



To: R. Tetreau

Date: June 30, 1983
File: 40.390103 Lakelse Lake

RE: PROJECT OUTLINE - LAKELSE LAKE CUTTHROAT
TROUT ENHANCEMENT OPPORTUNITIES

Purpose: This project is geared to provide basic information on production capabilities for cutthroat trout in streams tributary to Lakelse Lake and to there by identify enhancement opportunities available to lake cutthroat populations.

Methods:

A. Use gee traps to determine which lake tributary streams have cutthroat trout and in association with which other species. Gee sampled cutthroat should have enough scales (25-50?) taken to determine life history information and to reference against "B" length frequency studies.

B. From information gathered in "A" and in consideration of, species present fish densities, access, stability and etc. select the best enhancement candidate streams for intensive investigation, ie. length frequency investigation. I would suggest that the following streams may qualify and for the below listed reasons.

Herman Creek	a control (ideal cutthroat stream) access stability size
Hotsprings Creek	stability warm water incubation beaver dam stocking etc.
Clearwater Creek	stability access habitat

etc. and etc.

As you can see, choice may be somewhat subjective.

Length frequency studies are to be conducted in a fashion similar to that used for "Skeena" fry assessment ie. representative stream habitat is cordoned off using a downstream seine set while upstream habitat is electroshocked to determine stream resident fish.

Results from the above should include the following.

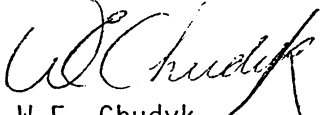
1. length frequency of all cutthroat shocked
2. Number of other stream residents, ie is this a coho-cutthroat stream or strictly a cutthroat stream.

Hopefully, results will identify presence or absence of cutthroat age groups, therefore enhancement opportunities. For example, if in a particular reach of stream 0+ & 1+ juvenile cutthroat were absent then one might suspect that the stream had insufficient spawning area. Obviously some of this length frequency stuff must be metred by the fact that this years eggs are not likely out of the gravel.

C. Lakelse Lake, where selected tributary streams enter the lake should be test gill netted or shocker boat surveyed (in conjunction with a seine net) to determine length frequencies/life history information.

In concluding I would recommend that you keep an eye out for any other obvious cutthroat enhancement opportunity or natural phenomena ie. hotsprings incubation, net pen rearing in Onion Lake, fry incubation in one tributary for distribution in others streams.

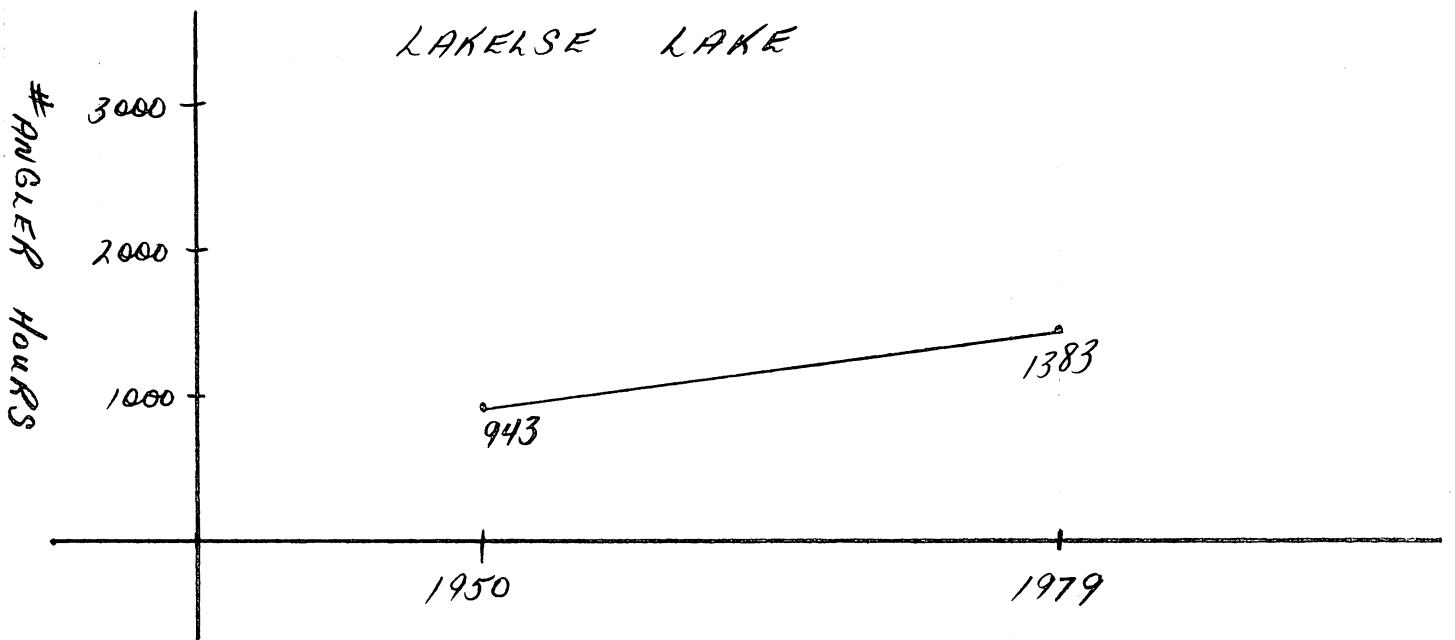
Cheers


W.E. Chudyk
Fisheries Biologist
Skeena Region

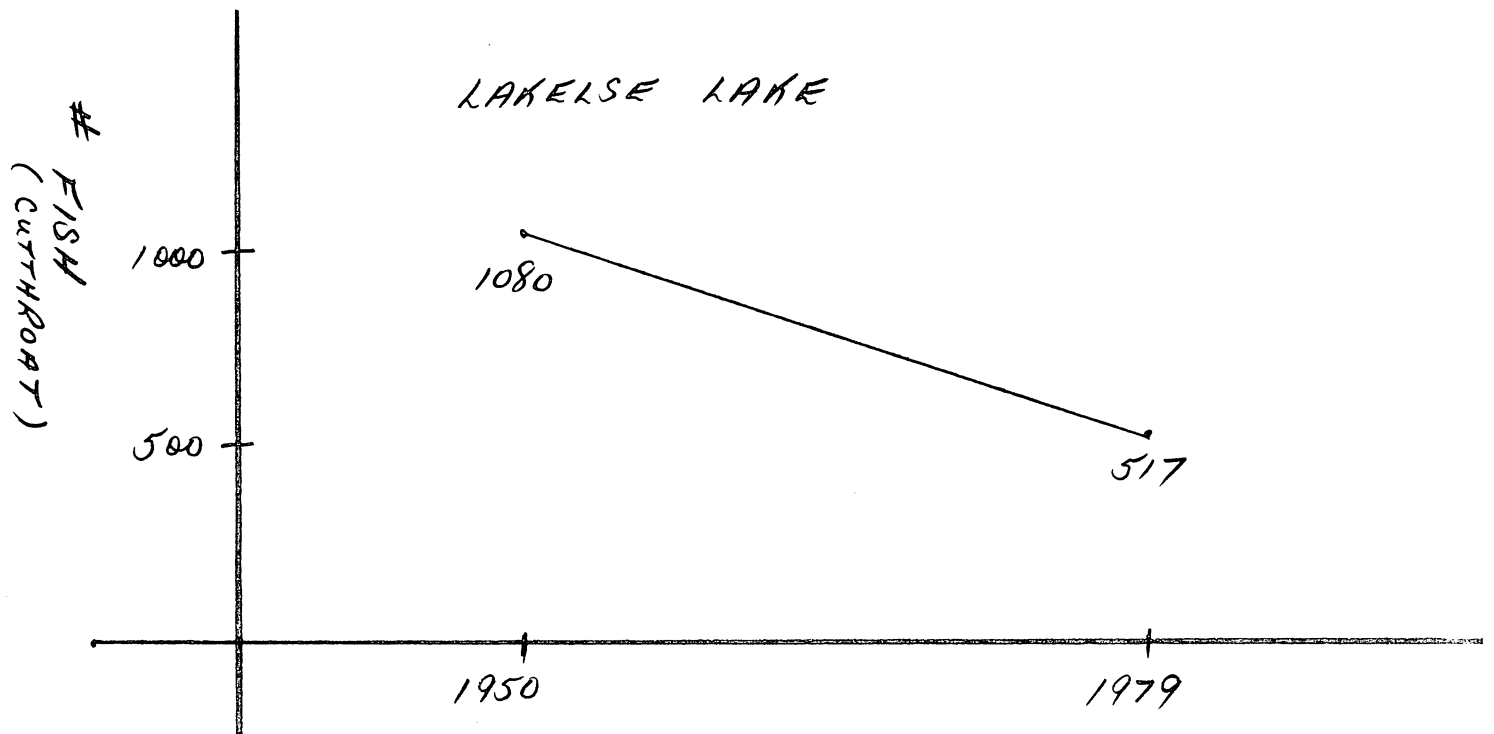
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CREEK CENSUS COMPARISON 1950 - 1979

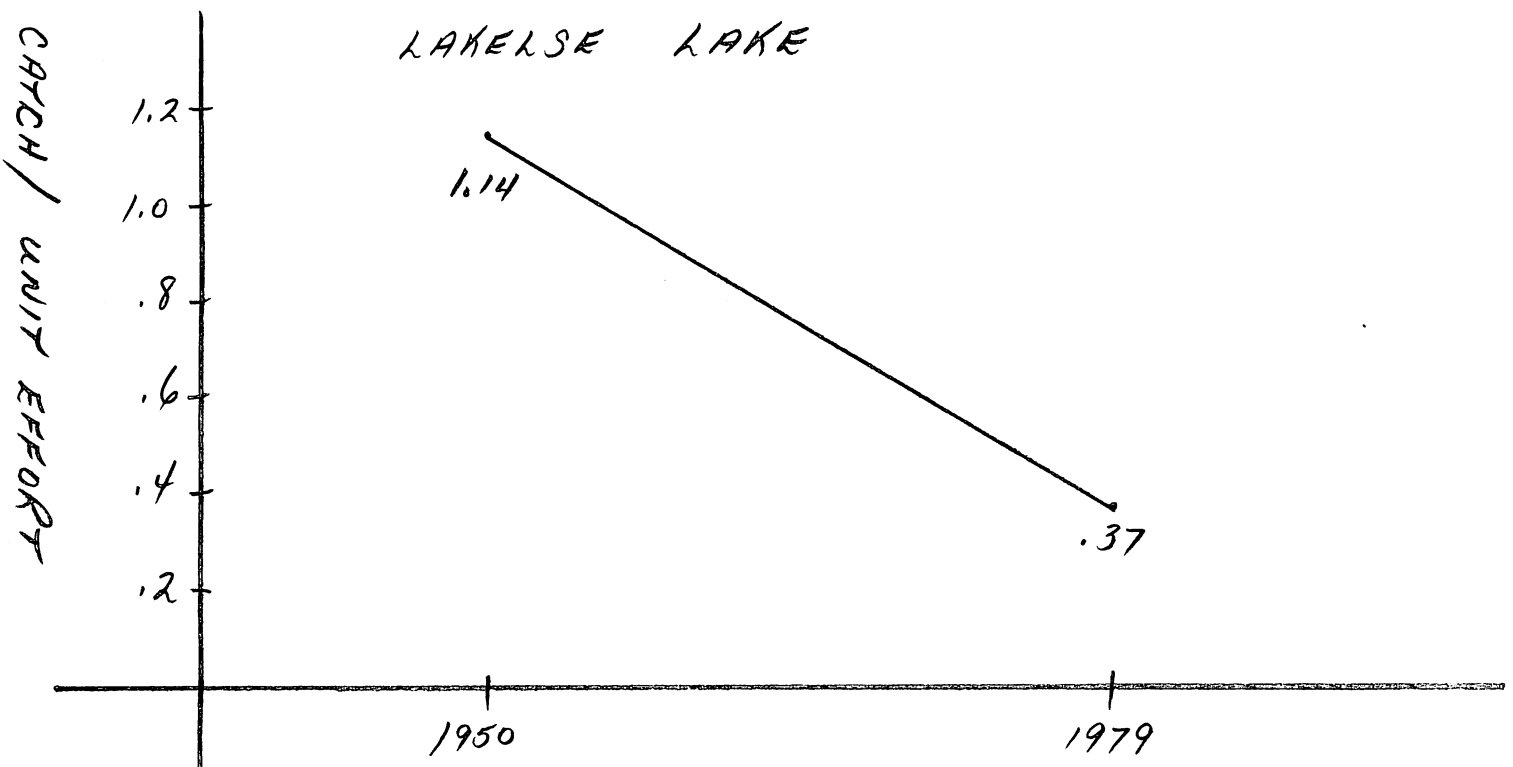
LAKELSE LAKE



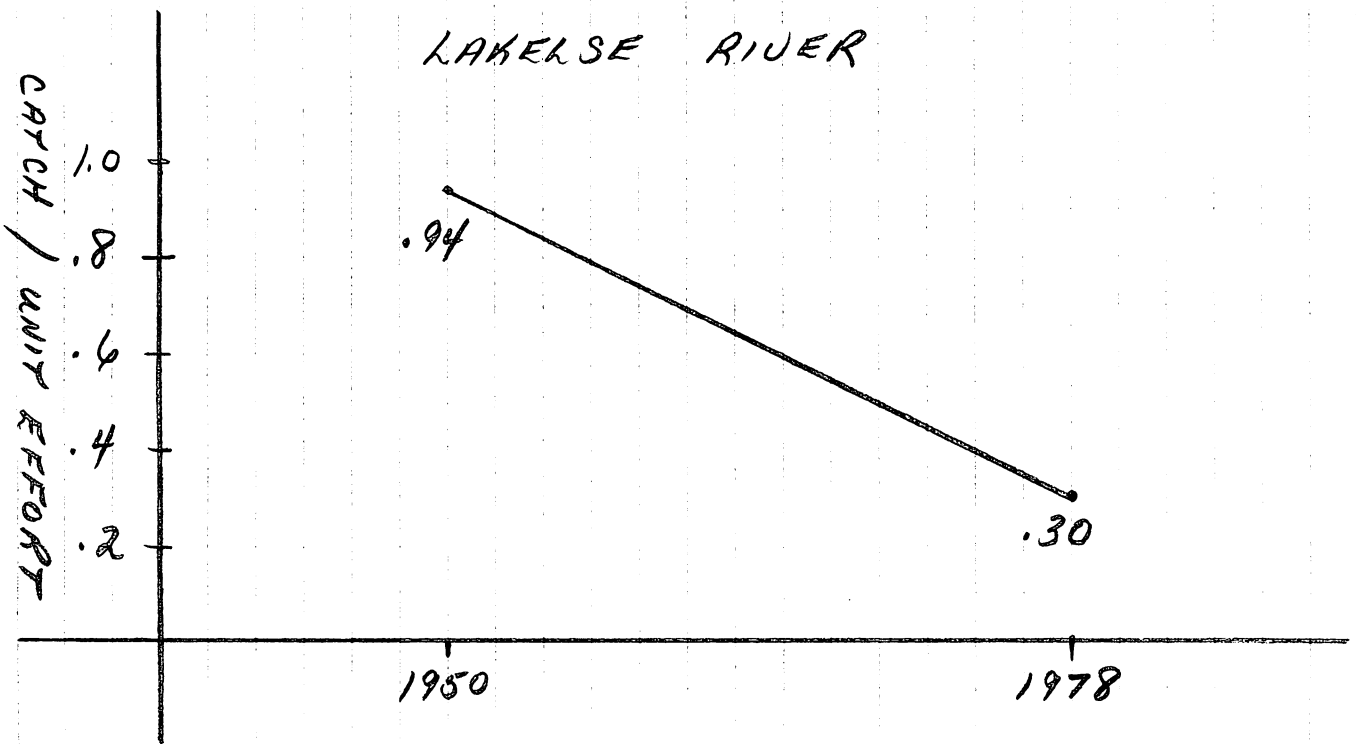
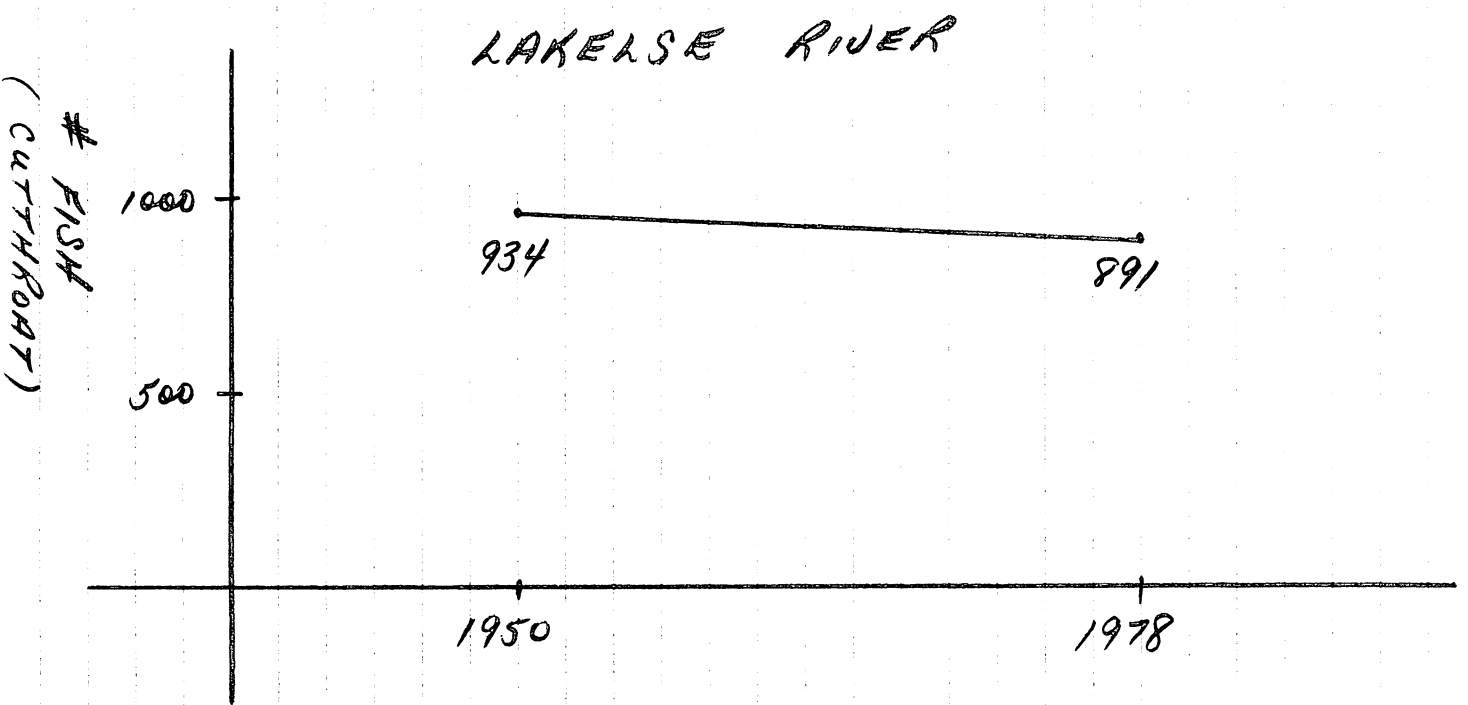
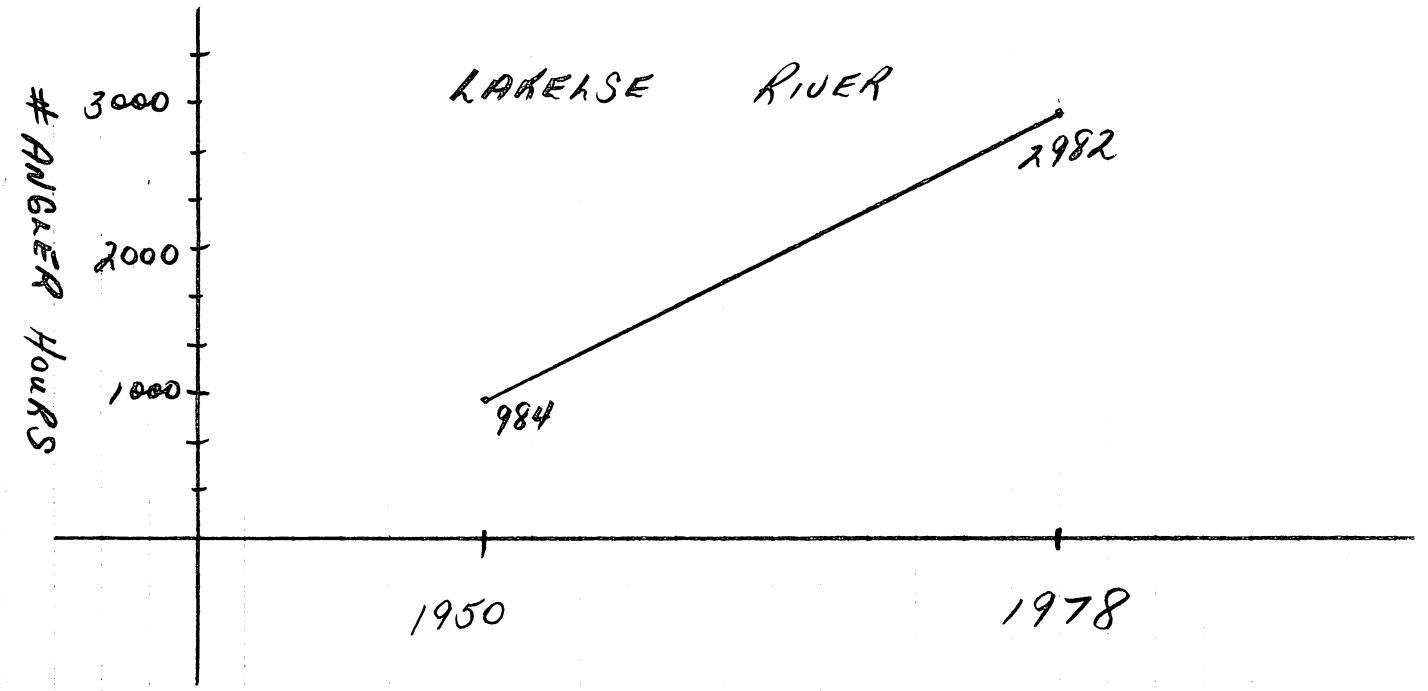
LAKELSE LAKE



