1996 SOUTH FORK TEN MILE RIVER

AND LITTLE NORTH FORK NOYO

OUTMIGRANT TRAPPING

FINAL REPORT

FOR

HUMBOLDT COUNTY

RESOURCE CONSERVATION DISTRICT

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BY

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ABSTRACT

As part of a program to employ commercial salmon fisherman impacted by fishery closures a study was initiated to determine the number of juvenile salmon emigrating from rearing areas to migrate to sea or attempt to rear in other areas downstream. Outmigrant traps were installed in the spring of 1996 in the Little North Fork Novo River (LNF), the South Fork Ten Mile River (SF) and two of its tributaries, Smith and Campbell Creek. Two type of traps were utilized, a fyke net with an attached livecar and a "pipe trap". All four traps were operated until downstream movement of yearling or older fish ceased. The fyke net traps were all located on the Ten Mile system while the pipe trap was utilized in the LNF. Fyke traps were pulled when high flows were expected or experienced while the pipe trap operated continuously. The SF trap was set in late April while all other traps were set in early March. Most yearling or older fish were marked with a caudal clip and released upstream to determine trap efficiency rates. The pipe trap design proved to be much more efficient due to the inability of outmigrants to leave livecar once entering while other trap design allowed fish to move back upstream which allowed fish to find ways get past trap unobserved. To estimate total numbers of fish passing trap sites, the number of yearling or older salmonids trapped were expanded by determining trap efficiency rates and estimates for days where traps were pulled were made by extrapolated from weekly averages or from prior and previous weeks.

The numbers and mortality of all fish, amphibians, snakes, and salamanders are given. Weekly or biweekly length and weights for yearling salmonids are also reported. For the Campbell Creek, SF, LNF and Smith Creek traps the number of Young of the Year (YOY) coho counted were 4,493, 42, 1,341, and 2,479, respectively. Coho smolts numbered 9,42,408, and 40, respectively. YOY steelhead numbered 22, 411, 5,526, 1829, and 32,812 respectively while yearling or older (Y+) steelhead trout numbered 947, 1,728, 556, and 1,216, respectively. The total number of coho smolts to have past trap sites from early March though June were estimated at 34,493, 450, and 89, respectively. Total Y+ steelhead numbers were estimated at 2,379, 15,795, 770, and 3,954, respectively. Total Y+ steelhead numbers were estimated at 2,379, 15,795, 770, and 3,954, respectively. Trapping data indicated that coho smolt populations were about 25 times higher in 19% than in 1995 in the SF and about twice as high this year in the LNF. Steelhead trout numbers were also up considerably. Improved flow conditions are believed to have contributed to improved production. The number of YOY coho observed leaving tributaries or moving downstream are believed to indicate that habitat above was fully seeded with both coho and steelhead trout this year with the possible exception of the SF. Results of a recent spawning survey and potential impacts of an adult coho trapping program in the SF are discussed in relation to trapping results.

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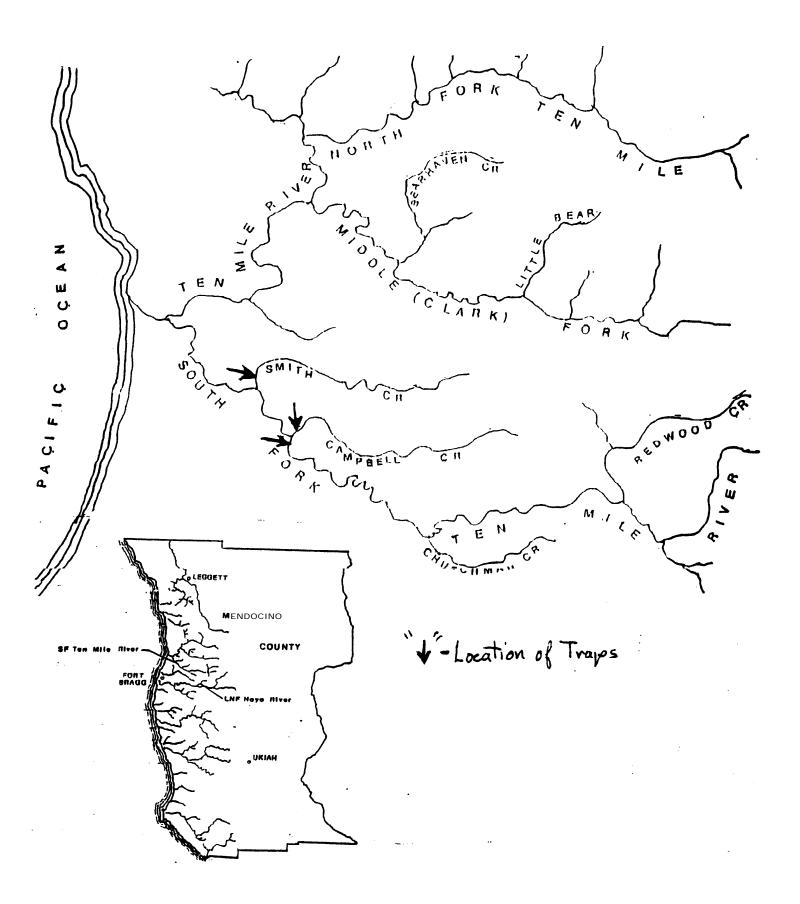
INTRODUCTION

This study was conducted by Salmon Trollers Marketing Association (STMA) as part of the Northwest Emergency Assistance Program (NEAP) to employ commercial fisherman effected by recent fishery closures due to low stock abundance expectations. In this study, outmigrant traps were put into a tributary of the Noyo River, the Little North Fork (LNF), the South Fork Ten Mile River and two of its tributaries, Campbell and Smith Creek (Figure 1). The purpose of the work in the Ten Mile River was to help determine levels of natural coho and steelhead production associated with a adult coho and steelhead trapping and propagation effort conducted by the Salmon Restoration The trapping in the LNF Noyo is done in conjunction with a study Association. conducted through Humboldt State University in association with the Institute for River Ecosystems and the Fish, Farm & Forestry Communities Forum (FFFC) for the purpose of determining relationships between habitat and limiting factors to coho production. The 1996 outmigrant trapping is the second consecutive year that trapping has occurred in both the LNF Noyo and SF Ten Mile River.

This report details the catch of fish and other animals found in outmigrant traps. It compares the findings from this years trapping operation with those from the previous year as well as findings from a salmon and steelhead spawning survey conducted in the Ten Mile River earlier this year by STMA. Survey information is discussed with reference to a ongoing program in the Ten Mile River basin where native coho and steelhead are collected as brood stock in a natural stock propagation/restoration program.

Since most trap operators had previous experience operating outmigrant traps, identification of Young-of-the-Year (YOY) fish to species progressed much better than in the initial year of operation. Since YOY were captured from the onset of emergence, the identification of the later emerging steelhead fry were clearly separable.

All traps were designed to minimize the chance that fish could pass the trap site uncounted. An unknown portion of young fry were expected to be able to move downstream uncounted due to the size of the wing-wall mesh but larger fish were



expected to enter trap and be counted before being allowed to continue their downstream movement. The exception was during periods of elevated flow where traps were pulled to minimize any potential salmon mortalities or high flows broke open sections of the weir or tore holes in screens. A mark and recapture program was utilized to determine what fraction of fish, yearling or older, were getting through uncounted.

METHODS

Traps were placed in streams to capture outmigrating or downstream moving juvenile salmonids. All three traps on the SF Ten Mile were of the same type consisting of a funnel shaped net which emptied in to a livecar fish holding box at the downstream end The livecar was constructed out of a plastic pipe frame to which a of the net. rectangular shaped net container was fixed. This livecar had a zipper opening utilized to scope out fish and debris that accumulated in the livecar. The funnel shaped net, or fyke net, was held in the stream by connecting the fyke net to metal fence posts that were pounded into the stream bed. Ropes were strung from the upstream end of the net to trees or any other sturdy structure on the bank to prevent loss of the trap during high water events. The lower portion of fyke net and livecar consisted of 1/8" mesh. The upper portion of fyke net varied from 3/16 to 1/2 inch mesh (See Appendix III). Wire wing-walls were strung out from the fyke net to edge of bank. A variety of types of wire mesh screens were used to prevent fish from being able to escape around the trap. 1/4inch mesh was used for wing-wall construction after having problems with smaller (1/8") mesh) catching too much debris during periods with elevated flow conditions. Various materials were used to secure the edges of wing-wall such as sand bags and rocks to help prevent fish from escaping past the trap.

Where the small end of the fyke net was connected to the livecar there was a section of plastic pipe to which the net and livecar was held together with hose clamps. This pipe (8 inch dia.) was extended into the livecar approximately 3 to 4 inches and a stove pipe elbow was inserted into he lower end of the plastic pipe to discourage fish from exiting the live car and swimming back upstream. This elbow was normally pointed down towards the bottom of livecar but turned upward when the trap was being checked.

In order to reduce flows that any trapped fish would be subjected to, sets of two side-by-side fyke nets and livecars were set. This double trap arrangement worked very well in reducing impacts due to high flow conditions. One other additional precautionary action was taken to reduce any potential mortalities. Whenever forecasts suggested that

significant amounts of rain were expected, traps were pulled and reset when threat ended or flows dropped.

The LNF trap was a "pipe-trap". This trap was constructed utilizing a perforated metal tray (McBain ramp). Wire-mesh screens across the stream funneled fish and water into a long pipe which spilled out onto this tray about 30 feet downstream. The perforations in the tray allowed much of the water to dissipate before reaching the livecar. The tray with sides and a screen cover directed the water and fish into the livecar at the lower end of the tray. Once fish were in the livecar, there was no way they could escape back upstream. This feature was an improvement compared to the other traps being used which could not prevent fish from escaping out of the livecar to swim back upstream. Once out of the trap, fish can search for other ways around trap which increases the likelihood that fish can escape downstream without being counted. It was also important in that it helped reduce the volume of water that reached the livecar which reduced velocities which the fish were subjected to, reducing potential mortalities. The flow entering the livecar was adjusted by placing a plastic sheet or gunny sack at the upper end where portions of the screen could be covered over or uncovered depending on whether there was need for more or less water to enter the livecar.

Wire mesh separators were installed in all livecars to allow smaller fish to go into lower end of box where larger fish would be excluded. This was done to protect smaller fish from being eaten by the larger fish and other aquatic animals. Other material such as large boulders, twigs & branches were used to give added cover for trapped fish.

The traps were ran once per day by two trap operators. Fish were scooped out of the livecar and placed in buckets. Fish were measured to nearest mm (up to 3 mm error on large fish possible -less for small fish- is likely due to fish movement during measurement.) fork length and a subset weighted by water displacement in a graduated cylinder where one ml was equal to one gram. Occasionally fish were anesthetized utilizing Alka Seltzer but normally fish were measured without its use. Non-salmon& were not normally weighed.

Most steelhead and coho smolts were marked with a caudal fin clip and released upstream to determine trap efficiency rates. Marking of smolts was done throughout trapping period in the LNF Noyo. In the S. F. Ten Mile, marking was not conducted until about three weeks after initiation of trapping because of recommendations from Fish & Game which wanted to avoid, to the greatest degree possible, any mortalities. **This** degree of concern was in part to the low number of yearling (Y+) coho expected in

this system. The marking was initiated once flow dropped to a level where the trap in the SF could be set and used as a recapture site for fish marked in Campbell Creek. This would allow a secondary check on SF trap efficiency. As it turned out, because trap operators didn't mark Campbell fish with just a upper caudal clip as directed but had been also utilizing a lower fin clip there was not a separate mark available for the SF trap so the planned SF trap location was moved to above the confluence of Campbell Creek.

RESULTS

The number and type of fish and other animals trapped in Campbell Creek, the South Fork Ten Mile, LNF Noyo and Smith Creek are shown on Tables 1 - 4. The significance of these numbers are discussed in detail in following sections. The length frequency distributions of the salmonids from the various traps are given on following tables as is information concerning the marking and recapture of salmonids. In Appendix I are given weight and length data and in Appendix II is information on the various physical parameter measurements taken during trapping operations. Flows were estimated from water velocities and cross section measurements in selected stream sections in Ten Mile areas and from water heights on a stream gauge in the LNF.

Tables 1-4 show the number of fish and other animals trapped, days per week traps were operational and the mortality observed. The mortalities of YOY are the number of fish actually observed dead. There were without doubt greater mortalities associated with ingestion by predatory salmonids, sculpins, salamanders and frogs which could not be estimated without inspecting contents of predator stomachs which was not done. It appears that salmon fry can and do at times make up a large part of the diet of fish in such streams. The livecar likely makes fry more available to predators than would occur in the stream even with screen separators in livecar.

It is apparent that by pulling traps when expecting elevated flow conditions, flow related mortalities were greatly reduced if not completely eliminated this trapping season. The mortalities experienced this year were significantly less than experienced in 1995.

Table 1Weekly Summaries of the number of Fish and Other Animals Trapped in the Campbell Creek Outmigrant Trap in 1996,
Number of Days a Week Trap was in operation, and Percent Mortaility Observed

	March	March	March	March	April	April	April	April	April-May	May	May	May	May-June	June	June	June	June-July		
	4-10	11-17	18-24	25-31	1-7	8-14	15-22	23-28	29-5	6-12	13-19	20-26	27-2	3-9	10-16	17-23	24-1	Total	Mortality
Coho YOY	0	378	940	215	1031	926	98	745	49	17	37	26	10	14	4	1	2	4493	0.27%
Coho Y+	0	0	0	0	1	2	0	1	2	2	1	0	0	0	0	0	0	9	0.00%
Steelhead YOY	0	0	41	4260	3609	4931	45	6197	1114	600	695	665	140	47	35	13	19	22411	0.39%
Steelhead Y+	8	25	15	9	62	99	13	50	85	177	196	6 8	62	46	22	7	3	947	1.06%
Ad.Steelhead	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0.00%
Sculpin Sp.	16	61	72	72	51	40	1	17	11	5	24	14	9	11	8	16	11	439	0.00%
Stickleback	1	11	16	7	13	11	0	22	6	15	30	47	17	2	10	16	2	226	0.00%
Juv. Lamprey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Adult Lampery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
GP Salamander	1	8	2	3	1	2	0	11	2	3	2	2	0	2	2	2	5	48	0.00%
Frog Sp.	2	2	4	3 ·	7	5	1	0	0	0	0	1	0	0	0	0	0	25	0.00%
Salamander Sp.	. 0	0	9	5	4	2	0	0	0	0	0	0	0	0	1	0	0	21	0.00%
Snake Sp.	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0.00%
Days Operated	1	4	7	7	7	7	1	7	7	7	7	7	7	7	7	7	8	105	

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 Table 2
 Weekly Summaries of the number of Fish and Other Animals Trapped in the South Fork Ten Mile Outmigrant Trap

 in 1996, Number of Days a Week Trap was in operation, and Percent Mortaility Observed

	March	March	March	March	April	April	April	April	April-May	May	May	May	May-June	June	June	June	June-July		
•	4-10	11-17	18-24	25-31	1-7	8-14	15-22	23-28	29-5	6-12	13-19	20-26	27-2	3-9	10-16	17-23	24-1	Total	Mortality
Coho YOY									4	17	9	2	0	4	4	1	1	42	0.00%
Coho Y+									1	6	20	1	0	1	0	0	0	29	0.00%
Steelhead YOY									6	2791	1427	527	61	132	169	241	172	5526	0.74%
Steelhead Y+									27	187	422	119	240	409	157	133	34	1728	0.29%
Steelhead Sculpin Sp.									0 33	0 101	0 115	0 28	0 66	0 48	0 81	0 50	0 36	0 558	0.00% 0.00%
Stickleback									54	130	127	85	144	135	79	93	71	918	0.00%
Juv.Lamprey									3	6	3	2	1	3	0	2	0	20	0.00%
Adult Lampery									1	3	6	6	1	1	0	0	0	18	5.56%
GP Salamande	r								0	0	İ	0	1	0	1	0	0	3	0.00%
Frog Sp.									2	8	1	2	1	1	0	0	0	15	0.00%
Salamander Sp	•								1	0	0	0	0	0	0	0	0	1	0.00%
W.Pond Turtle Days Operated	0	0	0	0	0	0	0	0	0 2	0 7	1 5	0 3	1 7	0 7	0 7	0 7	2 8	4 53	0.00%

