



TO: J. Stockner
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 Fish Culture Research Division
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FROM: R. N. Palmer
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SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE / NOTRE RÉFÉRENCE 5903-85-M391
YOUR FILE / VOTRE RÉFÉRENCE
DATE June 18, 1980

SUBJECT: Morice Lake Data
 OBJET:

I have enclosed the following data which was requested at our meeting in April:

- Tow net catches of sockeye juveniles in Morice Lake, 1961-65.
- Estimated abundance of sockeye salmon juveniles in Morice Lake in August, 1962-65.
- Maps showing tow net sampling stations before and after May 7, 1963.
- A map showing limnology stations on Morice Lake, 1961-67.
- Summary of zooplankton density information for Morice Lake, 1961-63.
- Summary of secchi disc observations in Morice Lake, 1961-65.
- A copy of a report "Meristic Characteristics of Pacific Salmon and Steelhead Trout Captured at Moricetown Falls, 1961-66". This report contains data on fecundity of Morice sockeye.

I have some additional information on size composition of sockeye juveniles which I will summarize and pass on as soon as I can dig it out of the records. There is also some water temperature information which can be pulled out if necessary.

R. N. Palmer

cc: D. Anderson
 R. Kadowaki ✓

TOW NET CATCHES OF SOCKEYE JUVENILES IN MORICE LAKE, 1961-65

1961

DATE

* DAILY CATCH

St. I

St. II

St. III

St. IV

Fry

1+

Fry

1+

Fry

1+

Fry

1+

July 5

0

4

6

3

3

9

7

6

10

7

2

11

9

13

12

3

0

13

6

3

15

21

18

16

2

8

18

7

6

20

5

3

Aug. 3

9

7

4

36

26

7

5

2

8

4

9

9

7

16

14

2

0

15

19

3

1962

DATE

DAILY CATCH

	<u>St. I</u>			<u>St. II</u>		<u>St. III</u>		<u>St. IV</u>	
	Fry	1+	2+	Fry	1+	Fry	1+	Fry	1+
April 25	0	0	7						
26	0	3	8						
27	0	2	4						
30	0	1	1						
May 1	0	0	3						
2	0	1	1						
3	0	3	6						
5	0	2	1						
7	0	1	1						
8	0	0	1						
Aug. 20	65	2	0						
21	6	0	0						
27						1	1		
28						3	9		
29								1	1
31	13	0	0						
Sept. 1				5	2				
2				96	5				
3						8	7		
4						10	2		
6	39	2	0						

1963

<u>DATE</u>	<u>DAILY CATCH</u>					
	<u>St. I</u>		<u>St. II</u>		<u>St. III</u>	
	1+	2+	1+	2+	1+	2+
April 21	7	1				
22	2	0				
23			7	3		
24			15	0		
26					1	1
28	19	2				
29	29	0				
May 1			10	3		
2			7	1		
3					6	0
6					3	5
7	14	1				

<u>DATE</u>	<u>DAILY CATCH</u>					
	Fry	<u>St. I**</u>		Fry	<u>St. II**</u>	
		1+	2+		1+	2+
May 14	0	9	1			
16	4	21	0			
17	1	8	2			
18				0	4	1
19				0	1	0
24	0	1	0			
25	67	16	1			
26	4	4	0			
27	62	22	0			
June 3				3	40	0
4				0	5	0
5				0	23	0
7	19	3	0			
9	21	25	0			
10	10	4	0			
12	11	0	0			
14				2	15	0
15				3	2	0
16				0	1	0
18	2	1	0			
19	6	5	0			
22	2	28	0			
23	10	16	0			
25				1	7	0
27				1	0	0
28				1	3	0

1963 (continued)

DATE	DAILY CATCH					
	St. I*			St. II*		
	Fry	1+	2+	Fry	1+	2+
June 29	3	41	0			
30	15	22	0			
July 1	5	23	0			
2	13	5	0			
13	10	12	0			
15	6	5	0			
17	10	3	0			
18	30	7	0			
21				5	4	0
23				35	6	0
24				2	4	0
25	25	6	0			
26	40	1	0			
27				5	1	0
28				2	2	0
Aug. 12	50	23	0			
13	69	5	0			
14	45	3	0			
15	81	1	0			
17				8	2	0
18				0	0	0
20				1	0	0
22	32	13	0			
23	58	9	0			
24	26	4	0			
25	43	2	0			
27				4	3	0
28				1	0	0

