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PCFFA
Trinidad Fishermen's
Salmon Enhancement

Prairie Creek Project
1989-1990

DATED OCTOBER, 1, 1990

Pacific Coast Federation
of Fishermen's Associations Inc.
Trinidad Fishermen's
Salmon Enhancement
P.O. Box 291
Trinidad, Ca. 95570

October 1, 1990

FINAL REPORT

On November 17, 1989 the Trinidad Fishermen's Salmon Enhancement (TFSE) organization was contacted by California Dept. of Fish and Game (CDF&G) and Redwood National Park (RNP) personnel following their decision to develop emergency measures to salvage adult salmon and Steelhead returning to spawn in the Prairie Creek drainage of Humboldt County. This was determined necessary due to extensive sedimentation problems associated with construction of a new section of U.S. Highway 101 bypassing the state and federal parklands.

A complete, biologically sound program was developed by Trinidad Fishermen's Salmon Enhancement and was given tentative approval for implementation by CDF&G on November 21. Time was extremely limited as adult salmon would begin their upstream migration with the next precipitation. Work started immediately on the weir, trap, and other specialized equipment needed. A contract was negotiated with the California Dept. of Transportation (CALTRANS) to perform the work recommended by CDF&G. CALTRANS Fisheries Biologist Mark Moore was designated as the contract supervisor and was to oversee all work undertaken.

On November 26 the trap and weir were set in place as Prairie Cr. flows increased from rainfall during the previous night. Adult salmon were trapped almost immediately and trapping was continuous through mid May except for periods of stream flows too low for fish movement and short periods when high flows rendered the trap inoperable,(see trapping records in Appendix A).

All adult salmon and Steelhead trout in good condition were transferred to Prairie Creek Fish Hatchery operated by Humboldt County. At Prairie Creek Fish Hatchery these fish were held separately until fully mature and then spawned. All spawning was done with the procedures and personnel normally used at Prairie Creek Fish Hatchery. Eggs were placed into incubators separate from normal hatchery production.

At this same time field work and agency review was taking place on the development of remote incubation and early rearing sites,(hatchbox type), within the Prairie Creek drainage. Specialized equipment was fabricated and the first site was constructed the second week of January 1990. Work was begun on an additional site shortly thereafter in anticipation of a combined salmon and Steelhead egg take of 150,000 to 200,000 eggs.

The first eggs and newly hatched alevins,(approx. 15,000), from Coho salmon were transferred to a rearing site from Prairie Creek Fish Hatchery on January 15.Thereafter both salmon and Steelhead eggs were transferred as they developed to the "eyed" stage when transfer becomes possible,(see transfer records in Appendix B). The second site was operable by February 15 when nearly 35,000 Chinook fry from Prairie Creek Fish Hatchery were transferred for rearing to release size. The source of these Chinook fry was both the early adults trapped in upper Prairie Creek by TFSE and adults taken at Prairie Creek Fish Hatchery during the same time period. In addition to the fry transferred, approximately 55,000 Chinook eggs were kept at Prairie Creek Fish Hatchery to eventually be reared there to yearlings. The source of these additional eggs was from adults taken at the upper Prairie Creek trap by TFSE.

A means of evaluating the results of the releases was to be developed as part of the original program. Arrangements were made to have a CDF&G crew tag the salmon using Coded Wire Tags provided by TFSE. This was to take place in mid May but fell through at the last minute due to unexpected CDF&G budget cuts. TFSE began making new plans to complete the tagging. However by that time it became apparent that, due to the relatively dry winter, stream conditions were quickly becoming unfavorable for Chinook to emigrate from the system. A decision was reached to release the Chinook untagged,(see release info. in Appendix C). The Coho however were held and TFSE successfully tagged 100% of them in early June. Due to conflicts with fin clips used in adjacent drainages on Steelhead, the only option to identify Prairie Cr. fish would have required the removal of multiple fins. Rather than reduce their chances for survival, TFSE, after consulting with CALTRANS and CDF&G, decided to release the Steelhead without fin clipping.(again see release info. in Appendix C)

In addition to using Coded Wire Tags for evaluation of the rearing program itself, the known number of marked fish being released was an obvious opportunity to assess the success of fish that spawned in Prairie Cr. and its major

tributaries. In order to utilize this opportunity, TFSE installed downstream migrant traps of several different designs in Prairie Cr.. These traps were located below the section of creek surveyed for spawners by RNP biological staff. The traps installed were operated from mid March through August in an attempt to compare the numbers of wild spawning Chinook smolts to the smolts released from the rearing program. (see Appendix D for Downstream Migrant Trap info.). Additional information gathered on Coho 1+ and trout 1+ smolts will be available for comparison in future years. TFSE also developed an evaluation program using population estimation both prior to and following release of Coho and Steelhead trout young of year into Prairie Cr. and selected tributaries.(see Appendix E for Population Estimate info.). This program will provide useful information on spawning success of these summering over stocks and on the suitability of this release strategy for increasing wild salmonid stocks.

Submitted by

Mitch Farro
Project Director

Appendix A
Prarie Creek Trapping Record

Trap and weir located at campsite #57, Elk Prarie Campground
h= held for spawning at Prarie Creek Hatchery
r= released above weir in Prarie Creek

Date	Chinook			Coho			
	M	F	G	M	F	G	
11/26			3r		2h	2r	
11/27					1h	2h	
12/4					1h	2h	
12/5	1h		1h		2h	1h	
12/6		1h	7h		3h	2h	
12/7			2h			1h	
12/8		1h				2h	
12/9			1h	1h	1h	1h	
12/11			2h	1h			
12/12					1r		spawned out
12/14			2h				
12/17	extremely low flow, weir opened untill 1/2/90						
1/2	1h			1h	1h	1r	grilse size
1/7					2h	15r	grilse size
1/7	weir washed out for approx. 24 hrs.						
1/8	1h	1h				14r	4 caudal clip
	weir washed out for approx. 15 hrs.						
1/9		1h	1r			10r	
1/10	3h	6h			3h	16r	1 female & 6 caudal clip
1/11	4h	1h				1r	
1/12			2r			2r	
1/13	4h			1r	1h	2r	spawned out
1/14	1h	1h		1h	1h		+1 spawned out
1/15	3h			1h		2r	1 caudal clip
1/16			1r	4h		6r	+1 escaped
1/17		1h		1h		4r	
1/20				1h		3r	2 caudal clip
1/22			2r				
1/23	1r		1r				
1/24						2r	
1/26						1r	
1/29						1r	
1/30						4r	1 caudal clip
1/31						3r	1 caudal clip
2/1						2r	
2/2				1h		5r	2 caudal clip
2/3						2r	1 caudal clip
2/6						1r	1 caudal clip
2/10						1r	1 caudal clip
2/13						2r	2 caudal clip
2/14						1r	
2/19				1r		1r	
3/13					1r		
Totals	**18h**	**13h**	**15h**	**12h**	**19h**	**11h**	
	1r		**10r**	**3r**	**3r**	**104r**	**22 caudal clip**

	Steelhead		Cutthroat		
Date	M	F	M	F	
11/26			1r	1r	
12/5			1r	1h	escaped
12/6			1h	1h	
1/7			1r		escaped
1/11	2h				
1/16	1h				
2/5		1h			
2/8	1h				
	1r				eroded dorsal
2/9	1h	1h			
2/10	1r				caudal clip
2/11	3r	1h			2 caudal clip 1 eroded dorsal
2/12	1h				
3/5	1r				caudal clip
3/7	1h				
3/10		1h			
3/11	2h	2h			
3/12	1h1r	1h			caudal clip
3/14	1r	1h1r			in poor cond.
Totals	**10h**	**8h**	**1h**	**2h**	
**	**8r**	**1r**	**3r**	**1r**	

**** 4 caudal clip**
2 eroded dorsal
2 in poor cond.

Appendix B

Egg and Fry Transfers
Prairie Cr. Fish Hatchery
to TFSE Rearing Sites

"[illegible]DONITASLE"
[illegible] Fish Hatchery
[illegible], California 95555

King salmon (KS) swim-up, fry transferred to CAL-TRANS, Prairie Creek project.

Trough Number	Fry/Lb	Pounds of Fry	Number of Fry	Total Pounds of Fry	Total Number of Fry	Source
1	652.0	4.6	2,990			LMC
2	954.0	3.3	3,180	7.9	6,170	LMC
3	734.0	5.8	4,430	13.7	10,600	PR CK
4	796.0	6.3	5,010	20.0	15,610	LMC
13	752.0	8.3	6,635	25.3	22,245	LMC
14	764.0	6.5	5,040	31.8	27,285	LMC
15	1,053.0	4.3	4,520	36.1	31,805	PR CK
16	804.0	3.6	2,895	39.7	34,700 TOTAL	LMC

Steven D. Sanders
Steven D. Sanders
Fish Hatchery Supt.

"HOME OF INDOMITABLE"
Prairie Creek Fish Hatchery
Orick, California 95555

Silver salmon eggs and fry moved from Prairie Creek Fish Hatchery to hatching facilities on Prairie Creek (CAL-TRANS Project).

