

**Nile Creek Sidechannel
Mark-Recapture
Population Study**

March 2000

**For
Mel Sheng,
Department of Fisheries and Oceans
Nanaimo**

and

Nile Creek Enhancement Society



Prepared by

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Nile Creek Sidechannel Fish Population Study - March 2000

Objective:

The objective of this study was to determine the fish population in the Nile Creek Side channels. These channels had been built in 1998 and 1999. They were built by the Nile Creek Enhancement Society in partnership with the Ministry of Transportation and Highways, the Department of Fisheries and Oceans and the Steelhead Society of B.C.

Survey Area:

The survey area was along the south side of Nile Creek approximately 2.0 kilometers upstream from the mouth. There are 4 smaller sidechannels built by Ministry of Highways and one large channel built with the Steelhead Society. After the trapping I measured the length and width of each channel to determine the wetted area.

Methods:

The fish population was evaluated using a mark-recapture methodology. Seventy-three "Gee" minnow traps were set in the survey area. The traps were baited with 5-10 grams of salmon eggs on skeins and set in even distribution throughout the channel areas. At least one trap was set in each small pool and larger areas had traps set at approximately 5 meter spacing. All traps were placed in rearing habitat and not in fast flowing water that could create stress for trapped fish. The traps were first set March 2, 2000 for 24 hours then pulled. The captured salmonids were then marked with an adipose clip and released. The traps were re-set and 24 hours later on March 23 they were pulled again to determine the recaptures. A sample population was measured for length and weight during the marking procedure.

The population estimate was done by using the Peterson Formula where;

$$N = M \cdot C / R$$

N = Estimated population

M = No. marked fish released.

R = No. marked fish recaptured

C = Total captured fish.

The sampling personnel were Nile Creek Enhancement Society members; Rod Allen, Vi Lebrecht, Anne George, Ernie Buckley, Carole McCallum and Bob Weir. Lorne Hepting of Big Qualicum Hatchery provided additional assistance during the mark/recaptures. Dave Clough helped set up the sample sites and bait the first trapping and then with fish sample data analysis. Carole McCallum and Rod Allen recorded and summarized all the field data.

Results:

1.) Population Estimates

The population estimates were based on individual areas based on their isolation from each other. The four Highways channels were separately estimated. The main channel was divided into four sections, the two large ponds and the outlet channels below them. Coho were 99% of the marked and captured population. Four rainbow, two Cottids, and two Dolly Varden were marked. None of these fish were recaptured. The population estimates are for Coho juveniles in the age 1 and 2 category. No young of the year coho fry were captured or marked. A complete breakdown of individual trap captures and the mark/un-mark frequency is available in Appendix 1. Bears destroyed or disturbed 7 traps and results were not available. The total Coho population was 7956 fish. The majority of fish were captured in the main sidechannels (Table 1).

Table 1. Nile Creek Sidechannel Coho Population Summary.

Survey Site	Population Estimate	Survey Area (m ²)	Density (Coho/m ²)
Highways Channel 1	7	43.4	0.16
Highways Channel 2	123	63.1	1.95
Highways Channel 3	204	66.9	3.05
Highways Channel 4	1365	208.75	6.53
Lower Channel	2179	378.25	5.75
Pond 1	2310	1332	1.73
Second channel	87	378.25	0.15
Pond 2	1681	568	2.96
Summary	7956	3038.65	2.62

Density Estimates: The average Coho density results were 2.62 fish per meters of area. Coho densities were quite different in the survey areas. Generally the areas closest to the mainstem of Nile Creek were highest. This may be explained by the opportunity for in-migration and out-migration of fish from the mainstem Nile Creek. The other sites were more isolated and some had physical barriers such as weirs, culverts and riffle crests that would restrict movement.

Fork Lengths and Weights: The sample population was 211 coho. The mean length was 82.1 millimeters with a minimum of 53 mm and maximum of 117 mm. The mean weight was 7.1 grams with a minimum of 1.7g and maximum of 15.5 g. The fish were in pre-smolt condition with only the larger two year olds' showing smolting appearance.