** New tow net stations were established May 14, 1963, ie. Stations I and II as shown on attached map.

1964

DATE DAILY CATCH

Fry St. I 1+ Fry St. II 1+

DATE	Fry	<u>St. I</u>	1+	Fry	<u>St. II</u>	1+
June 3	40		1			
4	90		1			
6				2		7
7				1		3
8	31		0			
9	61		3			
12				0		0
13				1		2
15	20		0			
17	8		0			
July 31	5		1			
Aug. 1	2		1			
2				5		0
3				10		3
4	35		1			
5	222		7			
6				14		3
7				8		3
8	136		7			
9	20		2			
10				14		7
11				12		6
12	33		0			
13	76		0			
14	7		0			
31	11		2			
Sept. 1	10		0			
3				0		0
4				2		0
5				9		1
9	5		0			
10				13		0
11				6		1
13	6		1			
14	3		1			

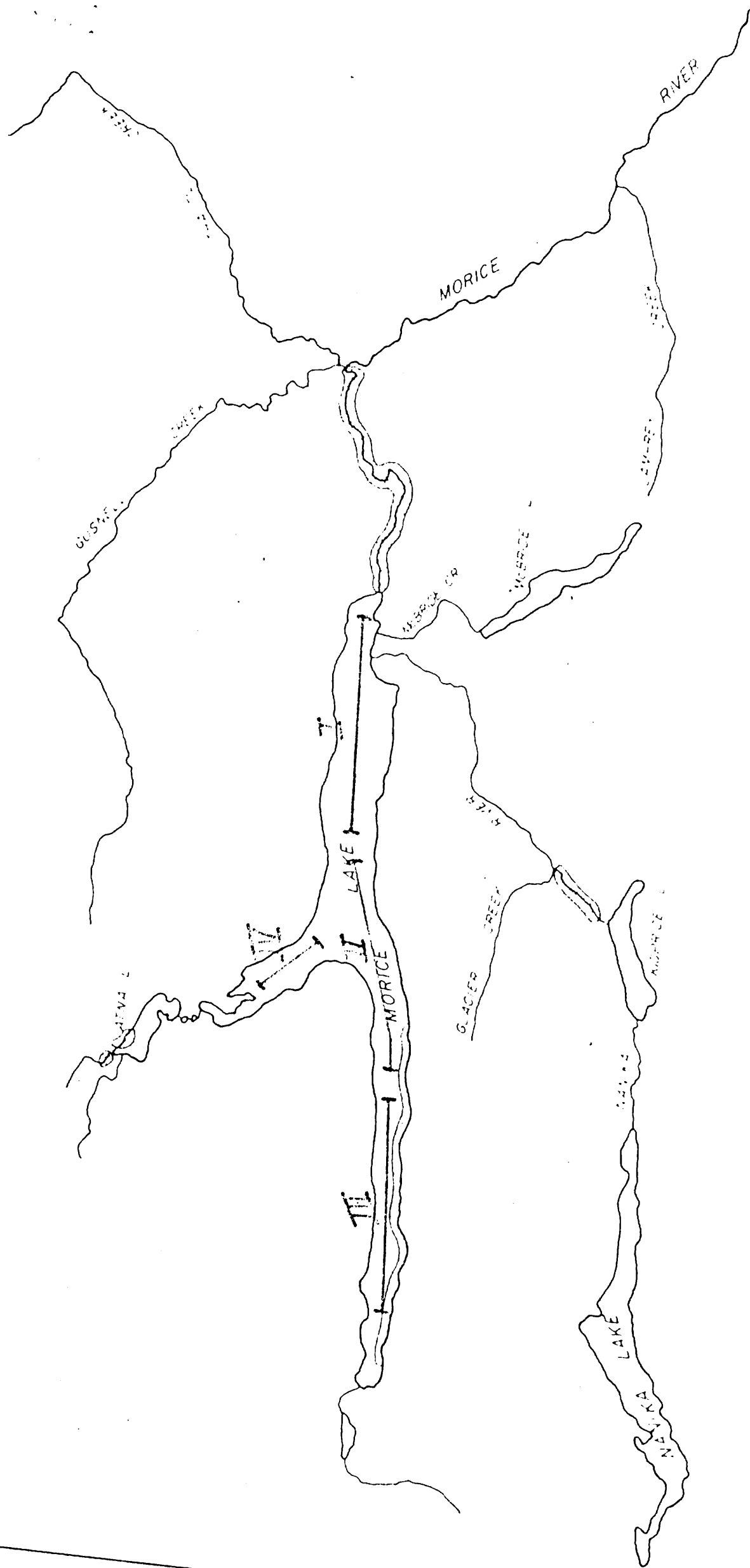
1965

<u>DATE</u>	<u>DAILY CATCH</u>			