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Table 3Weekfy Summaries of the number of Fir and Other Animals Trapped in the Little North Fork Noyo River Outmigrant Trap
in 1996, Number of Days a Week Trap was in operation, and Percent Mortality Observed

	March	Marc	h Mar	ch Ma	rch A	pril Ap	orii Ap	oril April	April	-May N	May Ma	ay May	May-Jun	June	June	June	June-July		
	4-10	11-17	18-24	25-31	I-7	8-14	15-21	22-28	29-5	612	13-19	20-26	27-2	3-9	1 0- 16	17-23	24-I	Total	Mortality
Coho YOY	104	246	307	181	224	66	33	50	8	17	23	35	15	25	7	0		1341	4.33%
Coho Y+	5	1	6	8	17	67	91	62	59	42	41	6	3	0	0	0		408	1.72%
Steelhead YOY	0	0	0	297	316	144	75	340	141	294	79	31	25	43	41	3		1829	1.37%
Steelhead Y+	2	10	59	56	53	105	99	23	45	32	33	32	4	3	0	0		556	1.08%
Steelhead	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		2	0.00%
Sculpin Sp.	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0		3	0.00%
Stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0.00%
Juv. Lamprey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0.00%
Adult Lampery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0.00%
GP Salamander		6	2	0	3	1	2	1	2	3	8	2	2	3	2	0		38	0.00%
Frog Sp.		2	2	0	11	13	7	7	5	0	0	0	0	0	0	0		48	0.00%
Salamander Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0			0.00%
Snake Sp.	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0			0.00%
Days Operated	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	2	0	103	

Table 4 Weekly Summaries of the Number of Fish and Other Animals Trapped in Smith Creek, Ten Mile River Outmigrant Trap in 1996, Number of Days a Week Trap was in operation, and Percent hlortaiiii Observed

	March	March	Marc	h Marc	ch Apr	il April	April	April	Ар-Му	Мау	May	May	My-Jun	June	June	June J	une-July		
	4-10	11-17	18-24	25-31	I-7	8-14	15-21	22-28	29-5	6-12	13-19	20-26	27-2	3-9	10-16	17-23	24-I	Total	Mortality
Coho YOY			152	152	206	1512	58	215	60	39	66	6	7	2	4	0	0	2479	0.16%
Coho Y+			0	0	4	12	1	5	11	5	1	1	0	0	0	0	0	40	0.00%
Steelhead YOY			98	953	10042	8433	158	2070	2308	5783	2416	453	18	30	27	13	10	32812	0.09%
Steelhead Y+			9	17	41	110	13	40	164	195	288	88	71	105	47	13	15	1216	0.33%
Ad. Steelhead			0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0.00%
Sculpin Sp.			92	118	210	161	16	80	27	35	46	49	8	11	13	21	17	904	0.00%
Stickleback			1	3	4	2	0	0	16	4	33	43	17	14	10		2	150	0.00%
Juv. Lamprey			1	1	5	1	0	4	0	0	0	1	0	0	0	0	0	13	0.00%
Adult Lamprey			0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	4	0 .00%
GP Salamande	r		0	4	3	5	0	1	3	5	9	1	0	0	1	3		36	0.00%
Frog Sp.			1	2	1	0	0	3	0	0	0	0	0	0	0	0	0	7	0.00%
Salamander Sp			0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	4	0.00%
Snake Sp.			0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0.00%
Days Operated	0	0	3	7	7	7	1	3	7	7	7	7	7	7	7	7	8	92	

Ten Mile River Trapping Operations

The Campbell Creek trap was set on March 9th. It was pulled due to high flows from March 13 through March 15. From April 15 through the 22nd, high flows were again experienced and traps were pulled during this period. The trap operated continuously from April 23 through July 1 and in operation a total of 105 days. The trap was located 700 feet above the mouth of Campbell Creek, a short distance below a bridge which crosses the stream. Only nine coho salmon (*Oncorhynchus kisutch*) yearlings were trapped this year while steelhead trout (0. *mykiss*) numbered 947. Coho YOY numbered 4,493 while steelhead YOY numbered 22,411. No Y+ coho mortalities occurred and steelhead Y+ mortality was just over 1 percent. Four adult steelhead were captured in traps and released downstream.

Both prickly and coastrange sculpin (*Cottus asper* and C. *aluticus*) were observed in trap. Most, over 90%, of the 429 captured were prickly sculpin. The other common fish observed was threespine stickleback (*Gasterosteus aculeatus*). Other animals observed were yellow -legged frogs (*Rana boylei*), giant pacific salamander (*Dicamptodon ensatus*) and aquatic garder snake (*Thamnophis couchii*). Others include the red-bellied newt (*Taricha torosa*) and a single northwestern salamander (*Ambystorna gracile*).

Y+ coho were captured between the first week of April and mid-May. Y+ Steelhead emigration peaked in mid-May. The first YOY coho were observed on March 12 and the first YOY steelhead on March 21. *The peak YOY* coho emigration occurred during the first week of April whereas the peak YOY steelhead numbers occurred in the later half of April. Sculpin numbers peaked in mid to late March while stickleback peaked in mid to late May. Frogs and salamanders occurred primarily in the March to mid-April period.

The Smith Creek trap was first set on March 21. As in Campbell, the trap was pulled from April 15 through the 22nd Smith Creek trap was again pulled on the 24th and reset the 27th. Trap operated continuously from the 28th through July 1 and was in operation a total of 92 days. The trap was located approximately 1500 feet above the mouth. There were 40 Y+ coho trapped and 1,2 16 Y+ steelhead There were 2,479 YOY coho and 32,812 YOY steelhead captured in Smith Creek trap. There were no Y+ coho mortalities and the mortality rate of steelhead yearlings was 0.33 percent. Two adult steelhead were also captured and released downstream.

Both prickly and coastrange sculpin were observed. The majority of sculpins were prickly but the portion of coastrange was higher in Smith than Campbell Creek. There also appeared to be a higher proportion of coastrange later in the trapping period. Smith Creek unlike Campbell, had both adult and juvenile pacific lamprey (*Lampetra tridentata*). Aquatic Garter Snakes, one red-legged frog (*Rana aurora*), Pacific treefrogs and yellow-legged frogs were also trapped.

Y+ coho were captured between the first week of April and late May. Steelhead Y+ peaked around mid-May, similar to Campbell Creek. YOY coho were observed on the first day of operation, March 21, and the first YOY steelhead came on March 24. *The peak YOY* coho emigration occurred the second week of April whereas the peak YOY steelhead numbers occurred a week earlier. A secondary peak in the number of YOY steelhead occurred during second week of May. Sculpin numbers peaked in mid to late March while stickleback peaked in mid to late May. Frog and salamanders occurred primarily in the March to mid-April period.

The South Fork trap was first set on May 3rd. The trap was pulled May 17 and reset on the 19th. The SF trap was pulled again on May 21 and was reset on May 25th. Trap was in operation a total of 53 *days*. *The* trap was located approximately 200 yards above the mouth of Campbell Creek. 29 Y+ coho were captured as well as 1,728 Y+ steelhead. Coho YOY captured totaled 42. YOY steelhead numbered 5,526. No Y+ coho mortalities were incurred and the mortality of Steelhead Y+ was 0.29 percent.

A majority of the 558 sculpin, about 83 percent, were prickly sculpin. There were 18 adult Pacific lamprey captured as well as 4 western pond turtles (*Clemmys marmorata*)

With the late date at which the SF trap was installed, no peak timing of emigration period can be determined. The 20 Y+ coho which were counted in mid-May were later than significant numbers of coho were counted in either Smith or Campbell.

Ten Mile Salmonid Lengths

The length frequency of salmonids trapped are shown on Tables 5-10. On these tables, the underlined areas are where YOY and yearling fish have been separated. There is likely some overlap between categories for juvenile steelhead in the later period Trap operators were able at times to identify fish within the same length category as either YOY or yearling steelhead. Operators did take photos of side by side fish of equal length

Creek Tendle Num N	Table 5		l ength	Frequer	ncy Dist	ribution	of Juv	enile Co	ho Sain	non Tra	pped in	1 Camp	bell		[
Image Image <th< th=""><th>Table 5</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>	Table 5																
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1.000 1.0000 1.000 1.000 <t< th=""><th>Fork</th><th>Marsh</th><th>March</th><th>March</th><th>40mil</th><th>April</th><th>April</th><th>April</th><th>Mav</th><th>Mav</th><th>May</th><th>Mav</th><th>Mav</th><th>June</th><th>June</th><th>June</th><th>June</th></t<>	Fork	Marsh	March	March	40mil	April	April	April	Mav	Mav	May	Mav	Mav	June	June	June	June
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B283		10-10	17-23	24-30	31-0	7-13	14-13	23-21	20-4		12.10						
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Table 6		i enath	Freque	ncv Dist	ribution	of Juve	enile Sta	elhead	Trappe	d in Ca	mpbell					
Table 0			Ten Mile													
		CIBER,		5 1 (176)	Duon t in	1000										
		_														
															huma	
Fork	March	March	March	April	April	April	April	May	May	May	May	May	June	June	June	June
Length	10-16	17-23	24-30	31-6	7-13	14-15	23-27	28-4	5-11	12-18	19-25	26- 1 2	2-8 1	9-15	16-22	23-30
23-25		9	36 1255	886	2088	118	112 2020	263	106	148	251	48	17	1		
28-28 29-31		19	2438	2460	3237	78	3031	1053	438	213	223	76	3	· · · · ·	1	1
32-34		5		49	209		337	226	211	174	77	28	1	3	2	2
35-37								19	8	19	58	4	2			1
38-40									16	13 13	14		1	1	1	2
41-43	1								16	19	7		1		·'	2
44-48 47-49										19	7		4	1	1	1
50-52									8	26	14	4	4	2	2	1
53-55	1						2		8	26	21	10	7	12	2	1
58-58	2		1		1		1				14	2	5	3	2	2
59-61			2	1	4	1	4		2		2	2	1	5	'	
62-64 65-67	1	2	2	1	3		1		6	6	2		1	1	2	1
68-70	1	3		2	11	2	2	5	8	9	1		2	1		
71-73	1	2	2	2	3	3	2	1	11	9	4	<u>-</u>				
74-76	4	2	1	4	14	3	11 2	5	32 23	18 18	7	<u>6</u> 2	4	3	1	
77-79 80-82	5 1	2		3	16 3		2	12	23	10	3	5	6	3	2	
83-85	2				6	2	9	9	19	21	10	10	5	4	1	1
88-88	3	1	1	2	5	4	3	6	13	13	4	7	5	1		
89-91	2			1	7	1	2	2	20 9	1 8 8	5	6 1	8	1	1	
92-94 95-97	1		1	4	3	1	1	4	11	5	3	4	3	2		
98-100	2			2	6	·	5	2	4	6	3	3	2	3	1	1
101-103		1			2			2	2	2	1		1	1		
104-108				2	2		1	1	3	2	4		1	2		
107-109		1	1	4	2		2	2	3	3	<u>6</u> 2	2	2		3	<u>'</u>
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122-124					1		1		1	1	2	0	1		1	
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AVE y+	81.2	75.2	76.7	99.2	89.1	83.4	84.7	85.1	84.6	86.6	99.4	95.5	98.6	98.4	102.0	97.0
SUM YOY		33	3728	3395	5534	196	5500	1560	812	671	684	181	51	35	14	14
AVE Y+		29.6	28.9	29.3	29.0	28.2	29.0	30.0	31.3	33.3	32.0	32.6	39.4	51.9	50.1	45.2

Table 7.		1996	Lenat	h Fred	quenc	y Distr	ibutio	n of J	uveni	le Coh	o Salı	mon ir	n Smit	h	
L HALL LA		Creek	Ten	Mile I	River	Basin									
		0.001	.,												
	-														
Fork	March	March	April	April	April	April	May	May	May	May	May	June	June	June	June
		24-30				21-27		5-11	12-18	19-25	26-1	2-8	9-15	16-22	23-30
26-28	LL 20	2100													
29-31		4	11							2					
32-34	1	20	15	93		5	6								
35-37	20	171	45	1053	124	90	14	10							
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41-43							26	1	24						
44-45								10	23		1				
47-49								10				1		·	
50-52											2	1	1		
53-55							6								
56-58										<u>-</u>	1	2	2		
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62-64															
65-67												0			1
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74-76 77-79															
80-82															
83-85															
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98-100			1	2		1	2								
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182-184														 	
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188-190															
SUM Y+	0	0	2	12	3	4	11	7			0	0	0	0	
AVE Y+			93.0	108.8	109.0		109.6	118.3	147.0	156.0					
				1.000		101			70	6	4	4	4	0	1
	25	268	94	1486	207	191	78	41							
SUM YOY	36.4		35.6	36.5	37.2	37.4	40.2	42.0	42.0	43.0	51.0	53.3	51.0	1	69.0

Lange Di-16 22-23 29-30 29-40 11 14-20 21-27 28-47 12-16 19-25 28-1 28-8 9.15 19-27 2 28-91 2 307 20-8 224 350 306 293 66 7 10 3 -	Table 8	1	19 96 L	ength Fi	requenc	y Distril	oution o	f Juven	ile Stee	lhead ir	n Smith						
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155-160 3 1 1				1	1												
101.163 2 1 </th <th></th> <th></th> <th><u> </u> </th> <th></th> <th></th> <th></th> <th>1</th> <th></th>			<u> </u>				1										
184-166 2 1 </th <th></th> <th><u> </u></th> <th> </th> <th></th> <th></th> <th>3</th> <th></th> <th>1</th> <th>1</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>		<u> </u>				3		1	1								
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173-175 1 </th <th></th> <th>+</th> <th>∤∤</th> <th></th> <th></th> <th></th> <th><u>_</u></th> <th></th>		+	∤ ∤				<u>_</u>										
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191-193 1 1 1 252 1 104 23 17 144 174 307 92 63 100 57 19 SUM Y+ 0 7 15 34 104 23 17 144 174 307 92 63 100 57 19 AVE 97.7 96.8 117.2 103.4 101.7 110.3 93.1 95.2 90.0 88.5 91.9 92.7 90.0 107.4 SUM YOY 0 2 808 6611 11848 415 1199 2562 100 84 106 28 25 29 15 SUM YOY 0 2 808 6611 11848 415 1199 2562 100 84 106 28 25 29 15			<u> </u>			1											
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SUM Y+ 0 7 15 34 104 23 17 144 174 307 92 63 100 57 19 AVE 97.7 96.8 117.2 103.4 101.7 110.3 93.1 95.2 90.0 88.5 91.9 92.7 90.0 107.4 SUM YOY 0 2 808 6611 11848 415 1199 2562 100 84 106 28 25 29 15		1														1	
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AVE 97.7 96.8 117.2 103.4 101.7 110.3 93.1 95.2 90.0 88.5 91.9 92.7 90.0 107.4 SUM YOY 0 2 808 6611 11848 415 1199 2562 100 84 106 28 25 29 15	SUM Y+	0	7	15													19
SUM FOT 0 2 300 3011 1040 415 100 202 00 01 0 0 0 0 0 0 0 0 0 0 0 0 0					117.2	103.4	101.7	110.3	93.1	95.2	90.0	88.5	91.9	92.7	90.0	107.4	115.9
SUM FOF 01 2 300 0011 1000 110 100 202 000 01 0 0 00 10 00		ļ															
		0															18 53.3
		1	30	28.1	29.0	29.5	29.8	29.7	29.9	30.9	31.3	31.5	36.2	42.6	43.0	52.8	55.5