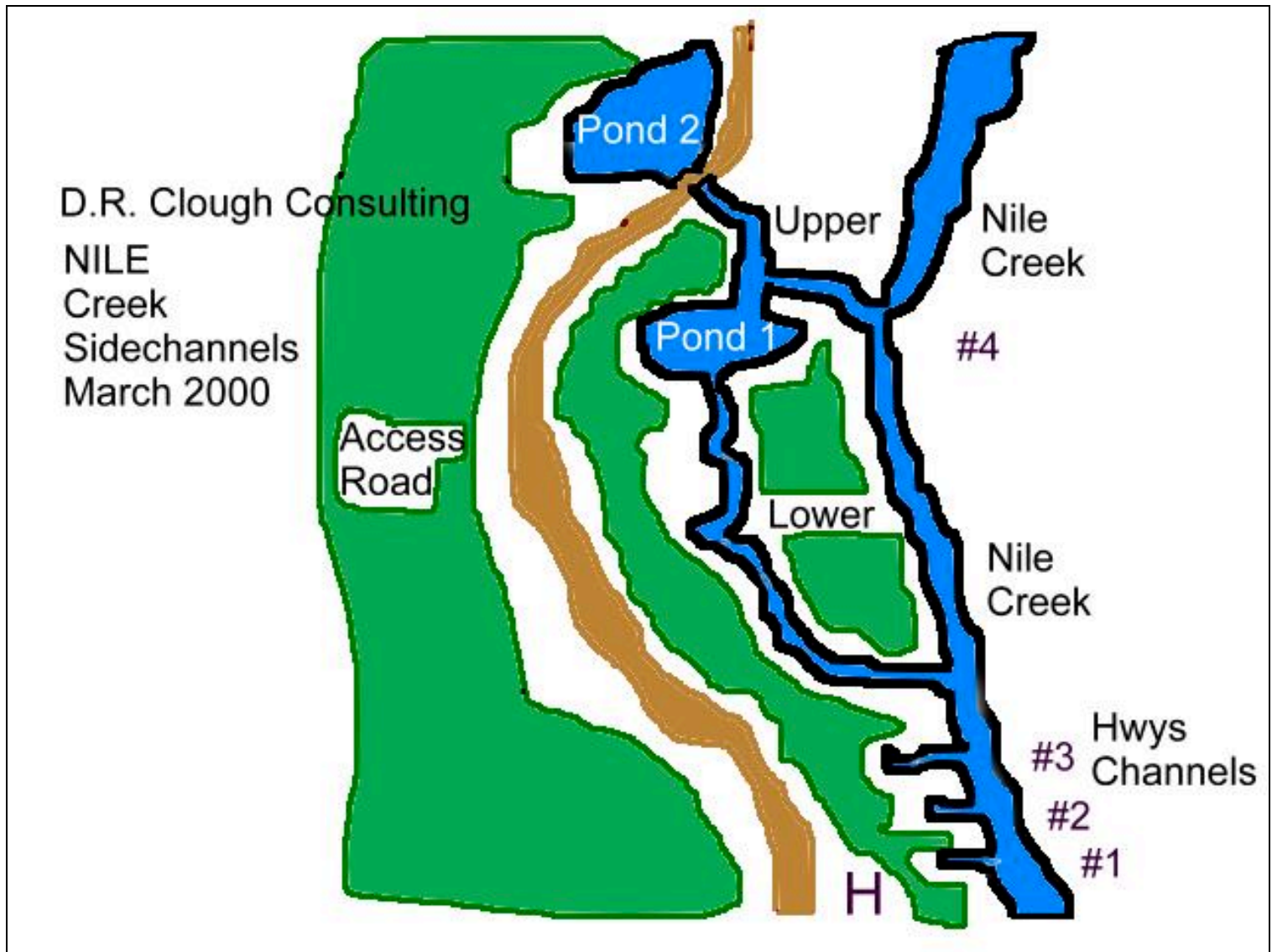
Discussion:

The results indicated a relatively low rate of re-capture in the lower end of the bigger channels. There may have been more freedom to migrate with a larger population in these areas. The fish from the Nile mainstem would certainly be attracted to the baited traps. In other areas where migration would be more difficult, there were lower population densities due to higher recapture rates. The habitat in the high density areas was very good with deep pools, lots of insects and year round water. The use of stop nets would have eliminated any doubts. Nets would have been placed if not for the haste to get the project underway. I would suggest this treatment be repeated next year with stop nets. The data needs a few years of accrual before we can assess the average annual production. The Society did an excellent job and if they're willing, another 2 years would be very helpful. This would allow us excellent production estimates and comparison for theirs and other sidechannel production.

