

Final Report 1997

URBAN SALMON HABITAT PROGRAM

**Restoration Projects on
BEACH CREEK**

Qualicum Beach BC

by

**Faye Smith
and the
Qualicum Beach Streamkeepers**

**Qualicum Beach BC
March 31, 1998**

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INTRODUCTION

The Qualicum Beach Streamkeepers became established in 1995 after a Streamkeepers Workshop given by Dave Clough. The group has since been involved with mapping, public education, signage, inventory, assessment and restoration on Beach Creek and Grandon Creek in Qualicum Beach.

Beach Creek starts out in a peat bog, now Glengarry Golf Course, just to the south of the boundary of Qualicum Beach. The Creek has been ditched from where it leaves the golf course to the corner of Rupert Road and Qualicum Road--approximately 1km. It then travels through Doug Davidson's property and another property where the riparian zone has been preserved in its natural state. Then the Creek is channelized again for about 500m as it goes through some small farms. There is a large pond situated on the KenDor property (nursery business) which is used for irrigation. According to the owner, he also has a well which he uses when the water level of the pond gets too low. That seems to be the case because there is always water downstream even when the creek runs dry upstream, as it does at the end of hot summers.

After the farms, the Creek goes through mostly natural forest again even though it is through residential lots--some of them 5 acres, a few of them the usual city lot size, and one of them, the Brown property, 50 acres. The latter is up for sale at present. It is hoped that the Town can acquire the large portion of wooded area for a park. The land consists of old growth Coastal Douglas Fir and has very high conservation value. It remains to be seen if the Brown Property Preservation Society and the citizens of Qualicum Beach can achieve this goal.

Beach Creek then meanders through the Qualicum Beach Memorial Golf Course where it enjoys a mostly natural riparian zone until it comes to the large pond at the north end of the golf course. This pond is used for irrigation from May until September when the stop logs must be removed to allow for fish passage.

Before reaching the ocean, Beach Creek passes through four private residences, then it goes into a culvert that is under the Old Dutch Inn on Highway 19a. This culvert is scheduled for replacement in 1998. The Qualicum Beach Streamkeepers will be involved with the plans for this culvert.

Beach Creek has 12 culverts along its length, most of them under private driveways. One such culvert, off Hemsworth Road, was unblocked by the Streamkeepers and the banks stabilized with sandbags, boulders and plants (photos 1 & 2).

Included in this report are a topographical map 1:2,000 (Fig. 1), a TRIM map 1:20,000 (Fig. 2) and a traced outline map for easy viewing (Fig. 3).

Beach Creek was assessed in 1996 and several habitat concerns were identified.

For Problem A-1--suspected poor water quality due to urban and agricultural drainage--the objective was to test the water quality.

For Problem B-2--need for riparian planting in selected areas--the objective was to replant with native plants unless landowners insisted on other plants (photos 3, 4 & 5).

For Problem C-3--headwater drying in summer leaving fry stranded--the objective was to excavate a pool on Doug Davidson's property at Rupert Road and Qualicum Road (photo 6).

For Problem D-4--poor spawning substrates in many areas--the objective was to add spawning gravel in selected areas (photo 7).

For Problem E-5--lack of stable instream cover--the objective was to place instream cover in strategic areas (photos 8, 9 & 10).

For Problem F-6--culverts blocking fish access--the objective was to meet with city engineers at problem sites (photo 11).

METHODS

The Streamkeepers planned to begin restoration of Beach Creek near the mouth and gradually work upstream.

Planting of approximately 400 conifers and black poplar was done on the Memorial Golf Course by the Streamkeepers with the help of members of the Arrowsmith Naturalists on April 18 and 19, 1997.

Ministry of Environment officials, George Reid and engineer Jim Bomford viewed the site of the proposed pool on Doug Davidson's property with Faye Smith on April 28. It is still uncertain if a water licence is required, although it was the opinion of Mr. Bomford that it would not be. In any case, the heavy rains at the end of the summer of 1997 made it impossible to do any excavating in the stream. This project, it is hoped, will be completed in the summer of 1998.

In preparation for the restoration work to be started on Beach Creek, several members of the Qualicum Beach Streamkeepers took the Restoration workshop with Dave Clough on June 21.

Dave Clough and Faye Smith met with Dagmar van Eugen, owner of two residences on Elizabeth Avenue (Beach Creek runs between them), on August 27 to discuss the placing of instream cover in the Creek and also stabilizing the banks.

The Town of Qualicum Beach was contacted for permission to do the instream cover work on the Memorial Golf Course in early August, but access to the Golf Course was not granted until September 2. Consequently work was not begun until September 6 and not everything was accomplished in 1997.

Water Quality samples were taken at 4 sites on Beach Creek on September 23, 1997 (Fig. 4). These samples were sent immediately to MB Labs in Victoria for analysis of chemicals and coliform. On December 12, 18 and 19, further tests of coliform were done by Environment Canada and the Regional District of Nanaimo, French Creek PCC Water Analysis facility.

A Fisheries assessment was conducted by Tracy Michalski, George Reid and Lew Carswell on the golf course near and at the treated sites on October 6.

On October 11 and 18, Streamkeepers placed over 100 boulders in Beach Creek just upstream of Elizabeth Avenue to provide instream cover and to help stabilize the banks.

More riparian planting was done downstream of the new culvert under Mant Road and the E & N Railway on November 14.

