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EVALUATION AND MONITORING OF WILD/NATURAL STEELHEAD TROUT PRODUCTION

ANNUAL PROGRESS REPORT
Period Covered January 1, 1995 - December 31, 1995

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ABSTRACT

Several key study streams in the Salmon River and Clearwater River drainages were snorkeled in the summer of 1995. The current Idaho Department of Fish and Game (IDFG) goal is to maintain a parr density at 70% of the rated carrying capacity. All streams snorkeled are considerably below the current goal (6.4% to 54.3% of goal).

Weirs were operated in Chamberlain Creek, West Fork Chamberlain Creek, Running Creek, and Rush Creek during the spring adult steelhead O*ncorhynchus mykiss* spawning migration. An adult steelhead migration barrier was operated in Rapid River. Adult steelhead escapements in all but Rapid River are at critically low levels. An adult salmon *O sp.* weir was operated in Running Creek using a new passive electronic/video counting facility. Five adult chinook salmon *O. tshawytscha* were captured on video as they passed the counting facility. A video record of all resident fish in excess of 10 to 12 in was also obtained. The video system performed adequately in most circumstances. Additional testing and modification will continue during the 1996 salmon spawning migration. An upstream migration barrier was operated in Rapid River during the salmon spawning migration. Four adult male salmon were passed above the barrier; no females were captured or passed above the barrier.

Rotary screw traps were operated in Running Creek and Rapid River during the spring and fall to monitor the juvenile steelhead and salmon downstream migration. Migration timing in Running Creek indicates that the majority of smolt size fish moved downstream out of Running Creek in the fall and few smolt size fish left Running Creek in the spring. Migration timing at Rapid River indicates a more equal distribution of the smolt size fish moving downstream out of Rapid River in the spring.

Juvenile steelhead were PIT-tagged in Chamberlain Creek, Running Creek and Rapid River during the summer and fall of 1995. Detections at the lower Snake and Columbia rivers from the 1994 tagging indicate a substantial drop in detection rates at successive hydroelectric projects. The majority of PIT tag detections at Lower Granite Dam occurred from April 9 -- May 25, with the peak detection on May 9.

Aerial redd counts were conducted in the spring of 1995 by IDFG project staff. Low adult escapements at the weirs are reflected in the low redd counts.

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INTRODUCTION

Definitive production data for wild steelhead *Oncorhynchus mykiss* and salmon *O. sp*. populations in Idaho is generally lacking, and with the classification of wild spring and summer chinook salmon *O. tshawytscha* populations as threatened and the impending classification of wild steelhead stocks, the priority for obtaining more definitive adult escapement and juvenile production data on representative streams has been greatly elevated. Key streams have been selected and weirs have been designed and installed to enumerate spawning adults into these streams. It is important in production studies to be able to precisely relate the number of spawning adults to the resultant parr abundance. Installation and operation of temporary weirs will enable the complete enumeration of spawning adults above the weirs. Weir locations were selected below the traditional spawning grounds.

Juvenile traps were installed to sample emigrating juvenile salmon and steelhead. Juvenile steelhead were PIT-tagged in Chamberlain Creek, Running Creek, and Rapid River to determine migration timing of steelhead smolts through the lower Snake River and Columbia River migration corridor. Timing of downstream emigration is lacking for many wild steelhead and salmon stocks in Idaho. Accurate smolt outmigration timing data will provide valuable information for future water flow management decisions in the downstream migration corridor of the lower Snake and Columbia rivers. Fry, parr, and smolt emigrations for salmon and steelhead from study streams will vary throughout the year and from year to year. We will also use these PIT tag detections in estimating smolt production from study streams.

To determine the relative abundance of juvenile salmon and steelhead in numerous anadromous production streams in Idaho, snorkel counts in representative sites have been conducted since 1985. Since 1992, several key study streams have been snorkeled intensively to reduce variability and increase the reliability of parr production estimates. Snorkel counts of all fish observed in representative sample sites were completed in the following study streams in 1995: Chamberlain Creek, Running Creek, Rush Creek, and Rapid River drainages. The sample sites encompass at least two habitat types (e.g., riffle, pool, run), and are usually between 50 m and 150 m in length. Physical habitat measurements taken are: average width, length, temperature, and visibility.

Much of the wild steelhead and chinook salmon refugium is located within the Frank Church River of No Return Wilderness Area and the Selway-Bitterroot Wilderness Area. These designations have preserved large areas of habitat in near pristine condition. The majority of the streams addressed in this report are located within the boundaries of these wilderness areas. Research techniques have been modified to meet wilderness management constraints and values.

RESULTS AND DISCUSSION

Parr Abundance

Idaho Department of Fish and Game (IDFG) research groups conducted snorkel surveys in several Salmon River and Clearwater River drainages during the summer of 1995. Results of snorkel surveys are displayed in Table 1. Densities for steelhead were calculated using data from B-channel (Rosgen 1985) types only, the preferred rearing habitat for steelhead. Densities for

Table I. Steelhead (STH) and chinook salmon (CHN) parr density summary for Salmon River and Clearwater River snorkel stations. PCC=percent of carrying capacity. Current IDFG goal is 70% of carrying capacity.

Stream	Sample Size [a] STH/CHN	Steelhead			Chinook Salmon		
		Age 1&2 Density	Age 1&2 PCC	% IDFG Goal	Age 0 Density	Age 0 PCC	% IDFG Goal
Chamberlain Creek	13/3	3.5	17.5	25.0	0.0	0.0	0.0
West Fork Chamberlain Creek	6/6	4.5	32.1	45.9	0.0	0.0	0.0
Chamberlain Creek Tributaries	9/3	3.7	18.5	26.4	0.0	0.0	0.0
Running Creek [b]	2/2	2.9	14.5	20.7	0.2	0.3	0.4
Rush Creek [b]	2/2	0.9	4.5	6.4	0.0	0.0	0.0
Rapid River [b]	7/7	7.6	38.0	54.3	0.2	0.5	0.6

[a] Sample size for steelhead and chinook salmon refers to the number of stations snorkeled that were used to determine the density of each fish, respectively. Density of fish is measured in parr/100 m^2.

[b] All sections snorkeled were B-channel.

chinook salmon were calculated using data from C-channel (Rosgen 1985) types only. All sections sampled in Running Creek, Rush Creek, and Rapid River were B-channel; chinook salmon densities were calculated using B-channel data for these three streams. IDFG has set a parr density goal at 70% of the rated carrying capacity for each stream. As in recent years, parr density of wild/natural stocks of steelhead in 1995 are well below the desired goal. Figure I shows the density trends in general parr monitoring (GPM) sites of three key study streams since 1985.

PIT Tagging

During the summer and fall of 1995, IDFG research groups collected and PIT-tagged juvenile steelhead in selected Salmon and Clearwater river study streams (Table 2). Results of PIT tag detections at the lower Snake and Columbia river dams will be available in the spring of 1996 and will be included in the IDFG 1996 Annual Report.