Yours truly,

David R. Clough

Attachments: Appendix 1, Site Sketch and Photos



Nile Creek Sidechannel Population Study - March 2000



Setting Minnow Traps



Marking Captures



Weighing Fish



Recording Data

Data Calculation Spreadsheet

Nile Creek Mark Recapture Study									
Participants: Nile Creek Enhancement Society									
Rod Allen, Carole McCallum, Bob Weir, Vi Lebrecht, Ann George, Ernie Buckley, Lome Hepting.									
Temp: 5.5 C	Time in start: Mar 22; 9:45 to 12:01				Time out start: Mar. 23; 9:10 to 14:50				
Mark-Recapture Results by Areas, Nile Creek Sidechannels, Mar. 22 & 23, 2000.									
Hwys #1									
Survey Site	No. Caught	No. Marked	Marked Recapt'd	Un Marked Recapt'd	Total Recapt'd	Pop'n Estimate	Other Species		
1	1	0	0	1	0	1			
2	1	7	7	0	0	0			
		7	7	1	0	1	7.0		
Hwys #2									
3	2	43	43	28	3	31			
4	2	81	40	55	18	73			
5	2	35	12	34	18	52			
		159	95	117	39	156	126.7		
Hwys # 3									
6	3	10	10	2	3	5			
7	3	33	33	4	21	25			
8	3	8	8	3	3	6			
		51	51	9	27	36	204.0		
Lower Channel upstream to Big Pond									
9	4	25	25	4	15	19			
10	4	36	36	4	17	21			
11	4	4	4	3	2	5			
12	4	4	3	2	2	4	Ct		
13	4	10	8	2	3	5	Rb & BH		
14	4	9	9	2	13	15			
15	4	28	28	0	29	29			
16	4	20	20	0	5	5			
17	4	18	18	0	10	10			
18	4	10	10	0	13	13			
19	4	24	24	3	11	14			
20	4	7	7	0	12	12			
21	4	12	12	0	3	3			
22	4	16	16	3	14	17			
23	4	10	10	0	2	2			
24	4	12	12	0	0	0			
25	4	6	6	0	2	2			
26	4	16	16	0	3	3			
27	4	13	13	0	2	2			
28	4	0	0	0	0	0			
29	4	0	0	0	0	0			
		280	277	23	158	181	2179.9		
Big Pool									
Survey Site	No. Caught	No. Marked	Marked Recapt'd	Un Marked Recapt'd	Total Recapt'd	Pop'n Estimate	Other Species		
30	5	0	0	0	2	2			
31	5	25	17	0	1	1	1 Rb, 3 DM		
32	5	0	0	0	8	8			
33	5	0	0	0	0	0			
34	5	1	1	0	4	4			
35	5	14	14	0	3	3			
36	5	5	5	0	0	0	Bear damaged		
37	5	5	5	0	1	1	Bear damaged		
38	5	8	8	0	0	0			
39	5	2	2	0	0	0			
40	5	3	3	0	3	3			
41	5	5	5	0	3	3			
42	5	3	3	1	4	5			
43	5	2	2	0	0	0	Bear damaged		
44	5	2	1	0	5	5	1 Rb		
45	5	0	0	0	0	0	Bear damaged		
		75	66	1	34	35	2310.0		
Hwys Channel #4									
46	6	0	0	0	0	0	Bear damaged		
47	6	0	0	0	0	0	Bear damaged		
48	6	10	10	0	51	51			
49	6	0	0	0	0	0	Bear damaged		
50	6	12	11	1	13	14	1 Dvt		
51	6	0	0	0	0	0	Bear damaged		
		22	21	1	64	65	1365.0		
Channel to Road Culvert									
52	7	7	3	1	0	1	1 Ct, 3Rb		
53	7	3	3	4	6	10			
54	7	10	10	0	2	2			
55	7	3	3	0	0	0			
56	7	11	10	0	2	2	1 Ct		
		34	29	5	10	15	87.0		
Top Pond									
57	8	4	1	0	1	1			
58	8	3	3	0	1	1			
59	8	3	3	0	1	1	Rb		
60	8	1	1	0	2	2			
61	8	3	3	0	0	0			
62	8	1	1	0	3	3			
63	8	7	5	0	2	2	2 ct		
64	8	0	0	0	0	0	Bear damaged		
65	8	2	0	0	0	0			
66	8	2	2	0	3	3			
67	8	0	0	0	6	6			
68	8	3	3	0	1	1			
69	8	1	1	1	1	2			
70	8	5	5	0	4	4			
71	8	11	6	0	4	4			
72	8	9	7	0	11	11	(72 & 73)		
		55	41	1	40	41	1681.0		
Survey Site	No. Caught	No. Marked	Marked Recapt'd	Un Marked Recapt'd	Total Recapt'd	Pop'n Estimate	Other Species		
Grand Total	683	587	158	372	530	7960.5			