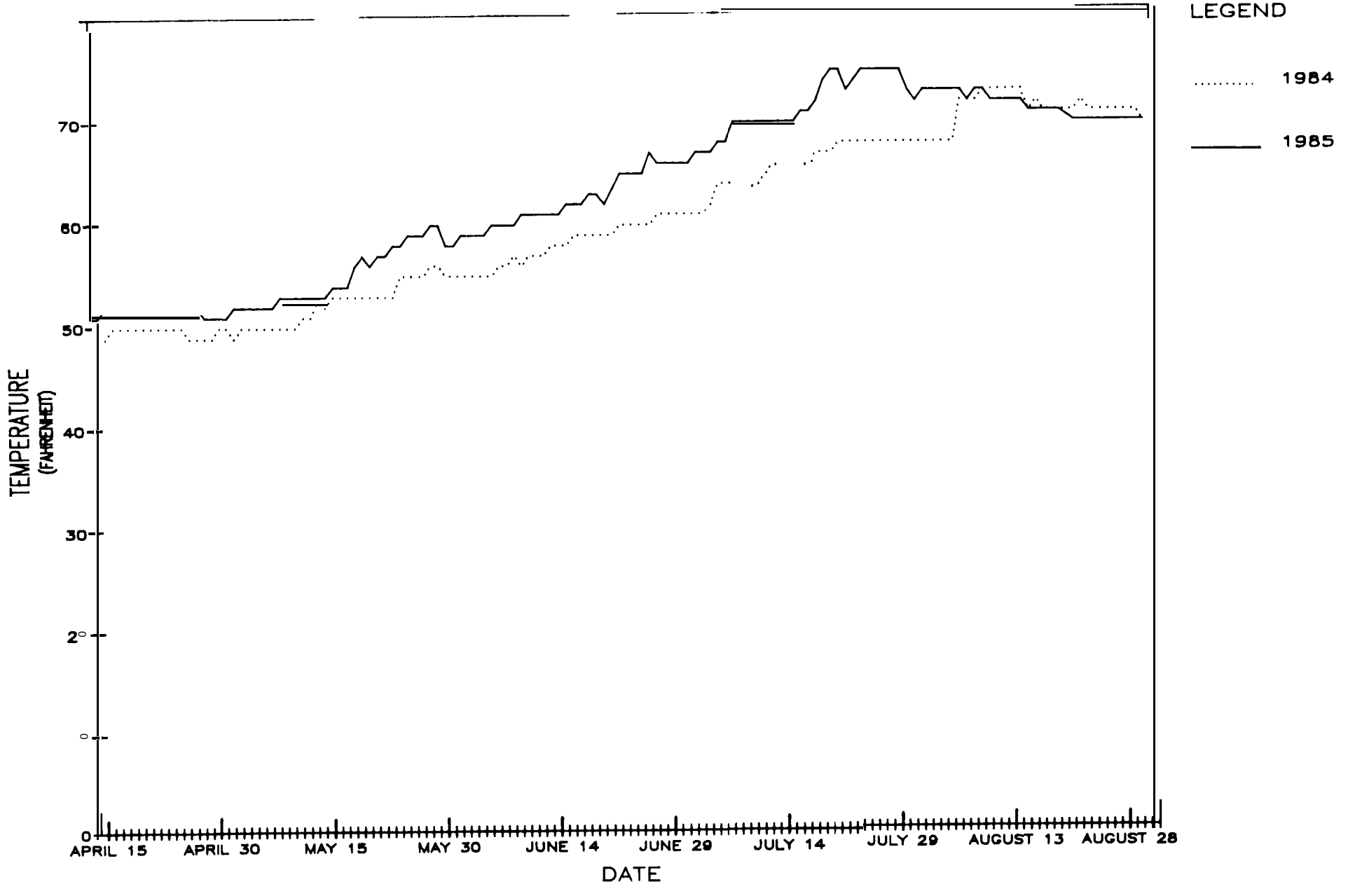


FIGURE 5

WATER TEMPERATURES: MCNARY DAM
1984 AND 1985



B. Travel Time of Marked Groups

1. Snake River

Spring/Summer Chinook. Five mark groups of yearling chinook were released in the Snake River and provided Information on smolt travel time and speed.

Travel time of these yearling chinook from release sites to Lower Granite Dam ranged from 20 to 41 days and averaged 29.4 days. Speed of migration ranged from 3.2 to 12.2 miles/day, with an average speed of 7.3 miles/day (Table A).

These same fish migrated from release sites to McNary Dam In 35 to 53 days, with the average being 42.6 days. The speed of migration from the release sites to McNary ranged from 6.1 to 12.1 miles/day,with an overall average speed of 8.4 miles/day, shown in Table B.

TABLE A: Travel Time of Marked Yearling Chinook from Point of Release to Lower Granite

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT LGR	% COLL AT LGR	50 PERCENT PASSAGE ARRIVAL DATE (1)	TRAV TIM (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LD-R-1	RAPID RIVER	34,225	9,133	27.56	25-Apr	20	76.20	8.7
LD-R-3	HELLS CANYDN	35,925	7,111	19.85	13-Apr	25	100.34	5.6
RD-R-1	SAWTOOTH HATCHERY	39,815	4,321	10.84	04-May	38	86.97	12.2
RD-R-2	DWORSHAK HATCHERY	23,100	6,403	21.72	27-Apr	23	72.33	3.2
RD-R-3	S. F. SALMON RIVER	25,600	4,204	16.42	14-May	41	73.11	6.9

1) ARRIVAL AT LOWER GRANITE DAM

2) AVERAGE FLOW THROUGH LOWER GRANITE AT 50% PASSAGE DATE +/- 3 DAYS

TABLE B: Travel Time of Marked Yearling Chinook IN the Snake River from Point of Release to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASEC	NO. COL:. AT MCN	\ COLL A? MCN	------SO PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIRE (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEEL (MILES/DAY)
LD-R-1	RAPID RIVER	34,225	4,769	13.93	08-May	37	85.97	7.9
LD-R-3	HELLS CANYON	35,825	6.61'	18.15	28-Aor	40	72.31	7.C
RD-R-1	SAWTOOTH HATCHERY	39,875	1.599	4.01	16-MAY	50	13.24	12.1
RD-R-2	DWDRSHAK HATCHER"	23,1000	4,962	21.48	09-May	35	85.97	6.1
RD-R-3	S. F. SALMON RIVER	25,600	1,139	4.45	26-May	53	110.87	8.0

1) ARRIVAL AT MCNARY DAM
2: AVERAGE flow THROUGH ICE HARBOR AT 50% PASSAGE DATE +/- 3 DAYS.

A travel time Index was obtained between Lower Granite and McNary Dams for yearling chinook. The travel time ranged from 12 to 15 days, and averaged 12.8 days. Speed through the Snake River monitoring area ranged from 9.3 to 11.7 miles/day, an average of 11.0 miles/day, as shown In Table C.

TABLE C: Travel Time of Harked Yearling Chinook from Lower Granite Dam to McNary Dam

BRAND	RELEASE SITE	No. RELEASED	NC. Coll AT MCN	b COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	Trav time (DAYS)	AVE. river FLOW (2)	AVE SPEED (MILES/DAY)
LD-R-1	RAPID RIVER	24,225	4,769	13.93	08-May	13	85.97	10.8
LD-R-3	HELLS CANYON	35,625	6.6'1	18.45	28-Aor	15	72.3'	9.3
RD-R-l	SAWTOOTH HATCHERY	35,875	1.599	4.01	16-May	12	73.24	11.7
RD-R-2	DWORShAK HATCHERY	23,100	4,962	21.49	09-May	12	85.97	'1.7
RD-R-3	S. F. Salmon river	25,600	1,139	4.45	26-Nay	12	110.87	11.7

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE +/- 3 DAYS.

River flows were much greater In 1984 when yearling chinook migrated from Lower Granite to McNary In 10.0 days, a rate of 14.1 miles per day. When the 1984 travel time Is compared to the 12.8 day8 travel time at 11.0 miles per day which occurred In 1985, It Is apparent that marked chinook yearlings travelled at a higher rate of speed, about 28% faster In 1984 than marked chinook yearlings in 1985 in the same index area.

Steelhead. Six mark groups were released at various points above Lower Granite Dam. Other releases, mainly from Lyons Ferry Hatchery, were planted in the lower Snake River. This section of the Snake River is located below Little Goose Dam and extends to the mouth of the Snake River.

Fourteen mark groups were released in this area, including the survival study groups of steelhead released below Little Goose Dam. The control portion of the survival groups were released below Ice Harbor Dam. The Washington Department of Game marked and released fish into the Tucannon River as well as on site production releases at Lyons Ferry Hatchery. Travel time and speed of the marked groups were measured from their release site to Lower Granite and McNary, as shown in (Tables D, E, and F).

Six groups released above Lower Granite migrated from release sites to the project in from 5 to 49 days. The average time required to traverse this distance was 22.0 days. Speed of the steelhead groups ranged from 6.4 to 14.6 miles per day and averaged 10.3 miles/day.

TABLE D: Travel Time of Marked Steelhead in the Snake River from Release Site to Lower Granite Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT LGR	% COLL AT LGR	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LD-Y-1	HELLS CANYON	30,000	2,821	9.40	10-May	10	82.02	14.0
LD-Y-2	DWORSHAK HATCHERY	30,625	6,831	22.31	04-May	5	86.97	14.6
RD-Y-1	STANLEY/SALMON RIVER	35,125	3,576	10.18	28-May	49	109.46	9.4
RD-Y-3	E. F. SALMON RIVER	31,775	2,454	7.72	28-May	41	109.46	10.3
RA-17-1	GRANDE RONDE RIVER	41,028	12,110	29.52	22-May	14	101.03	6.4
RA-17-3	GRANDE RONDE RIVER	40,201	12,022	29.90	21-May	13	95.53	6.9

1) ARRIVAL AT LOWER GRANITE DAM
2) AVERAGE FLOW THROUGH LOWER GRANITE AT 50% PASSAGE DATE +/- 3 DAYS

Seventeen marked releases were used to measure travel time and speed from release sites to McNary Dam. Only 3 groups (LD-Y-2, RA-17-1, RA-17-3) from the Snake River above Lower Granite provided enough recoveries at McNary to

adequately assess travel time. However, these 3 groups migrated more rapidly than did any of the lower Snake River releases, 12.0 miles/day as compared to 5.3 miles/day respectively. The overall travel time ranged from 6 to 26 days, and averaged 15.2 days to reach McNary project. The speed of these groups ranged from 3.9 to 17.7 miles/day, and averaged 6.5 miles/day.

TABLE E: Travel Time of Marked Steelhead in the Snake River from Release Site to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LD-Y-2	DWORSHAK HATCHERY	30,625	313	1.02	11-May	12	78.43	17.7
RA-17-1	GRANDE RONDE RIVER	41,028	457	1.11	02-Jun	26	96.05	8.8
RA-17-3	GRANDE RONDE RIVER	40,201	633	1.57	31-May	24	97.46	9.6
RA-7N-1	BELOW LITTLE GOOSE	19,983	6,528	32.67	21-May	15	96.17	6.7
RA-7N-3	BELOW LITTLE GOOSE	19,906	6,516	32.73	26-May	16	110.87	6.3
RA-H-1	LYONS FERRY	28,191	10,134	35.95	28-May	16	107.17	5.7
RA-H-2	LYONS FERRY	28,373	6,128	21.60	01-Jun	20	98.05	4.6
RD-H-1	LYONS FERRY	22,394	6,240	27.86	29-May	17	104.61	5.4
RD-H-2	LYONS FERRY	25,540	6,741	26.39	01-Jun	20	98.05	4.6
LA-S-2	LYONS FERRY	39,094	6,344	16.23	04-Jun	23	94.33	4.0
LA-S-1	TUCANNON	39,094	6,295	16.10	05-Jun	24	96.37	3.9
LA-7S-1	BELOW ICE HARBOR	4,076	1,155	28.34	15-May	7	68.67 *	5.9
LA-7S-3	BELOW ICE HARBOR	3,755	1,130	30.09	17-May	8	80.31 *	5.1
LD-7S-1	BELOW ICE HARBOR	4,050	1,065	26.30	19-May	6	91.95 *	6.8
LD-7S-3	BELOW ICE HARBOR	4,020	784	19.50	23-May	10	115.07 *	4.1
RA-7S-1	BELOW ICE HARBOR	4,159	1,104	26.54	18-May	8	86.85 *	5.1
RD-7S-1	BELOW ICE HARBOR	4,219	1,142	27.07	21-May	7	79.41 *	5.9

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE +/- 3 DAYS
* AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE + 3 DAYS

Three brand groups were used to assess travel time index and speed from Lower Granite to McNary Dam (Table F). Two of the groups were reared at Lyons Ferry Hatchery before being hauled to the Grande Ronde and acclimated for a specified time span. These groups were approximately equal in number and released at the same location and time. Both groups arrived at Lower Granite and McNary sampling sites in nearly equal numbers, and travel speeds were about equal. The travel time of the three groups ranged from 7 to 11 days, and

averaged 9.3 days. The speed ranged from 12.7 to 20.0 miles/day, and averaged 15.6 miles/day.

TABLE F: Travel Time of Marked Steelhead in the Snake River from Lower Granite Dam to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE SPEED (MILES/DAY)
LD-Y-2	DWORSHAK HATCHERY	30,625	313	1.02	II-Nay	7	70.43	20.0
RA-17-l	GRANDE RONDE RIVER	41,028	457	1.11	02-JUN	11	96.05	12.7
RA-17-3	GRANDE RONDE RIVER	40,201	633	1.57	31-May	10	97.46	14.0

1) ARRIVAL AT MCNARY DAR
2) AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE +/- 3 DAYS.

Summer Migrating Chinook. This was the initial year of assessing travel time and speed of sub-yearling (O-age) fall chinook salmon releases in the Snake River. This group was released in early June, and arrived 18 days later at Lover Granite. The migration speed was 3.4 miles/day (Table G). This same group required 34 days from release site to arrive at McNary, .a speed of 5.9 miles/day (Table H). The O-age chinook group had a passage time of 16 days between Lover Granite Dam and McNary Dam, at a rate of 8.7 miles/day (Table I).

TABLE G: Travel Time of Marked Sub-Yearling Chinook in the Snake River from Release Site to Lower Granite Dam.

BRAND	RELEASE SITE	NO. RELEASED	No. CDLL. AT LGR	% COLL AT LGR	------SO PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER flow (2)	AVE. SPEED (MILES/DAY)
LD-R-4	GRANDE RONDE RIVER	33,700	7,002	20.78	22-Jun	18	55.96	3.4

1) ARRIVAL AT LOWER GRANITE DAM
2) AVERAGE FLOW THROUGH LOWER GRANITE AT 50% PASSAGE DATE +/- 3 DAYS

TABLE H: Travel Time of Marked Sub-Yearling Chinook in the Snake River from Release Site to McNary Dam.

8RAND	RELEASE SITE	NC. RELEASED	NO. COLL. At MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LD-R-4	GRANDE RONDE RIVER	33,700	695	2.06	08-JUL	34	31.70	5.9

1) ARRIVAL AT McNary DAM
2) AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE +/- 3 DAYS

TABLE I: Travel Time of Marked Sub-Yearling Chinook in the Snake River from Lower Granite to McNary Dam.

BRAND	RELEASE SITE	ND. RELEASED	NO. COLL AT RCN	t COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE SPEED (WILES/DAY)
LD-R-4	GRANDE RONDE RIVER	33,700	695	2.06	08-Jul	16	31.7	8.7

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH ICE HARBOR AT 50% PASSAGE DATE t/- 3 DAYS.

To summarize, travel time and migration speed were calculated for three species, sub-yearling chinook, yearling chinook and steelhead. The established travel time index area is from Lover Granite to McNary Dam. The travel time index for 1985 in the Snake River by species is: sub-yearling fall chinook, 16.0 days, 8.7 miles/day; yearling chinook, 12.8 days, 11.0 miles/day; steelhead, 9.3 days, 15.6 miles/day.

The steelhead moved through the Snake River system at a higher rate of speed than did the chinook yearling and sub-yearling groups. Average flows which occurred at Ice Harbor Dam were calculated for the migration period of the marked groups were as follows: yearling chinook 85.83 kcfs; sub-yearling chinook 31.4 kcfs; and steelhead 93.14 kcfs. Table 11 lists the travel time established in 1984 and 1985. Travel time from Lover Granite Dam to McNary Dam was more rapid in 1984 because of higher flows than occurred in 1985. In 1985, average rates of travel between the recovery points were in all cases greater

than rates of travel from the release site to the first downstream recovery point. Fish behavior, condition and environmental factors such as water temperature and flow contribute to the intial delay which occurs upon release.

2. Mid-Columbia

Spring Chinook. Six groups of yearling chinook were marked at mid-Columbia hatcheries to determine travel time and migration speed to downstream sampling sites located at Rock Island and McNary Dams. Other marked groups were released below Priest Rapids Dam by Grant County PUD, as well as three control releases from the Winthrop Hatchery as part of the survival monitoring. A release of yearlings was also made into the Naches River, a tributary of the Yakima River. Travel time and migration speed of the releases below Priest Rapids were calculated to McNary Dam.

The travel time of the six mark groups from Winthrop and Leavenworth Hatcheries to Rock Island site ranged from 22 to 29 days, and averaged 26.0 days. The migration speed ranged from 1.7 to 5.5 miles/day, with the average being 4.2 miles/day (Table J). The group from Leavenworth Hatchery exhibited a slower migration rate than did the Winthrop groups.

TABLE J: Travel Time of Marked Yearling Chinook in the Mid-Columbia River from Release Site to Rock Island Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT RIS	% COLL AT RIS	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7C-1	WINTHROP HATCHERY	35,186	179	0.51	16-May	26	131.45	4.6
LA-7C-3	WINTHROP HATCHERY	36,704	130	0.35	13-May	27	147.05	4.5
LA-7F-1	WINTHROP HATCHERY	12,568	47	0.37	12-May	26	149.82	4.6
LA-7K-1	WINTHROP HATCHERY	34,959	193	0.55	16-May	22	131.45	5.5
LA-7T-1	WINTHROP HATCHERY	5,890	19	0.32	15-May	29	138.10	4.2
LA-7U-1	LEAVENWORTH HATCHERY	30,422	215	0.71	09-May	26	149.61	1.7

1) ARRIVAL AT ROCK ISLAND DAM
2) AVERAGE FLOW THROUGH ROCK ISLAND AT 50% PASSAGE DATE +/- 3 DAYS

These fish exhibited a travel time from release site to McNary of 31 to 38 days. Average travel time was 33.7 days. The migration speed ranged from 5.4 to 9.1 miles/day, and the average rate of speed was 8.1 miles/day (Table K).

A travel time index was calculated for yearling chinook between Rock Island and McNary Dams for the 1985 migration year. Travel time for six groups of marked yearling chinook ranged between 6 and 12 days, an average of 7.7 days. The migration speed ranged from a low of 13.5 to a high of 26.9 miles/day. The migration speed for yearling chinook was 21.0 miles/day through the mid-Columbia reach (Table L).

The marked yearling chinook released belov Priest Rapids by Grant County PUD were river-run fish marked at Priest Rapids Dam. The Winthrop fish released at this site were transported directly from the hatchery and released. Travel time and migration speed were quite different between river-run and hatchery releases made directly below Priest Rapids Dam. Travel time of Winthrop Hatchery and a Naches River release to McNary are calculated independently from travel time of the river run fish to McNary sampling facility.

The Winthrop Hatchery (control releases of the survival experiment LA-7T-3, RA-7T-1, RA-7T-3) had a range of travel time of 17 to 23 days from release site to McNary Dam, an average of travel time of 20.7 days. The speed of the groups ranged from 4.6 to 6.2 miles/day, with an average rate of 5.2 miles/day.

A single release from the Naches River, a tributary of the Yakima River, had a 40 day travel time at a rate of 4.0 miles/day to McNary Dam.

Marked releases from transportation research studies at Priest Rapids Dam were captured in large numbers at McNary Dam. Travel time of these fish from Priest Rapids to McNary ranged from 3 to 15 days, vith an average of 7.3 days. Migration speed ranged from 7.0 to 35.0 miles/day, with an average of 18.1 miles per day for the eleven marked groups, as shown in (Table K). These

river-run fish traveled 3 to 4 times the rate of the Winthrop Hatchery and Naches River groups.

TABLE K: Travel Time of Marked Yearling Chinook in the Columbia River from Release Site to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7C-1	WINTHROP HATCHERY	35,186	6,131	17.42	22-May	32	129.54	8.8
LA-7C-3	WINTHROP HATCHERY	36,704	7,386	20.12	19-May	33	128.75	8.5
LA-7F-1	WINTHROP HATCHERY	12,568	2,586	20.58	19-May	33	128.75	8.5
LA-7K-1	WINTHROP HATCHERY	34,959	6,194	17.72	25-May	31	119.41	9.1
LA-7T-1	WINTHROP HATCHERY	5,890	1,195	20.29	21-May	35	127.56	8.1
LA-7U-1	LEAVENWORTH HATCHERY	30,422	7,535	24.77	21-May	38	127.56	5.4
RA-IR-1	NACHES RIVER	25,000	3,379	13.52	19-May	40	------	4.0
LA-IL-1	BELOW PRIEST RAPIDS	6,603	2,843	43.06	09-May	15	162.13 *	7.0
LA-IL-3	BELOW PRIEST RAPIDS	10,569	6,165	58.33	21-May	5	126.39 *	21.0
LA-IN-1	BELOW PRIEST RAPIDS	8,201	3,326	40.56	12-May	11	155.78 *	9.5
LA-IN-3	BELOW PRIEST RAPIDS	6,779	3,422	50.48	27-May	4	127.99 *	26.3
LA-IS-1	BELOW PRIEST RAPIDS	14,431	6,820	47.26	16-May	7	126.92 *	15.0
LA-IS-3	BELOW PRIEST RAPIDS	3,117	1,828	58.65	06-Jun	5	96.64 *	21.0
LA-2C-1	BELOW PRIEST RAPIDS	7,067	2,844	40.24	13-May	10	151.20 *	10.5
LA-2C-3	BELOW PRIEST RAPIDS	4,005	2,197	54.86	26-May	3	113.75 *	35.0
LA-2J-1	BELOW PRIEST RAPIDS	7,404	4,033	54.47	19-May	10	129.13 *	10.5
LA-2J-3	BELOW PRIEST RAPIDS	1,679	995	59.26	05-Jun	4	107.44 *	26.3
LA-7T-3	BELOW PRIEST RAPIDS	12,695	4,623	36.42	09-May	23	162.13 *	4.6
RA-7T-1	BELOW PRIEST RAPIDS	12,299	5,372	43.68	11-May	17	156.06 *	6.2
RA-7T-3	BELOW PRIEST RAPIDS	12,451	5,235	42.04	12-May	22	155.78 *	4.8
LA-14-1	BELOW PRIEST RAPIDS	5,398	2,224	41.20	23-May	6	122.01 *	17.5

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS
* AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE + 3 DAYS

TABLE L: Travel Time of Marked Yearling Chinook in the Mid-Columbia from Rock Island Dam to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE SPEED (MILES/DAY)
LA-7C-1	WINTHROP HATCHERY	35,186	6,131	17.42	22-May	6	129.54	26.9
LA-7C-3	WINTHROP HATCHERY	36,704	7,386	20.12	19-May	6	128.75	26.9
LA-7F-1	WINTHROP HATCHERY	12,568	2,586	20.58	19-May	7	128.75	23.1
LA-7K-1	WINTHROP HATCHERY	34,959	6,194	17.72	25-May	9	119.41	17.9
LA-7T-1	WINTHROP HATCHERY	5,890	1,195	20.29	21-May	6	127.56	26.9
LA-7U-1	LEAVENWORTH HATCHERY	30,422	7,535	24.77	21-May	12	127.56	13.5

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS

Steelhead. Indexing of steelhead travel time in the mid-Columbia was again done in conjunction with monitoring of survival of steelhead from Wells Hatchery. Three groups were released near the mouth of the Methow River, and subsequently sampled at Rock Island and McNary Dam sites.

The three groups had an average travel time of 7.0 days to Rock Island Dam. The travel time ranged from 6 to 9 days. The migration rate was 7.8 miles/day for one group, and 11.8 miles/day for the other two releases. These groups migrated at an average of 10.5 miles/day (Table M).

TABLE M: Travel Time of Marked Steelhead in the Mid-Columbia River from Release Site to Rock Island Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT RIS	% COLL AT RIS	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7U-1	METHOW RIVER	30,378	685	2.25	20-May	6	121.59	11.8
RA-7U-1	METHOW RIVER	30,479	994	3.26	15-May	9	138.10	7.8
RA-7U-3	METHOW RIVER	30,351	928	3.06	16-May	6	131.45	11.8

1) ARRIVAL AT ROCK ISLAND DAM
2) AVERAGE FLOW THROUGH ROCK ISLAND AT 50% PASSAGE DATE +/- 3 DAYS

The travel time of the same groups from Rock Island to McNary ranged from 5 to 9 days, and ranged in speed from 17.9 to 32.3 miles/day. Travel Time index and migration rate through the mid-Columbia reach are 7.7 days and 21.0 miles per day, respectively (Table N).