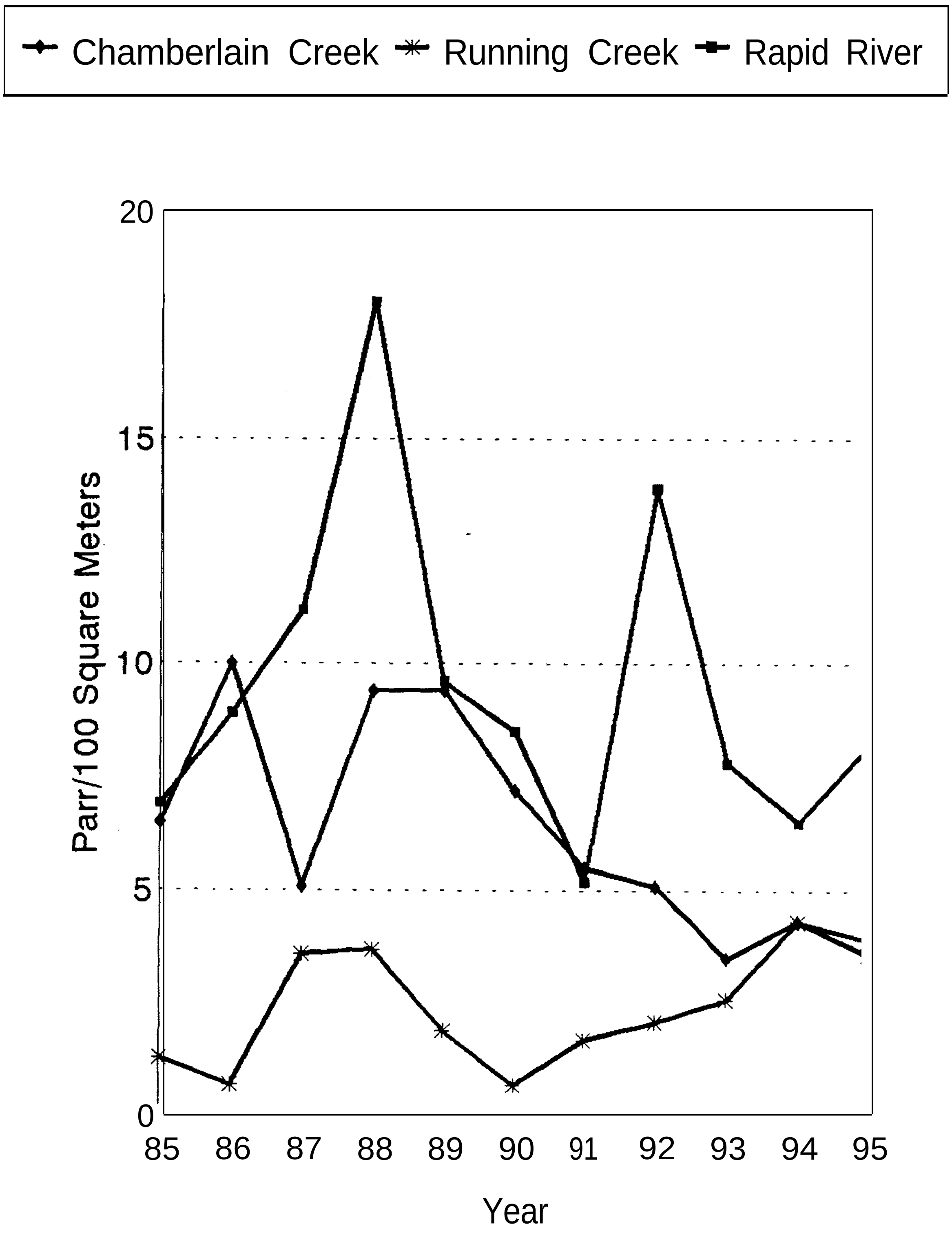

Figure 1. Wild steelhead parr density trends (parr/100 m^2 age 1 and 2 combined) for Chamberlain Creek, Running Creek and Rapid River, 1985-l995.

Table 2. Summary of wild juvenile steelhead collection and PIT tagging by project staff from IDFG during summer and fall 1995.

Stream	Number of Steelhead Tagged and Released	Collection and Tagging Mortalities
Chamberlain Creek	145	0
Running Creek	226	1
Rapid River	194	1

PIT Tag Interrogations

During the summer and fall of 1994, IDFG and National Marine Fisheries Service (NMFS) research groups PIT-tagged juvenile steelhead trout and chinook salmon in Chamberlain Creek, Rush Creek, Running Creek, and Rapid River. Results of PIT tag detections at the lower Snake and Columbia river dams are displayed in Table 3. Arrival timing of steelhead smolts at Lower Granite Dam is shown in Figure 2.

Many of the steelhead tagged in 1994 were smaller parr that would not migrate to the ocean the following spring. It has become apparent from PIT tag interrogations, that fish tagged in the summer and fall at less than 135 mm fork length do not typically migrate to the ocean the following spring. In order to approximate the proportion of migration size fish detected at the lower Snake River and Columbia River hydroelectric complex, only fish 135 mm or greater are considered large enough to migrate the following spring. The majority of fish tagged at Chamberlain and Rush creeks

Table 3. Wild juvenile steelhead PIT tag detections at lower Snake River and Columbia River dams from Idaho streams, spring 1995. LGD=Lower Granite Dam, LGO=Little Goose Dam, LMD=Lower Monumental Dam, MCN=McNary Dam.

					Percentage at			
Stream	**Tagging Agency**	**Number Tagged and Released**	**Number at Migratory Size**	**Number of Unique Detections**	**LGD**	**LGO**	**LMD**	**MCN**
				STEELHEAD				
Chamberlain Creek	**NMFS**	**119**	**15**	**1**	**0.0**	**6.7**	**0.0**	**0.0**
W. Fork Chamberlain Creek	**NMFS**	**143**	**15**	**1**	**6.7**	**0.0**	**0.0**	**0.0**
Running Creek	**IDFG**	**312**	**244**	**98**	**26.6**	**20.5**	**23.0**	**5.7**
Rush Creek	**NMFS**	**135**	**10**	**2**	**20.0**	**0.0**	**0.0**	**0.0**
Rapid River	**IDFG**	**380**	**369**	**149**	**29.8**	**15.7**	**17.3**	**8.1**
				CHINOOK				
Chamberlain Creek	**IDFG**	**76**	**NA**	**5**	**1.3**	**1.3**	**1.3**	**5.3**
W. Fork Chamberlain Creek	**IDFG**	**496**	**NA**	**49**	**6.9**	**2.6**	**2.6**	**2.6**