	<u>St. I</u>		<u>St. II</u>	
	Fry	1+	Fry	1+
June 8	111	3		
9	156	38		
10	51	6		
18	58	0		
20	52	2		
27	20	4		
28	9	7		
July 23	15	0		
24	58	0		
25			2	9
26			4	8
28	34	4		
29	44	1		
30			7	3
31			8	2
Aug. 6	192	30		
7	147	8		
19	15	1		
20	7	0		
21			5	0
23			15	1
25	240	2		
26	18	1		
29			1	1
31			5	1
Sept. 2			3	0
3	47	0		

* The daily unit of effort was 3-30 minute tows using the method described by Johnson, 1956.

Johnson, W.E., 1956, On the Distribution of Young Sockeye Salmon (*Oncorhynchus nerka*) in Babine and Nilkitkwa Lakes, B.C., Journal Fisheries Research Board Canada, 13(5), pp 695-708.

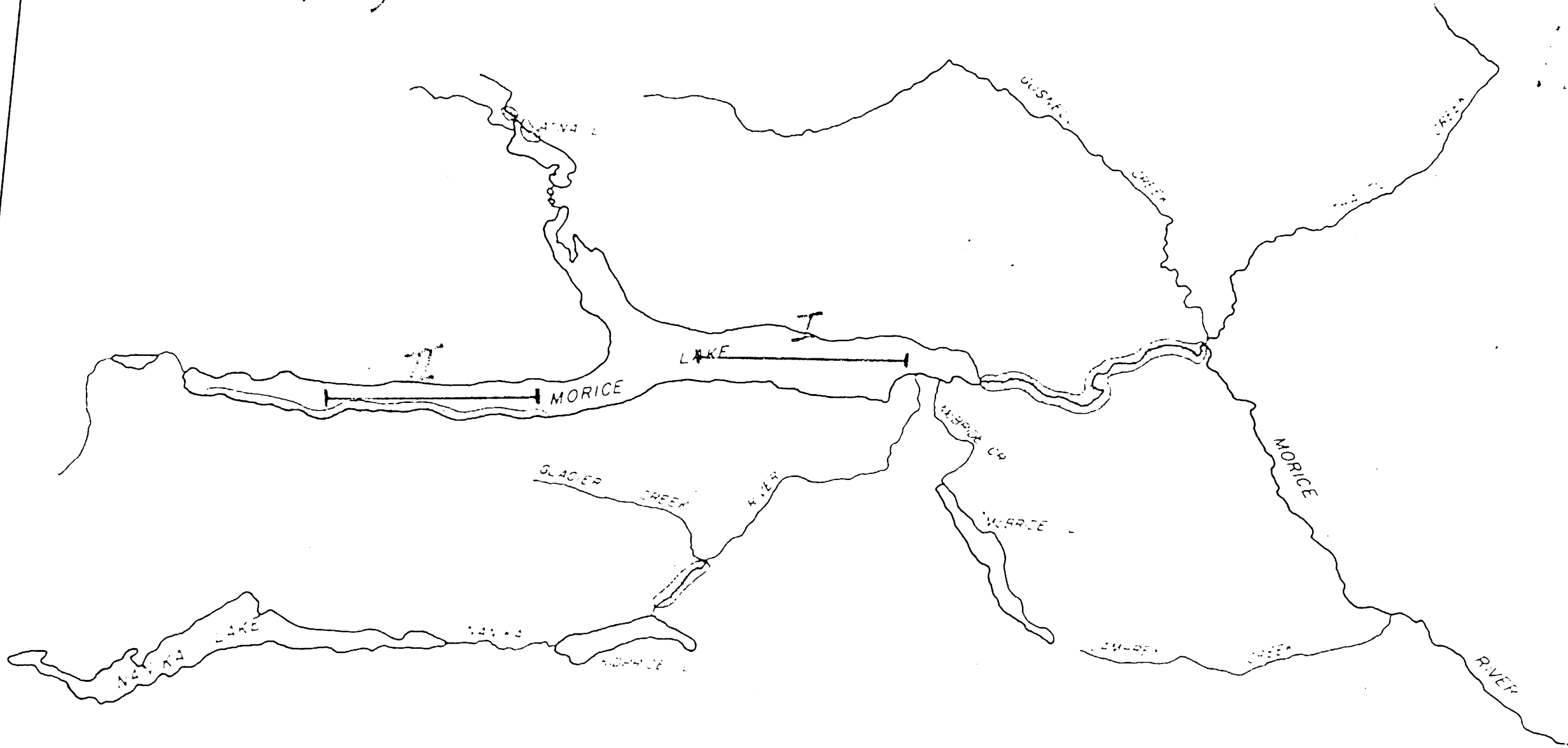
(From 1961 to May 7/63)



