Province of British Columbia — Ministry of Environment — FISH AND WILDLIFE BRANCH

MEMORANDUM

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 capablilities 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 similiar 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.

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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

WEC:je
c.c. M.R. Whately

LAKELSE LAKE CUTTHROAT TROUT:

ENHANCEMENT OPPORTUNITY SURVEY, 1983-1984

by

M.R. Whelpley

Submitted As Partial Requisite To A
Canada Works Project 1983-1984

LAKELSE CUTTHROAT SURVEY

SUMMARY

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 conterparts cho 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, Andalas). They 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 and juveniles if possible.

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3. Each specimen could be sampled (i.e. 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 (i.e. Williams Creek log removal below Highway 25 bridge). Stream enhancement should encompass adding to the creeks potential (i.e. 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. Lakelse 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.

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Notes on Creel Census Comparison

It is noted from simple graphs comparing creel censuses dones 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 wrk and ample time to fish.

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

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 fisherman off the river and catch to the elite fly fisherman who practices catch and 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 Lakelse River is a quality stream which provides quality angling and whatever regulations are necessary to ensure its future must be imposed.

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Clearwater Creek

Histogram indicates absence of 4^+ or older cutthroat in the electro-shocked sample area. As these older fish require a more substantial environs 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 Lakelse 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 Lakelse 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 suseptible to fall floods as are other tributaries of the Lakelse. Prime spawning and rearing habitat making it a model stream.

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

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Refuge Creek

Refuge Creek is also influenced by hotsprings which is shown by the 17 C water temperature at the sample site. It is adjacent to the hotsprings pool (south) and empties into the boat channel behind the hotsprings 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 Lakelse tributaries its chief competitor are coho which out number them 2:1 (31).

Granite Creek

In terms of esthetics Granite Creek leaves a lot to be desired but would probably rate high with the U.S. Army Corp. 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 clean 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.

Hotsprings Creek

Hotsprings Creek as the name implies is unique in the Lakelse 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 and 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.

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 supports 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.

Herman Creek

Herman Creek is the most important tributary of the Lakelse 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 Lakelse River as they reach this stage of development.

Should artificial enhancement be deemed necessary for the Lakelse 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 Lakelse 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 precepitation. Flows in fall freshet may be substantial but not devastating and allows good movement of adult and juvenile fish. A small fence was installed on the lower 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.

Furlong Creek Site #11

Furlong Creek has been channelized and contained by D.O.H. above and below the Kitimat Highway. Above the highway, the gradient is fairly steep moderating around the bridge area and eventually fanning out to form many channels and swamp prior to entering Lakelse 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.

0^+	1^+	2^+	3^+	4^+
0-50 mm	50-100	100-150	150-250	250-300

Number of 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

Schulbuckhand Creek

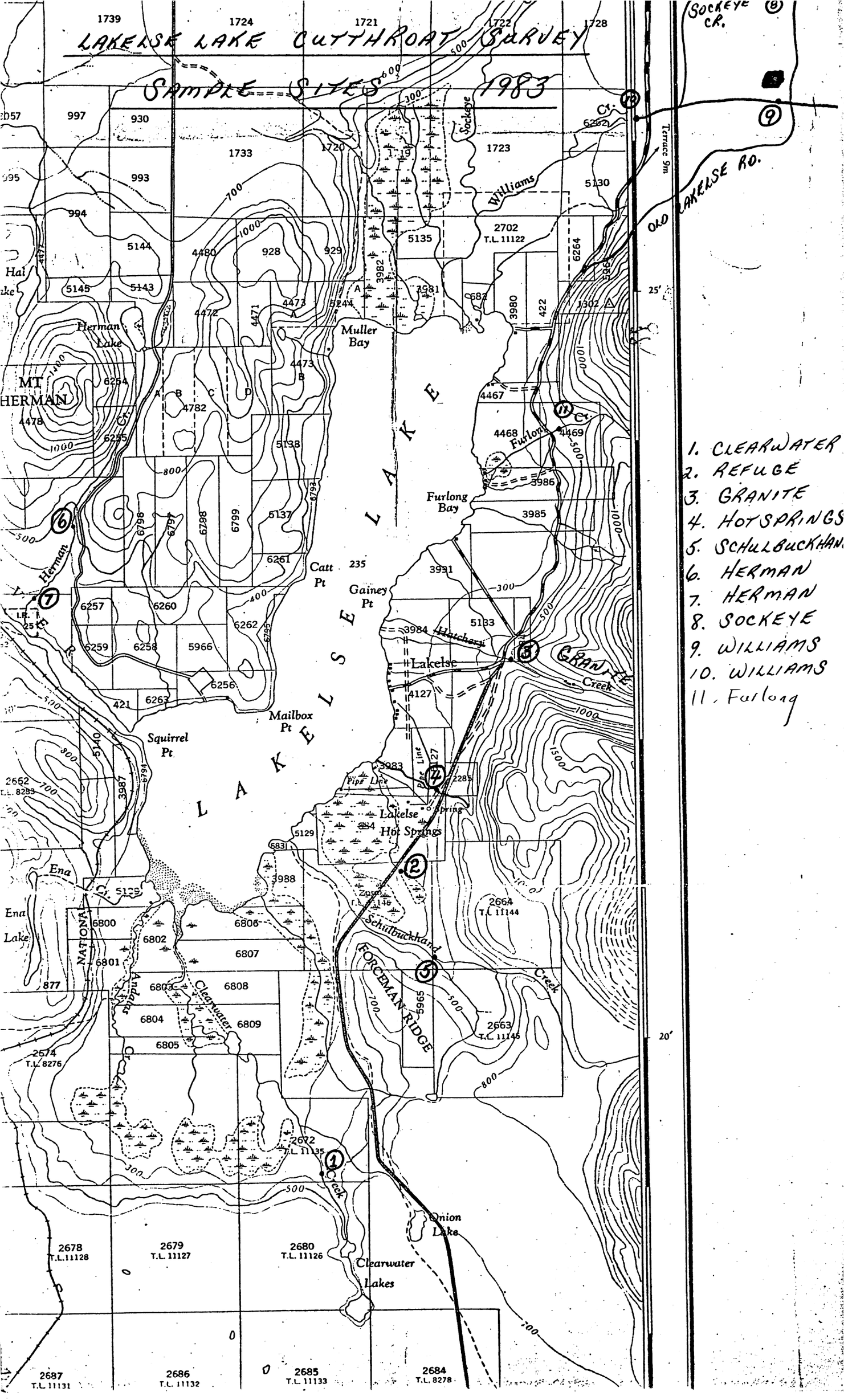
0-50	-	0
50-100	-	8
100-150	-	1
150-250	-	0

Granite Creek

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

Sockeye Creek

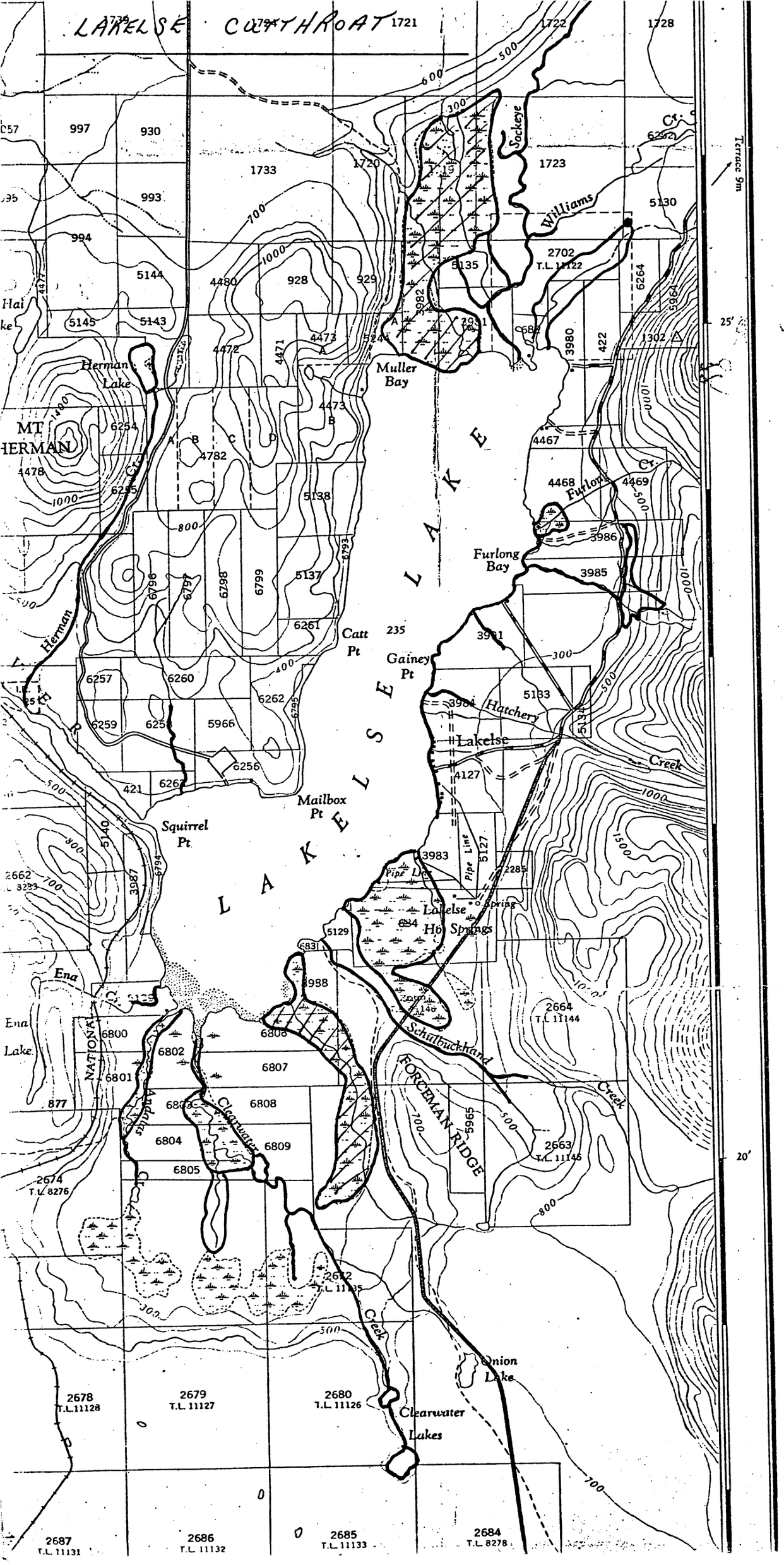
0-50	-	1
50-100	-	3
100-150	-	1
150-250	-	0
250-300	-	0


