Docee River Counting Fence 1986 Operations

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ABSTRACT

Bachen, S.K., B.L. Thomson and R.D. Goruk. 1988. Docee River counting fence. 1986 Operations. Can. Data Rep. Fish. Aquat. Sci. 703: iv + 15p.

The Docee River counting fence has been in operation on the Docee River, Central Coast, B.C., since 1972. Salmon escapement data collected at the fence provides inseason estimates of escapement to managers operating the Smith Inlet sockeye fishery. Sockeye age, length and sex statistics are collected as part of the enumeration program. In 1986 198,152 sockeye salmon were counted through the fence. From a sample of 108 fish, 31% were age 4_2 and 69% age 5_2, with 64% of all samples being female. General repairs required to the fence to maintain fence performance and for personnel safety are identified.

RESUME

Bachen, S.K., B.L. Thomson and R.D. Goruk. 1988. Docee River counting fence. 1986 Operations. Can. Data Rep. Fish. Aquat. Sci. 703: iv + 15p.

Depuis 1972, une barrière de comptage, servant a évaluer la montaison de saumons adultes, a été mise en operation sur la Rivière Docee située sur la côté Centrale de la Colombie-Britannique. Cette barrière sert a recuillir des données sur le saumon rouge adulte et fournissent ainsi des évaluations aux gestionnaires responsables de la zone Smith Inlet durant la saison de pêche. Les statistiques recueillies comportent des informations pertinentes sur l'âge, la longueur et le sexe des saumons rouge durant l'application du programme d'enumeration. En 1986 198152 saumons rouges ont été recences pour avoir passes cette barrière. De ce prélèvement, un échantillonnage de 108 poissons nous indique les resultats suivants: 31% étaient âges de 4_2 et 69% avaient 5_2 ans. De plus, nous avons note que dans tous les échantillonnages, 64 des saumons étaient des femelles. Enfin, il fut porte a nôtre attention que cette barrière de comptage necessite une reparation generale pour faciliter la tache du personnel de sécurité et également assurer pour l'avenir une performance réelle.

INTRODUCTION

Smith Inlet (Canadian Department of Fisheries and Oceans, Statistical Area 10) is situated in the southern portion of the Central Coast of British Columbia (Figure 1.) The Docee is a short river (<1 km long) draining Long Lake into Wyclees Lagoon which then flows into Smith Inlet. The Docee River counting fence is located in the upper Docee River at the lake outlet (Figures 1 and 2).

The Docee River counting fence has been used since 1972 to monitor sockeye escapement into Long Lake. The enumeration program provides inseason estimates of escapement to managers operating the Smith Inlet sockeye fishery. The counting fence operates from late June until August 8th.

DOCEE RIVER 1986

The Docee camp was opened on June 18, 1986. The camp was in fair condition with no damage sustained since the last season.

The skidder road from Wyclees Lagoon to the camp was in poor condition, due to encroachment by small alder bushes along the sides. The road is used during the season to transport equipment, personnel and supplies by an All-Terrain Vehicle. A dangerous approach to and on a hill near the camp was improved and straightened. This resulted in easier and safer transport of equipment and personnel to the camp. There is still about one-quarter mile of road that will have to be improved next season.

The river was above normal on June 18 when camp was opened. There was a fairly large log jam above the counting fence location, consisting of three huge root masses and large amounts of smaller debris. The All-Terrain Vehicle, jet boat, and block and tackle were used to remove the log jam. Logs were sawn in half and the root masses removed to deeper water to be floated downstream. By June 22, the jam was totally removed. Logs and other loose debris at the end of the lake (entrance of the Docee River above the fence) were collected and floated down the river. At the entrance of the Docee River a shear boom was installed to prevent debris drifting down Long Lake from collecting on the fence during its operation.

On June 25, Bill Southgate arrived with one of two fish traps to be installed on the fence. These traps were intended to live-trap sockeye for scale sampling purposes. The traps were put on the second frame (from the walkway side) of the fence. There was considerable difficulty installing the traps. First, the wheel shafts had to be ground in order for the trap to roll up and down the aluminum channels with the minimum