LAKELSE LAKE



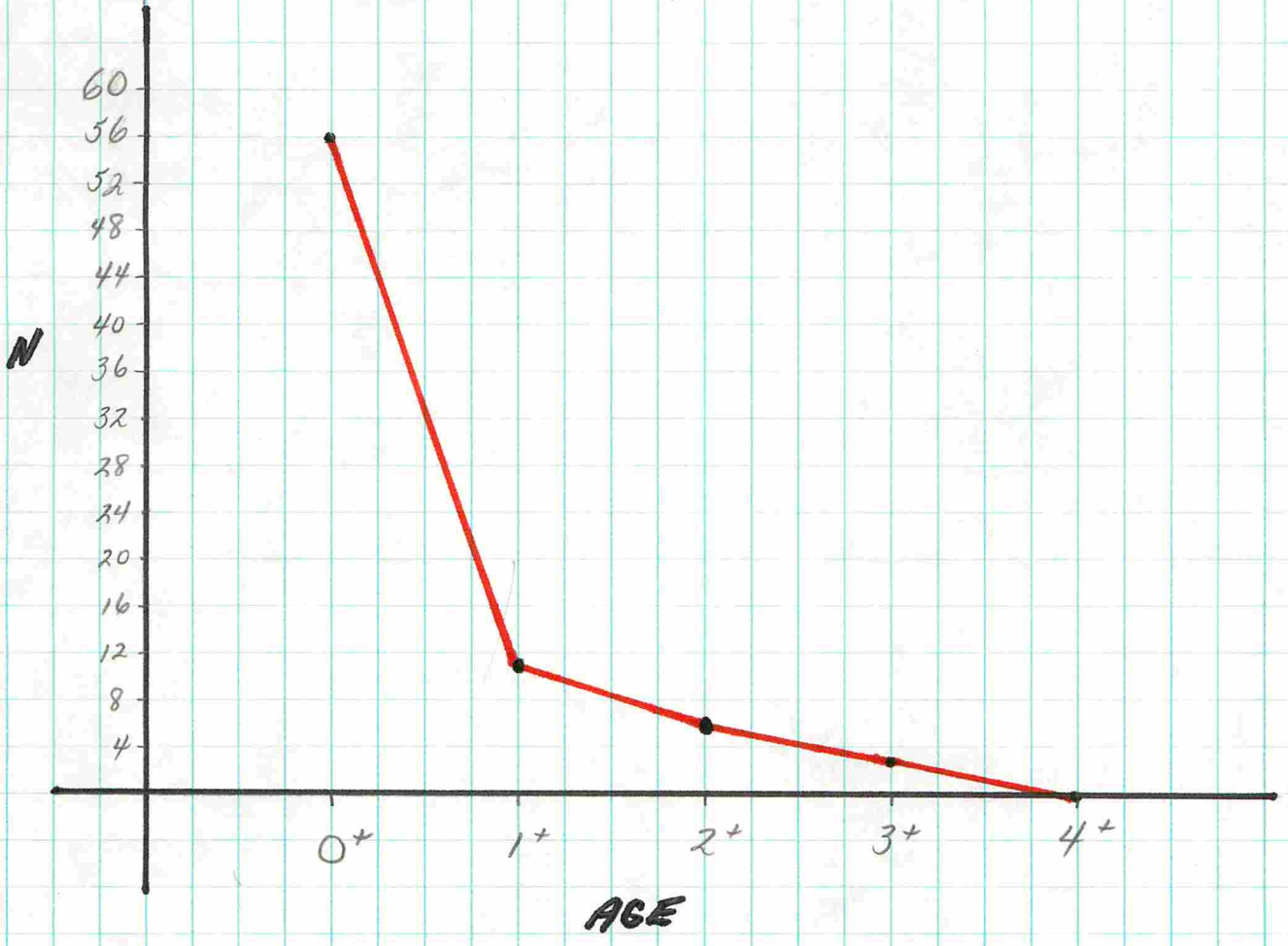
CREEK CENSUS COMPARISON 1950 - 1978



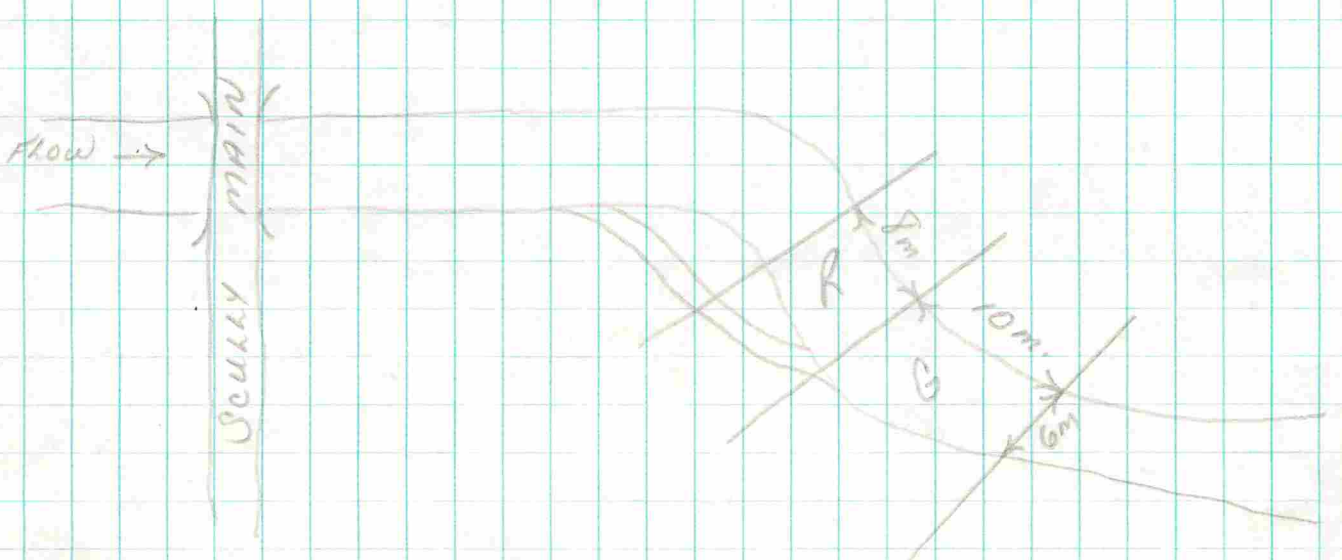
CUTTHROAT
 AGE / NUMBER HISTOGRAM

CLEARWATER CR. SITE # 1

DATE - JULY 5/83
 WATER TEMP. - 12°C
 AREA - 6m. x 18m. = 108 m²
 P VALUE - .6
 density - 2.36 fish / m²
 total cutthroat - 74 % - 73.9%



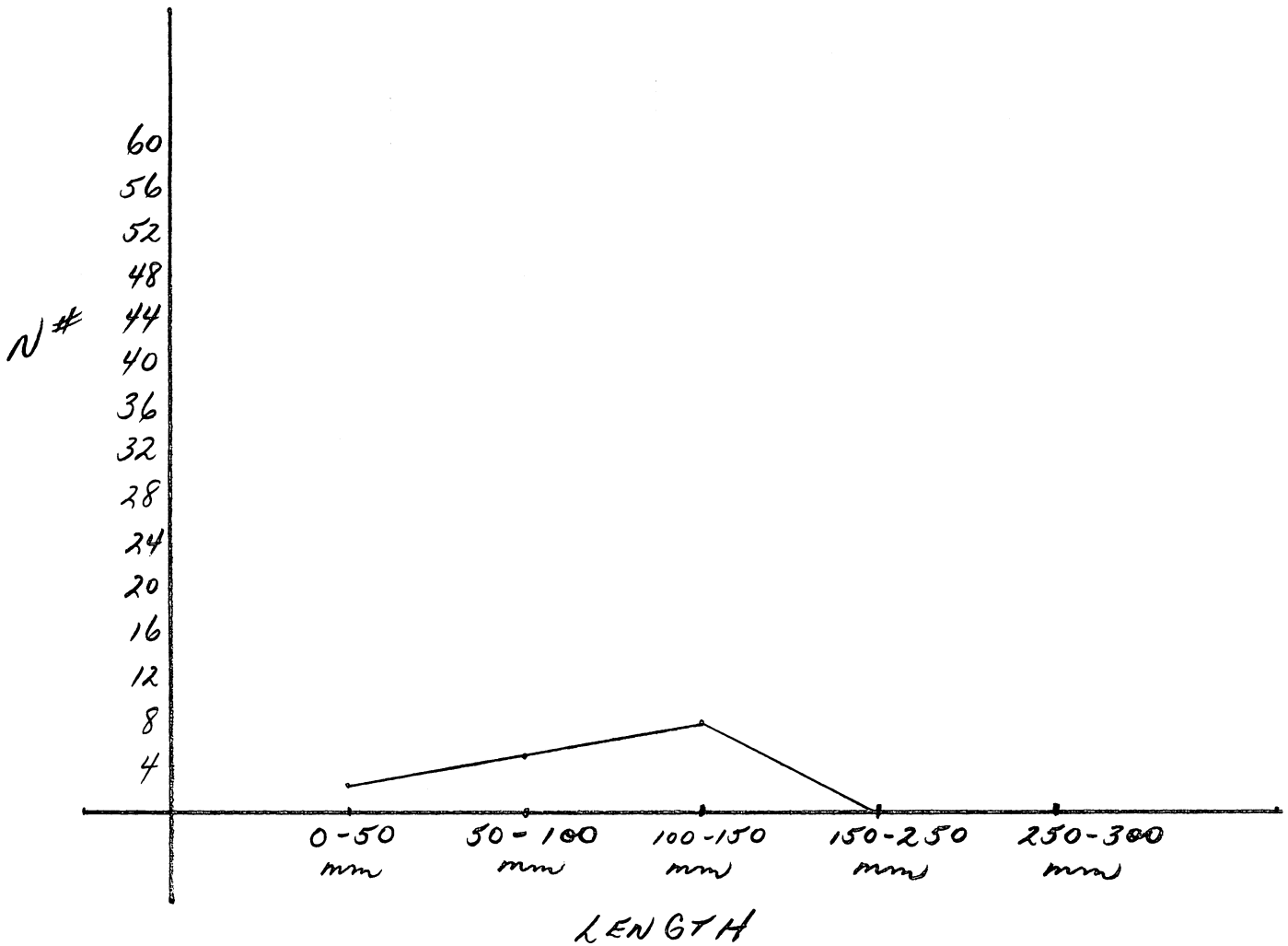
SAMPLE SITE MAP



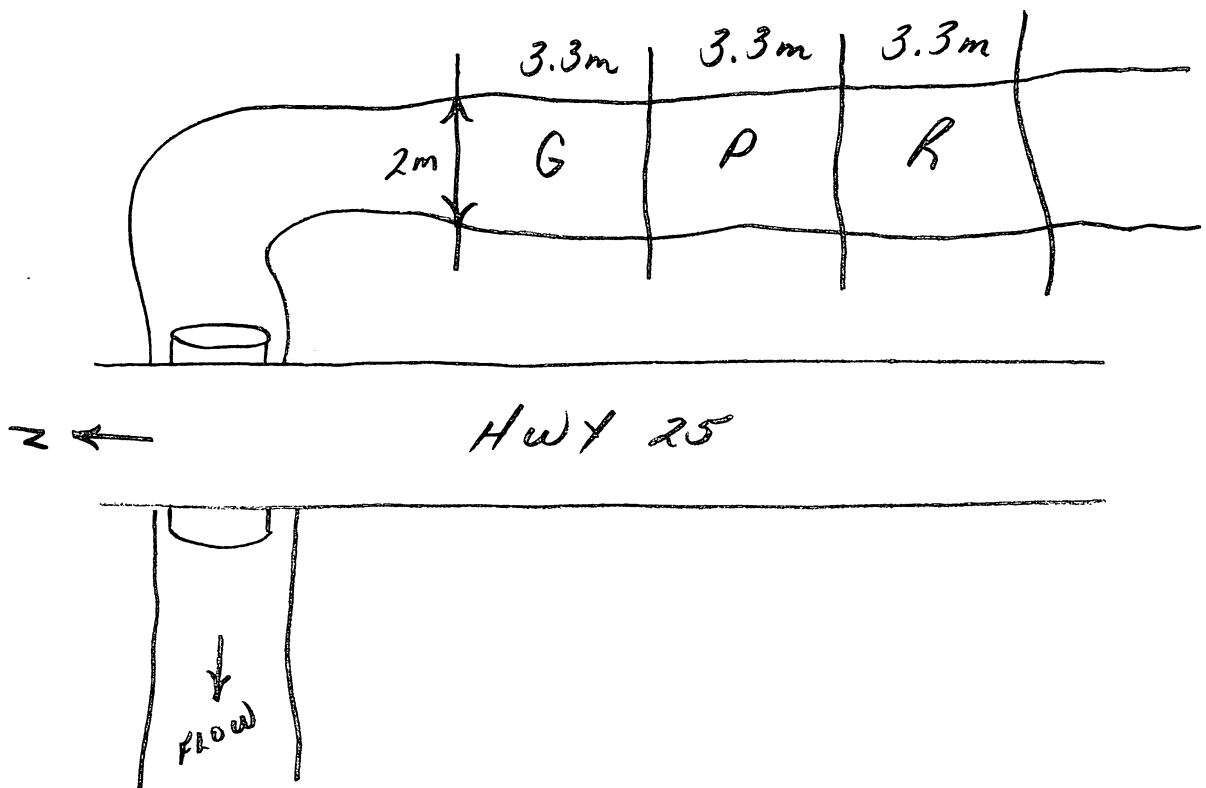
REFUGE CREEK

Site #2

Date - July 5/83
 Water temp - 17°C
 Area - 2m x 11m = 22m²
 P value - .95
 density - 2.27 fish / m²
 total - cutthroat 15 90 - 30%