TABLE N: Travel Time of Marked Steelhead in the Mid-Columbia River from Rock Island Dam to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7U-1	METHOW RIVER	30,378	6,692	22.03	29-May	9	124.55	17.9
RA-7U-1	METHOW RIVER	30,479	8,542	28.03	20-May	5	124.08	32.3
RA-7U-3	METHOW RIVER	30,351	9,179	30.24	25-May	9	119.41	17.9

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS

In addition to the 3 test release groups from Wells Hatchery, nine specific steelhead brand codes from the Wells survival experiment were released below Priest Rapids. These nine groups had travel times ranging from 5 to 9 days from Priest Rapids to McNary, with an average travel time of 6.6 days. The migration rate ranged from 11.7 to 21.0 miles/day, with an average of 16.7 miles/day (Table O).

TABLE O: Travel Time of Marked Steelhead in the Mid-Columbia River from Release Site to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7U-1	METHOW RIVER	30,378	6,692	22.03	29-May	15	124.55	15.5
RA-7U-1	METHOW RIVER	30,479	8,542	28.03	20-May	14	124.08	16.6
RA-7U-3	METHOW RIVER	30,351	9,179	30.24	25-May	15	109.97 *	15.5
LA-7K-1	BELOW PRIEST RAPIDS	4,041	2,091	51.74	17-May	7	117.89 *	15.0
LD-7K-1	BELOW PRIEST RAPIDS	4,038	1,589	39.35	22-May	7	130.51 *	15.0
RA-7K-1	BELOW PRIEST RAPIDS	4,041	1,736	42.96	19-May	6	129.13 *	17.5
RD-7K-1	BELOW PRIEST RAPIDS	4,047	1,891	46.73	24-May	7	115.09 *	15.0
LA-7K-3	BELOW PRIEST RAPIDS	4,058	1,425	35.12	20-May	9	128.52 *	11.7
LD-7K-3	BELOW PRIEST RAPIDS	4,022	1,435	35.68	24-May	8	115.09 *	13.1
LD-7T-1	BELOW PRIEST RAPIDS	3,986	1,586	39.79	25-May	5	109.97 *	21.0
LD-7T-3	BELOW PRIEST RAPIDS	4,138	640	15.47	26-May	5	113.75 *	21.0
RD-7T-3	BELOW PRIEST RAPIDS	4,289	1,146	26.72	27-May	5	127.99 *	21.0

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS
* AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE + 3 DAYS

Sockeye. Eleven groups of sockeye were marked and released at Priest Rapids Dam by Grant County PUD. The travel time of these groups to McNary Dam ranged from 3 to 10 days, and averaged 6.7 days. These groups had an average migration speed of 17.6 miles/day (Table P).

TABLE P: Travel Time of Marked Sockeye Salmon In the Mid-Columbia River from Release Site to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT MCN	% COLL AT MCN	50 PERCENT PASSAGE ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-IL-1	BELOW PRIEST RAPIDS	9,614	3,175	33.02	04-May	10	138.38	10.5
LA-IL-3	BELOW PRIEST RAPIDS	6,451	2,471	38.30	24-May	8	122.49	13.1
LA-IN-1	BELOW PRIEST RAPIDS	8,189	3,094	37.78	09-May	8	158.66	13.1
LA-IN-3	BELOW PRIEST RAPIDS	10,403	4,171	40.09	28-May	5	125.45	21.0
LA-IS-1	BELOW PRIEST RAPIDS	8,171	2,992	36.62	16-May	7	137.04	15.0
LA-IS-3	BELOW PRIEST RAPIDS	12,604	5,408	42.91	05-Jun	5	105.69	21.0
LA-2C-1	BELOW PRIEST RAPIDS	2,299	815	35.45	12-May	9	157.13	11.7
LA-2C-3	BELOW PRIEST RAPIDS	2,014	675	33.52	28-May	5	125.45	21.0
LA-2J-1	BELOWPRIESTRAPIDS	1,069	387	36.20	18-May	9	131.32	11.7
LA-2J-3	BELOW PRIEST RAPIDS	2,382	967	40.60	04-Jun	3	110.36	35.0
LA-14-1	BELOW PRIEST RAPIDS	835	404	48.38	22-May	5	129.54	21.0

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE + 3 DAYS

Sub-yearling Summer/Fall Chinook. Two groups of zero-age summer chinook were marked and released at Wells Hatchery for indexing travel time for summer migrants. One group was released in early May; the second in late May. The median passage date at Rock Island was the same for both groups, June 19. The travel time from release site to Rock Island was 36 days for the early release, and 20 days for the late release group. The migration rate for the early group was 1.7 miles/day, and 3.1 miles/day for the late group (Table Q). Travel time from Rock Island Dam to McNary Dam was identical for both groups. The travel time index for sub-yearling chinook through the mid-Columbia is 14.0 days; a migration speed of 11.5 miles/day (Table R).

TABLE Q: Travel Time of Marked Sub-Pearling Chinook in the Mid-Columbia from Release Site to Rock Island Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT RIS	% COLL AT RIS	50 PERCENT PASSAGE ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
RA-T-3	WELLS HATCHERY	22,515	40	0.18	19-Jun	36	118.67	1.7
LA-T-3	WELLS HATCHERY	101,328	257	0.25	19-Jun	20	118.67	3.1

1) ARRIVAL AT ROCK ISLAND DAM
2) AVERAGE FLOW THROUGH ROCK ISLAND AT 50% PASSAGE DATE +/- 3 DAYS

TABLE R: Travel Tlme of Marked Sub-Yearling Chinook In the Mid-columbia from Rock Island to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-T-3	WELLS HATCHERY	101,328	4,687	4.63	03-Jul	14	95.37	11.5
RA-T-3	WELLS HATCHERY	22,515	871	3.87	03-Jul	14	95.37	11.5

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS

A single group of sub-yearling fall chinook was marked and released at Priest Rapids Hatchery. Travel time and migration speed of the two summer and one fall chinook groups were measured from release site to McNary Dam. The migration speed was nearly equal, ranging from 4.5 to 6.6 miles/day. Median arrival date at McNary was July 1 for the fall chinook release, and July 3 for the two summer chinook releases (Table S).

TABLE S: Travel Time of Marked Sub-Yearling Chinook In the Mid-Columbia from Release Site to McNary Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT MCN	% COLL AT MCN	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
RA-T-1	PRIEST RAPIDS HATCH	78,312	20,410	26.06	01-Jul	19	105.56 *	5.5
LA-T-3	WELLS HATCHERY	101,328	4,687	4.63	03-Jul	34	95.37	6.6
RA-T-3	WELLS HATCHERY	22,515	871	3.87	03-Jul	50	95.37	4.5

1) ARRIVAL AT MCNARY DAM
2) AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE +/- 3 DAYS
* AVERAGE FLOW THROUGH PRIEST RAPIDS AT 50% PASSAGE DATE + 3 DAYS

To summarize travel time Indices for the mid-Columbia reach, Rock Island Dam to McNary Dam, were calculated for three species in 1985. Sub-yearling summer/fall chinook: 14.0 days, 11.5 miles/day; yearling chinook: 7.7 days, 21.0 miles/day; steelhead: 7.7 days, 21.0 miles/day.

As noted, migration speed of the yearling chinook and steelhead groups both were 21.0 miles/day. The rate of travel for sub-yearling chinook was considerably less than that of steelhead or yearling chinook migrants, 11.5

miles/day compared to 21.0 miles/day.

3. Lower Columbia

John Day was utilized to develop limited travel time estimates in the lower Columbia River. Because of modifications to John Day bypass and sampling, and problems with starting up a consistent sampling program, the data collected at John Day should be regarded cautiously.

Consistent sampling did not begin at John Day until May 11. For this reason, only marked groups that were recovered at McNary Dam after May 10 were used to estimate travel time. Percent of each mark group collected at John Day was quite small. For some groups, the median date of passage occurred at McNary and John Day on the same date. Since a zero travel time from McNary to John Day is not possible, a minimum travel time of one day was arbitrarily assigned. The migration pattern for this group was examined. The travel time for the 10% and 90% dates of passage were examined for the steelhead between McNary and John Day.

For these reasons, an annual index of migration is not calculated for the McNary to John Day reach. However, the following travel time information on marked groups is presented with the qualification that it represents a too limited portion of the migration to be utilized as an annual index.

A single group of steelhead showed zero travel time days from McNary to John Day. (In order to calculate travel time, an arbitrary minimum travel time of 1 day was assigned to this group.) This infers that the 50% passage or median passage dates occurred at John Day and McNary on the same day. This is obviously not a realistic indication of travel time between the two points. This Indicates that the recovery pattern was skewed at John Day. We examined the migration patterns at John Day and McNary. The 10% and 90% dates of passage of at McNary and John Day was examined for this group. The dates of

10% and 90% passage of chinook yearlings and steelhead are shown in (Table T). Table T shows that for steelhead two days elapsed between the 10% dates of passage at McNary and John Day, and 2 days elapsed between the 90% dates of passage at the two projects.

TABLE T: Travel Time for 10% and 90% Passage of Steelhead from McNary to John Day.

Steelhead LA-7K-3	10% Passage	50% Passage	90% Passage
McNary	5/15	5/20	5/28
John Day	5/17	5/20	5/30
Travel Time	2 days	0 days	2 days

Yearling Chinook. John Day Dam was again used to assess the smolt migration in the lower Columbia River. Three groups from the mid-Columbia River arrived in sufficient numbers to measure travel time and migration speed between McNary and John Day Dam sites. The mid-Columbia marked groups had an average passage time of 4.3 days; an average speed of 17.8 miles/day (Table U).

Steelhead. Steelhead groups used to calculate travel time were mid-Columbia releases. Most groups exhibited good recapture patterns at John Day, with the previously stated qualifications. The average travel time was 2.0 days from McNary to John Day. The average speed of the groups was 42.5 miles/day (Table V).

An annual index is not calculated for John Day for 1985 because of sampling and data limitations.

TABLE U: Travel Time of Marked Chinook Yearlings between McNary and John Day Dams.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT JDA	5 COLL AT JDA	-----40 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (RILES/DAY)
LA-IL-3	BELOM PRIEST RAPIDS	!3,569	123	1.16	26-May	5	243.89	15.3
LA-IN-3	BELOW PRIEST RAPIDS	6,779	63	0.93	Ol-Jun	5	246.14	15.3
LA-14-l	BELOW PRIEST RAPIDS	5,398	59	1.09	26-May	3	243.89	25.5

1) ARRIVAL At JOHN DAY DAM
2) AVERAGE FLOW THROUGH JOHN DAY AT 50% PASSAGE DATE +/- 3 DAYS

TABLE V: Travel Time of Marked Steelhead between McNary and John Day Dam.

BRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT JDA	1 COLL AT JDA	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
LA-7U-1	METHOW RIVER	30,378	129	0.42	31-Way	2	243.30	25.5
RA-7U-1	METHOM RIVER	30,479	308	1.01	22-May	2	237.68	38.2
RA-7U-3	METHOW RIVER	30,351	186	0.61	27-May	2	247.34	38.2
LA-7K-1	BELOW PRIEST RAPIDS	4,041	65	1.61	20-May	3	231.5i	25.5
LA-7K-3	BELOW PRIEST RAPIDS	4,058	64	1.58	20-May	1 (0)	231.51	76.4
LD-7K-1	BELOW PRIEST RAPIDS	4,038	56	1.39	24-May	2	241.20	38.2
LD-7K-3	BELOW PRIEST RAPIDS	4,022	52	1.29	25-May	1	241.33	76.4
RA-7K-1	BELOW PRIEST RAPIDS	4.041	55	1.36	22-May	3	237.68	25.5
RD-7K-1	BELOW PRIEST RAPIDS	4,047	66	1.63	26-May	2	243.89	38.2

1) ARRIVAL AT JOHN DAY DAM
2) AVERAGE flow THROUGH JOHN DAY A? 508 PASSAGE DATE +/- 3 DAYS

Sockeye. Three groups of marked river-run sockeye were recovered in sufficient numbers at John Day to determine travel time in the lower Columbia. The average travel time was 4.7 days; an average migration speed of 17.0 miles/day (Table W).

TABLE W: Travel Time of Marked Sockeye Salmon between McNary and John Day Dams.

BRAND	RELEASE SITE	NO. RELEASED	NO. COIL. AT JDA	t COLL AT JDA	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER flow (2)	AVE. SPEED (MILES/DAY)
LA-IL-3	Below PRIEST RAPIDS	6,451	33	0.51	30-May	6	241.56	12.7
LA-IN-3	BELOW PRIEST RAPIDS	10,403	61	0.59	01-Jun	4	246.14	19.1
LA-IS-3	below PRIEST RAPIDS	12,604	60	0.48	09-Jun	4	211.07	19.1

1) ARRIVAL AT JOHN DAY Dam
2) AVERAGE flow THROUGH JOHN DAY AT 50% PASSAGE DATE +/- 3 DAYS

Sub-yearling Chinook. One group of sub-yearling migrante, Priest Rapid8 fall chinook, was monitored to John Day. The proportion recaptured at the project was low. This group cannot be considered representative of the sub-yearling migration as a whole. The passage time for this group was 17 days, a migration speed of 4.5 miles/day (Table X).

TABLE X: Travel Time of Marked Sub-yearling Chinook from McNary to John Day Dam.

GRAND	RELEASE SITE	NO. RELEASED	NO. COLL. AT JDA	% COLL AT JDA	------50 PERCENT PASSAGE------ ARRIVAL DATE (1)	TRAV TIME (DAYS)	AVE. RIVER FLOW (2)	AVE. SPEED (MILES/DAY)
RA-l-1	PRIEST RAPIDS HATCHERY	78,312	63	0.38	18-Jul	17	101.99	4.5

1) ARRIVAL AT JOHN DAY DAM
2) AVERAGE FLOW THROUGH JOHN DAY AT 50% PASSAGE DATE +/- 3 DAYS

C. Migration Characteristices

1. Snake River

Lewiston Trap. The collection trap at Lewiston, Idaho operated from March 16 through September 17. Yearling chinook peaked on April 6 (Figure 6), while steelhead peaked on May 21 (Figure 7). a separation of 45 days. In 1984, yearling chinook peaked on April 19, 13 day8 1ater;than in 1985. The steelhead passage for the two years are not comparable, due to an incomplete data set in 1984 caused by early removal of the trap.

A more complete analysis of data from this site, as well as other Snake River traps, is to be published by Idaho Department of Fish and Game.

Lower Granite. Sampling at Lower Granite Dam began on March 27 and ended on July 23. The 1985 starting date was 13 days earlier than in 1984 when sampling started on April 10, in order to avoid missing the beginning of the yearling chinook passage, as was done in 1984.

In 1985, the passage of yearling chinook was characterized by 3 peaks, the highest occurring on April 26 (Figure 8). This period occurred within the first increase of flow. Steelhead peaked on May 6 (Figure 9), coinciding with the increasing flow levels at the beginning of May. The peak8 for both yearling chinook and steelhead were earlier in 1985 than 1984 by 6 and 9 days, respectively. Passage at Lower Granite Dam coincided with daily flow fluctuations at the project as shown in Figure 10. The time period between the yearling chinook and eteelhead median date8 of passage was 15 days in 1985, similar to the 14 day8 in 1984 (Table 4).

FIGURE 6

MIGRATION TIMING: LEWISTON TRAP
YEARLING CHINOOK
1984 AND 1985

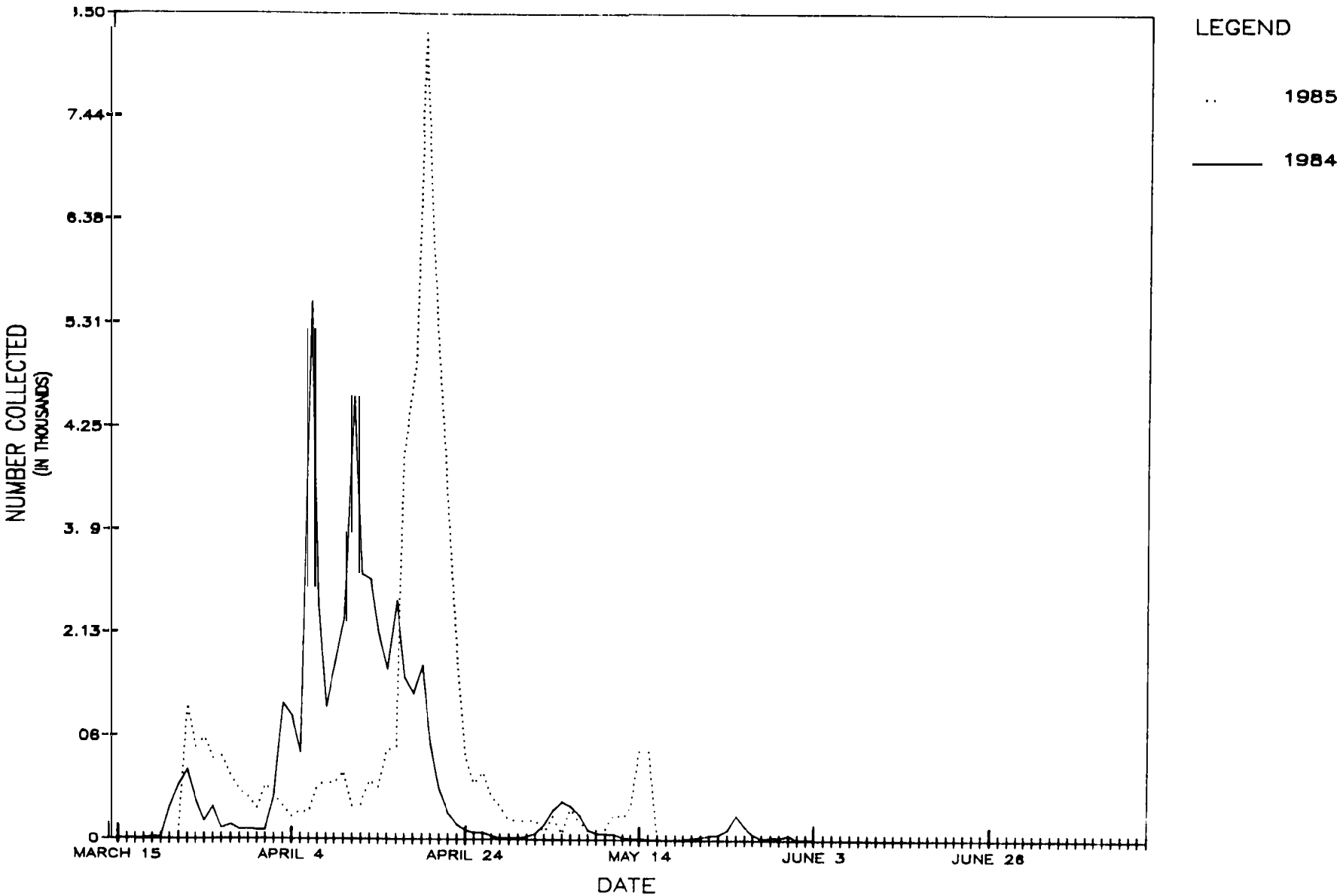


FIGURE 7

MIGRATION TIMING: LEWISTON TRAP
STEELHEAD
1985

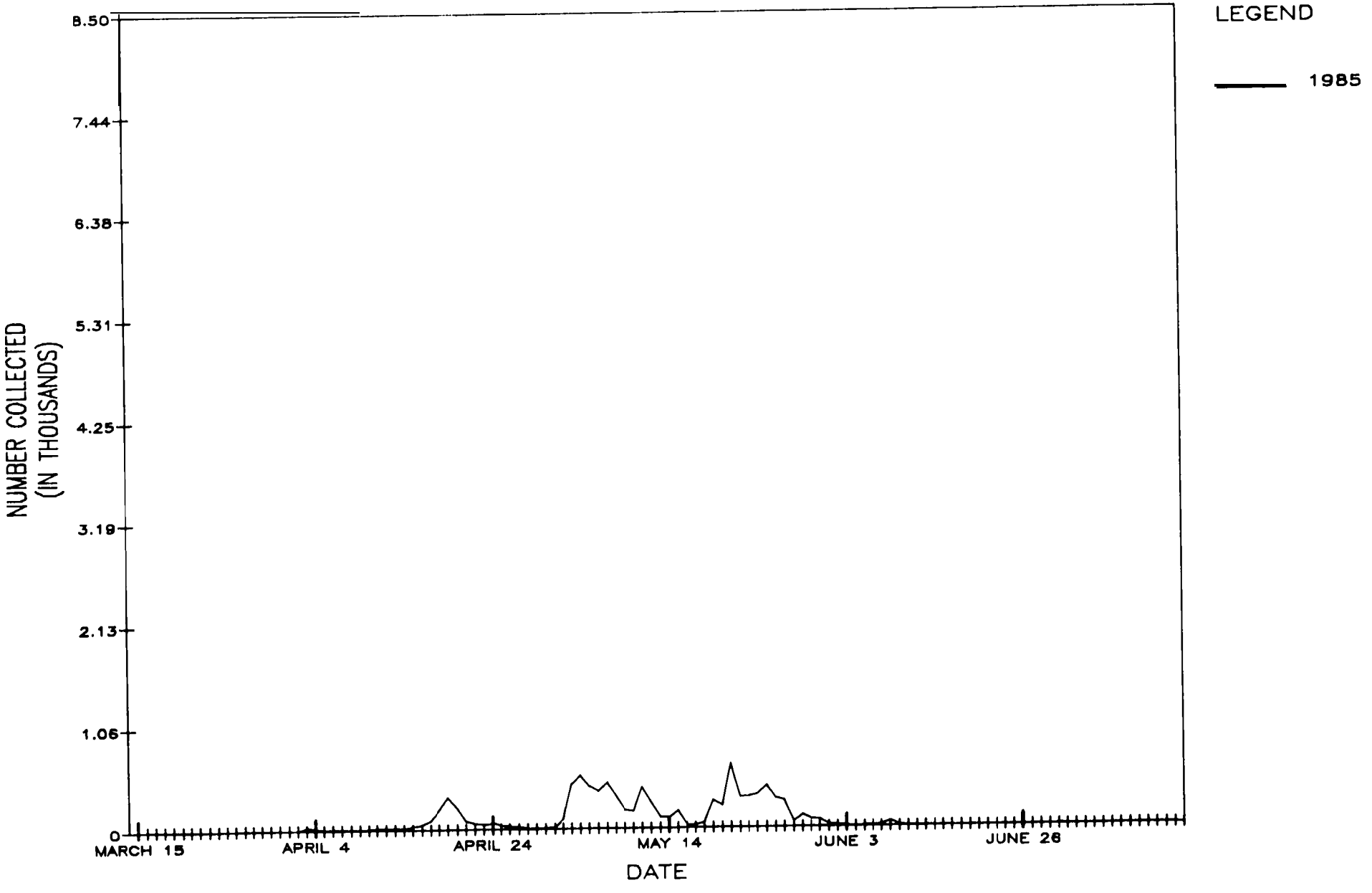


TABLE 4: Juvenile Passage Dates at Lower Granite Dam, 1985 and 1984.

Species	Passage Dates				Duration
	Peak	10%	50%	90%	
		1985			
Yearling Chinook	4/26	4/15	4/30	5/24	39 days
Steelhead	5/6	5/3	5/15	5/31	28 days
Sub-yearling Chinook	7/9	6/11	7/3	7/13	32 days
Sockeye	5/18	4/5	5/18	6/11	67 days
		1984			
Yearling Chinook	5/2	4/20	5/1	6/10	51 days
Steelhead	5/15	4/30	5/15	6/2	33 days
Sub-yearling Chinook	6/17	4/25	5/24	6/30	66 days
Sockeye	5/25	5/11	6/5	6/23	43 days

Sub-yearling chinook displayed a sharp peak on July 9 in 1985 (Figure ll), much later than the two peaks of May 2 and June 17 in 1984. The period of heaviest passage, including the peak, occurred during very low flows and high water temperatures.

Sockeye were present when sampling began and peaked on May 18 (Figure 12). The passage in 1984 was characterized by two peaks on May 25 and June 13. In 1985 the peak of sockeye passed during a period of declining flow.

There were no coho (oncorhynchus kiautch) sampled at Lower Granite in 1985, and very few sampled in 1984 (<50).

The passage indices for all species at Lower Granite for 1985 and 1984 are shown in Table 5. The indices for both yearling chinook and steelhead were greater in 1985 than in 1984, increasing by 59% and 76%, respectively. Sub-yearling chinook and sockeye passage indices both decreased in 1985 by 67% and 59%. respectively.

TABLE 5: Total Passage Indices at Lower Granite 1985 & 1984.