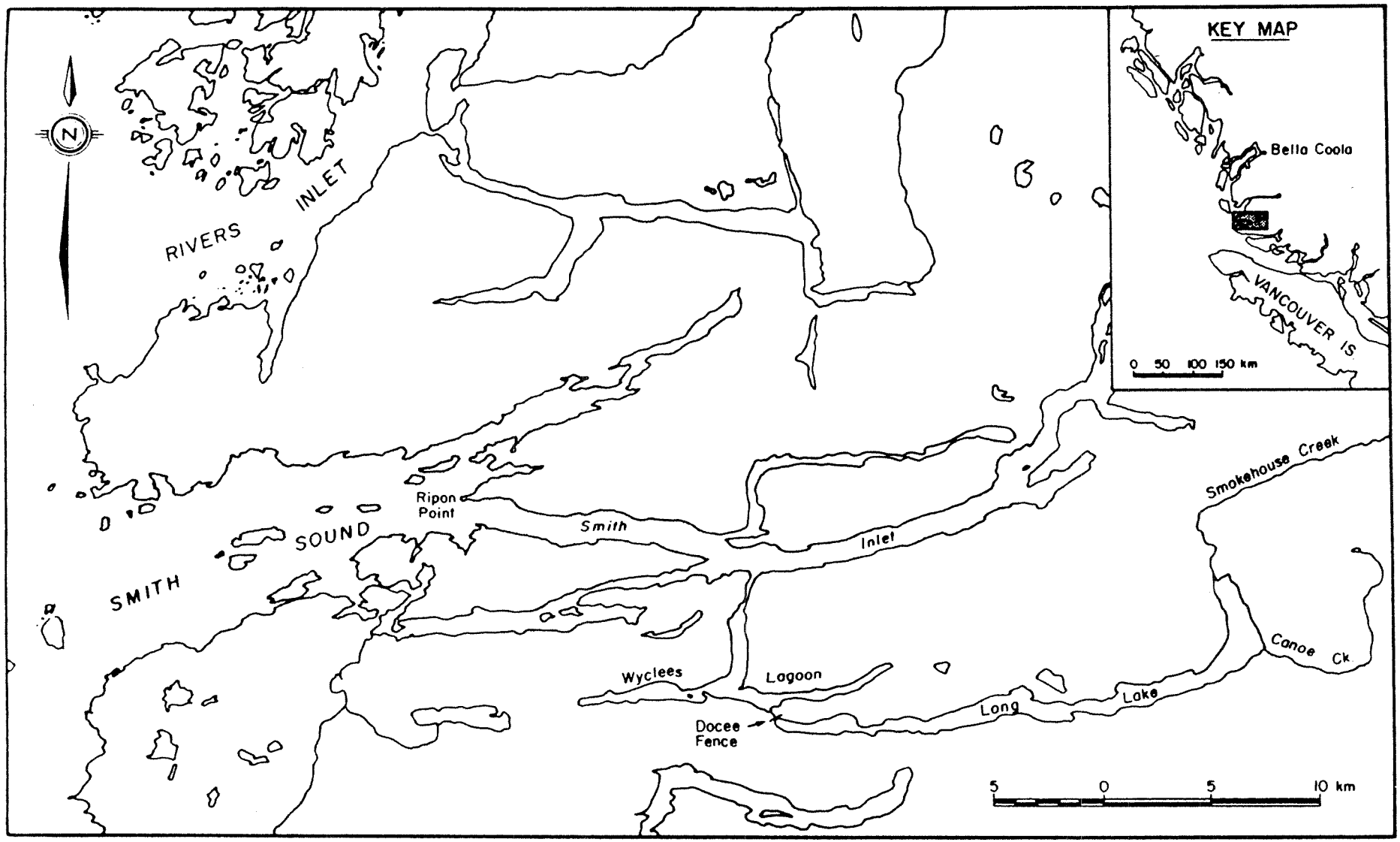


FIGURE 1. Location of Docee River, Smith Sound.

FIGURE 2. Docee River fence.

amount of binding. Second, as a result of the angle of the frame in the river, the water current held the traps on the surface. A cable from a winch on the catwalk was run through a pulley on the front bottom of the frame and then to the bottom of the trap, to pull the trap down. Holding pins were installed to hold the trap down when the winch was released. To assist in pulling and holding the trap down against the current's pressure, a plywood fin was installed on the bottom front edge of the trap at an angle to the river current. This removed pressure off the winches once the traps were pulled into the water.

At high water levels (flowing over the top of the trap) poor water visibility from turbulence made trapping difficult. To be able to use the traps, the Docee River water level should be at least 32 cm below the cement pad. Increasing the height of the trap sides by 60 cm should correct this.

The fish were very hesitant about entering the traps, especially during high water conditions. Turbulence created by water entering the trap through the aluminum bars, deterred fish from entering. Inside the trap, the current appeared to push the fish around causing them to back out almost immediately. This problem was reduced by placing plywood on the front of the trap which decreased the current and also the turbulence. The bars of the trap were painted black as the sockeye seemed to be startled by bright, shiny aluminum bars. A lid on top of the trap, to keep it darker, may also help in trapping the fish. It was noted that only one or two fish would enter the trap at one time, regardless of the size of the build-up behind the fence.

It is anticipated that by reducing the water flow and therefore the turbulence through the sides and bottom of the traps, the efficiency of the traps will be improved. In the 1987 season, these changes will be tested.

DOCEE FENCE 1986

The Docee River counting fence was installed and operational on June 27 with all fence frames and panels in the river. As in previous years, all panels had to be manoeuvred to seat properly on the river bed. Panel #1 (nearest the walkway) created the most problems. Large boulders washed downstream during winter and spring floods were under the fence preventing the proper seating of this panel. Normally, boulders that have moved under the fence can be removed fairly easily using pike poles and pry bars. However, due to their position and size, other methods had to be devised to remove them. Wire rope straps were made to fit around the boulders which were then pulled downstream using the All-Terrain Vehicle. This procedure worked quite well. The last frame on the opposite side of the river rests against a solid rock face, and the area under the frame has been scoured out in recent years. Holes were cut on the bottom of the frame to allow steel pins to drop through. The other frames went into place reasonably well. Holes between frames were plugged with expanded metal. Sand bags were then used to plug the smaller gaps along the fence.