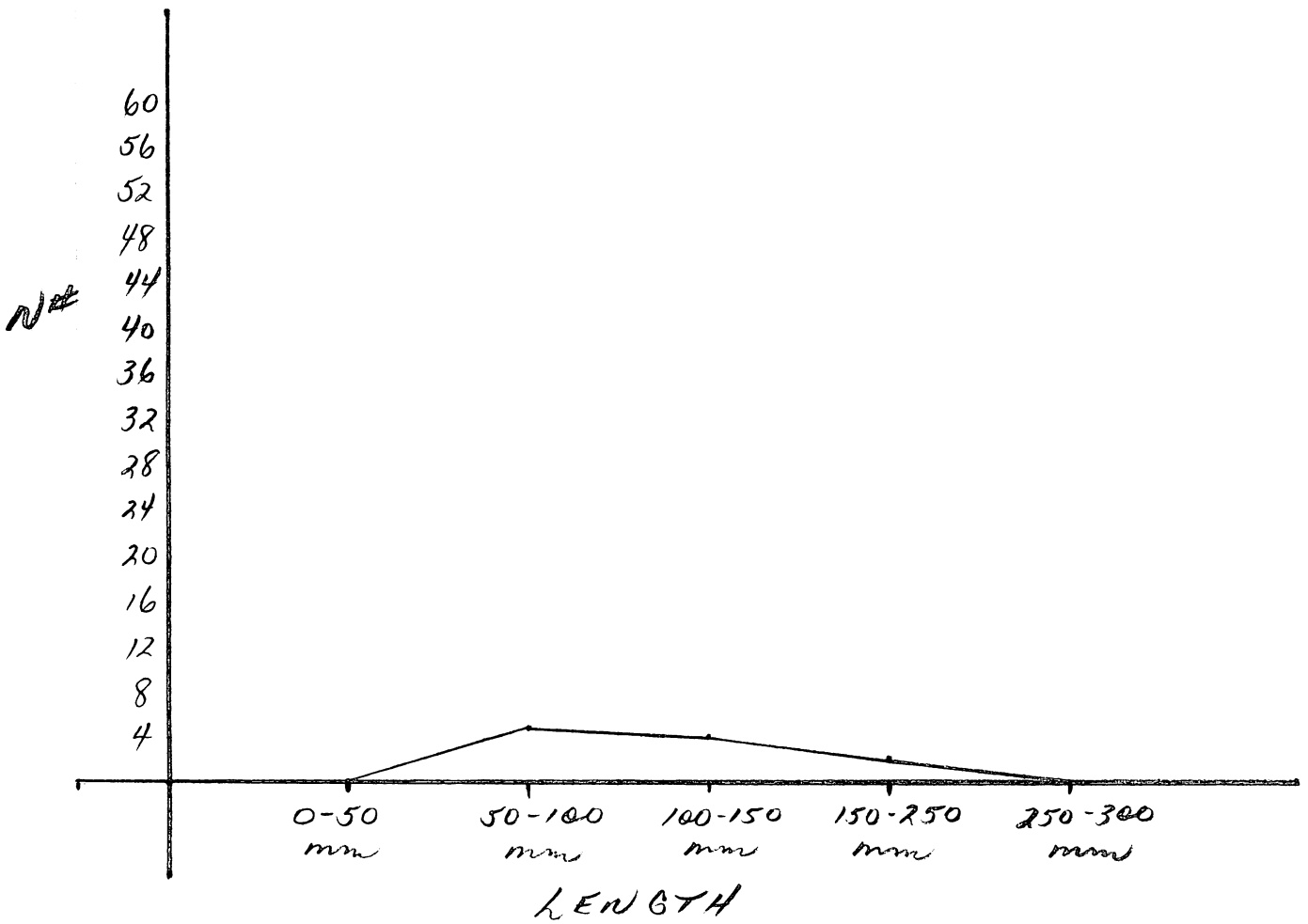
SAMPLE SITE MAP



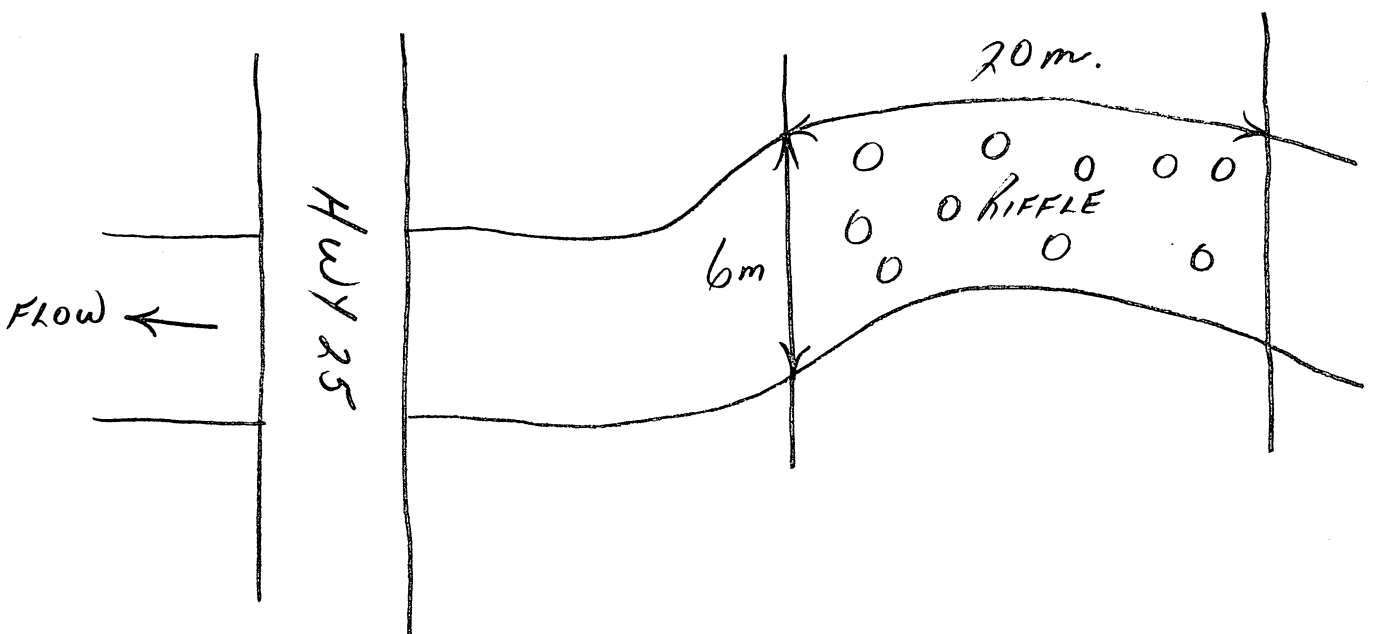
GRANITE CREEK

SITE #3

Date - July 6/83
Water temp - 9.5°C
Area - 6 x 20 m = 120 m²
P value - .85
density - .91 fish / m²
total Cutthroat - 11 % - 10.1



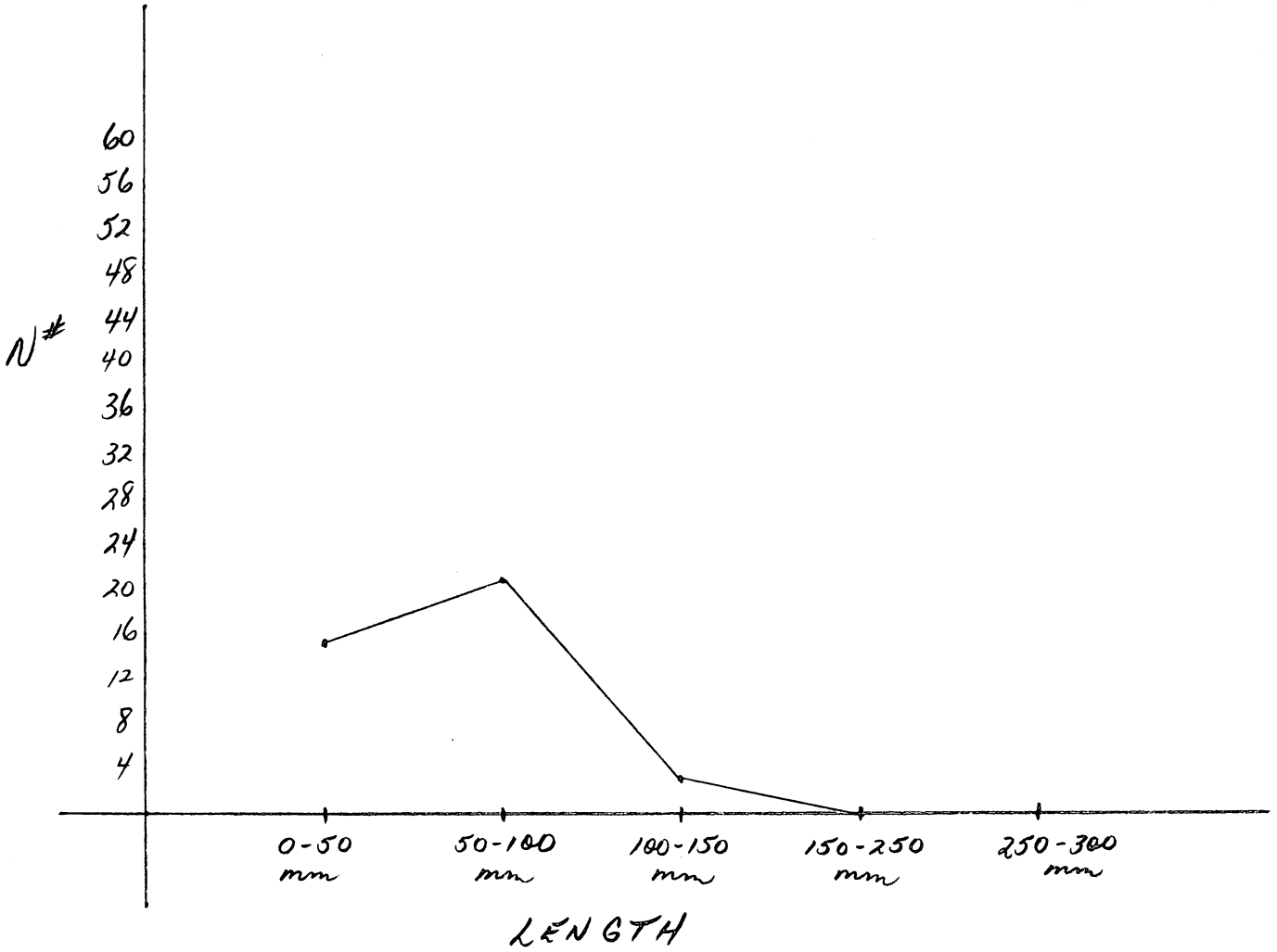
SAMPLE SITE MAP



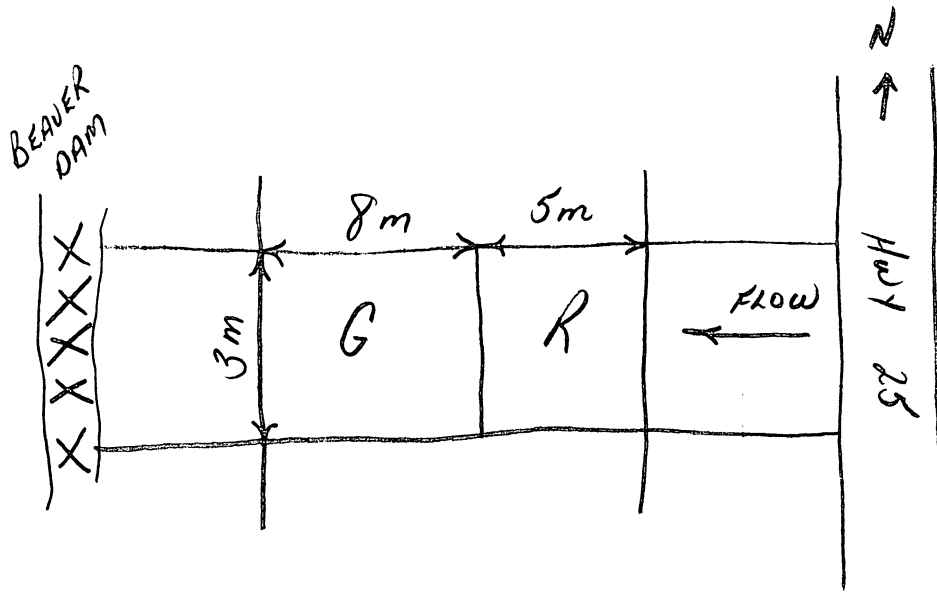
Hot Springs Creek

Site # 4

Date June 25/83
 water temp - 12°C
 Area = 3m x 13m = 39m²
 P value - .8
 density - 3.56 fish/m²
 total Cutthroat - 38 % - 27.3%



SAMPLE SITE MAP



Schulbuckhand Creek

Site #5

Date - June 28/83

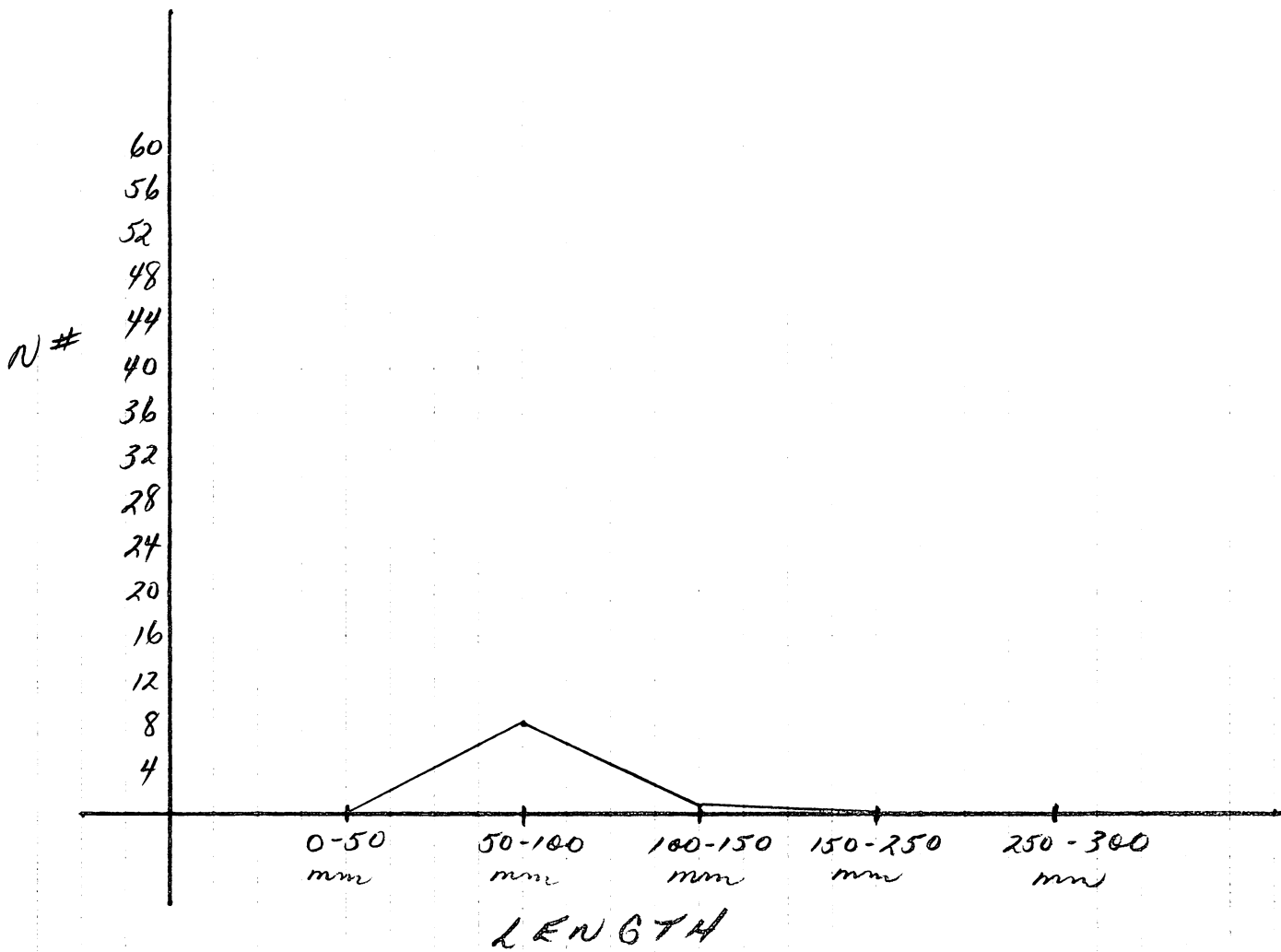
Water temp. - 11°C

Area - 9m x 19m = 171m²

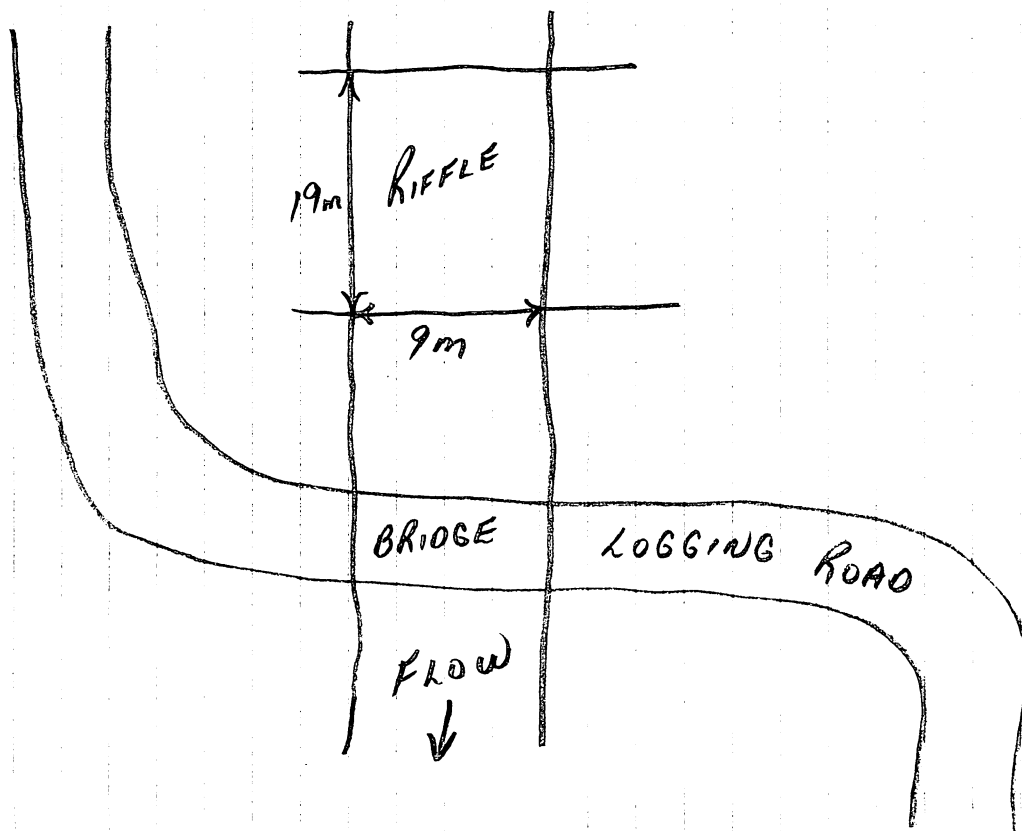
P value - .7

density - .38 fish/m²

total cutthroat - 9 % - 13.6%



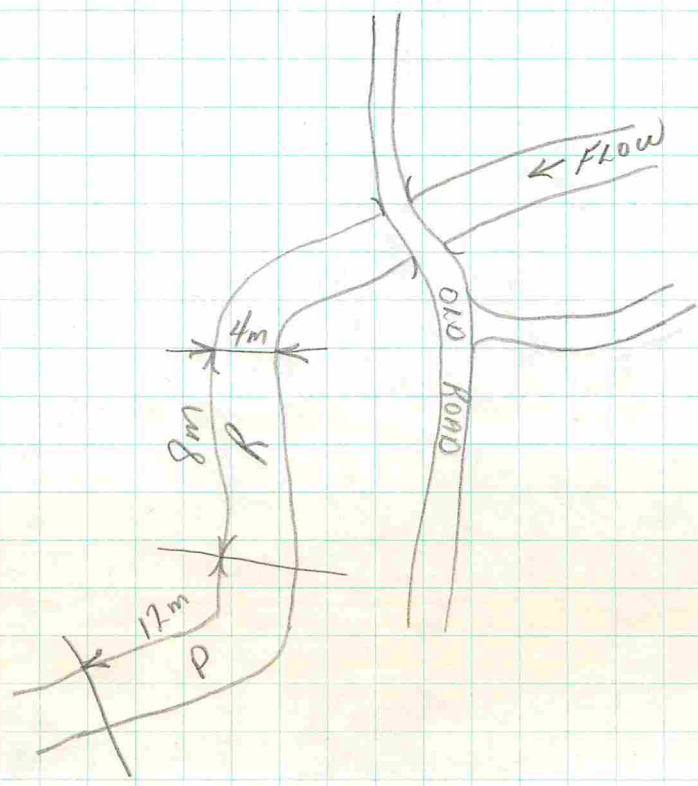
SAMPLE SITE MAP



Herman Creek Site #7
 Date - June 29/83
 Water temp. - 12.5°C
 Area - 4 m x 21 m = 84 m²
 P value - .7
 density - .91 fish/m²
 total cutthroat - 34 % - 44.2