EGGS & FRY MOVED 1-15-90:

11-28-A	84.7 eggs/oz	20 oz	1,695 eggs		70.8 % Fert
11-28-B	63.5 eggs/oz	40 oz	2,540 eggs	4,235 total	91.5 % Fert
12-05-A	76.0 eggs/oz	21 oz	1,600 eggs	5,835 total	96.9 % Fert
12-05-B	76.2 eggs/oz	33 oz	2,515 eggs	8,350 total	98.5 % Fert
12-06-A	65.7 eggs/oz	11 oz	725 eggs	9,075 total	36.0 % Fert
12-06-B	86.5 eggs/oz	20 oz	1,730 eggs	10,805 total	97.0 % Fert
12-08-89	72.7 eggs/oz	28 oz	2,035 eggs	12,840 total	96.2 % Fert
12-15-89	70.2 eggs/oz	33 oz	2,325 eggs	~~15,165 total~~ NOT THE TOTAL	99.2 % Fert

Eggs and fry transported in lidded buckets of water.

12-06-89 started hatch 1-15-90

12-05-89 started hatch 1-14-90

11-28-89 moved as sac fry

Steven D. Sanders
Fish Hatchery Superintendent

"HOME OF INDOMITABLE"
Prairie Creek Fish Hatchery
Orick, California 95555

Silver salmon eggs transferred to Prairie Creek Project:

Moved late afternoon February 2, 1990.

Lot #	eggs/oz	wt in oz	# eggs	total # eggs	% fert
12-30-AG	125.5	10	1,255		99.2
01-07-A	85.7	26	2,230	3,485	92.7
01-07-B	56.8	40	2,275	5,760	98.5
01-07-C	58.3	15	875	6,635	84.1
01-07-D	62.5	34	2,125	8,760	89.4
01-07-E	63.5	34	2,160	10,920	96.2

Steven D. Sanders

Steven D. Sanders
Fish Hatchery Supt.

Prairie Creek Fish Hatchery
Orick, California 95555

Silver salmon eggs transferred from Prairie Creek Fish Hatchery to hatching facilities on Prairie Creek (CAL-TRANS Project).

Moved February 10, 1990:

Lot #	eggs/oz	wt in oz	# eggs	total # eggs	% fert.
01-08-AG	127.8	13	1,665		84.9
Moved February 20, 1990					
01-12-A	64.5	26	1,680	3,345	99.6
01-12-BG	134.0	26	3,485	6,830	98.5
01-15-CG	127.6	16	2,045	8,875	95.7
01-15-G	66.5	44	2,925	11,800	91.4
01-15-K	56.5	32	1,310	13,610	92.7
01-15-N	76.7	31	2,380	15,990	89.2
01-15-R	65.2	33	2,150	18,140	97.5

TOTAL EGGS TRANSFERRED TO PRAIRIE CREEK TO DATE: 44,225

EGGS FROM 1 SILVER SALMON FEMALE STILL TO BE TRANSFERRED

All eggs transferred to Prairie Creek project received Rocadyne bath: - 100 ppm for 10 minutes.

Steven D. Sanders
Fish Hatchery Superintendent

"NOT FOR HUMAN CONSUMPTION"
Prairie Creek Fish Hatchery
Orick, California 95555

Last lot of silver salmon eggs transferred to hatching facilities on Prairie Creek (CAL-TRANS project).

Moved February 26, 1990

Lot #	eggs/oz	wt in oz	# eggs	total # eggs	% fert
01-27-90	86.3	14	1,210	1,210	75.2

TOTAL NUMBER OF SILVER SALMON EGGS TRANSFERRED: 45,435
TOTAL

Steven D. Sanders
Fish Hatch. Supt.

"HOME OF INCOMPARABLE"
Prairie Creek Fish Hatchery
Orick, California 95555

Steelhead eggs transferred from Prairie Creek Fish Hatchery to hatching facilities on Prairie Creek (CAL-TRANS Project).

Lot #	eggs/oz.	wt in oz	# eggs	total # eggs	% fert
Transferred March 16, 1990					
02-15-90	155.5	38	5,880		96.7
Transferred April 11, 1990					
03-12-A	155.0	38	5,890	11,770	97.0
03-12-B	132.8	41	5,445	17,215	98.0
03-16-90	123.0	41	5,040	22,225	96.6
Transferred April 20, 1990					
03-20-A	119.3	44	5,250	27,505	93.1
03-20-B	122.5	13	1,595	29,100	89.2
03-20-C	137.3	43	5,905	35,005	96.2
Transferred April 28, 1990					
04-06-90	114.0	23	2,625	37,730 TOTAL	62.0

Steven D. Sanders
Fish Hatchery Superintendent

Appendix C
TFSE Fish Releases
Prairie Creek 1990

Chinook

May 16	14,740 released in Prairie Cr. @ Elk Prairie
May 21	19,160 released in Prairie Cr. @ Elk Prairie

All Chinook releases were un-tagged and weighed 120/lb. The total Chinook release of 33,900 represents 99.7% of the fry transferred from Prairie Cr.Fish Hatchery.

Coho

June 25	13,425 released in Prairie Cr. below US 101 @ 47/lb
July 9	4,690 released in upper Prairie Cr. tributaries ; Hope Cr., Little Cr.,etc. @ 76/lb
July 10	4,820 released in Boyes Cr. @ 80/lb
July 11	5,560 released in Brown's Cr. @ 80/lb
July 12	3,360 released in Prairie Cr. above US 101
	3,790 released in middle Prairie Cr. tribs.; Big Tree Cr., CREA Cr., etc. @ 75/lb

All Coho released by TFSE were Coded Wire Tagged with tag #06-01-05-01-02. The number of tagged Coho released was 35,645. The tag shed rate was determined to be 9.9%. An additional 1,640 un-tagged Coho escaped from the rearing site into an un-named tributary to Prairie Cr. during tagging due to a plumbing mishap. Another 1,275 Coho died due to this plumbing problem. The total of the releases and the escapees combined is 37,285. This represents 82.1% of the number of eggs according to Prairie Cr. Fish Hatchery's egg counts. TFSE can account for only an additional 3,000 mortalities at its facilities and believes the % surviving to release was higher than the number given.

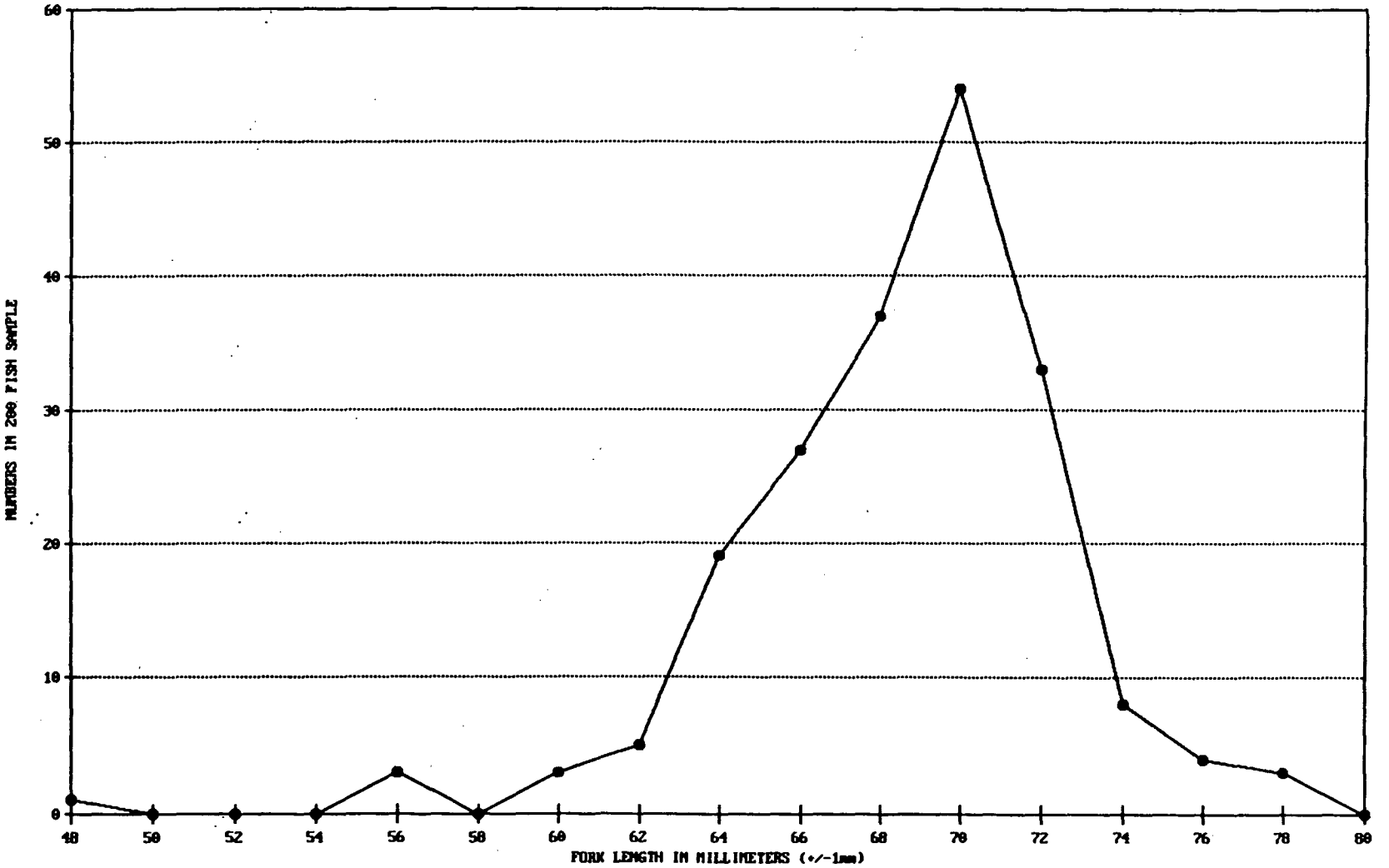
Steelhead

July 18	24,800 released in upper Prairie Cr. and Boyes Cr. @ 330/lb ave. (189/lb to 405/lb)

All Steelhead were released without an identification fin clip. The number released represents 65.7% of the eggs transferred based on Prairie Cr. Fish Hatchery's egg counts. TFSE can account for mortality rate of only 7.5% and again believes the % surviving to release was considerably higher.