The aluminum grates are also in need of repair. Reinforcing rods holding the grates together had numerous broken welds from vibration and debris drifting downriver and hitting them. This created holes through which fish could escape. This problem occurs annually and is generally repaired using expanded metal. In 1987 these reinforcing rods will have to be replaced and rewelded. The damage is now to a point where the structural strength of the grates themselves may be in jeopardy. A summary of the fence repairs currently required is presented in Appendix I.

The sockeye started running through the fence on June 29, with the first daily count over 1,000 on July 8. There were three peak days: July 14 with 18,794 fish; July 15 with 18,275; July 21 with 17,950 (Table 1, Fig. 3). The run of sockeye into Long Lake followed a pattern similar to previous years with daily counts dropping a few days after a commercial fishery opened and increasing again after it closed. The fence was pulled out of the river on August 8. At this time, the total sockeye count through the fence was 198,152 (Fig. 4). This was later rounded to 199,000 to include the few late sockeye that would still arrive. To August 8, 66 chinook had been counted through the fence, along with a few coho. There was a fairly good showing of chinook below the fence, but an estimate of the run size was impossible due to poor water visibility. Biological samples were taken from sockeye found dead on the fence. Details of biological data from all sockeye sampled are listed in Appendix II. The hypural length, sex and age data sampled from 132 sockeye at the fence in 1986 are presented in Table 2. The frequency of daily sockeye sampling, by sex, is illustrated in Figure 5. The average age composition of the 108 readable scale samples was 32% age 4_2 and 68% age 5_2 fish. Daily weather and water levels for the Docee River are reported in Table 3 and Figure 6.

TABLE 1. Docee River fence daily counts 1986.

DATE	DAILY #SOCKEYE	DAILY #CHINOOK	CUMULATIVE #SOCKEYE	CUMULATIVE #CHINOOK	COMMENTS
JUNE 28					1 FENCE DEAD
JUNE 29	1		1		
JUNE 30	25		26		
JULY 01	553		579		
JULY 02	526		1105		
JULY 03	213		1318		
JULY 04	84		1402		
JULY 05	34		1436		
JULY 06	31		1467		
JULY 07	176		1643		NO MOON
JULY 08	10543		12186		
JULY 09	3227		15413		
JULY 10	402		15815		
JULY 11	60		15875		
JULY 12	90		15965		
JULY 13	70		16035		
JULY 14	18794		34829		
JULY 15	18275		53104		
JULY 16	5290		58394		
JULY 17	1701		60095		
JULY 18	1311		61406		
JULY 19	4113		65519		
JULY 20	6535		72054		
JULY 21	17950		90004		FULL MOON
JULY 22	14675		104679		
JULY 23	3347		108026		
JULY 24	9491		117517		
JULY 25	9254		126771		
JULY 26	11367	1	138138	1	
JULY 27	6242	1	144380	2	
JULY 28	6722	2	151102	4	
JULY 29	8908	2	160010	6	1 PINK
JULY 30	5411	1	165421	7	
JULY 31	6176	1	171597	8	
AUG 01	4258		175855	8	
AUG 02	4991	2	180846	10	
AUG 03	5961	2	186807	12	
AUG 04	5177	6	191984	18	
AUG 05	3504	25	195488	43	NO MOON
AUG 06	1576	18	197064	61	
AUG 07	627	5	197691	66	
AUG 08	160		197851	66	

FIGURE 3. Docee River fence daily sockeye counts, June 28 to August 8, 1986.