Table 9								rapped	in the	South F	ork of th	e				
		Ten Mil	e River	Basin ir	1 996 ,	by Wee	<u>k</u>									
Fork	March	March	March	April	April	April	April	Мау	Мау	May	May	May	june	June	June	June
	10-16	17-23	24-30	31-6	7-13	14-15	23-27	28-4	5-11	12-18	19-25	26-1	2-8	9-15	16-22	23-30
Length 23-25	10-10	17-25	24-30	31-0												
26-28																
29-31																
32-34																
35-37									1							
38-40 41-43									1							
44-46										1						
47-49												1	1			
50-52									1	1			1	3		
53-55									!					1		
58-58 59-61														1		
62-64														1		
65-67										1				1		
68-70									1	1						
71-73													1			
74-76 77-79					·	<u>├</u>										
80-82																
83-85										ļ						<u> </u>
86-88										<u> </u>						
89-91 92-94																
92-94																
98-100									l							
101-103																
104-108										<u>}</u>						
107-109																
113-115		<u> </u>														
118-118										1						
119-121										 						
122-124																•
125-127 128-130									1							
131-131									İ.							
134-136										2						
137-139								ļ	<u>-</u>	3						
140-142						ļ			2	1						
143-145										2						
148-148 149-151									1	1						
152-154										ļ		1				ļ
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158-160		 				<u> </u>			1	2						
161-163 164-166										<u> </u>						
167-169		1								1						
170-172																
173-175										<u> 1</u>						<u> </u>
178-178		+							<u> </u>	+						<u> </u>
179-181 182-184										<u> </u>	<u> </u>					
185-187																
188-190																
191-193																<u> </u>
194-196						↓			<u> </u>	<u> </u>						<u> </u>
197-199		<u> </u>				<u> </u>										
200-202 203-205		+				1										
203-205																
		ļ							6	16	0	1	ō	0	0	<u> </u>
VE LEN	0	0	0	207	0		0					154				
VE LEN		1								1					0	
UM YOY	0	0	0	0	0	0	0	0	5	. 57.8		47.0				54

Table 10		Length	Freque	ncy of J	uvenile	Steelhe	ad Trap	ped in	the Sou	th Fork	of the					
						by Wee										
Fork	March	March	March	April	April	April	April	May	May	May	May	May	June	June	June	June
Length	10-16	17-23	24-30	31-6	7-13	14-15	23-27	28-4	5-11	12-18	19-25	26-1	2-8	9-15	16-22	23-30
23-25												2			1	1
26-28									284	115	32 280	36 93	1 27	19	5	1
29-31 32-34									1786 345	1149 287	200	93	17	24	12	1
35-37									61	29	11	4	9	15	15	3
38-40									20	57	11	2	5	7	14	7
41-43						ļ				29	<u>11</u>	2	6 5	7	12 21	8 13
44-46 47-49									0				8	11	18	28
50-52										2		2	13	22	33	36
53-55									1	0	11		8	11	30	27
56-58		ļ							4	4	<u> </u>	2	1	12 7	36 10	<u>34</u> 21
59-61 62-64									1	7		1	4	4	10	13
65-67									9	27	3	1	9	2	9	7
68-70									14	43	4	4	28	8	5	7
71-73									11 25	40 60	14 5	11 23	29 49	14 13	5 10	9
74-78						<u>}</u>			15	60	6	17	43	25	13	6
77-79 80-82									11	42	15	24	36	28	8	9
83-85									12	42	18	20	49	18	14	11
86-88									10	33 17	11 4	27 12	45 30	12 15	20 16	11 4
89-91 92-94									9 8	20	4	16	26	9	10	3
92-94 95-97						1			8	19	8	6	21	13	10	4
98-100									5	12	1	3	18	5	6	5
101-103		ļ							3	6	1	14	9	9 2	2	1
104-108 107-109										8	3	1	9	2	3	3
110-112				<u> </u>		1			2	9	1	5	7	2	2	
113-115									2	2	1	4	8	4		
116-118				ļ						5	1	2	2	1	1	1
119-121				<u> </u>		·····			1	2	1	5	3		1	
122-124 125-127									2	2	1	2	2	2	1	•
128-130		1							1	1	3	2	2			1
131-133						ļ				1		1	3	1	1	<u> </u>
134-138					<u> </u>				1	'		1	1			
137-139 140-142									<u> </u>	1			2	1		
143-145												1	1			
146-148																
149-151									 				1			
152-154 155-157						<u> </u>			<u> </u>							
158-160]
161-163			ļ		ļ			<u> </u>		 					1	┟────┥
164-166 187-169		+		<u> </u>		 									'	
170-172		<u> </u>														
173-175																
176-178		ļ						ļ	 							i
179-181 182-184		 			<u> </u>	<u>+</u>										
185-187																
188-190																l
191-193	L															
194-196 197-199						<u> </u>										
200-202																
203-205																
206-208				ļ					 							
SUM Y+	0	0	0	0	0	0	Ö	0		479	108	208	452	184	132	67
AVE LEN						ļ			73.1	73.0	74.7	75.7	75.0	74.8	76.1	75.9
SUM YOY	0	0	0	0	0	0	0	0	2496	1668	431	154	111	153	229	218
VE LEN		· · · · ·				<u> </u>			30.3	31.0	31.9	30.5	41.5	44.1	49.8	53.4

to show differences. The separation in these tables is determined from length frequency distributions and not from operator determinations since such observational differences were not always apparent or not made by all trap operators.

What is most interesting is the lengths of Y+ coho. There appear to be three or even four length groups evident. The YOY are clearly separated from older fish. These fish average about 35 mm when first showing up in traps and reached lengths in the mid-50's range by mid-June. Campbell Creek YOY coho appeared to grow slightly faster than The second group of fish had lengths from 90 to 120mm fork those in Smith Creek. length and was represented in both Smith and Campbell Creek but not really represented in the South Fork this year. The third group had lengths from about 130 to 160mm in length and was most heavily represented in the South Fork but in Smith and Campbell as well. The other grouping, represented by a single fish, is a 207mm coho found in Campbell Creek. The second group, from 90 to 120mm, is the length most commonly associated with coho smolts (see Table C-2, NMFS, 1995). This third group is relatively large for Y+ coho which lead to suspicion that they were coho which had spent a second year in fresh water. To determine if this was the case, scales were taken from several individuals for aging. The scale growth patterns were quite even throughout and showed no tight pattern indicative of slow winter growth. Scales did not confirm or discount the possibility that fish spent two years in the stream.

Another perhaps more plausible explanation for this third group's existence is that their parents may have spawned considerably earlier than the other group's. These larger coho tended to be primarily in the South Fork where earlier spawning is more likely to occur due to flow limitations typical in tributary areas. Some of the progeny of early spawning fish may have sought out cooler tributary flows during the summer and may have entered and remained in Smith and Campbell Creek to rear. The last group, represented by the single 207mm coho, would be best explained as a 2nd year freshwater fish. No scales were taken from this fish.

The steelhead YOY start out smaller than coho, averaging around 29mm. There is very little growth apparent through April and then fairly steady growth there forward Some of this apparent lack of growth may be a long duration of emerging fry which keeps down the average size. There is evident of two groups of emergent fry, early and late emerging fish. This is especially evident in Campbell and to a lesser degree in Smith Creek

The largest yearling or older steelhead were found in Smith during the early portion of trapping. It appears that the largest and likely oldest fish emigrated early. The late

portion may consist of primarily age 1 and/or slower growing individuals. The average lengths of Y+ steelhead in the South Fork were considerably smaller (about 20mm less) than in either Smith or Campbell Creek.

Populations of Outmigrants

To estimate the total population of outmigrant coho and steelhead two parameters need to be developed: 1) an estimate of the number of fish that would have been trapped on days when traps were not operational, and 2) the efficiency rate of the traps. To estimate the first parameter, the average daily catch for a week where data is missing is multiplied by the fraction of the days in that week that were trapped. For example, during the week from March 11-17 in Campbell Creek, where 4 days of trap operation netted 25 steelhead, the total estimate for the week would be:

$$(25/4) \times 7 \text{ days} = 44 \text{ Steelhead} \text{ Y+}$$

If only a single day of data was available, the daily average from the previous and flowing week were averaged to make the week estimate.

With these expansions, the estimated number of fish that would have been captured for the duration of the actual trapping period for Campbell, Smith Creek and the South Fork is shown below. The Smith numbers are for the full duration trapped at Campbell Creek and for SF the estimate shown is for the period from April 29 through July 1. Smith Creek numbers were extrapolated for the first two weeks from Campbell Creek data by comparing Campbell and Smith data in late March and early April period.

	<u>CampbellCreek</u>	Smith Creek	<u>So</u> u <u>th Fo</u> rk
Coho YOY	5,493	4,410	59
Coho Y+	10	58	42
Steelhead YOY	27,189	41,387	6,815
Steelhead Y+	1,030	2,428	2,152

Assuming that the outmigration timing in the SF is similar to that in Smith & Campbell Creeks, the fraction of salmonids emigrating after April 28 (averaged for Smith and Campbell Creeks) is used to estimate to total number of salmonids that would have been trapped in the South Fork from March 10 to July 1. This would be:

Table 11

Number of Marked and Recovered Coho and Steelhead in Campbell and Smith Creek and the South Fork Ten Mile River in 1996

							SMITH Coho	CREEK	head	SOL Cot		RK TEN N Steel	
Date		Marked	Coho Recov	Steel Marked	Recov							Marked	
April	567 8910 111 123 14 15 18 17 18		0 0 0 0	21 23 23 16 21 9 8 7	0 10 9 8 9 3 4 3 4 9	1 2 4 2 2 2 2 1	1	3 8 13 18 15 18 15 15 15 12 11 13	1 7 7 11 6 5 3 3 3				
	19 20 21 22 23 24 25 26	۱	0	13 27 11 0	4 16 3	2	2	12	3 16				
May	27 28 29 30 1 2 3 4	0 1	0	6 0 7 9 6 11 20 29	3 0 4 6 8 1 4 8	1 2 2 2 1 1 1	2 1 2 3 2	6 7 18 31 29 25 23 17	1 6 8 14 17 23 20 17	1		2 20	
	5 6 7 8 9 10 11 12 13	1	1	29 28 34 6 25 9 15 9 7	9 11 16 3 6 1 0 0	1 1 1 1 1	1 1 1 2 1 1 1	26 29 16 18 17 26 29 33	9 11 18 6 11 11 21 14	1 1	1	1 24 12 19 5 8 18	2 8 3 7
	14 15 16 17 18 19 20 21	o	0	2 0 1 22 80 34 5 7	4 0 3 2 42 11 6 8	t	1	32 39 25 18 31 11 8 10	38 17 21 12 8 11 6 10	1 3 1	2 1		10 3 15 46 1 9
	22 23 24 25 26 27 28 29 30			1 22 0 6 7 15 0 5	4 8 10 3 1 2 4 4 0	t	1	20 6 9 6 5 9 1 4 2	24 8 5 6 5 1 1 2 3	1		28 21 10 4 33	2 5 3 6 5
June	31 1 2 3 4 5 6 6 7 8 9 10 11 12 3 4 5 6 6 7 8 9 9 10 11 12 13 14 15 16 16 17 18 19 201 21 22 23 24 22 23 24 25 26 20 20 10 11 12 22 23 24 25 26 20 20 20 20 20 20 20 20 20 20			1 10 4 9 2 3 2 2 2 3 8 3 1 4 2 2 2 3 8 3 1 4 2 2 2 10 4 9 2 3 2 2 2 3 8 3 1 4 1 2 10 4 9 2 3 2 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 10 4 9 2 3 2 2 3 1 1 4 1 4 1 4 1 1 4 1 1 4 1 1 1 1 1 1	0 2 1 4 3 0 0 0 0 0 2 2 2 1 1 1 1 1 2 2 2 2 1 1 1 1			7 9 11 9 17 10 23 3 3 2 6 6 4 8 2 5 0 2 0 2 4 2 2 2 1 3 2 2 0 2 0 2 0 2 0 2	1 4 7 7 8 6 6 4 4 5 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			24 9 34 57 11 44 6 13 4 18 18 18 18 18 18 12 17 6 11 26 11 25 2 3 0 0 4 2 0	10 6 4 6 15 7 11 3 2 2 1 3 7 5 5 1 0 1 1 2 3 2 8 1 0 1 0 0 0 0 2
July SUM	1	7	2 29. 0%	700	303 43.3%	37	24 64.9%	879	540 61.4%	19	4 21.1%	895	232 25.9%

Coho YOY	1,685
Coho Y+	104
Steelhead YOY	35,039
Steelhead Y+	4,091

The figures above don't account for the fish that would pass traps uncounted while traps were operational. To account for these fish, the recapture rate of marked Y+ fish is used. Table 11 shows the number marked and recaptured at the South Fork, Campbell, and Smith Creek traps. The recapture rate for Campbell Creek was surprising low. The trap was assumed to be quite efficient due to trap configuration and the small size of the stream. Weir panels were adjusted a couple of times for various reasons, but efficiency remained low until the last two weeks. Smith Creek trap also operated less efficient than expected. Low efficiency was expected in the South Fork trap due to high flow conditions encountered during operations. Using the listed recapture rates at the bottom of the Table, the number of Y+ fish that moved downstream past the trap sites were determined and are shown below:

Total Number of Salmonids Estimated	to Travel past Outmigrant Trap Site
-------------------------------------	-------------------------------------

	Campbell Creek	Smith Creek	South	F o r k	<u>Total</u>
Coho Y+	34	89	493		616
Steelhead Y+	2,379	3,954	15,795		22,128

Little North Fork Noyo Trapping Operations

The LNF trap was installed on March 7th. The trap was operated continuously through June 18th for a total of 103 days. The trap was located approximately 1/2 mile above the mouth and about 100 yards above a logging road bridge. The trap was installed by Dave Manning of Humboldt State University with assistance from Georgia Pacific Corp. and Salmon Trollers Marketing Association. There were 408 Y+ **coho** and 556 Y+ steelhead trapped. YOY **coho** numbered 1,341 while YOY steelhead numbered 1,829. The YOY counts are not comparable to the Ten Mile YOY counts due to the larger (1/2") screen used in weir panels. Two adult steelhead were trapped and released this year.

Mortalities were higher at this trap compared to those in Ten Mile due mainly to trapping consistently through changing flow conditions. Rapid changes in flow resulted on a couple of occasions fish becoming stranded on McBain Ramp. This was primarily a

problem where flows increased significantly and an insufficient amount of water was able to pass through ramp perforations (upper segment of perforated tray was covered to increase flows into livecar during prior low water condition). This elevated the water level in ramp and allowed fish to jump over and become entrapped in material used to seal upstream end of ramp. About half of the total losses of Y+ fish occurred in a single event.

Only three sculpin were trapped this season, including both a prickly and coastrange specimen. No sticklebacks or lampreys were observed. The number of yellow-legged frogs, 48, were considerable higher here than in other traps. A few giant Pacific salamanders, a single newt and an aquatic garter snake were also trapped.

Relatively low numbers of Y+ coho were observed up through the first week of April and after May 20th. Peak numbers occurred between the first and third week of April. No Y+ coho were trapped in June. For Y+ steelhead, the peak occurred around mid-April. Coho emigration timing was quite similar between the LNF and the SF Ten Mile tributaries but the steelhead were about a month earlier here than in Ten Mile tributaries. Coho YOY were present in trap on first day of operation and peaked from mid-March through the first week of April somewhat earlier than Campbell Creek but similar to coho in Smith Creek. The first steelhead YOY came on March 26, 2 days later than in Smith Creek and 5 days later than Campbell. Pacific giant salamander numbers were fairly consistent throughout the period while frogs were trapped primarily in the Month of April which was a bit later than in Ten Mile.