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
11. Furlong
LAKELSE LAKE
Lakelse
Hot Springs
Muller Bay
Furlong Bay
Catt Pt
Gainey Pt
Mailbox Pt
Squirrel Pt
Herman Lake
MT HERMAN
Ena Lake
Onion Lake
Clearwater Lakes
Williams Creek
Schulbuckhand Creek
FORCEMAN RIDGE
GRANITE Creek
Sockeye Cr.
OLD LAKELSE RD.
Terrace 9m
Pipe Line
Spring

LAKELSE CUTTHROAT SAMPLE SURVEY

DATA COMPARISON

	CLEARWATER CR. SITE #1	REFUGE CR. SITE #2	GRANITE CR. SITE #3	HOTSPRINGS CR. SITE #4	SCHULBUCKHAND CR. SITE #5	HERMAN CR. SITE #6	HERMAN CR. SITE #7	SOCKEYE CR. SITE #8	WILLIAMS CR. SITE #9	WILLIAMS CR. SITE #10	FURLONG CR. SITE #11
DATE 1983 (MONTH/DAY)	7/5	7/5	7/6	6/28	6/28	6/29	6/29	6/30	7/6	7/6	7/5
WATER TEMPERATURE	12°C	17°C	9.5°C	12°C	11°C	12.5°C	12.5°C	10°C	9°C	10°C	14.5°C
AREA (SAMPLE SITE)	108 m^2	22 m^2	120 m^2	39 m^2	171 m^2	62.5 m^2	84 m^2	48 m^2	96 m^2	42.5 m^2	51. m^2
DENSITY (# fish / area)	2.36 $/m^2$	2.27 $/m^2$	.91 $/m^2$	3.56 $/m^2$	.38 $/m^2$	1.68 $/m^2$	.91 $/m^2$	.79 $/m^2$	.46 $/m^2$	1.6 $/m^2$	.32 $/m^2$
P. VALUE	.6	.95	.85	.8	.7	.9	.7	.9	.9	.9	1.0
# COHO	166	31	0	101	28	39	35	22	23	31	0
% COHO	65.1	62	0	72.7	42.4	37.1	45.4	57.9	51.1	45.6	0
# DOLLY VARDEN	15	4	5	0	26	7	0	0	0	0	0
% DOLLY VARDEN	5.9	8	4.6	0	39.4	6.7	0	0	0	0	0
# RAINBOW	0	0	0	0	0	0	0	0	3	1	0
% RAINBOW	0	0	0	0	0	0	0	0	6.7	1.5	0
# SCULPIN	0	0	93	0	3	0	6	11	19	36	0
% SCULPIN	0	0	85.3	0	4.5	0	7.8	28.9	42.2	52.9	0
# CUTTHROAT	74	15	11	38	9	59	34	5	0	0	16
% CUTTHROAT	29	30	10.1	27.3	13.6	56.2	44.2	13.2	0	0	100
LENGTH 0-50 mm AGE 0+	54	2	0	15	0	33	16	1	0	0	0
LENGTH 50 - 100 mm AGE 1+	11	5	5	21	8	19	0	3	0	0	7
LENGTH 100 - 150 mm AGE 2+	6	8	4	3	1	5	15	1	0	0	9
LENGTH 150 - 250 mm AGE 3+	3	0	2	0	0	2	3	0	0	0	1
LENGTH 250 - 300 mm AGE 4+	0	0	0	0	0	0	0	0	0	0	0


LAKELSE CUTTHROAT
LAKELSE LAKE
Herman Lake
MT HERMAN
Muller Bay
Sockeye
Williams
Furlong Creek
Furlong Bay
Catt Pt
Gainey Pt
Hatchery
Lakelse
Mailbox Pt
Squirrel Pt
Lakelse Hot Springs
Pipe Line
Spring
Ena Lake
Schulbuckhand Creek
FORCEMAN RIDGE
Clearwater Creek
Onion Lake
Clearwater Lakes
Terrace 9m
25'
20'
1720
1721
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1723
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1733
997
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6831
3988
2664
T.L. 11144
2663
T.L. 11145
6800
6802
6801
6807
6808
6809
6804
6805
2674
T.L. 8276
2672
T.L. 11135
2678
T.L. 11128
2679
T.L. 11127
2680
T.L. 11126
2687
T.L. 11131
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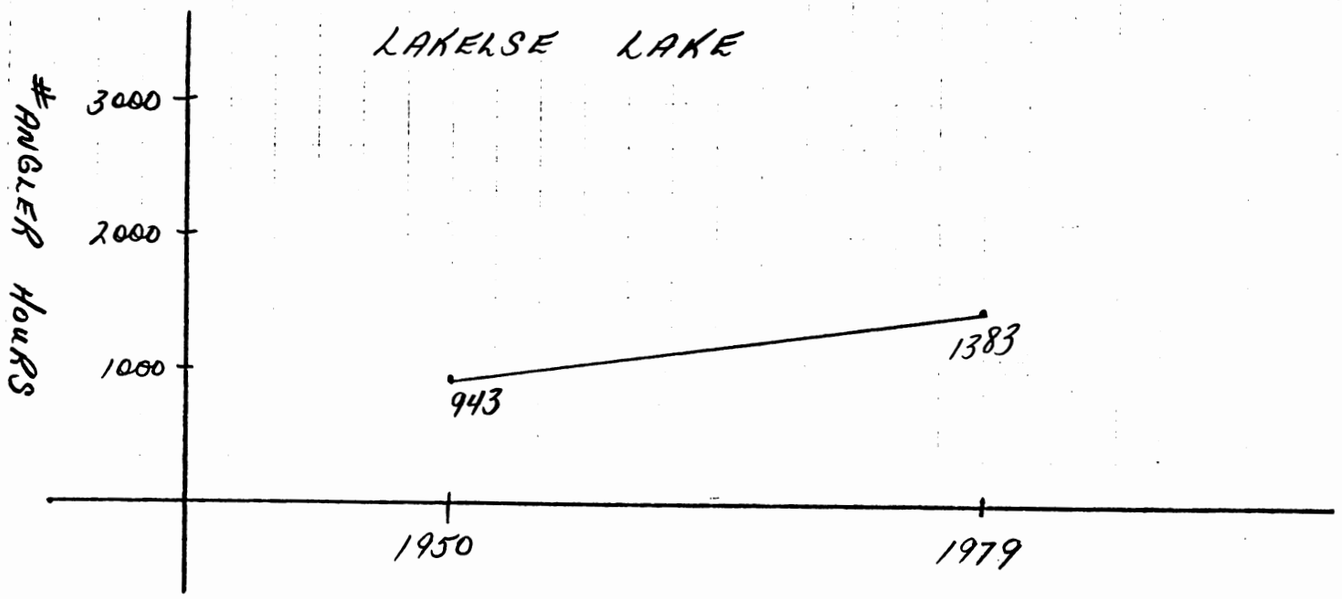
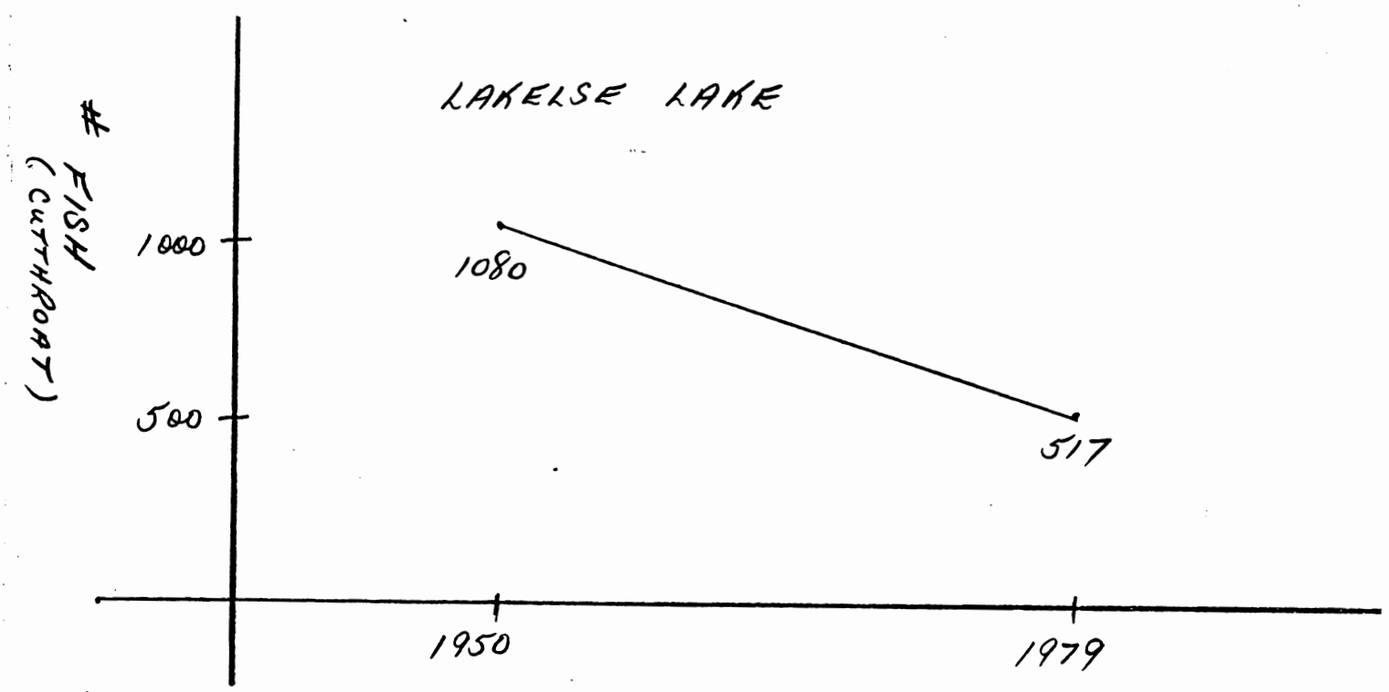
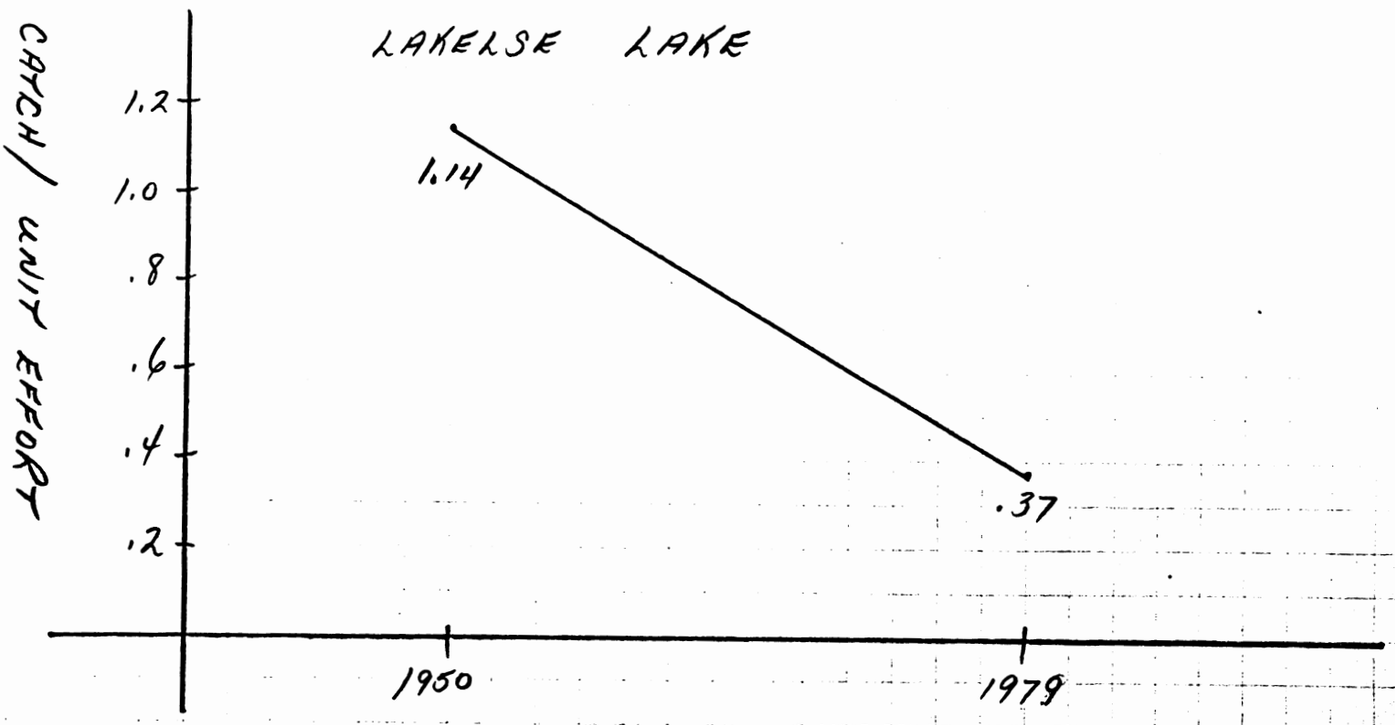
T.L. 11132
2685
T.L. 11133
2684
T.L. 8278