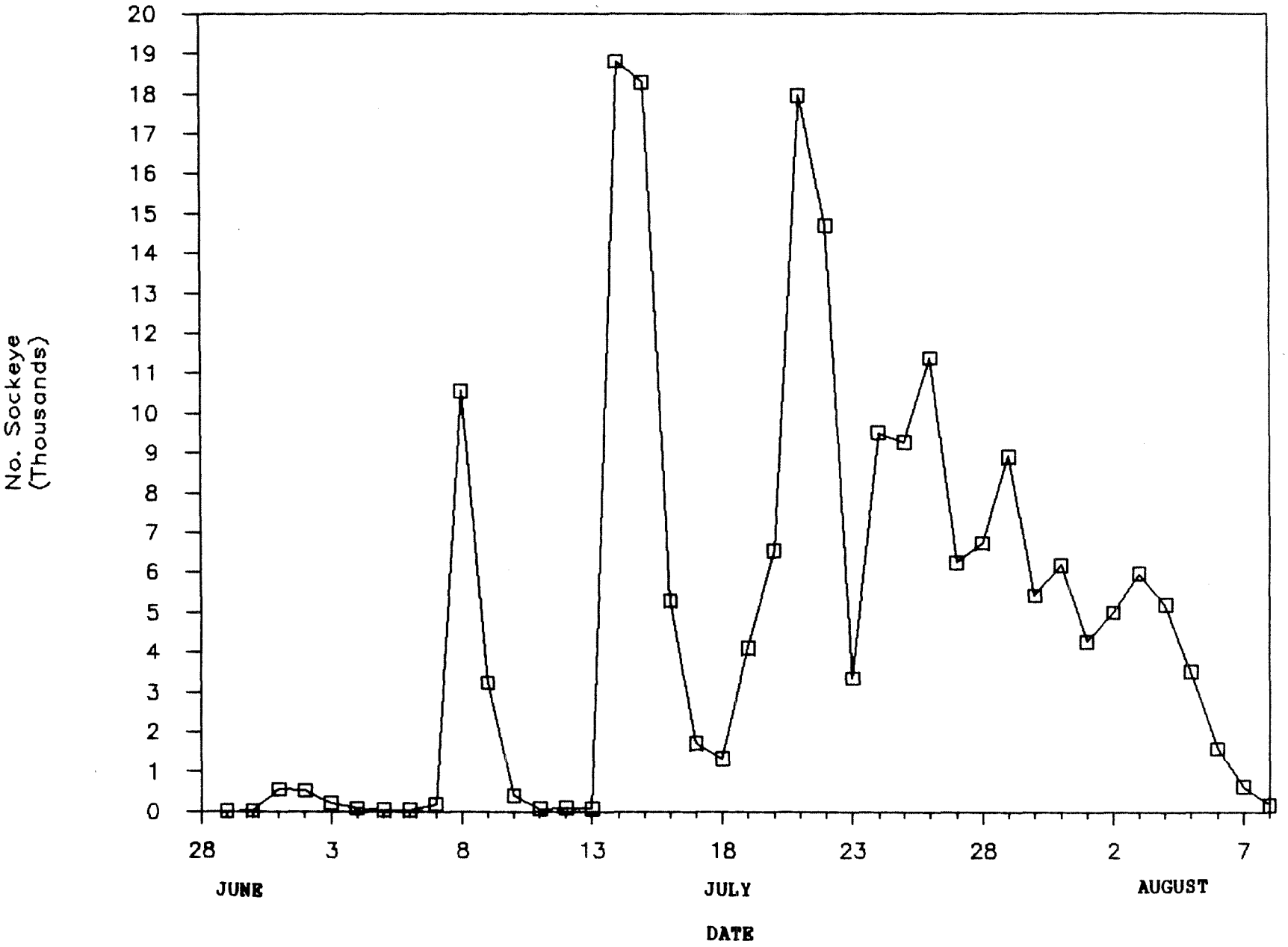


FIGURE 4. Docee River cumulative sockeye counts, June 28 to August 8, 1986.