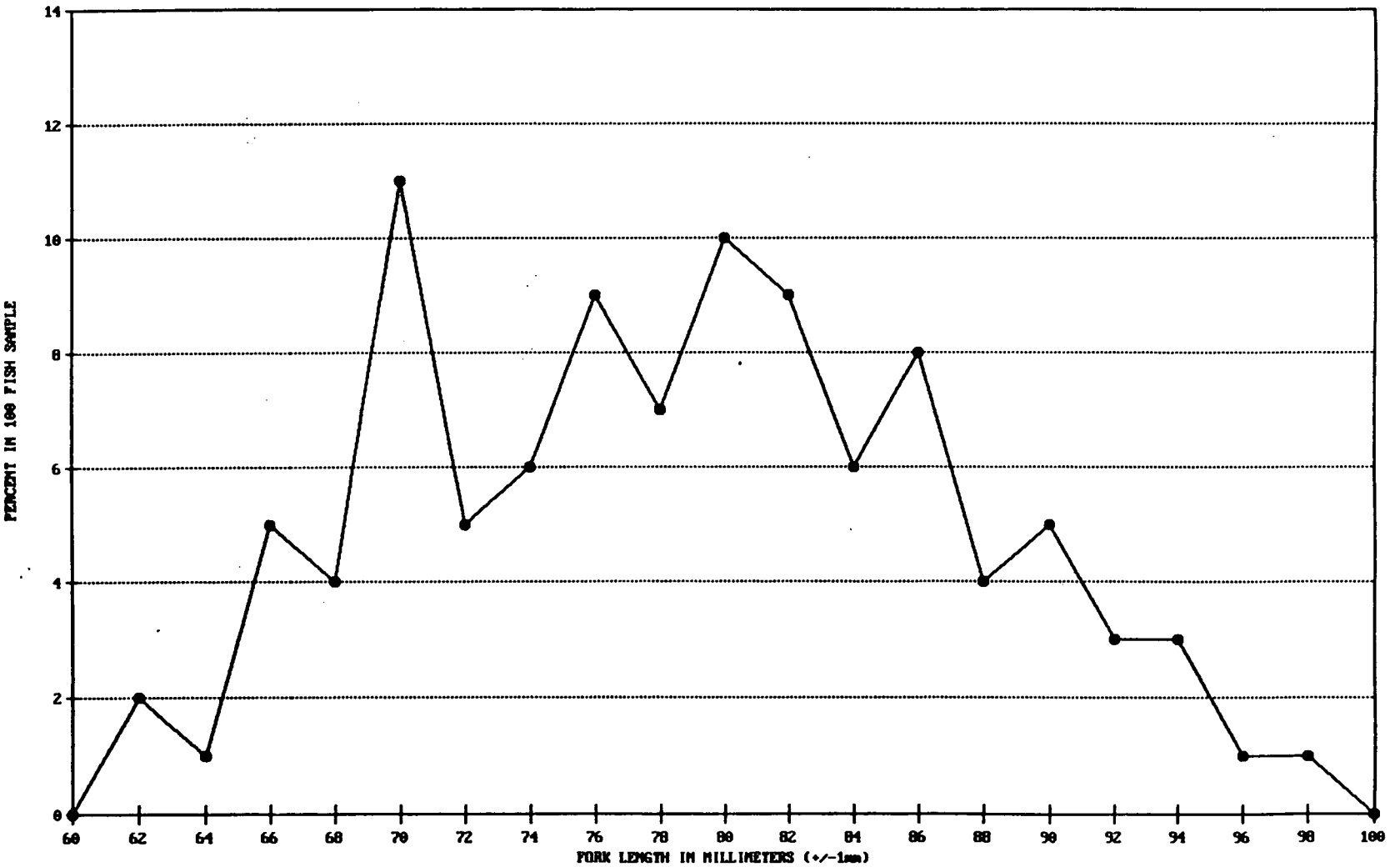
CHINOOK LENGTH FREQUENCIES AT RELEASE

PRAIRIE CREEK MAY 16th & 21st, 1990



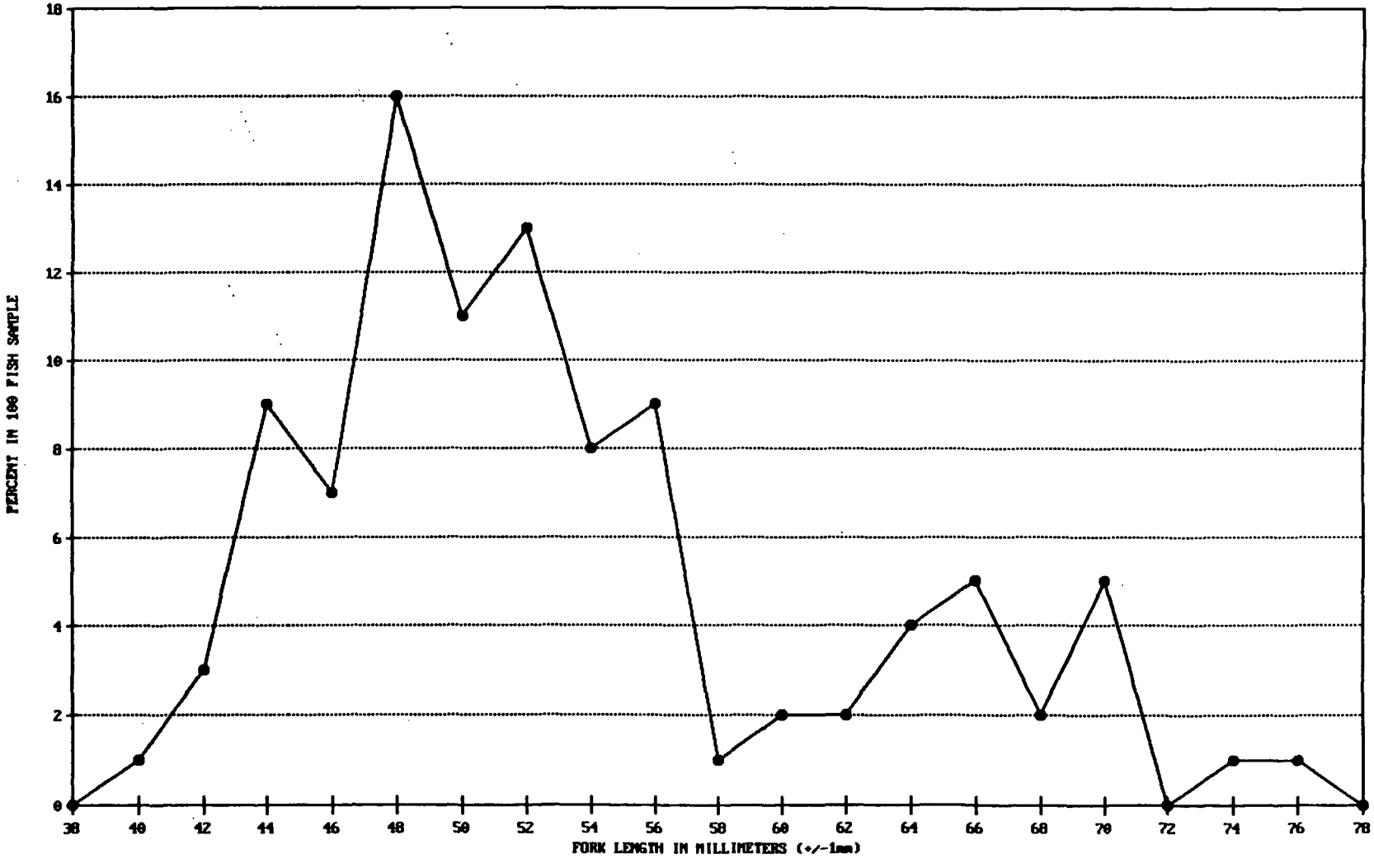
COHO LENGTH FREQUENCIES AT RELEASE

PRAIRIE CREEK AND TRIBS JULY 9-12,1990



STEELHEAD LENGTH FREQUENCIES @ RELEASE

PRAIRIE CR. & BOYES CR. JULY 18, 1990



Appendix D
Downstream Migrant Trapping Information
Prairie Creek 1990

Background

In early March TFSE installed a standard fyke type trap in Prairie Cr. in order to help assess Chinook egg to smolt survival for the 89/90 brood year. Two weeks later another trap of a new pipe design was installed. Both traps were located just below the section of stream surveyed by RNP staff for spawning activity during the winter spawning period. These traps were attended daily between March 13 and July 15. After July 15 the traps were run with decreasing frequency down to no less than twice weekly through the end of August.