Little North Fork Salmonid Lengths

The length frequency of LNF juvenile coho and steelhead are shown on Tables 12 & 13, respectively. Y+ coho in LNF tended to be about 1 Omm smaller than those in Campbell. or Smith. There was also a clear difference in the size of emerging steelhead fry in LNF. Here, these fish averaged only about 26mm compared to 29mm in Campbell and Smith.

LNF Populations of Outmigrants

The number of outmigrants in the Little North Fork is estimated here by expanding the number trapped by the fraction recaptured Table 14 gives the number coho and steelhead marked and recaptured. The recovery of marked Y+ coho and steelhead is 90.5 and 72.3 percent, respectively. Utilizing these figures, an estimated 450 Y+ coho and 770 Y+ steelhead moved downstream past the LNF outmigrant trap in 1996.

Table 12			Lengt	h Frec	uency	Distri	bution	of Ju	venile	Coho	Salm	on Tra	pped	in the	LNF	
			Novo	River	Basin	in 19	96 by 1	Week								
	<u> </u>				T		<u> </u>	1								
	·	 						<u>↓</u>		[<u> </u>		
											ļ					
Fork	Merch	March	March	March	April	April	April	April	May	May	May	May	May	June	June	June
Length				24-30		7-13		21-27	28-4	5-11	12-18		26-1	2-8	9-15	16-22
the second second second second second second second second second second second second second second second s	8-9	10-16	17-23	24-30	30-0	1-13	14-20	21-21	20-4	3-11	12-10	13-23	20-1	2-0	3-13	10-22
23-25 26-28	<u> </u>	<u> </u>						}								
29-31	<u> </u>	8			6						<u>}</u>					
the second second second second second second second second second second second second second second second s	11	41	20	14	18	2					1					
32-34 35-37	41	107	184	129	71	10	2		1		·'					
38-40	16	47	67	108	138	63	11	18	2	1	2	1	1	<u> </u>		
41-43	7	47	0/	100	130	10	10	23	7	2	7	8	2	2		<u> </u>
	<u> </u>						4	- 23	3	6	6	10	4	2	2	
44-46	<u> </u>						4			3	5	6	3	5	2	
4/-49 50-52							1			1	2	5	5	10	2	
53-55							'			1	2	1	2	5	3	
<u></u> 58-58										 '			1	1	1	
59-61	<u>}</u>	1											<u>`</u>	├ <u>'</u> -	<u> </u>	
		1				1										i
62-64 65-67	1	<u>├' </u>		1		1										<u> </u>
68-70	<u> </u>	1		'		4	2	1								
71-73		1	2		2	1										· · · · · · · · · · · · · · · · · · ·
74-78		·'		2	1	3	8	3	2	1	1					
77-79			1	1		2	11	2	1	2	6					
80-82			1	1		7	17	11	2	5	1					
83-85			<u>`</u>	i	4	7	14	11	6	5	6	1				
86-88			1		1	8	7	5	5	3	3	2				,
89-91				1		9	14	12	14	5	5		2			
92-94				2	1	3	5	2	10	3	11	1				··
95-97						3	5	2	7	8	8	2	1			,
98-100			1		1	1	3	2	2	4	2					
101-103							3	1	2	1						
104-106						2		1	1		2					
107-109	1						2	1	1	1	1					
110-112	<u> </u>				1	2	2				1					
113-115							1	2	2	1						
118-118						1										
119-121						1					1					
122-124									1							
125-127							1									
128-130																
131-133																
135-137																
138-140								'			'					
SUM Y+	2	4	6		11	56	95	58	56	39	49	7	3	0	0	0
AVE LEN	84.0	63.0	78.5	78.4	82.9	83.7	83.8	85.1	89.1	87.6	89.1	87.4	89.0			
					394			51	13	14	25	- 30	18	25	10	
SUM YOY	72 35.2	203 33.0	271 33.5	264 34.5	231 34.4	86 35.4	28 38.1	38.6	38.8	42.9	42.0	44.3	45.2	47.0	47.7	

Table 13			l engt	h Freg	LIEDCY	Distri	hution	of Ju	venile	Steelt	head 1	rappe	d in th	e LNF	:	
Table 12			Noyo	River	Basin	in 199	6		V C I III C	0100		Tappe			,	
Fork	March	March	March	March	April	April	April	April	May	May	May	May	May	June	June	June
Length		10-16		24-30	30-6	7-13	14-20		28-4	5-11	12-18	19-25	26-1	2-8	9-15	16-17
23-25										2		1		1		
26-28				50	213	49	4	12	9	60	13 54	2	3	2	2	
29-31 32-34				67	235	140	4 6 7	211 53	132 22	256 17	19	12 6	5	3	2	
35-37							<u> </u>			4	4	3	4	5	4	
38-40								2					2		2	
41-43												1			7	1
44-46 47-49		1							2		2	1	1	11 9	3	'
50-52		· ·											3	8	9	
53-55								1					1	6	4	
58-58			1						1						1	
59-61 62-64		1				1	1	2					1			
65-67						·····	· ·	1			1					
68- 70					1		1		1		. 1					
71-73		ļ			<u> </u>	2		2		1		1		1		
7 4-76 77-79	1	2			1	1	1	1	1 1	1	2			2		
80-82			1	1	1	2	1	1	3	1	1			1		
83-85			4		1	4	2	1	4							
86-88		<u> </u>	2	1 5	2	1 8	7		3	1	2	2	1			
89-91 92-94		1	4	8	2	10	4	2	2	2	2	1	1			
95-97			9	4	2	14	7	1	4	3	4					
98-100		2	4	7	6	15	14	1	3	3	3	5	1			
101-103 104-106			5 4	4	1	<u>4</u> 10	6 5	1	1	2 4	5	2				
107-109		1	4	4	2	3	8	1	2		2					
110-112		1	2	1	3	7	10		2	1	2	4				
113-115			2	3	4	5	8		7	3	4		1			
118-118 119-121			8 2	3	1	3	3	1	1	1	4	2				
122-124			2			2	3		1	3	1					
125-127				2	2	4	1			1	1	3				
128-130				1	1	3	1	1		1		2				
131-133 134-136			1	1	1	2	2	1	1		1					
137-139			'				2	1				1				
140-142					1	1						2				
143-145		ļ					2									
146-148 149-151				1			1									
152-154				1								1				
155-157										1		1				
158-180					1				1			1				
161-163 164-168					1											
167-169					'							1				
170-172							2]
173-175																
176-178 179-181						1				1	1					
182-184																
185-187							3									
188-190							1	1								
191-193 194-196					1											
197-199				1												
200-202																
203-205	1															
206-208					1											
SUM Y+	2 137.5	9 77.7	52 97.3	58 94.6	43 93.1	103 96.4	110 93.8	21 81.4	43 92.5	32 94.2	37 97.1	32 84.9	6 78.0	4 74.3	0	0
														_		
SUM YOY	0	0	0	117 25.7	448 25.6	189 26.2	57 27.2	278 27.5	165 26.9	339	92 27.8	28.2	23 37.0	45	43 41.8	2 43
AVELEN				23./	23.0	20.2	61.6	41.3	40.8	40.3	41.0	20.2	91.0	-+1.V	71.0	

Table	14		The Number	of Marked	and Recapt	ured Co	ho and S	Steelhead Y	earlings		
			in the Little M	North Hork N	ioyo River in	1996,	by Date				
			pho	Stee	head			Co	ho	Steel	head
						Da	te	Marked	Recov	Marked	Recov
Da March	8	Marked 1	recov	Marked	Recov	May	16	Markeu 2	6	0	
THEFT	- 9	i	ō	1	Ō		17	6	5	4	
	10	3	1	0	Ó		18	5	9	5	
	11	0	0	2	0		19		2	3	
	12	1	0	0	0		20 21	3			
	13	0	0	0	0		22	3		15	1
	15	0	0	<u>0</u>	0		23		1	• 3	
	16	0	0	5	Ō		24			1	
	17	0	0	2	1		25		1		
	18	0	0	5	1		26			2	
	19	4	0	9	4		27	1	1		
	20	1	2	6	4		28	1			
	21	0	0	5	3		29 30	1			
	22	1	2	12			31		1		
	23	0	0	6	5	June	1			2	
	25	1	Ő	13	2		2			1	
	26	1	1	7	3		3				
	27	0	0	4	1		4				
	28	2	1	10	19		5				
	29 30	1	0	8	5 0		7				
	30	0	0	4	0		8				
		<u>0</u>	1	11	12		9				
	2	1	0	3	2		10				
	3	0	1	5	3		11				
	4	0	0	4	2		12				
	5	0	0	4	3		13				
April	6	3	0	7	4		15				
	7	13	3	12	4		16				
	9	5	6	13	2		17				
	10	7	8	17	7		18				
	11	10	2	16	3		19				
	12	7	15	14	13		20				
	13	9	2	13	3		21 22				
	14	10 8	7	11 17	<u>11</u> 7		22				
	16	36	9	50	59		24				
	17	19	10	12	10		25				•
	18	7	23	6	23		26				
	19	10	7	3	8		27				
	20	4	7	3	4		28				
	21	4	7	1	1		29 30				
	22 23	6	13	3	2	July					
	23	16	4	4	4		SUM 1	378	342	492	35
	25	14	15	3	3				90.50%		72.30
	26	6	14	2	3						
	27	4	8	2	2						
	28	7	4	4	4						
	29	9	6	4	6 6						
10-	30	4	10	8	2						
May	2	5		7	9						
	3	12	10	4	7						
	4	13	6	6	3						
	5	9	12	6	6						
	6	8	4	4	1						
	7	7	15	2	1						
	8	6	5	6 5	1				+		
	9	· 2 4	9	5	2						
	11	4	5	2	5						
	12	10	5	5	2						
	13	11	7	7	7						
	14	2	6	. 4	1						
	15	8	14	0	2		T				

DISCUSSION

COMPARISONS TO 1995

South Fork Ten Mile

The South Fork trap in 1995 was located below Campbell Creek whereas this year it was above Campbell Creek so the two years data are not comparable unless the South Fork and Campbell data are combined. This year's estimate of 493 coho smolts in the South Fork and 34 coho smolts in Campbell Creek compare to an estimate of 2 1 in 1995, approximately a 25 fold increase in 1996. The number of Y+ steelhead was also up considerably. Trapping efficiency for steelhead in 1995 was about half of what it was in 1996. There were 211 trapped in 1995 compared to 1,728 this season. There were additionally about 670 Y+ steelhead trapped in Campbell Creek during the same period, indicating there was roughly a 6 fold increase in 1996, may have contributed to this apparent increase in production of salmonids.

In 1995, there were no coho in the upper size ranges observed in 1996. The largest coho found was 122 mm in 1995. The steelhead were comparable in size both years.

Little North Fork

The estimate of Y+ coho passing the trap site after April 24, 1995 was 108. The comparable estimate this year is about 215. Coho in 1995 were about 6mm longer than in 1996. This size difference could possibly be due to increased competition due to an increase in population density or a later emergence in 1996. Larger yearlings might have been expected this year due to the improved summer flow conditions in 1995 compared to summer of 1994 but the opposite situation occurred. An increase in the number YOY produced in 1995 compared to 1994 could have played are role here as well although there is no data to show whether or not this was the case. No spawning escapement data is available for either year in this stream nor is there any information on spawning timing.

Spawner Survey Data in Ten Mile in 1995-96

Spawning coho salmon were noted as early as the 23 of December (Maahs, 1996) in the SF. Coho were seen through the second week of January. The population was estimated to be around 52 fish. Spawning activity was found on Smith Creek on December 26 but no activity was noted in Campbell until the third survey on January 6. Spawning coho were evident through mid-February on both tributaries. Coho spawning numbers were estimated at around 14 fish in each of these tributaries.

It would be expected that coho YOY would have emerged earlier in Smith than Campbell but due to the later installation of the trap in Smith Creek this could not be verified. The peak numbers of coho YOY trapped occurred a week later in Smith than Campbell which is the opposite of what would have been expected based on spawning survey information. It is possible the fish in Smith spawned farther upstream and the later trapping peak reflects the distance upstream fish spawned more than when spawning occurred. The numbers of YOY trapped in Campbell were about double that in Smith even though spawning estimates were similar. This could be related to amount of habitat available or possibly that the population estimate in Campbell Creek underestimated the population relative to Smith Creek. One of three methods used to estimate spawner population, the mark/recovery of carcasses estimated twice as many in Campbell while live fish counts suggested 1.5 times as many in Campbell creek. Redd based estimates suggested less in Campbell Creek.

Steelhead YOY first appeared in Smith and Campbell Creek traps March 24th and 21st, respectively, and generally, about two weeks later than coho. No live steelhead or steelhead carcasses were observed on either Campbell or Smith Creek in 1996. It appears that in early February through mid-March, based on numbers and timing of YOY steelhead in traps, good numbers of steelhead did spawn in Campbell and Smith Creek. Low numbers of redds were observed in Campbell and Smith Creek in February and were primarily found in the first half of February. High flows in the later half on the month limited surveys. It appears from steelhead YOY counts that considerable steelhead spawning did occur in the later half of February and early March that was never detected by either live fish or redd counts. The high flow period limited surveys and likely made redds constructed during this period indiscernible.

Adult Coho Trapping

An adult coho trapping operation carried out by Salmon Restoration Association, Inc. was located in the South Fork Ten Mile River approximately 1/2 mile downstream of the mouth of Campbell Creek and approximately 1 mile above Smith Creek. At this site, 7 females and 5 males were taken for brood stock purposes. These fish were destined for either Campbell, the South Fork or other upstream tributaries to spawn. One of the purposes of this survey was to develop information to help evaluate what impact the trapping program had on natural production in the basin.

It does not appear that the trapping program had a negative impact on Campbell Creek coho production due to large number of YOY coho outmigrating from this relatively small tributary. The fact that thousands of YOY coho were emigrating from Campbell Creek indicates the habitat was fully seeded. The same can not be necessarily be said for Coho YOY in SF Ten Mile. Here, the number of coho YOY were only about 1/4 that in Campbell Creek for the period when the SF trap was in operation. While lower trap efficiency and earlier emergence in the SF might partially explain the lower number of coho YOY trapped in the SF, there was clearly, when considering the relatively large size of the SF, a lower density of coho YOY outmigrants. Whether or not lower coho smolt production will occur next spring through a brood stock collection induced reduction in YOY coho this year, will depend on the amount of suitable summer and winter habitat available in the system. The appearance of YOY outmigrants in the SF does indicate significant numbers were produced

Due to losses suffered at the hatchery facility during storm events this winter, no planting of coho will be made into the SF from this brood. Had progeny of trapped fish survived and been planted into upstream areas, where fish have not been found in recent years and where good habitat is believed to presently exist, there would have significant benefit from trapping operations. While this did not occur this year, the opportunity still remains to increase natural production in the basin by reestablishing runs in the upper basin through fish propagation efforts. This may also occur naturally given sufficient time where large enough spawning runs occur, to allow for straying, and high enough flow conditions occur, to allow passage.