1985

	Total Number Collected	Total Passage Index
Yearling Chinook	1,742,244	1,768,547
Steelhead	2,689,579	2,803,144
Sub-yearling Chinook	44,008	44,008
Sockeye	6,467	6,519
Coho	0	0

1984

	Total Number Collected	Total Passage Index
Yearling Chinook	828,332	1,112,829
Steelhead	1.114.740	1,589,910
Sub-yearling Chinook	97,639	132,582
Sockeye	11,152	15,803
Coho	256	--

FIGURE 8

MIGRATION TIMING: LOWER GRANITE DAM
YEARLING CHINOOK
1984 AND 1985

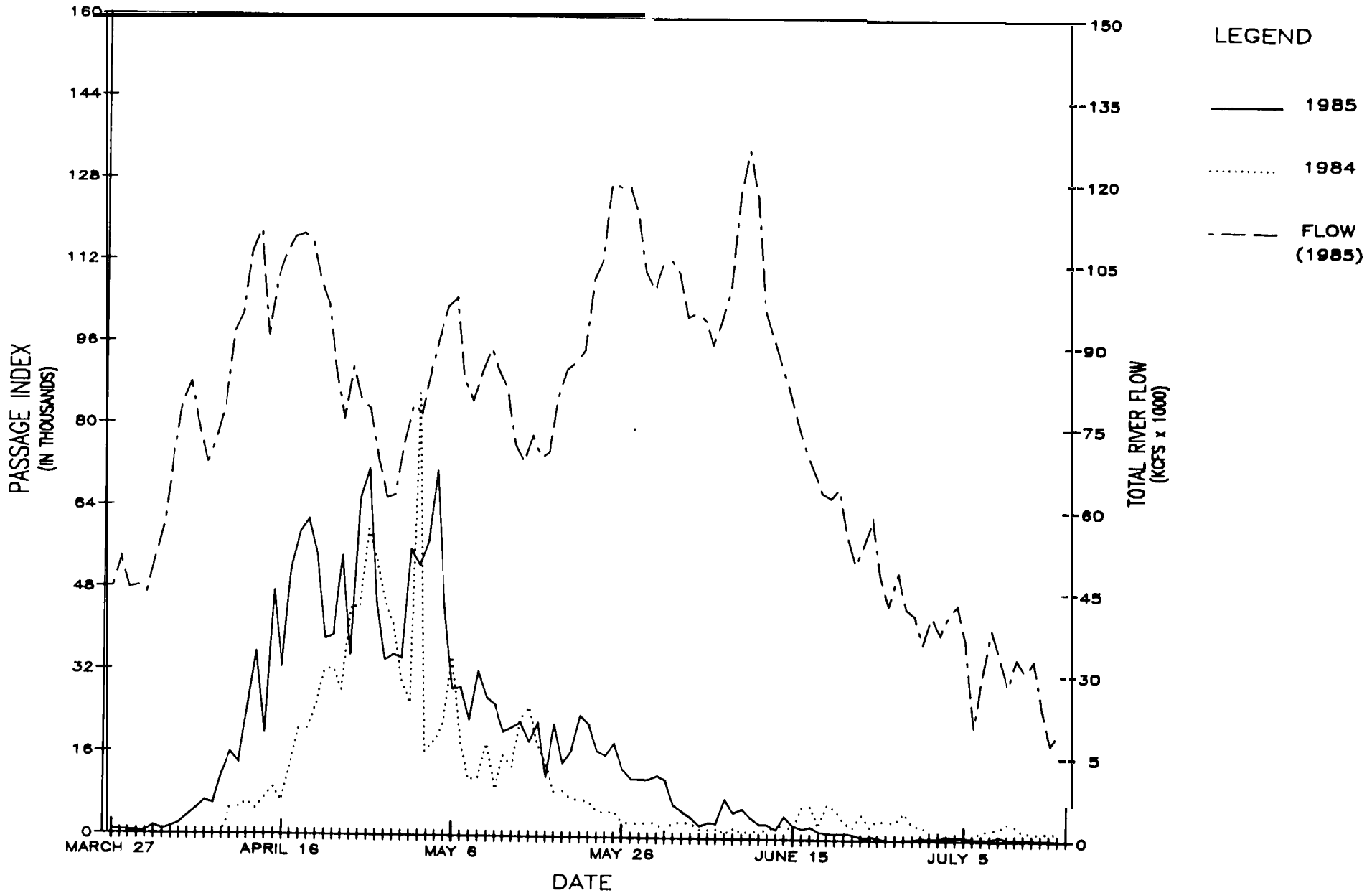


FIGURE 9

MIGRATION TIMING: LOWER GRANITE DAM
STEELHEAD
1984 AND 1985

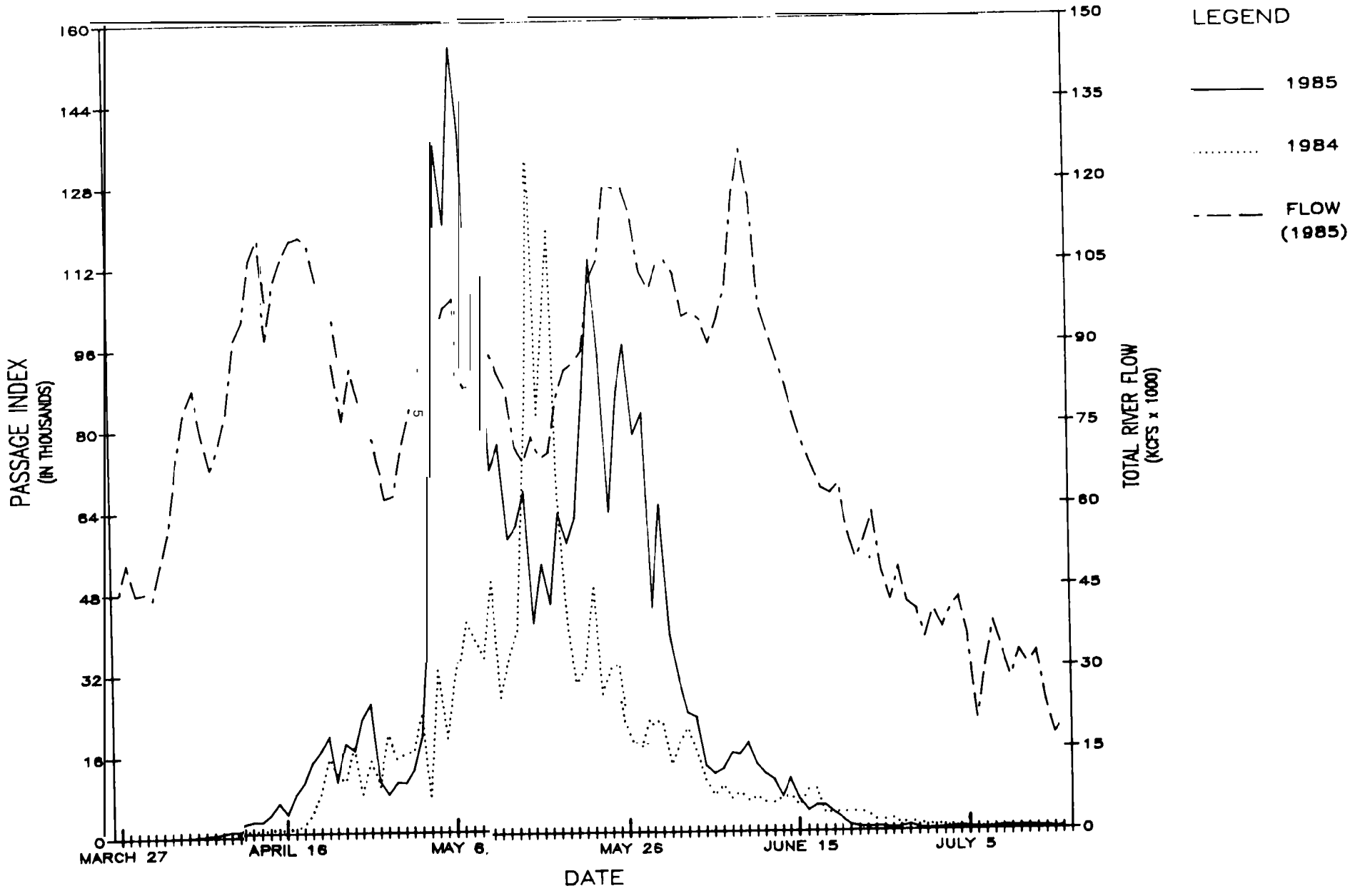


FIGURE 10

MIGRATION TIMING: LOWER GRANITE DAM
YEARLING CHINOOK AND STEELHEAD
1985

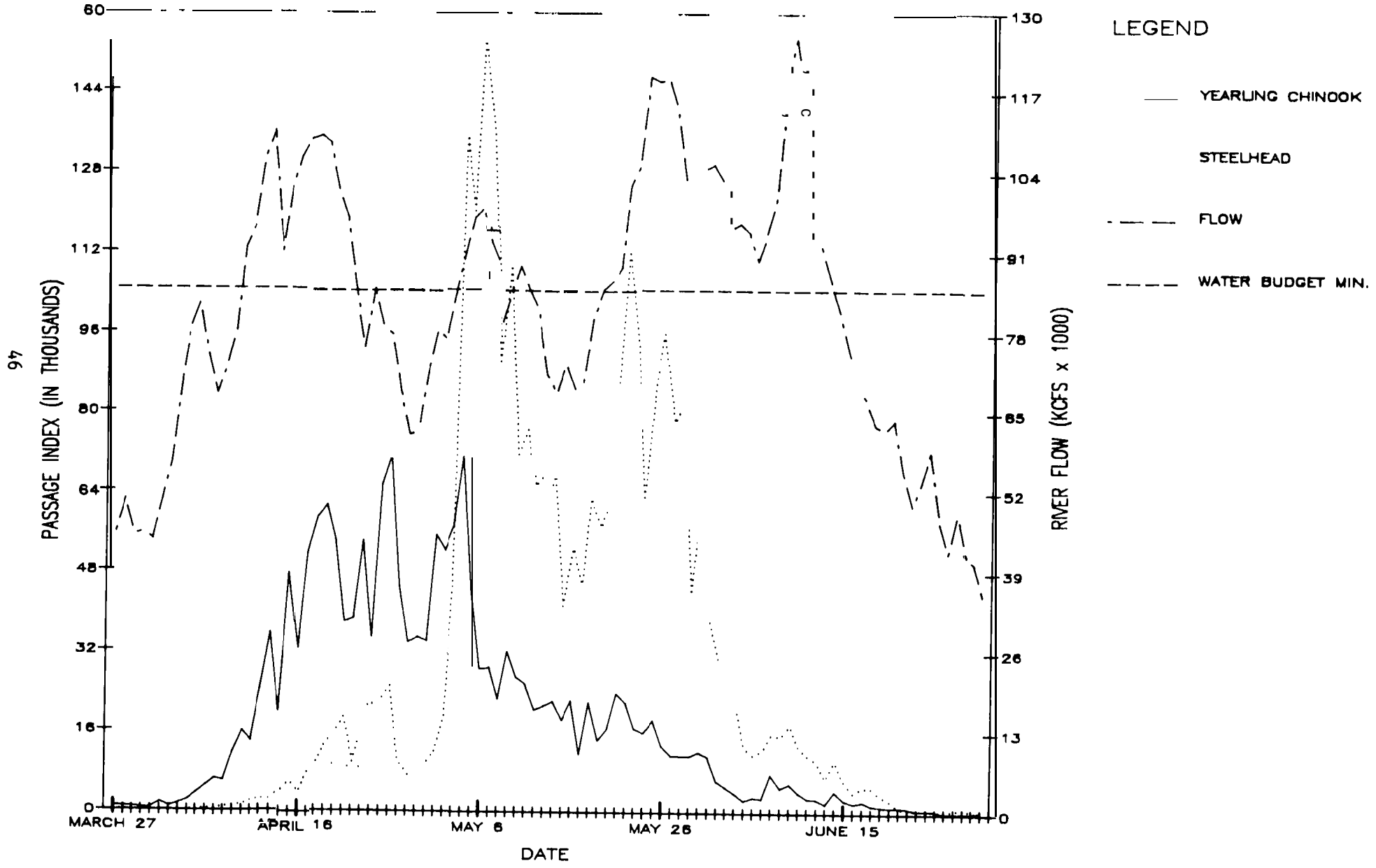


FIGURE 11

MIGRATION TIMING: LOWER GRANITE DAM
SUB-YEARLING CHINOOK
1984 AND 1985

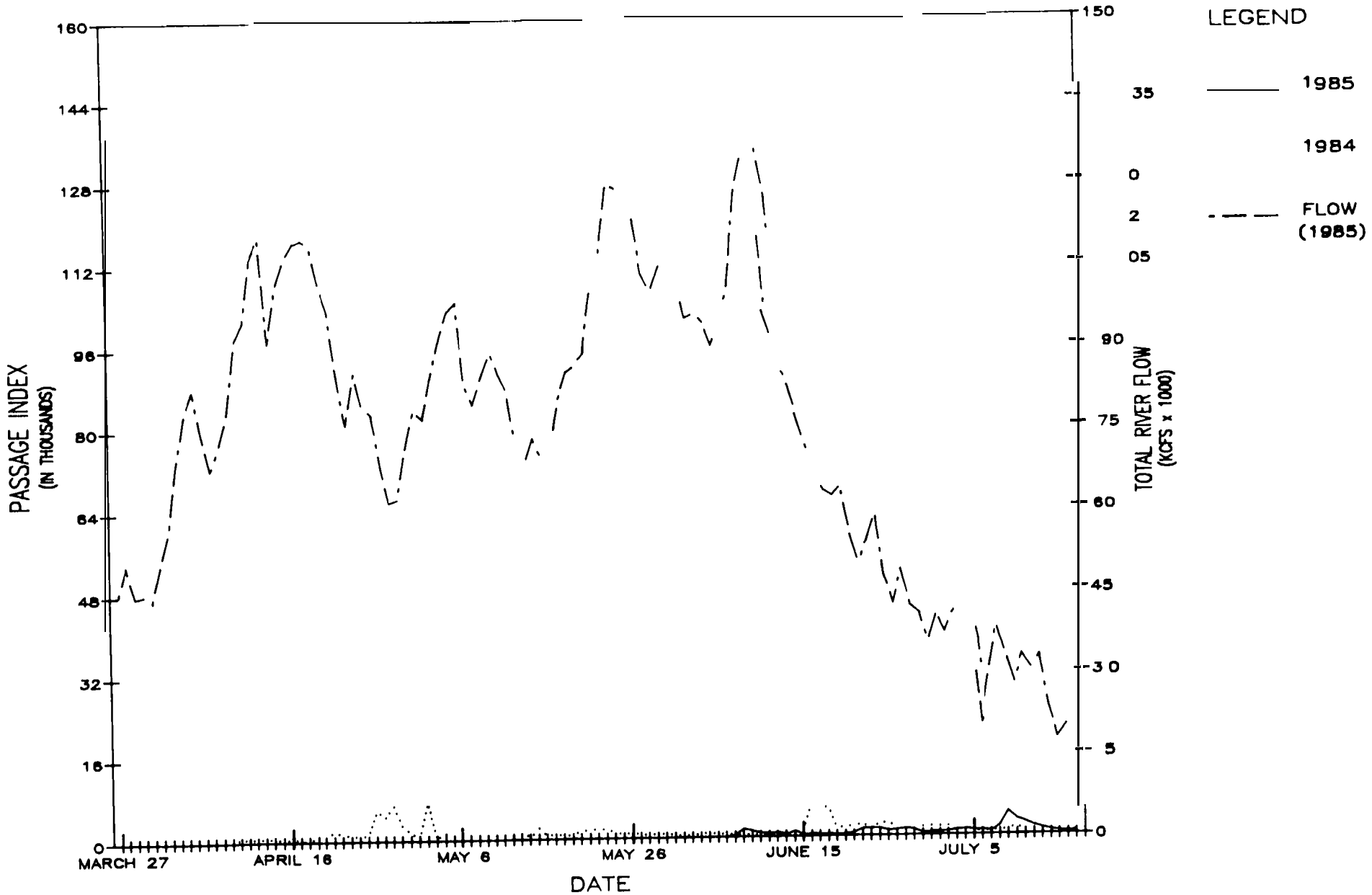
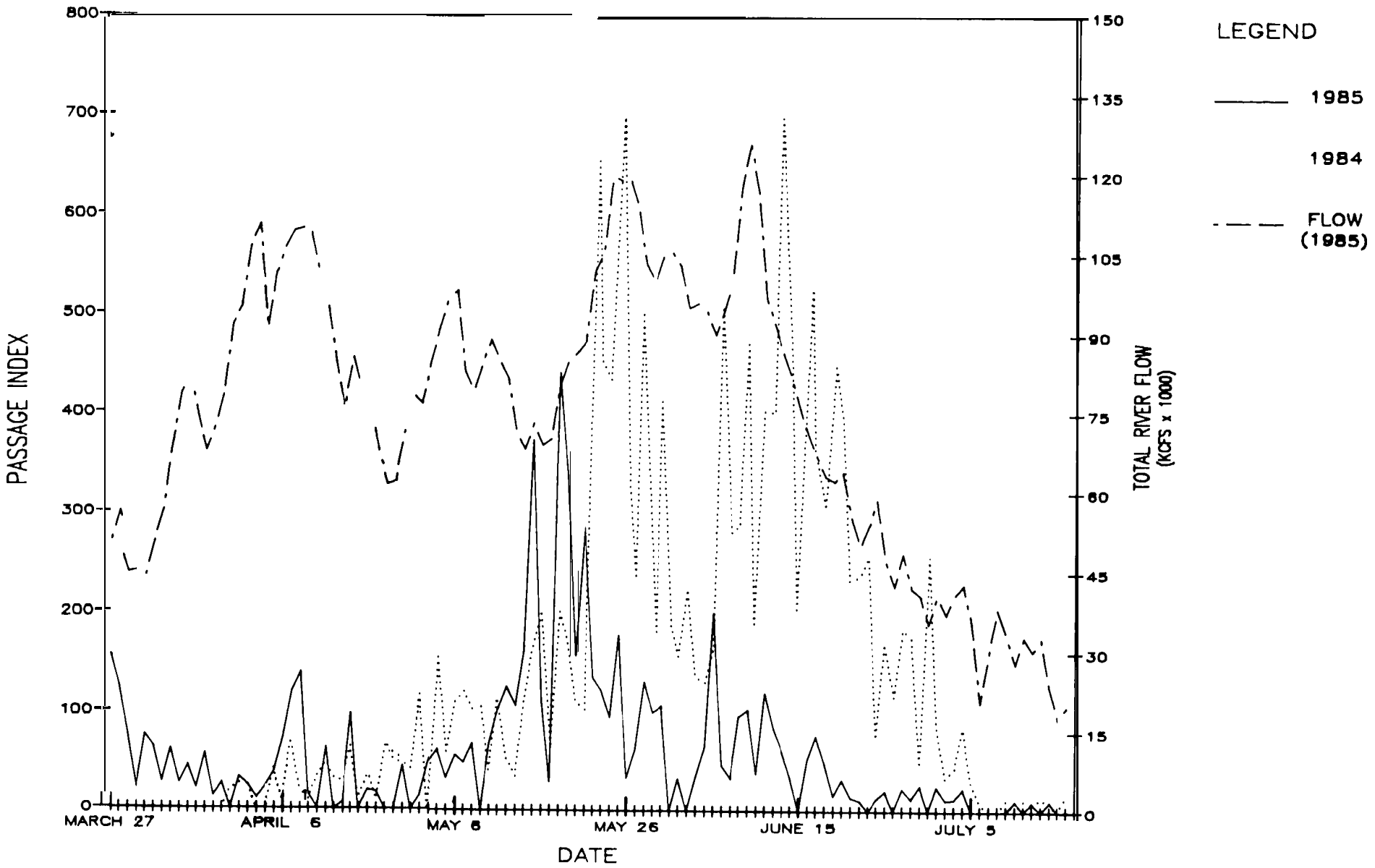


FIGURE 12

MIGRATION TIMING: LOWER GRANITE DAM
SOCKEYE
1984 AND 1985



NOTE: Passage index scale differs from other species at Lower Granite.

2. Mid-Columbia

Rock Island Dam. In 1985, sampling at Rock Island Dam occurred between April 1 and August 31. The collection facility was not in full operation in 1984, therefore, no data are available for comparative purposes.

River flow at Rock Island was extremely varied throughout the season. Flow occurred in spikes, caused by decreased power demands on weekends. Yearling chinook passed in two distinct peaks, the first and largest being on April 16, and the second on May 8 (Figure 13). Steelhead peaked on May 23 (Figure 14), 37 days later than the first peak of yearling chinook. The time between the 50% passage dates for the two species was 15 days (Table 6). The peaks for both yearling chinook and steelhead occurred during relatively high flows.

TABLE 6: Timing and duration of migration at Rock Island Dam, 1985.

	Passage Dates				
Species	Peak	10%	50%	90%	Duration
Yearling Chinook	4/16	4/16	5/7	5/22	36 days
Steelhead	5/23	5/11	5/22	6/2	22 days
Sub-yearling Chinook	6/19	6/9	7/10	8/8	60 days
Sockeye	4/15	4/13	4/18	5/29	46 days
COHO	5/24	5/23	5/28	6/5	13 days

Sub-yearling chinook also passed in two distinct peaks (Figure15). The first peak was larger, occurring on June 19, while the second occurred on July 25.

Sockeye peaked sharply on April 15 (Figure 16), soon after collection started.

Coho passed through in a relatively short time span, peaking on May 24 (Figure 17). one day later than the steelhead peak. This was 4 days later than

the release from Rocky Reach Hatchery, which vas the only coho release in the mid-Cloumbia,

The passage Indices for all species collected at Rock Island are shovn in (Table 7) belov.

TABLE 7: Total Passage Indices at Rock Island Dam, 1985.