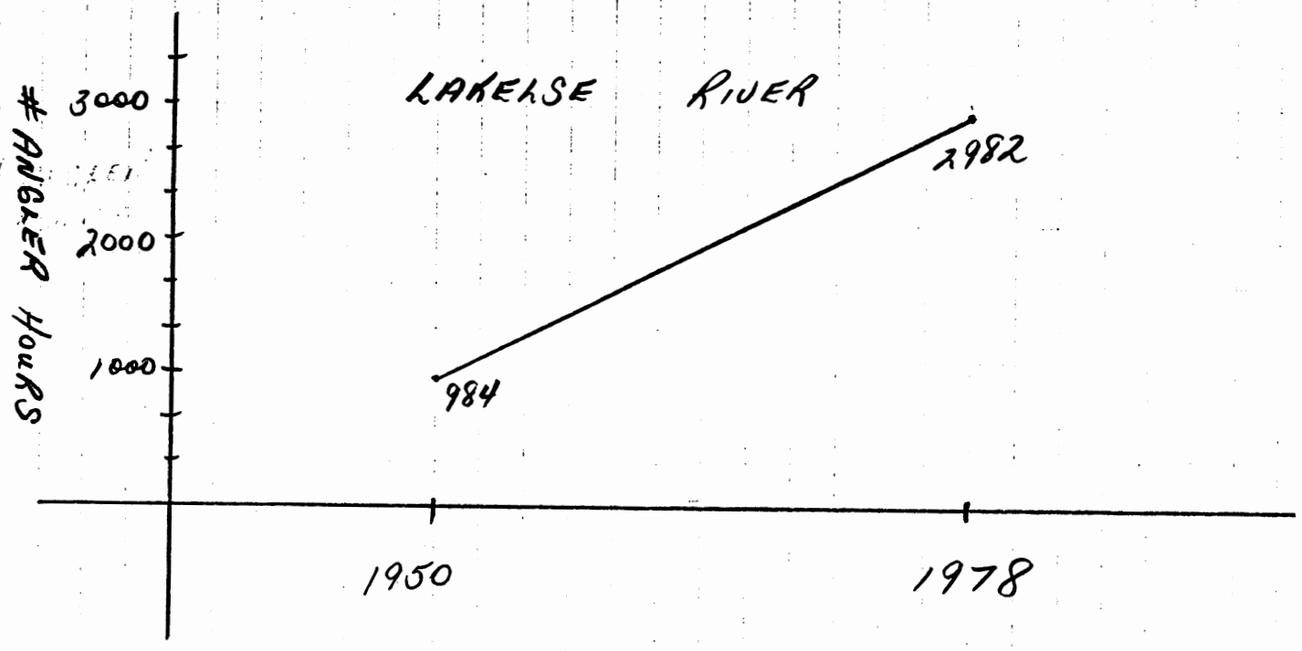
CREEL CENSUS COMPARISON
1950 – 1979

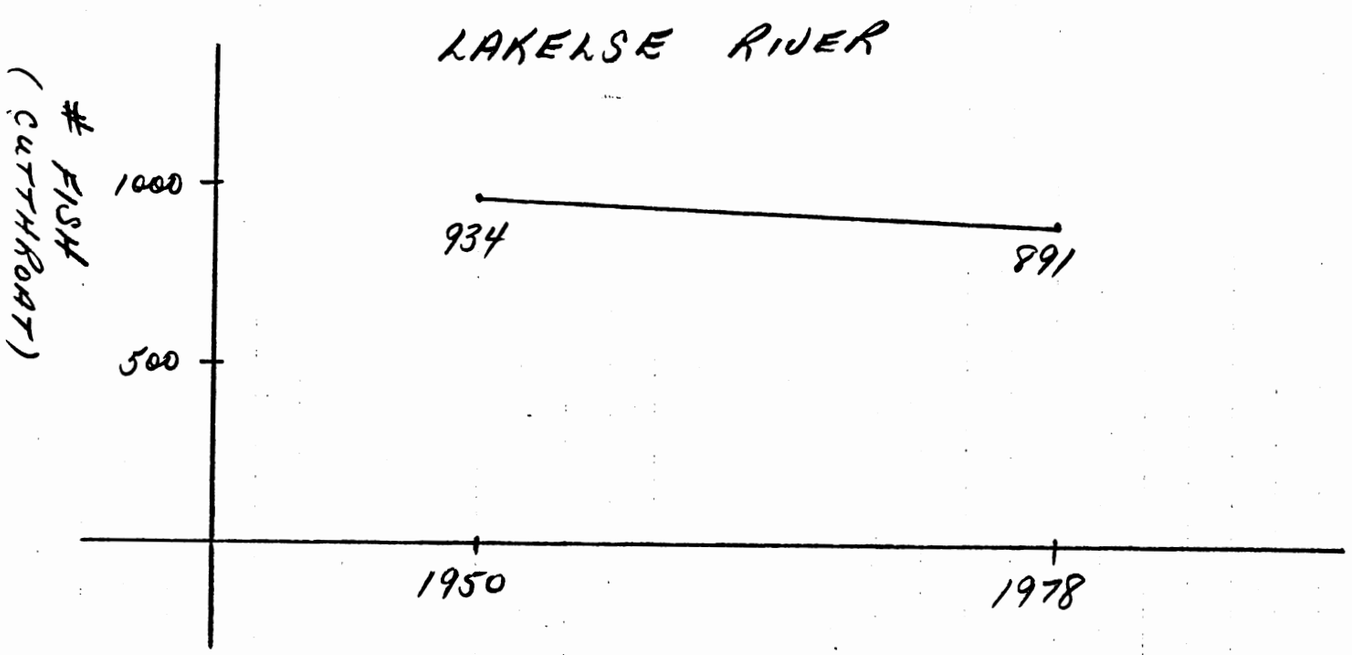


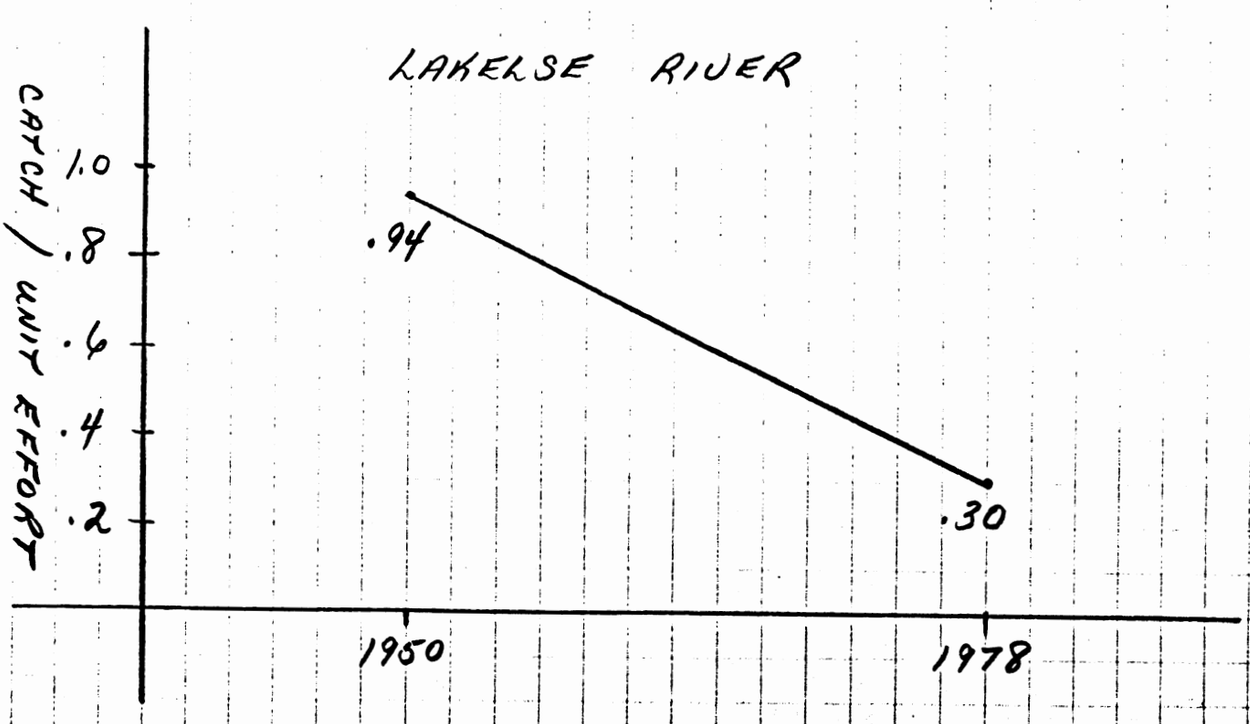




CREEL CENSUS COMPARISON 1950 - 1978



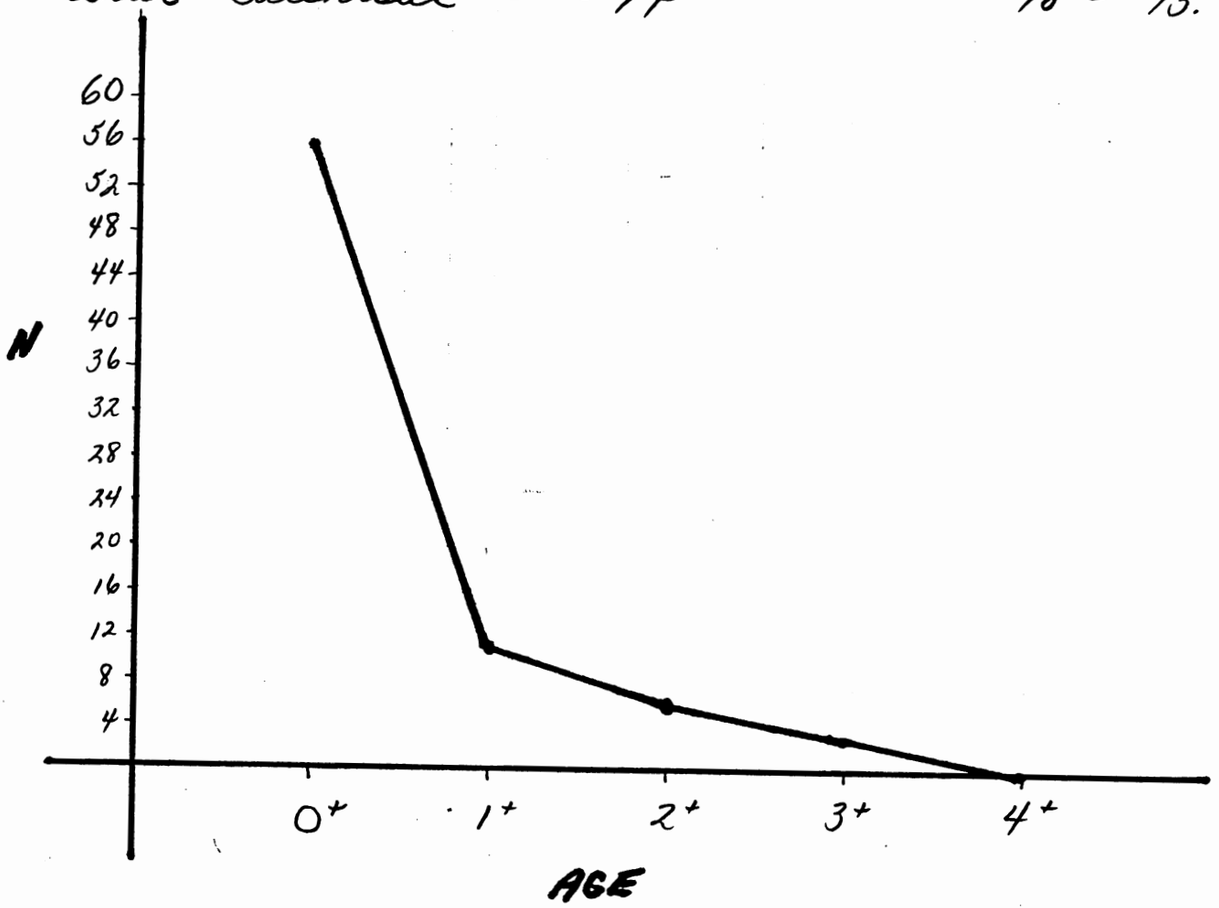




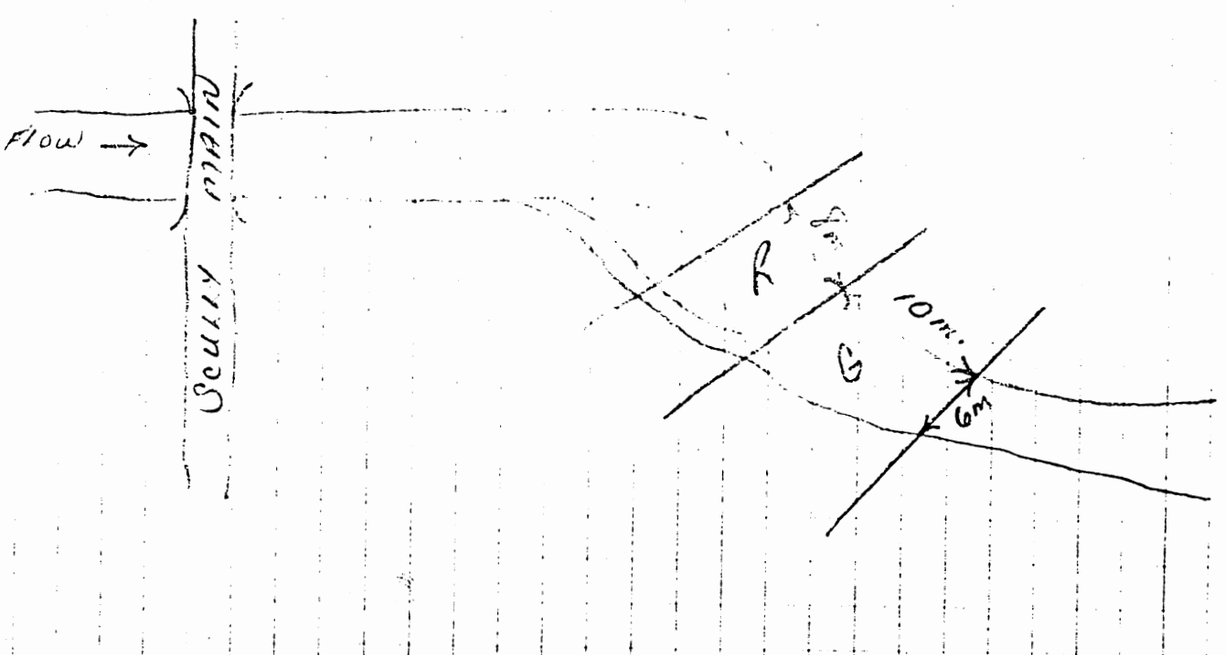
AGE / NUMBER HISTOGRAM

CLEARWATER CR. SITE # 1

DATE - JULY 5/83