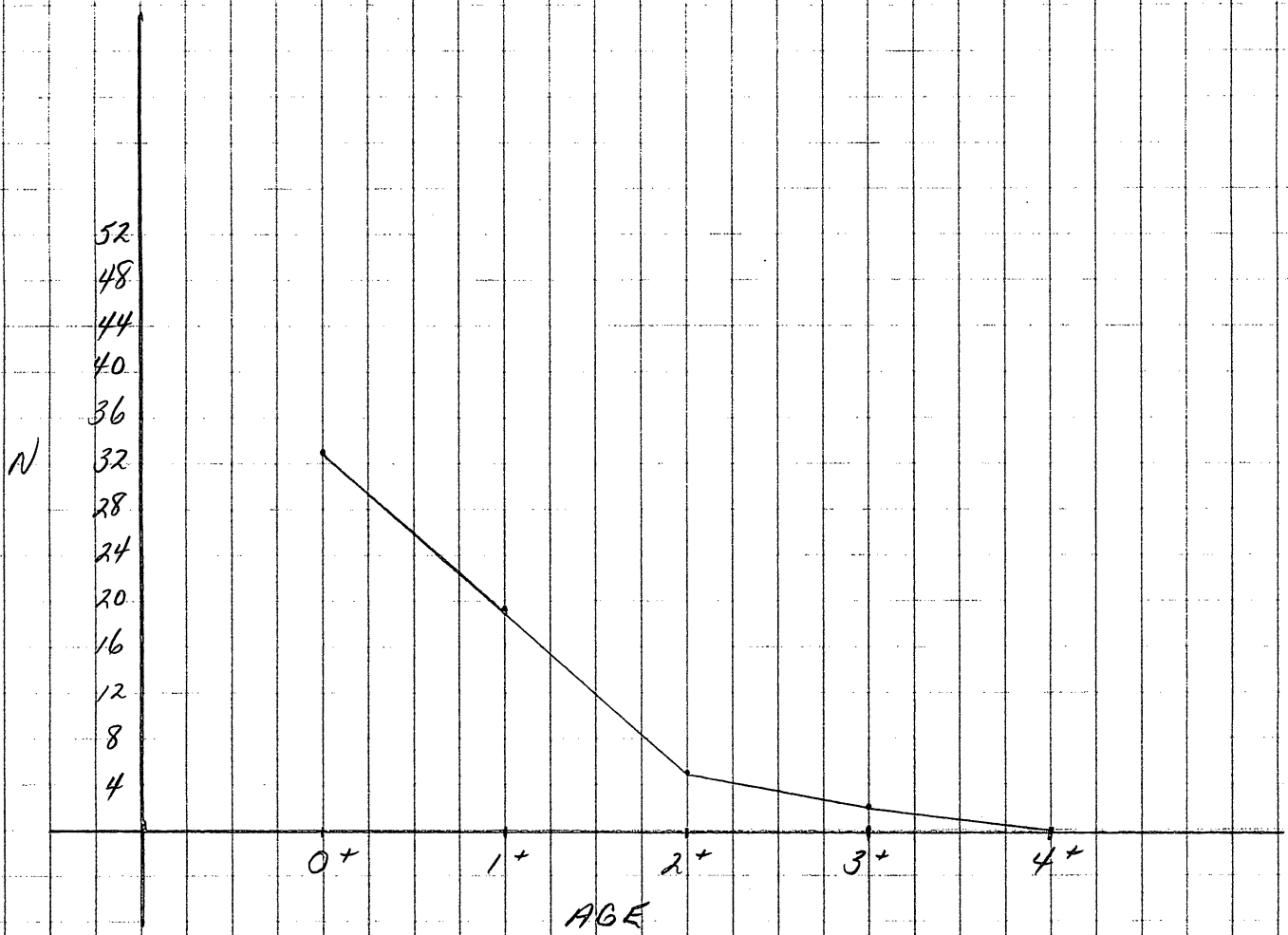
SAMPLE SITE MAP



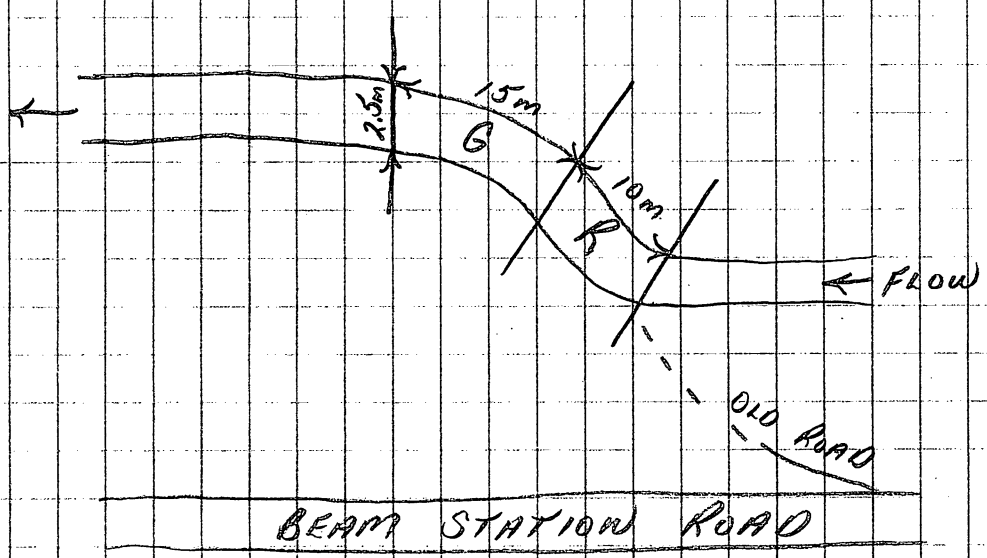
HERMAN CREEK

SITE # 6

DATE - JUNE 29/83
 WATER TEMP. - 12.5°C
 AREA - 2.5m x 25m = 62.5 m²
 D value - .9
 density - 1.68 fish/m²
 total cutthroat - 59 % - 56.2%