LITERATURE CITED

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APPENDIX 1 (Continued) LENGHT & WEIGHT DATA

LITTLE NORTH FORK NOYO RIVER COHO YEARLINGS+

	March		March 2		April		April 21	I-May 4	May	5- 18	May 19	June 1	June	2-15	June 16-July 1
1	Length	Grams	Length 73	Grams 5	Length 62	Grams 4	Length 80	Grams 5	Length 78	Grams 4.5	Length 95	Grams 9	Length	Grams	Length Grams
2			75	5	62 65	4	82	5	76	4.5	90	3			
3			84	5	70	4	80	5	84	5					
4 5			83 73	7 8	75 73	4 5	76 85	5.5 6	79 79	5 5					
6			85	9	75	5	80	6	78	5.5					
7			93	10	77	5	90	6	80	6					
8 9			112	10	82 80	5 5	80 82	6 6	76 81	6 6					
10					82	5	81	6	80	6					
11					80	5	80	6	80	6					
12 13					76 80	5.5 5.5	80 81	6 6	83 87	6 7					
14					76	5.5	79	6	89	7					
15					78	6	80	6	84	7					
16 17					82 82	6 6	81 85	6 6.5	96 90	7 <u>.5</u> 8					
18					83	6	86	7	82	8					
19					83	6	82	7	85	8					
20 21					84 85	6 6	85 90	7 7	88 90	8 8					
22					90	6	90	7	91	8					
23					90 85	6	85 83	7 7	93 95	8					
24 25					85 80	6 6	83 85	7	95 86	8 8.5					
26					90	6	84	7	94	8.5					
27 28					80 82	6 6	84 75	7	95 93	9 9					
28 29					81	6	75 90	7	93 94	9					
30					80	6	86	7	9 8	9.5					
31 32					80 84	7 7	84 85	7 7	93 102	10 10					
33					86	7	86	7.5	95	10					
34					87	7	87	7.5	100	10.5					
35 36					86 82	7 7	90 82	7.5 7.5	95 114	11 14					
37					85	7	70	8							
38					90	7	80	8							
39 40					90 85	7	90 90	8 8							
41					83	7	90	8							
42					85	7	88	8							
43 44					84 84	7 7	90 90	8 8							
45					75	7	90	8							
46 47					86 87	7.5 7.5	93 86	8 8							
48					85	8	88	8							
49					85	8	90	8							
50 51					86 86	8 8	90 85	8 8							
52					70	8	90	8							
53					80	8	90	8							
54 55					90 90	8 8	92 80	8.5							
56					88	8	85	9							
57 58					90 90	8 8	90 89	9 9							
59					80	o 8.5	90	9							
60					88	9	92	9							
61 62					90 95	9 9	94 93	9 9							
63					85	9	88	9							
64					90	9	90	9							
65 66					89 90	9 10	84 92	10 10							
67					95	10	100	10							
68 68					84 92	10	90 95	10							
69 70					86	10 11	93	10 10							
71					95	11	102	11							
72 73					102 108	11 11.5	105	11 11.5							
74					105	11.5	108 102	11.5							
75					115	12	115	12							
76					100 105	13 14	100 107	13 13					,		
76 77 78					112	14	107	15							
79					115	15	114	16							
80					120	17	122	17							
														•	

APPENDIX 1 (Continued) LENGHT & WEIGHT DATA

	March	10-23	March 2	4-April 6	April	7-20	April 21	-May 4	May	5-18	May 19	June 1	June	2-15	June 10	S∼July 1
	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams
1	=		-						116	20						
2									146	25						
3									138	25						
4									138	25						
5									137	25						
6									130	26						
7									150	30						
8									148	30						
9									155	34						
10									180	35						
11									159	40						
12									173	50						

APPENDIX 1 (Continued)
, , ,
LENGHT & WEIGHT DATA

SMITH COHO YEARLINGS

	March	10-23	March 2	4-April 6	Aprii	7-20	April 21	-May 4	May	5- 18	May 19	June 1	June	2-15	June 16	6-July 1
	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams	Length	Grams
1			88	9	98	9	95	9	95	9						
2			98	11	94	10	100	10								
3					98	10	111	15								
4					109	12	124	16								
5					119	13	150	25								
6					115	14										
7					115	15										
8					120	19										
9																
10																

APPENDIX 1 (Continued) LENGHT & WEIGHT DATA

CAMPBELL CREEK COHO YEARLINGS+

	March	10-23	March 2	4-April 6	April	7 -20	April 21	I-May 4	May	5- 18	May 19	June 1	June	2-15	June 1	6-July 1
1 2 2	Length	Grams	Length 207	Grams 75	Length 101 110	Grams 11 13	Length 100 110	Grams 12 20			Length	Grams	Length	Grams	Length	Gram
3 4 5 6																
7 8 9																

	March	10-23	March 2	4-April 6	April	7-20	April 21	-May 4	May	5- 18	May 19	June 1	June	2-15	June 1	5-July 1
	Length	Grams			Length				Length		Length		Length	Grams		
1			74 72	3.5	58	3 3	62	3	75	4.5	73	5 5	80	7 9	78	5
2 3			64	4	62 62	3.5	68 73	4	73 74	4.5 4.5	86 85	5	90 93	9.5	83 81	6 6
4			73	4	62	4	64	4	80	5	83	6	92	9.5	81	6.5
5			75	4	65	4	64	4	78	5	89	8	110	12	83	7
6			75	4	67	4	66	4	73	5	104	10	105	12	100	11.5
7 8			75 77	4 5	68 75	4	75 68	4	77	5	100	10	109	15	108	12
9			63	6	75	4	70	4.5 5	75 75	5.5 5.5	108 112	12 16	132 133	25 55	111 112	13 16
10			87	7	77	4	75	5	75	5.5	115	17			110	17
11			87	7	70	4.1	80	5	77	6	114	21			1 47	35
12			97	7	70	4.5	95	5	79	6	130	24				
13 14			58 95	8 8	70 70	5 5	75 80	5 5	83 82	6 6	148 200	35 130				
15			96	9	72	5	83	5	83	6	200	150				
16			95	10	72	5	84	5	68	6						
17			98	10	75	5	78	6	72	6						
18			115	10	76	5	80	6	79	6						
19 20			108 105	11 12	. 76 77	5 5	80 83	6 6	80 80	6 5						
21			108	13	77	5	83	6	80	6						
22			108	14	78	5	85	6	80	6						
23			112	14	78	5	87	6	82	6						
24 25			112 76	15 16	79 80	5 5	72 85	6 6	87 88	6.5 7						
26			115	17	80	5	86	6	75	7						
27			134	25	87	5	86	6	80	7						
28			163	35	75	6	80	7	80	7						
29			167	35	76	6	74	7	80	7						
30 31			168	45	דד דד	6 6	75 75	7 7	82 83	7 7						
32					78	6	78	7	85	7						
33					82	6	90	7	85	7						
34					85	6	77	8	87	7						
35 36					85 87	6 6	80 82	8 8	85 93	7.5 7.5						
37					92	6	78	8	92	7.5						
38					76	7	80	8	87	8						
39					78	7	83	8	91	8						
40					85	7 7	84	8.5	85	8						
41 42					87 89	7	85 97	8.5 9	85 90	8 8						
43					90	7	84	9	90	8						
44					96	7	85	9	87	8.5						
45					85	8	88	10	90	8.5						
46 47					89 85	8 9	100 85	10 10	88 85	9 9						
48						9	89	10	87	9						
49					94	9	88	10.5	90	9						
50					98	9	95	11	90	9.5						
51 52					98 97	9 10	102 111	11 12	90 93	10 10						
53					97	10	114	12	93	10						
54					100	10	101	12.5	95	10						
55					92	11	95	13.5	90	10.5						
5 6 57					100 115	11	110 100	16	101 99	11 11.5						
58					96	12	100	18	105	13						
59					107	12	122	20	95	13						
60					105	13	114	25	95	13						
61 62					115	13 15			107	14 16.5						
62 63					107 116	15			125 112	10.5						
64					112	18			112	17						
6 5					123	25			117	18						
6 6					135	30			115	18						
67 68					165 175	40 50			120 120	19 20						
69					180	50			120	20						
70									133	22						
71									128	24						
72																

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	March	10-23	March 2	4-April 6	April	7-20	April 21	-May 4	May	5- 18	May 19	June 1	June	2-15	June 16	July 1
	Length	Grams	Length		Length	Grams		Grams	Length	Grams		Grams	Length		Length	
1 2	76 80	4 5	75 76	4 5	61 68	3 3.5	71 72	4	70 78	4 5	79 77	4 5	75 78	4.8 5	70 67	4
3	93	6	77	5	73	3.5	75	4	75	5	85	5	78	5.75	78	4
4	90 97	8 10	81 84	5 5	64 70	4	72 72	4	77	5	85 82	6 6	79 82	6 .2 7	72 71	4
6	123	19	87	5	73	4	67	4.5	78	6	81	6	86	8	79	4
7	127	22	77	6	80	4	72	4.5	83	6	85	6	87	8	72	4
8 9			87 8 5	6 6	70 74	5 5	76 85	5	91 88	6.5 7	85 80	6 6	86 73	8 9	70 72	4 5
10			6 6	7	80	5	85	5	86	7	85	6.5	97	9	75	5
11 12			82 83	7 7	80 82	5 5	80 80	5 5	82 80	7 7	86 87	7 7	111 84	10 10	83 85	5 5
13			92	7	87	5	85	5	93	7	90	7	100	10	73	5
14			88	8	90	5	80	5.5	80	7	87	7	105	12	79	5
15 16			100 94	9 9	82 80	5.5 6	81 80	6 6	90 85	7	86 95	8 8	108 112	14 17	69) 78	5 5.5
17			94	9	81	6	85	6	87	7.5	86	8	120	18	86	6
18 19			101 80	10 11	83 92	6 6	85 85	6 6	92 87	8 8	90 95	8 8	126 138	22 24	86 81	6 6
20			98	11	85	7	83	7	85	8	97	9		24	82	6
21			99	11	87	7	90	7	85	8	97	9			84	6
22 23			105 109	12 14	87 90	8 8	90 98	7 7	87 88	8 8	95 95	9 9			84 78	6 6
24			110	14	90	8	85	7	95	8	110	9			80	6
25 26			125 142	17 24	90 95	8 8	91 90	7.5 8	90 96	8 8.5	96 95	9 9			85 83	6 6.5
27			153	30	97	8	92	8	91	8.5	97	10			82	6.5
28 29			138 152	34	100 95	8 9	90 88	8 9	88 52	8.5 8.5	99 100	10 11			89 84	7 7
30			152	42	95 97	9	109	9	90	0.5 9	100	11			87	7
31			172	45	97	9	96	9	95	9	102	12			88	7
32 33			180	45	120 95	9 10	98 95	9 9	92 90	9 9	107 100	12 12			91 80	7 7
34					98	10	95	9	95	9	102	12			90	7
35 36					100 101	10 10	109 100	9.5 9.5	100 95	9	114 112	13 15			86 85	7 7.5
37					102	10	107	9.5	100	9	114	15			82	8
38 39					93 95	11 11	98 100	10 10	86 96	9 9	113 110	15 15			98 87	8 8
40					100	11	102	10	95	10	114	16			90	9
41					105	11 12	95 100	10 10	98 96	10	115	17 17			98 93	9
42 43					114 100	13	98	10	103	11 11	118 125	18			93 96	10 10
44					101	13	100	10	99	11	129	18			104	10
45 45					113 109	13 14	98 97	10 11	100 110	11 11					95 99	10 11
47					110	14	103	11	100	11					81	11
48 49					109 110	15 15	105 107	12 12	113 103	11 11					108 106	12 12
43 9 50					115	15	120	12	110	11					108	12
51					118	15	106	13	102	11					108	13
52 53					120 113	15 17	110 102	14 15	100 105	11.5 13					97 111	14 15.5
54					140	30	115	15	103	13					117	16
55 56					160 167	30 35	130 110	15 15	108 115	15 15					103 120	18 19
57					160	40	110	15.5	115	15.5					127	20
58					168	45	110	16	105	16					122	22
59 60					155 170	50 50	114 112	17 17	115 112	16 18					129 142	22 25
61					174	50	125	18	109	18					141	27
62 63					138 160	70 70	115 132	20 23	118 117	18 18					2 52	145
64					170	80	133	25	121	19						
65 66							147 150	30 40	115 120	19 20						
67							178	40	120	20						
68							155	50	121	21						
69 70							1 60	50	126 130	22 25						
71									140	30						
72									143	35						

APPENDIX 1 (Continued) LENGHT & WEIGHT DATA

SOUTH FORK TEN MILE RIVER STEELHEAD YEARLINGS+

	March 10-23 Length Grams	March 24-April 6 Length Grams	April 7-20 Length Grams	April 21-May 4 Length Grams	May (Length	Grams		Grams		Grams		Grams	June 16- Length	
1 2 3					68 74 64	3.5 4 4	71 72 82	4 4 5	84 78 76	5 5 5	78 78 79	5 5 5	CONTIN	UED
4 5 6					67 75 75	4 4.5 5	77 84 84	5 6 6	77 70 73	5 5 5	78 70 77	5 5 5		
7					73 80	5 5	85 98	7 7	72 79	5 5	77 83	5 5	95	9
9 10					73 74 77	5 5.5 6	86 91 89	7.5 8 8	78 77 80	5.5 5.5 6	75 83 85	5 5 5	90 98 96	9 9 9.5
11 12 13					87 79	6	93 92	8 8.5	84 82	6	73 79	55	99 99	9.5 9.5 9.7
14 15					78 77	6 6	93 92	9 9	80 82	6 6	69 77	5 5.2	104 98	10 10
16 17 18					78 77 86	6 6 6.5	95 101 102	9.5 10 11	82 86 77	5 6 6	85 76 84	5.4 5.5 5.5	99 95 93	10 10 10
19 20					80 80	6.5 6.5	104 120	12 12	84 78	6 6	80 78	5.5 5.5	98 104	10 10
21 22					80 87 80	6.5 7 7	115 110 111	12 12	78 80 9 8	5 6.8 7	80 81 84	5.7 5.75 5.8	95 98 112	10 11
23 24 25					85 80	7 7 7	109 107	12.5 13 14	82 85	7	84 80	5.8 6 6	103 108	11 11 11
26 27					80 85	7 7	123 128	19 20	82 89	7 7	89 83	6 6	97 99	11 11
28 29 30					87 86 85	7 7.5 7.5	1 30 125	22 23	80 85 82	7 7 7	84 87 86	6 5 5	81 114 105	11 11.5 11.5
31 32					90 90	8 8			97 8 6	7 7	87 78	6 6	108 106	12 12
33 34 35					84 75 92	8 8 8			87 95 95	7 7 7	81 82 84	6 6 6	108 108 102	12 12.5 13
36 37					81 87	8 8			86 108	7 8	84 78	6	108 108	13 14
38 39					90 89 85	8 8.5 8.5			91 90 85	8 8	80 85 8 8	6 6 6.5	115 117 121	16 16
40 41 42					90 102	8.5 10 10			90 74	8 8 8	85 84	6.8 7	122	17 19 19
43 44					94 102	10 11			96 89	8 8.5	86 97	7 7	129	22
45 48 47					99 104 100	11 11 11.5			101 93 91	9 9 9	84 85 88	7 7 7		
48 49					105 105	12 12			102 94	9 9	84 86	7 7		
50 51					107 110 95	12 12 13			91 95 96	9 9.5 9.5	90 88 87	7 7 7		
52 53 54					110 119	15 15			97 97	9.5 9.5	88 91	7		
56 56					117 115	17 20			92 98	9.5 10	80 90	77		
57 58 59					125 118 125	20 20 20			99 100 102	10 10 11	86 88 86	7 7.1 7.1		
60 61					125 125	25 30			102 102	11 11	84 89	7.2 7.4		
62 64 65					134	30			113 104 108	11 12 12	94 75 94	7.5 7.7 7.7		
66 67									105 102	12 12	89 89	7.8 8		
68 69									103 108	13 14	91 90	8 8		
70 71 72									105 115 118	14 15 15	90 95 92	8 8 8		
73 74									114 115	16 16	98 87	8 8		
75 76 77									128 120 127	21 21 24	89 94 93	8.3 8.3 8.3		
78 79									140 141	26 27	93 92	8.5 8.8		
80 81									135 157	28 30	95 93	9 9		

APPENDIX 1 (Continued)