WATER TEMP. - 12°C
AREA - 6m. x 18m. = 108 m²
PVALUE - .6
density - 2.36 fish / m²
total Cutthroat - 74 % - 73. %



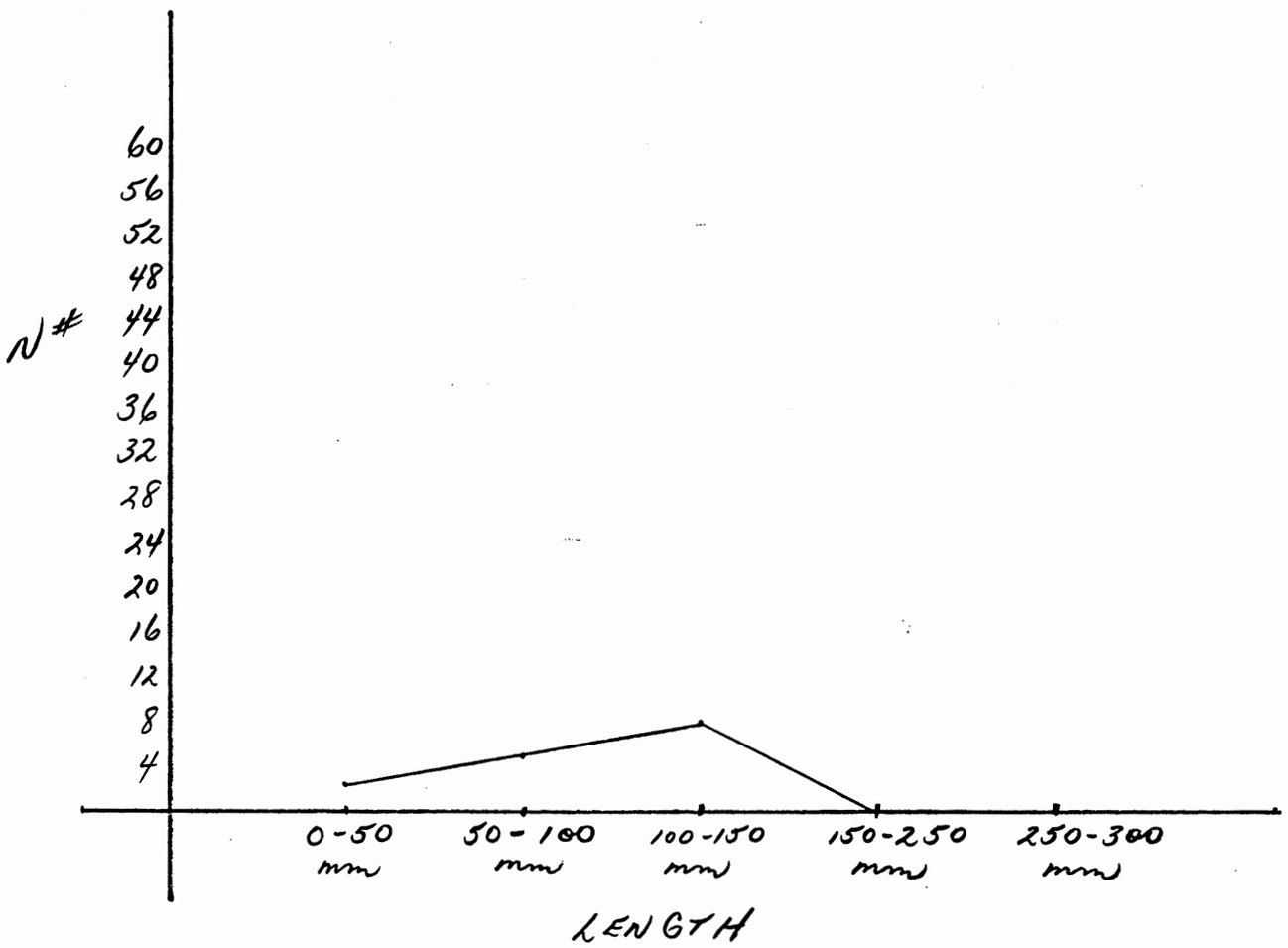
SAMPLE SITE MAP



REFUGE CREEK

Site #2

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



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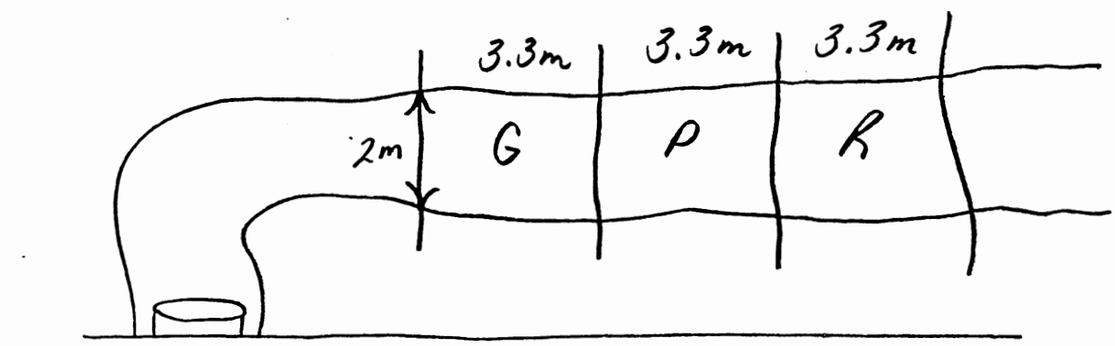