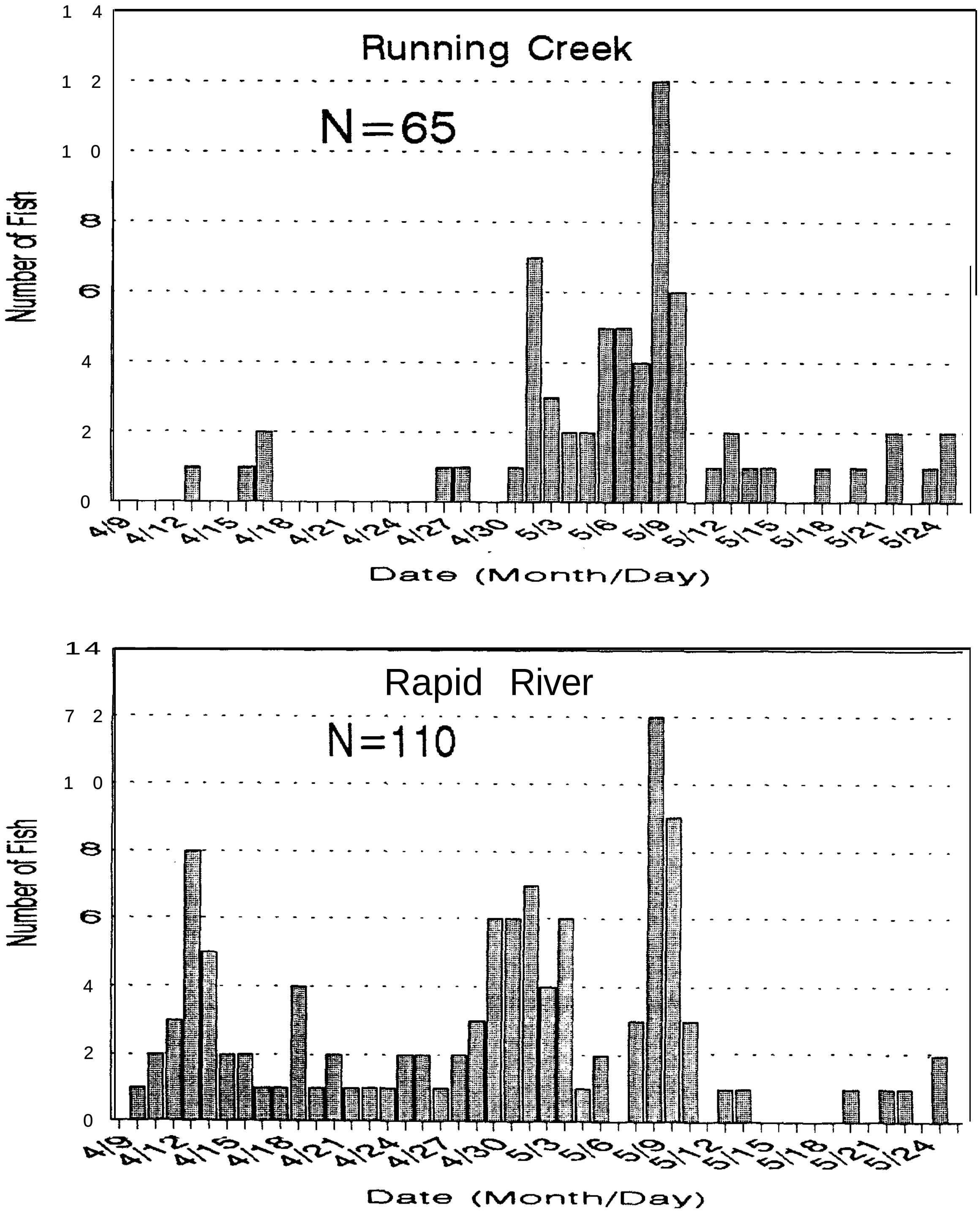

Figure 2. Arrival timing of steelhead smolts from Running Creek and Rapid River at Lower Granite Dam, spring 1995.

in 1994 were smaller fish that would not migrate in 1995. Interrogations in 1996 may reveal detections from the 1994 tagging and will be included in the 1996 annual report.

The number of unique detections represents the proportion of tagged fish that were detected at one of the hydroelectric projects on the lower Snake and Columbia rivers. The percentages of fish detected at individual projects are not unique detections and include fish that were detected at previous projects. Due to variations in flow and spill at each project, detection rates at successive projects do not necessarily reflect survival through the complex, but do give some indication of persistence of the fish through the projects, assuming that all tagged fish were returned back to the river.

Juvenile Emiaration

Running Creek

From the last few years of PIT tag detections, it has become apparent that fish tagged in the summer and fall at less than 135 mm fork length do not migrate to the ocean the following spring. Only fish 135 mm or more were PIT-tagged and released above the trap to determine trap efficiency. All fish captured at less than 135 mm fork length were released below the trap. Because we cannot assume equal catchability among all size groups of juvenile steelhead, the estimated outmigration is only for steelhead 135 mm or more.

A 5 ft rotary screw trap was installed in Running Creek on April 2 and remained operational until November 1, when icing conditions prompted its removal.

In order to determine trap efficiencies under different flow conditions for steelhead trout less than 135 mm fork length, the trapping season was divided into three periods (Table 4). During the first period April 6 - June 30, a total of 31 fish were caught, 15 were tagged and 4 were recaptured, resulting in a 26.7% efficiency and an estimated 116 fish by the trap. During the second period July 1 -August 31, a total of 31 fish were captured, 28 were marked and 5 were recaptured, resulting in a 17.9% efficiency and an estimated 173 fish by the trap. In the final period September 1 - Nov I, a total of 190 fish were captured and marked. Sixty- three fish were recaptured, yielding a 33.2% efficiency and an estimated 572 fish by the trap. Total estimated fish (≥ 135 mm) by the trap from April 2 - November I, was 861.

Table 4. Running Creek juvenile screw trap collection summary and outmigration estimation for steelhead trout ≥ 135 mm fork length, separated into three trapping periods, 1995.

Dates of Operation	Number of Fish Captured	Number of Fish Marked	Number of Fish Recaptured	Efficiency	Estimated Number of Migrants
4/6-6/30	31	15	4	26.7%	116
7/1-8/31	31	28	5	17.9%	173
9/1-11/1	190	190	63	33.2%	572
Total Migrants					861

Outmigration Timing - During the trapping period April 2- November 1, a total of 995 juvenile steelhead were captured at the screw trap. The movement of juvenile steelhead out of Running Creek occurred in three primarily separate periods, one in the spring, one in mid-summer, and one in the fall (Figure 3).

The spring movement began when the trap was installed on April 2 and lasted until the end of May. A total of 98 juvenile steelhead were captured, the majority of which were smaller age 1 and age 2 fish. Only a small portion (20%) were larger smolt size fish (Figure 4).

The movement during mid-summer was the largest movement (611 juvenile steelhead) and occurred from June 1 - July 31. This group consisted almost entirely of smaller age 1 and age 2 fish (Figure 4).

The fall migration began around mid-August and lasted until the first of November. A total of 286 juvenile steelhead were captured, the majority of which were larger (135 mm to 195 mm) migratory size fish that would be leaving for the ocean the following spring (Figure 4). The largest daily movement occurred on October 10, when 87 steelhead were captured. During the last 10 days of operation, only 16 steelhead were captured, indicating the fall outmigration was essentially over. It appears that once these fish leave Running Creek, they do not come back. We have not had a single recapture of a fish that had been PIT-tagged in a previous year.

Rapid River

Spring - A 5 ft rotary screw trap was installed approximately 40 m above the Rapid River Fish Hatchery diversion intake on March 23 to monitor the juvenile steelhead trout and chinook salmon spring outmigration. Steelhead captured were marked by cutting a small portion on the trailing edge of the dorsal tin. All marked fish were released 200 m above the trap. All fish recaptured were released below the hatchery diversion intake to alleviate the problem of multiple recaptures. The trap remained in operation until May 7, when high flows warranted its removal. During this period, 238 juvenile steelhead were captured, 88 were marked, and 27 were subsequently recaptured yielding a 30.7% efficiency and an estimated 775 steelhead by the trap. The majority of steelhead moved during the month of April with the largest daily movement on April 28 (27 steelhead). Steelhead juveniles were migrating when the trap was installed and it appears that the time frame between March 23 and May 7 was insufficient to monitor the complete spring outmigration (Figure 5). It is recommended that the trap be installed near the first of March in future years. The spring migration consisted almost entirely (93.3%) of larger 140 mm to 265 mm fish that would be migrating to the ocean (Figure 6). No PIT tagging was conducted during the spring trapping season. A total of 64 juvenile chinook salmon were captured at the screw trap from March 23 - April 30. No chinook salmon were marked or tagged and were immediately released below the trap; no estimation of chinook salmon outmigration was made. Juvenile chinook salmon were migrating when the trap was installed on March 23, and the last juvenile chinook salmon was trapped on April 30. It appears that the period between March 23 and April 30 was insufficient to monitor the complete chinook salmon spring outmigration.

Fall - During the fall trapping period in Rapid River, a picket weir located 300 m downstream of the screw trap was in operation to capture downstream migrating adult bull trout Salvelinus confluentus. Although the spacing of the weir pickets was adequate to capture most size classes of steelhead, it was decided to continue using the screw trap to monitor the fall downstream migration. In previous years, due to excessive debris, partial or complete failure of this weir enabled steelhead to bypass this weir, making an estimation of migrating fish unreliable. A summary of the