SAMPLE SITE MAP



Burlong Creek

Site #11

Date - July 5/83

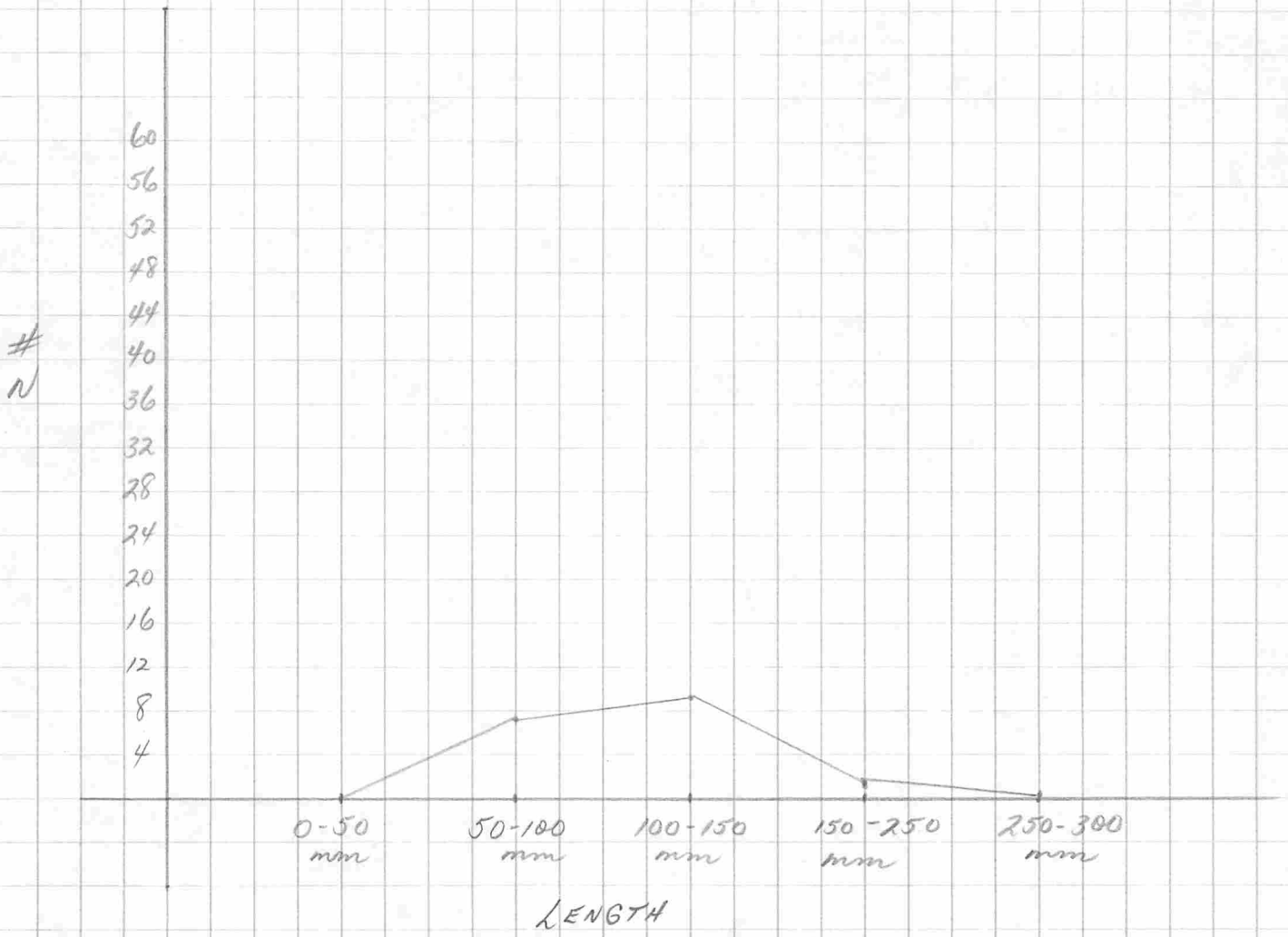
Water temp - 14.5°C

Area - 3m x 17m = 51 m²

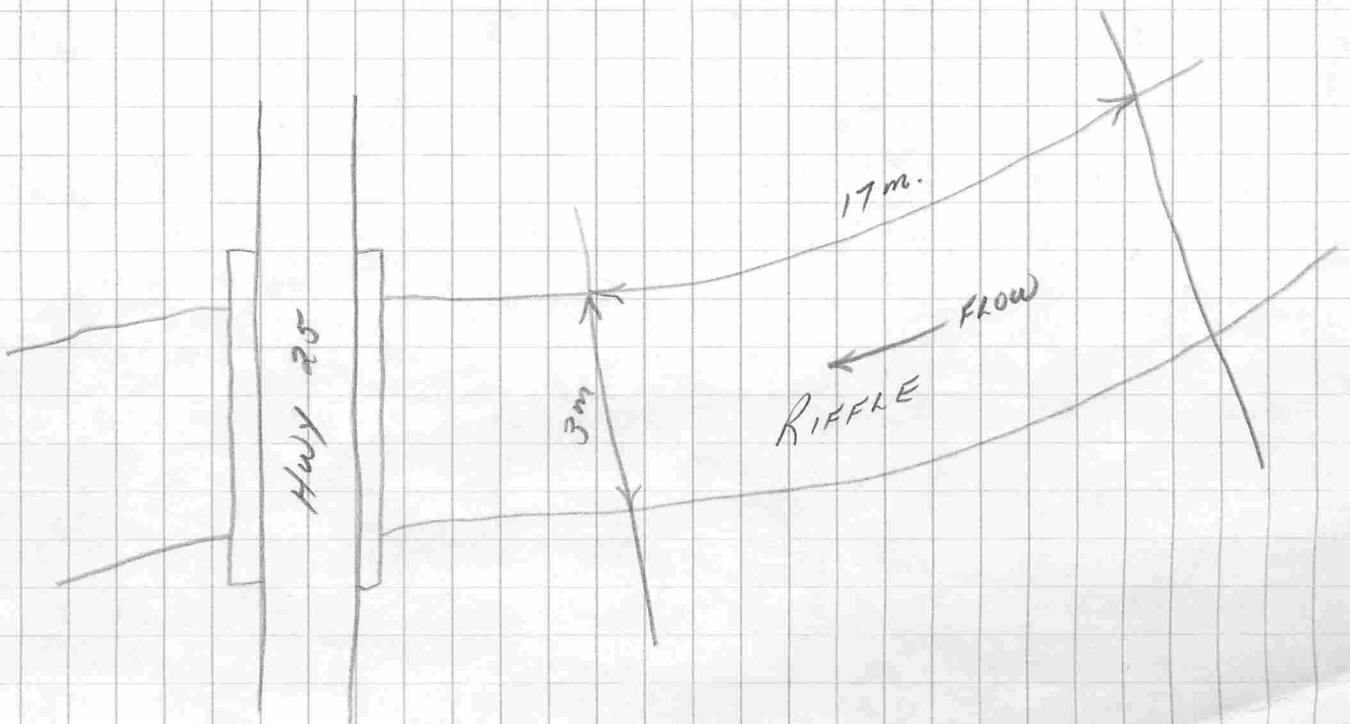
D value - 1.0

density - .32 fish/m²

total cutthroat - 16 % - 100%



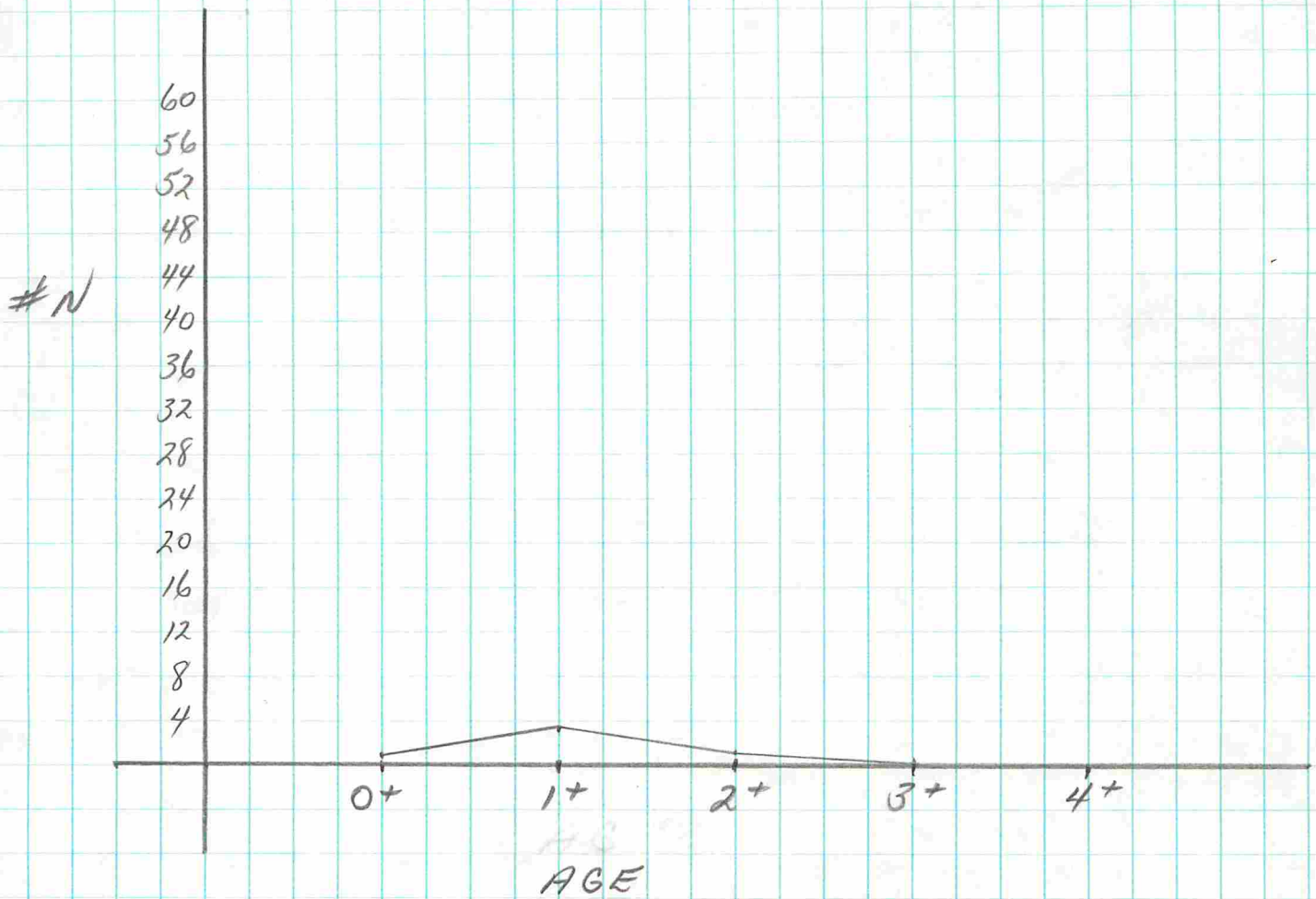
SAMPLE SITE MAP



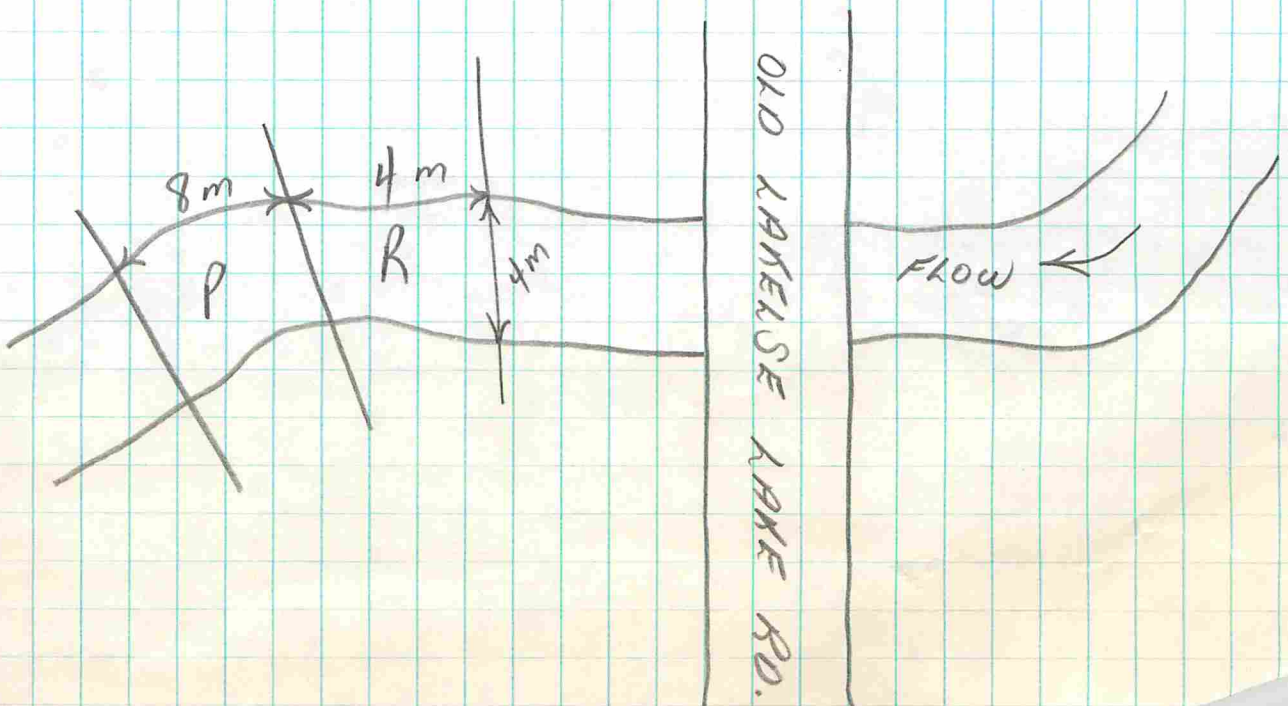
SOCKEYE CREEK

SITE #8

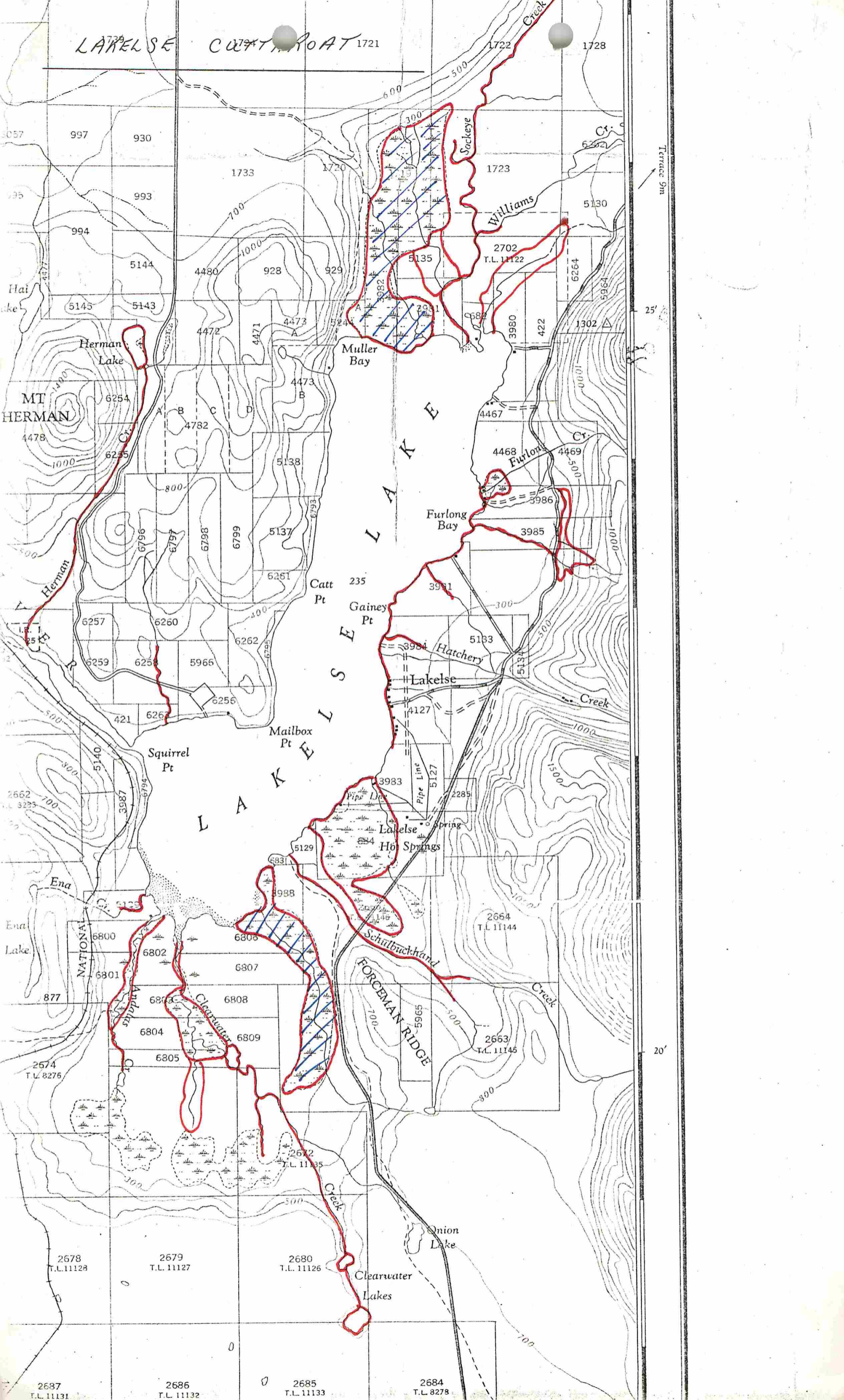
DATE - JUNE 30/83
WATER TEMP. - 10°C
AREA - 4m x 12m = 48m²
P. VALUE - .9
DENSITY - .79 fish/m²
TOTAL CUTTHROAT - 5 % 13.2



SAMPLE SITE MAP



LAKELSE COUNTRY ROAD 1721



Terrace 9m

25'

20'

Lakeba cutthroat

Fur long creek

Has a fairly steep gradient and from the appearance of the banks is very flashy. Extreme flooding occurs during periods of continuous heavy rainfall. During the summer months the creek is just a trickle with excellent rearing habitat. 100% of the fish electroshocked were cutthroat

Clearwater creek.

Is headed by two small lakes which helps keep a fairly consistent flow. The upper reaches have excellent gravel and large numbers of rearing juveniles. (2.36 per sq meter.) The lower reaches have mud and clay banks with lots of debris and jams. This is excellent cover and rearing area for larger CT juveniles. There is several swamp areas draining into lower Clearwater lake. These have large numbers of who fly and juvenile CT's 2+3+. These ponds have very little inflow or outflow during the summer months. The fly migrations correspond to heavy fall rains and spring freshets.

Creek beside Hotsprings Cr.

This creek has excellent potential. We found a hot spring adjacent to the creek that is over 50°C .

The creek itself provides phenomenal growth rates. The water temp is 17°C .

In 22 sq meters we captured 50 fish.

There were 3 species present with coho being the predominant species at 62%.

Dolly varden 8% and CT at 30%.

The lower creek is channelized with very little gradient (excellent coho rearing). Eventually the creek flows into a large swampy area near the mouth.

The area is poor fly habitat but has excellent potential if the fly are raised to a size larger than the coho, where they can compete.

Granite Cr

Very similar to Furlong cr. Flashy and unstable during periods of heavy rain.

No coho found. The predominant species is sculpin. Possibly very little competition to resident cutthroat stocks.

Hotpungo Cr.

Upper reaches has excellent fry habitats, but there is extreme competition with the coho (which are also larger because of emergence timing) there are also large coho smolts (1 yr) competing against the CT's. The lower reaches has very little gradient and develops into a huge meandering swamp, infested with beavers. Because of the excellent water temps the growth is rapid. We found no fry in this area but there were lots of cts (fry and yearlings) with fair numbers of larger cutthroat 2+ 3+ →

Sully Cr

Sully cr appears to have good gravel and habitat its entire length (base of mtⁿ downstream)

4 species were present CT - 13.6% DV 39.4% CO 42.4% and sculpin 4.5%

The main contributing factor to slightly lower fish production seems to be the slightly lower water temps.

Heaman Creek

One of the major cutthroat rearing creeks on the system. Excellent gravel flows habitat, possibly heavy competition with coho during extreme low flows during the summer.

Norman Cr.

Fairly stable flows because it is lake headed.

The upper reaches are utilized predominately by cutthroat. As you drop down into the lower reaches the ratio is about 50-50 CO-CT by the time you get to the lower road crossing. site #2 Hermeau

Sockeye Cr.

One of the major contributing factors is the slightly lower water temps. At the time of sampling it appeared the CT fry may not have emerged from the gravel yet. (while they had in several other streams)

Williams Cr.

Very cold water temps.

predominately CO

We found a few rainbows but no cutthroat. Possibly the stream is used for spawning but not for rearing because of low water temps.

Blackwater Cr.

The area above the highway is a huge swamp. Access is almost impossible. There are lots of cutthroats in this system. It is one of the favorite angling location just below the highway culverts.

Lakelse Cutthroat - Electro shocking Results.

Furlong Creek - Water temp 14.5°C .

Area $3\text{m} \times 17\text{m} = 51\text{sq metres}$. P. value - 10.

Total Cutthroat = 16 ^{.32} 100% No other species captured.

- ~~16~~ cutthroat per sq. metre.

- very few fry observed.

- Scale samples taken from various length frequencies

Clearwater creek - Water temp 12°C

Site #1

Area - $6\text{m} \times 18\text{m} = 108\text{sq metres}$. P. - .6

species	CT.	DV	coho	Total
	74	15	166	255
%	29.0%	5.9%	65.1%	

Age Composition of CT.

0+	1+	2+	3+	total
54	7 11	6	3	74
72.97%	14.86%	8.1%	4.05%	

2.36 fish per sq metre.

Creek beside hot springs Cr. temp 17°C

Site #2

Area - $2\text{m} \times 11\text{m} = 22\text{sq metres}$.

Species	CT	DV	CO	
	15	4	31	50
	30%	8%	62%	

Granite Cr - temp 9.5°C

site #3

Area - $6 \times 20\text{m}$ - 120 sq metres.

species	CT	DV	Sculpin.	total
	11	5	93	109
	10.1%	4.6%	85.3%	

.91 fish per sq metre.

Hotsprings Cr. temp 12°C

Site #4

Area $13 \times 3\text{metres}$. - 39 sq metres. P. - .8.

species	CT	CO	total
	38	101	139
	27.33%	72.66%	

3.56 fish per sq metre.

Scully Cr temp 11°C

Site #5

Area $19\text{m} \times 9\text{m}$ = 171 sq metres. P. - .7

species.	CT	DV	CO	Sculpin.	Total
	9	26	28	3	66
	13.6%	39.4%	42.4%	4.5%	

.38 fish per sq metre.

Herman Cr. temp 12.5°C

Site #6

Area - $2.5\text{m} \times 25\text{m}$. - 62.5 sq metres.

species	CT	CO	DV	Total
	59	39	7	105
	56.2%	37.1%	6.66%	

Age Composition. of CT

0+	1+	2+	3+	total
33	19	5	2	59
55.9%	32.2%	8.5%	5.1%	

Herman Cr - site #1 - site #6

1.68 fish per sq metre.

Herman Cr Site #2 lower. temp 12.5°C site #7
Area $21\text{m} \times 4\text{m} = 84\text{sq metres}$. P. = .7

Species.	CT	CO	CN	sculpin	total.
	34	35	2	6	77
	44.15%	45.4%	2.5%	7.8%	

Age Composition of CT.

0+	1+	2+	3+	
16 16	14	3		34
47.0%	41.2%	8.8%		

appears to be a gap in 1+ juveniles.

.91 fish per sq metre.

Site #8

Sockeye Cr. - upper old lakelse rd. temp 10°C .

Area $4 \times 12\text{m} = 48\text{sq metres}$. P. = .9

species.	CT	CO	sculpin.	Total
	5	22	11	38
	13.15%	57.9%	28.9%	

Age Composition.

0+	1+	2+
1	3	1

fy may not have emerged because of cold temperatures

site #9

Williams Cr - old lakeelse rd temp 9°C

Area 16x6 = 96 sq metres (side CHAW) very cold.

Species	Rb	CO	Sculpins.	
	3	23	19	45
	6.66%	51.1%	42.2%	

no cutthroat found.

0.46 fish per sq metre.

Williams Cr - Kitimat Hwy temp - 10°C site #10

Area 2.5m x 17m = 42.5 sq metre.

Species	Rb	CO	sculpin.	
	1	31	36	68
	1.5%	45.6%	52.9%	

1.6 fish per sq metre.

Clearwater lake (little)

June 14/83

Cutthroat

CO

Rb

- 12.8 cm - 1 - scales #2
- 18.6 cm - 2 - scales #3
- 20.0 cm - 1
- 20.2 cm - 1 - scales #3
- 21.0 cm - 2
- 21.5 cm - 1
- 24.5 cm - 1 - scales #4

12.0 cm - Scales #5 20.7 cm - Scales #1

Total

9

1

Clearwater lake little.

June 14/83

Coho - Geetrap 15 min set

- 4.5 cm - 11
- 5.0 cm - 12
- 5.5 cm - 6
- 6.0 cm - 6
- 7.0 cm - 1
- 8.0 cm - 1

total

37

Scully Cr. - 9.5c

June 15/83 Angling

cutthroat

- ♀ 8.0 cm
- ♂ 26.0 cm - #2 scales
- ♀ 26.0 cm - #1 scales
- ♀ 32.0 cm - #3 scales.

Socketeye Cr. - upper bridge - old Kelse rd.

CO

cutthroat

June 22/83

Gee trapping

4.6 cm

8.0 cm

7.0 cm

8.5 cm

Upper Williams Cr June 23/83

3 Gee traps - 0 except for Sculpins.

Granite Cr June 23/83

2 Gee traps - 0 except for Sculpins.

Hot Springs Cr (Below Highway to beaver dam)

Angling

Lengths	Cutthroat	Coho
Date	10.0 cm	8.0
June 13/83	11.2 cm - scales #1	8.3
	12.5 cm	8.5 - scales #1
	15.0 cm - scales #2	
	16.0 cm - scales #2	
	16.5 cm	
	♀ - 31.5 cm - (kelt) scales #3	

Hot Springs Cr (below highway)

Gee traps

June 13/83 trap #1

	CT	CO
3	6.5 cm	4.2 cm
	7.0 cm	8.0 cm
	7.0 cm	
	7.0 cm	
	9.5 cm	

June 13/83 trap #2

	CT	CO
	1 - 9.0 cm	1 - 7.0 cm
	1 - 10.0 cm	2 - 7.5 cm
	1 - 10.5 cm	9 - 8.0 cm
	1 - 11.0 cm	12 - 8.5 cm
	3 - 11.5 cm	6 - 9.0 cm
	1 - 13.0 cm	1 - 9.2 cm
		1 - 10.0 cm
		1 - 10.5 cm
		1 - 11.0 cm

Total 8 34

Clearwater Creek

June 14/83 Upper bridge (3rd)

	CT	DV
	1 - 8.7 cm	13.0 cm
	1 - 9.5 cm	
	1 - 10.0 cm	
	2 - 10.5	
	1 - 11.2	
	1 - 11.5	
	1 - 12.0	
	1 - 12.5	
	1 - 12.6	

Total 10 1

Scully Cr June 21/83 Temp 10.5°
Angling Cutthroat

♀ 22.8 cm - scales
♀ 32.5 - Kelt - scales.
♀ 33.0 Scales.
35.0 Scales
♂ 38.5 Kelt - Scales.

Upper Scully Cr.

Geotrapping

COHO - 9

7.4 cm.
9.0 cm
6.0 cm
6.7 cm
6.5 cm
7.4 cm
7.4 cm
7.9 cm
8.3 cm

6.0 - 1
6.5 - 1
6.7 - 1
7.4 - 3
7.9 - 1
8.3 - 1
9.0 - 1

Cutthroat D.V.