Legend

Major salmon spawning areas	[]
Sockeye	[]
Chook	[]
Pink	[]
Scale	1 inch

Flow Net Sampling Stations
 (After May 7/63)



Legend Major salmon spawning areas

- Salmon
- Chinook
- Pink

Scale — 1 inch = 1 mile

ESTIMATED ABUNDANCE OF SOCKEYE SALMON JUVENILES IN MORICE LAKE IN AUGUST, 1962-65

Year	Sample Period	Mean Date	Age. Cl.	Geometric Mean Catch (95% c.i.)		¹ Fish/Hectare (95% c.i.)		² Estimated Population (Millions)		
				St. I	St. II	St. I	St. II	St. I.	St. II	Total
1962	Aug. 20 - Sept. 6	Aug. 28	Fry	21.4 (5.8-79.2)	3.9 (0-21.0)	529(143-1956)	96 (0-519)	4.0 (1.1-15.0)	0.2 (0-1.1)	4.2 (1.1-16.1)
			1+	1.8 (0-3.5)	3.3 (0-17.5)	45(0-86)	82 (0-432)	0.3 (0-0.6)	0.2(0-1.0)	0.5 (0-1.6)
1963	Aug. 12-25	Aug. 18	Fry	47.5 (34.6-65.3)	2.0 (0-6.8)	1173(855-1613)	49 (0-168)	6.2 (4.5-8.6)	0.2(0-0.8)	6.4 (4.5-9.4)
			1+	4.9 (2.1-11.7)	1.4 (0-5.5)	121(52-289)	35 (0-136)	0.6 (0.3-1.5)	0.2(0.0.6)	0.8 (0.3-2.1)
1964	July 31- Sept. 14	Aug. 22	Fry	14.5 (7.0-30.0)	6.6(3.8-11.6)	358(173-741)	163 (94-287)	1.9 (0.9-3.9)	0.7(0.4-1.3)	2.6(1.3-5.2)
			1+	1.4 (0-2.1)	2.0(1.3-3.1)	35 (0-52)	49 (32-77)	0.2 (0-0.3)	0.2(0.1-0.3)	0.4(0.1-0.6)
1965	July 23- Sept. 3	Aug. 13	Fry	42.3 (18.7-95.6)	4.1(2.1-8.0)	1045(462-2361)	101(52-198)	5.5 (2.7-12.5)	0.5(0.2-0.9)	6.0(2.7-13.4)
			1+	2.0 (1.3-3.2)	2.1(0-5.1)	49(32-79)	52(0-126)	0.3(0.2-0.4)	0.2(0-0.6)	0.5(0.2-1.0)

¹ Number of Fish/Hectare was estimated using the method described by *Johnson, 1958.
ie. Unit of effort - 3-1/2 hour tows at dusk with standard 36" diameter tow net.