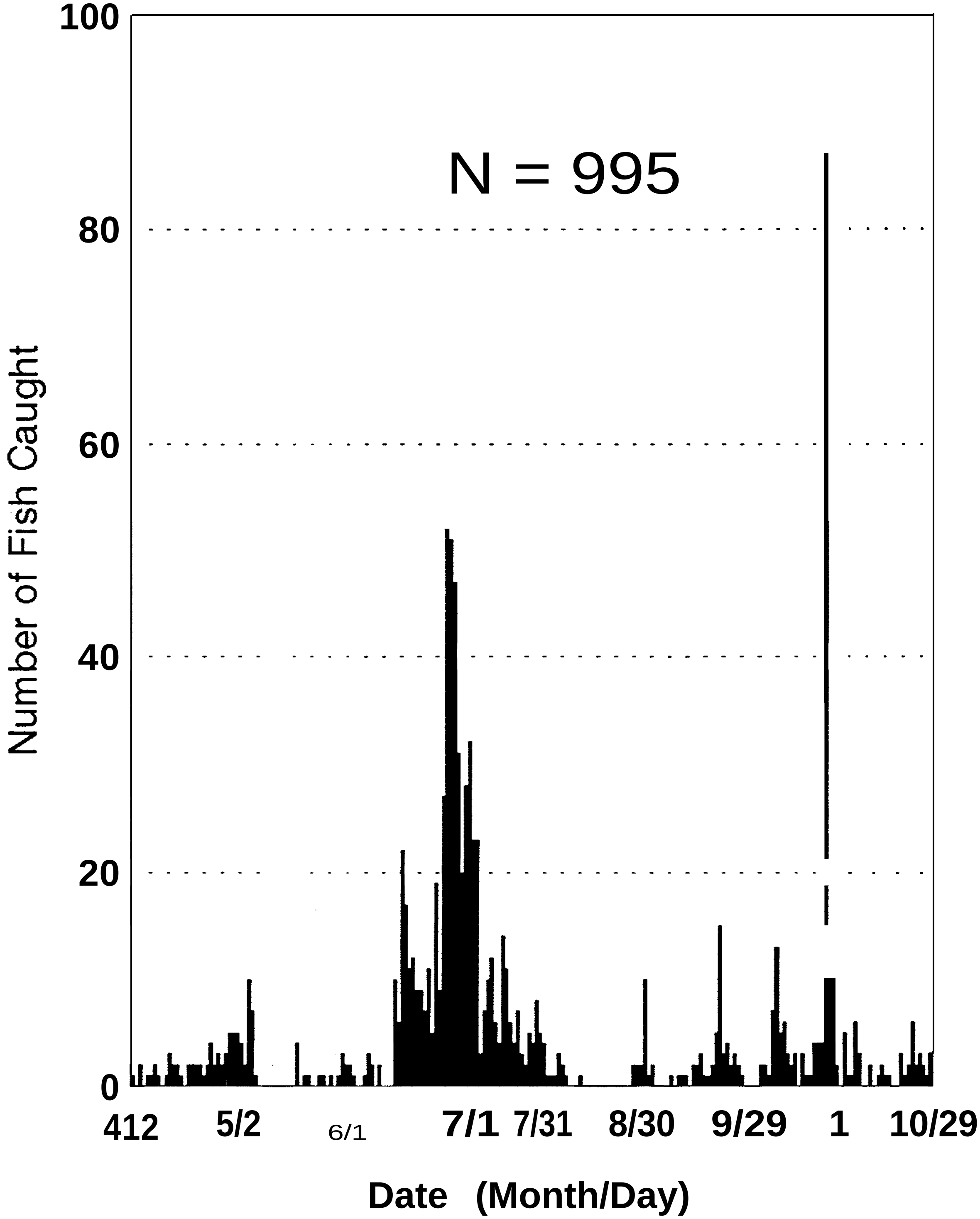

Figure 3. Juvenile steelhead outmigration timing at the Running Creek screw trap, April 1 - November 2, 1995.

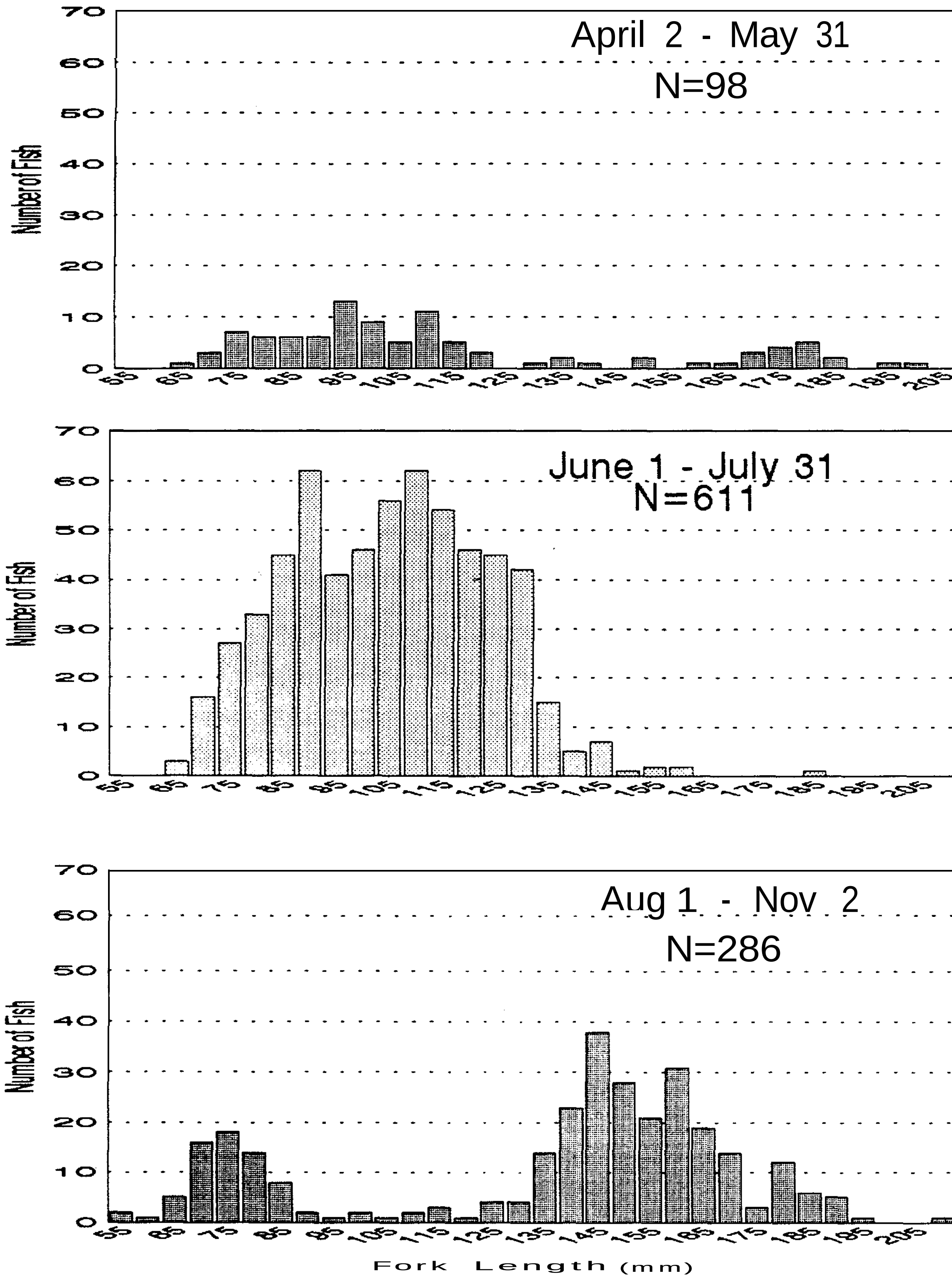

Figure 4. Length frequency of juvenile steelhead at the Running Creek screw trap, April 1-November 2, 1995.