8.9 cm - Scales 11.5 cm
13.3 cm - Scales 10.8
10.9 cm 6.8

Herman Cr

June 22/83

Water temp 12°C

Gee trapping

	<u>CO</u>	Cutthroat	Dolly Varden
4.5		7.2	8.1
6.5		7.5	8.2
6.6		7.6	
6.7		7.7	
6.8		7.8	
6.9		7.9	8.8
7.0		8.0	scales
7.1		8.1	
7.2		8.2	9.8
7.3		8.3	
7.4		8.4	
7.5		8.5	
7.6		8.6	11.9
7.7		8.7	
7.8		8.8	
7.9		8.9	
8.0		9.0	
8.1		9.1	
8.2		9.2	
8.3		9.3	
8.4		9.4	
8.5		9.5	
8.6		9.6	
8.7		9.7	
8.8		9.8	
8.9		9.9	
9.0		10.0	
9.1		10.1	
9.2		10.2	
9.3		10.3	
9.4		10.4	
9.5		10.5	
9.6		10.6	
9.7		10.7	
9.8		10.8	
9.9		10.9	
10.0		11.0	scales
10.1		11.1	
10.2		11.2	
10.3		11.3	scales
10.4		11.4	
10.5		11.5	
10.6			
10.7			
10.8			
10.9			
11.0			
11.1			
11.2			
11.3			
11.4			
11.5			
11.6			
11.7			
11.8			
11.9			
12.0			
12.1			
12.2			
12.3			
12.4			
	10.3	13.8	

(31)

(15)

(6)

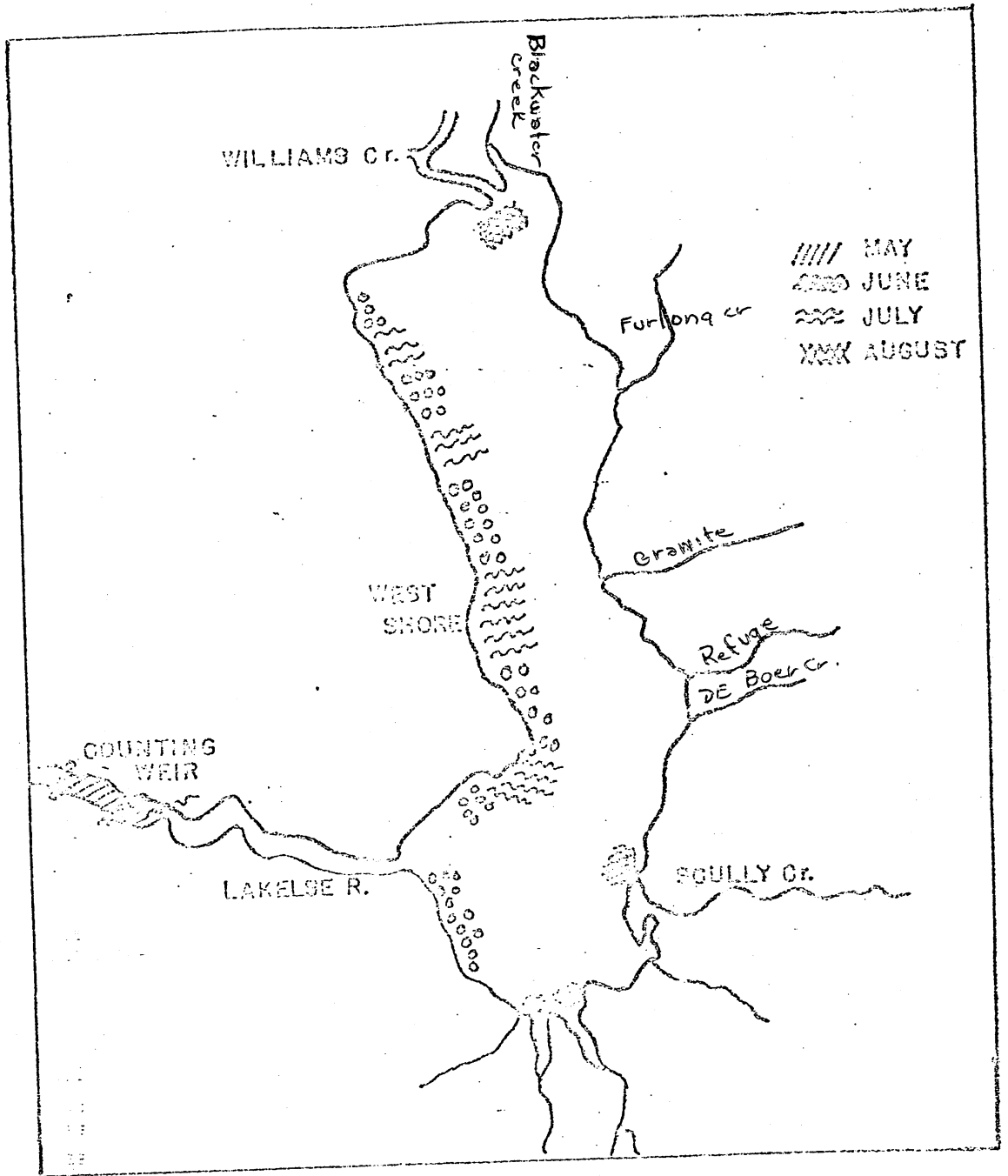


Figure 3. Distribution of fishing effort on the Lakelse River and on Lakelse Lake.

CUMULATIVE LENGTH PERCENTAGE

①

SYSTEM

lake/se lake

DATE

July 5/83

TRIBS. SAMPLED

Clearwater Cr.

P. - .6

18m x 6m

26 II CT DV

CONO

Sev. Am.

Cut DV

CONO

Rifle - glide

Length	Count	%
28		
29		
30	90	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
40	100	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
50	110	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
60	120	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
70	130	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
80	140	
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
		29.0%
		5.9%
		65.1%
9	150	
	180	
	160	

CONO
TR 14 14 14
14 14

74 15 166 Total 255

Site # 2

CUMULATIVE LENGTH FREQUENCY

SYSTEM

DATE

TRIBS SAMPLED Creek beside Hot Springs Temp

lake

Georon Creek

R-95

Rifle

Pool

slide

11x2m

CT

DV

CO

CT

DV

CO

1/3

1/3

1/3

30				90					0
1				1					1
2				2					2
3				3					3
4				4					4
5				5					5
6				6					6
7				7					7
8				8					8
9				9					9
40				100					0
1				1					1
2				2					2
3				3					3
4				4					4
5				5					5
6				6					6
7				7					7
8				8					8
9				9					9
50				110					0
1				1					1
2				2		scales			2
3				3					3
4				4					4
5				5					5
6				6					6
7				7					7
8				8					8
9				9					9
60				120					0
1				1					1
2				2					2
3				3					3
4				4					4
5				5					5
6				6					6
7				7					7
8				8					8
9				9					9
70				130					0
1				1					1
2				2					2
3				3					3
4				4					4
5				5					5
6				6					6
7				7		scales			7
8				8					8
9				9					9
80				140					0
1				1					1
2	X			2					2
3				3					3
4				4					4
5				5					5
6				6					6
7				7					7
8				8		30%	8%	62%	8
9				9					9

15 4 31 Total 50

site # 3 CUMULATIVE LENGTH FREQUENCY
 SYSTEM lakelse DATE July 6/83

TRIBS. SAMPLED Granite Cr. Hwy

P-85 - 20 x 6m			CT	DV	SCULPIN		
CT	DV	SCULPIN					
30			90		###		0
1			1				1
2			2				2
3			3		#1		3
4			4				4
5			5				5
6			6				6
7			7				7
8			8				8
9			9				9
			100				0
40			1				1
1			2				2
2			3				3
3			4				4
4			5				5
5			6				6
6			7				7
7			8				8
8			9				9
9			110				0
50			1				1
1			2				2
2			3				3
3			4				4
4			5				5
5			6				6
6			7				7
7			8				8
8			9				9
9			120				0
60			1				1
1			2				2
2			3				3
3			4				4
4		###	5				5
5		###	6				6
6		###	7				7
7			8				8
8			9				9
9		###	130				0
70			1				1
1			2				2
2			3				3
3			4				4
4			5				5
5			6				6
6			7				7
7			8				8
8			9				9
9			140				0
80			1				1
1			2				2
2	*		3				3
3			4				4
4			5				5
5			6				6
6			7				7
7			8				8
8			9				9
9			150				0
90			1				1
1			2				2
2			3				3
3			4				4
4			5				5
5			6				6
6			7				7
7			8	10.1%	4.6%	85.3%	8
8			9		150		9
9							

Total (||) 180 462 (5) (93) Total 109

Site #4

RINGS

SYSTEM

CUMULATIVE LENGTH FREQUENCY

Takeuse

DATE June 28/83

Electro shock

TRIBS. SAMPLED Hot Springs Cr - below Highway

	CT	CO		CT	CO	
25						
26						
27						
30				90	1	0
1				1	1	1
2				2		2
3				3		3
4				4		4
5				5		5
6		— 2		6		6
7		— 8		7		7
8		— 17		8		8
9		— 15		9	1	9
40		— 9		100		0
1		— 7		1	1	1
2		— 13		2		2
3		— 9		3		3
4		— 6		4		4
5		— 6		5		5
6		— 3		6		6
7		— 4		7		7
8		— 1		8		8
9				9		9
50				110	1	0
1				1		1
2				2		2
3				3		3
4				4		4
5				5		5
6				6		6
7				7		7
8				8		8
9				9		9
60				120		0
1				1		1
2				2		2
3				3		3
4				4		4
5				5		5
6				6		6
7				7		7
8				8		8
9				9	1	9
70				130		0
1				1		1
2				2		2
3				3		3
4				4		4
5				5		5
6				6		6
7				7		7
8				8		8
9				9		9
80				0		0
1				1		1
2				2		2
3				3		3
4				4		4
5				5		5
6				6		6
7				7		7
8				8		8
9				9		9
Totals	38			101		
	CT			CO		

AREA
13M x 3M
RIFLE SLIDE

P = 0.8

27.33% 72.66%

site #5 CUMULATIVE LENGTH FREQUENCY
 SYSTEM LAKEUSE DATE JUNE 24/87

TRIBS SAMPLED SKULLY CR (UPPER BRIDGE)
 AREA 19M x 9M RIFFLE
 P = 0.7

	CT	DV	CoHo	SKULPIN		CT	DV	CoHo	SKULPIN	
26										
27										
28	CT	DV			90					0
29										1
30										2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
49					100					1
40										2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
9										1
50					110					2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
9										1
60					120					2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
9										1
70					130					2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
9										1
40					140					2
1										3
2										4
3										5
4										6
5										7
6										8
7										9
8										0
9										1

Total 66

9 2.6 28 3
 CT

13.6% 39.4% 42.4% 4.5%

Site #6 CUMULATIVE LENGTH FREQUENCY SYSTEM lakelse DATE June 29/83.

TRIBS. SAMPLED UPPER Herman Creek Temp 12.5°
 riffle-glide P=.9
 Area 2.5m x 25m.

	CT	CO	DV					
29								
30				90				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
40				100				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
50				110				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
60				120				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
70				130				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
80				140				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6		56.2%	37.1%	6.66%
7				7				7
8				8				8
9				9				9
				153				
				157				

Total 105. 59 CT 39 CO 7 DV.

Site # 7 CUMULATIVE LENGTH FREQUENCY M
 SYSTEM lake DATE June 29/83

TRIBS SAMPLED lower Herman Cr Temp 12.5

COND CUT CH 27 Riffle-pool Sculpin P₀ - .17 Area CUT 21m x 4m Sculpin

3	0	0	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9
4	0	10	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9
5	0	11	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9
6	0	12	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9
7	0	13	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9
8	0	14	0
1	1	1	1
2	1	2	2
3	1	3	3
4	1	4	4
5	1	5	5
6	1	6	6
7	1	7	7
8	1	8	8
9	1	9	9

7.8%
 45.4% 2.6% 44.15% Sculpin
 CH 35 2 34 .6 Total = 77 154
 198

Site # 8

CUMULATIVE LENGTH FREQUENCY

SYSTEM lakelse

DATE JUNE 30/83

TRIBS SAMPLED upper Sockeye - old lakelse rd 4M x 12M

TEMP 10°

Pool-riffle

P. - .9

	CT	CO	Sculpin		CT	CO	SC	
30				10	1			0
1				1				1
2				2			1	2
3				3			11	3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
40				10			1	0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
50				10				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8	1			8
9				9				9
60				10				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
70				10				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
80				10				0
1				1				1
2	1			2				2
3	1			3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
90				10				0
1				1				1
2	1			2				2
3	1			3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
100				10				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
13.15%								
57.9%								
28.9%								

Total - 38

5

22

11

Site # ~~10~~ 9 CUMULATIVE LENGTH FREQUENCY

SYSTEM lakelse

DATE July 6/83

TRIBS. SAMPLED Williams Cr - old lakelse rd Temp 9°C

P. 09 Area 16x6m side channel

CT	Rb	SCULPIN	CO	Scale
30			90	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
40			100	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
50			110	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
60			120	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
70			130	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
80			0	0
1			1	1
2			2	2
3			3	3
4			4	4
5			5	5
6			6	6
7			7	7
8			8	8
9			9	9
86.66%	6.66%	42.2%	51.1%	0
3	19	23		45

Total 45

Site #10

CUMULATIVE LENGTH FREQUENCY

SYSTEM lakelse

DATE July 6/83

TRIBS SAMPLED Williams Cr - Kitimat Hwy Temp 10°C

SIDE CH Area = 2.5m x 1.7m

side channel

	COHO	SCULPIN	RB		COHO	SCULPIN		
30				90	1			0
1				1				1
2				2	1			2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8	1			8
9				9	1			9
10				100	1			0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7	1			7
8				8				8
9				9				9
10				110				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
10				120				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
10				130				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8				8
9				9				9
10				140				0
1				1				1
2				2				2
3				3				3
4				4				4
5				5				5
6				6				6
7				7				7
8				8	45.6%	52.9%	1.5%	8
9				9			Rb	9

31 36 1 Total 68

te # 11

CUMULATIVE LENGTH FREQUENCY

SYSTEM

FURLONGS CR LAKEUSE

DATE JULY 5/83

AREA 3M X 17M

TRIBS. SAMPLED

FURLONGS CR

P = 100%

CT				CT			
0			110				0
1			1				1
2			2				2
3			3				3
4			4				4
5			5	1			5
6			6				6
7			7				7
8			8				8
9			9				9
0	1		120				0
1			1				1
2			2				2
3			3				3
4			4				4
5			5	1			5
6			6				6
7			7				7
8			8	1			8
9	1		9				9
0			130	1			0
1			1				1
2			2				2
3			3				3
4			4				4
5			5	1			5
6			6	1			6
7			7				7
8			8				8
9	1		9				9
0			140				0
1			1				1
2			2				2
3			3				3
4			4				4
5			5				5
6			6				6
7			7				7
8	1		8				8
9			9				9
0	1		150				0
1			1				1
2			2				2
3	1		3				3
4			4				4
5			5				5
6			6				6
7			7				7
8			8				8
9	1		9				9
0			160				0
1			1				1
2	1		2				2
3	1	SCALE SAMPLED	3				3
4			4				4
5	1		5				5
6			6				6
7			7				7
8			8	100%			8
9			9				9
0			200	1	SCALE SAMPLED		0
1			1				1
2			2				2
3			3				3
4			4				4
5			5				5
6			6				6
7			7				7
8			8				8
9			9				9

SCALE SAMPLED

SCALE SAMPLED

100%

200 1 SCALE SAMPLED

16

Lakelse Cutthroat - Electro shocking Results.

Furlong Creek - Water temp 14.5°C

Area 3m x 17m = 51 sq metres P. Value - 10.

Total Cutthroat = $\frac{16}{.32}$ 100% No other species captured.

- ~~16~~ cutthroat per sq. metre.

- very few fry observed.

- Scale samples taken from various length frequencies

Clearwater creek - Water temp 12°C

Site #1

Area - 6m x 18m = 108 sq metres. P. - .6

species	CT.	DV	coho	Total
	74	15	166	255
%	29.0%	5.9%	65.1%	

Age Composition of CT.

0+	1+	2+	3+	total
54	7 11	6	3	74
72.97%	14.86%	8.1%	4.05%	

2.36 fish per sq metre.

Refuge.

Creek beside hot springs Cr. temp 17°C

Site #2

Area - 2m x 11m = 22 sq metres.

Species	CT	DV	CO	
	15	4	31	50
	30%	8%	62%	

Granite Cr - temp 9.5°C

site #3

Area - 6 x 20m - 120 sq metres.

species	CT	DV	Sculpin.	total
	11	5	93	109
	10.1%	4.6%	85.3%	

.91 fish per sq metre.

Hotsprings Cr. temp 12°C

Site #4

Area 13 x 3 metres. - 39 sq metres. P. - .8.

species	CT	CO	total
	38	101	139
	27.35%	72.66%	

3.56 fish per sq metre.

Scully Cr temp 11°C

Site #5

Area 19m x 9m = 171 sq metres. P. - .7

species.	CT	DV	CO	Sculpin.	Total
	9	26	28	3	66
	13.6%	39.4%	42.4%	4.5%	

.38 fish per sq metre.

Herman Cr. temp 12.5°C

Site #6

Area - 2.5m x 25m. - 62.5 sq metres.

species	CT	CO	DV	Total
	59	39	7	105
	56.2%	37.1%	6.66%	

Age Composition. of CT

0+	1+	2+	3+	total
33	19	5	2	59
55.9%	32.2%	8.5%	5.1%	

Herman Cr - site #1 - site #6
 1.68 fish per sq metre.

Herman Cr Site #2 lower. temp 12.5°C site #7
 Area 21m x 4m. = 84 sq metres. P. = .7

Species.	CT	CO	CH	sculpin	total.
	34	35	2	6	77
	44.15%	45.4%	2.5%	7.8%	

Age Composition of CT.

0+	1+	2+	3+	
16 16	14	3		34
47.0%	41.2%	8.8%		

appears to be a gap in 1+ juveniles.

.91 fish per sq metre.

Site #8
 Sockeye Cr. - upper old lakelse rd. temp 10°C.
 Area 4 x 12m = 48 sq metres. P. = .9

species.	CT	CO	sculpin.	Total
	5	22	11	38
	13.15%	57.9%	28.9%	

Age Composition.

0+	1+	2+
1	3	1

fy may not have emerged because of cold temperatures

site #9

Williams Cr - old lakeelse rd temp 9°C
Area 16x6 = 96 sq metres (side Chan) very cold.

Species	Rb	Co	Sculpins.	
	3	23	19	45
	6.66%	51.1%	42.2%	

no cutthroat found.

.46 fish per sq metre.