$$\text{Fish/Acre} = \text{Daily catch} \times 10$$

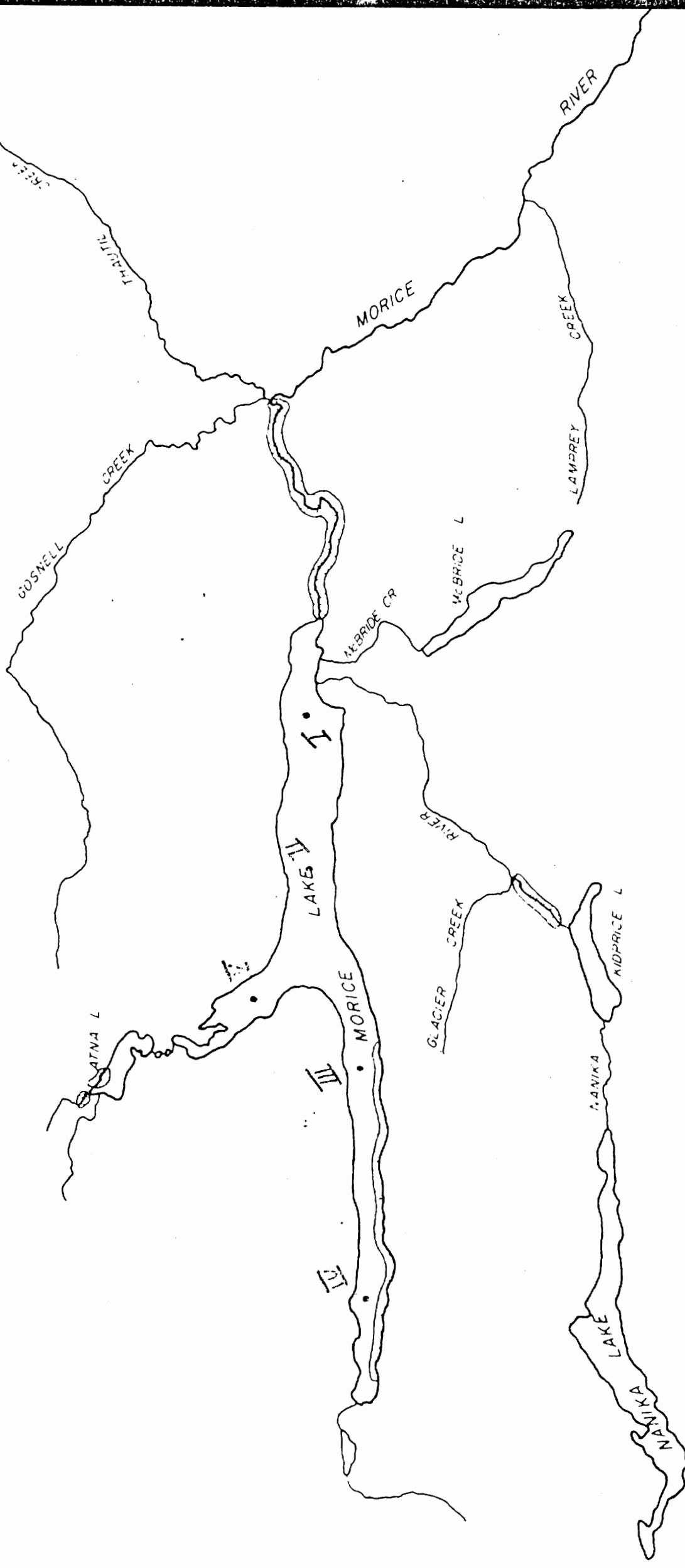
$$\text{Fish/Hectare} = \text{Fish/Acre} \times 2.47$$

² For calculation of population - 1962 St. I (includes St. I, II and IV shown on map) = 7644 Hectares
St. II = 2202 Hectares

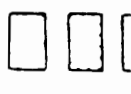
1963-65 St. I = 5312 Hectares
St. II = 4534 Hectares

* Johnson, W.E., 1958, Density of Distribution of Young Sockeye Salmon (*Oncorhynchus nerka*) throughout a Multibasin Lake System, J. Fish. Res. Bd. Canada, 15(5), pp 961-982.

Limnology Stations (1961-67)



Major salmon spawning areas



Legend
 Sockeye
 Chinook

1953
 MEN

SUMMARY OF ZOOPLANKTON DENSITY INFORMATION FOR MORICE LAKE, 1961-63

<u>Year</u>	<u>Station</u>	<u>Date Sampled</u>	<u>Weight¹ (Mg./Tow)²</u>
1961	I	June 5	10.9
		June 22	22.3
		July 6	18.2
		July 15	8.6
		July 24	30.5
		August 17	24.0
	II	June 5	38.6
		July 5	20.3
		July 15	31.5
		July 24	61.0
		August 17	22.2
	III	June 6	14.4
		July 10	25.5
		July 25	49.6
		August 18	50.4
	IV	July 3	15.7
		July 10	35.8
		July 25	80.5
		August 18	22.2
	V	July 12	33.8
July 24		68.6	
August 17		26.4	
1962	I	May 24	13.3
		June 18	39.0
		August 29	34.7
	II	August 29	31.2
		September 23	33.6
	III	August 29	156.9
		September 23	30.5
	IV	May 24	16.7
		July 10	16.9
		August 29	45.2
		September 23	22.7
	V	May 24	5.1
		July 10	21.0
		September 5	43.4
		June 16	34.6

SUMMARY OF ZOOPLANKTON DENSITY INFORMATION FOR MORICE LAKE, 1961-63
(continued)

<u>Year</u>	<u>Station</u>	<u>Date Sampled</u>	<u>Weight¹ (Mg./Tow)²</u>
1963	I	April 21	25.5
		July 21	19.0
		May 21	25.8
		August 13	32.2
	II	April 21	25.6
		July 21	80.1
		May 21	33.7
		August 13	92.1
	III	May 21	28.0
		August 13	71.9
	IV	April 21	23.9
		July 21	68.0
		May 21	26.3
		August 13	100.1
	V	April 21	30.5
		July 21	62.5
		May 21	33.6
		August 13	30.4

¹ Weight in Mg. = Dry weight of sample - Ash weight.