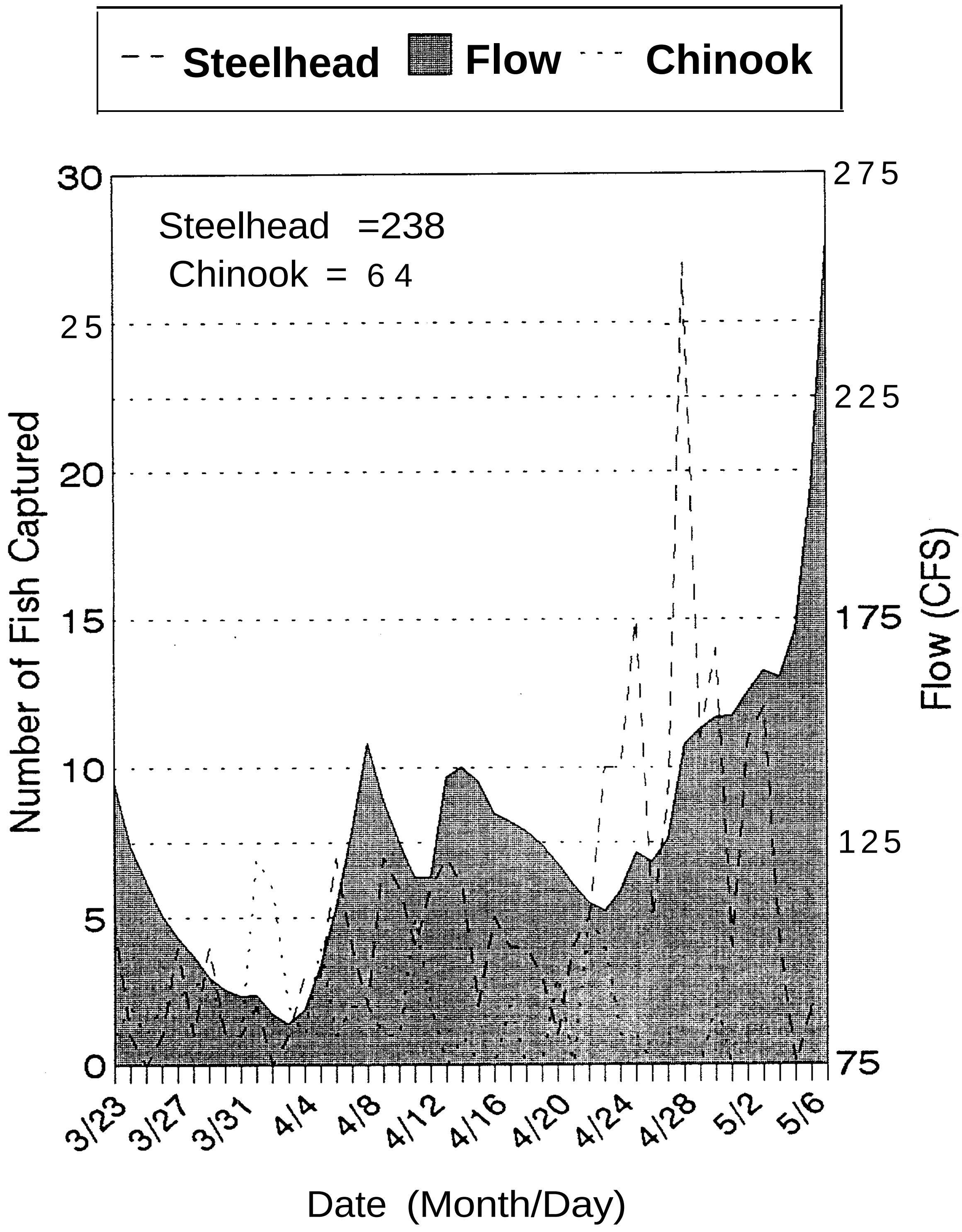

Figure 5. Outmigration timing of natural juvenile steelhead at the Rapid River screw trap, March 23 - May 7, 1995.

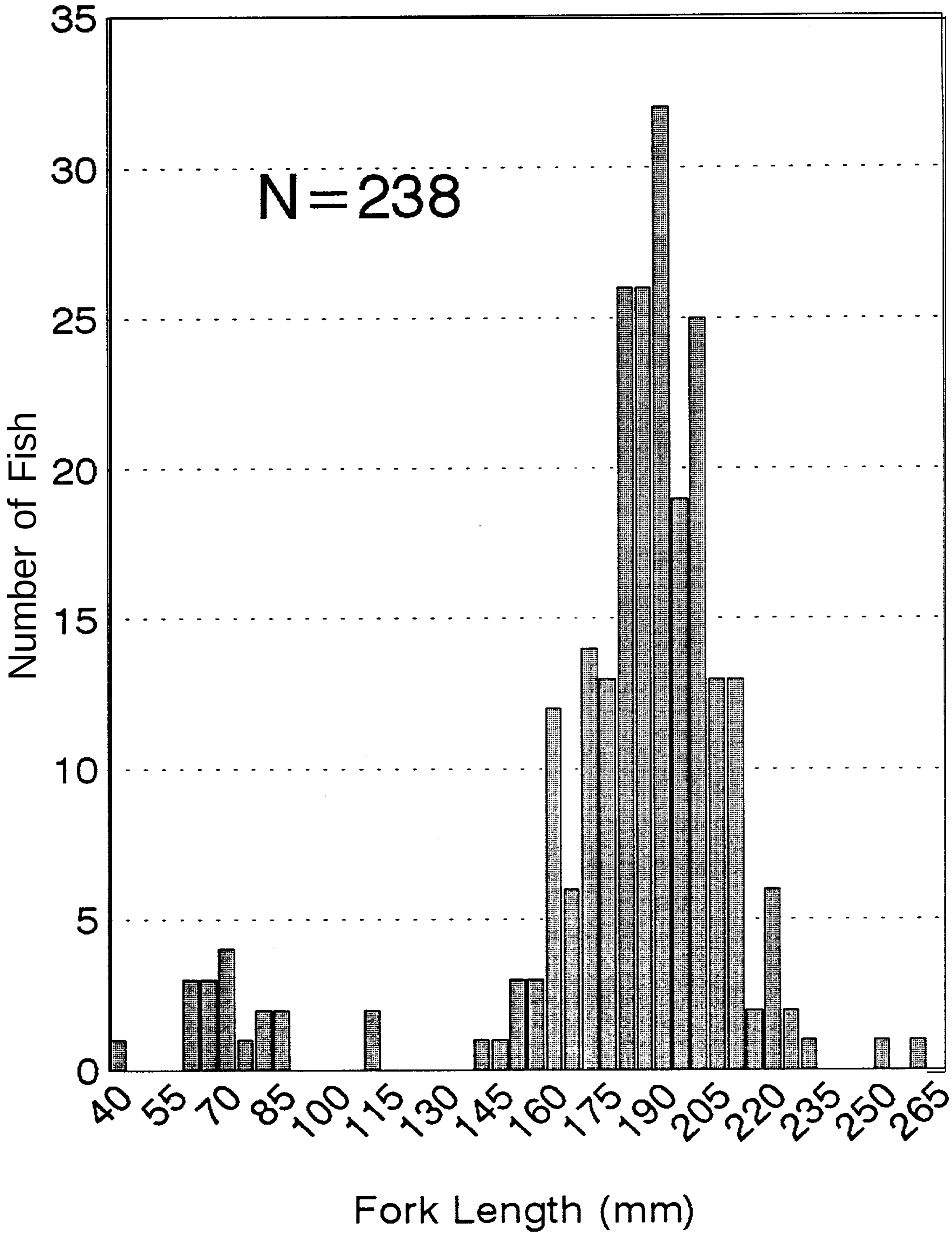

Figure 6. Length frequency of migrating juvenile steelhead at the Rapid River screw trap, March 23 - May 7, 1995.

screw trap record is displayed in Table 5. The screw trap began operating on September 12 and was continued until November 2, when water temperatures dropped to less than 2°C and fish movement had essentially stopped. The majority of juveniles were captured in the screw trap from mid-September to mid-October (Figure 7). Although a few fish were still being captured when the trap was removed, it is doubtful that many fish migrated after November 2.