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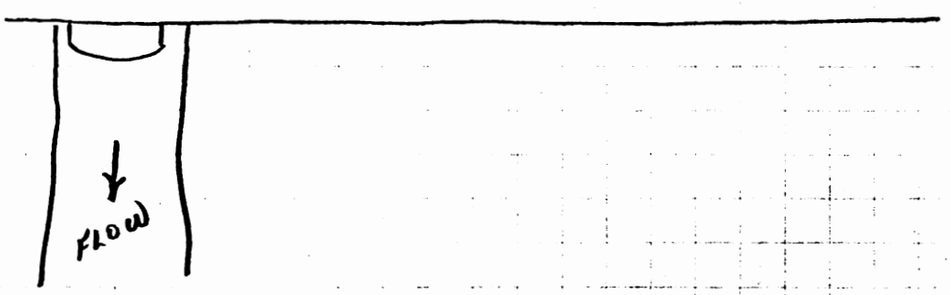
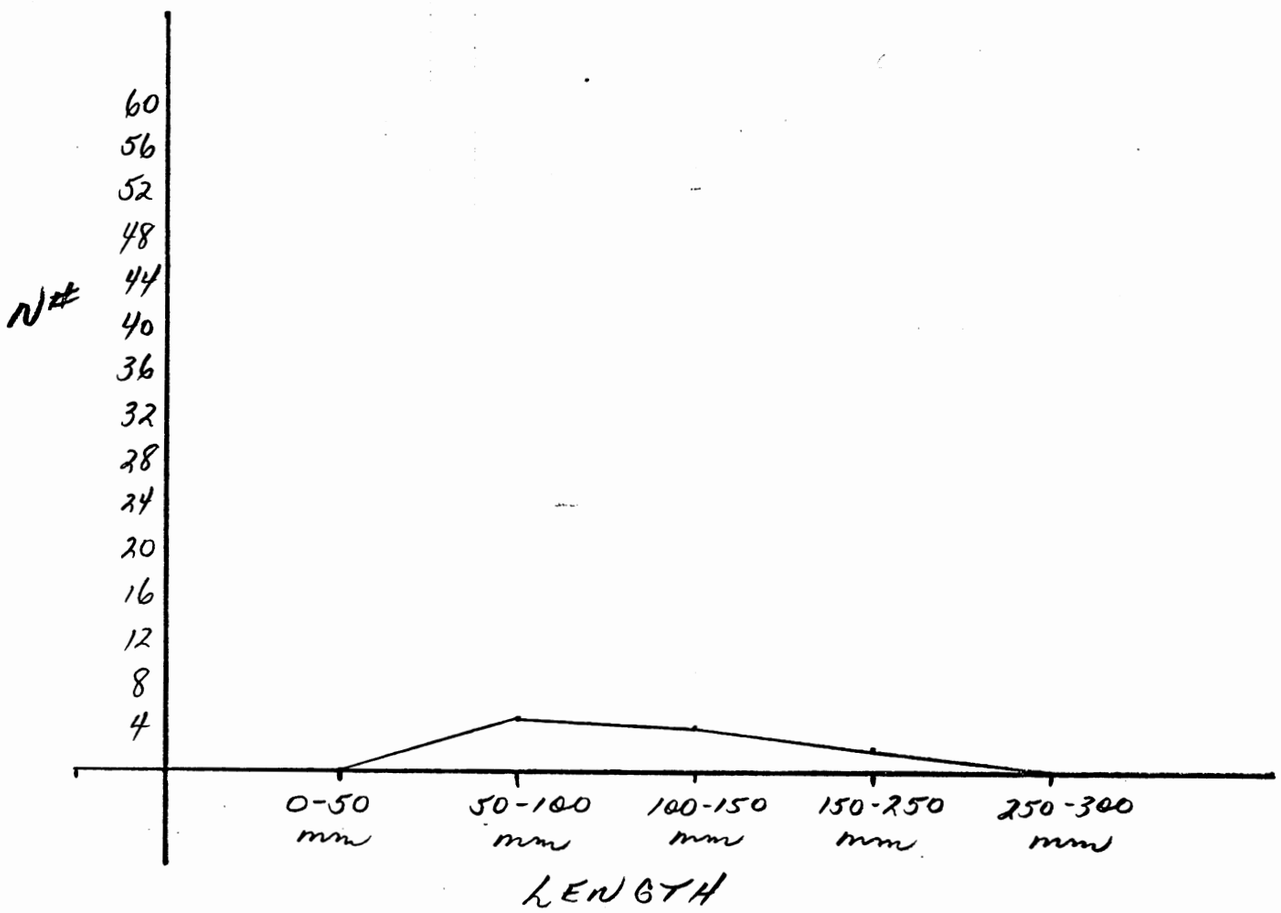
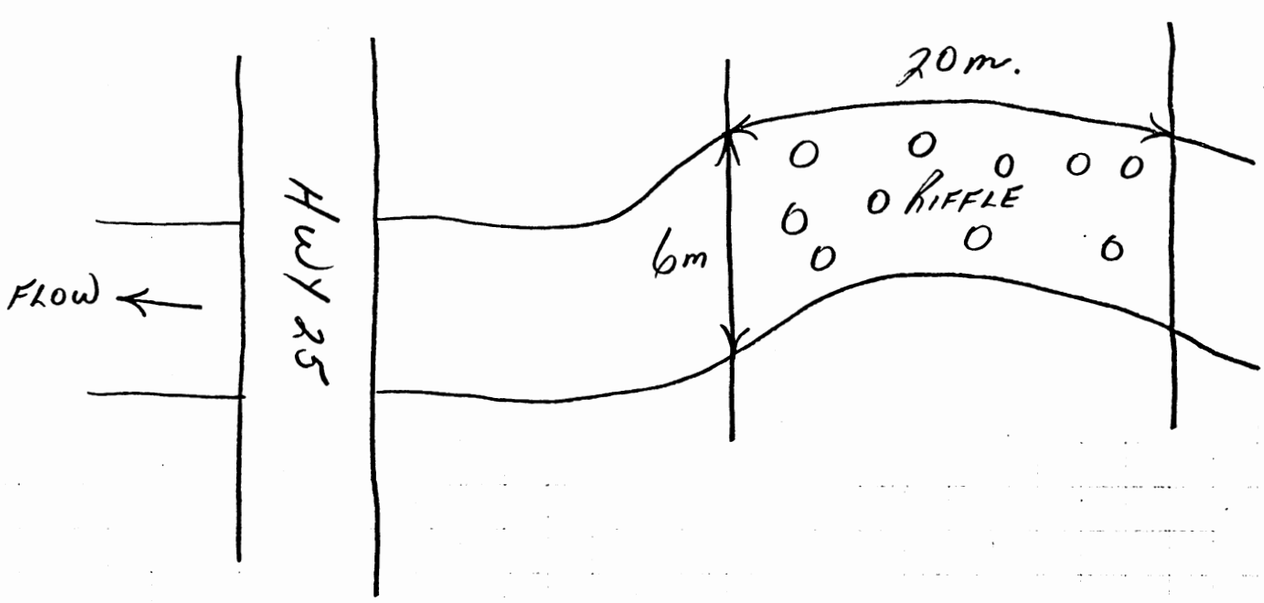