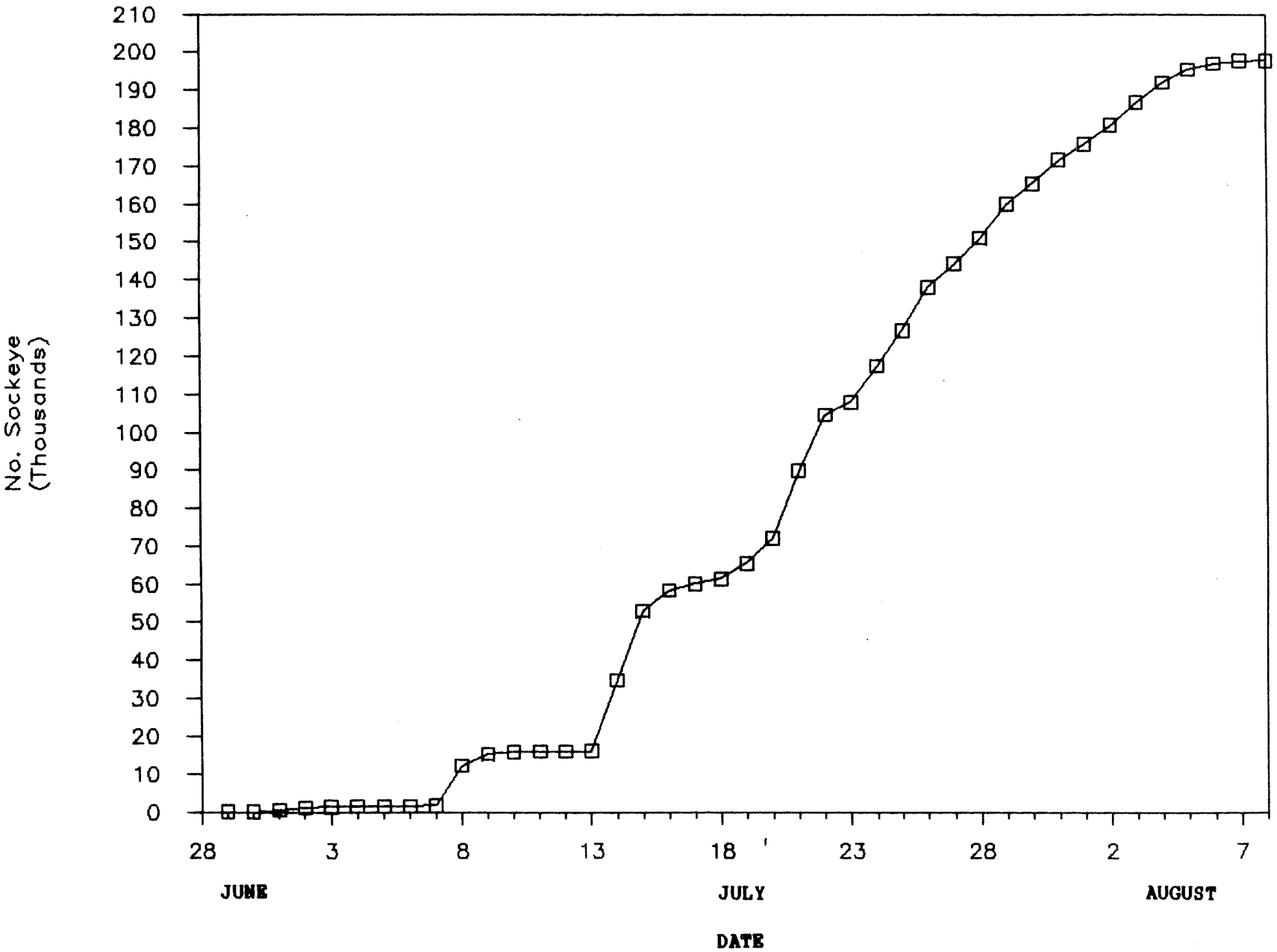


TABLE 2. Age, sex and length of sockeye salmon sampled from the Docee River Fence 1986.

Hypural Length (cm)	Age					
			4_2		5_2	
	M	F	M	F	M	F
60						
59						
58						
57	1					
56					1	
55		1			1	2
54	1				3	1
53	1	1			2	5
52		1			2	8
51		1	1		2	9
50		2		1	3	13
49	2	2	4	2	4	9
48	1	2	2	3	2	3
47		4	3	2		1
46	2		3			1
45		2	3	3		
44			1	1	1	
43			1	4		
42			1			
41						
40						
TOTAL N	8	16	19	16	21	52

Total Sampled : 132

Age Unknown : 18%
Age 4_2 : 27%
Age 5_2 : 55%

FIGURE 5. Docee River sockeye samples by sex, 1986.