The screw trap captured a total of 87 juvenile steelhead; 84 were marked and released above the trap. On September 24, the screw trap position was moved upstream approximately 7 ft in order to fish a larger portion of the thalweg. The fall trapping period was broken into two periods to evaluate trap efficiency for both trap positions. During the period of September 12-24, 34 fish were captured, 34 were marked, and 3 were subsequently recaptured, yielding a 8.8% efficiency and an estimated migration by the screw trap of 386 juvenile steelhead. During the period of September 25 - November 2, 53 steelhead were caught, 50 were marked, and 7 were recaptured, resulting in 14% efficiency and an estimated 379 steelhead passed the screw trap. We estimated a total of 765 steelhead juveniles migrated passed the screw trap between September 12 and November 2. The percentage of steelhead marked and released at the screw trap that were subsequently recaptured at the weir was used to determine the weir efficiency. The weir was installed on July 25 and was removed on October 26, when excessive debris caused the weir to breech. A total of 194 steelhead were captured at the weir. Of the 81 steelhead marked at the screw trap, 20 were recaptured at the weir, yielding a 24.7% efficiency at the weir and an estimated 785 juvenile steelhead passing the weir. Since the dates of operation for the weir and the screw trap overlapped, data was adjusted so only days (September 13 - October 26) when both the weir and screw trap were operating were used to calculate their relative outmigration estimates. The adjusted comparative outmigration numbers of the screw trap and weir were 715 and 717 juvenile steelhead, respectively (Table 5). With such close estimates, we are confident about the estimated migration numbers.

Neatly the entire fall sample consisted of larger (≥ 135 mm) smolt-sized steelhead that would be migrating to the ocean in the spring of 1996 (Figure 8).

Table 5. Rapid River juvenile steelhead weir and screw trap collection summaries and outmigration estimates, fall 1995. Comparative outmigration estimates were derived by adjusting data using only dates when both traps were in operation.

Collected at	Dates of Operation	Number of Fish Captured	Number of Fish Marked	Number of Recaptures	Efficiency	Estimated Migration
Weir	7/26/10/28	199	81	21	26%	765
Screw Trap	9/12-9/24	34	33	3	9.1%	374
	9/25-11/2	51	47	8	17.0%	300
Screw Trap Total	9/12-11/2	81	80	10	NA	674
			Comparative Estimates			
Weir	9/13-10/26	177	81	21	26%	680
Screw Trap	9/13-9/24	34	33	3	9.1%	374
	9/25-1 0/26	47	44	7	15.9%	296
Screw Trap Total	9/13-10/26	81	77	10	NA	670

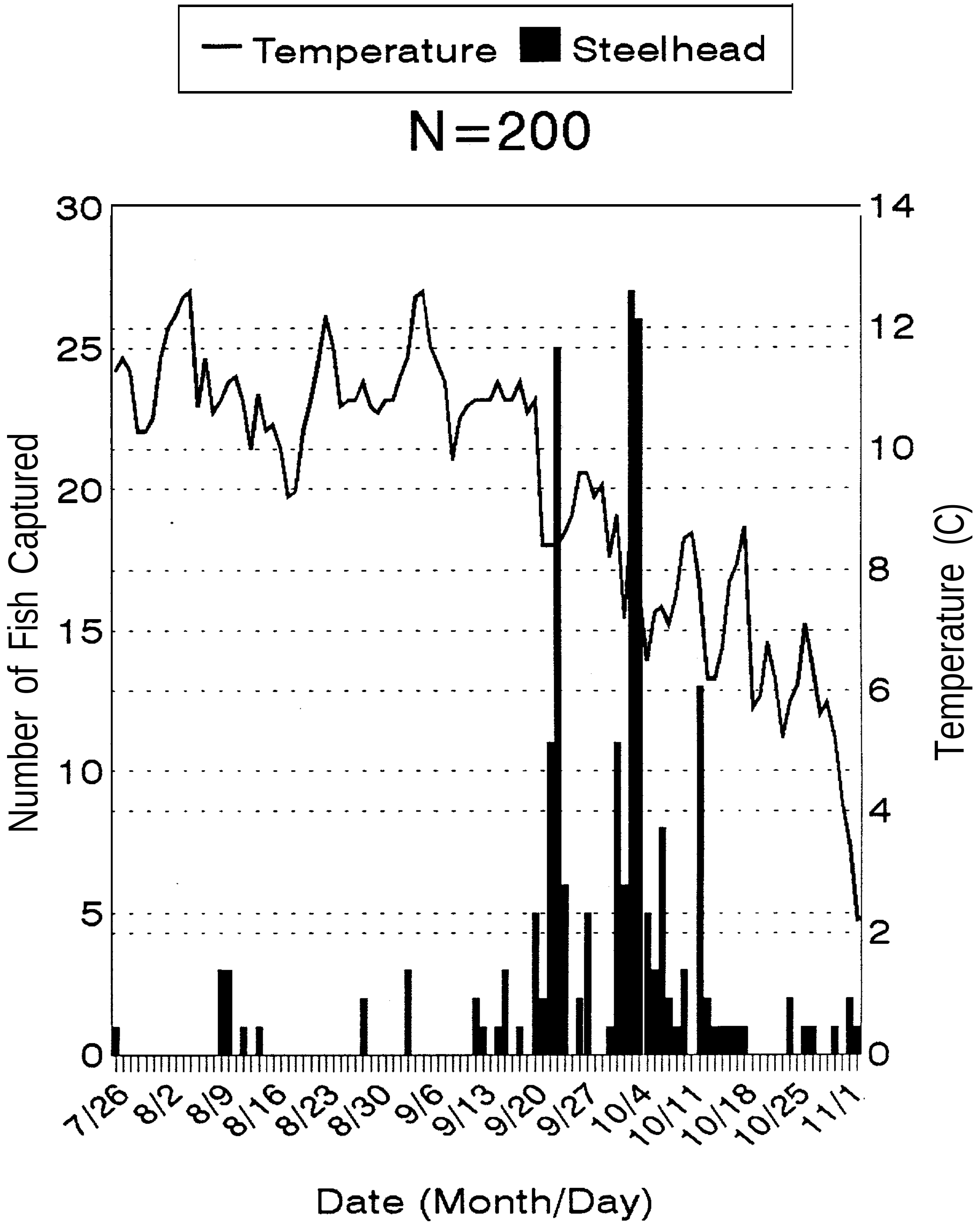

Figure 7. Migration timing of juvenile steelhead captured and water temperature (°C) at Rapid River weir trap, July 26-October 26, 1995; and screw trap, October 27-November 2, 1995.