All fish were classified as to species and measured by fork length in mm. In addition, periodic weights were taken using a portable scale with an accuracy of+/- .1g. Any mortalities were noted as well as any visually observable irregularities in health condition.

In order to provide a means to extrapolate from observed numbers to an estimate of total numbers of smolts, several attempts were made at calibrating the efficiency of the traps. *Because of their scarcity, wild Chinook were not used in trap calibration using any mark/recapture methods.*

Because the two traps were being evaluated for their individual efficiency, they alternated in location within the same stream cross channel. Due to this changing of location within the cross channel, the traps were found to vary significantly in individual efficiency. *For this reason trap efficiency will be given as a combined efficiency for each calibration.*

Results

I. May 19, Using an additional pipe trap with a complete weir to block escape located below the traps, three passes with a seine, and using wild Coho smolts;

	Traps	Weir	Total
# of fish	46	48	94

Efficiency = 48.9%

II. May 9-22, Using dye marked caudal fins on wild Coho smolts released 200 meters above traps;

	Traps	Released
# of fish	36	92

Efficiency = 39.1%

III. May 14-22, Using blue anal fin marks on wild Coho smolts released 200 meters above traps;

	Traps	Released
# of fish	38	81

Efficiency = 46.9%

IV. June 28-July 4, Using Bismark Brown stain on TFSE reared Chinook smolts released 200 meters above traps;

	Traps	Released
# of fish	24	43

Efficiency = 55.8%

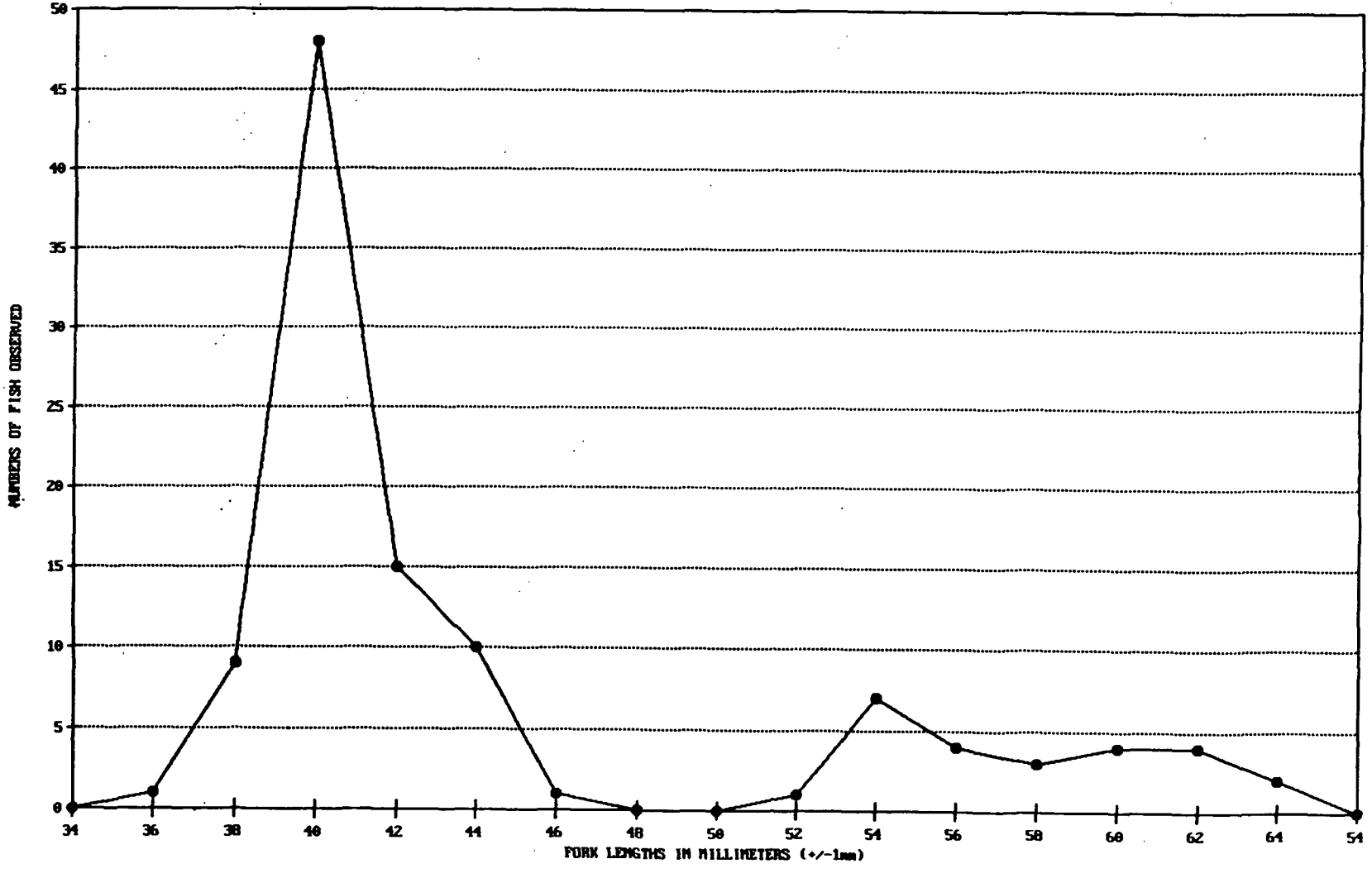
V. Average Efficiency = 47.7%

VI. Chinook salmon trapped were classified as either those originating from eggs deposited in Prairie Cr. by spawning adults,(wild), or those reared and released by TFSE, (reared). Prior to release of reared Chinook all smolts were known to be wild, (see graph of length frequencies). Following release on May 16, until high water rendered the traps inoperable for three weeks beginning May 22, visual differentiation between wild and reared Chinook was possible. When trapping resumed on June 13 the classification was based on length frequency differences. The assumption that wild Chinook were primarily less than 60mm at that time and reared Chinook average larger than 60mm is apparent when comparing the two length frequency charts. The length frequency cutoff for wild Chinook was increased over time. *Less than 20 wild Chinook between 50mm and 62mm were observed prior to May 22 and are probably some of the few survivors of December spawning adults. The last of these slightly larger Chinook smolts were trapped in early May.*

The total number of wild Chinook observed was 423. This number represents continuous trapping between March 13 and August 31, excluding a three week period from May 22 through June 12. Using trap calibrations this expands to a total downstream migrating population of between 758 to 1,082. An unknown number of wild Chinook obviously migrated past the trapsite while the traps were inoperable. When estimating the number of smolts migrating on this period of higher flows, consideration should include the relatively small size of these Chinooks to be smolting and the observed peak in migration not occurring until late June when stream temperatures increased to provide the " thermal push ".