LENGHT & WEIGHT DATA LITTLE NORTH FORK NOYO RIVER STEELHEAD YEARLINGS+

	March	10-23	March 2	4-April 6	April	7-20	April 21	-May 4	May	5-18	May 19	June 1	June	2-15	June 16	July 1
					Length	Grams			Length						Length	
1	•		78	5	73	4	73	4	75	5	8 8	7			-	
2 3			89 70	7 8	75 71	4	75 71	4 4	88 94	6 7.5	104 120	9 15				
4			75	8	72	5	80	5	93	8						
5 6			98 98	8 9	79 59	5 6	78 85	5.5 6	91 90	8.5 9						
7			108	10	84	6	78	6	9 6	9						
8			110	10 12	88	6 6	82 84	6 6	102	10 10						
9 10			103 104	12	85 78	6	85	7	105 95	10.5						
11			98	13	80	7	85	7	98	10.5						
12 13			115 115	15 15	90 92	7 7	82 89	7.5 9	98 105	11 11						
14			112	17	82	7.5	90	9	105	11.5						
15 16			125	17	90 92	8 8	98 94	9 9.5	105 95	12 12.5						
17					93	8	93	10	108	12.5						
18					95	8	95	10	108	13						
19 20					85 90	9 9	99 95	10 10	114 105	14 14						
21					95	9	93	10	112	14						
22 23					95 94	9 9.5	99 104	11 12	117 121	16 19						
24					92	10	96	12								
25 26					95 95	10 10	107 110	12.5 13.5								
27					95	10	100	14								
28 29					97 97	10 10	114 113	16 16								
30					97 98	10	114	16								
31					98	10	120	17								
32 33					100 105	10 10	115 115	17 17								
34					93	10	130	18								
35 36					95 93	10 11	120 120	18 18								
37					95	11	134	24								
38 39					97 98	11 11										
40					99	11										
41					100 100	11 11										
42 43					100	11										
44					97	12										
45 46					97 100	12 12										
47					100	12										
48 49					100 104	12 12										
50					105	12										
51 52					105 107	12 12										
53					106	13										
54 55					106 110	13 13										
56					100	14										
57 58					105 110	15 15										
59					110	15										
60 61					111	15 15										
61 62					115 115	15 15										
63					118	15										
64 66					109 112	16 16										
66					112	16										
67 68					120 116	17 18										
69					11 6	18										
70 71					130 113	18 19										
72					125	20										
73					1 26	20										
74 75					123 134	21 24										
						- 1										

APPENDIX II Physical Parameters

Little North Fork 1996

	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	March	March	March	March	March	March		March	March	March	March	March	March	March
Date					8	9	10	11	12	13	14	15	16	17
Time					9:45 9	9:30	8:30 9	10:00 10.5	9:00 10	9:39 9	8:30 10	8:45 9.5	8:30 10	8:45 9.5
Water Temp Air Temp					12		11	10.5	9		8	9.J 6	8	9.5 8
Weather					Clear	Clear		Rain	P.Clou	-	Clear	Clear	Clear	Clear
Flow Gauge								0.6	0.76	0.7	0.58	0.47	0.42	0.37
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	March	March	March		March			March		March			March	March
Date	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Time	9:40	9:00	8:30	8:30	8:00	9:00	9:00	10:00	9:00	8:30	8:35	8:45	8:40	8:45
Water Temp	10	10	9.5	8	9	7.5	7.5	8	7	9	9	8	8	8
Air Temp	10	10	9	6	8	6	6	9	6	10	9	7	7	9
Weather Flow Gauge	Clear 0.33	Clear 0.3	Clear 0.28	Clear 0.27	Rain 0.26	0.23	P.Clou 0.22	Clear 0.21	Clear 0.2	0.22	P.Clou 0.28	0.24	P.Clou 0.22	Clou. 0.2
Tion Gauge														
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Date	April 1	April 2	April 3	April 4	April 5	April 6	April 7	April 8	April 9	April 10	April 11	April 12	April 13	April 14
Time	9:40	8:30	8:40	8:40	8:30	7:45	8:45	9:00	8:30	8:35	8:30	9:00	8:30	8:30
Water Temp	9	10	9.5	9	9	9	10	10.5	10	9	10	10	8	8
Air Temp	12	10	11	6	12	8	10	12	10.5	7	11	9	6	9
Weather		L.Rain	Clear	Clear	Clear	Fog	Clear		L.Rain			L.Rain	Clear	Clear
Flow Gauge	0.4	0.38	0.35	0.32	0.28	0.26	0.24	0.23	0.22	0.2	0.2	0.2	0.18	0.18
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	April	April	April	April	April	April	April	April	April	April	April	April	April	April
Date	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Time Water Temp	8:35 10	9:00 10	8:30 9.5	8:35 9	8:30 10	8:20 9.5	8:30 10	9:15 10	8:30 10.5	7:35	8:30 10	8:37 10	8:30 9.5	8:35 9
Air Temp	10	10	5.5	3 7	8	9.5 6	9	10	10.5	12	7	4	9.5 5	6
Weather	L.Rain	Rain	Rain	P.Clou	Rain	Clou	Rain	P.Clou		Clou	Clear	Clear	Clear	Clear
Flow Gauge	0.18	0.36	0.3	0.52	0.59	0.52	0.57	0.42	0.36	0.52	0.51	0.46	0.39	0.35
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	Mon April	Tues April	Wed May	Thur May	Fri May	Sat May	Sun May	Mon May	Tues May	Wed May	Thur May	Fri May	Sat May	Sun May
Date														
Time	April 29 9:00	Aprii 30 8:37	May 1 8:30	May 2 8:35	May 3 8:30	May 4 7:20	May 5 8:30	May 6 9:00	May 7 8:30	May 8 8:37	May 9 8:30	May 10 8:30	May 11 8:30	May 12 8:30
Time Water Temp	April 29 9:00 9.5	April 30 8:37 10	May 1 8:30 9.5	May 2 8:35 10	May 3 8:30 10	May 4 7:20 8	May 5 8:30 8	May 6 9:00 8	May 7 8:30 9.5	May 8 8:37 6	May 9 8:30 8	May 10 8:30 8	May 11 8:30 8.5	May 12 8:30 10
Time Water Temp Air Temp	April 29 9:00 9.5 7	April 30 8:37 10 8	May 1 8:30 9.5 6	May 2 8:35 10 9.5	May 3 8:30 10 9	May 4 7:20 8 3.5	May 5 8:30 8 6	May 6 9:00 8 7.5	May 7 8:30 9.5 7	May 8 8:37 6 4	May 9 8:30 8 6	May 10 8:30 8 6	May 11 8:30 8.5 6	May 12 8:30 10 8
Time Water Temp	April 29 9:00 9.5	April 30 8:37 10	May 1 8:30 9.5	May 2 8:35 10 9.5 Clear	May 3 8:30 10	May 4 7:20 8	May 5 8:30 8 6	May 6 9:00 8	May 7 8:30 9.5 7	May 8 8:37 6	May 9 8:30 8	May 10 8:30 8 6 Clear	May 11 8:30 8.5	May 12 8:30 10
Time Water Temp Air Temp Weather	April 29 9:00 9.5 7 Clear 0.32	April 30 8:37 10 8 Clear 0.28	May 1 8:30 9.5 6 Clear	May 2 8:35 10 9.5 Clear 0.24	May 3 8:30 10 9 Clear 0.23	May 4 7:20 8 3.5 Fog 0.22	May 5 8:30 8 6 Clou 0.21	May 6 9:00 8 7.5 P.Clou 0.2	May 7 8:30 9.5 7 Clou 0.19	May 8 8:37 6 4 Clear 0.18	May 9 8:30 8 6 Clou 0.18	May 10 8:30 8 6 Clear 0.18	May 11 8:30 8.5 6 Clear 0.16	May 12 8:30 10 8 Clear 0.17
Time Water Temp Air Temp Weather	April 29 9:00 9.5 7 Clear 0.32 Mon	April 30 8:37 10 8 Clear 0.28 Tues	May 1 8:30 9.5 6 Clear Wed	May 2 8:35 10 9.5 Clear 0.24 Thur	May 3 8:30 10 9 Clear 0.23 Fri	May 4 7:20 8 3.5 Fog 0.22 Sat	May 5 8:30 8 6 Clou 0.21 Sun	May 6 9:00 8 7.5 P.Clou 0.2 Mon	May 7 8:30 9.5 7 Clou 0.19 Tues	May 8 8:37 6 4 Clear 0.18 Wed	May 9 8:30 8 6 Clou 0.18 Thur	May 10 8:30 8 6 Clear 0.18 Fri	May 11 8:30 8.5 6 Clear 0.16 Sat	May 12 8:30 10 8 Clear 0.17 Sun
Time Water Temp Air Temp Weather Flow Gauge	April 29 9:00 9.5 7 Clear 0.32 Mon May	April 30 8:37 10 8 Clear 0.28 Tues May	May 1 8:30 9.5 6 Clear Wed May	May 2 8:35 10 9.5 Clear 0.24 Thur May	May 3 8:30 10 9 Clear 0.23 Fri May	May 4 7:20 8 3.5 Fog 0.22 Sat May	May 5 8:30 8 6 Clou 0.21 Sun May	May 6 9:00 8 7.5 P.Clou 0.2 Mon May	May 7 8:30 9.5 7 Clou 0.19 Tues May	May 8 8:37 6 4 Clear 0.18 Wed May	May 9 8:30 8 6 Clou 0.18 Thur May	May 10 8:30 8 6 Clear 0.18 Fri May	May 11 8:30 8.5 6 Clear 0.16 Sat May	May 12 8:30 10 8 Clear 0.17 Sun May
Time Water Temp Air Temp Weather	April 29 9:00 9.5 7 Clear 0.32 Mon	April 30 8:37 10 8 Clear 0.28 Tues	May 1 8:30 9.5 6 Clear Wed	May 2 8:35 10 9.5 Clear 0.24 Thur	May 3 8:30 10 9 Clear 0.23 Fri	May 4 7:20 8 3.5 Fog 0.22 Sat	May 5 8:30 8 6 Clou 0.21 Sun	May 6 9:00 8 7.5 P.Clou 0.2 Mon	May 7 8:30 9.5 7 Clou 0.19 Tues May	May 8 8:37 6 4 Clear 0.18 Wed	May 9 8:30 8 6 Clou 0.18 Thur	May 10 8:30 8 6 Clear 0.18 Fri	May 11 8:30 8.5 6 Clear 0.16 Sat	May 12 8:30 10 8 Clear 0.17 Sun
Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp	April 29 9:00 9.5 7 Clear 0.32 Mon May 13 9:00 10.5	April 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11	May 2 8:35 10 9.5 Clear 0.24 Thur May 16 9:00 12	May 3 8:30 9 Clear 0.23 Fri May 17 8:30 12	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:30 12	May 5 8:30 8 Clou 0.21 Sun May 19 8:40 11	May 6 9:00 8 7.5 P.Clou 0.2 Mon May 20 9:30 10	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11	May 9 8:30 8 Clou 0.18 Thur May 23 9:00 9.5	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5
Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Air Temp	April 29 9:00 9.5 7 Clear 0.32 Mon May 13 9:00 10.5 10.5	Aprii 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12 15	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11	May 2 8:35 10 9.5 Clear 0.24 Thur May 16 9:00 12 13	May 3 8:30 9 Clear 0.23 Fri May 17 8:30 12 12.5	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:30 12 13	May 5 8:30 8 6 Clou 0.21 Sun May 19 8:40 11	May 6 9:00 8 7.5 P.Clou 0.2 Mon May 20 9:30 10 14	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11 10	May 9 8:30 8 6 Clou 0.18 Thur May 23 9:00 9.5 6	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10 10	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10 12	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5 10.5
Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Air Temp Weather	April 29 9:00 9.5 7 Clear 0.32 Mon May 13 9:00 10.5	April 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12 15 Rain	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11 12 L.Rain	May 2 8:35 10 9.5 Clear 0.24 Thur May 16 9:00 12 13 Clou	May 3 8:30 10 9 Clear 0.23 Fri May 17 8:30 12 12.5 L.Rain	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:30 12 13 Rain	May 5 8:30 8 6 Clou 0.21 Sun May 19 8:40 11 10 Clear	May 6 9:00 8 7.5 P.Clou 0.2 Mon May 20 9:30 10 14 Clear	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11 10 Rain	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11 10 Clou	May 9 8:30 8 6 Clou 0.18 Thur May 23 9:00 9.5 6 Clear	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10 10 Clear	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10 12 Clear	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5 10.5 P.Clou
Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Air Temp	April 29 9:00 9.5 7 Clear 0.32 Mon May 13 9:00 10.5 10.5	Aprii 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12 15	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11 12 L.Rain 0.18	May 2 8:35 10 9.5 Clear 0.24 Thur May 16 9:00 12 13	May 3 8:30 9 Clear 0.23 Fri May 17 8:30 12 12.5	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:30 12 13	May 5 8:30 8 6 Clou 0.21 Sun May 19 8:40 11	May 6 9:00 8 7.5 P.Clou 0.2 Mon May 20 9:30 10 14	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11 10	May 9 8:30 8 6 Clou 0.18 Thur May 23 9:00 9.5 6	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10 10	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10 12	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5 10.5
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Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Weather Flow Gauge Date Time Water Temp Weather Flow Gauge	April 29 9:00 9.5 7 Clear 0.32 Mon 10.5 10.5 Clear Mon May 27 8:30 10 8.5 Clear 0.22 Mon June 10 9:00 10.5	April 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12 15 Rain 0.2 Tues 9:00 10 9 P.Clou 0.2 Tues June 11 8:30 10	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11 12 L.Rain 0.18 Wed May 29 13:15 11.5 12 Clear 0.19 Wed June 12 8:30 0 10	May 2 8:35 10 9.5 Clear 0.24 Thur May 10 0.17 Thur May 30 8:30 9.5 8 Clou 0.18 Thur June 13 8:30 10	May 3 8:30 10 9 Clear 0.23 Fri May 12 12:5 L.Rain 0.18 Fri May 31 8:30 10 8 Clear 0.17 Fri June 14 8:30 10	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:300 12 13 Rain 0.23 Sat June 1 8:40 11 11 Clear 0.16 Sat June 15 9:00 11	May 5 8:30 8 6 Clou 0.21 Sun 19 8:40 11 10 Clear 0.19 Sun June 2 8:30 10.5 8 Clear 0.16 Sun 10.5 8 13:30 12	May 6 9:00 8 7.5 P.Clou 0.2 Mon 10 9:30 10 14 Clear 0.19 Mon June 3 9:00 10.5 10 Clear 0.15 Mon June 17 9:00 7	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11 0.21 Tues June 4 8:30 10.5 9.5 Clear 0.14 Tues June 18 8:45 9	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11 10 Clou 0.34 Wed June 5 8:30 10.5 8:30 10.5 8:30 10.5 8:30 10.5 8 8:07 14 Wed June	May 9 8:30 8 6 Clou 0.18 Thur May 23 9:00 9.5 6 Clear 0.29 Thur June 6 8:30 10.3 8 Clear 0.13 Thur June	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10 10 Clear 0.28 Fri June 7 9:15 11 8.5 Clear 0.13 Fri June	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10 12 Clear 0.24 Sat June 8 8:30 8 7 Clear 0.12 Sat June	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5 P.Clou 0.23 Sun June 9 8:30 10 8 8:30 10 8 Clear 0.12 Sun 8 June
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Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Air Temp Weather Flow Gauge Date Time Water Temp Weather Flow Gauge Date Time Water Temp Weather Flow Gauge	April 29 9:00 9.5 7 Clear 0.32 Mon 10.5 10.5 Clear Mon May 27 8:30 10 8.5 Clear 0.22 Mon 10 9:00 10.5	April 30 8:37 10 8 Clear 0.28 Tues May 14 8:40 12 15 Rain 0.2 Tues 9:00 10 9 P.Clou 0.2 Tues June 11 8:30 10	May 1 8:30 9.5 6 Clear Wed May 15 8:30 11 12 L.Rain 0.18 Wed May 29 13:15 11.5 12 Clear 0.19 Wed June 12 8:30 0 10	May 2 8:35 10 9.5 Clear 0.24 Thur May 10 0.17 Thur May 30 8:30 9.5 8 Clou 0.18 Thur June 13 8:30 10	May 3 8:30 10 9 Clear 0.23 Fri May 12 12:5 L.Rain 0.18 Fri May 31 8:30 10 8 Clear 0.17 Fri June 14 8:30 10	May 4 7:20 8 3.5 Fog 0.22 Sat May 18 8:300 12 13 Rain 0.23 Sat June 1 8:40 11 11 Clear 0.16 Sat June 15 9:00 11	May 5 8:30 8 6 Clou 0.21 Sun 19 8:40 11 10 Clear 0.19 Sun June 2 8:30 10.5 8 Clear 0.16 Sun 10.5 8 13:30 12	May 6 9:00 8 7.5 P.Clou 0.2 Mon 10 9:30 10 14 Clear 0.19 Mon June 3 9:00 10.5 10 Clear 0.15 Mon June 17 9:00 7	May 7 8:30 9.5 7 Clou 0.19 Tues May 21 7:00 11 0.21 Tues June 4 8:30 10.5 9.5 Clear 0.14 Tues June 18 8:45 9	May 8 8:37 6 4 Clear 0.18 Wed May 22 8:30 11 10 Clou 0.34 Wed June 5 8:30 10.5 8:30 10.5 8:30 10.5 8:30 10.5 8 8:07 14 Wed June	May 9 8:30 8 6 Clou 0.18 Thur May 23 9:00 9.5 6 Clear 0.29 Thur June 6 8:30 10.3 8 Clear 0.13 Thur June	May 10 8:30 8 6 Clear 0.18 Fri May 24 7:30 10 10 Clear 0.28 Fri June 7 9:15 11 8.5 Clear 0.13 Fri June	May 11 8:30 8.5 6 Clear 0.16 Sat May 25 8:30 10 12 Clear 0.24 Sat June 8 8:30 8 7 Clear 0.12 Sat June	May 12 8:30 10 8 Clear 0.17 Sun May 26 8:30 10.5 P.Clou 0.23 Sun June 9 8:30 10 8 8:30 10 8 Clear 0.12 Sun 8 June