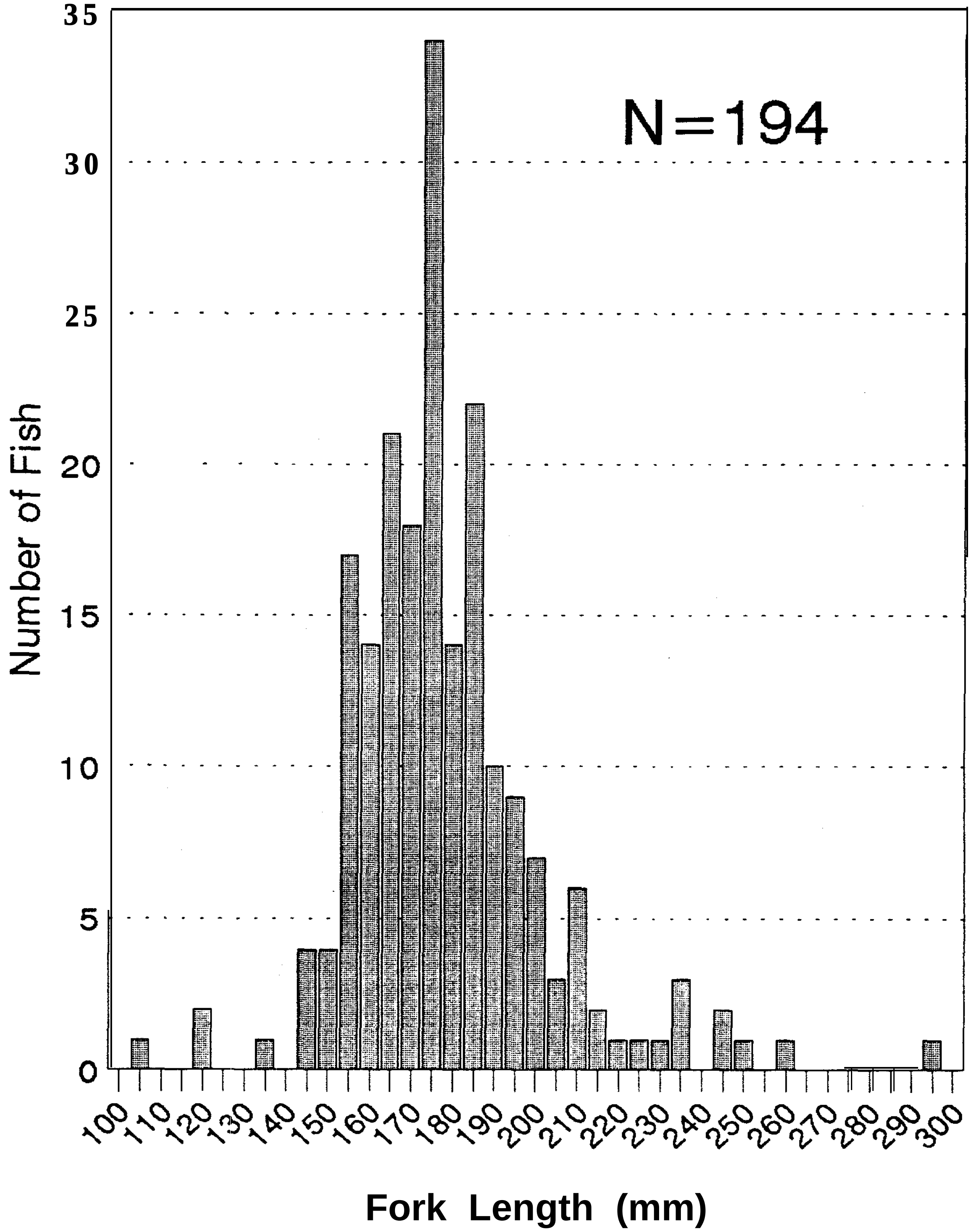

Figure 8. Length frequency of juvenile steelhead captured at Rapid River, July 26 - November 2, 1995.

Adult Spawner Enumeration

Chamberlain Creek Weir

Chamberlain Creek weir installation began on April 6 and was completed on April 7, 1995. It remained in operation through the steelhead spawning season and was dismantled on May 18, 1995. Due to the low recent spawning escapements of salmon to the Chamberlain drainage, neither the Chamberlain Creek nor West Fork Chamberlain Creek weirs were in operation during the salmon spawning migration.

During the early morning of April 15 and 16, ice formed between weir pickets which floated the weir up above the sill beam. Picks were used to clear the ice and the weir was realigned on the sill beam. On both days, fish could have passed undetected for about 4 h in the early morning between 6:00 am and 10:00 am. No other difficulties were encountered through the trapping season.

Two adult female steelhead were passed above the weir on May 7. Their lengths were estimated at 28 in and 32 in. On the same day a steelhead was observed by the weir attendant approximately 3/4 mile downstream of the weir after the two females had been released above the weir. No other steelhead were observed above or below the weir for the remainder of the trapping.

No significant problems were encountered during the weir operation. The weir held bank full flows and moderate debris. After the weir was removed, spring runoff shifted the long sill beam downstream approximately 20 ft. In the fall, two project staff members winched the sill beam back upstream with little difficulty and realigned it back in the substrate.

West Fork Chamberlain Creek Weir

The West Fork Chamberlain Creek weir was installed on April 9, and remained in operation through the entire steelhead spawning migration. The weir was dismantled on May 17, 1995. Due to below freezing conditions on April 15 and 16, the West Fork weir also froze and was lifted off the sill beam. The ice was promptly removed and the weir was realigned on the sill beam. As with the main Chamberlain weir, there were about 4 h during each episode where fish could have been allowed passage through the weir without detection.

One 30 in male steelhead was passed above the West Fork Chamberlain weir on May 17. Daily walks by the weir attendant revealed no other steelhead in the West Fork. No significant problems were encountered during the weir operation. The weir held bank full flows and light debris.

A helicopter redd count on May 16 revealed one redd above Chamberlain Creek weir and no redds above or below the West Fork weir.

Running Creek Weir

Steelhead - The Running Creek weir was installed on April 1. On April 30, a 33 in male steelhead was passed above the weir and two other adults were observed below the weir. One 28 in female was released above the weir on May 9 and one adult was observed below the weir. No other steelhead were observed above or below the weir for the remainder of the trapping season. The weir was operated until May 10 when high water and debris warranted the removal of two weir panels. On May 17 the remainder of the panels were removed. It is possible that additional fish escaped above the weir after May 10 when the weir was partially dismantled.

It is recommended that in following years additional manpower be available during high water to help ensure the weir will remain operational through the entire steelhead spawning migration.

Chinook Salmon - Salmon spawners were enumerated in the Running Creek drainage with a portable weir diverting upstream migrants through an electronic counting tunnel and video recording apparatus. Adult chinook salmon, bull trout, cutthroat trout 0. clarki, and whitefish Prosopium williamsoni were counted and images recorded on video tape as they migrated upstream through the electronic facility.

While still in an experimental stage, the electronic/video recording system performed adequately in most circumstances, with the exception of the following problems encountered during its operation:

Infrared light was inadequate to give clear resolution during nighttime recording;
Tape heads on the video recorder got dirty frequently, causing a loss of video quality;
The solar panel could not always supply sufficient energy to power the recording system;
Lightning would trigger the electronic counter, resulting in spurious counts; and
Technical problems with the camera occurred.

The following strong points of electronic/video operation were noted in 1995:

The video equipment was not labor-intensive;
The Smith-Root electronic tunnel performed perfectly in 1995;
The ability to compile a continuous record of fish movement.
Fish were not delayed and were allowed immediate passage through the facility; and
No fish over 11 in were missed by the video system.

The electronic video system was set up to monitor all fish over approximately 10 to 12 in length. A video record was compiled and later reviewed by project staff. All fish were identified and lengths were estimated to the nearest inch. Upstream migrant counts of resident species through the weir, as well as salmon and steelhead, are displayed in Table 6.

Rush Creek

Initial installation of the Rush Creek weir began in mid-March 1995 when the sill beam was installed by a four-man crew. The final stages of the installation were delayed due to scheduling problems with the weir fabricator. The weir was not fully installed until April 22 and was attended by researchers at the Taylor Ranch, a satellite research facility of the University of Idaho. On May 2 and 3 two spawned out females were observed lingering on the upstream face of the weir. No adults were observed below the weir or were passed above the weir during the trapping season. The weir remained in operation until May 7 when excessive high water and debris caused the weir

Table 6. Running Creek upstream migrant count using temporary weir and new electronic/video monitoring system [a]

Species	Count
Chinook Salmon	5
Steelhead	2
Bull Trout	24
Cutthroat Trout	36
Trout (species unknown)	50
Whitefish	248

[a] The video monitoring system was not in operation during the steelhead spawning migration and the manual trap box was used in concert with the weir.

to breech rendering the weir unusable and was dismantled. It is possible fish escaped above the weir undetected after May 7.

It is recommended that in following years IDFG personnel be on site throughout the entire trapping period and that backup personnel be available during times when high water is expected. Weir installation should occur no later than the first of April.

Rapid River

During the spring of 1995, 46 wild/natural adult steelhead were passed above the Rapid River adult migration barrier between April 5 and May 27. The majority of fish arrived between April 25 and May 22 (Figure 9). The catch consisted of 18 males and 28 females. A total of 57 (32 males and 25 females) hatchery stray adult steelhead were captured at the barrier and released to the Little Salmon River.

During the summer of 1995, only four male chinook salmon were passed above the barrier; no females were captured or passed above the barrier.

Redd Counts

IDFG conducts helicopter redd count surveys every spring. Results of the 1995 redd count are included in the redd count trend table (Table 7).