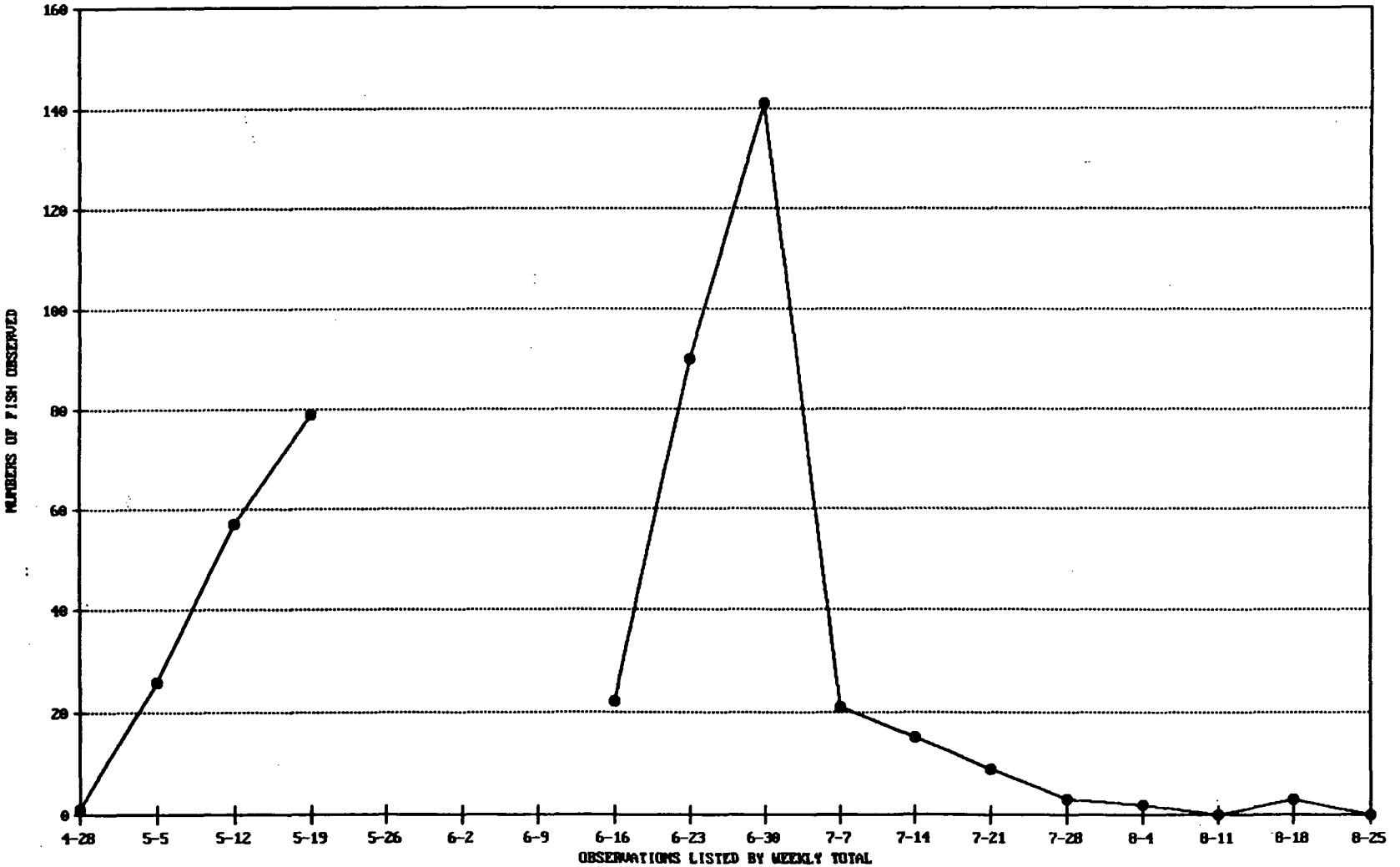
WILD CHINOOK DOWNSTREAM MIGRANTS

LENGTH FREQUENCIES 4/25 TO 5/22/90



WILD CHINOOK DOWNSTREAM MIGRANTS

TRAP OBSERVATIONS, MAR 13-AUG 31,1990



Appendix E
Electrofishing Information
Prairie Creek 1990

Background

Electrofishing surveys were conducted on Prairie Creek and four tributaries during June, July, August and September, 1990. The purpose of the surveys was to estimate abundance and other fish population parameters within selected sections. These estimates can then be used to help evaluate the effect of sediment introductions resulting from Highway 101 bypass construction.

Eight sections were selected for study (location of these sections is depicted in Figure 1 of this Appendix, and physical features of each are found in Table 1). The two Godwood Creek sections and the Little Lost Man section represent streams unaffected by sediment introductions. The Godwood Creek sections are located upstream of the adult fish trap operated by the TFSE; young-of-year populations in these sections may have been affected by adult captures at the trap.

Table 1. Selected physical features of Prairie Creek drainage electrofishing sections.

Section	Length (m)	Surface Area (m^2)	Gradient	Substrate
Lower Prairie	285	1,850	low	small
Little Lost Man	99	370	moderate	large
Boyes	140	370	moderate	moderate
Lower Godwood	137	366	low	small
Upper Godwood	82	230	low	small
Lower Browns	134	428	moderate	moderate
Upper Browns	49	148	moderate	moderate
Upper Prairie	85	421	low	moderate

Methods

Fish were captured with a backpack electrofishing unit. Population estimates were prepared using a depletion estimator. Sections were blocked off with seines, and two passes were conducted within the section. All fish were identified to species; young-of-the-year cutthroat may have been included in the steelhead and resident rainbow category, especially during the first surveys. Cutthroat began to show positive markings at about 65 mm. Some cutthroat grew sufficiently to be identified as cutthroat in the second survey, even though they were listed as rainbow in the first (this was most prevalent in the Browns Creek sections). Captured fish were measured to the nearest mm and weighed to the nearest 0.1 g.

The length of the section varied from area to area. Population estimates are therefore reported in terms of density. The surface area of each section was estimated by measuring total length and a sample of widths. Estimates of population size were divided by area to yield density.

In all sections, capture efficiency of 0+ juveniles of all species was too low to allow estimates to be prepared of these groups. Furthermore, in most sections the number of fish

captured was too low to allow estimates to be prepared for individual species. The young-of-the-year estimates contained in this report were therefore prepared by calculating population size based on the total number of fish caught and scaling these estimates to the group in question. For example, an estimate was prepared for the total number of fish in the section; an estimate would be prepared for 0+ coho by scaling the estimate for the total number of fish by the proportion of 0+ coho captured.

Preparation of the estimates in this fashion results in two problems. First, estimates of 0+ abundance are biased towards underestimation due to the fact that capture efficiencies for 0+ are lower than those for older fish. This bias increases as the size of the estimate increases. Second, confidence intervals for 0+ fish are unrealistically narrow, again due to the fact that capture efficiency is low for small fish. Due to these concerns, density estimates that are relatively similar in magnitude should not be considered statistically different even if the calculated confidence intervals do not overlap. It is also inappropriate to compare these estimates to other estimates prepared differently. However, the estimates are valuable for detecting large differences in density between the sections studied in this survey.

Electrofishing surveys were conducted on each section twice. The first survey occurred in late June or early July, prior to the stocking of hatchbox-reared steelhead and coho. The second survey occurred in late August or early September, after the stocking of hatchbox-reared fish.

Results

Juvenile chinook were only captured in one section, Lower Prairie Creek. The first survey of this section occurred on June 28; at least half of the chinook had already migrated out of the Prairie Creek system by this time based on downstream migrant trapping data. The density estimate for wild chinook was quite low in this section (0.0059 +/- .0017 per square meter), in June, probably partly due to migration. Only three chinook were captured in this section during the second survey, and they could not be differentiated from hatchbox-reared fish.

Length-frequency distributions of coho salmon during the first electrofishing surveys are depicted in Figure 2. Note that the frequency axis varies from section to section. From these histograms, 0+ were estimated to be under 70 mm. The density estimates of 0+ coho during the first survey (Figure 4) indicate that these fish were most abundant in Little Lost Man Creek, followed by Godwood Creek. The density of 0+ coho in all other sections appears to be lower.

Length-frequency distributions of steelhead and resident rainbow trout during the first electrofishing surveys are found in Figure 3. Again, the frequency axis varies from section to section. Young-of-the-year steelhead and resident rainbow were estimated to be under 60 mm at this time. Density estimates of 0+ rainbow and steelhead during the first survey indicate that they were far more abundant in Little Lost Man Creek than in any other section (Figure 5). They may also have been more abundant in Browns Creek than other sections except Little Lost Man, although this may have been due to the inclusion of cutthroat.

Figures 6 and 7 depict the change in coho and steelhead/rainbow densities from the first electrofishing survey to the second. Hatchbox-reared fish are included in the estimates where applicable. Increases in density are therefore likely attributable to stocking. Decreases in density may be due to mortality or emigration. In the case of Upper Browns Creek, the decrease in steelhead/rainbow density is probably due to species identification; fish that were considered steelhead/rainbow in the first electrofishing survey were large enough to positively identify as cutthroat in the second. No estimate could be prepared for the Upper Godwood Creek section in the second survey due to low efficiency.

Finally, Figure 8 depicts the population size of 0+ wild coho in the Upper and Lower Prairie Creek sections prior to and after stocking of hatchbox-reared coho. Data was insufficient to evaluate this trend in any other sections, in some because coho were not stocked, and in others

because wild populations were too small. The information available indicates that stocking of hatchbox-reared coho did not cause emigration of wild coho.

Figure 1. Location of Prairie Creek drainage electrofishing sections, June-September, 1990. Scale is approximately one inch equals four miles.