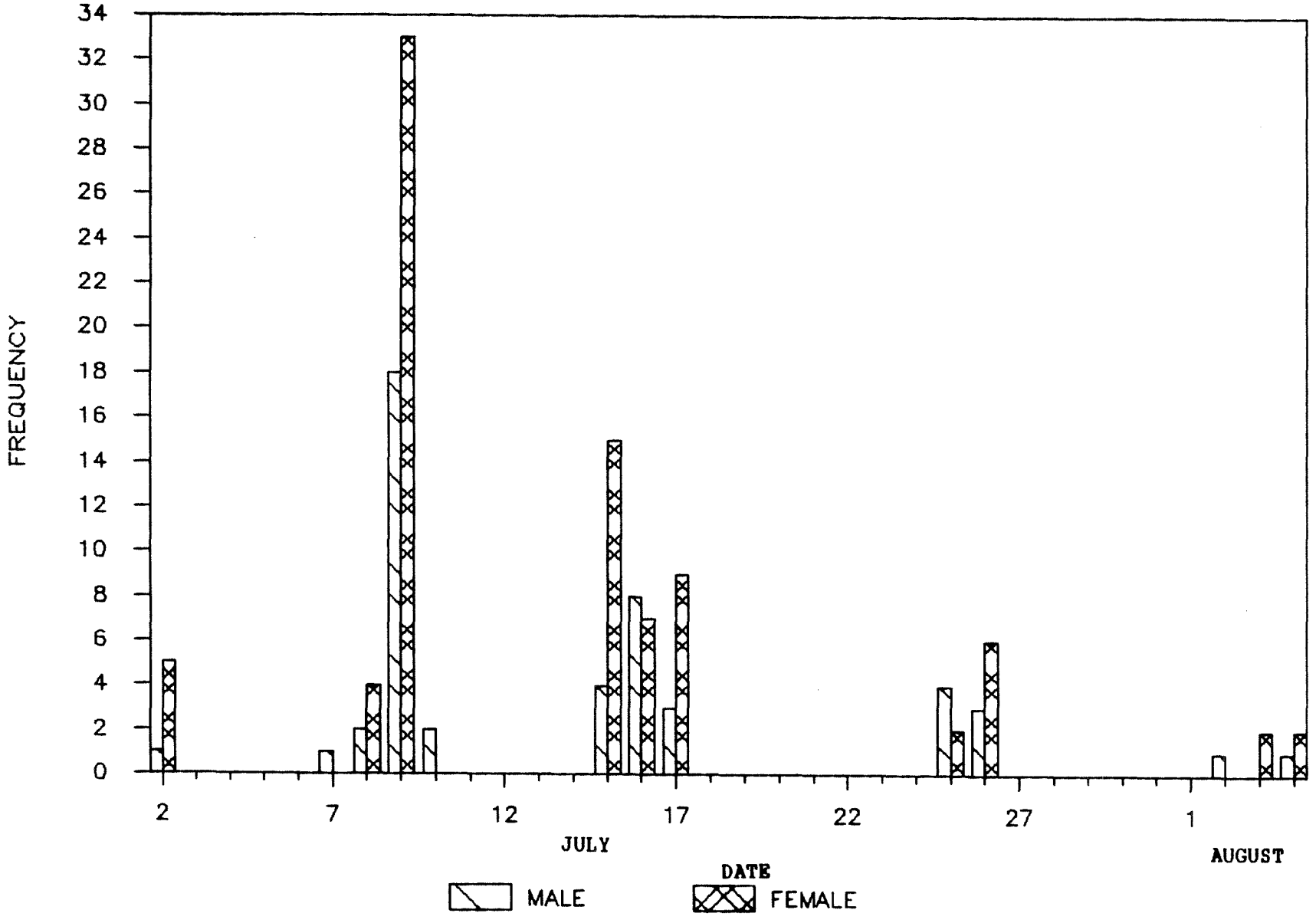
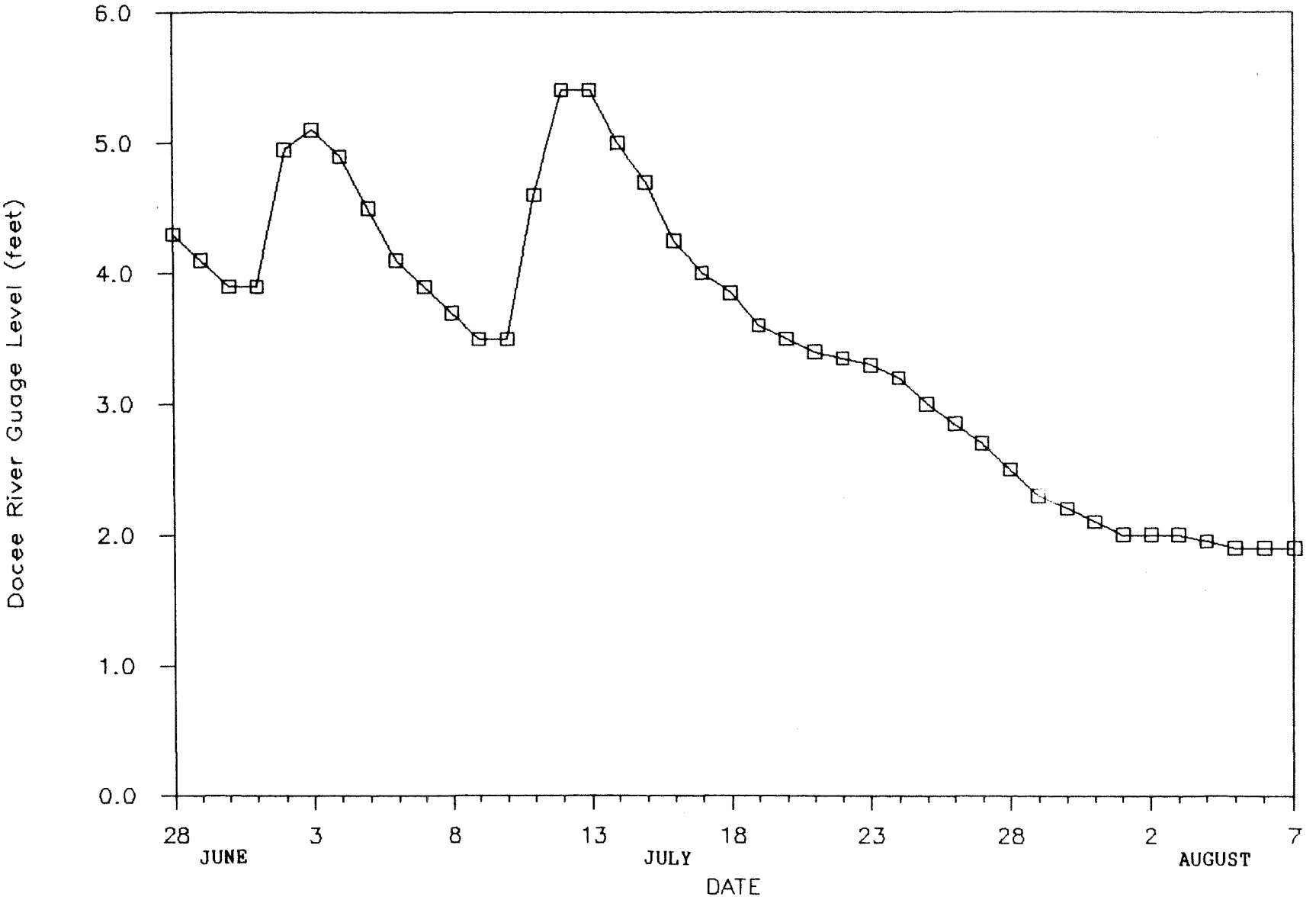


TABLE 3. Docee River 1986. Daily weather and river levels.