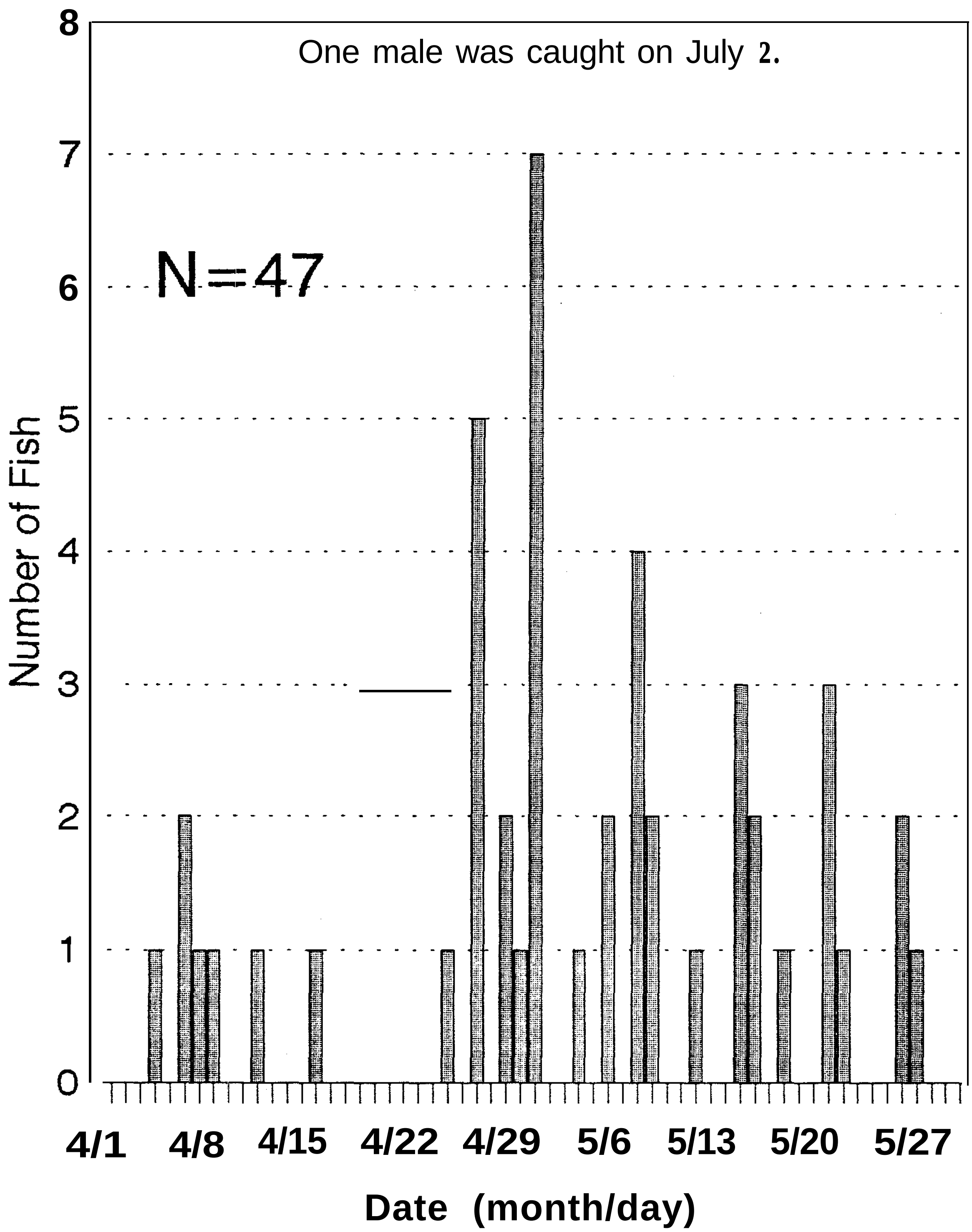

Figure 9. Wild/natural adult steelhead spawning escapement at the Rapid River migration barrier, spring 1995.

Table 7. Steelhead redd count trends for recent years in selected study streams in Idaho.

	1988	1989	1990	1991	1997.	1993	1994	1995
South Fork Salmon River								
Johnson Creek	23	NC	23	64	27	66	28	29
South Fork-Poverty			62	76	31	75	30	44
South Fork Darling Cabin			25	39	17	49	25	34
South Fork-Oxbow			37	31	26	34	11	14
South Fork-Krassel				38	8	23	5	15
Middle Fork Salmon River								
Bear Valley Creek	27	11	62	32	26	28	17	13
Marsh Creek			23	1	10	7	1	1
Sulphur Creek	17	7	14	6	5	18	2	2
Loon Creek			38	17	8	NC	3	4
Camas Creek			55	26	3	NC	12	10
Big Creek			44	25	NC	NC	3	4
South Fork Camas			6	1	4	3	0	1
Salmon River								
Valley Creek			8	6	26	9	4	5
Alturas			6	NC	3	NC	NC	NC
Upper Salmon								
-Pole to Busterback			6	0	0	0	NC	NC
-Busterback to Alturas Lake Creek			1	0	0	12	NC	NC
-Alturas Lake to Hell Roaring Bridge			16	2	17	3	NC	NC
-Hell Roaring Bridge to weir			33	13	12	21	NC	NC
-Weir to Redfish Lake			101	24	26	79	30	18
East Fork Salmon River								
-Germania to weir			9	3	0	NC	NC	NC
-Weir to Herd Creek			NC	15	10	NC	NC	NC
Chamberlain Creek			6	1	0	1	0	1
West Fork Chamberlain Creek			5	0	3	5	0	0
South Fork Clearwater River								
Crooked River								
-Mouth to Weir		NC	NC	1	2	NC	0	NC
-Weir to Meanders		NC	NC	9	8	0	0	0
-Meanders		NC	NC	25	5	1	1	2
-Meanders to Canyon		NC	NC	6	1	0	0	0
-Canyon to Bridge			128	4	3	1	0	2
-Bridge to Orogrande			91	5	1	2	2	0
Lochsa River								
White Sand Creek		NC	10	7	20	NC	12	3
Storm Creek			11	0	3	NC	3	8
Crooked Fork			33	7	10	NC	8	11
Fish Creek			9	0	3	NC	5	5
Selway River								
-Magruder to Little Clearwater							NC	1
Bear Creek			15	2	4	NC	6	8
East Fork Moose						NC	3	6

RECOMMENDATIONS

Recently developed plans for recovery of endangered salmon runs and the threat of listing Snake River steelhead populations under the Endangered Species Act bring focus to the need for monitoring responses of wild populations of salmon and steelhead to various recovery efforts. Wild populations that are located within wilderness areas where habitat quality is unquestioned will be especially important. It is recommended that adult escapement continue to be monitored precisely with weirs or migration barriers and resultant juvenile production be monitored by downstream migrant traps and/or snorkeling in key representative production streams for the foreseeable future.

Comparative escapement and resultant juvenile production data for Idaho streams should be presented to Columbia River Compact agencies to inform them of the inadequacy of Snake River and Columbia River group-B escapement objectives. There is a critical need to modify Columbia River Compact group-B wild steelhead escapement objectives. The escapement objective of 13,300 at Bonneville Dam and 10,000 at Lower Granite Dam results in extremely low seeding levels for Idaho's group-B steelhead production streams.

Efforts to refine and fully develop electronic/video fish counting systems that can pass adult salmon and steelhead above a weir without delay should continue. Problems' with the Smith-Root counting tunnel observed in 1994 were corrected and the tunnel performed perfectly in 1995. The video system provided high quality images during the daylight hours. All fish passing through the system were identified and their lengths were estimated to the nearest inch. Video quality during the hours of darkness was reduced. It is recommended that testing be done to improve the quality of video recorded at night.

The weirs functioned over a wide range of flows and generally were satisfactory. Some damage did occur at the Rush Creek weir due to excessive buildup of debris. It is recommended that IDFG personnel be at the weir site during the entire trapping period as water levels can increase significantly with little warning. Backup personnel should be available to fly in on short notice and assist with weir operations. Although no damage occurred at the Running Creek weir, backup personnel should also be available to help with weir operations when needed. Since the Chamberlain weirs are located higher in the drainage and have lower flows than the other weirs, it appears that one person is able to run both weirs with little difficulty.

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We would also like to thank the University of Idaho for their assistance in operating the weir at Rush Creek and for letting us use the facilities at the Taylor Ranch.

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