Williams Cr - Kitimat Hwy temp - 10°C Site #10

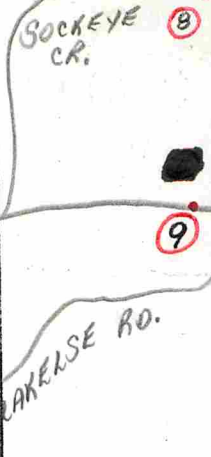
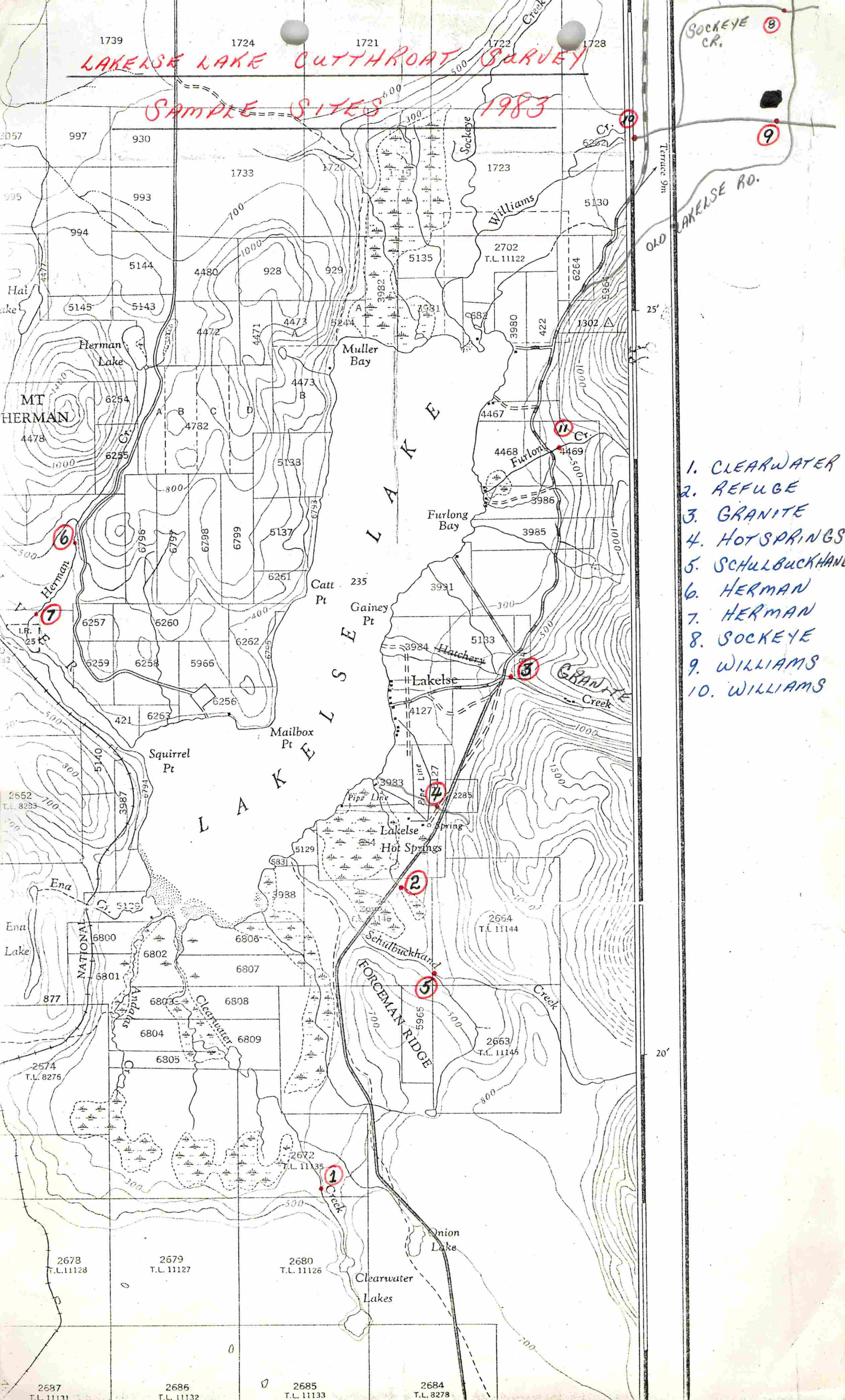
Area 2.5m x 17m = 42.5 sq metre.

Species	Rb	Co	sculpin.	
	1	31	36	68
	1.5%	45.6%	52.9%	

1.6 fish per sq metre.

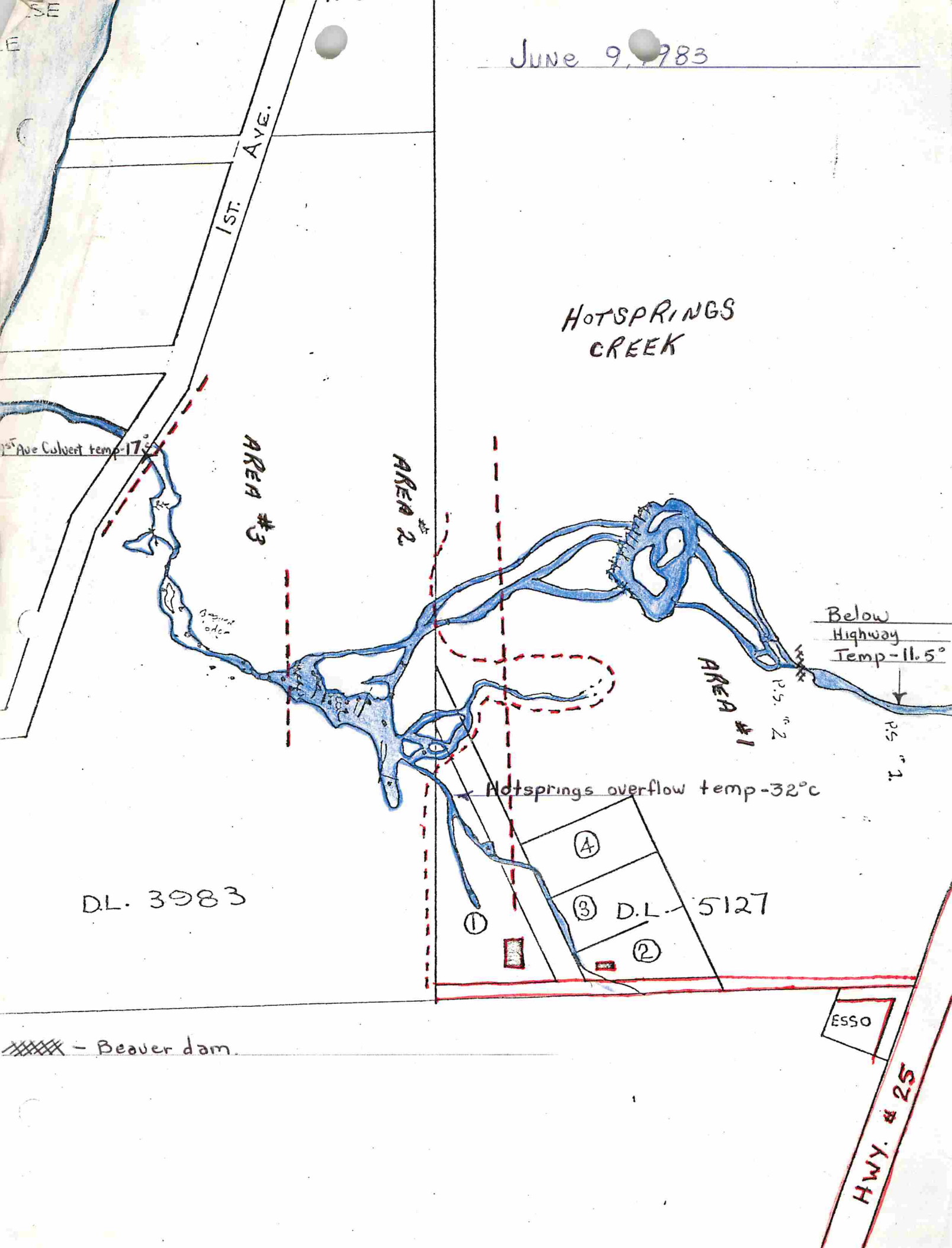
1739 1724 1721 1722 1728
LAKELSE LAKE CUTTHROAT SURVEY

SAMPLE SITES 1983



1. CLEARWATER
2. REFUGE
3. GRANITE
4. HOTSPRINGS
5. SCHULBUCKHAND
6. HERMAN
7. HERMAN
8. SOCKEYE
9. WILLIAMS
10. WILLIAMS

June 9, 1983



HOTSPRINGS CREEK

1st AVE.

AREA #3

AREA #2

AREA #1

Below Highway Temp - 11.5°

Hot Springs overflow temp - 32°c

DL. 3983

DL. 5127

ESSO

HWY. # 25

Beaver dam

ps. # 1

ps. # 2

1

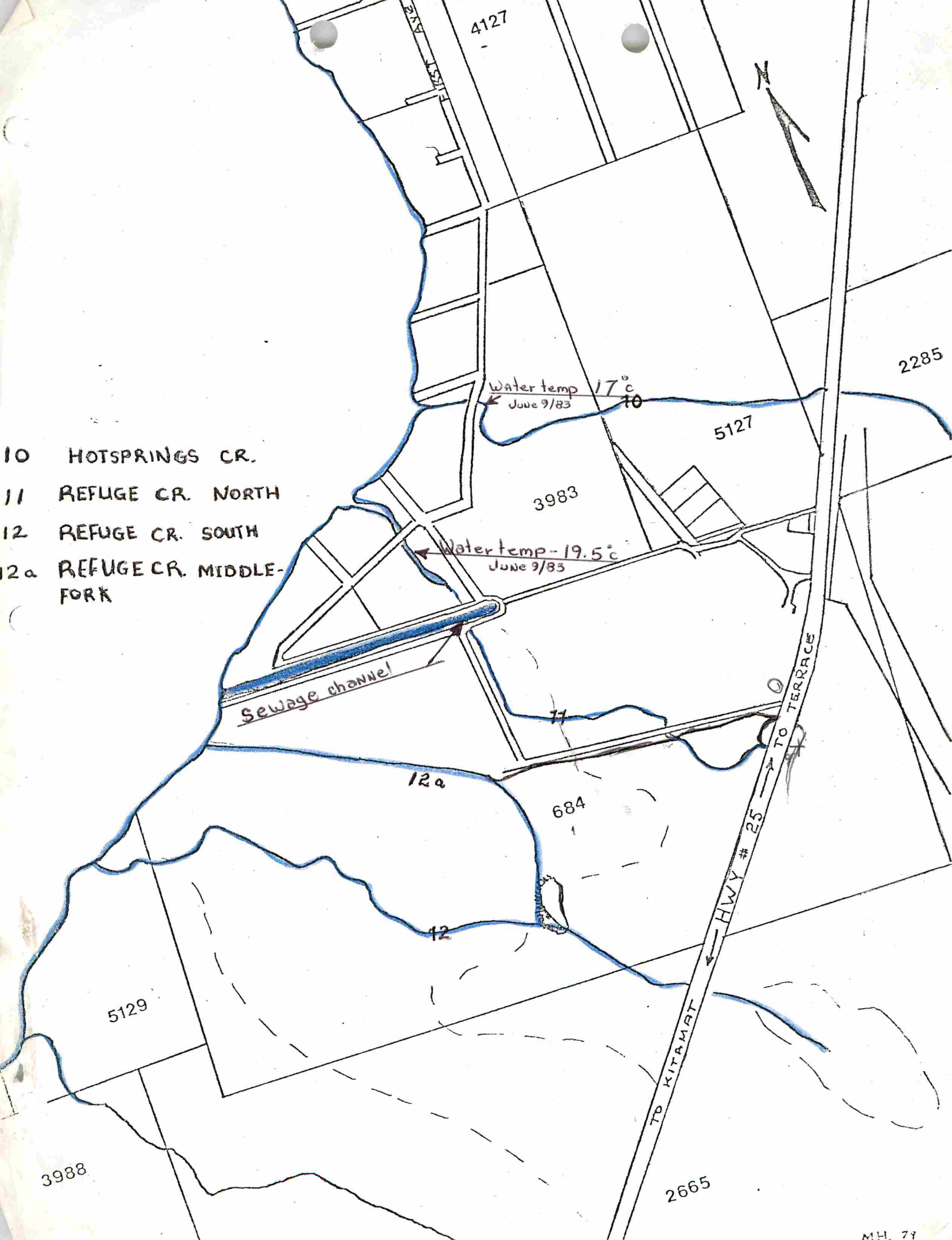
4

3

2

Spring

- 10 HOTSPRINGS CR.
- 11 REFUGE CR. NORTH
- 12 REFUGE CR. SOUTH
- 12a REFUGE CR. MIDDLE-FORK



4127



2285

Water temp 17°C
June 9/83

5127

3983

Water temp - 19.5°C
June 9/83

Sewage channel

12a

684

12

5129

TO TERRACE
← HWY # 25
TO KITAMAT

2665

3988



To: Ron Tetreau,
Fisheries Technician,
Smithers.

Date: July 7, 1983.

Re: Trip to Lakelse Lake, my comments.

My first impression of the sites you took me to indicated no shortage of juvenile cutthroats. Although perhaps premature, the electrofishing results to date also seem to indicate this; more sampling is needed, however.

I suggest the following:

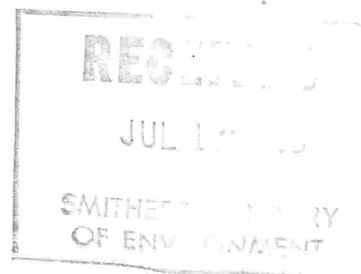
1. Have a look at the sales of angling licences in the Kitimat, Terrace areas over the past 10 years and note any increases. This can be done during the winter. (Will send you complete copies later.)
2. Quantify the available habitats (i.e. stream spawning and rearing, as well as ponds associated with the lake).
3. Map the distribution of cutthroat juveniles in above habitats, and also their relative abundance.
4. Fish abundance within age classes. Additional electrofishing of tribs and beach seining in lake if possible. If an age frequency plot can be constructed (note fry included), then a decision can be made if enhancement is needed. Lack of good catches may just be a function of fish being distributed over a larger clientele. It occurred to me that perhaps some of the ponds are not being utilized to their fullest extent by rearing juvenile cutthroats.

Any further questions, don't hesitate to call.

Cheers!

D. de Leeuw/w.r.
Dionys de Leeuw,
Fisheries Biologist,
Queen Charlotte Islands.

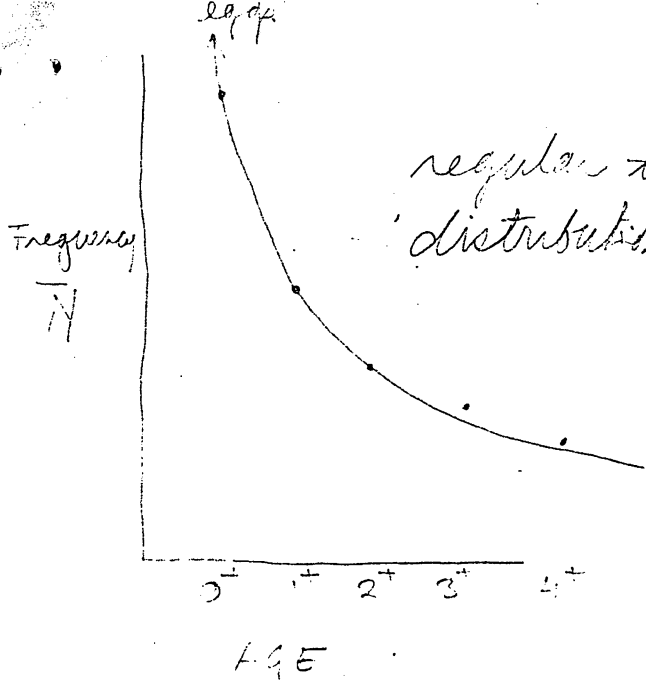
DdL/wr



Statement of Resident Angling Licences

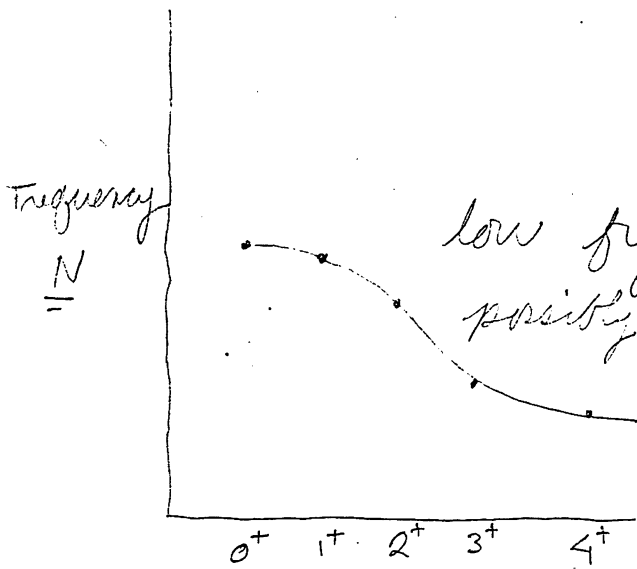
		<u>TERRACE</u>	<u>KITIMAT</u>	<u>TOTAL</u>
1972-73	(\$2.00)	3133	2629	5762
1973-74	(\$3.00)	3965	2800	6765
1974-75	(\$5.00)	3141	2529	5670
1975-76	(\$5.00)	4041	2661	6702
1976-77	(\$5.00)	3621	2352	5973
1977-78	(\$5.00)	4183	2528	6711
1978-79	(\$5.00)	4551	2602	7153
1979-80	(\$5.00)	4751	2524	7275
1980-81	(\$5.00)	5221	2372	7593
1981-82	(\$5.00)	5759	2341	8100

As you can see, in Terrace angler licence sales have almost doubled during the 1972 to 1982 period.



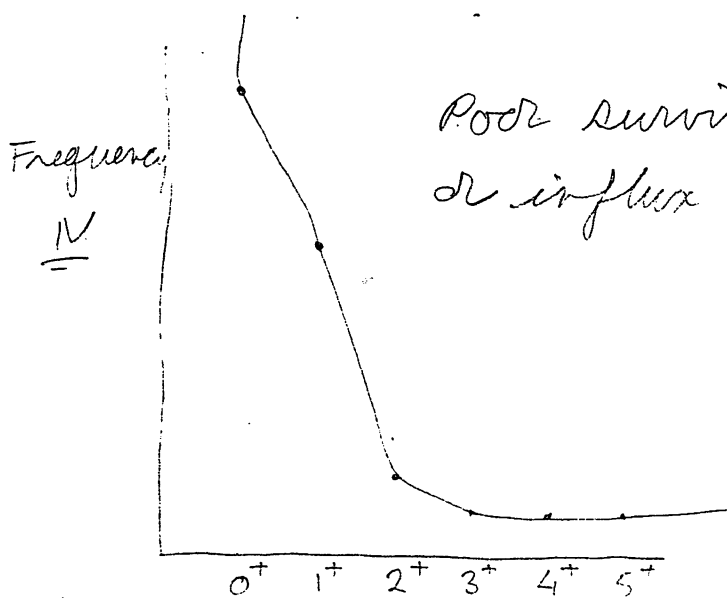
regular theoretical age frequency-distribution, no excessive harvest

Fig 1.



low fish abundance, poor adult recruits possibly poor spawning habitat.

Fig 2.



Poor survival of 1+ to 2+, possibly habitat or influx of other species.

Fig 3.

To File

File # 40.390103 ①

Lakelse

cc Mike Whately

LAKELSE CUTTHROAT SURVEY

SUMMARY

Jarma

Bill Chudyk

Mike Whately

Although all major tributaries of the system were sampled and some interesting data was obtained I feel we are missing the bulk of the lakelse cutthroat potential. Cutthroat like their salmon counterparts are secretive fish. They frequent the same type of habitat and are each others major competitor. By these characteristics the small creeks most of which are unnamed and flow into the lake directly or form part of a tributary (i.e. Blackwater, Andalus, etc.). There are numerous along 1st avenue, but many others throughout the entire system. The difficulty in sampling these creeks is access as they are usually covered with alder and willow thickets which are well suited to those who walk on all fours but not to those that travel upright.