	1985	
	Total Number Collected	Total Passage Index
Yearling Chinook	32,399	38,891
Steelhead	30,128	34,253
Sub-yearling Chinook	21,017	24,289
Sockeye	31,201	36,803
Coho	12,034	13,654

FIGURE 13

MIGRATION TIMING: ROCK ISLAND DAM
YEARLING CHINOOK
1985

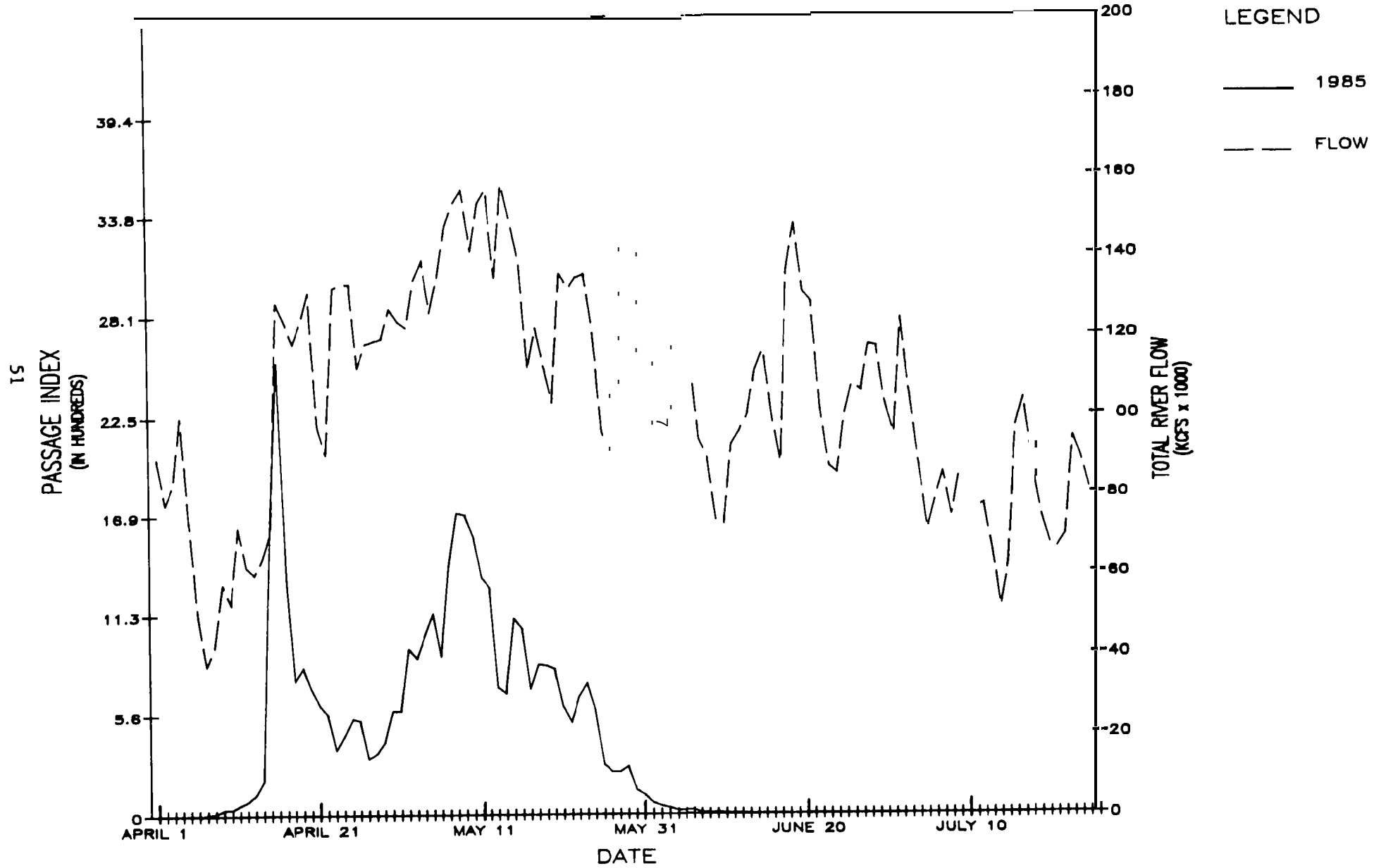


FIGURE 14

MIGRATION TIMING: ROCK ISLAND DAM

STEELHEAD

1985

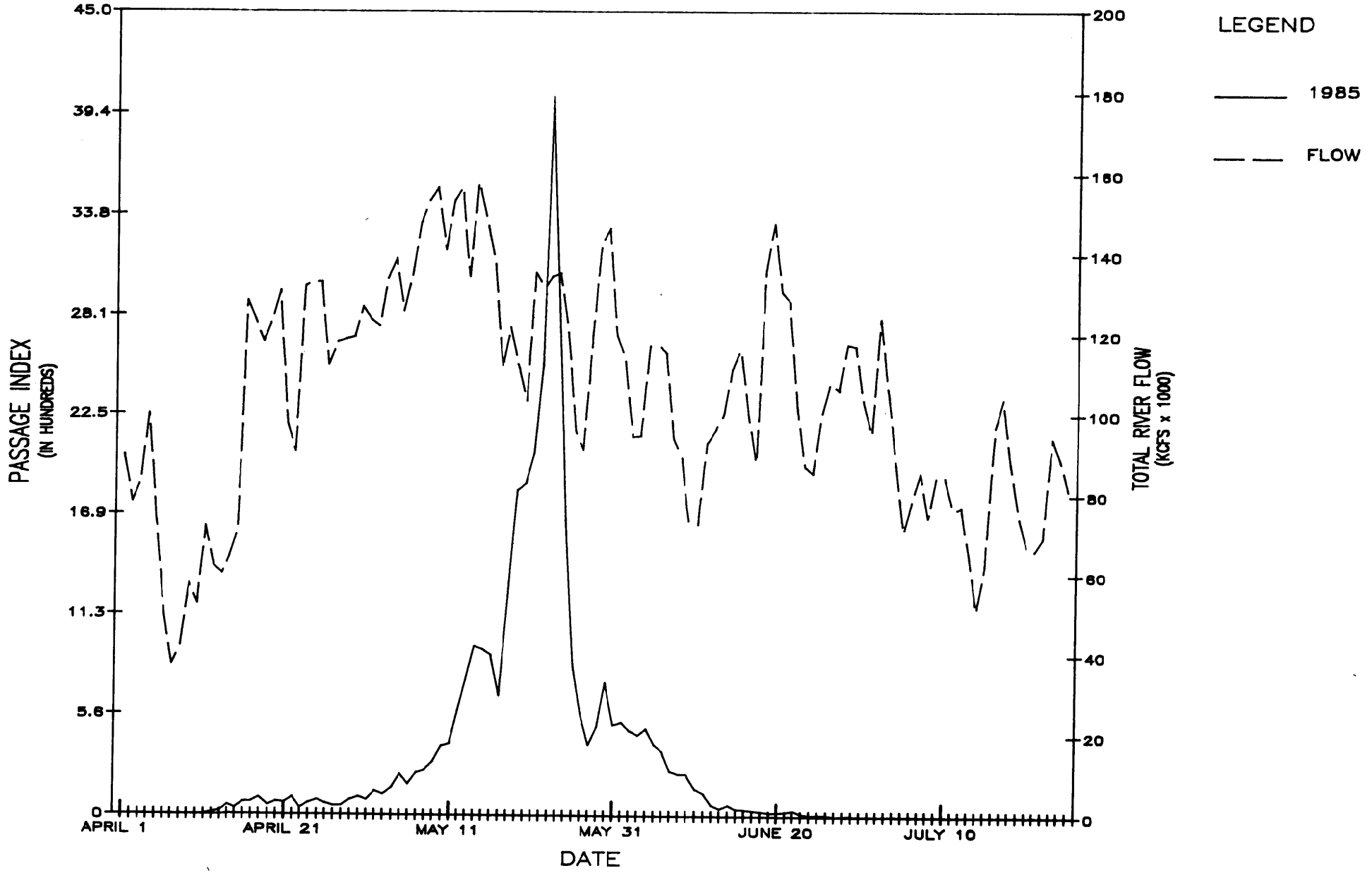


FIGURE 15

MIGRATION TIMING: ROCK ISLAND DAM
SUB-YEARLING CHINOOK
1985

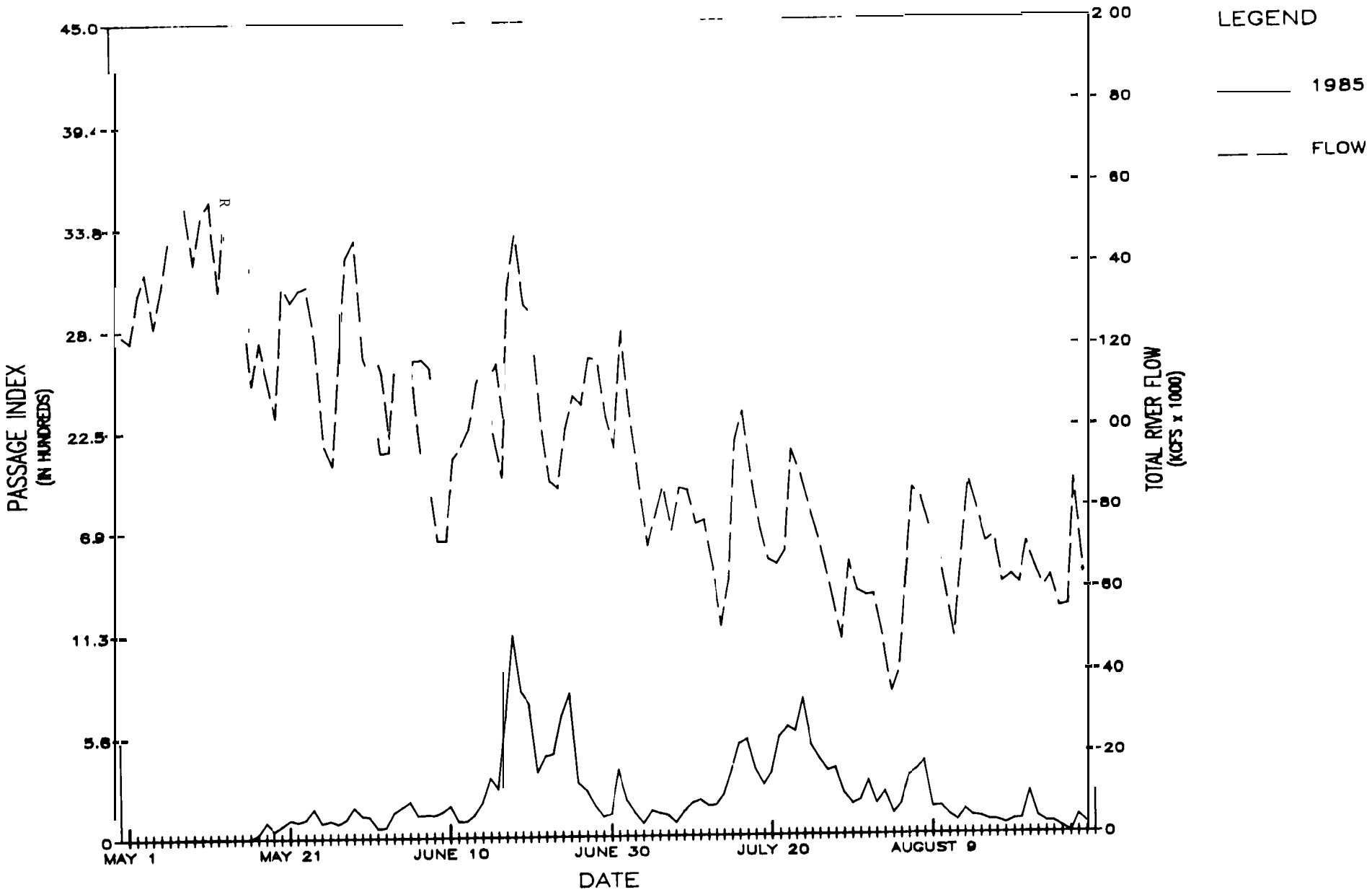


FIGURE 16

MIGRATION TIMING: ROCK ISLAND DAM

SOCKEYE

1985

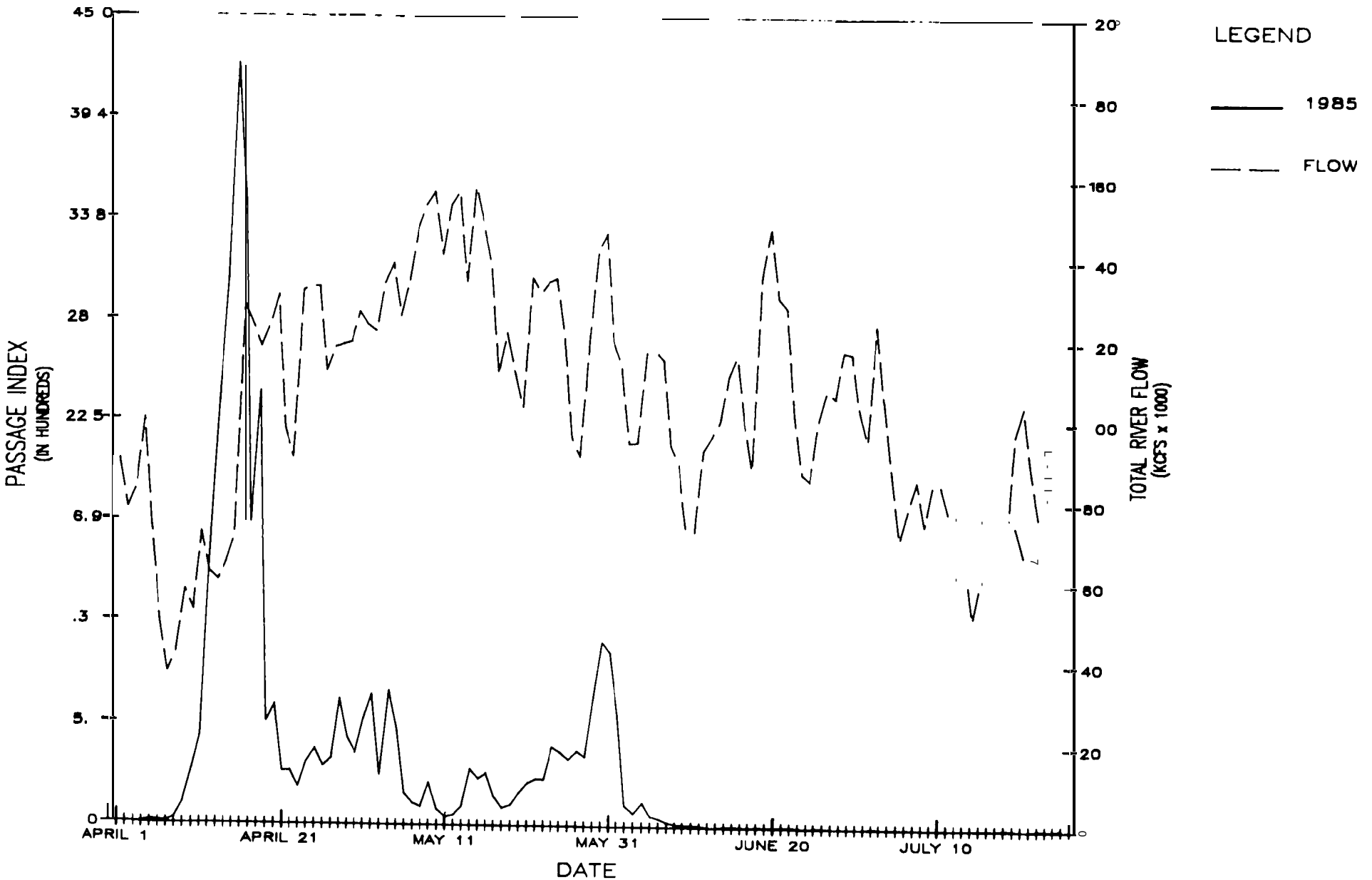
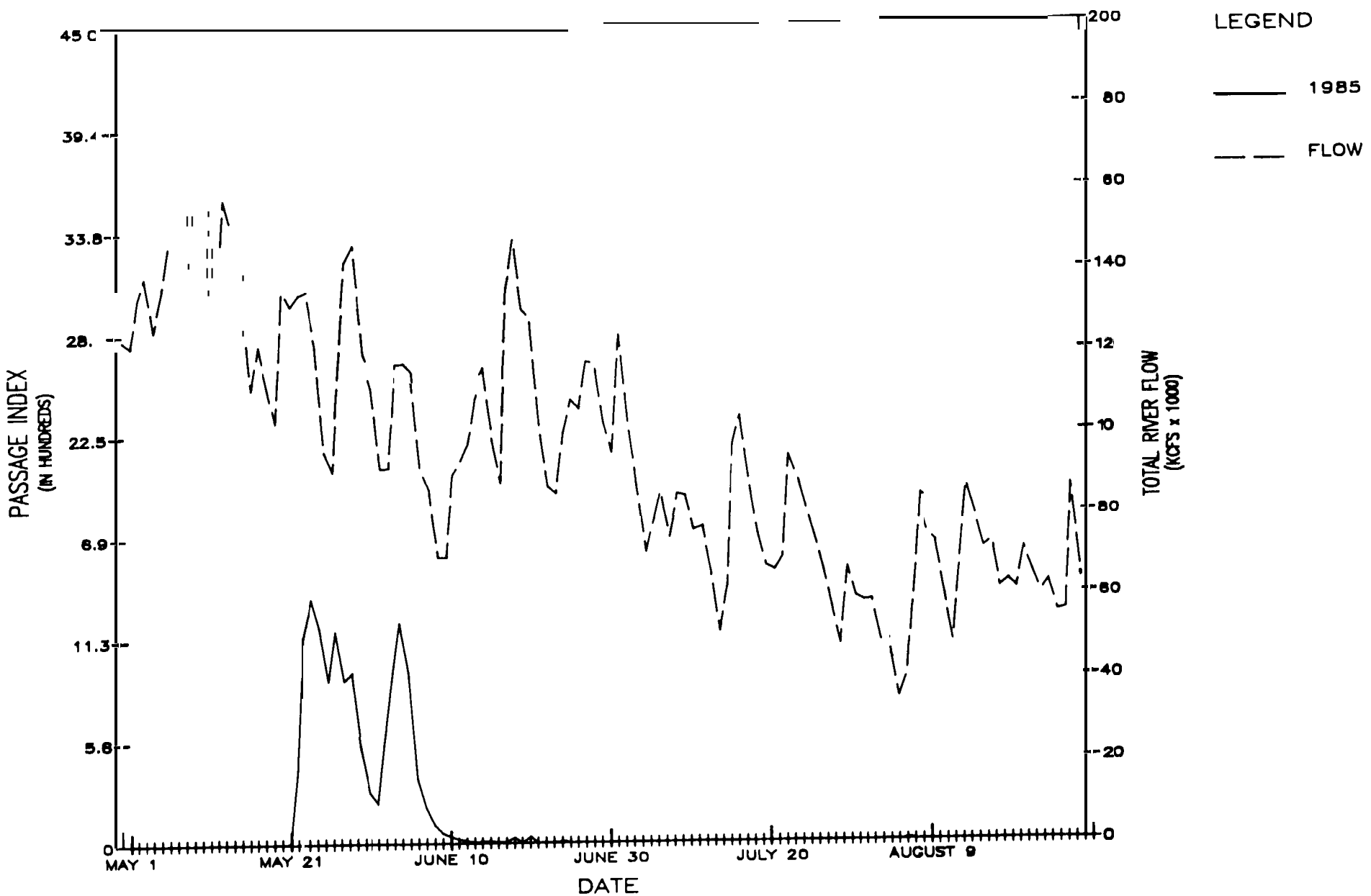


FIGURE 17

MIGRATION TIMING: ROCK ISLAND DAM

COHO

1985



3. Lover Columbia

McNary Dam. Sampling at McNary Dam began on March 29, and ended on September 26. Yearling chinook passed through McNary in two peaks (Figure 18). The first, smaller peak, consisting of yearling fall chinook from Ringold Hatchery, occurred soon after sampling began, on April 7, and the second, larger peak was on May 13. Steelhead peaked on May 26 (Figure 19). 13 days later than the largest peak of yearling chinook. Both peaks occurred during the two periods of highest flow of the season. The span between the 50% passage dates of yearling chinook and steelhead was 11 days in 1985, similar to the 8 day span in 1984 (Table 8).

In 1984, yearling chinook peaked on May 21, 8 days later than in 1985. This is a result of earlier release in 1985 from Leavenworth, Winthrop and Entiat Hatcheries. Steelhead peaked on May 7, 19 days earlier than in 1985. This reflects a release date which was three weeks later in 1985 than 1984 at Wells Dam. The duration of passage for both species were slightly longer in 1985 thaan in 1984 (Table 8).

As in 1984, sub-yearling chinook appeared at McNary in several spikes in 1985 (Figure 20). The highest peak was on July 13, 4 days earlier than in 1984. On July 14, one day after the peak, the average river flov reached one of the lowest points of the sampling season.

Sockeye also passed in a similar pattern in 1985, as in 1984 (Figure 21). The date of highest passage was May 26, while the peak period of passage occurred around April 30. Flow during this peak period was relatively low. In 1984, sockeye peaked on May 7.

The duration of coho passage vas short, lasting only 10 days. The peak date of passage vas on June 11, 17 days later than the 1984 peak of May 25 (Figure 22). River flow was declining throughout the period of coho passage.

Table 9 contains the passage indices for all species at McNary Dam in 1984 and 1985. The index for yearling chinook increased by 50% in 1985. The steelhead Index, however, declined by 16%. The index for sub-yearling chinook was 23% greater in 1985 than in 1984, and sockeye increased by 241%. Coho passage declined 52% in 1985 from 1984.

TABLE 8: Timing and duration of migration at McNary Dam, 1984 and 1985.

	Passage Dates				
	Peak	10%	50%	90%	Duration
Species			1985		
Yearling Chinook	5/13	4/11	5/11	5/27	46 days
Steelhead	5/26	4/25	5/22	6/06	42 days
Sub-yearling Chinook	7/13	6/17	7/09	7/24	37 days
Sockeye	5/26	4/30	5/20	6/08	39 days
Coho	6/11	6/03	6/11	6/13	10 days
			1984		
Yearling Chinook	5/21	4/23	5/11	5/25	32 days
Steelhead	5/7	4/27	5/19	6/05	39 days
Sub-yearling Chinook	7/17	6/07	7/15	8/11	70 days
Sockeye	5/07	5/02	5/16	6/13	42 days
Coho	5/25	5/19	5/25	6/04	16 days

TABLE 9: Total Passage Index at McNary Dam, 1984 and 1985.

1985

	Total Number Collected	Total Passage Index
Yearling Chinook	2,952.613	3,116,570
Steelhead	840,493	882,532
Sub-yearling Chinook	6,562,483	6,562,944
Sockeye	1,030,017	1,076,162
Coho	71,752	72,110

1984

	Total Number Collected	Total Passage Index
Yearling Chinook	1,261,187	2,085,232
Steelhead	610,511	1,051,936
Sub-yearling Chinook	4,098,004	5,348,554
Sockeye	191,930	315,313
Coho	82,144	149,250