² 100 M. vertical tows with 25 cm. diameter plankton net.

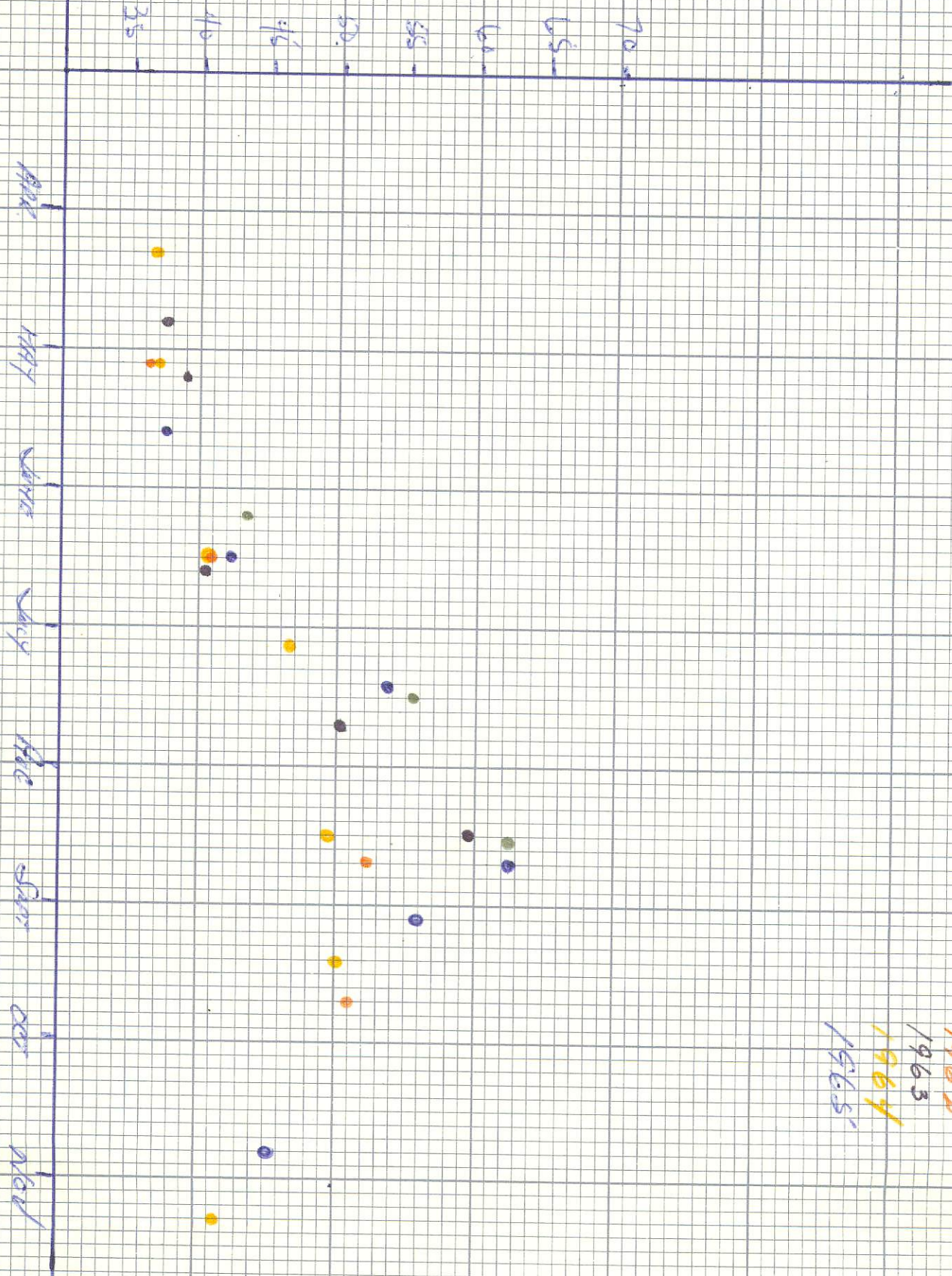
SUMMARY OF SECCHI DISC OBSERVATIONS
IN MORICE LAKE, 1961-65

<u>Year</u>	<u>Station</u>	<u>Date</u>	<u>Depth (Meters)</u>	
1961	I and II	June 8	11.3	
		July 5	6.6	
		July 15	8.5	
		July 24	7.8	
		August 17	6.3	
	III and IV	July 10	7.5	
		July 25	4.9	
		August 18	4.0	
	V	July 24	5.5	
		August 17	4.0	
	1962	I and II	May 24	10.5
			June 18	10.6
			August 29	5.5
September 23			6.5	
III and IV		May 24	7.0	
		July 10	4.6	
		August 29	4.3	
		September 23	5.0	
V		May 24	13.5	
		June 16	9.5	
		July 10	2.3	
		August 29	6.0	
		September 25	5.5	
1963		I and II	April 21	13.3
			May 21	15.5
	June 7		1.5	
	July 21		8.8	
	August 13		7.3	
	III and IV	April 24	12.8	
		May 21	15.5	
		June 6	11.5	
		July 8	6.3	
		July 21	3.5	
		August 13	5.5	
	V	April 21	14.0	
		May 21	15.0	
		June 6	12.0	
		July 21	9.5	
		August 13	8.5	

SUMMARY OF SECCHI DISC OBSERVATIONS
IN MORICE LAKE, 1961-65
(continued)

<u>Year</u>	<u>Station</u>	<u>Date</u>	<u>Depth (Meters)</u>
1964	I and II	April 24	12.0
		May 3	14.0
		May 20	7.0
		June 13	6.4
		July 4	5.3
		August 5	7.9
		August 17	7.9
	III and IV	May 3	14.0
		June 12	9.5
		July 4	6.1
		August 5	4.0
		August 17	5.2
	V	June 10	7.6
		July 4	5.5
		August 5	4.3
1965	I and II	May 18	13.7
		June 14	10.0
		July 18	5.8
		July 23	6.1
		August 20	6.1
		September 3	4.0
		October 25	5.8
	II and III	May 18	14.03
		June 14	9.76
		July 13	5.50
		July 23	3.7
		August 20	5.2
		September 3	3.40
		October 25	5.5
	V	May 18	11.6
		June 14	8.2
		July 13	6.1
		July 23	3.4
August 20		6.3	
September 3		3.4	
October 25	5.2		

0
Fork



1961 - 65
1962
1963
1964
1965

1961
1962
1963
1964
1965

Morice Lake - Water Surface Temperatures