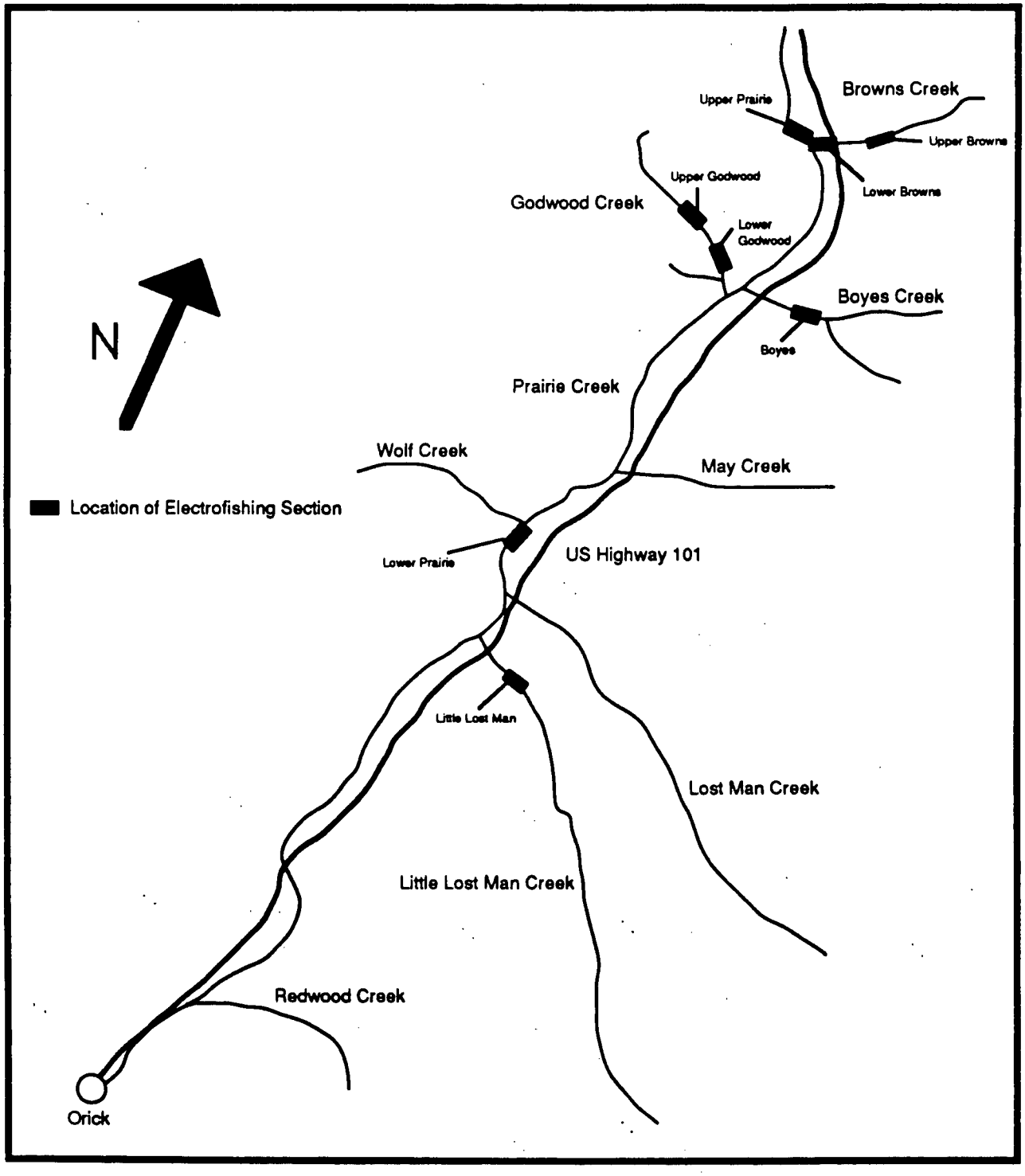


Figure 2. Length-frequency distribution of coho salmon, initial electrofishing samples.

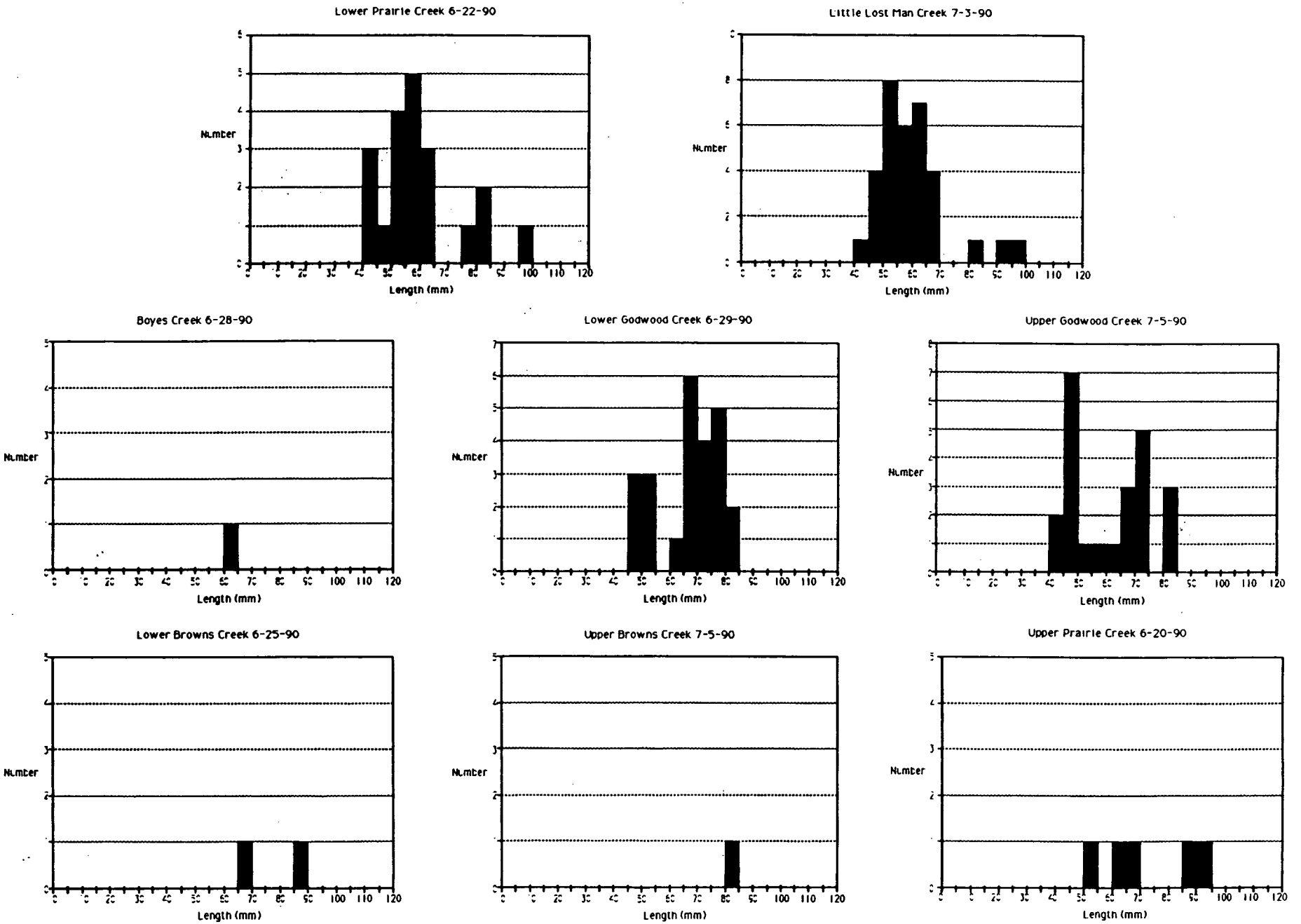


Figure 3. Length-frequency distribution of steelhead and resident rainbow trout, initial electrofishing samples.

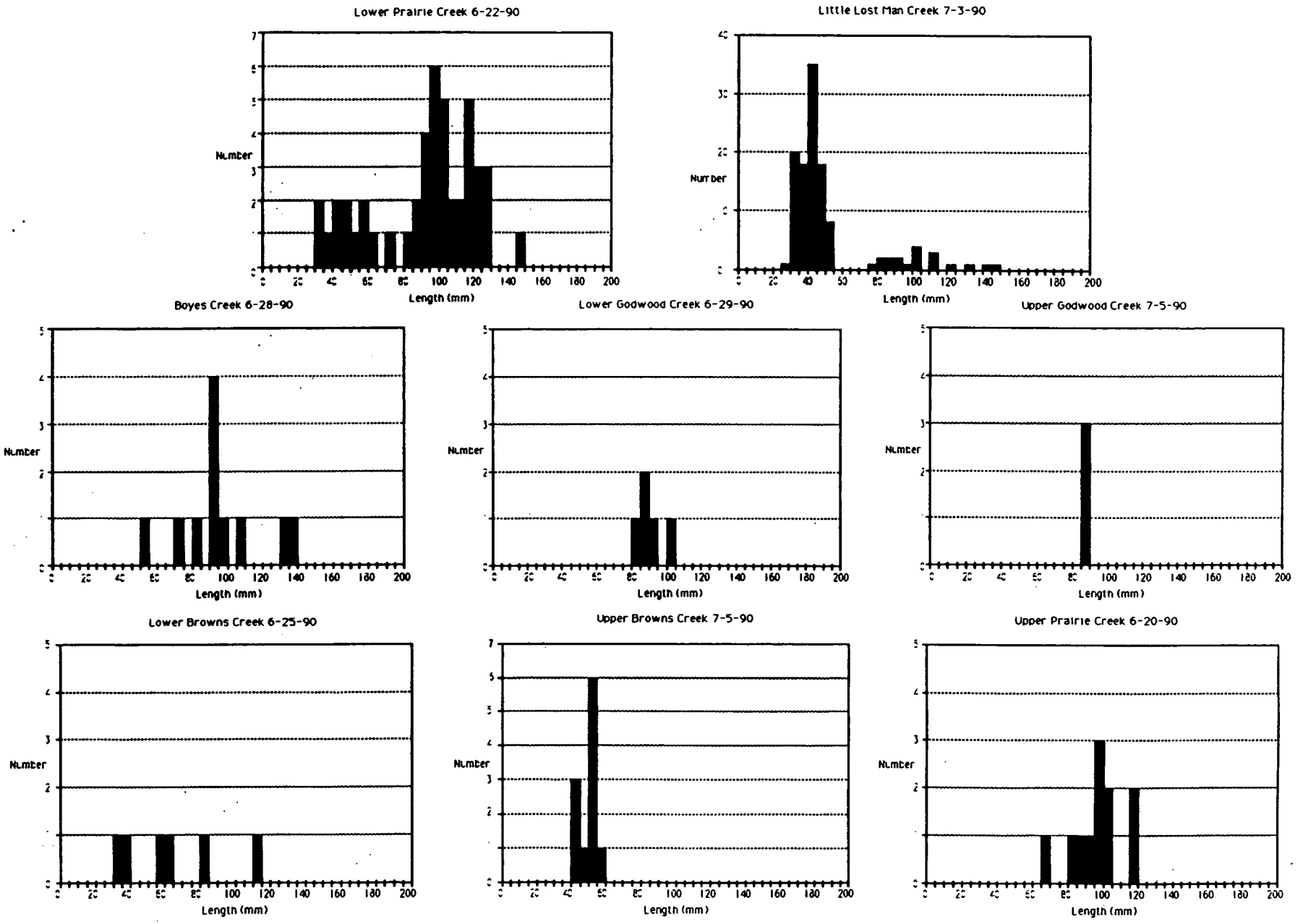


Figure 4. Density estimates of young-of-the-year coho salmon from the initial electrofishing runs. Bars represent 95% confidence intervals. Section abbreviations: LP-Lower Prairie Creek; LLM-Little Lost Man Creek; BOY-Boyes Creek; LG-Lower Godwood Creek; UG-Upper Godwood Creek; LB-Lower Browns Creek; UB-Upper Browns Creek; UP-Upper Prairie Creek.