FIGURE 18

MIGRATION TIMING: MCNARY DAM
YEARLING CHINOOK
1984 AND 1985

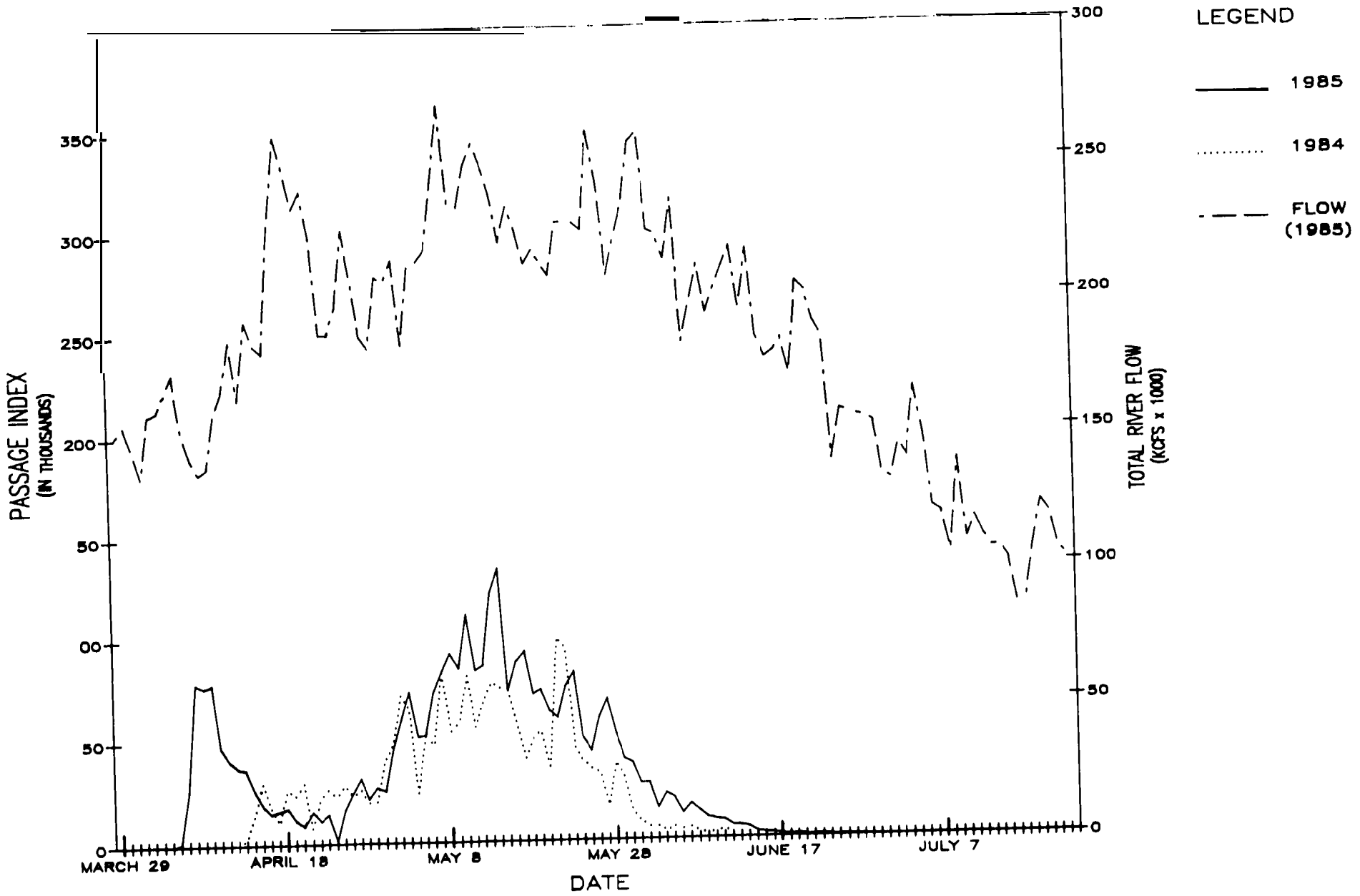


FIGURE 19

MIGRATION TIMING: MCNARY DAM
STEELHEAD
1984 AND 1985

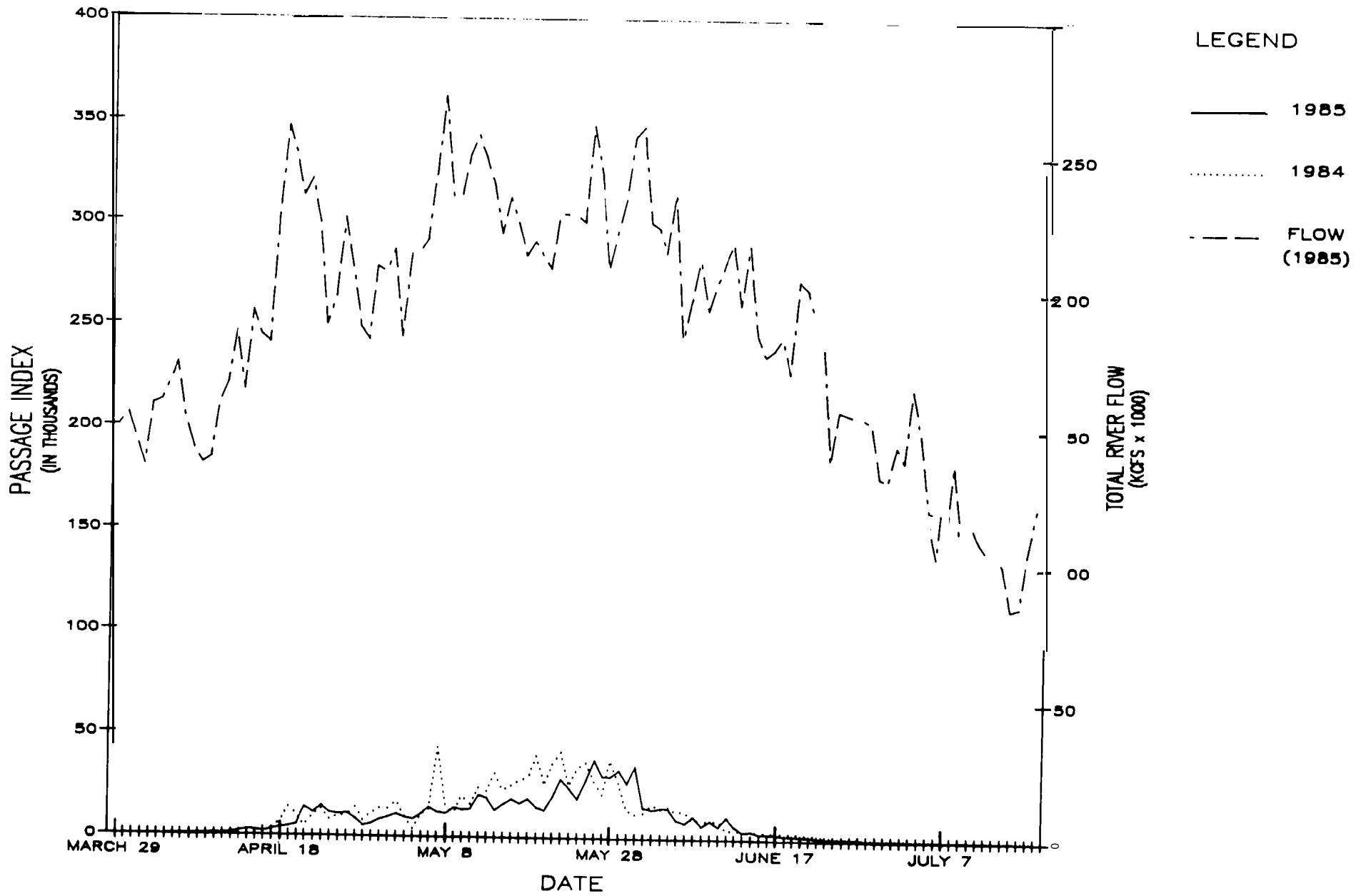


FIGURE 20

MIGRATION TIMING: MCNARY DAM
SUB-YEARLING CHINOOK
1984 AND 1985

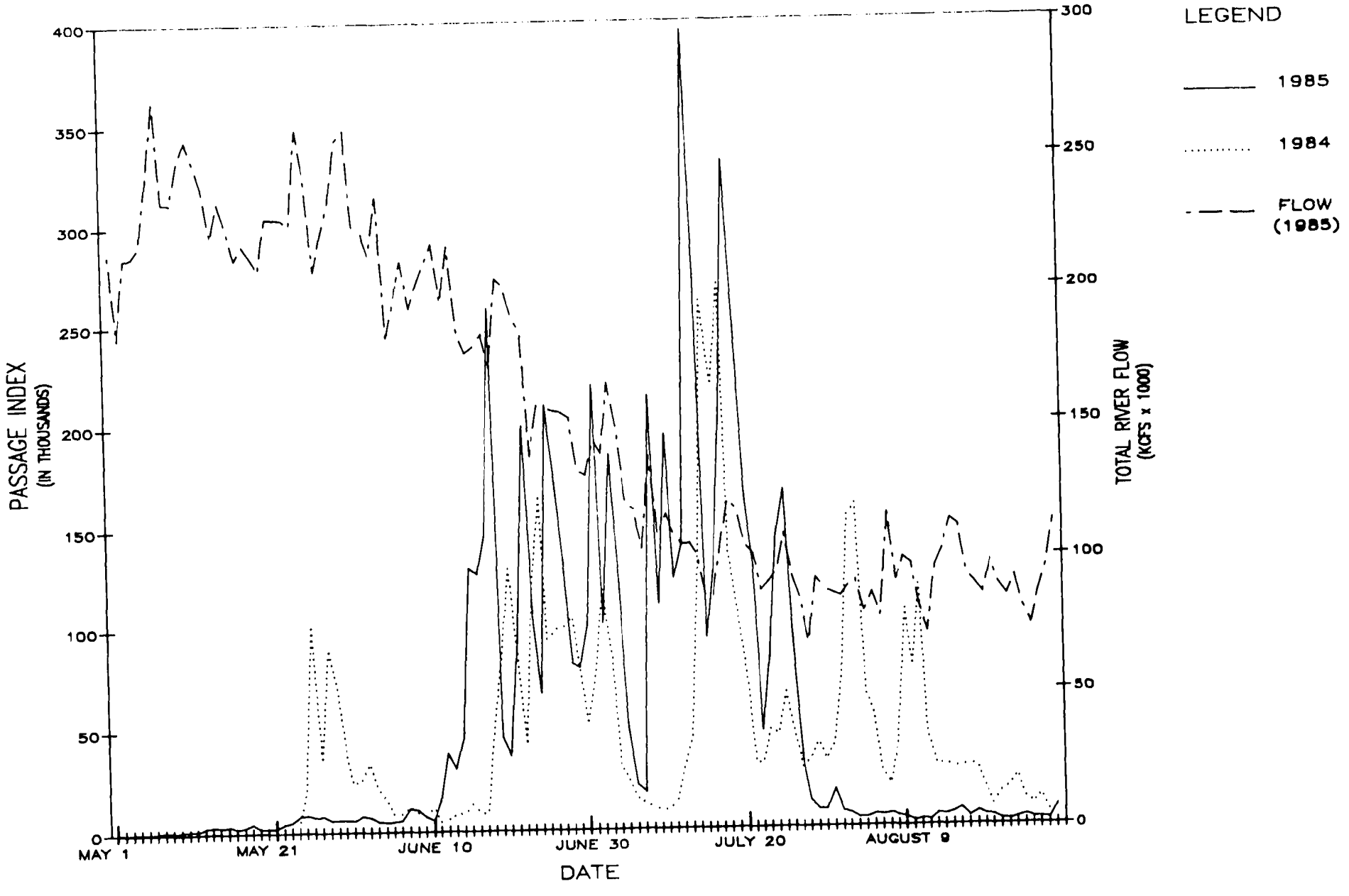


FIGURE 21

MIGRATION TIMING: MCNARY DAM

SOCKEYE

1984 AND 1985

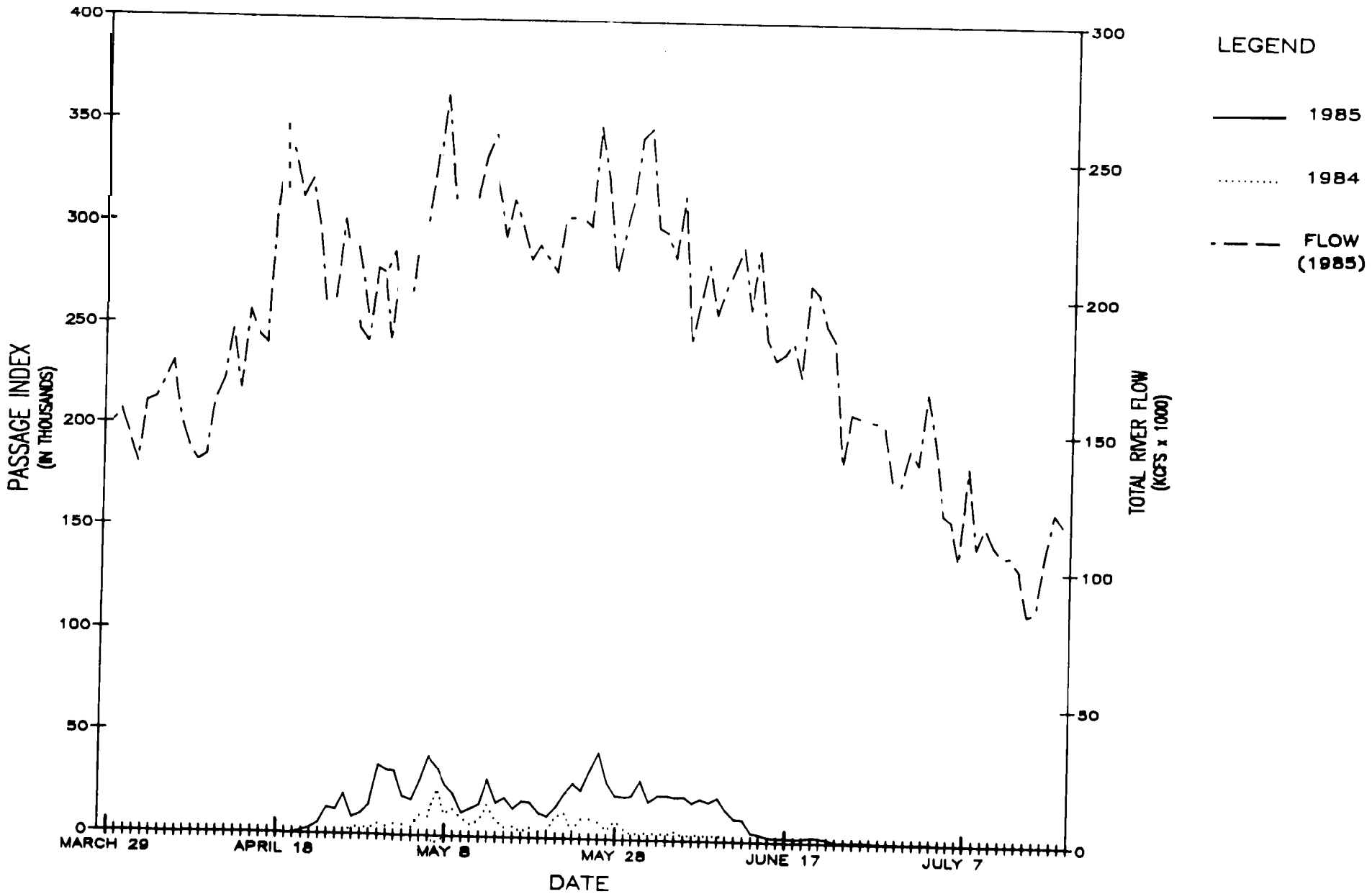
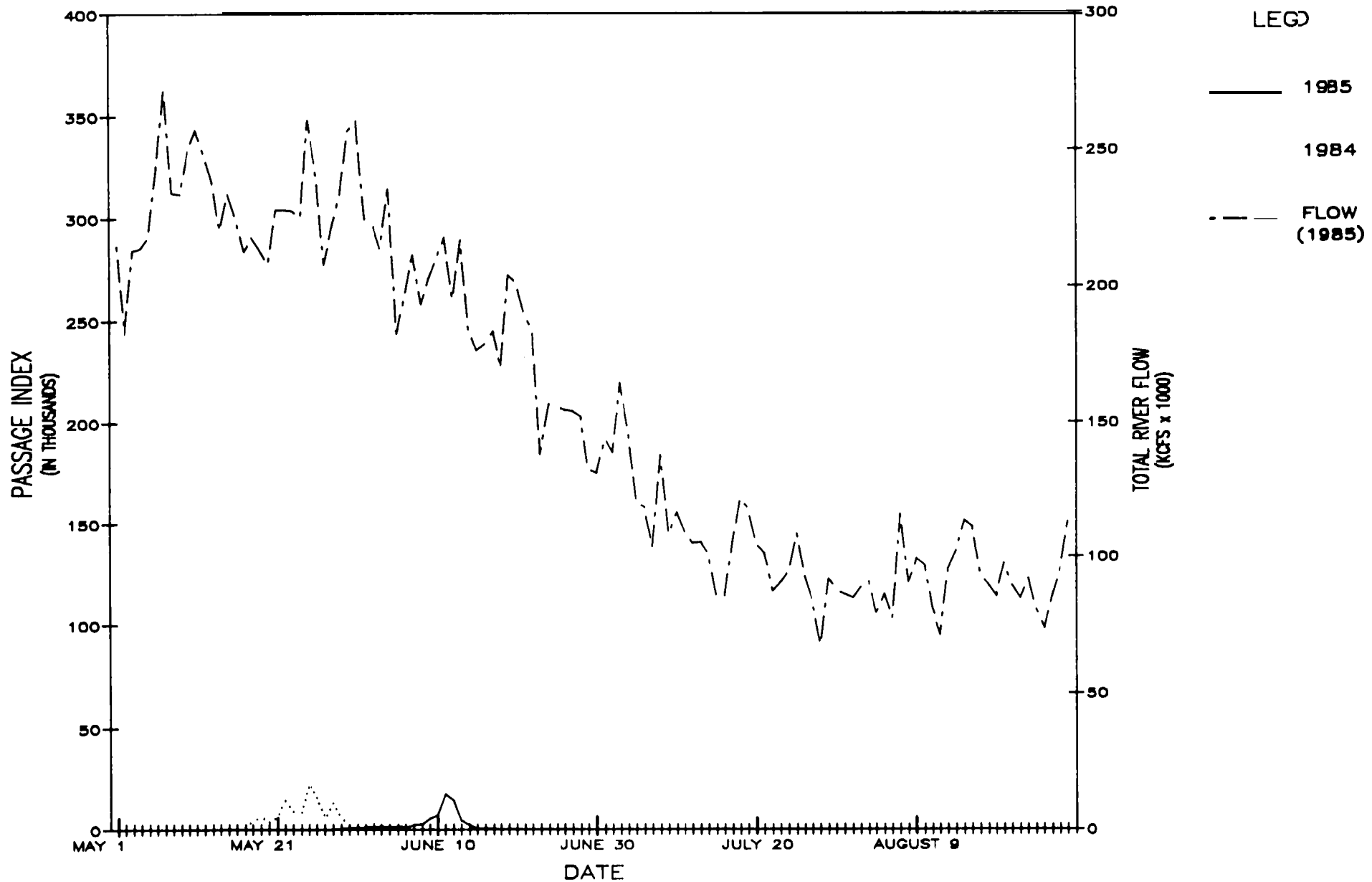


FIGURE 22

MIGRATION TIMING: MCNARY DAM

COHO

1984 AND 1985



V. 1985 HATCHERY RELEASES

Approximately 63.9 million juvenile salmonids were released above Bonneville Dam; 15.0 million salmon and steelhead were released in the Snake River, 18.8 million in the Mid-Columbia, and 30.1 million in the Lover-Columbia. Total hatchery releases for 1985 were about 11 million less than the 1984's total (Table 10). Releases in the Snake River were essentially equal in 1985 and in 1984. Both the mid and lower Columbia hatchery release totals were reduced in 1985; 24% and 15% reduction from 1984 totals, respectively. Hatchery releases in 1985 were comprised of 18.1 million spring chinook; 2.4 million summer chinook; 17.3 million bright fall chinook; 15.5 million tule fall chinook; 2.6 million coho; and 7.9 million steelhead. Numbers of summer chinook increased 51% in 1985; spring chinook, bright fall chinook, tule fall chinook, coho and steelhead declined in 1985; 12, 12, 25, 42, and 3% of the 1984 totals, respectively.

The release totals in 1985 are generally calculated from fish releases made during the time frame September 1, 1984 to August 31, 1985. We believe this time frame gives the best picture of fish migrating in 1985. If, for example, sub-yearling spring chinook were released in September 1984, they were included as a 1985 migrant, unless the fish agency recommended that this release group be classified as a 1984 outmigrant. The agency releasing the fish makes the final decision as to the migration year.

Preliminary listings of 1985 hatchery releases are provided in the Appendix I. When this information is finalized, the Fish Passage Center or the individual agencies can make available a final summary of the hatchery releases for 1985. Final compilations from the fishery agencies typically are not available until February or later of the following year.

TABLE 10

PRELIMINARY SUMMARY OF FISH RELEASES BY SPECIES AND RELEASE AREA
FROM 1982 TO 1985

(To be revised when final 1985 counts are available)

River Area	Spring Chinook	Summer Chinook	Fall Chinook[1] Brights	Fall Chinook[1] Tule	Coho	Steelhead	Total
1985*							
Snake R.	7,086,889	781,405	1,317,921	0	0	5,849,153	15,035,368
Mid-Col. R.	4,715,729	1,630,322	10,689,637	0	388,790	1,344,712	18,769,190
Lower Col. R.	6,344,905	0	5,298,276	15,505,925	2,162,846	738,290	30,050,242
TOTAL	18,147,523	2,411,727	17,305,834	15,505,925	2,551,636	7,932,155	63,854,800
1984							
Snake R.	8,054,425	356,673	427,191	0	0	6,214,760	15,053,049
Mid-Col. R.	6,129,744	1,240,865	15,548,324	0	517,100	1,422,329	24,858,362
Lower Col. R.	6,398,645	0	3,604,403	20,773,294	3,905,834	534,124	35,216,300
TOTAL	20,582,814	1,597,538	19,579,918	20,773,294	4,422,934	8,171,213	75,127,711
1983							
Snake R.	5,626,000	264,000	115,000	0	0	3,475,000	9,480,000
Mid-Col. R.	4,369,017	1,608,798	12,537,557	0	535,029	1,235,000	20,285,401
Lower Col. R.	4,743,230	0	2,370,249	21,200,000	5,385,004	447,000	34,145,483
TOTAL	14,738,247	1,872,798	15,022,806	21,200,000	5,920,033	5,157,000	63,910,884
1982							
Snake R.	2,657,000	148,000	900,000	0	0	5,300,000	9,005,000
Mid-Col. R.	5,354,641	2,713,266	6,297,241	0	482,510	1,115,000	15,962,658
Lower Col. R.	5,556,645	0	0	21,200,000	4,603,437	352,000	31,712,082
TOTAL	13,568,286	2,861,266	7,197,241	21,200,000	5,085,947	6,767,000	56,679,740

[1] 1982 and 1983 Tule Fall Chinook numbers are estimated.

* 1985 IS PRELIMINARY DATA ONLY.
Note: 210,000 sockeye were released 6/84 by IDFG in Stanley and Alturas Lake (Snake River area).

399/CM

VI. CONCLUSIONS

TABLE 11: Summary of Travel Time and Annual Indices of Migration of Marked Salmon and Steelhead in the Columbia Basin, 1984 - 1985.

species/Race	Reach	n. 1985	ANNUAL INDEX Standard Error 1985	Travel Time(Days) 1984	Travel Time(Days) 1985	Speed Miles/day 1984	Speed Miles/day 1985
Yearling Ch.	LWG-MCN	5	0.73	10.0	12.8	14.0	11.0
Steelhead	LWG-MCN	3	1.51	7.0	9.3	20.0	15.6
Sub-year Ch.	LWC-MCN	1			16.0		8.7
Yearling Ch.	RI-MCN	6	1.24		7.7		21.0
Steelhead	RI-MCN	3	1.67		7.7		21.0
Sub-year Ch.	RI-MCN	2			14.0		11.5

Species/Race	Reach	TRAVEL TIME Travel Time(Days) 1984	Travel Time(Days) 1985	Speed Miles/day 1984	Speed Miles/day 1985
Spring Ch.	Winthrop-MCN	26.0	32.8	10.8	8.6
Steelhead	Methow R-MCN	16.0	14.7	14.8	15.9
Steelhead	Priest R-MCN	6.0	6.6	18.7	16.7
Sockeye	Priest R-MCN	4.5	6.7	24.0	17.6
Summer Ch.	Wells-MCN	51.0	42.0	4.4	5.6
Fall Ch.	Priest Rapids-MCN	28.0	19.0	3.8	5.5
Yearling Ch.	Rapid River-MCN	47.0	35.0	6.6	9.0
Yearling Ch.	Hells Canyon-MCN	38.0	40.0	7.4	7.0
Yearling Ch.	Sawtooth H.-MCN	52.0	50.0	11.6	12.1
Yearling Ch.	So.F.Salmon-MCN	45.0	53.0	9.5	8.0
Yearling Ch.	Dworshak H.-MCN		35.0		6.1
Steelhead	Dworshak H.-MCN	16.0	12.0	13.3	17.7
Steelhead	Grande Ronde-MCN		25.0		9.2

A. Travel Time of Mark Groups

Snake River

1. The smolt Monitoring Program in 1985 monitored travel time of marked sub-yearling chinook, yearling chinook and steelhead.
2. The travel time for 1985 for the established index area Lower Granite to McNary for five groups of marked chinook was 12.8 days, with a standard error of .73. Migration speed through the index area was 11.0 miles per day.
3. The travel time index for three steelhead groups was 9.3 days, with a standard error of 1.51. Migration speed through the index area was 15.6 miles per day.
4. The travel time index for one group of summer migrating chinook (fall chinook sub-yearlings) was 16 days. Migration speed through the index area was 8.7 miles per day.
5. Steelhead migrated through the monitored system at a higher rate of speed than chinook yearlings or sub-yearlings.
6. Travel times in 1985 were slower than those which occurred in 1984. This is attributed to higher flows and better migration conditions that occurred in 1984.
7. Travel time of marked groups was greater from release points to downstream recovery points than migration rate and travel time between downstream recovery points.

Mid-Columbia

8. Travel time of marked steelhead, yearling chinook and sub-yearling chinook was monitored in the established index area from Rock Island to McNary Dam.

9. Travel time index for six marked groups of yearling chinook was 7.7 days, with a standard error of 1.24. The migration speed was 21.0 miles per day.
10. Travel time of six marked groups of yearling chinook to Rock Island Dam from Leavenworth and Winthrop hatcheries averaged 26.0 days, with an average migration speed of 4.2 miles per day.
11. Travel time index for three marked groups of steelhead was 7.7 days, with a standard error of 1.67. The migration speed was 21.0 miles per day.
12. Travel time of eleven marked groups of sockeye salmon from Priest Rapids to McNary Dam averaged 6.7 days, with an average migration speed of 17.6 miles per day.
13. Travel time index for two groups of marked sub-yearling chinook was 14.0 days. The migration speed was 11.5 miles per day.
14. Sub-ye&rling chinook rate of travel was considerably less than chinook yearlings, or steelhead: 11.5 miles per day, compared to 21.0 miles per day through the index area.

Lower Columbia

15. Sampling and data at John Day did not allow calculation of annual travel time indices. Travel time information for McNary to John Day in 1985 is limited, and does not represent the entire juvenile migration.

B. Migration Characteristics

Snake River

16. The Lewiston trap operated from March 16 to September 17. Yearling chinook peaked on April 6 in 1985, as compared to April 19 in 1984. Steelhead peaked on May 21 at the Lewiston trap in 1985.
17. Sampling occurred between March 27 and July 23 at Lower Granite Dam. Yearling chinook peaked on April 26 in 1985, compared to May 2 in 1984.

18. The yearling chinook passage index at Lower Granite in 1985 was 1,768,547 compared to 1,112,829 in 1984.
19. Steelhead passage at Lower Granite peaked on May 6 in 1985, compared to May 15 in 1984.
20. The steelhead passage index for 1985 was 2,803,144 compared to 1,589,910 for 1984.
21. The duration between median dates of passage of steelhead and yearling chinook was 15 days in 1985, and 14 days in 1984.
22. Sub-yearling chinook peaked on July 9 in 1985, as compared to June 17 in 1984. The 1985 passage index was 44,008, as compared to 132,582 in 1984.
23. There were no coho sampled in 1985 at Lower Granite Dam, and very few (<50) sampled in 1984.

Mid-Columbia

24. Sampling occurred at Rock Island Dam from April 1 to August 31 in 1985. Comparisons with 1984 were not made because of inconsistent sampling in that year.
25. Yearling chinook peaked at Rock Island on April 16; the passage index was 38,891.
26. Steelhead peaked on May 23; the passage index was 34,253.
27. The time period between median dates of passage of steelhead and chinook was 15 days.
28. Sub-yearling chinook peaked on June 19; the passage index for 1985 was 24,289.
29. Sockeye passage peaked on April 15; the 1985 passage index was 36,803.
30. Coho passage peaked on May 24; the 1985 passage index was 13,654.