Cutthroat have chosen these type of surroundings even though small by comparison but have provided it with a good cover. A good majority of these creeks are groundwater fed and may be cold at their sources. I am uncertain of whether cutthroat will spawn in water 4°C or less. but they

may do so very early in order to emerge with proper timing. Perhaps each race of fish has adjusted his biological clock with the stream of origin.

In order to answer these questions I feel the following is necessary.

1. Pick several of these small streams which we think have the best potential with reasonable access.
2. Set up traps in streams to capture migrating adults & juveniles if possible.
3. Each specimen could be sampled. (ie length, age (scales)). Adults should be tagged in some manner so we can monitor movement and access whether they continue to spawn in natal stream.
4. Although this may be several years away, research is going on involving marking juvenile fish with tetracycline which could provide means to monitor juvenile movement.
5. The sample stream should be mapped and inventoried with water temperature obtained at specific sites and flows monitored. Habitat for rearing, spawning and enhancement potential noted.

6. Should we be fortunate to find a heavily utilized spawning area assistance in gravel recruitment could prove beneficial. Of course taking care to protect the values which exist there at present (crown cover, overhang).

A note on instream enhancement (formerly called stream clearance). Far too often in the past stream technicians have gone into creeks and removed everything that looked messy, defeating the purpose they originally intended. (ie Williams Creek log removal below Hwy 25 bridge) Stream enhancement should encompass adding to the creeks potential (ie gravel recruitment, boulder placement, bank deflectors to protect sensitive areas) and not remove anything from a stream unless it is an obstruction. Cover for concealment is most important for large fish in small streams.

7. Rabuse river float survey should attempt to enumerate cutthroat as well as steelhead.

8. As mentioned in item #3 a comprehensive tagging program for cutthroat would provide invaluable information although logistics and cost might prove difficult.

I am reluctant to recommend artificial propagation for the following reasons:

1. insufficient information of current populations and movement of fish.
2. cost of such a program during a period and government of restraint.

Notes on Creel Census Comparison

It is noted from simple graphs comparing Creel census's done in 1950 and 1978-79 that some simple relationships exist. Our angling effort has increased tremendously even more so since the last census with a large portion of the population out of work and ample time to fish.

The total cutthroat population is probably less but not so much so as the effort has increased. Last years float showed healthy numbers of cutthroat albeit in areas of few fishermen.

The catch per unit effort has decreased largely as a function of increased effort. Some not so obvious things have also altered the fishery. The fly fishing only regulation has forced people to

angle by the method that is the most productive. Since 1950 the equipment we have at our disposal is of better quality making the angler far more efficient.

Although I am hesitant to regulate to fisherman off the river and catch to the elite fly fisherman who practices catch & release rather than the forked stick artist, fishing regulations and angler education is the only sensible way to approach the problem. We have made great progress in the last decade.

The Habelse river is a quality stream which provides quality angling and whatever regulations are necessary to ensure its future must be imposed.

Granite Creek

0 - 50	-	0
50 - 100	-	5
100 - 150	-	4
150 - 250	-	2
250 - 300	-	0

Stockeye Creek

0 - 50	-	1
50 - 100	-	3
100 - 150	-	1
150 - 250	-	0
250 - 300	-	0

0⁺ 1⁺ 2⁺ 3⁺ 4⁺

0-50 mm 50-100- 100-150 150-250 250-300

Cutthroat by length (mm)

Furlong Creek

0-50	-	0	-
50-100	-	7	-
100-150	-	9	-
150-250	-	1	-

Hotsprings Creek

0-50	-	15
50-100	-	21
100-150	-	3
150-250	-	0

Refuge Creek

0-50	-	2
50-100	-	5
100-150	-	8
150-250	-	0

Schulbuchhand Creek

0-50	-	0
50-100	-	8
100-150	-	1
150-250	-	0

Furlong Creek

Site # 11

Furlong Creek has been channelized and contained by D.O.H above and below the Kintat highway. Above the highway the gradient is fairly steep moderating around the bridge area and eventually fanning out to form many channels and swamps prior to entering Kakesel Lake. Beavers are again a problem in lower reaches but as the creek is flashy depending on surface flows, adult and juvenile movements probably coincide with spring and fall freshets.

As sampling occurred in low summer flows juveniles had moved up into channelized area which concentrates flow and keeps temperatures moderate. Due to high numbers of cutthroat in sample and absence of coho the system requires further looking into possibly good area to acquire brood stock.

Herman Creek.

Herman Creek is the most important tributary of the Hakelse River. It represents the major gravel recruitment for the upper river which is a major spawning area for Pink, Coho, and Steelhead. Again the absence of 4" or older cutthroat from sample area indicates probable movement to the Hakelse River as they reach this stage of development.

Should artificial enhancement be deemed necessary for the Hakelse system, Herman Creek represents a model cutthroat stream and should be considered for a rearing or release site. I state this in spite of the fact that it may be saturated to capacity at the present time due to its proximity to the area in the Hakelse river which has the greatest concentration of fishing pressure for cutthroat namely Herman Creek to Coldwater Creek.

Herman Creek has ample spawning and rearing. The limiting factor is most likely low summer and winter flows as it has only small amounts of ground water and depends on precipitation. Flows in fall freshet may be substantial but not devastating and allows good movement of adult & juvenile fish. A small fence was installed on the lower

(2)

Herman Cr (cont.)

creek in the spring of 1979 to monitor possible use by steelhead but no fish were captured. Water levels were monitored and seemed to be the reason why no fish entered the creek, although steelhead have been observed in Herman Creek in the past.

Schulbuckhand Creek (Skully)

Like Williams, and Coldwater Creeks, Skully Creek relies of surface runoff and snowmelt and can suffer a wide variation of flows. Therefore cutthroat recolonization may be necessary after a very high freshet, which may have some bearing on the small sample size (9) on this tributary. It support a fair number of sockeye and coho and I am puzzled why no rainbow were obtained as it would seem a small number of steelhead should use this system. Excellent spawning and rearing for all species are apparent in the tributary and low summer flows probably limit its rearing capacity.

Hotsprings Creek

Hotsprings Creek as the name implies is unique in the Kabele watershed due to warm spring water entering the main creek and tempering the water. Certain areas are far too warm for salmonids but after mixing with surface creek water an excellent temperature regime occurs. With the access to warm & cold water it represents an exceptional potential for fish culture, but would have to be used to satellite other creeks as present density (3.56 fish per sq. metre) indicates saturation. Additionally it is a prime coho area with competition between species.

Lower Hotsprings creek at its junction with 1st avenue near the lake may be a suitable area to install an upstream / downstream trap to monitor migration into and out of the creek. It has good access and gradient during most water levels is low.

Granite Creek

In terms of esthetics granite creek leaves a lot to be desired but would probably rate high with the U.S. Army Corps of Engineers who delight in channelizing and attempting to contain any watercourse which threatens private property. Nature has made provisions for creeks and rivers of a flashy nature by providing a wide alluvial fan to temper these high water flows but of course engineers have a different sense of values (Channelized 1978)

Nevertheless where there is flowing water, there will be fish and Granite Creek is no exception. Again as with Furlong Creek, low summer flows are concentrated by channelization and do provide habitat for the early age classes but as it lacks sufficient cover for larger fish they outgrow the system. Flashy nature probably results in need for recolonization after each freshet.

Enhancement opportunities for streams of this nature are limited.

REFUGE CREEK

Refuge creek is also influenced by hot springs which is shown by the 17°C water temp at the sample site. It is adjacent to the Hot Springs Pool (South) and empties into the boat channel behind the Hot Springs site. Again beavers are a continual problem on this tributary.

With such a small cutthroat sample (15) it is difficult to analyze such data but I feel Refuge Creek is an important cutthroat producer. Like many other lake side tributaries it chuff competitors are who which out number them 2:1 (31).

Clearwater Creek

Histogram indicates absence of 4" or older cutthroat in the electroshocked sample area. As these older fish require a more substantial environment they are more likely to be found in either the beaver ponds (there are several on the system), in the two lakes which headwater the tributary or move downstream to Lake O Lake. The Clearwater lakes are known cutthroat fisheries with trails to both lakes.

The Clearwater tributary is one of the most important Coho producers of the Lake O system. Enhancement of Coho is presently being ^{done} by the Public Involvement group (S.E.P.) headed by Mr. Jim Wold of Terrace. The project is a headwater stocking of Thornhill Creek with Clearwater brood Coho being used a transplant. Releases to date in Clearwater Creek are as follows:

May 82	-	40,000
May 83	-	80,000
May 84	-	80,000 (projected)

Clearwater Creek is spring fed and very stable in flow. Winter temperatures at sources have been taken at 5°C. It is not ^{are} susceptible to fall floods as ~~with~~ other tributaries of the Lake O. ~~with~~ Prime spawning and rearing habitat making it a model stream.

Clearwater Creek

A note should be made about beaver problems on the Kakeel system. On streams with substantial surface runoff migration of juvenile and adults both upstream and downstream takes place during periods of highwater. On Clearwater Creek as with many groundwater creeks beaver dams pose extreme problems as freshets do not occur and migration is obstructed. Annual surveys should be made to monitor potential problem areas.

DAILY FRY TRAPPING RECORD Lakelse Lake tributary

DATE April 4th, 1970

	Stream	Air Temp.	H2O Temp.	Turb.	Flow	Set Length	Trap Type	SALMON	CO.	CH.	PI.	SO.	CHH.	TROUT	CT.	DV.	FB.	OTHERS
12	Thorhill Cr. RR BR	13°	12°							23							168#1	200
UNE																		
8	Herman Cr	*1	12.5	clear	low 1 cfs	15min	Gee		1						2			
8	" "	*2	"	"	"	"	"		8						4	2		
8	" "	*3	"	"	"	30 min	"		3						1			
8	" "	*4	"	"	"	"	"		2						1			

Hot Springs Cr (Below Highway to beaver dam)

Angling

Lengths	Cutthroat	Coho
Date	10.0 cm	8.0
June 13/83	11.2 cm - scales #1	8.3
	12.5 cm	8.5 - scales #1
	15.0 cm - scales #2	
	16.0 cm - scales #2	
	16.5 cm	
	♀ - 31.5 cm - (kelt) scales #3	

Hot Springs Cr (below highway)

Gee traps

June 13/83 trap #1

	CT	CO
3	6.5 cm	4.2 cm
	7.0 cm	8.0 cm
	7.0 cm	
	7.0 cm	
	9.5 cm	

June 13/83 trap #2

	CT	CO
1	9.0 cm	1 - 7.0 cm
1	10.0 cm	2 - 7.5 cm
1	10.5 cm	9 - 8.0 cm
1	11.0 cm	12 - 8.5 cm
3	11.5 cm	6 - 9.0 cm
1	13.0 cm	1 - 9.2 cm
		1 - 10.0 cm
		1 - 10.5 cm
		1 - 11.0 cm

Total 8 34

Clearwater Creek

June 14/83 Upper bridge (3rd)

	CT	DV
1	8.7 cm	13.0 cm
1	9.5 cm	
1	10.0 cm	
2	10.5	
1	11.2	
1	11.5	
1	12.0	
1	12.5	
1	12.6	

Total 10 1

JUNE 13

	Stream	Air Temp.	H2O Temp.	Turb.	Flow	Set Length	Trap Type	SALMON	CO.	CH.	PI.	SO.	CHH.	TROUT	CT.	DV.	SB.	OTHERS
12	Thorhill Cr. RR BR	15°c	12°c							23							(55#1)	250-
JUNE 13	Refuge Creek	"1		Murky Brown	Almost Nil	5 Hr	Gee											0
	1st AVENUE	"2		(sewage outflow)	Nil	5 Hr	Gee											2 Beetles
13	Hotsprings Creek	"1		clear		5 Hr	Gee		1									
	1st AVENUE	"2		clear		5 Hr	Gee											7 sculpins
	Hotspring Creek	"1	12°	"		1 Hr	Gee		2						5			Details on
	Below Highway	"2	12°	"		1 Hr	Gee		34						8			length + Scales
		3	12°	"		1 Hr	Angling		3						7			Page 1
JUNE 14	clearwater Cr.	"1	9°c	"		3.5 Hr	Gee											0
	lower bridge	"2	9°c	"		3.5 Hr	Gee		2									9 sculpins
14	Second bridge	"1	9°c	"		3.5 Hr	Gee											1 sculpin
		"2	9°c	"		3.5 Hr	Gee		12							4		5 sculpins
14	(upper) 3rd bridge	"1	11°c	"		3 Hr	Gee								2	1		
		"2	11°c	"		3 Hr	Gee								8			
14	clearwater lake (11 Hie)	"1	13°c	"		15 MIN	Gee		37									1 stickleback
		"2	13°c	"		15 Hr	Angling		2						9		1	
	Andulas Cr	"1	9°c	Glacial creek		3.75 Hr	Gee		10							1		
	lower bridge	"2	9°c	"		3.15 Hr	Gee		4							3		

Clearwater lake (little)

June 14/83

Cutthroat

- 12.8 cm - 1 scales #2
- 18.6 cm - 2 scales #3
- 20.0 cm - 1
- 20.2 cm - 1 - scales #3
- 21.0 cm - 2
- 21.5 cm - 1
- 24.5 cm - 1 - scales #4

CO

Rb

- 12.0 cm - Scales #5
- 20.7 cm - Scales #1

Total

9

1

Clearwater lake little.

June 14/83

Coho - Geetrap 15 min set

- 4.5 cm - 11
- 5.0 cm - 12
- 5.5 cm - 6
- 6.0 cm - 6
- 7.0 cm - 1
- 8.0 cm - 1

total

37

Scully Cr. - 9.5

June 15/83 Angling

Cutthroat

- ♀ 8.0 cm
- ♂ 26.0 cm - #2 scales
- ♀ 26.0 cm - #1 scales
- ♀ 32.0 cm - #3 scales.

#	Stream	Air Temp.	H2O Temp.	Turb.	Flow	Set Length	Trap Type	SALMON	CO.	CH.	PI.	SO.	CHH.	TROUT	CT.	DV.	FS.	OTHERS
42	Thorhill Cr. RR BR	+3°c	+2°c							23								1 sculpin
JUNE 15	Socketeye Cr (Highway)	#1	9°c	clear		2.5hr	Gee		1									1 sculpin
		#2	9°c	"		2.5hr	"		1									
	Upper Socketeye old lake rd	#1	9°c	"		1.5hr	"											
		#2	9°c	"		1.5hr	"		1						3			
	Williams Cr Highway	#1	9.5°c	"		2.5hr	"											
		#2	9.5°c	"		2.5hr	"											1 sculpin
	old lake rd	#1	9.5°c	"		2.25hr	"											
		#2	9.5°c	"		2.25hr	"											4 sculpins
	Blackwater creek	#1	9.0°c			2.0	GEE - Stolen											
		#2	9.0°c			2.0	GEE											0
	furlong Creek (Highway)	#1				2.0	"								1			
		#2				2.0	"								1			
	Between furlong + Granite	#1	13°c	Murky		2.0	"											0
		#2	13°c	Murky		2.0	"											0
	Granite Creek	#1	8.5°c	clear		2.0	"											0
		#2	8.5°c			2.0	"											0
	Scully Cr	#1	9.5°c			1.5	"								1			
		#2	9.5°c			1.5	"											0
		#3	"			1.0	"											0
		#4	"			1.0	"											1 sculpin
		#5	"			1.0	"											0
		6"	"			2.0	Angling								4			

Scully Cr
Angling

June 21/83

Temp 10.5°

Cutthroat

♀ 22.8 cm - scales

♀ 32.5 Kelt - scales.

♀ 33.0 Scales.

35.0 Scales

♂ 38.5 Kelt - scales.

Upper Scully Cr.

Geotrapping

COHO - 9

7.4 cm.

9.0 cm

6.0 cm

6.7 cm

6.5 cm

7.4 cm

7.4 cm

7.9 cm

8.3 cm

Cutthroat

D.V.

8.9 cm - scales

11.5

13.3 cm - scales

10.8

10.9 cm

6.8

6.0 - 1
6.5 - 1
6.7 - 1
7.4 - 3
7.9 - 1
8.3 - 1
9.0 - 1

	Stream	Air Temp.	H2O Temp.	Turb.	Flow	Set Length	Trap Type	SALMON	CO.	CH.	PI.	SO.	CHH.	TROUT	CT.	DV.	FS.	OTHERS
12	Thorhill Cr. RR BR Sockeye Cr upper bridge	+3°c	+2°c	clear			Gee Gee Gee Gee			23 2 1					1		(SS#1)	2sc 1 sculpin 1 sculpin

Stream	Air Temp.	H2O Temp.	Turb.	Flow	Set Length	Trap Type	SALMON	COI	CH.	PI.	SO.	CHH.	TROUT	CT.	DV.	FB.	OTHERS
Thorhill Cr. RR BR	+3°c	+2°c							23						1	100/4	250
JUNE 22/33 Clearwater Cr		11.5°c	clear		1hr	Gee Gee Gee Gee		1						2			lengths + scales

• Sockeye Cr upper bridge - old lake rd.

CO

cutthroat

June 22/83

Gee trapping

4.6 cm

8.0 cm

7.0 cm

8.5 cm

Upper Williams Cr June 23/83

3 Gee traps - 0 except for Sculpins.

Granite Cr June 23/83

2 Gee traps - 0 except for Sculpins.

Herman Cr June 22/83

Water temp 12°C

Gee trapping

	<u>CO</u>	Cutthroat	Dolly Varden
4.5	I	7.2 I	8.1 I
6.5	I	7.5 I	8.2 I
6.6	I	7.6	
6.7		7.7	
6.8		7.8	
6.9		7.9 I	8.8 II
7.0		8.0 I	
7.1	I	8.1 I	
7.2		8.2 I	9.8 I
7.3	I	8.3	
7.4	II	8.4 I	
7.5	I	8.5	
7.6		8.6	11.9 I
7.7	III	8.7 I	
7.8	I	8.8	
7.9	II	8.9 I	
8.0	I	9.0	
8.1		9.1	
8.2	I	9.2	
8.3		9.3	
8.4		9.4	
8.5	III	9.5	
8.6		9.6	
8.7		9.7	
8.8		9.8 I	
8.9		9.9	
9.0	III	10.0	
9.1	I	10.1	
9.2		10.2	
9.3	II	10.3	
9.4		10.4	
9.5		10.5	
9.6		10.6	
9.7	I	10.7 I	
9.8		10.8 I	
9.9		10.9	
10.0	II	11.0	
10.4	I	11.1 I	scales
11.4		11.2	
12.4	I	11.3	scales
		11.4	
		11.5 I	scales
		13.8 I	scales
	10.3 I		

(31)

(15)

(6)