Area 1961	Dates	Mean Date	Source	Surface Temp. °F	°C	Area 1963	Dates	Me Da
St. 1+2	June 5	-	Limn.	43.5	6.5	St. 1+2	April 21+22	-
	July 5	-	"	51.0	10.5		April 28+29	-
	July 13-15	July 14	Tow	55.5	13.0		May 7	-
	July 24	-	Limn.	60.0	15.5		May 14-17	Ma
	August 3+4	-	Tow	62.5	17.0		May 24-27	Ma
	August 17	-	Limn.	62.5	17.0		June 7	-
St. 3+4	June 7	-	Limn.		5.0	St. 3+4	June 7-30	Jun
	July 11+12	-	Tow	53.0	11.5		July 1+2	-
	July 20	-	Tow		12.0		July 13-26	Jul
	July 25	-	Limn.		14.5		Aug 12-15	Aug
	August 14+15	-	Tow		12.0		Aug 22-25	Aug
	August 18	-	Limn.		15.0		April 24	-
St. 5	July 12	-	Limn.		11.0	May 21	-	
	July 24	-	Limn.		13.5	June 6	-	
	August 17	-	Limn.		15.0	June 14-16	Jun	
<u>1962</u>								
St. 1+2	April 27-May 11	May 3	Tow	36.5	2.5	St. 5	June 25-28	Jun
	May 24	-	Limn.	38.5	3.5		July 8	-
	June 16	-	Limn.	41.0	5.0		July 21-28	Jul
	June 25	-	Tow	43.5	6.5		Aug. 18-20	Aug
	August 20+21	-	Tow	52.0	11.0		Aug 27-28	Aug
	August 29	-	Limn.	55.5	13.0		April 24	-
	August 30+31	-	Tow	54.0	12.0		May 21	-
	September 23	-	Limn.	51.0	10.5		June 6	-
<u>1964</u>								
St. 3+4	May 24	-	Limn.		3.5	St. 1+2	July 21	-
	July 10	-	Limn.		5.5		April 9	-
	August 27+28	-	Tow	48.0	9.0		April 24	-
	August 29	-	Limn.		11.0		May 3	-
	September 23	-	Limn.		10.0		May 20	-
St. 5	May 24	-	Limn.		3.5	St. 1+2	June 3-9	Ju
	July 10	-	Limn.		7.5		June 14-17	Ju
	August 29	-	Limn.		13.5		July 4	-
	September 25	-	Limn.		11.0		July 31-Aug 9	Aug
* Station #5 1965 Continued								
	JULY 23	-	LIMN	50.9°	10.5°	St. 3+4	Aug 12-14	Aug
	AUG 20	-	LIMN	61.7°	14.5°		Aug 31-Sept 1	Se
	SEPT 3	-	LIMN	55.4°	13.0°		Sept. 9-14	Se
	OCT 25	-	LIMN	45.5°	7.5°		Nov. 9	-
							May 3	-
							June 6-13	Ju
							July 4	-
							Aug 2-11	Aug
							Aug 17	-