DATE	RIVER LEVEL (FT) AM	PM	WEATHER
JUNE 17			RAIN
JUNE 18			HEAVY RAIN
JUNE 19			HEAVY RAIN
JUNE 20			HEAVY RAIN
JUNE 21			HEAVY RAIN
JUNE 22		6.10	SE 20-30, RAIN
JUNE 23	6.40	6.30	PART CLOUD, SUN IN PM
JUNE 24	6.15	5.95	SUNNY & CLEAR
JUNE 25		5.35	SUN, CLEAR, NW
JUNE 26	5.20		SUN, CLEAR, NW
JUNE 27	4.70	4.20	FOG AM, NOON-SUN & CLEAR, NW
JUNE 28	4.30	4.10	FOG AM, CLEAR PM, FOG BY 20. HOURS, NW
JUNE 29	4.10	3.90	FOG AM, CLEAR PM, NW CLOUDS MOVE IN
JUNE 30	3.90	3.85	RAIN, SE 30
JULY 01	3.90	4.85	RAIN AM, SUNNY PERIODS AFTERNOON, SE 30-40
JULY 02	4.95	5.00	FOG AM, RAIN PM, SW
JULY 03	5.10	5.10	HIGH OVERCAST AM, NE OUTFLOW
JULY 04	4.90	4.65	HIGH OVERCAST AM, SOME FOG, CALM
JULY 05	4.50	4.30	AM- CALM & HIGH OVERCAST, PM- SUNNY BREAKS
JULY 06	4.10	3.95	FOG AM, SUNNY PM
JULY 07	3.90	3.80	HIGH FOG AM, SUNNY BREAKS PM
JULY 08	3.70	3.60	SUNNY & CLEAR, LIGHT RAIN PM
JULY 09	3.50	3.45	AM HIGH OVERCAST, PM RAIN, SE
JULY 10	3.50	4.00	AM- SE, RAINSHOWERS; PM- SE, STEADY RAIN
JULY 11	4.60	5.00	AM- SE, RAINSHOWERS; PM- SE, STEADY RAIN
JULY 12		5.40	RAIN AM, CLOUDY PM
JULY 13	5.40		HIGH FOG, COOL, CALM
JULY 14	5.00	4.80	HIGH FOG AM; CLOUDY, FEW CLEAR BREAKS PM
JULY 15	4.70	4.40	CLEAR, CALM AM; HIGH OVERCAST
JULY 16	4.25	4.00	FOG
JULY 17	4.00	4.00	FOG & DRIZZLE, HIGH OVERCAST PM
JULY 18	3.85	3.70	LIGHT FOG & SUN AM, SUNNY & CLOUD PM
JULY 19	3.60	3.50	SUNNY ALL DAY
JULY 20	3.50		FOG, CLEAR
JULY 21	3.40	3.35	FOG AM, SUN PM
JULY 22	3.35	3.30	FOG AM, SUN & CLOUD PM
JULY 23	3.30	3.20	FOG & CLOUD AM, SUN & CLEAR PM
JULY 24	3.20	3.00	FOG & CLOUD AM, CLEAR & SUNNY PM, NW
JULY 25	3.00	2.90	FOG & LIGHT RIAN AM, CLOUD WITH SUN PM
JULY 26	2.85	2.70	FOG AM, CLOUDY PM
JULY 27	2.70	2.55	FOG, OVERCAST, LIGHT RAIN AM; PM LIGHT RAIN
JULY 28	2.50	2.35	CLOUD WITH SUN AM, SUNNY PM
JULY 29	2.30		LIGHT FOG & SUNNY
JULY 30	2.20	2.15	OVERCAST AM, LIGHT RAIN PM
JULY 31	2.10	2.00	OVERCAST, LIGHT RAIN AM, SUN & CLOUD PM
AUG 01	2.00	2.00	FOG AM, SUNNY PM
AUG 02	2.00	2.00	FOG AM, SUNNY PM, NW
AUG 03	2.00	1.95	FOG AM, SUNNY PM, NW
AUG 04	1.95	1.95	FOG, OVERCAST AM; LIGHT RAIN PM
AUG 05	1.90		FOG AM,SUN & CLOUD PM
AUG 06	1.90	1.90	FOG AM, CLEAR & HOT PM
AUG 07	1.90		SUNNY & CLEAR ALL DAY

FIGURE 6. Docee River water levels (AM), June 28 to August 7, 1986.



APPENDIX I

GENERAL REPAIRS REQUIRED TO THE DOCEE RIVER COUNTING FENCE (1986)

1) Replace top decking (rotten) - the decking must be heavy enough to support the winch motor while lifting and lowering the panel frames and other debris.
2) Top safety railing - the 4X4 support posts of the current safety railing are rotten in the middle. The rail protects personnel against a 20 foot fall.
3) The decking on the lower catwalks is split and rotten in places (2X12" upper decking, 2X6" lower catwalk).
4) Winch cable guides - a block for each panel frame for the cable to ride on. (At present, 6 of the 9 pulleys have broken at the welds - the cable is currently rubbing on the angle iron).
5) Panel winches - the present ones are starting to breakdown due to wear and tear (18 winches in total).
6) Two windows in counting tower - preferably sliding windows with screens; a door is also needed.
7) New method of drop pins on bottom of the frames. (This will help to stop leaks and will make sand bagging easier).
8) Re-weld aluminum support bars on panel grates.
9) General maintenance on the fence structure (Paint - black, white, gray - nonskid).