	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Data	March 18	March 19	March 20	March 21	March 22	March 23	March 24	March 25	March 26	March 27	March 28	March 29	March 30	March 31
Date Time	10	19	20	21	10:30	10:37	11:00	11:00	11:30	13:45	12:00	14:00	13:00	13:15
Water Temp						9.5	9.5	10	10	10	10	10	10.5	11.5
Air Temp						. 11	11.5	11	12.5	12	8.5	11	12.5	12
Weather					Clou.	Clear		P.Clou	Clear	L.Rain	Clear	Clou.	Clear	L.Rain
Flow (cfs)							21.5					19.8		
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Моп	Tues	Wed	Thur	Fri	Sat	Sun
Data	April	April	April	April	April	April	April	April	April	April	April	April	April	April
Date Time	1 14:15	2 12:45	3 14:30	4 12:00	5 12:15	6 10:45	7 11: 4 5	8 12:08	9 12:15	10 12:45	11 12:00	12 12:00	13 12:07	14 12:00
Water Temp	11	11.5	11.5	11	11.5	12.3	12.3	11	11.5	11	10.5	11.5	11	10.5
Air Temp	8	14	13	12	12	13	13	12	13	12	12	12	14	16
Weather	Clou.	Clou.	Clear	Clou.	Clear	Clear	Clear	Clou.	Clou.	Clou.	Clou.	Clear	Clear	Clou.
Flow (cfs)			34.6					1 9 .1						11.6
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	April	April	April	April	April	April	April	April	April	April	April	April	April	April
Date	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Time Water Temp	13:45 11.5					14:45			12:00 12	13:30 12.5		13:45		12:00 12
Air Temp	13								16	15				13
Weather	Rain					Clou			Clou	Clear		Clear	Clear	Clear
Flow (cfs)						78 .7						37.4		
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	April	April	May	May	May	May	May	May	May	May	May	May	May	May
Date	29	30	1	2	3	4	5	6	7	8	9	10	11	12
	11:30 12	11:15 12.8	11: 00 12	11:30 12	9:45 10	12:24	13:15 10.5	13:30 11	13:00 11.5	14:00 11	13:30 11.5	12:45 11	8:35 10	13:15 12
Water Temp Air Temp	12	12.0	14	12	9	11.5	10.5	15	14	13	14	14	10	12
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clou	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Flow (cfs)									•					
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	May	May	May	May	May	May	May	May	May	May	May	May	May	May
Date	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Time	8:45	8: 45 11.5	8:30 12.5	13:45 13	13:20 12.5	12:30 12.5	10:10 12	12:15 13	1:00	8:30 12	12:30 11	9:45 10.5	8:45 11	14:30 13
Water Temp Air Temp	11.5 12	12	12.5	15	12.5	12.5	11.5	14	14	10	14	10.5	11.5	14.5
Weather	Clear	Clear	Clou	Rain	Rain	Clou	Clear	Clear	Rain	Clou	Clear	Clear	Clear	Clou
Flow (cfs)	8.9				14.5			10.9	17.2		20.5	19.1		
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	May	May	May	May	May	June	June	June	June	June	June	June	June	June
Date	27	28	29	30	31	1	2	3	4	5	6	7	8	9
Time	14:30	8:45	9:15	14:00	14:45		13:30		14:15	14:30	14:45	12:00	10:15	10:00
Water Temp Air Temp	13 14	10 9	10 9			13 18		14.3 19	14 18	14 15		13 18	11 14	13 13
Weather	Clear		Clear	Clear	Clear		Clear				Clear	Clear		Clear
Flow (cfs)			,		9.9					6.7				
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Моп	Tues	Wed	Thur	Fri	Sat	Sun
	June	June	June	June	June	June	June	June	June	June	June	June	June	June
Date	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Time	14:30	14:30	13:45	14:15	14:15	10:20	8:45	10:30	10:00	8:30	8:30	8:30	13:00	7:45
Water Temp Air Temp	13 14	14 17	13.5 15	14 16	13 14.8	12 13	11 11	12 12	12 14	11 10		11 10	12 13	11 9
Weather	Clear		Clear	Clear	14.0	Clear	Clear	Clear		Clear	Clear	Clear	Clear	Clear
Flow (cfs)				4.9		4.4				4.2				3.9
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon						
	June	June	June	June	June	June	June	July						
Date	24	25	26	27	28	29	30	1						
Time	9:00	17:40	13:50	6:10	13:10	12:45	13:00	11:00						
Water Temp	12.5 12	13.5 16	14 14	13	14	15 17.5	15 16.5	14 14						
Air Temp Weather	Clear		Clear	18 Clear		Ciear		Clear						
Flow (cfs)		2.344	2.244											

Date Time Water Temp Air Temp Weather Flow (cfs)	Mon April 29	Tues April 30	Wed May 1	Thur May 2	Fri May 3	Sat May 4 10:45 10.5 12 Clear	Sun May 5 11:00 10.5 11 Clou	Mon May 6 12:30 11 13 P.Clou	Tues May 7 8:45 P.Clou 34.6	Wed May 8 10:45 10.5 13 Clear	Thur May 9 10:45 10.5 13 Clear	Fri May 10 10:45 11.5 16 Clear	Sat May 11 12:15 13 20 P.Clou	Sun May 12 9:30 11 13 Clear
Date Time Water Temp Air Temp Weather	Mon May 13 12:30 15 19 Clear	Tues May 14 9:30 14 16 Rain	Wed May 15 12:35 14 15 Rain	Thur May 16 9:45 13.5 16 L.Rain	Fri May 17 10:15 13.5 15 Rain	Sat May 18 8:30 13.5 14 Rain	Sun May 19 Clear	Mon May 20 10:00 12 13 Clear	Tues May 21 10:00 12 13 Rain	Wed May 22	Thur May 23	Fri May 24	Sat May 25	Sun May 26 12:15 14 Clou
Flow (cfs)	23.3 Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	May	May	May	May	May	June	June	June	June	June	June	June	June	June
Date	27	28	29	30	31	1	2	3	4	5	6	7	8	9
Time	12:30	10:00	10:45	12:00	11:30	11:45	11:35	11:00	11:00	11:15	11:00	14:00	13:00	11:30
Water Temp		12.8	10	13	13	14.5	13.5	15	15	15.2	15	15	14	13
Air Temp		15	11	13	17	18	18.5	18	18	16.5	17	18	16	16
Weather Flow (cfs)	Clear	Clear	Clear	Clear	Clear 32.8	Clear	Clear	Clear	Clear	Clear 19.1	Clear	Clear	Clear	Clear
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	June	June	June	June	June	June	June	June	June	June	June	June	June	June
Date	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Time	11:45	12:15	11:30	11:15	11:00	12:30	10:30	13:00	13:00	11:15	11:00	13:30	10:00	9:30
Water Temp	14	15	12	15	14	14	13	13.5	14		14	12	12	12
Air Temp	16	16.5	14	15	16	18	17	14	15		15	12	12	12
Weather Flow (cfs)	Clear	Clear	Clear	Clear 22.6	Clear	Clear	Clear	Clear	Clear 21.2	Clear	Clear	Clear	Clear	Clear 17.6
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon						
-	June	June	June	June	June	June	June	July						
Date	24	25	26	27	28	29	30	10.15						
Time	10:15	6:50 13	14:40	7:00 15	14:00	13:30 15	14:00 17	12:15 16.5						
Water Temp	12.5 13	13	15 15	15	16 18	19	20.5	10.5						
Air Temp Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear						
Flow (cfs)	Orcai	Gieai	Jical	Jical	Vicai	Uleai	Jical	Vical						