Lower Columbia

31. Sampling at McNary Dam took place from March 27 through September 26.
32. Yearling chinook peaked on May 13 in 1985, compared to May 21 in 1984. The 1985 passage index was 3,116,570 compared to 2,085,232 in 1984.
33. Steelhead passage peaked on May 26 in 1985, compared to May 7 in 1984. The 1985 passage index was 882,532 compared to 1,051,436 in 1984.
34. The time period between the median points of passage of yearling chinook and steelhead was 11 days in 1985, compared to 8 days in 1984.
35. Sub-yearling chinook peaked on July 13 in 1985, compared to July 17 in 1984. The 1985 passage index was 6,562,944 compared to 5,348,554 in 1984.
36. Sockeye peaked on May 26 in 1985, compared to May 7 in 1984. The passage index in 1985 was 1,076,162 compared to 315,313 in 1984.
37. Coho peaked on June 11 in 1985, compared to May 25 in 1984. The 1985 passage index was 72,110 compared to 149,250 in 1984.

C. 1985 Hatchery Releases

38. A total of 63.9 million salmon and steelhead were released into the Columbia River above Bonneville Dam in 1985. This included 18.1 million spring chinook; 2.4 million summer chinook; 17.3 million bright fall chinook; 15.5 million tule fall chinook; 2.6 million coho; and 7.9 million steelhead. In 1984 a total of 75.1 million salmon and steelhead were released; this total included 20.6 million spring chinook; 1.6 million summer chinook; 19.6 million bright fall chinook; 20.8 million tule fall chinook; 4.4 million coho; and 8.2 million steelhead.

VII. REFERENCES CITED

Ambrogetti, Walter J., 1976. Special report, micro-tagging trailer. USPWS, Northwest Fisheries Program, Tumuater, Washington.

Duke, Rodney C., 1980. Fish tagging mobile unit, operation and service manual. Idaho Department of Fish and Game Manual.

Mighell, J. L., 1969. Rapid cold-branding of salmon and trout wiht liquid nitrogen. Journal of Fisheries Research Board, Canada. 26: 2765-2769.

Sims, C.W. J.G. Williams, D.A. Faurot, R.C. Johnsen, and D.A. Brege, 1981, Migrational characteristics of juvenile salmon and steelhead in the Columbia River basin and related passage research at John Day Dam, Vol. I and II. National Marine Fisheries Service, NUAPC, CZES, Seattle, WA.

sokol, R.R. and F.J. Rohlf, 1981. Biometry. W.H. Freeman and Co.. NY, 859 PP.

APPENDIX I

APPENDIX I: 1985 Columbia Basin Hatchery Releases

Hatchery Releases

Summaries of hatchery salmonids released into the Columbia River Basin above Bonneville Dam are presented in Tables A-l and A-2. Table A-l includes hatchery releases made between September 1, 1984 and August 30, 1985 that were classified as active migrants in 1985. Table A-2 includes releases made in 1985 that were classified as 1986 migrants.

Each report is organized in alphabetical order by agency and hatchery, respectively. Within each Agency/Hatchery section the individual releases are in ascending order by the start date of the release. The number of releases and total number of fish released is summarized by hatchery and agency. Table headings requiring clarification are defined below:

AGCY = The agency responsible for the release, identified by an acronym.

BRD YR = Brood year; the year of egg production.

MGR YR = Migration year; the year that all or the majority of the fish release migrated.

RELEASE DATES = The start and end dates of the release period.

ZONE = Major river zone of the release site; LCOL - Lower Columbia River system; MCOL - Mid-Columbia River system; SNAK = Snake River system.

WBCLOT ID = An identification number assigned by the WBC to each hatchery release.

Brand Releases

The brand release table (Table A-3) summarizes freeze branded fish released above Bonneville Dam from September 1, 1984 through August 30, 1985. Branded fish released below Bonneville as part of the WBC/COE transport study are also included in this table. Table A-3 is organized similarly to the hatchery release tables (Tables A-l and A-2). Each major release in the brand release table (identified by a unique lot ID) includes one or more groups of freeze brand releases. Each freeze brand group within a major release has a unique combination of brand location, brand symbol, and brand rotation. The agency, hatchery and lot ID associated with a major release group can be used to reference additional information from the hatchery release tables. Major freeze brand releases listed in Table A-3 with the hatchery identified as "From-River" (i.e., originating from captures of actively migrating fish) are not listed in Tables A-2 or A-3. Freeze branded fish released as part of the WBC Smolt Monitoring Program are identified with a "Y" under the "WBC Brand" heading. The number of freeze brand releases and total number of fish released are summarized by major release group (i.e., lot ID), hatchery, and agency. These totals are indicated by asterisks on the table margins.

TABLE A-1: Hatchery releases above Bonneville Dam to migrate in 1985.

PROGRAM WBC670
TIME 8:59:19

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

PAGE NO.
DATE 1/27/8

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOI ID	COMMENTS
IDFG	MCCALL	SU CHINOOK SOUTH FORK	83	19	85	4/01/85 4/04/85	564,405	S F SALMON R	S F SALMON R	SNAK	85057	TRUCKED, 25.6K FB 38,100 AD/CWT (10-25-18), 40,100 AD/CWT (10-26-33)
*					HATCHERY TOTAL.		564,405	FROM 1 RELEASES				*
	NIAGARA SPRING	STEELHEAD "A"	84	5	85	3/25/85 4/19/85	800,000	PAHSIMEROI R	PAHSIMEROI R	SNAK	85062	100% AD, 23,400 LV/CWT (10-28-53)
		STEELHEAD "A"	84	4	85	4/11/85 4/30/85	140,000	BRUNOS	SALMON R	SNAK	85061	100% AD, 45,800 LV/CWT (10-25-21)
		STEELHEAD "A"	84	4	85	4/29/85 5/01/85	500,000	HELLS CANYON	SNAKE R	SNAK	85059	30K FB, 100% AD
		STEELHEAD "A"	84	5	85	5/02/85 5/10/85	140,000	PANTHER CRK	SALMON R	SNAK	85060	100% AD, DELAYED BECAUSE OF ICE 23,900 LV/CWT (10-28-51), 24,600 LV/CWT (10-28-52)
*					HATCHERY TOTAL.		1,580,000	FROM 4 RELEASES				*
	PAHSIMEROI H	SP CHINOOK HAYDEN CRK	83	25	85	4/01/85 4/10/85	186,000	PAHSIMEROI R	PAHSIMEROI R	SNAK	85056	VOLITIONAL RELEASE
		SU CHINOOK PAHSIMEROI	83	25	85	4/01/85 4/10/85	217,000	PAHSIMEROI R	PAHSIMEROI R	SNAK	85058	VOLITIONAL RELEASE
*					HATCHERY TOTAL.		403,000	FROM 2 RELEASES				*
	RAPID RIVER H	SP CHINOOK RAPID R	83	35	85	9/01/84 11/01/84	1,816,729	RAPID RIVER H	RAPID R	SNAK	85064	VOLITIONAL RELEASE
		SP CHINOOK RAPID R	83	27	85	3/18/85 3/20/85	437,360	HELLS CANYON	SNAKE R	SNAK	85053	TRUCKED, 35,825 FB
		SP CHINOOK RAPID R	83	23	85	3/31/85 4/10/85	674,509	RAPID RIVER H	RAPID R	SNAK	85052	100% AD, 34,225 FB 39,425 LV/CWT (10-28-10), 40,850 LV/CWT (10-28-11), 19,725 LV/CWT (10-28-15), VOLIT. REL.
*					HATCHERY TOTAL.		2,928,598	FROM 3 RELEASES				*
	RED RIVER	SP CHINOOK RED R	83	25	85	4/22/85 4/22/85	80,000	RED R	RED R	SNAK	85054	VOLITIONAL RELEASE DELAYED BECAUSE OF ICE
*					HATCHERY TOTAL.		80,000	FROM 1 RELEASES				*

TABLE A-1 (CONTINUED):


```
****************************************************************************
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance                                                       *
****************************************************************************
```

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
IDFG	SAWTOOTH H	SP CHINOOK SAWTOOTH	83	22	85	3/25/85 3/29/85	420,060	SAWTOOTH H	SALMON R	SNAK	85055	100% AD, 39,875 FB, 41,200 CWT (10-26-34), 38,150 CWT (10-26-35) RAISED AT MCCALL, TRUCKED TO SAWTOOTH FOR RELEASE FL-120.5MM

* HATCHERY TOTAL. 420,060 FROM 1 RELEASES *

** AGENCY TOTAL... 5,976,063 FROM 12 RELEASES **

TABLE A-1 (CONTINUED):

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY.......	SPECIES...... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER .... NAME	ZONE	WBC LOT ID	COMMENTS...
ODFW	BONNEVILLE H	FA CHINOOK COL URB	83	8	85	3/12/85 3/15/85	198,145	UMATILLA R	UMATILLA R	LCOL	85201	89,762 AD-CWT 07-31-27 137,655 RELEASED INTO MEACHAM CREEK.
		FA CHINOOK COL URB	84	90	85	6/17/85 6/20/85	3,221,993	UMATILLA R	UMATILLA R	LCOL	85202	228,475 AD-CWT 07-33-26 BELOW THREE-MILE DAM
		FA CHINOOK COL URB	84	117	85	6/21/85 6/21/85	861,292	YAKIMA R	YAKIMA R	MCOL	85203	BELOW PROSSER
*						HATCHERY TOTAL.	4,281,430	FROM 3 RELEASES				*
	IRRIGON	SU STEELHEAD WALLOWA	84	6	85	3/01/85 3/01/85	15,690	SPRING CRK CHNL	WALLOWA R	SNAK	85218	
		SU STEELHEAD IMNAHA	84	6	85	4/10/85 5/01/85	79,115	LI SHEEP CRK	IMNAHA R	SNAK	85214	
		SU STEELHEAD WALLOWA	84	8	85	4/25/85 4/26/85	96,040	BIG CANYON CRK	WALLOWA R	SNAK	85215	74,755 AD, 46,440 FROM CATHERINE CREEK, 23,919 FROM WALLOWA
		SU STEELHEAD WALLOWA	84	6	85	4/29/85 5/04/85	630,355	SPRING CRK CHNL	WALLOWA R	SNAK	85216	
*						HATCHERY TOTAL.	821,200	FROM 4 RELEASES				*
	LOOKINGGLASS H	SP CHINOOK IMNAHA	83	24	85	9/10/84 9/10/84	56,211	IMNAHA R	IMNAHA R	SNAK	85222	100% CWT 28,520 CWT 07-30-12, 27,691 CWT 07-30-13
		SP CHINOOK CARSON	83	16	85	9/11/84 9/12/84	171,573	BIG CANYON CRK	WALLOWA R	SNAK	85227	PRESMOLTS, 40,525 AD-CWT 07-31-57, 36,658 CWT 07-31-58
		SP CHINOOK LOOKINGGLASS	83	30	85	9/16/84 11/01/84	224,141	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85223	38,707 AD-CWT 07-31-51, 37,371 AD-CWT 07-31-52, 38,364 AD-CWT 07-31-53, 34,275 AD-CWT 07-31-54
		SP CHINOOK CARSON	83	20	85	9/16/84 11/01/84	447,555	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85228	PRESMOLTS, 37,125 AD-CWT 07-31-49, 36,553 AD-CWT 07-31-50
		SP CHINOOK IMNAHA	83	17	85	3/21/85 3/21/85	59,578	IMNAHA R	IMNAHA R	SNAK	85204	29,563 AD-CWT 07-30-16 FROM IMNAHA POND, 30,015 AD-CWT 07-30-17
		SP CHINOOK FALL CRK/CARSON	83	24	85	4/04/85 4/04/85	225,554	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85206	39,165 AD-CWT 07-31-55 26,558 AD-CWT 07-31-56
		SP CHINOOK CARSON	83	16	85	4/04/85 4/04/85	694,974	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85207	
*						HATCHERY TOTAL.	1,879,586	FROM 7 RELEASES				*

TABLE A-1 (CONTINUED):

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY.......	SPECIES...... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
ODFW	OAK SPRINGS	STEELHEAD SOUTH SANTIAM	84	53	85	9/10/84 9/11/84	114,000	HOOD R	HOOD R	LCOL	85224	
		STEELHEAD UMATILLA	84	135	85	11/16/84 11/16/84	22,000	UMATILLA R	UMATILLA R	LCOL	85225	
		SU STEELHEAD SOUTH SANTIAM	84	4	85	4/03/85 4/16/85	86,067	HOOD R	HOOD R	LCOL	85211	100% AD
		SU STEELHEAD UMATILLA	84	8	85	5/07/85 5/09/85	59,930	UMATILLA R	UMATILLA R	LCOL	85213	100% AD, RELEASED IN MEACHAM CREEK.
*						HATCHERY TOTAL.	281,997	FROM 4 RELEASES				*
	ROUND BUTTE H	STEELHEAD DESCHUTES	84	51	85	9/17/84 9/20/84	150,015	DESCHUTES R	DESCHUTES R	LCOL	85220	100% AD-LM
		SP CHINOOK DESCHUTES	83	9	85	10/08/84 10/30/84	97,992	DESCHUTES R	DESCHUTES R	LCOL	85221	100% CWT, 2,700 CWT 07-31-30, 95,292 CWT 07-31-31, ALSO RELEASED AT WHITE RIVER.
		SP CHINOOK DESCHUTES	83	6	85	4/02/85 5/30/85	179,219	BELOW PELTON D	DESCHUTES R	LCOL	85209	100% AD-CWT, 57,743 AD-CWT 07-31-28, 60,715 AD-CWT 07-31-29, 60,761 AD-CWT 07-31-30
		SU STEELHEAD DESCHUTES	84	4	85	4/22/85 5/02/85	176,006	DESCHUTES R	DESCHUTES R	LCOL	85212	100% AD RV
*						HATCHERY TOTAL.	603,232	FROM 4 RELEASES				*
**						AGENCY TOTAL...	7,867,445	FROM 22 RELEASES				**

TABLE A-1 (CONTINUED):

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
USFW	CARSON NFH	SP CHINOOK	83	27	85	2/13/85 2/15/85	847,040	CARSON NFH	WIND R	LCOL	85010	
		SP CHINOOK	83	18	85	4/15/85 4/15/85	1,543,931	CARSON NFH	WIND R	LCOL	85008	
		SP CHINOOK CARSON	83	19	85	4/16/85 4/16/85	100,330	CATHERINE CRK	GRANDE RONDE R	SNAK	85009	
	*				HATCHERY TOTAL.		2,491,301	FROM 3 RELEASES				*
	DWORSHAK NFH	SP CHINOOK	83	22	85	4/03/85 4/04/85	1,137,139	DWORSHAK NFH	CLEARWATER R	SNAK	85031	23,100 FB
		STEELHEAD	84	7	85	4/29/85 5/06/85	1,035,573	DWORSHAK NFH	CLEARWATER R	SNAK	85030	100% AD, 30,625 FB
		STEELHEAD	84	8	85	4/29/85 5/01/85	299,632	SF CLEARWATER R	SF CLEARWATER R	SNAK	85038	100% AD, TRUCKED
		STEELHEAD	84	8	85	4/30/85 5/01/85	266,490	MF CLEARWATER R	MF CLEARWATER R	SNAK	85011	145,206,CLEAR CRK,100%-AD 121,284,ELDORADO CRK,100%-AD
	*				HATCHERY TOTAL.		2,738,834	FROM 4 RELEASES				*
	ENTIAT NFH	SP CHINOOK	83	19	85	4/15/85 4/15/85	894,600	ENTIAT NFH	ENTIAT R	MCOL	85001	
	*				HATCHERY TOTAL.		894,600	FROM 1 RELEASES				*
	HAGERMAN NFH	STEELHEAD HAGERMAN "A"	84	4	85	3/26/85 4/30/85	786,186	STANLEY	SALMON R	SNAK	85033	100% AD, 35,125 FB, 40,475 LV-CWT (10-26-30)
		STEELHEAD HAGERMAN "B"	84	4	85	3/26/85 4/30/85	270,208	E F SALMON R	E F SALMON R	SNAK	85034	100% AD, 31,775 FB, 39,375 LV-CWT (10-26-31), 35,225 LV-CWT (10-26-36), 17,425 LV-CWT (10-25-55), 16,950 LV-CWT (10-28-03), 8,100 LV-CWT (10-28-02), 25,525 LV-CWT (10-28-54)
		STEELHEAD HAGERMAN "A"	84	4	85	3/26/85 4/30/85	308,103	HAZARD CREEK	LITTLE SALMON R	SNAK	85037	100% AD, 39,175 LV-CWT (10-26-32)
		FA CHINOOK HAGERMAN URB	84	49	85	6/04/85 6/04/85	128,229	GRANDE RONDE R	GRANDE RONDE R	SNAK	85035	100% AD, TRUCKED, 54,425 CWT (05-13-53), 33,700 FB
	*				HATCHERY TOTAL.		1,492,726	FROM 4 RELEASES				*

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8:50:14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
USFW	KOOSKIA NFH	SP CHINOOK	83	22	85	11/01/84 11/01/84	53,423	KOOSKIA NFH	MF CLEARWATER R	SNAK	85042	48,100 AD-CWT 10-25-22
		SP CHINOOK	83	20	85	3/22/85 3/29/85	301,753	KOOSKIA NFH	MF CLEARWATER R	SNAK	85032	
	*					HATCHERY TOTAL.	355,176	FROM 2 RELEASES				*
	LEAVENWORTH NFH	SP CHINOOK	83	25	85	9/13/84 9/15/84	102,833	YAKIMA R	YAKIMA R	MCOL	85043	BY YAKIMA TRIBE
		SP CHINOOK	83	21	85	11/26/84 11/26/84	108,261	YAKIMA R	YAKIMA R	MCOL	85044	BY YAKIMA TRIBE
		SP CHINOOK LEAVENWORTH	83	20	85	4/01/85 4/12/85	82,365	YAKIMA R	YAKIMA R	MCOL	85004	BY YAKIMA TRIBE 50K FROM ACCLIMATION POND, 50K TRUCKED, 10% FB, THE REST CWT MARKING DONE BY FISHERY ASSISTANT PEOPLE
		SP CHINOOK	83	15	85	4/08/85 4/09/85	25,850	NACHES R	NACHES R	MCOL	85039	REL AT RATTLE SNAKE CRK 100% FB
		SP CHINOOK	83	17	85	4/13/85 4/13/85	2,190,000	LEAVENWORTH NFH	WENATCHEE R	MCOL	85003	30K FB
		STEELHEAD	83	11	85	4/16/85 4/16/85	111,600	LEAVENWORTH NFH	WENATCHEE R	MCOL	85015	NO AD CLIPS
		SP CHINOOK	83	16	85	5/28/85 6/12/85	6,000	YAKIMA R	YAKIMA R	MCOL	85045	100% FB, AD-CWT 05-17-05 4,300 USED FOR SCREEN STUDIES ON YAKIMA RIVER
		SP CHINOOK LEAVENWORTH	84	62	85	6/11/85 6/11/85	100,750	YAKIMA R	YAKIMA R	MCOL	85005	BY YAKIMA TR. 9K FB.
	*					HATCHERY TOTAL.	2,727,659	FROM 8 RELEASES				*
	LWHITE SALMON H FA	CHINOOK URB	83	16	85	4/03/85 4/03/85	95,364	LWHITE SALMON H	LWHITE SALMON R	LCOL	85024	
		SP CHINOOK	83	17	85	4/17/85 4/17/85	946,949	WILLARD NFH	LWHITE SALMON R	LCOL	85026	
		SP CHINOOK	83	10	85	4/17/85 4/17/85	408,000	LWHITE SALMON H	LWHITE SALMON R	LCOL	85027	
		SP CHINOOK	84	66	85	5/06/85 5/06/85	404,370	LWHITE SALMON H	LWHITE SALMON R	LCOL	85028	PRESMOLTS

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8.50.14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

FROM 9/01/84 TO 8/30/85

AGCY HATCHERY.....	SPECIES..... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS.....
USFW LWHITE SALMON H	FA CHINOOK TULE	84	110	85	5/23/85 5/23/85	1,600,008	LWHITE SALMON H	LWHITE SALMON R	LCOL	85023	
	COHO	83	16	85	5/30/85 5/30/85	999,358	LWHITE SALMON H	LWHITE SALMON R	LCOL	85022	
	FA CHINOOK URB	84	87	85	6/20/85 6/20/85	1,045,758	LWHITE SALMON H	LWHITE SALMON R	LCOL	85025	
	SP CHINOOK	84	43	85	6/20/85 6/20/85	261,579	LWHITE SALMON H	LWHITE SALMON R	LCOL	85029	PRESMOLTS
*				HATCHERY TOTAL.		5,761,386	FROM 8 RELEASES				*
SPRING CRK NFH	FA CHINOOK TULE	84	164	85	2/25/85 2/28/85	13,905,917	SPRING CRK NFH	LOWER COLUMBIA	LCOL	85014	
	FA CHINOOK URB	84	95	85	5/16/85 5/17/85	221,251	SOC SEC PONDS	LOWER COLUMBIA	LCOL	85018	206K AD-1/2 CWT,5-7-(2-3) 196K AD-1/2 CWT, 5-7-(1&4)
	FA CHINOOK URB	84	103	85	5/16/85 5/16/85	232,999	ROCK CREEK	LOWER COLUMBIA	LCOL	85019	
	FA CHINOOK URB	84	91	85	6/10/85 6/17/85	1,000,382	YAKIMA R	YAKIMA R	MCOL	85020	BY YAK TR,200K CWT,10K FB
	FA CHINOOK URB	84	150	85	6/11/85 6/11/85	159,666	ROCK CREEK	LOWER COLUMBIA	LCOL	85041	123K AD-1/2 CWT 5-7-(5-6)
	FA CHINOOK URB	84	84	85	6/18/85 6/19/85	385,363	HANFORD	MID COLUMBIA R	MCOL	85021	
*				HATCHERY TOTAL.		15,905,578	FROM 6 RELEASES				*
WINTHROP NFH	SP.CHINOOK	83	17	85	4/16/85 4/24/85	1,167,625	WINTHROP NFH	METHOW R	MCOL	85002	105K FB
	SP CHINOOK	83	15	85	4/16/85 4/24/85	37,445	BELOW FRST RAPI	MID COLUMBIA R	MCOL	85036	100X FB
*				HATCHERY TOTAL.		1,205,070	FROM 2 RELEASES				*
WARM SPRINGS H	SP CHINOOK	83	10	85	10/16/84 10/16/84	423,481	WARM SPRINGS R	WARM SPRINGS R	LCOL	85226	

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8.50.14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY.....	SPECIES..... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER ..... NAME	ZONE	WBC LOT ID	COMMENTS.....
USFW	WARM SPRINGS H	SP CHINOOK	83	18	85	4/09/85 4/09/85	382,844	WARM SPRINGS H	WARM SPRINGS R	LCOL	85012	100% VENTRAL CLIPPED
*						HATCHERY TOTAL.	806,325	FROM 2	RELEASES			*
**						AGENCY TOTAL...	34,378,655	FROM 40	RELEASES			**

TABLE A-1 (CONTINUED):

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY.......	SPECIES...... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER .... NAME	ZONE	WBC LOT ID	COMMENTS....................................
WDF	KLICKITAT H	SP CHINOOK KLICKITAT	83	33	85	10/08/84 10/10/84	235,000	UPPER KLICKITAT	KLICKITAT R	LCOL	85114	
		SP CHINOOK KLICKITAT	83	10	85	4/01/85 4/01/85	614,500	KLICKITAT H	KLICKITAT R	LCOL	85101	
		FA CHINOOK KLICKITAT	84	76	85	4/19/85 4/19/85	59,900	KLICKITAT H	KLICKITAT R	LCOL	85103	
		COHO TYPE-S	83	13	85	4/21/85 6/13/85	1,163,488	KLICKITAT H	KLICKITAT R	LCOL	85104	45K CWT 63-30-(30-31) VOLITIONAL RELEASE
		FA CHINOOK KLICKITAT	84	52	85	5/09/85 5/09/85	63,200	KLICKITAT R	KLICKITAT R	LCOL	85117	
	*				HATCHERY	TOTAL.	2,136,088	FROM 5 RELEASES				*
	LYONS FERRY	FA CHINOOK SNAKE R	83	10	85	4/17/85 4/17/85	650,300	LYONS FERRY	SNAKE R	SNAK	85106	334K AD-CWT 63-21-52 & 63-32-18
		FA CHINOOK SNAKE R	84	75	85	6/06/85 6/06/85	539,392	LYONS FERRY	SNAKE R	SNAK	85107	235K AD-CWT 63-32-(26-27-28)
	*				HATCHERY	TOTAL.	1,189,692	FROM 2 RELEASES				*
	PRIEST RAPIDS H	FA CHINOOK PRIEST RAPIDS	84	62	85	6/05/85 6/18/85	6,988,800	PRIEST RAPIDS H	MID COLUMBIA R	MCOL	85109	209K AD-CWT 63-32-(21-22) 78K FB, RELEASE SCHED. 1.6M 6/5, 2.7M 6/11, 1.3M 6/15, 1.2M 6/18
	*				HATCHERY	TOTAL.	6,988,800	FROM 1 RELEASES				*
	RINGOLD H	FA CHINOOK BRTG-BONNV DAM	83	7	85	4/01/85 4/01/85	1,200,000	RINGOLD H	MID COLUMBIA R	MCOL	85108	REL. INTO SPRING CREEK
	*				HATCHERY	TOTAL.	1,200,000	FROM 1 RELEASES				*
	ROCKY REACH H	FA CHINOOK PRIEST RAPIDS	83	8	85	5/01/85 5/01/85	253,800	ROCKY REACH H	MID COLUMBIA R	MCOL	85115	198K AD-CWT 63-28-57
		COHO TYPE-S	83	13	85	5/31/85 5/31/85	128,100	ROCKY REACH H	MID COLUMBIA R	MCOL	85116	INCLUDES 35K REL AT TURTLE ROCK HATCHERY
		COHO TYPE-S	83	13	85	5/31/85 5/31/85	260,690	YAKIMA R	YAKIMA R	MCOL	85120	
	*				HATCHERY	TOTAL.	642,590	FROM 3 RELEASES				*