GRANITE CREEK SITE #3

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

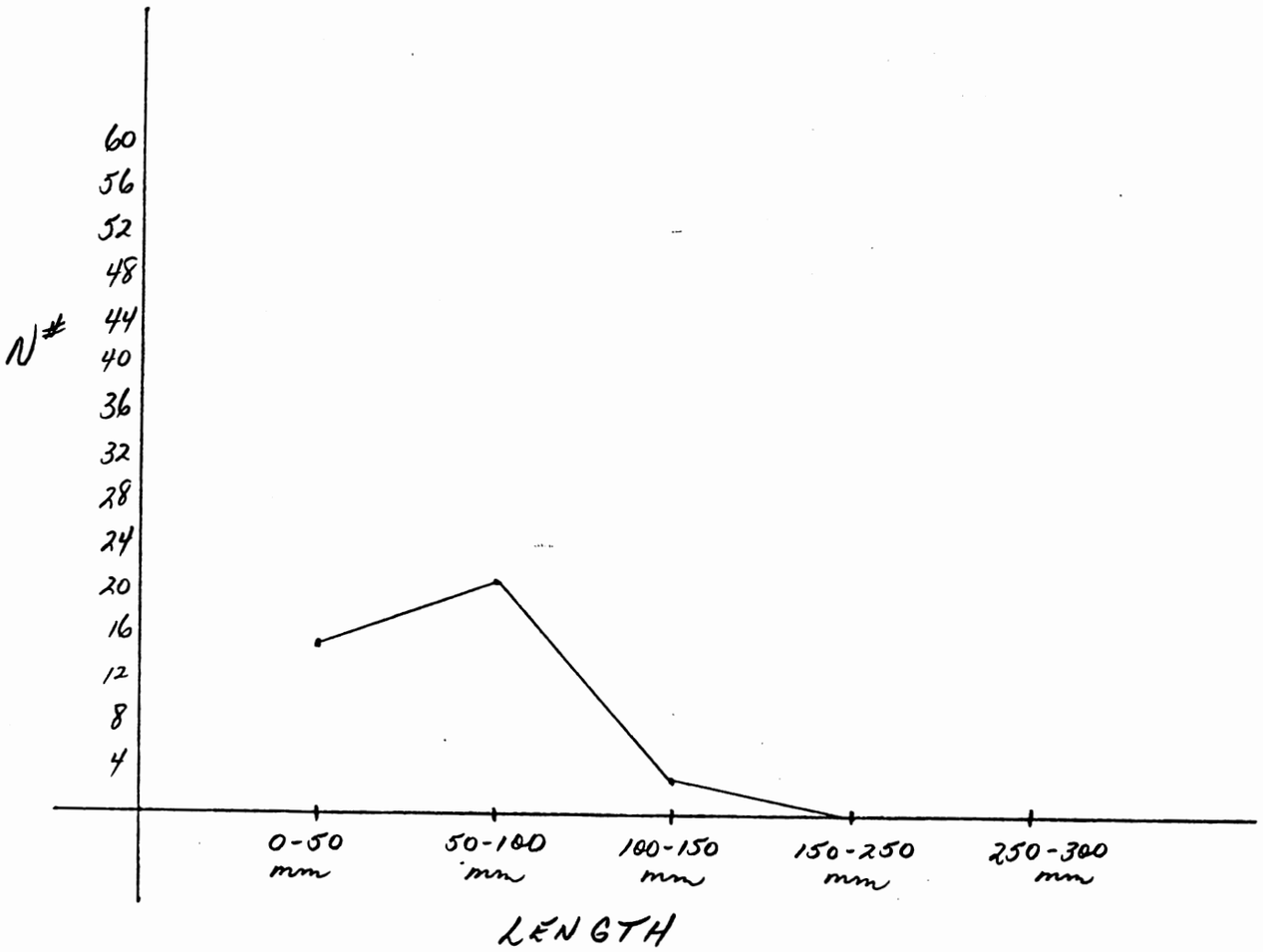


SAMPLE SITE MAP

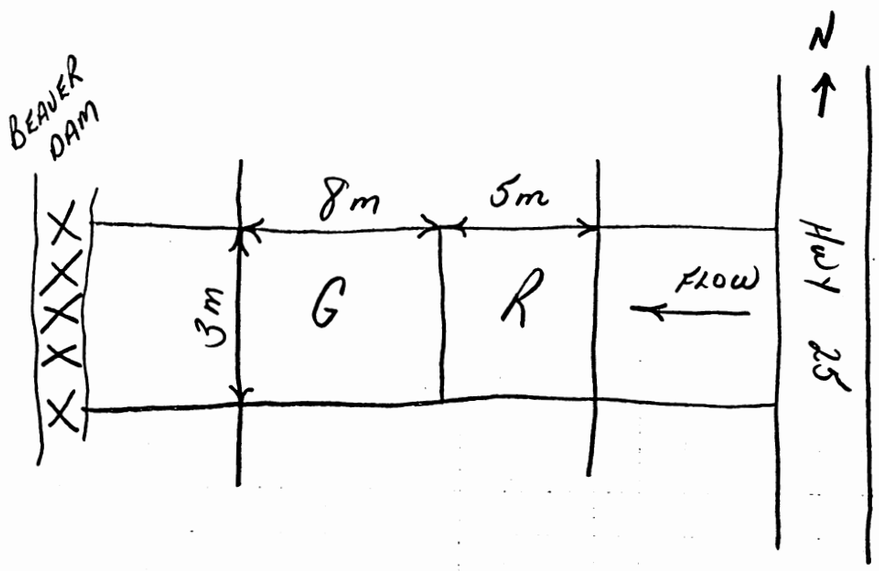


Hotsprings Creek Site # 4

Date - June 28/83
water temp - 12°C
area = 3m x 13m = 39m²
P value - .8
density - 3.56 fish/m²
total cutthroat - 38 % - 27.3%