APPENDIX II. 1986 Docee River fence sockeye samples.

DATE	SEX	LENGTH (CM)	AGE	DATE	SEX	LENGTH (CM)	AGE	DATE	SEX	LENGTH (CM)	AGE
JULY 2	F	49.5	5_2	JULY 9	F	49.0		JULY 16	F	43.0	4_2
JULY 2	F	45.0	4_2	JULY 9	F	52.0		JULY 16	F	48.5	5_2
JULY 2	F	52.5	5_2	JULY 9	F			JULY 16	F	49.5	
JULY 2	M	48.5		JULY 9	F	49.5		JULY 16	M	45.0	4_2
JULY 2	F	45.0		JULY 9	F	46.5	4_2	JULY 16	M	50.0	5_2
JULY 2	F	52.5		JULY 9	F	46.0	5_2	JULY 16	M	54.0	5_2
JULY 7	M	45.5		JULY 9	F	51.0	5_2	JULY 16	F	49.5	5_2
JULY 8	M	49.0	5_2	JULY 9	F	52.0	5_2	JULY 16	F	47.0	
JULY 8	F	49.5	5_2	JULY 9	M	45.0	4_2	JULY 16	F	50.0	5_2
JULY 8	M	54.0		JULY 9	M	46.5	4_2	JULY 16	F	52.0	5_2
JULY 8	F	44.5		JULY 9	M	43.5	5_2	JULY 16	M	54.0	5_2
JULY 8	F	46.5		JULY 9	F	52.5	5_2	JULY 16	M	51.0	5_2
JULY 8	F	47.0		JULY 9	F	49.0	4_2	JULY 17	F	45.0	4_2
JULY 8			5_2	JULY 9	M	48.5	4_2	JULY 17	F	42.5	4_2
JULY 9	F	50.0	5_2	JULY 9	F	48.5	4_2	JULY 17	F	43.5	4_2
JULY 9	M	52.5		JULY 9	F	52.0	5_2	JULY 17	F	52.5	5_2
JULY 9	M	51.0	4_2	JULY 9	F	42.5	4_2	JULY 17	M	49.0	4_2
JULY 9	M	45.5	4_2	JULY 9	F	50.0	5_2	JULY 17	F	47.5	
JULY 9	F	54.5		JULY 9	F	51.0		JULY 17	F	43.0	4_2
JULY 9	M	49.0	4_2	JULY 9	M	46.0	4_2	JULY 17	M	56.5	
JULY 9	F	47.5	5_2	JULY 10	M	42.5	4_2	JULY 17	F	54.5	5_2
JULY 9	F	48.0		JULY 10	M	45.0	4_2	JULY 17	M	47.5	
JULY 9	F	47.5	4_2	JULY 15	F	53.5	5_2	JULY 17	F	49.5	5_2
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JULY 9	F	47.5	4_2	JULY 15	M	52.0	5_2	JULY 25	M	52.0	5_2
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JULY 9	M	53.5	5_2	JULY 15	M	48.0	4_2	JULY 25	F	50.5	5_2
JULY 9	F	48.0	5_2	JULY 15	M	52.5	5_2	JULY 26	F	48.5	5_2
JULY 9	F	49.0	5_2	JULY 15	F	52.0	5_2	JULY 26	F	52.0	5_2
JULY 9	F	49.0	5_2	JULY 15	F	49.5	5_2	JULY 26	M	49.0	5_2
JULY 9	F	45.0	4_2	JULY 15	F	50.5	5_2	JULY 26	F	49.5	5_2
JULY 9	F	49.0	5_2	JULY 15	F	49.0	5_2	JULY 26	M	49.0	5_2
JULY 9	F	50.5	5_2	JULY 15	F	49.5	4_2	JULY 26	F	51.0	5_2
JULY 9	M	56.0	5_2	JULY 15	F	49.5	5_2	JULY 26	F	49.5	5_2
JULY 9	M	47.0	4_2	JULY 15	M	48.5		JULY 26	M	48.5	5_2
JULY 9	M	47.5	5_2	JULY 15	F	52.0	5_2	JULY 26	F	47.5	5_2
JULY 9	F	52.5	5_2	JULY 15	F	47.0	5_2	AUG 2	M	53.0	5_2
JULY 9	F	51.5	5_2	JULY 15	F	50.5	5_2	AUG 3	F	54.5	5_2
JULY 9	F	49.0	5_2	JULY 15			5_2	AUG 3	F	47.0	4_2
JULY 9	F	51.0	5_2	JULY 16	M	49.5	5_2	AUG 4	M	48.5	4_2
JULY 9	M	47.5	5_2	JULY 16	M	41.5	4_2	AUG 4	F	52.0	5_2
JULY 9	F	48.0	4_2	JULY 16	M	43.5	4_2	AUG 4	F	49.5	5_2
JULY 9	M	47.5	4_2								

APPENDIX III. 1986 Smith Inlet tide levels (Bella Bella).