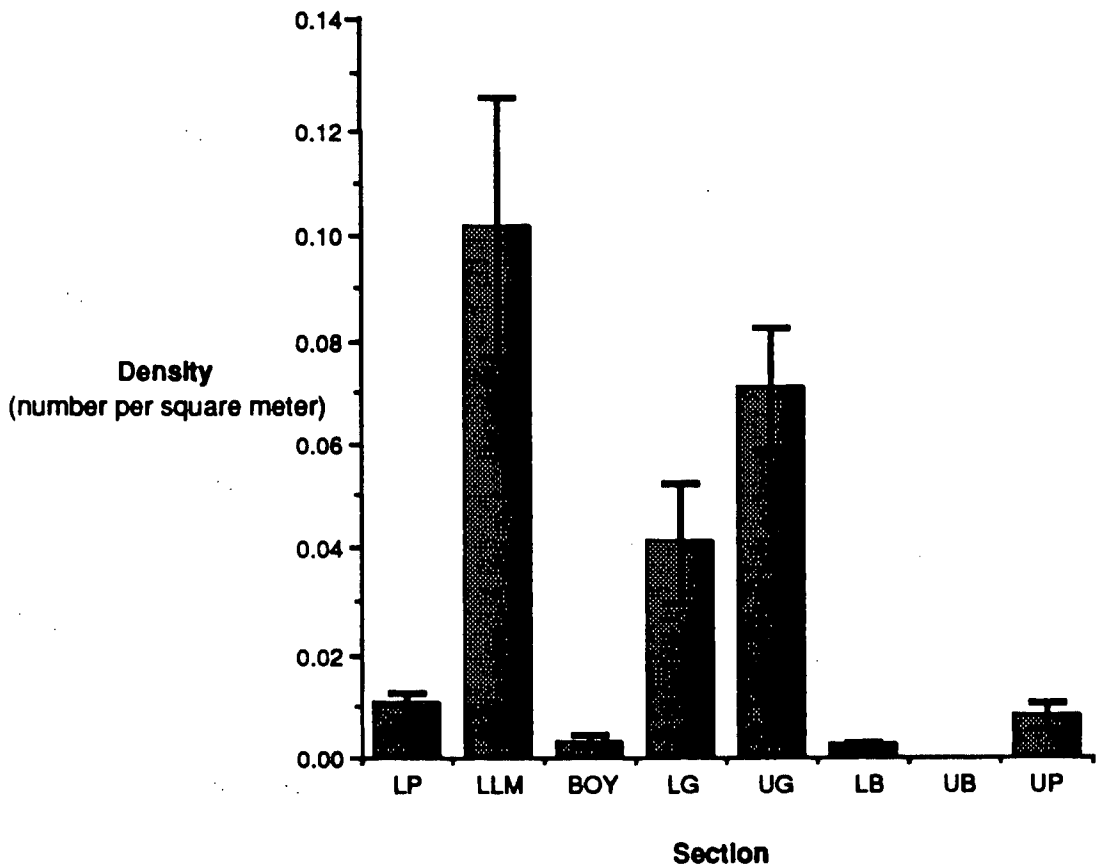


Figure 5. Density estimates of young-of-the-year steelhead and resident rainbow trout from the initial electrofishing runs. Bars represent 95% confidence intervals. Section abbreviations: LP-Lower Prairie Creek; LLM-Little Lost Man Creek; BOY-Boyes Creek; LG-Lower Godwood Creek; UG-Upper Godwood Creek; LB-Lower Browns Creek; UB-Upper Browns Creek; UP-Upper Prairie Creek.

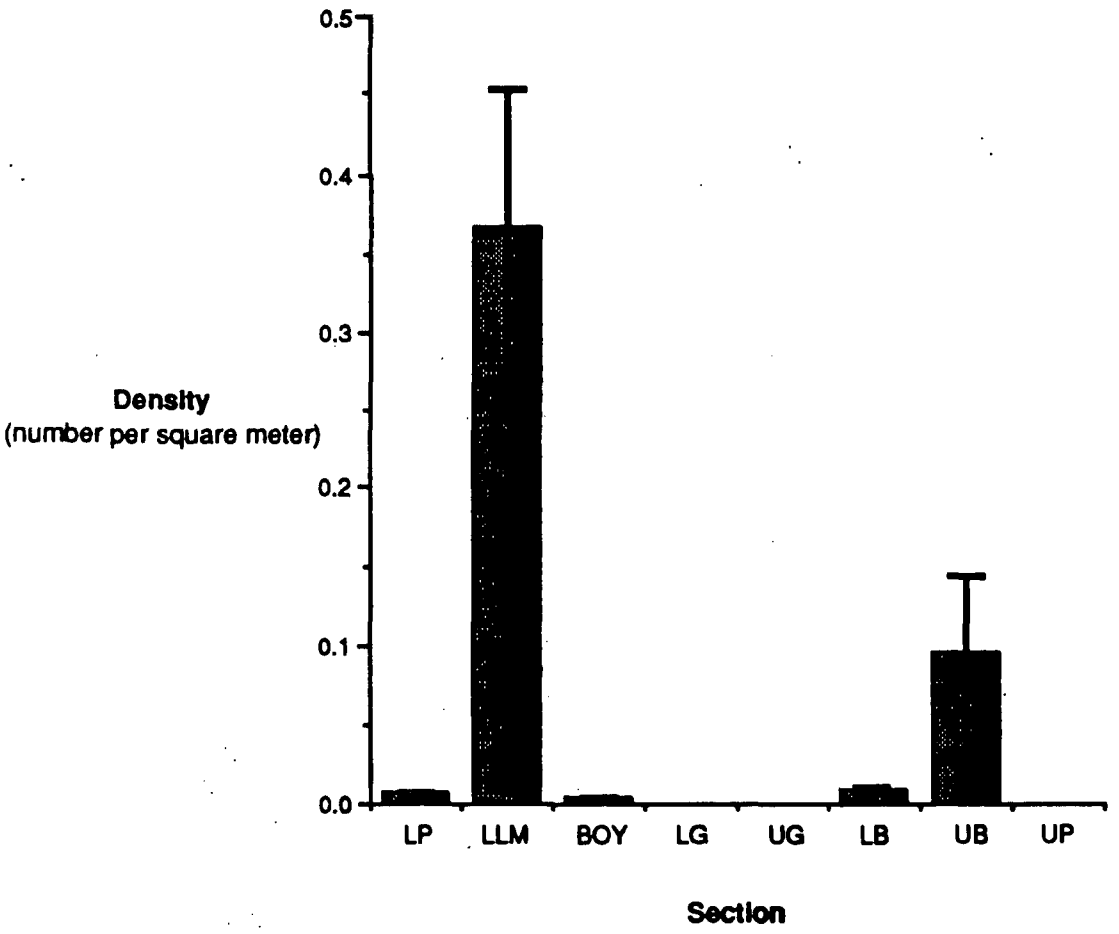


Figure 6. Density of 0+ coho salmon from the first and second electrofishing surveys. Hatchbox-reared coho are included. Bars represent 95% confidence intervals. Section abbreviations: LP-Lower Prairie Creek; LLM-Little Lost Man Creek; BOY-Boyes Creek; LG-Lower Godwood Creek; UG-Upper Godwood Creek; LB-Lower Browns Creek; UB-Upper Browns Creek; UP-Upper Prairie Creek.