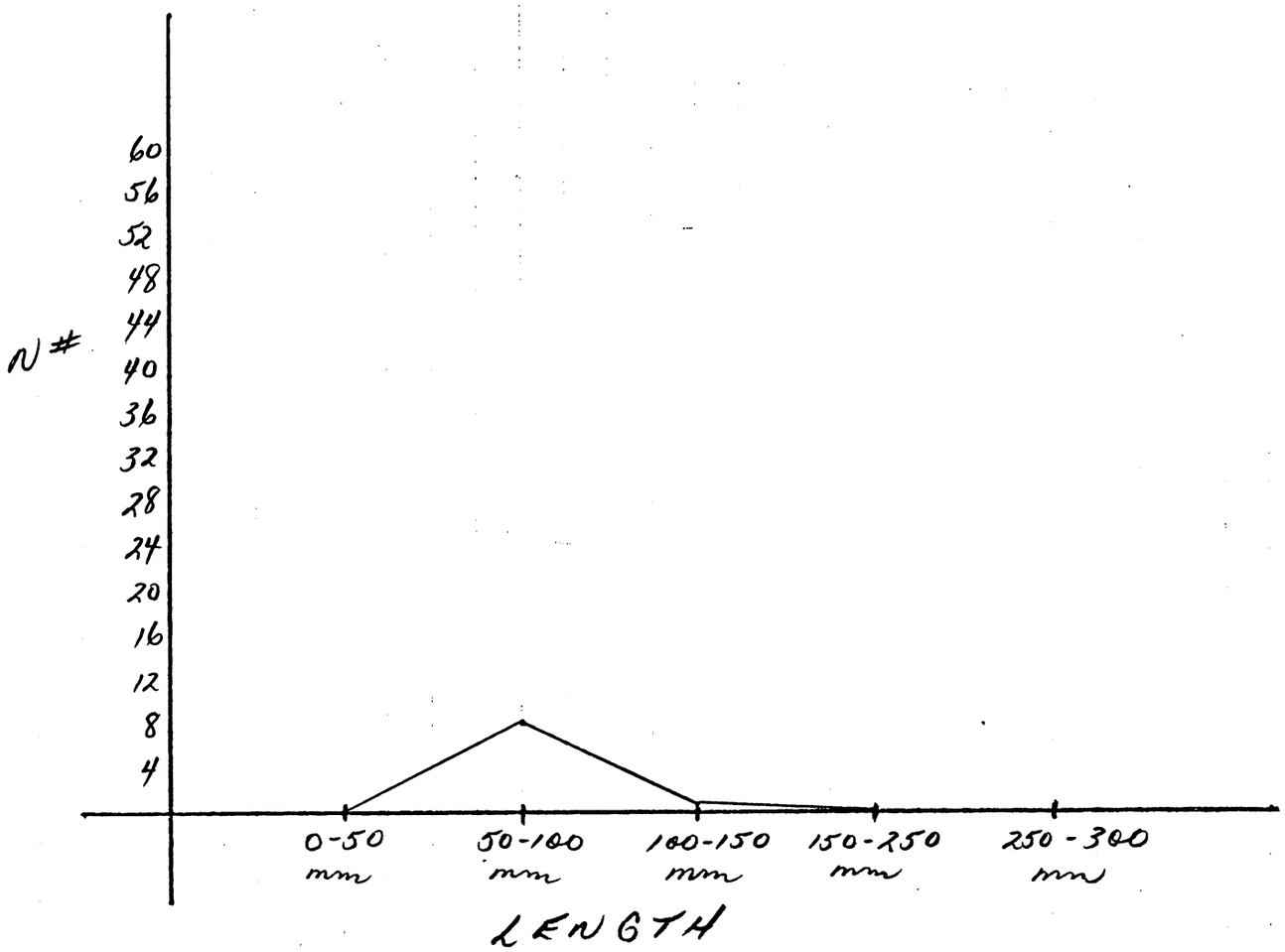


SAMPLE SITE MAP

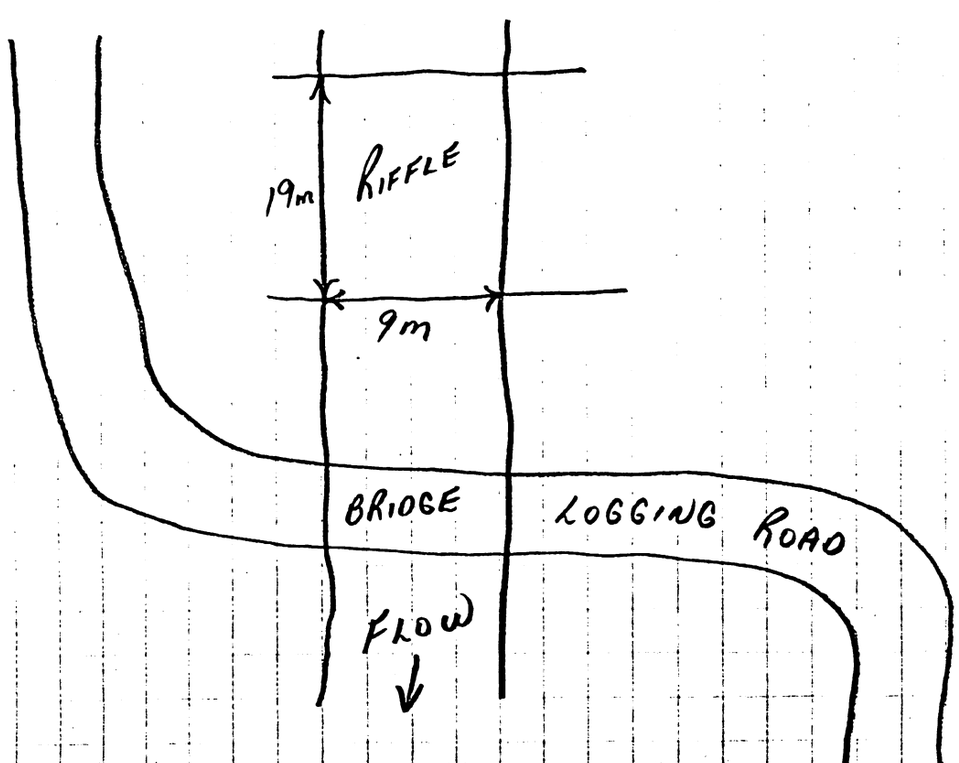


Schulbuckhand Creek Site #5

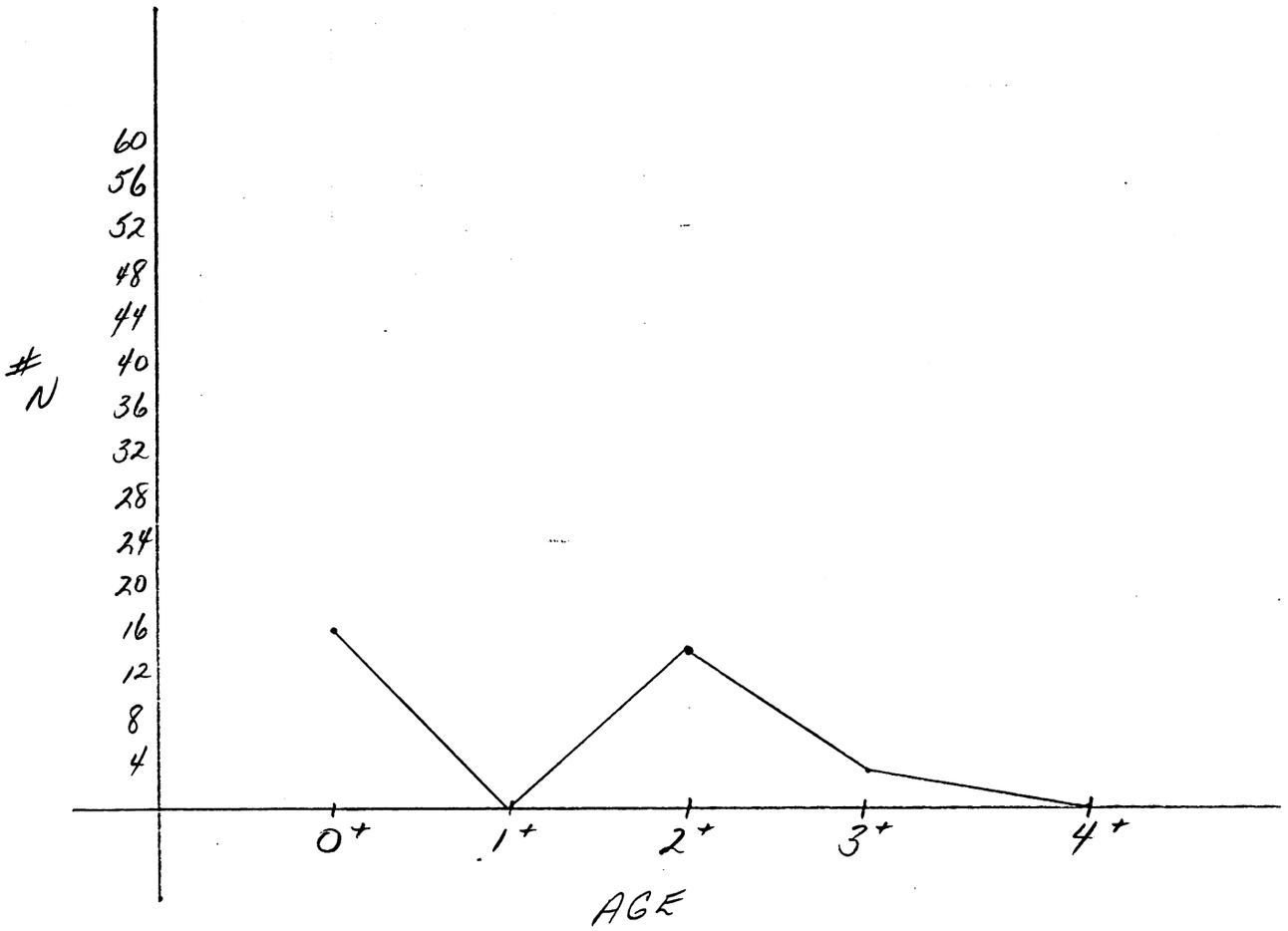
Date - June 28/83
Water temp. - 11°C
Area - 9m x 19m = 171m²
P value - .7
density - .38 fish/m²
total cutthroat - 9 % - 13.6 %