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8:50:14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
WDF	WELLS-WDF	SU CHINOOK WELLS DAM	83	12	85	4/16/85 4/16/85	186,000	WELLS-WDF	MID COLUMBIA R	MCOL	85110	74K AD-CWT 63-23-26
		SU CHINOOK WELLS DAM	84	75	85	5/10/85 5/18/85	630,660	WELLS-WDF	MID COLUMBIA R	MCOL	85118	VOLITIONAL RELEASE 20K FB
		SU CHINOOK WELLS DAM	84	72	85	5/29/85 5/31/85	701,312	WELLS-WDF	MID COLUMBIA R	MCOL	85111	207K CWT-AD 63-32-(19-20) 100K FB-AD
		SU CHINOOK WELLS DAM	84	35	85	7/25/85 7/25/85	112,350	WELLS-WDF	MID COLUMBIA R	MCOL	85112	53K AD-CWT 63-32-34
*						HATCHERY TOTAL.	1,630,322	FROM	4 RELEASES			*
**						AGENCY TOTAL....	13,787,492	FROM	16 RELEASES			**

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8:50:14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOI ID	COMMENTS
WDG	CHELAN PUD	SU STEELHEAD	84	6	85	4/16/85 4/26/85	293,760	WENATCHEE R	WENATCHEE R	MCOL	85154	AD 90K FROM TURTLE ROCK H
		SU STEELHEAD	84	6	85	4/22/85 4/24/85	44,280	ENTIAT R	ENTIAT R	MCOL	85153	AD
	*			HATCHERY TOTAL.			338,040	FROM 2 RELEASES				*
	LYONS FERRY	SU STEELHEAD	84	6	85	4/15/85 4/19/85	241,465	WALLA WALLA R	WALLA WALLA R	MCOL	85159	AD
		SU STEELHEAD	84	8	85	4/24/85 4/24/85	31,500	ASOTIN CREEK	SNAKE R	SNAK	85165	AD
		SU STEELHEAD	84	6	85	5/03/85 5/13/85	127,946	GRANDE RONDE R	GRANDE RONDE R	SNAK	85156	AD,81,229 LV-AD-FB-CWT 62-16-(27-28)
		SU STEELHEAD	84	5	85	5/05/85 5/16/85	104,498	LYONS FERRY	SNAKE R	SNAK	85158	100% AD-FB 59,544 CWT-LV 62-16-(44-45)
		SU STEELHEAD	84	5	85	5/06/85 5/10/85	41,344	BELOW LI GOOSE	SNAKE R	SNAK	85166	100% FB
		SU STEELHEAD	84	5	85	5/08/85 5/14/85	24,864	BELOW ICE HARBR	SNAKE R	SNAK	85167	100% FB
		SU STEELHEAD	84	6	85	5/13/85 5/19/85	151,609	TUCANNON R	TUCANNON R	SNAK	85157	AD,81,196 LV-AD-FB-CWT 62-16-(29-30)
	*			HATCHERY TOTAL.			723,226	FROM 7 RELEASES				*
	NACHES H	SU STEELHEAD WELLS	84	6	85	4/08/85 4/09/85	89,970	NACHES R	NACHES R	MCOL	85155	AD
		' STEELHEAD	84	6	85	5/16/85 6/03/85	1,925	YAKIMA R	YAKIMA R	MCOL	85169	BY YAKIMA TRIBE. ALL AD CLIP. SCREEN STUDIES.
	*			HATCHERY TOTAL.			91,895	FROM 2 RELEASES				*
	RINGOLD H	SU STEELHEAD	83	6	85	4/12/85 4/30/85	112,001	RINGOLD H	MID COLUMBIA R	MCOL	85164	AD
	*			HATCHERY TOTAL.			112,001	FROM 1 RELEASES				*
	SKAMANIA H	SU STEELHEAD VANCOUVER	84	5	85	4/09/85 5/03/85	30,195	WIND R	WIND R	LCOL	85162	AD

TABLE A-1 (CONTINUED):

PROGRAM WBC670
TIME 8:50:14

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
WDG	SKAMANIA H	SU STEELHEAD	84	6	85	4/22/85 5/07/85	80,063	KLICKITAT R	KLICKITAT R	LCOL	85160	AD
		SU STEELHEAD	84	10	85	5/10/85 5/10/85	10,006	WHITE SALMON R	WHITE SALMON R	LCOL	85161	AD
		WI STEELHEAD	84	9	85	5/10/85 5/10/85	10,008	WHITE SALMON R	WHITE SALMON R	LCOL	85168	
	*			HATCHERY TOTAL.			130,272	FROM 4 RELEASES				*
	WELLS-WDG	SU STEELHEAD	84	7	85	5/06/85 5/17/85	326,692	METHOW R	METHOW R	MCOL	85152	AD, 91,208 FB
		SU STEELHEAD	84	6	85	5/10/85 5/27/85	36,660	BELOW PRST RAPI	MID COLUMBIA R	MCOL	85163	100% AD-FB
		SU STEELHEAD	84	7	85	5/13/85 5/17/85	55,534	SIMILKAMEEN R	SIMILKAMEEN R	MCOL	85151	AD
		SU STEELHEAD	84	8	85	5/21/85 5/21/85	30,825	WELLS-WDG	MID COLUMBIA R	MCOL	85172	AD
	*			HATCHERY TOTAL.			449,711	FROM 4 RELEASES				*
**				AGENCY TOTAL...			1,845,145	FROM 20 RELEASES				**
****				TOTAL RELEASE..			63,854,800	FROM 110 RELEASES				****

****
* L A S T P A G E *
****

TABLE A-2: 1985 Hatchery releases above Bonneville Dam to migrate in 1986.

PROGRAM WBC670
TIME 8.49.27

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

PAGE NO. 1
DATE 1/27/86

```
**********************************************************************************
# This information is preliminary or has been derived from sources other than NMFS and #
# as such should not be used for distribution, quotation or publication without proper #
# authorization and/or clearance                                                 #
**********************************************************************************
```

FROM 1/01/85 TO 12/31/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
ODFW	LOOKINGGLASS H	SP CHINOOK CARSON	84	32	86	7/19/85 7/19/85	104,800	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85205	PRESMOLTS 100% AD-CWT 52,832 (07-33-13), 51,968 (07-33-14)
		SP CHINOOK CARSON	84	20	86	9/18/85 9/18/85	373,454	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85208	40,237 FB 180K AD-CWT 07-33-(57-58)
		SP CHINOOK CARSON	84	20	86	11/01/85 11/01/85	277,997	LOOKINGGLASS CR	GRANDE RONDE R	SNAK	85230	88,068 CWT 07-33-59 87,409 CWT 07-33-60
	*					HATCHERY TOTAL.	756,251	FROM 3 RELEASES				*
	ROUND BUTTE H	SU STEELHEAD DESCHUTES	85	27	86	12/26/85 12/26/85	17,113	DESCHUTES R	DESCHUTES R	LCOL	85231	100% AD-LP, 4,625 RM 12,488 LM
	*					HATCHERY TOTAL.	17,113	FROM 1 RELEASES				*
**						AGENCY TOTAL...	773,364	FROM 4 RELEASES				**

TABLE A-2 (CONTINUED):

PROGRAM WBC670
TIME 8.49.27

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* H a t c h e r y R e l e a s e s *

****
This information is preliminary or has been derived from sources other than NMFS and
as such should not be used for distribution, quotation or publication without proper
authorization and/or clearance
****

FROM 1/01/85 TO 12/31/85

AGCY	HATCHERY	SPECIES / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	WBC LOT ID	COMMENTS
USFW	LEAVENWORTH NFH	SP CHINOOK LEAVENWORTH	84	23	86	9/18/85 9/19/85	101,724	YAKIMA R	YAKIMA R	MCOL	85006	PRESMOLTS,10% FB RELEASED 150 MILES FROM COLUMBIA RIVER
		SP CHINOOK LEAVENWORTH	84	21	86	11/19/85 11/20/85	101,522	YAKIMA R	YAKIMA R	MCOL	85007	PRESMOLTS
	*					HATCHERY TOTAL.	203,246	FROM 2 RELEASES				*
	WARM SPRINGS H	SP CHINOOK	84	9	86	10/01/85 10/01/85	325,823	WARM SPRINGS H	WARM SPRINGS R	LCOL	85013	100% VENTRAL CLIPPED
	*					HATCHERY TOTAL.	325,823	FROM 1 RELEASES				*
**						AGENCY TOTAL...	529,069	FROM 3 RELEASES				**

TABLE A-2 (CONTINUED):

PROGRAM WBC670
TIME 8.49.27

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
* Hatchery Releases *

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

FROM 1/01/85 TO 12/31/85

AGCY	HATCHERY.....	SPECIES..... / STOCK	BRD YR	SIZE #/lb	MGR YR	RELEASE DATES	NUMBER RELEASED	RELEASE SITE	RIVER ..... NAME	ZONE	WBC LOT ID	COMMENTS.....
WDF	COWLITZ H	COHO COWLITZ	84	118	86	7/15/85 7/18/85	501,100	WHITE SALMON R	WHITE SALMON R	LCOL	85121	
	*					HATCHERY TOTAL.	501,100	FROM 1 RELEASES				
	KLICKITAT H	COHO TYPE-S	84	432	86	3/15/85 3/15/85	1,002,200	KLICKITAT H	KLICKITAT R	LCOL	85105	50K CWT
		SP CHINOOK KLICKITAT	84	114	86	4/24/85 4/24/85	258,100	UPPER KLICKITAT	KLICKITAT R	LCOL	85102	PRESMOLTS
		COHO TYPE-S	84	124	86	5/08/85 5/08/85	349,700	KLICKITAT R	KLICKITAT R	LCOL	85119	
	*					HATCHERY TOTAL.	1,610,000	FROM 3 RELEASES				
	ROCKY REACH H	FA CHINOOK PRIEST RAPIDS	84	143	86	8/07/85 8/07/85	95,500	ROCKY REACH H	MID COLUMBIA R	MCOL	85122	
	*					HATCHERY TOTAL.	95,500	FROM 1 RELEASES				
##						AGENCY TOTAL...	2,206,600	FROM 5 RELEASES				
####						TOTAL RELEASE..	3,509,033	FROM 12 RELEASES				

TABLE A-3: Freeze brand releases for the 1985 migration.

****

* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *

****

AGCY	HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS..............	WBC BRAN
IDFG	MCCALL	SU CHINOOK	4/01/85	4/04/85	564,405	85057	01	RD	R	3	4/01/85	4/04/85	25,600	S F SALMON R	S F SALMON R	SNAK	FL - 131.8MM, 25,653 MARKED, 19.1/LB	Y
*											LOT ID TOTAL.		25,600	FROM 1 RELEASES				
**											HATCHERY TOTAL.		25,600	FROM 1 RELEASES				'
	NIAGARA SPRING	STEELHEAD	4/29/85	5/01/85	500,000	85059	01	LD	Y	1	4/29/85	5/01/85	30,000	HELLS CANYON	SNAKE R	SNAK	30,495 MARKED, 5.1/LB	Y
*											LOT ID TOTAL.		30,000	FROM 1 RELEASES				
**											HATCHERY TOTAL.		30,000	FROM 1 RELEASES				*
	FROM RIVER	CHINOOK	3/24/85	5/15/85	20,337	85250	04	RD	K	4	3/24/85	3/26/85	436	BELOW WHT BIRD	SALMON R	SNAK		
							05	RA	K	1	3/27/85	3/29/85	538	BELOW WHT BIRD	SALMON R	SNAK		
							06	RA	K	2	3/30/85	4/01/85	63	BELOW WHT BIRD	SALMON R	SNAK		
							07	RA	K	3	4/02/85	4/04/85	566	BELOW WHT BIRD	SALMON R	SNAK		
							08	RA	K	4	4/05/85	4/07/85	3,350	BELOW WHT BIRD	SALMON R	SNAK		
							09	LA	K	1	4/08/85	4/10/85	6,056	BELOW WHT BIRD	SALMON R	SNAK		
							10	LA	K	2	3/15/85	3/17/85	4,527	BELOW WHT BIRD	SALMON R	SNAK		
							11	LA	K	3	4/14/85	4/16/85	1,492	BELOW WHT BIRD	SALMON R	SNAK		
							12	LA	K	4	4/17/85	4/19/85	828	BELOW WHT BIRD	SALMON R	SNAK		
							13	RD	E	1	4/20/85	4/22/85	273	BELOW WHT BIRD	SALMON R	SNAK		
							14	RD	E	2	4/23/85	4/25/85	420	BELOW WHT BIRD	SALMON R	SNAK		
							15	RD	E	3	4/26/85	4/28/85	303	BELOW WHT BIRD	SALMON R	SNAK		
							16	RD	E	4	4/29/85	5/01/85	538	BELOW WHT BIRD	SALMON R	SNAK		
							17	RA	E	1	5/02/85	5/04/85	380	BELOW WHT BIRD	SALMON R	SNAK		
							19	RA	E	3	5/07/85	5/09/85	172	BELOW WHT BIRD	SALMON R	SNAK		
							20	RA	E	4	5/10/85	5/12/85	86	BELOW WHT BIRD	SALMON R	SNAK		
							21	LA	E	1	5/13/85	5/15/85	3	BELOW WHT BIRD	SALMON R	SNAK		
							25	LD	K	2	4/21/85	4/23/85	306	BELOW WHT BIRD	SALMON R	SNAK		
*											LOT ID TOTAL.		20,337	FROM 18 RELEASES				*
		STEELHEAD	4/05/85	5/15/85	1,072	85251	08	RA	K	4	4/05/85	4/07/85	3	BELOW WHT BIRD	SALMON R	SNAK		
							09	LA	K	1	4/08/85	4/10/85	6	BELOW WHT BIRD	SALMON R	SNAK		
							10	LA	K	2	4/11/85	4/13/85	50	BELOW WHT BIRD	SALMON R	SNAK		
							11	LA	K	3	4/14/85	4/16/85	36	BELOW WHT BIRD	SALMON R	SNAK		
							12	LA	K	4	4/17/85	4/19/85	156	BELOW WHT BIRD	SALMON R	SNAK		
							13	RD	E	1	4/20/85	4/22/85	53	BELOW WHT BIRD	SALMON R	SNAK		
							14	RD	E	2	4/23/85	4/25/85	274	BELOW WHT BIRD	SALMON R	SNAK		
							15	RD	E	3	4/26/85	4/28/85	149	BELOW WHT BIRD	SALMON R	SNAK		
							16	RD	E	4	4/29/85	5/01/85	139	BELOW WHT BIRD	SALMON R	SNAK		
							17	RA	E	1	5/02/85	5/04/85	136	BELOW WHT BIRD	SALMON R	SNAK		
							19	RA	E	3	5/07/85	5/09/85	31	BELOW WHT BIRD	SALMON R	SNAK		
							20	RA	E	4	5/10/85	5/12/85	38	BELOW WHT BIRD	SALMON R	SNAK		

TABLE A-3 (CONTINUED):

PROGRAM WBC680 — NATIONAL MARINE FISHERIES SERVICE — PAGE NO. 2
TIME 15:17:12 — FISH PASSAGE DATA SYSTEM — DATE 1/24/86
* Brand Releases * FROM 9/01/84 TO 8/30/85

```
##########################################################################################
# This information is preliminary or has been derived from sources other than NMFS and #
# as such should not be used for distribution, quotation or publication without proper #
# authorization and/or clearance                                                       #
##########################################################################################
```

AGCY	HATCHERY.....	SPECIES.....	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID #	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER	ZONE	COMMENTS.....	WBC BRAND
IDFG	FROM RIVER	STEELHEAD	4/05/85	5/15/85	1,072	85251 21	LA	E	1	5/13/85	5/15/85	1	BELOW WHT BIRD	SALMON R	SNAK		
*										LOT ID TOTAL.		1,072	FROM 13 RELEASES				*
**										HATCHERY TOTAL.		21,409	FROM 31 RELEASES				**
	RAPID RIVER H	SP CHINOOK	3/31/85	4/10/85	674,509	85052 01	LD	R	1	3/31/85	4/10/85	34,225	RAPID RIVER H	RAPID R	SNAK	41,230 MARKED, 23.0/LB	Y
*										LOT ID TOTAL.		34,225	FROM 1 RELEASES				*
			3/18/85	3/20/85	437,360	85053 01	LD	R	3	3/18/85	3/20/85	35,825	HELLS CANYON	SNAKE R	SNAK	43,160 MARKED, 27.0/LB	Y
*										LOT ID TOTAL.		35,825	FROM 1 RELEASES				*
**										HATCHERY TOTAL.		70,050	FROM 2 RELEASES				**
	SAWTOOTH H	SP CHINOOK	3/25/85	3/29/85	420,060	85053 01	RD	R	1	3/25/85	3/29/85	39,875	SAWTOOTH H	SALMON R	SNAK	40,654 MARKED, 22.5/LB	Y
*										LOT ID TOTAL.		39,875	FROM 1 RELEASES				*
**										HATCHERY TOTAL.		39,875	FROM 1 RELEASES				**
***										AGENCY TOTAL...		186,934	FROM 36 RELEASES				***

TABLE A-3 (CONTINUED):

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

AGCY HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
NMFS FROM RIVER	SP CHINOOK	4/20/85	6/05/85	50,490	85302	01	RA	IH	1	4/20/85	4/28/85	7,285	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-46	
						02	RA	IJ	1	4/28/85	5/04/85	8,388	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-10	
						03	RA	IK	1	5/05/85	5/12/85	14,384	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-12	
						04	RA	IH	3	5/13/85	5/19/85	10,688	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-14	
						05	RA	IJ	3	5/20/85	5/26/85	6,405	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-48	
						06	RA	IK	3	5/27/85	6/05/85	3,340	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-56	
*										LOT ID TOTAL.		50,490	FROM 6 RELEASES				*
		4/20/85	6/05/85	49,700	85304	01	LA	IL	1	4/20/85	4/28/85	6,603	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-53	
						02	LA	IN	1	4/28/85	5/04/85	8,201	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-11	
						03	LA	IS	1	5/05/85	5/12/85	14,431	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-13	
						04	LA	IL	3	5/13/85	5/19/85	10,569	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-15	
						05	LA	IN	3	5/20/85	5/26/85	6,779	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-55	
						06	LA	IS	3	5/27/85	6/05/85	3,117	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-58	
*										LOT ID TOTAL.		49,700	FROM 6 RELEASES				*
		5/01/85	6/05/85	26,287	85306	01	RA	IZ	1	5/01/85	5/04/85	6,964	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-28	
						02	RA	IY	1	5/05/85	5/13/85	7,543	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-30	
						03	RA	IX	1	5/15/85	5/19/85	5,827	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-40	
						04	RA	IZ	3	5/20/85	5/26/85	4,266	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-22	
						05	RA	IY	3	5/27/85	6/05/85	1,687	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-44	
*										LOT ID TOTAL.		26,287	FROM 5 RELEASES				*
		5/01/85	6/05/85	25,553	85308	01	LA	2C	1	5/01/85	5/04/85	7,067	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-25	
						02	LA	2J	1	5/05/85	5/13/85	7,404	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-27	

TABLE A-3 (CONTINUED):


```
##############################################################################
# This information is preliminary or has been derived from sources other than NMFS and #
# as such should not be used for distribution, quotation or publication without proper #
# authorization and/or clearance                                                       #
##############################################################################
```

AGCY HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
NMFS FROM RIVER	SP CHINOOK	5/01/85	6/05/85	25,553	85308	03	LA	14	1	5/15/85	5/19/85	5,398	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-41	
						04	LA	2C	3	5/20/85	5/26/85	4,005	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-43	
						05	LA	2J	3	5/27/85	6/05/85	1,679	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-45	
*										LOT ID	TOTAL.	25,553	FROM 5 RELEASES				*
		8/08/85	8/12/85	3,911	85309	01	RA	P	1	8/08/85	8/08/85	788	HAT ROCK PARK	MID COLUMBIA R	MCOL	100% UC CLIP, 10% PIT TAG	
						02	RA	P	2	8/09/85	8/09/85	786	HAT ROCK PARK	MID COLUMBIA R	MCOL	100% UC CLIP, 10% PIT TAG	
						03	RA	P	3	8/10/85	8/10/85	781	HAT ROCK PARK	MID COLUMBIA R	MCOL	100% UC CLIP, 10% PIT TAG	
						04	RA	P	4	8/11/85	8/11/85	773	HAT ROCK PARK	MID COLUMBIA R	MCOL	100% UC CLIP, 10% PIT TAG	
						05	LA	P	1	8/12/85	8/12/85	783	HAT ROCK PARK	MID COLUMBIA R	MCOL	100% UC CLIP, 10% PIT TAG	
*										LOT ID	TOTAL.	3,911	FROM 5 RELEASES				*
	SOCKEYE	4/20/85	6/04/85	55,406	85301	01	RA	IH	1	4/20/85	4/28/85	10,232	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-16	
						02	RA	IJ	1	4/28/85	5/04/85	8,146	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-50	
						03	RA	IK	1	5/05/85	5/12/85	8,171	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-52	
						04	RA	IH	3	5/13/85	5/19/85	6,506.	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-54	
						05	RA	IJ	3	5/20/85	5/26/85	10,259	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-26	
						06	RA	IK	3	5/27/85	6/04/85	12,092	BELOW BONN	LOWER COLUMBIA	LCOL	PRD TRANSPORT GROUP CWT 23-17-57	
*										LOT ID	TOTAL.	55,406	FROM 6 RELEASES				*
		4/20/85	6/04/85	55,432	85303	01	LA	IL	1	4/20/85	4/28/85	9,614	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-17	
						02	LA	IN	1	4/28/85	5/04/85	8,189	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-47	
						03	LA	IS	1	5/05/85	5/12/85	8,171	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-49	
						04	LA	IL	3	5/13/85	5/19/85	6,451	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-51	
						05	LA	IN	3	5/20/85	5/26/85	10,403	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-19	
						06	LA	IS	3	5/27/85	6/04/85	12,604	BELOW PRST RAPI	MID COLUMBIA R	MCOL	PRD CONTROL GROUP CWT 23-17-59	
										LOT ID	TOTAL.	55,432	FROM 6 RELEASES				*

TABLE A-3 (CONTINUED):

PROGRAM WBC680
TIME 15.17.42

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
Brand Releases

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY	SPECIES	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID #	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	COMMENTS	WBC BRAND
NMFS	FROM RIVER	SOCKEYE	5/01/85	6/03/85	8,602	85305 01	RA	IZ	1	5/01/85	5/04/85	2,127	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-16-62	
						02	RA	IY	1	5/05/85	5/13/85	947	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-18	
						03	RA	IX	1	5/15/85	5/19/85	1,049	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-20	
						04	RA	IZ	3	5/20/85	5/26/85	2,149	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-42	
						05	RA	IY	3	5/27/85	6/03/85	2,330	BELOW BONN	LOWER COLUMBIA	LCOL	WAN TRANSPORT GROUP CWT 23-17-24	
*										LOT ID TOTAL.		8,602	FROM 5 RELEASES				*
			5/01/85	6/03/85	8,599	85307 01	LA	2C	1	5/01/85	5/04/85	2,299	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-16-61	
						02	LA	2J	1	5/05/85	5/13/85	1,069	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-16-63	
						03	LA	14	1	5/15/85	5/19/85	835	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-01	
						04	LA	2C	3	5/20/85	5/26/85	2,014	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-21	
						05	LA	2J	3	5/27/85	6/03/85	2,382	BELOW PRST RAPI	MID COLUMBIA R	MCOL	WAN CONTROL GROUP CWT 23-17-23	
*										LOT ID TOTAL.		8,599	FROM 5 RELEASES				*
**										HATCHERY TOTAL.		283,980	FROM 49 RELEASES				**
***										AGENCY TOTAL...		283,980	FROM 49 RELEASES				***

TABLE A-3 (CONTINUED):