APPENDIX II Physical Parameters South Fork Ten Mile

APPENDIX II Physical Parameters Campbell Creek

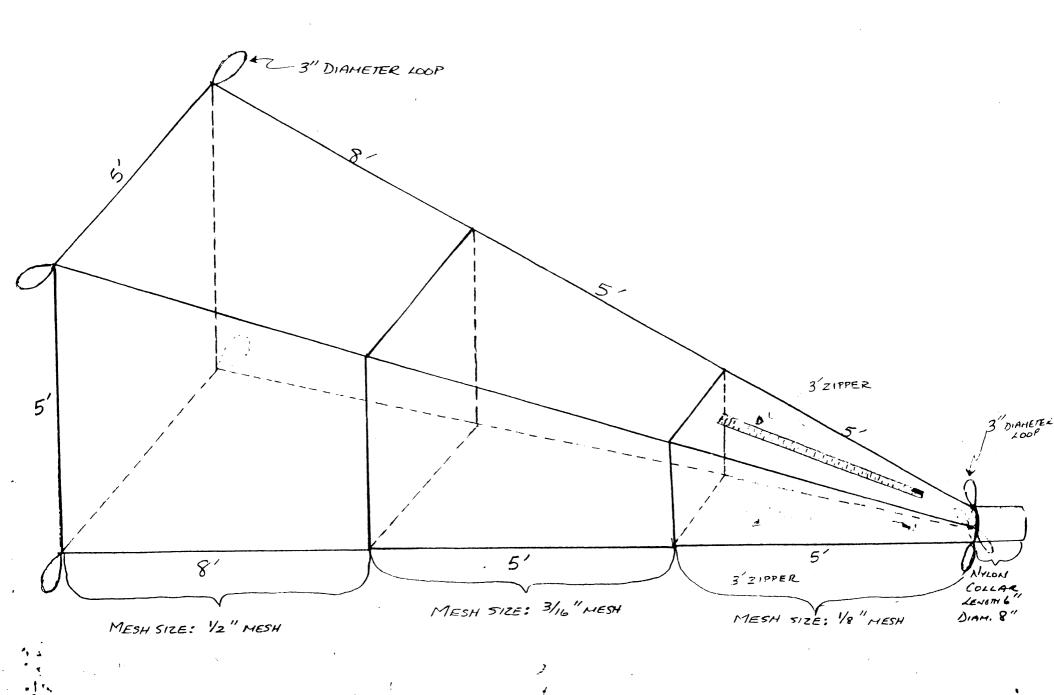
	Моп	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	March	March	March	March	March	March								
Date							10	11	12	13	14	15	16	17
Time Water Temp							8:30 10.5	13:30 11.5	9:15 11				8:30 10	8:30 10.5
Air Temp							10.5	14	15.5				11.5	10.5
Weather							Rain		Clear		Clear	Clear		Clear
Flow (cfs)													33.5	
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
		March	March	March	March			March	March	March	March	March	March	
Date	18	19	20	21	22	23	24		26	27	28	29	30	31
Time	8:30	14:13	8:30	8:30	8:30	9:00	8:30	8:30	9:30	9:00	8:30	10:30	9:00	8:30
Water Temp	10 12.5	12.5 15	9.5 7	9.5 10.5	10 8.5	8.5 6	8 7	9 9	9 12.3	10 12	9 7	9.5 11	9 11	10.2 16
Air Temp Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Glou.		L.Rain	Clou.	Clear	Clear	Clou.
Flow (cfs)	oicui	Giou,	0.04	13.4	orcui	Gioui	8.4	0104.	0.00.	L	0.00.	13.8	Giçai	0.00.
	Моп	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	April	April	April	April	April	April	April	April	April	April	April	April	April	April
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Time	9:00	9:00	9:05	8:30	8:45	7:30	8:30	8:40	8:35	8:30	8:30	8:35	8:30	9:45
Water Temp	11 8	12	10	9.5	12 15	9.5	10	11 14	11 12	9.5	9	10 9	8.5 7	9.8
Air Temp Weather	-	P.Clou	11 Clear	12.5 Clear	Clear	8 Clear	12 Clear		L.Rain	10 Clear	10 Clou	P.Clou		11.5 P.Clou
Flow (cfs)	(Califi	1.0100	Cicui	22.2	oicui	olcui	olcai	olou.	12	oicui	8.8	1.0104	oicai	1.0100
•	Mon	Tues	Wed	Thur	Eri	Sat	Sue	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	Mon April	Tues April	April	Thur April	Fri April	April	Sun April	April	Tues April	April	April	April	Sat April	Sun April
Date	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Time	8:30					13:00			8:35	8:30	9:00	8:30	8:24	8:30
Water Temp	10								11	12	11	10	10	10
Air Temp	13	-	- ·	2.01	a .	~		-	13	14.5	10	9	8	9
Weather Flow (cfs)	Clou 6	Rain	Rain	P.Clou	Rain	Clou 46.3	Rain	P.Clou	Clou	Clou	Clear	Clear	Clear	Clear
		-			_ .	_	_		-		_	.		-
	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun
	Annil	Annil	Mov	Mary	Mary	1401	Maria	Move	Mari		2401	14014		
Date	April 29	April 30	May 1	May 2	May 3	May 4	May 5	May 6	May 7	May 8	May 9	May 10	May 11	May 12
Date Time	April 29 9:00	April 30 8:30	May 1 8:40	May 2 8:30	May 3 10:00	May 4 8:35	May 5 8:37	May 6 9:30	May 7 12:45	May 8 8:30	May 9 8:35	May 10 9:00	May 11 11:00	May 12 8:30
	29	30	1	2	3	4 8:35 9	5	6	7	8	9	10	11	12
Time Water Temp Air Temp	29 9:00 10 11	30 8:30 10.8 12	í 8:40 10.5 12	2 8:30 10 12	3 10:00 11 11	4 8:35 9 9.5	5 8:37 10 8	6 9:30 10 10	7 12:45 10.5 13	8 8:30 9 9	9 8:35 9 7	10 9:00 9.5 12	11 11:00 15	12 8:30
Time Water Temp Air Temp Weather	29 9:00 10 11 Clear	30 8:30 10.8 12 Clear	1 8:40 10.5	2 8:30 10	3 10:00 11	4 8:35 9 9.5	5 8:37 10	6 9:30 10 10	7 12:45 10.5 13 P.Clou	8 8:30 9 9	9 8:35 9	10 9:00 9.5	11 11:00	12
Time Water Temp Air Temp	29 9:00 10 11	30 8:30 10.8 12 Clear 14.1	1 8:40 10.5 12 Clear	2 8:30 10 12 Clear	3 10:00 11 11 Clear	4 8:35 9 9.5	5 8:37 10 8 P.Clou	6 9:30 10 10 Clear	7 12:45 10.5 13 P.Clou 8.5	8 8:30 9 9	9 8:35 9 7 Clear	10 9:00 9.5 12 Clear	11 11:00 15	12 8:30 Clear
Time Water Temp Air Temp Weather	29 9:00 10 11 Clear 14.8 Mon	30 8:30 10.8 12 Clear 14.1 Tues	1 8:40 10.5 12 Clear Wed	2 8:30 10 12 Clear Thur	3 10:00 11 11 Clear Fri	4 8:35 9 9.5 Clear Sat	5 8:37 10 8 P.Clou Sun	6 9:30 10 10 Clear Mon	7 12:45 10.5 13 P.Clou 8.5 Tues	8 8:30 9 9 Clear Wed	9 8:35 9 7 Clear Thur	10 9:00 9.5 12 Clear Fri	11 11:00 15 Clear Sat	12 8:30 Clear Sun
Time Water Temp Air Temp Weather Flow (cfs)	29 9:00 10 11 Clear 14.8 Mon May	30 8:30 10.8 12 Clear 14.1 Tues May	1 8:40 10.5 12 Clear Wed May	2 8:30 10 12 Clear Thur May	3 10:00 11 11 Clear Fri May	4 8:35 9 9.5 Clear Sat May	5 8:37 10 8 P.Clou Sun May	6 9:30 10 10 Clear Mon May	7 12:45 10.5 13 P.Clou 8.5 Tues May	8 8:30 9 Clear Wed May	9 8:35 9 7 Clear Thur May	10 9:00 9.5 12 Clear Fri May	11 11:00 15 Clear Sat May	12 8:30 Clear Sun May
Time Water Temp Air Temp Weather Flow (cfs) Date	29 9:00 10 11 Clear 14.8 Mon May 13	30 8:30 10.8 12 Clear 14.1 Tues May 14	1 8:40 10.5 12 Clear Wed May 15	2 8:30 10 12 Clear Thur May 16	3 10:00 11 11 Clear Fri May 17	4 8:35 9 9.5 Clear Sat May 18	5 8:37 10 8 P.Clou Sun May 19	6 9:30 10 10 Clear Mon May 20	7 12:45 10.5 13 P.Clou 8.5 Tues May 21	8 8:30 9 9 Clear Wed May 22	9 8:35 9 7 Clear Thur May 23	10 9:00 9.5 12 Clear Fri May 24	11 11:00 15 Clear Sat May 25	12 8:30 Clear Sun May 26
Time Water Temp Air Temp Weather Flow (cfs)	29 9:00 10 11 Clear 14.8 Mon May	30 8:30 10.8 12 Clear 14.1 Tues May 14	1 8:40 10.5 12 Clear Wed May	2 8:30 10 12 Clear Thur May	3 10:00 11 11 Clear Fri May	4 8:35 9 9.5 Clear Sat May	5 8:37 10 8 P.Clou Sun May	6 9:30 10 10 Clear Mon May	7 12:45 10.5 13 P.Clou 8.5 Tues May	8 8:30 9 Clear Wed May	9 8:35 9 7 Clear Thur May	10 9:00 9.5 12 Clear Fri May	11 11:00 15 Clear Sat May	12 8:30 Clear Sun May
Time Water Temp Air Temp Weather Flow (cfs) Date Time	29 9:00 10 11 Clear 14.8 Mon May 13	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16	2 8:30 10 12 Clear Thur May 16 8:30	3 10:00 11 11 Clear Fri May 17 8:45	4 8:35 9 9.5 Clear Sat May 18 9:45	5 8:37 10 8 P.Clou Sun May 19	6 9:30 10 10 Clear Mon May 20 9:00	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40	8 8:30 9 9 Clear Wed May 22 12:00	9 8:35 9 7 Clear Thur May 23 8:30 10.5 13	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16	11 11:00 15 Clear Sat May 25 10:30	12 8:30 Clear Sun May 26 11:00
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Air Temp Weather	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15	1 8:40 10.5 12 Clear Wed May 15 11:30 13	2 8:30 10 12 Clear Thur May 16 8:30 12.5 13	3 10:00 11 Clear Fri May 17 8:45 14	4 8:35 9 9.5 Clear Sat May 18 9:45 12.3	5 8:37 10 8 P.Clou Sun May 19	6 9:30 10 Clear Mon May 20 9:00 12.5 Clear	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5	8 8:30 9 Clear Wed May 22 12:00 12	9 8:35 9 7 Clear Thur May 23 8:30 10.5	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16	11 11:00 15 Clear Sat May 25 10:30 11.5	12 8:30 Clear Sun May 26 11:00 11.75 14.5
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Air Temp	29 9:00 10 11 Clear 14.8 Mon 13 11:35	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16	2 8:30 10 12 Clear Thur May 16 8:30 12.5 13	3 10:00 11 Clear Fri May 17 8:45 14 15	4 8:35 9 9.5 Clear Sat May 18 9:45 12.3 14	5 8:37 10 8 P.Clou Sun May 19 8:30	6 9:30 10 Clear Mon May 20 9:00 12.5	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5 12	8 8:30 9 Clear Wed May 22 12:00 12 13	9 8:35 9 7 Clear Thur May 23 8:30 10.5 13	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5	12 8:30 Clear Sun May 26 11:00 11.75 14.5
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Air Temp Weather	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16 Clou Wed	2 8:30 10 12 Clear Thur 16 8:30 12.5 13 Fog Thur	3 10:00 11 11 Clear Fri 8:45 14 15 L.Rain	4 8:35 9 9.5 Clear Sat 18 9:45 12.3 14 Rain Sat	5 8:37 10 8 P.Clou Sun 19 8:30 Clear Sun	6 9:30 10 10 Clear Mon 420 9:00 12.5 Clear 5.7 Mon	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5 12 Rain Tues	8 8:30 9 Clear Wed 12:00 12:00 12:00 Wed	9 8:35 9 7 Clear Thur 43 8:30 10.5 13 Clear Thur	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear Fri	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5 Clear Sat	12 8:30 Clear Sun May 26 11:00 11.75 14.5 Clear Sun
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Weather Flow (cfs)	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon April	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain Tues April	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16 Clou Wed May	2 8:30 10 12 Clear Thur May 16 8:30 12.5 13 Fog Thur May	3 10:00 11 11 Clear Fri 8:45 14 15 L.Rain Fri May	4 8:35 9 9.5 Clear Sat 18 9:45 12.3 14 Rain Sat June	5 8:37 10 8 P.Clou Sun 19 8:30 Clear Sun June	6 9:30 10 Clear Mon 420 9:00 12.5 Clear 5.7 Mon June	7 12:45 10.5 13 P.Clou 8.5 Tues 8:40 11.5 12 Rain Tues June	8 8:30 9 Clear Wed May 22 12:00 12 13 Clou Wed June	9 8:35 9 7 Clear Thur 4:30 10.5 13 Clear Thur June	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear Fri June	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5 Clear Sat June	12 8:30 Clear Sun May 26 11:00 11.75 14.5 Clear Sun June
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Weather Flow (cfs) Date	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon April 27	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain Tues April 28	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16 Clou Wed May 29	2 8:30 10 12 Clear Thur May 16 8:30 12.5 13 Fog Thur May 30	3 10:00 11 11 Clear Fri 8:45 14 15 L.Rain Fri May 31	4 8:35 9 9.5 Clear Sat 18 9:45 12.3 14 Rain Sat June 1	5 8:37 10 8 P.Clou Sun 19 8:30 Clear Sun June 2	6 9:30 10 10 Clear Mon 20 9:00 12.5 Clear 5.7 Mon June 3	7 12:45 10.5 13 P.Clou 8.5 Tues 4 8:40 11.5 12 Rain Tues June 4	8 8:30 9 9 Clear Wed May 22 12:00 12:13 Clou Wed June 5	9 8:35 9 7 Clear Thur May 23 8:30 10.5 13 Clear Thur June 6	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear Fri June 7	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5 Clear Sat June 8	12 8:30 Clear Sun May 26 11:00 11.75 14.5 Clear Sun June 9
Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Weather Flow (cfs)	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon April	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain Tues April 28 11:00	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16 Clou Wed May 29 9:45	2 8:30 10 12 Clear Thur May 16 8:30 12:5 13 Fog Thur May 30 10:30	3 10:00 11 11 Clear Fri 8:45 14 15 L.Rain Fri May 31 10:00	4 8:35 9 9.5 Clear Sat 18 9:45 12.3 14 Rain Sat June 1 11:00	5 8:37 10 8 P.Clou Sun 19 8:30 Clear Sun June 2 12:15	6 9:30 10 10 Clear Mon 20 9:00 12.5 Clear 5.7 Mon June 3 10:00	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5 12 Rain Tues June 4 10:00	8 8:30 9 9 Clear Wed 12:00 12 13 Clou Wed June 5 10:00	9 8:35 9 7 Clear Thur 4:30 10.5 13 Clear Thur June 6 10:00	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear Fri June 7 13:00	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5 Clear Sat June 8 11:15	12 8:30 Clear Sun May 26 11:00 11:75 14.5 Clear Sun June 9 11:00
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Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Weather Flow (cfs) Date Time Water Temp Air Temp Water Temp Air Temp Weather	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon April 27 10:15 12 14.5 Clear Mon	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain Tues April 28 11:00 12 13.5 Windy Tues	1 8:40 10.5 12 Clear Wed May 15 11:30 13 16 Clou Wed May 29 9:45 10 10.5 Clear Wed	2 8:30 10 12 Clear Thur May 16 8:30 12.5 13 Fog Thur May 30 10:30 11.3 14 Clear 5.7 Thur	3 10:00 11 11 Clear Fri May 17 8:45 14 15 L.Rain Fri May 31 10:00 11 12 Clear Fri	4 8:35 9 9.5 Clear Sat May 18 9:45 12.3 14 Rain Sat 11:00 12.5 14 Clear Sat	5 8:37 10 8 P.Clou Sun 19 8:30 Clear 2 12:15 12 21 Clear Sun Sun 2	6 9:30 10 10 Clear Mon May 20 9:00 12.5 Clear 5.7 Mon June 3 10:00 13 19 Clear Mon	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5 12 Rain Tues 4 10:00 12 18 Clear Tues	8 8:30 9 9 Clear Wed May 22 12:00 12 13 Clou Wed 5 10:00 12.5 12 Clear Wed	9 8:35 9 7 Clear Thur May 23 8:30 10.5 13 Clear Thur June 6 10:00 12 17 Clear	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear Fri June 7 13:00 13 18 Clear Fri	11 11:00 15 Clear Sat May 25 10:30 11.5 5 Clear Sat 11:15 12 16 Clear Sat	12 8:30 Clear Sun May 26 11:00 11.75 14.5 Clear Sun June 9 11:00 12 13 Clear Sun Sun
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Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Air Temp Weather Flow (cfs) Date Time Water Temp Weather Flow (cfs) Date	29 9:00 10 11 Clear 14.8 Mon May 13 11:35 Clear 5.4 Mon April 27 10:15 12 14.5 Clear 14.5 Clear	30 8:30 10.8 12 Clear 14.1 Tues May 14 8:30 13 15 Rain Tues April 28 11:00 12 13.5 Windy Tues June 11	1 8:40 10.5 12 Clear Wed May 29 9:45 10 10.5 Clear Wed June 12	2 8:30 10 12 Clear Thur May 16 8:30 125 13 Fog Thur May 30 10:30 11.3 14 Clear 5.7 Thur 5.7 Thur 13	3 10:00 11 11 Clear Fri May 17 8:45 14 15 L.Rain Fri May 31 10:00 11 12 Clear Fri June 14	4 8:35 9 9.5 Clear 38 9:45 12.3 14 Rain 53 14 11:00 12.5 14 Clear 53 15	5 8:37 10 8 P.Clou Sun 19 8:30 Clear Sun 2 12:15 12 21 Clear Sun 212:15 12 21 Clear 12:15 12 21	6 9:30 10 10 Clear Mon May 20 9:00 12.5 Clear 5.7 Mon 10:00 13 19 Clear Mon June 17	7 12:45 10.5 13 P.Clou 8.5 Tues May 21 8:40 11.5 12 Rain Tues 4 10:00 12 18 Clear Tues June 18	8 8:30 9 9 Clear Wed May 22 12:00 12 13 Clou 12:00 12:5 10:00 12:5 10:00 12:5 12 Clear Wed June 19	9 8:35 9 7 Clear Thur 23 8:30 10.5 13 Clear Thur 6 10:00 12 17 Clear Thur 20	10 9:00 9.5 12 Clear Fri May 24 12:15 14 16 Clear 7 13:00 13 18 Clear Fri June 7 13:00 13 18 Clear	11 11:00 15 Clear Sat May 25 10:30 11.5 15.5 Clear Sat June 22 Sat June 22	12 8:30 Clear Sun May 26 11:00 11.75 14.5 Clear Sun June 9 11:00 12 13 Clear Sun June 23
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	June	July						
Date	24	25	26	27	28	29	30	1
Time	9:45	8:10	15:40	8:10	15:10	14:40	13:30	12:10
Water Temp	12.5	13.5	14	14	15	16	15	15
Air Temp	13	16	23	17	18	19	16	17
Weather Flow (cfs)	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear

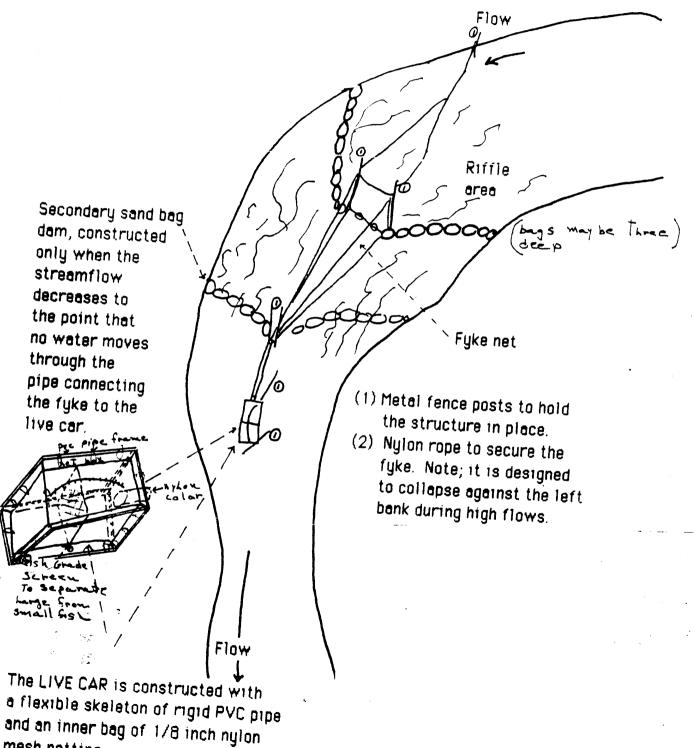
FYKE NET & OR CAPTURE OF

APPENDIX III

DOWNSTREAM ANADROMOUS FISHES)



APPENDIX III



mesh netting.