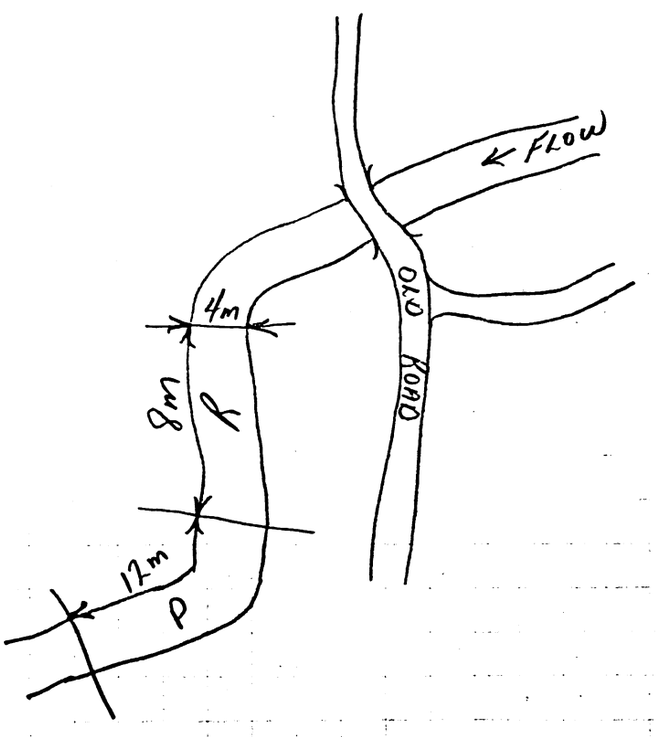
SAMPLE SITE MAP



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

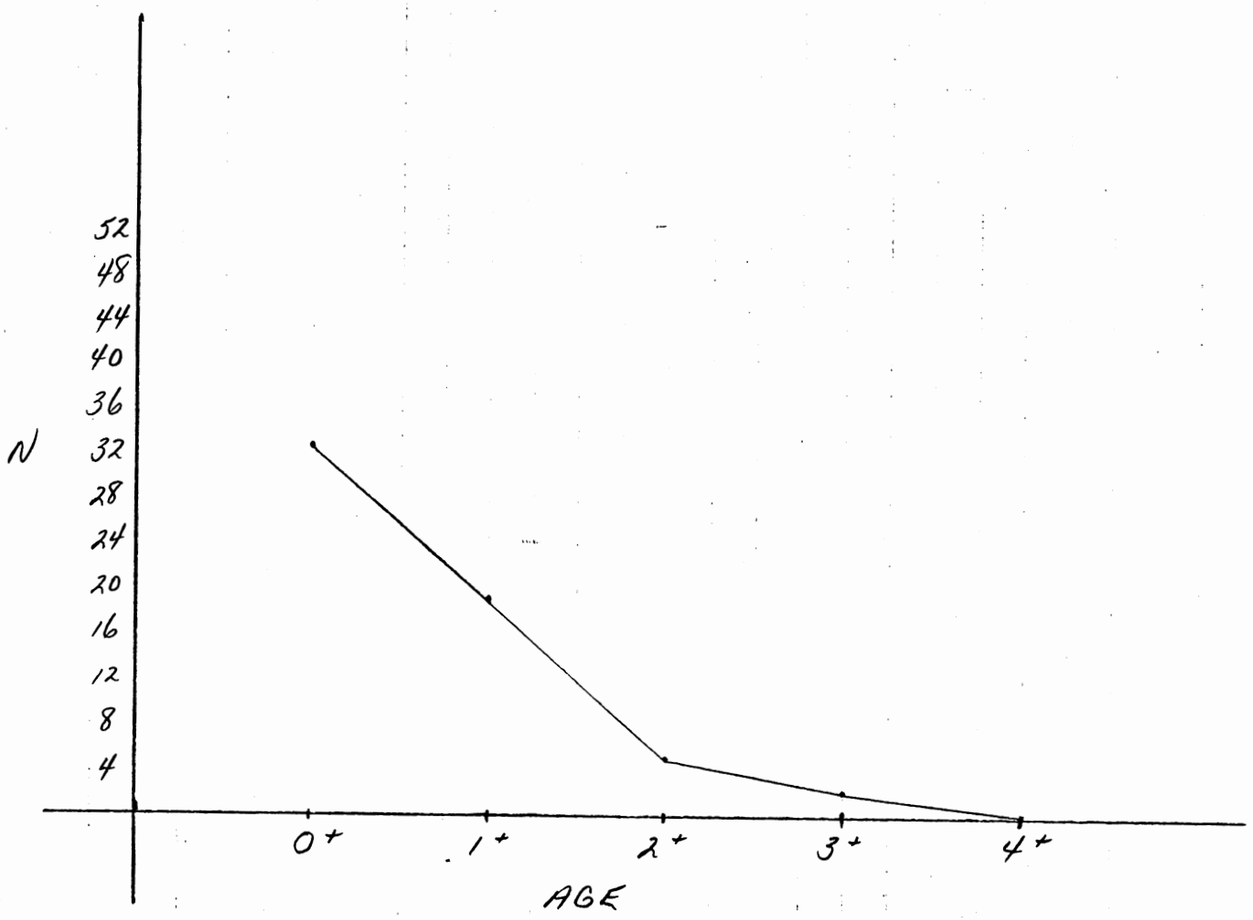


SAMPLE SITE MAP

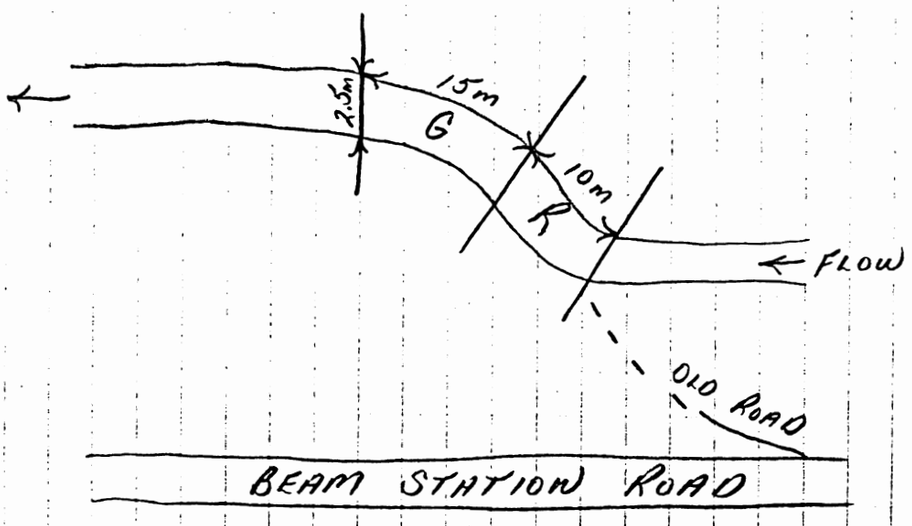


HERMAN CREEK — SITE #6

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

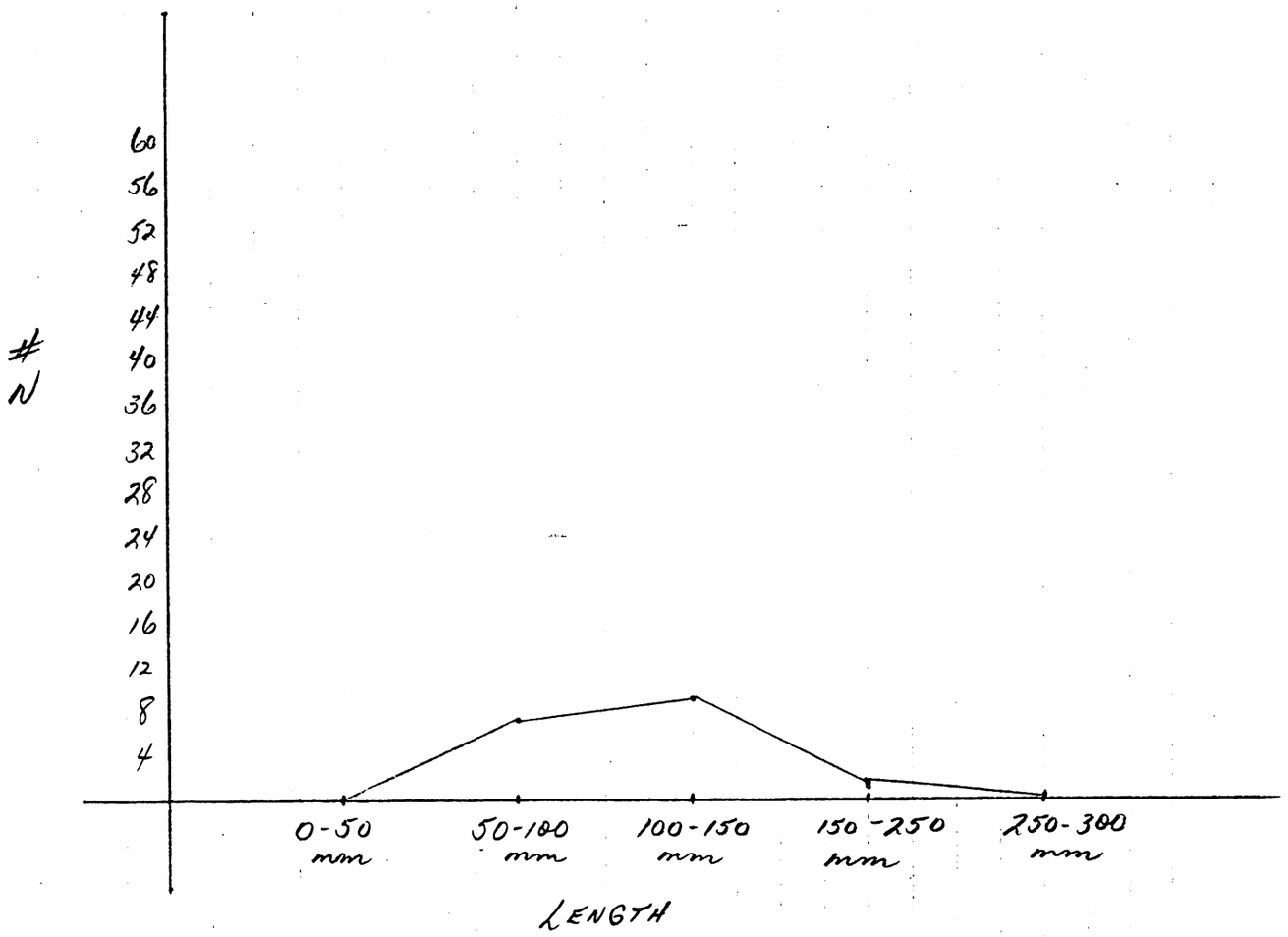


SAMPLE SITE MAP

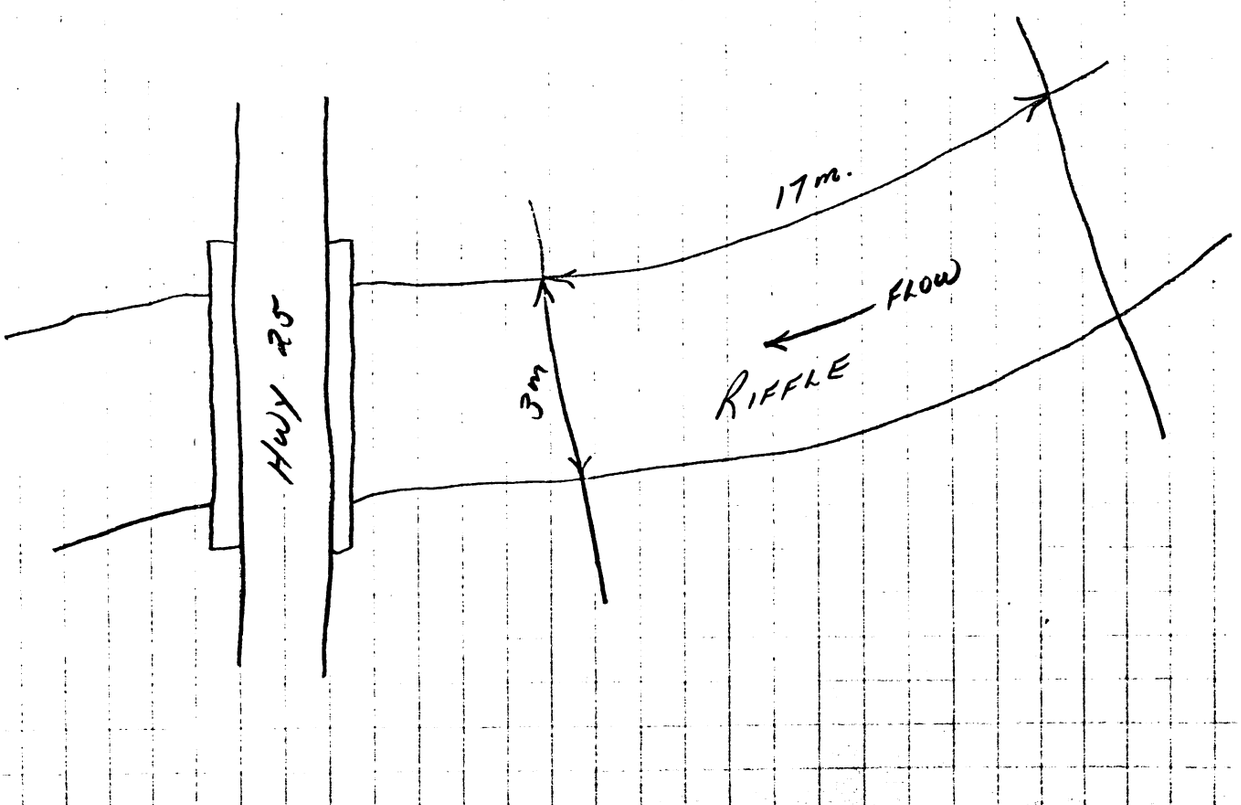


Furlong Creek Site #11

Date - July 5/83
Water temp - 14.5°C
Area - 3m x 17m = 51 m²
P value - 1.0
density - .32 fish/m²
total cutthroat - 16 - % - 100%

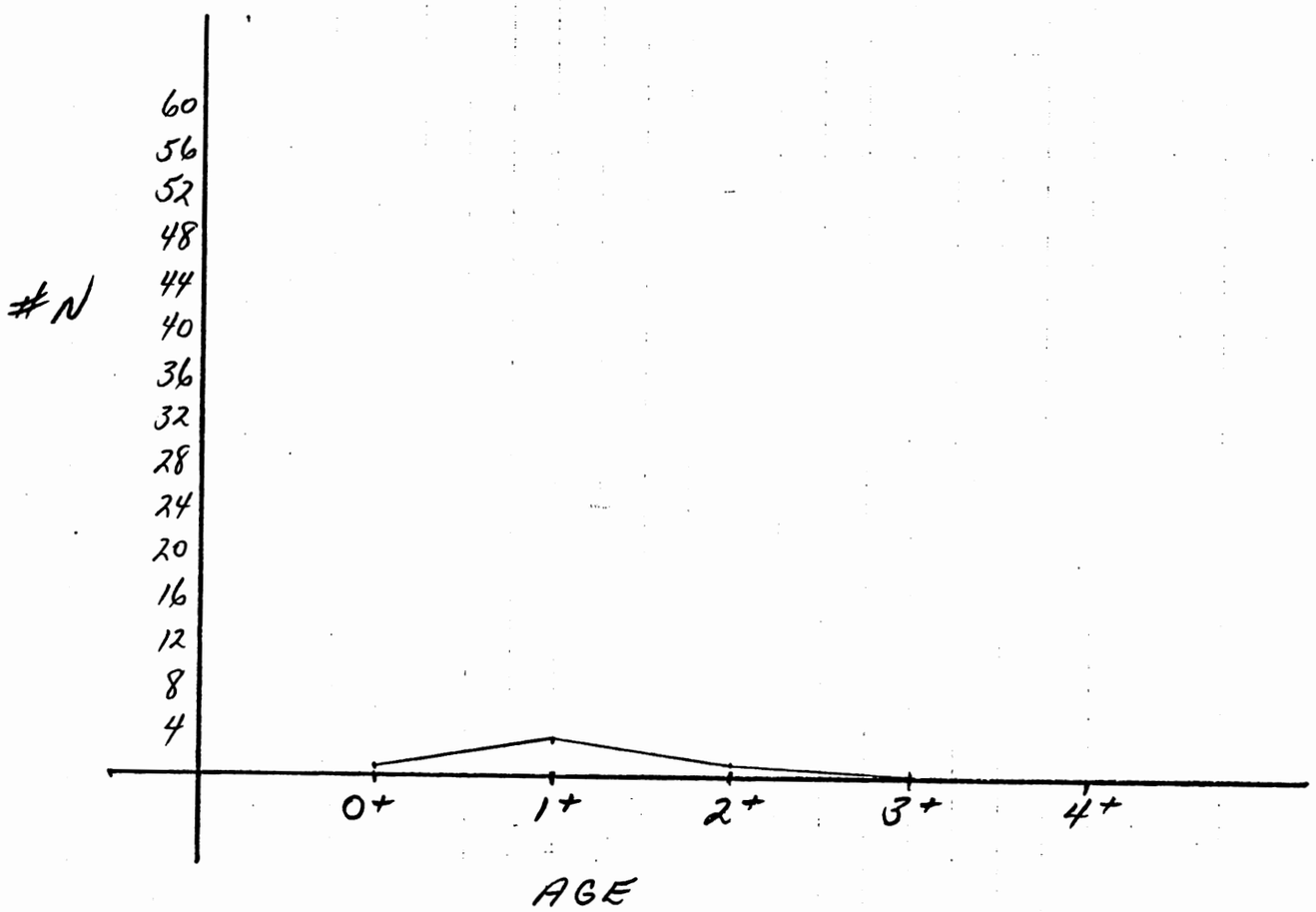


SAMPLE SITE MAP



SOCKEYE CREEK SITE #8

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



SAMPLE SITE MAP