Stn.	Source	Surface Temp °F	Temp °C	Area 1964	Dates	Mean Date	Source	Surface Temp °F	Temp °C
16	Tow	38	3.5	St. 344	Sept 4	-	Tow	50.0	
16	Tow	39	4.0		Sept 11	-	Tow	50.0	
16	Tow	38	3.5		Nov 9	-	Linn.	42.5	
26	Tow	40.5		St. 5	June 10	-	Linn.	40.5	
19	Linn.	42.0	5.5		July 4	-	Linn.	44.0	
19	Tow	45.5	7.5		Aug. 8	-	Linn.	51.5	
19	Tow	49.5			Nov. 9	-	Linn.	42.5	
20	Tow	50.0							
14	Tow	59.0		1965					
14	Tow	57.0		St. 148	MAY 8	-	LINN	37.5	8.0
5	Linn.		3.5		JUNE 8-10	JUNE 9	Tow	40.5	4.7
5	Linn.		5.0		JUNE 14	-	LINN	40.5	5.9
5	Linn.		5.0		JUNE 18	-	Tow	41.0	5.0
5	Linn.		5.0		JUNE 22	-	Tow	41.0	5.0
27	Tow	41.5			JUNE 27-28	27-28	Tow	42.5	5.8
27	Tow	43.5			JULY 13	-	LINN	54.5	12.5
25	Linn.		11.0		JULY 23	-	LINN	52.3	11.9
25	Tow	49.5			JULY 23-24	23-24	Tow	46.5	8.1
19	Tow	57.0			JULY 28-29	28-29	Tow	47.5	8.4
18	Tow	57.0			AUG 6-7	-	Tow	58.0	14.5
	Linn.		3.5		AUG 19-20	19-20	Tow	62.5	17.0
	Linn.		4.5		AUG 30	-	LINN	63.3	17.4
	Linn.		6.0		AUG 30-26	25-26	Tow	62.5	16.6
	Linn.		10.5		SEPT 3-3	3-3	Tow	57.0	13.2
	Linn.		10.5		SEPT 3	-	LINN	66.3	15.5
	Linn.		10.5		OCT 25	-	LINN	48.5	7.5
	Tow	37.0		STATIONS #1	MAY 18	STATION #3	LINN	37.0	2.8
	Linn.	37.0	2.3		JUNE 14	-	LINN	47.0	8.4
	Linn.	37.0	2.5		JULY 13	-	LINN	54.5	12.5
	Linn.	39.0	3.0		JULY 23	-	LINN	57.8	14.0
6	Tow	39.5			JULY 25-26	25-26	Tow	44.5	7.0
16	Tow	41.0			JULY 30-31	30-31	Tow	47.5	8.4
16	Linn.	46.5			AUG 20	-	LINN	44.5	11.9
5	Tow	49.0			AUG 21	-	Tow	63.0	17.2
13	Tow	49.0			AUG 23	-	Tow		
1	Tow	52.0			AUG 25	-	Tow	54.0	12.8
12	Tow	50.0			AUG 31	-	Tow	53.5	12.0
	Linn.	42.5			SEPT 2	-	Tow	53.5	12.0
e10	Linn.	37.0			SEPT 3	-	LINN	54.5	12.7
	Tow	40.0		STATION #5	OCT 25	-	LINN	45.0	7.2
7	Linn.	42.0			MAY 8	-	LINN	37.0	2.8
	Tow	47.0			JUNE 14	-	LINN	44.0	6.4
	Linn.	48.5			JULY 13	-	LINN	53.0	12.0