AGCY	HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS................	WBC BRAND
USFW	DWORSHAK NFH	SP CHINOOK	4/03/85	4/04/85	1,137,139	85031	01	RD	R	2	4/03/85	4/04/85	23,100	DWORSHAK NFH	CLEARWATER R	SNAK	38,530 MARKED, 21.9/LB	Y
*											LOT ID TOTAL.		23,100	FROM 1 RELEASES				*
		STEELHEAD	4/29/85	5/06/85	1,035,573	85030	01	LD	Y	2	4/29/85	4/29/85	30,625	DWORSHAK NFH	CLEARWATER R	SNAK	30,680 MARKED, 6.9/LB	Y
*											LOT ID TOTAL.		30,625	FROM 1 RELEASES				*
**											HATCHERY TOTAL.		53,725	FROM 2 RELEASES				**
	HAGERMAN NFH	FA CHINOOK	6/04/85	6/04/85	128,229	85035	01	LD	R	4	6/04/85	6/04/85	33,700	GRANDE RONDE R	GRANDE RONDE R	SNAK	40,054 MARKED, 52.2/LB	Y
*											LOT ID TOTAL.		33,700	FROM 1 RELEASES				*
		STEELHEAD	3/26/85	4/30/85	786,186	85033	01	RD	Y	1	4/09/85	4/09/85	35,125	STANLEY	SALMON R	SNAK	35,566 MARKED, 4.3/LB	Y
*											LOT ID TOTAL.		35,125	FROM 1 RELEASES				*
			3/26/85	4/30/85	270,208	85034	01	RD	Y	3	4/17/85	4/17/85	31,775	E F SALMON R	E F SALMON R	SNAK	32,406 MARKED, 4.8/LB	Y
*											LOT ID TOTAL.		31,775	FROM 1 RELEASES				*
**											HATCHERY TOTAL.		100,600	FROM 3 RELEASES				**
	LEAVENWORTH NFH	SP CHINOOK	4/13/85	4/13/85	2,190,000	85003	01	LA	7U	1	4/13/85	4/13/85	30,422	LEAVENWORTH NFH	WENATCHEE R	MCOL		Y
*											LOT ID TOTAL.		30,422	FROM 1 RELEASES				*
			4/01/85	4/12/85	82,365	85004	01	LA	2	3	4/08/85	4/12/85	6,056	YAKIMA R	YAKIMA R	MCOL		
							02	RA	F	4	4/08/85	4/11/85	3,841	YAKIMA R	YAKIMA R	MCOL		
							03	RA	2	3	4/08/85	4/11/85	100	YAKIMA R	YAKIMA R	MCOL	5K FB, 2X RETENTION REBRANDED AS RA-F-4	
							04	LA	F	1	4/08/85	4/11/85	100	YAKIMA R	YAKIMA R	MCOL	5K FB, 2X RETENTION REBRANDED AS LA-2-3	
*											LOT ID TOTAL.		10,097	FROM 4 RELEASES				*
			6/11/85	6/11/85	100,750	85005	01	RA	S	1	6/11/85	6/11/85	9,000	YAKIMA R	YAKIMA R	MCOL	RELEASED AS CH 0	
*											LOT ID TOTAL.		9,000	FROM 1 RELEASES				*
			4/08/85	4/09/85	25,850	85039	01	RA	IR	1	4/08/85	4/09/85	25,000	NACHES R	NACHES R	MCOL		
*											LOT ID TOTAL.		25,000	FROM 1 RELEASES				*

TABLE A-3 (CONTINUED):

PROGRAM WBC680
TIME 15.17.42

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM
Brand Releases

FROM 9/01/84 TO 8/30/85

AGCY	HATCHERY.....	SPECIES.....	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID #	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER ..... NAME	ZONE	COMMENTS.....	WBC BRAN
USFW	LEAVENWORTH NFH	SP CHINOOK	9/13/84	9/15/84	102,833	85043 01	LA	2	4	9/13/84	9/15/84	1,000	YAKIMA R	YAKIMA R	MCOL	10K FB, (10% RETAINED	
										LOT ID TOTAL.		1,000	FROM 1 RELEASES				*
			11/26/84	11/26/84	108,261	85044 01	RA	2	2	11/26/84	11/26/84	10,800	YAKIMA R	YAKIMA R	MCOL	CH 1	
										LOT ID TOTAL.		10,800	FROM 1 RELEASES				*
			5/28/85	6/12/85	6,000	85045 01	RA	BB	1	5/28/85	6/12/85	1,200	YAKIMA R	YAKIMA R	MCOL	CWT 05-17-05/AD CLIP 600 REL 5/28,600 REL 6/12	
						02	RD	BB	1	6/11/85	6/12/85	1,100	YAKIMA R	YAKIMA R	MCOL	CWT 05-17-05/AD CLIP 600 REL 6/11,500 REL 6/12	
						03	LA	BB	1	6/11/85	6/11/85	1,000	YAKIMA R	YAKIMA R	MCOL	ALL CWT 05-17-05 AND AD CLIP	
						04	LD	BB	1	6/11/85	6/11/85	1,000	YAKIMA R	YAKIMA R	MCOL	ALL CWT 05-17-05 AND AD CLIP	
										LOT ID TOTAL.		4,300	FROM 4 RELEASES				*
										HATCHERY TOTAL.		90,619	FROM 13 RELEASES				**
	SPRING CRK NFH	FA CHINOOK	6/10/85	6/17/85	1,000,382	85020 01	RA	+	1	6/13/85	6/13/85	10,000	YAKIMA R	YAKIMA R	MCOL		
										LOT ID TOTAL.		10,000	FROM 1 RELEASES				*
										HATCHERY TOTAL.		10,000	FROM 1 RELEASES				**
	WINTHROP NFH	SP CHINOOK	4/16/85	4/24/85	1,167,625	85002 01	LA	7K	1	4/24/85	4/24/85	34,959	WINTHROP NFH	METHOW R	MCOL		Y
						02	LA	7C	1	4/20/85	4/20/85	35,186	WINTHROP NFH	METHOW R	MCOL		Y
						03	LA	7C	3	4/16/85	4/16/85	36,704	WINTHROP NFH	METHOW R	MCOL		Y
						04	LA	7T	1	4/16/85	4/16/85	5,890	WINTHROP NFH	METHOW R	MCOL		Y
						05	LA	7F	1	4/16/85	4/16/85	12,568	WINTHROP NFH	METHOW R	MCOL		Y
										LOT ID TOTAL.		125,307	FROM 5 RELEASES				*
			4/16/85	4/24/85	37,445	85036 01	LA	7T	3	4/16/85	4/16/85	12,695	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
						02	RA	7T	3	4/20/85	4/20/85	12,451	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
						03	RA	7T	1	4/24/85	4/24/85	12,299	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
										LOT ID TOTAL.		37,445	FROM 3 RELEASES				*
										HATCHERY TOTAL.		162,752	FROM 8 RELEASES				**
										AGENCY TOTAL...		417,696	FROM 27 RELEASES				***

TABLE A-3 (CONTINUED):

PROGRAM WBC680 — NATIONAL MARINE FISHERIES SERVICE — PAGE NO. 8
TIME 15.17.42 — FISH PASSAGE DATA SYSTEM — DATE 1/24/86
\# Brand Releases # — FROM 9/01/84 TO 8/30/85

\# This information is preliminary or has been derived from sources other than NMFS and as such should not be used for distribution, quotation or publication without proper authorization and/or clearance #

AGCY	HATCHERY	SPECIES	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE	RIVER NAME	ZONE	COMMENTS	WBC BRAND
WBC	FROM RIVER	CHINOOK	4/14/85	5/24/85	45,433	85253	01	RA	PI	1	4/14/85	4/20/85	9,893	BELOW BONN	LOWER COLUMBIA	LCOL	AD-CWT 23-18-7	Y
							02	RA	PI	2	4/21/85	4/27/85	17,427	BELOW BONN	LOWER COLUMBIA	LCOL	AD-CWT 23-18-8 AND CWT 23-18-9	Y
							03	RA	PI	3	5/01/85	5/05/85	9,539	BELOW BONN	LOWER COLUMBIA	LCOL	AD-CWT 23-18-14	Y
							04	RA	PI	4	5/08/85	5/16/85	3,724	BELOW BONN	LOWER COLUMBIA	LCOL	AD-CWT 23-18-15	Y
							05	LA	PI	1	5/17/85	5/24/85	4,850	BELOW BONN	LOWER COLUMBIA	LCOL	AD-CWT 23-18-16	Y
*											LOT ID TOTAL.		45,433	FROM 5 RELEASES				*
		SU STEELHEAD	4/22/85	5/27/85	30,041	85252	01	RA	PI	1	4/22/85	4/28/85	1,635	BELOW BONN	LOWER COLUMBIA	LCOL	AD-LV-CWT 23-18-17	Y
							02	RA	PI	2	5/01/85	5/05/85	3,084	BELOW BONN	LOWER COLUMBIA	LCOL	AD-LV-CWT 23-18-10	Y
							03	RA	PI	3	5/08/85	5/12/85	7,640	BELOW BONN	LOWER COLUMBIA	LCOL	AD-LV-CWT 23-18-11	Y
							04	RA	PI	4	5/15/85	5/19/85	8,855	BELOW BONN	LOWER COLUMBIA	LCOL	AD-LV-CWT 23-18-12	Y
							05	LA	PI	1	5/20/85	5/27/85	8,827	BELOW BONN	LOWER COLUMBIA	LCOL	AD-LV-CWT 23-18-13	Y
*											LOT ID TOTAL.		30,041	FROM 5 RELEASES				*
**											HATCHERY TOTAL.		75,474	FROM 10 RELEASES				**
***											AGENCY TOTAL...		75,474	FROM 10 RELEASES				***

TABLE A-3 (CONTINUED):

NATIONAL MARINE FISHERIES SERVICE
FISH PASSAGE DATA SYSTEM

PROGRAM WBC680 | TIME 15.17.42 | * Brand Releases * | FROM 9/01/84 TO 8/30/85 | PAGE NO. 9 | DATE 1/24/86

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

AGCY	HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
WDF	PRIEST RAPIDS H	FA CHINOOK	6/05/85	6/18/85	6,988,800	85109	01	RA	T	1	6/12/85	6/12/85	78,312	PRIEST RAPIDS H	MID COLUMBIA R	MCOL		Y
*											LOT ID TOTAL.		78,312	FROM 1 RELEASES				*
**											HATCHERY TOTAL.		78,312	FROM 1 RELEASES				**
	WELLS-WDF	SU CHINOOK	5/29/85	5/31/85	701,312	85111	01	LA	T	3	5/29/85	5/31/85	101,328	WELLS-WDF	MID COLUMBIA R	MCOL		Y
*											LOT ID TOTAL.		101,328	FROM 1 RELEASES				*
			5/10/85	5/18/85	630,660	85118	01	RA	T	3	5/10/85	5/18/85	22,515	WELLS-WDF	MID COLUMBIA R	MCOL		Y
*											LOT ID TOTAL.		22,515	FROM 1 RELEASES				*
**											HATCHERY TOTAL.		123,843	FROM 2 RELEASES				**
***											AGENCY TOTAL...		202,155	FROM 3 RELEASES				***

TABLE A-3 (CONTINUED):

AGCY	HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
WDG	LYONS FERRY	SU STEELHEAD	5/03/85	5/13/85	127,946	85156	01	RA	17	1	5/03/85	5/13/85	41,028	GRANDE RONDE R	GRANDE RONDE R	SNAK	CWT 62-16-27	
							02	RA	17	3	5/03/85	5/13/85	40,201	GRANDE RONDE R	GRANDE RONDE R	SNAK	CWT 62-16-28	
*											LOT ID TOTAL.		81,229	FROM 2 RELEASES				*
			5/13/85	5/19/85	151,609	85157	01	LA	S	1	5/13/85	5/19/85	39,094	TUCANNON R	TUCANNON R	SNAK	CWT 62-16-29	
							02	LA	S	2	5/13/85	5/19/85	39,094	TUCANNON R	TUCANNON R	SNAK	CWT 62-16-30	
*											LOT ID TOTAL.		78,188	FROM 2 RELEASES				*
			5/05/85	5/16/85	104,498	85158	01	RA	H	1	5/05/85	5/16/85	28,191	LYONS FERRY	SNAKE R	SNAK	CWT-LV 62-16-44	
							02	RD	H	1	5/05/85	5/16/85	22,394	LYONS FERRY	SNAKE R	SNAK		
							03	RA	H	2	5/05/85	5/16/85	28,373	LYONS FERRY	SNAKE R	SNAK	CWT-LV 62-16-45	
							04	RD	H	2	5/05/85	5/16/85	25,540	LYONS FERRY	SNAKE R	SNAK		
*											LOT ID TOTAL.		104,498	FROM 4 RELEASES				*
			5/06/85	5/10/85	41,344	85166	01	RA	7N	1	5/06/85	5/06/85	19,983	BELOW LI GOOSE	SNAKE R	SNAK	21,035 BRANDED,# RELEASED ADJUSTED FOR SURV. STUDY	Y
							02	RA	7N	3	5/10/85	5/10/85	19,906	BELOW LI GOOSE	SNAKE R	SNAK	20,309 BRANDED,# RELEASED ADJUSTED FOR SURV. STUDY	Y
*											LOT ID TOTAL.		39,889	FROM 2 RELEASES				*
			5/08/85	5/14/85	24,864	85167	01	LA	7S	1	5/08/85	5/08/85	4,076	BELOW ICE HARBR	SNAKE R	SNAK	4,159 BRANDED, # RELEASED ADJUSTED FOR SURV. STUDY	Y
							02	LA	7S	3	5/09/85	5/09/85	3,755	BELOW ICE HARBR	SNAKE R	SNAK	4,038 BRANDED, # RELEASED ADJUSTED FOR SURV. STUDY	Y
							03	RA	7S	1	5/10/85	5/10/85	4,159	BELOW ICE HARBR	SNAKE R	SNAK	4,378 BRANDED,# RELEASED ADJUSTED FOR SURV. STUDY	Y
							04	LD	7S	1	5/13/85	5/13/85	4,050	BELOW ICE HARBR	SNAKE R	SNAK		Y
							05	LD	7S	3	5/13/85	5/13/85	4,020	BELOW ICE HARBR	SNAKE R	SNAK		Y
							06	RD	7S	1	5/14/85	5/14/85	4,219	BELOW ICE HARBR	SNAKE R	SNAK		Y
*											LOT ID TOTAL.		24,279	FROM 6 RELEASES				*
**											HATCHERY TOTAL.		328,083	FROM 16 RELEASES				**
	NACHES H	STEELHEAD	5/16/85	6/03/85	1,925	85169	01	LA	BB	1	6/03/85	6/03/85	500	YAKIMA R	YAKIMA R	MCOL	CH 1, AD CLIP	
							02	LD	BB	1	6/03/85	6/03/85	500	YAKIMA R	YAKIMA R	MCOL	CH 1, AD CLIP	
							03	RA	BB	1	5/16/85	6/03/85	500	YAKIMA R	YAKIMA R	MCOL	CH 1, 225 REL 5/16-5/17, 275 REL 6/3, ALL AD CLIP.	
							04	RD	BB	1	5/16/85	6/03/85	425	YAKIMA R	YAKIMA R	MCOL	CH 1, 225 REL 5/16-5/17, 200 REL 6/3, ALL AD CLIP.	
*											LOT ID TOTAL.		1,925	FROM 4 RELEASES				*
**											HATCHERY TOTAL.		1,925	FROM 4 RELEASES				**

TABLE A-3 (CONTINUED):

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

AGCY	HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
WDG	WELLS-WDG	SU STEELHEAD	5/06/85	5/17/85	326,692	85152	01	RA	7U	1	5/06/85	5/06/85	30,479	METHOW R	METHOW R	MCOL	AD CLIPPED	Y
							02	RA	7U	3	5/10/85	5/10/85	30,351	METHOW R	METHOW R	MCOL	AD CLIPPED	Y
							03	LA	7U	1	5/14/85	5/14/85	30,378	METHOW R	METHOW R	MCOL	AD CLIPPED	Y
*											LOT ID TOTAL.		91,208	FROM 3 RELEASES				*
			5/10/85	5/27/85	36,660	85163	01	LA	7K	1	5/10/85	5/10/85	4,041	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							02	LA	7K	3	5/11/85	5/11/85	4,058	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							03	RA	7K	1	5/13/85	5/13/85	4,041	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							04	LD	7K	1	5/15/85	5/15/85	4,038	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							05	LD	7K	3	5/16/85	5/16/85	4,022	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							06	RD	7K	1	5/17/85	5/17/85	4,047	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							07	LD	7T	3	5/21/85	5/21/85	4,138	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							08	LD	7T	1	5/20/85	5/20/85	3,986	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
							09	RD	7T	3	5/22/85	5/22/85	4,289	BELOW PRST RAPI	MID COLUMBIA R	MCOL		Y
*											LOT ID TOTAL.		36,660	FROM 9 RELEASES				
**											HATCHERY TOTAL.		127,868	FROM 12 RELEASES				
***											AGENCY TOTAL...		457,876	FROM 32 RELEASES				*

TABLE A-3 (CONTINUED):

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

AGCY HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAND
YATR FROM RIVER	SP CHINOOK	4/20/85	6/08/85	4,504	85351	01	RA	W	4	4/20/85	6/08/85	227	YAKIMA R	YAKIMA R	MCOL	110 REL 4/20,100% CH1,117 REL 6/8,87% CH0,13% CH1	
						02	RA	+F	1	4/20/85	4/20/85	193	YAKIMA R	YAKIMA R	MCOL	12% CH 0, 88% CH 1	
						03	LA	+F	1	4/20/85	4/20/85	55	YAKIMA R	YAKIMA R	MCOL	12% CH 0, 88% CH 1	
						04	RA	+N	1	4/27/85	4/27/85	132	YAKIMA R	YAKIMA R	MCOL	4% CH 0, 96% CH 1	
						05	LA	+N	1	4/27/85	4/27/85	105	YAKIMA R	YAKIMA R	MCOL	4% CH 0, 96% CH 1	
						06	RA	+P	1	5/02/85	5/02/85	204	YAKIMA R	YAKIMA R	MCOL	20% CH 0, 80% CH 1	
						07	LA	+P	1	5/02/85	5/02/85	87	YAKIMA R	YAKIMA R	MCOL	20% CH 0, 80% CH 1	
						08	RA	+F	3	5/16/85	5/16/85	199	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						09	LA	+F	3	5/16/85	5/16/85	142	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						10	LA	+F	4	5/16/85	5/16/85	112	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						11	RA	+L	1	5/09/85	5/09/85	224	YAKIMA R	YAKIMA R	MCOL	47% CH 0, 53% CH 1	
						12	LA	+L	1	5/09/85	5/09/85	197	YAKIMA R	YAKIMA R	MCOL	47% CH 0, 53% CH 1	
						13	RA	+1	3	5/12/85	5/12/85	236	YAKIMA R	YAKIMA R	MCOL	47% CH 0, 53% CH 1	
						14	LA	+1	3	5/12/85	5/12/85	106	YAKIMA R	YAKIMA R	MCOL	47% CH 0, 53% CH 1	
						15	LA	+1	2	5/12/85	5/12/85	127	YAKIMA R	YAKIMA R	MCOL	47% CH 0, 53% CH 1	
						16	RA	+Y	3	5/20/85	5/20/85	232	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						17	LA	+Y	3	5/20/85	5/20/85	174	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						18	LA	+Y	1	5/20/85	5/20/85	199	YAKIMA R	YAKIMA R	MCOL	44% CH 0, 56% CH 1	
						19	RA	+P	3	5/24/85	5/24/85	300	YAKIMA R	YAKIMA R	MCOL	63% CH 0, 37% CH 1	
						20	LA	+P	3	5/24/85	5/24/85	158	YAKIMA R	YAKIMA R	MCOL	63% CH 0, 37% CH 1	
						21	LA	+P	4	5/24/85	5/24/85	114	YAKIMA R	YAKIMA R	MCOL	63% CH 0, 37% CH 1	
						22	RA	NN	1	5/25/85	5/25/85	178	YAKIMA R	YAKIMA R	MCOL	63% CH 0, 37% CH 1	
						23	LA	NN	1	5/25/85	5/25/85	116	YAKIMA R	YAKIMA R	MCOL	63% CH 0, 37% CH 1	
						24	RA	W	1	6/01/85	6/01/85	198	YAKIMA R	YAKIMA R	MCOL	75% CH 0, 25% CH 1	
						25	LA	W	1	6/01/85	6/01/85	103	YAKIMA R	YAKIMA R	MCOL	75% CH 0, 25% CH 1	
						26	RA	W	3	6/01/85	6/01/85	92	YAKIMA R	YAKIMA R	MCOL	75% CH 0, 25% CH 1	
						27	LA	W	3	6/01/85	6/01/85	103	YAKIMA R	YAKIMA R	MCOL	75% CH 0, 25% CH 1	
						28	LA	W	4	6/08/85	6/08/85	74	YAKIMA R	YAKIMA R	MCOL	87% CH 0, 13% CH 1	
						29	RA	W	4	6/08/85	6/08/85	117	YAKIMA R	YAKIMA R	MCOL	87% CH 0, 13% CH 1	
*										LOT ID TOTAL.		4,504	FROM 29 RELEASES				*
		4/08/85	5/14/85	1,068	85352	01	LA	00	1	4/08/85	4/08/85	100	NACHES R	NACHES R	MCOL	100% CH 1	
						02	LP	00	1	4/08/85	4/08/85	100	NACHES R	NACHES R	MCOL	100% CH 1	
						03	LA	+1	1	4/12/85	4/12/85	198	NACHES R	NACHES R	MCOL	100% CH 1	
						04	LP	+1	1	4/17/85	4/17/85	196	NACHES R	NACHES R	MCOL	100% CH 1	
						05	LA	+Y	1	4/20/85	4/20/85	149	NACHES R	NACHES R	MCOL	100% CH 1	
						06	LA	7N	1	4/23/85	4/23/85	20	NACHES R	NACHES R	MCOL	100% CH 1	
						07	LP	+Y	1	4/25/85	4/25/85	99	NACHES R	NACHES R	MCOL	100% CH 1	
						08	LA	+Y	3	4/29/85	4/29/85	151	NACHES R	NACHES R	MCOL	100% CH 1	
						09	LA	+1	2	5/14/85	5/14/85	55	NACHES R	NACHES R	MCOL	100% CH 1	
*										LOT ID TOTAL.		1,068	FROM 9 RELEASES				*
		6/13/85	6/14/85	1,837	85357	01	RA	W	1	6/13/85	6/14/85	1,837	YAKIMA R	YAKIMA R	MCOL	CH 0	
*										LOT ID TOTAL.		1,837	FROM 1 RELEASES				*

TABLE A-3 (CONTINUED):

****
* This information is preliminary or has been derived from sources other than NMFS and *
* as such should not be used for distribution, quotation or publication without proper *
* authorization and/or clearance *
****

AGCY HATCHERY.......	SPECIES......	MAJOR RELEASE START	MAJOR RELEASE STOP	TOTAL NUMBER RELEASED	LOT ID	#	LOC	BRND	ROT	BRAND RELEASE START	BRAND RELEASE STOP	BRAND NUMBER RELEASED	RELEASE SITE...	RIVER NAME	ZONE	COMMENTS...............	WBC BRAN
YATR FROM RIVER	FA CHINOOK	6/24/85	6/24/85	93	85358	01	RA	+P	1	6/24/85	6/24/85	43	YAKIMA R	YAKIMA R	MCOL		
						02	LA	+P	1	6/24/85	6/24/85	50	YAKIMA R	YAKIMA R	MCOL		
*										LOT ID TOTAL.		93	FROM 2 RELEASES				
	COHO	6/08/85	6/15/85	215	85354	01	RA	W	4	6/08/85	6/15/85	141	YAKIMA R	YAKIMA R	MCOL		
						02	LA	W	4	6/08/85	6/15/85	74	YAKIMA R	YAKIMA R	MCOL		
*										LOT ID TOTAL.		215	FROM 2 RELEASES				*
	STEELHEAD	4/27/85	5/09/85	1,211	85353	01	RA	+N	1	4/27/85	4/27/85	245	YAKIMA R	YAKIMA R	MCOL		
						02	LA	+N	1	4/27/85	4/27/85	117	YAKIMA R	YAKIMA R	MCOL		
						03	RA	+P	1	5/02/85	5/02/85	267	YAKIMA R	YAKIMA R	MCOL		
						04	LA	+P	1	5/02/85	5/02/85	156	YAKIMA R	YAKIMA R	MCOL		
						05	RA	+L	1	5/09/85	5/09/85	225	YAKIMA R	YAKIMA R	MCOL		
						06	LA	+L	1	5/09/85	5/09/85	201	YAKIMA R	YAKIMA R	MCOL		
*										LOT ID TOTAL.		1,211	FROM 6 RELEASES				*
**										HATCHERY TOTAL.		8,928	FROM 49 RELEASES				**
***										AGENCY TOTAL...		8,928	FROM 49 RELEASES				***

****
* L A S T P A G E *
****