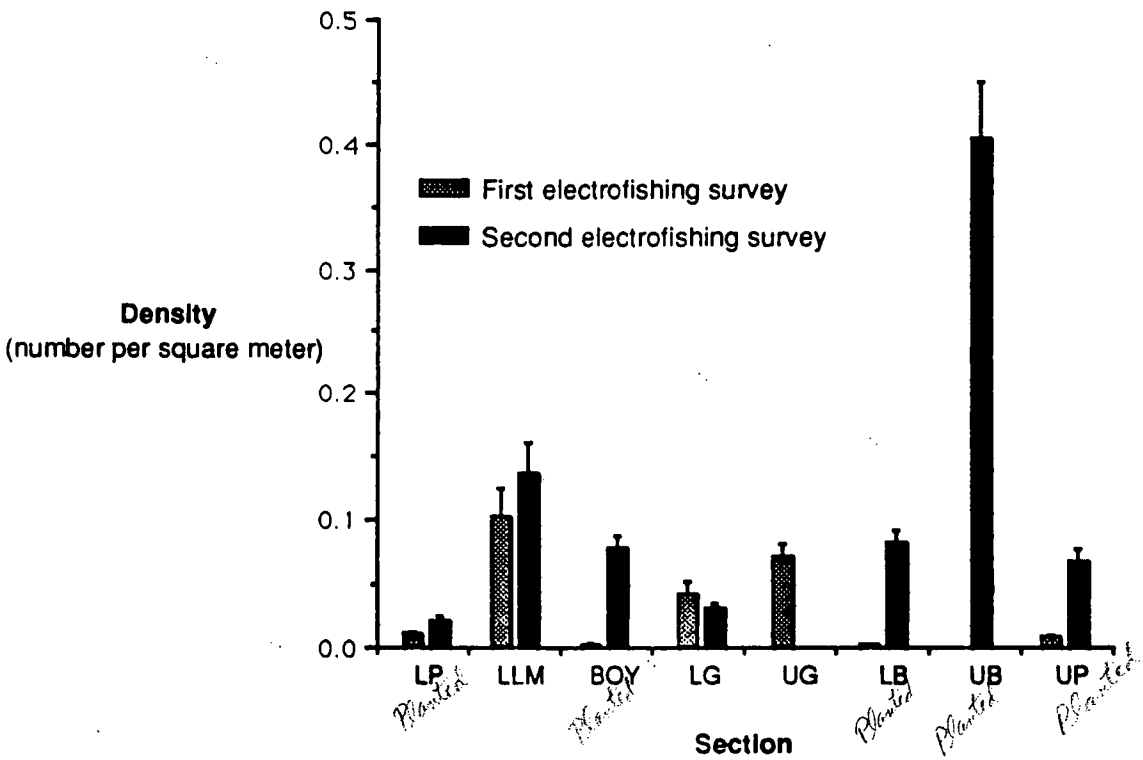


Figure 7. Density estimates of young-of-the-year steelhead and resident rainbow trout from the first and second electrofishing surveys. Hatchbox-reared steelhead are included. Bars represent 95% confidence intervals. Section abbreviations: LP-Lower Prairie Creek; LLM-Little Lost Man Creek; BOY-Boyes Creek; LG-Lower Godwood Creek; UG-Upper Godwood Creek; LB-Lower Browns Creek; UB-Upper Browns Creek; UP-Upper Prairie Creek.

Steelhead density increased in second survey due to planting and being able to differentiate CTC from SH.

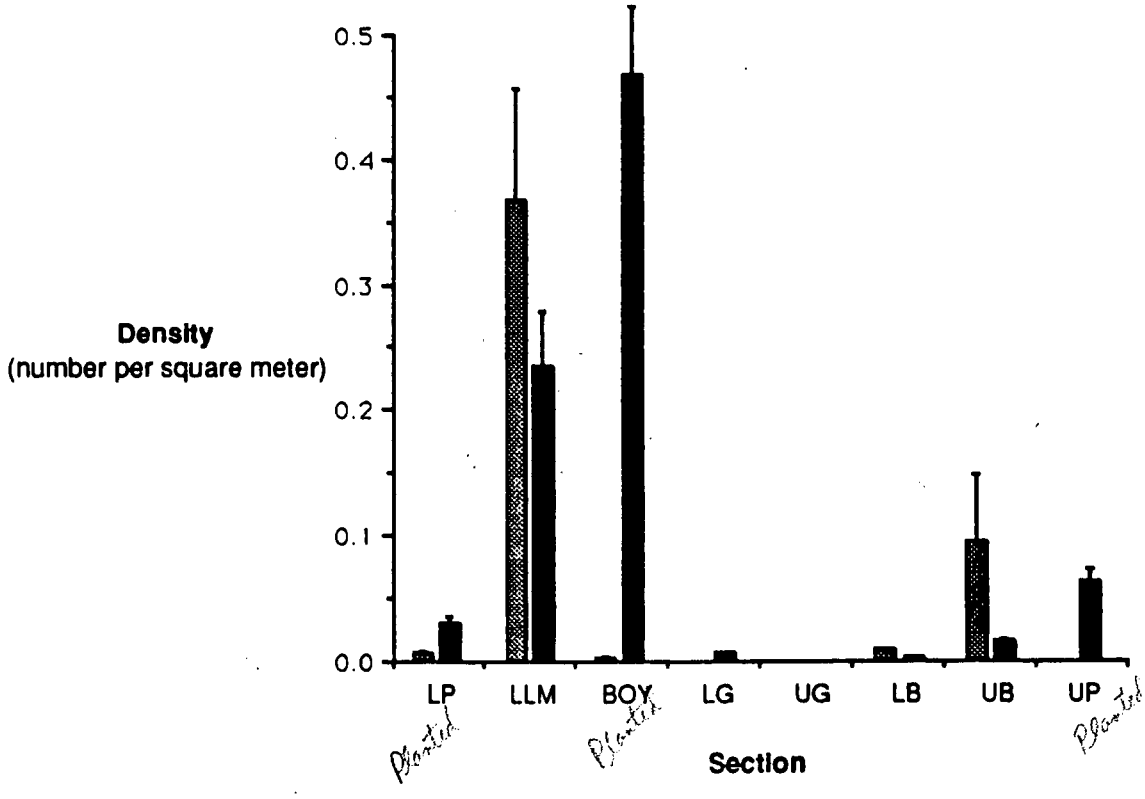
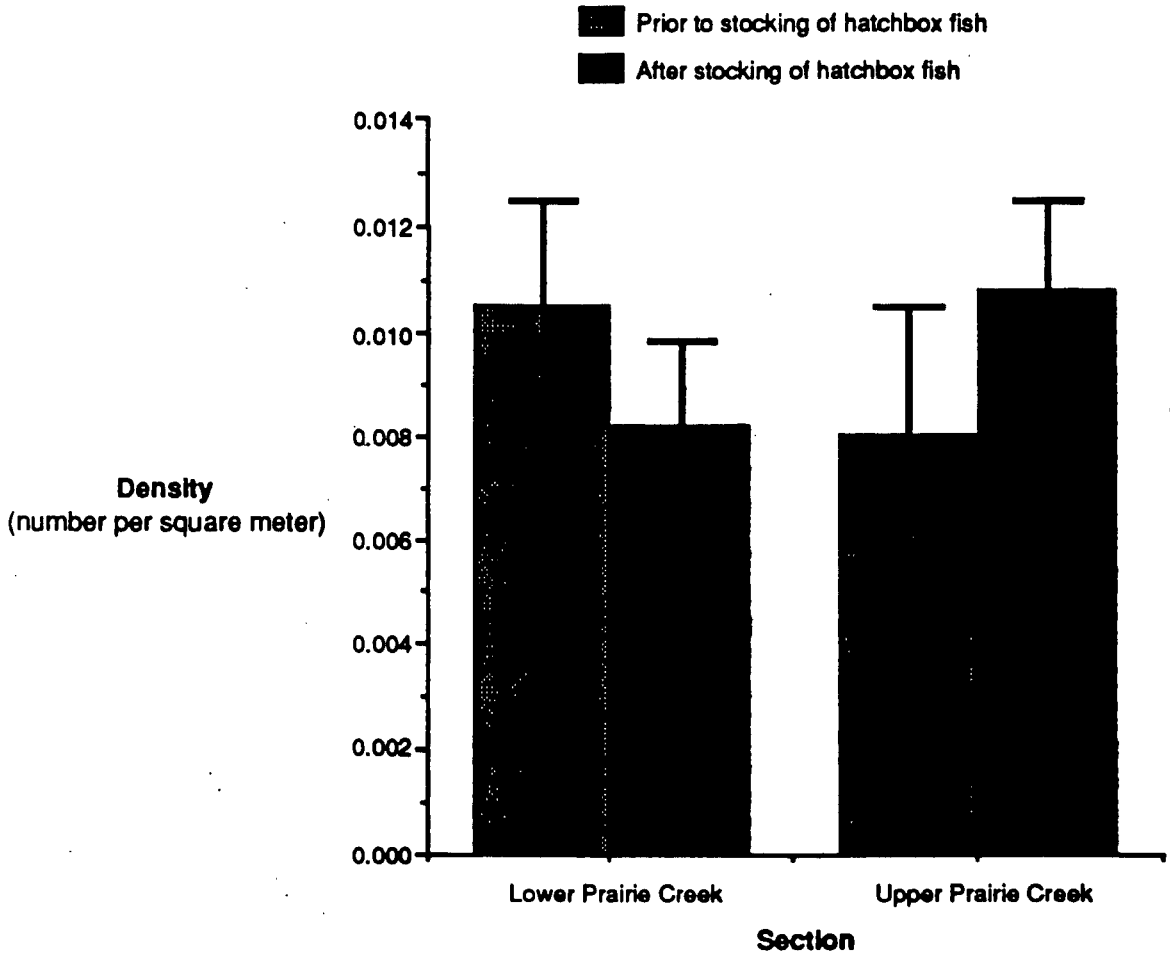


Figure 8. Density estimates of wild young-of-the-year coho salmon prior to and following stocking of hatchbox coho. Bars represent 95% confidence intervals.



Small sample size

wilds not displaced