Many Streamkeepers, Ministry of Environment staff and private consultants were involved with 1997 restoration or monitoring activities on Beach Creek. Some of the names are: Doug Taylor, Betty and Bob Drew Brook, Faye Smith, Norm Burow, John Ebell, Dave Clough, Gordon Stewart, Hugh Stanhope, Barbara Joughin, Ron Speller, Danny Peel, Mike Thomson, Doug Davidson, Jurgen Meninga, Rob Burkovsky, Vic Teng, Tracy Michalski, George Reid, Lew Carswell and Gloria Carswell.

RESULTS

Project A-1 Water samples were taken at the mouth of Beach Creek, at the confluence with a drainage ditch coming from the Qualicum Woods subdivision (photo 12), at the confluence with Violetta Creek (which is sometimes called School Creek because it goes through Kwalikum Secondary School) coming from the downtown area of Qualicum Beach (photo 13) and at a control point just upstream of Violetta Creek (photo 14). The samples were sent the same day, September 23, to MB Labs in Victoria for analysis.

Project B-2 More than 400 tree seedlings, mostly conifers, were planted on the Memorial Golf Course (photo 15). Although the area is 'natural forest' it consists mainly of mature alder and is quite thin in spots. More plants were placed at the site of the culvert under the private driveway on Hemsworth Road to increase the overhead cover and to stabilize the sandy banks (photos 16 & 17). Where a new culvert was put in at Beach Creek and the E & N Railway line on Mant Road in 1996, the Creek was moved a couple of meters leaving it without sufficient riparian vegetation on one side (photo 18). The Streamkeepers planted several trees and shrubs along the banks except for approximately 30m belonging to Henry Mant. He did not want anything planted there.

Project C-3 Until a better solution can be worked out with Glengarry Golf Course to keep water in the headwaters of Beach Creek, the Streamkeepers wanted to excavate a pool on Doug Davidson's property so that as many fry as possible can survive the summer droughts (photo 19). It was not possible to implement this project in the summer of 1997.

Project D-4 To improve the spawning substrates on Beach Creek, the Streamkeepers added approximately 50 buckets of gravel (taken from a gravel bar in Grandon Creek) to an existing gravel site on the Memorial Golf Course near East Crescent (photo 20).

Project E-5 Boulder clusters were placed in 11 spots on Beach Creek above Elizabeth Avenue to increase the amount of instream cover in that area (photos 21 & 22). More boulders were placed against the outside curves of the stream.

Instream cover was improved on one area of the Golf Course in 1997. Approximately 8 log installations were anchored against the banks and one log was placed at an angle across the creek to increase stream activity (photos 23 to 32).

One scour log and two cover logs were anchored to the banks of Beach Creek on the Brown property (photos 33 & 34).

Project F-6 The culvert running under the Old Dutch Inn on Beach Creek is long and does not offer good passage for spawning salmon. The Town of Qualicum Beach has budgeted money for its replacement this year, but additional funding will have to be found to make it fish friendly. The Streamkeepers have been meeting with the town engineer, Bob Weir, to discuss possible funding strategies.

FISHERIES ASSESSMENT

Approximately 5,000 coho fry were transplanted into Beach Creek on June 13, 1997 from the French Creek Hatchery which is run by the Parksville-Qualicum Fish & Game Club. The fry were placed in the Creek on each side of Village Way (photos 33 & 34).

On October 7, 1997, Tracy Michalski, George Reid, Lew Carswell and Gloria electrofished, using the two-pass method, 5 sites on Beach Creek on the Golf Course (Fig. 5) (photos 37, 38 & 39). One coho fry and only a few cutthroat trout were found.

A pair of coho spawners were sighted on November 27, 1997 on the Brown Property by Streamkeeper Daryl Fisher. He says he saw 6 more over the next few days but some of those may have been counted before. Faye Smith, Betty Drew Brook and Danny Peel went to the site (photo 40) on November 28 and saw one coho (the water was quite murky from an overnight heavy rain).

DISCUSSION

A-1 Water Quality. Because Beach Creek is impacted quite directly from urban development, the Streamkeepers feel that a documentation of water quality is a valuable part of the stream data. So far, the pollutants entering the stream from the storm drains are not damaging to fish in Beach Creek, according to Town Engineer Bob Weir.

B-2 Riparian Planting. The planting on the Golf Course has been monitored and appears to be doing well. It will continue to be monitored over the coming year and more planting will be done in this area if possible. The plantings done near Mant Road and Hemsworth Road will also continue to be monitored and more plants added if necessary.

There are more areas of Beach Creek that need riparian planting. They are: upstream of Elizabeth Avenue to the Golf Course forested area, the KenDor property, the ditched area along Qualicum Road above Rupert Road and along Nenzel Road toward the Glengarry Golf Course outlet.

C-3 Pool Excavation. The Qualicum Beach Streamkeepers are hoping to complete the pool excavation project on Doug Davidson's property in the summer of 1998. A water licence was applied for in 1996.

D-4 Spawning Gravel Addition. The site where gravel was added to existing gravel beds on Beach Creek near East Crescent Road will be monitored when the water level drops. The Qualicum Beach Streamkeepers will also be minnow trapping in the area over the summer.

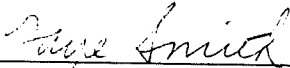
E-5 Instream Cover. This area of Beach Creek is quite problematical. The owner of the two houses on each side of the Creek at Elizabeth Avenue has been complaining to the Town over the years about water in her basement and erosion of the banks which is threatening one of the houses. The Streamkeepers have been talking to her and trying to alleviate the situation. Hence the boulders, to create more activity in the centre of the stream and away from the banks as well as provide some protection for the banks. When the proposed new culvert replacing the one under the Old Dutch Inn is being constructed, the Town intends to add plenty of rip rap to the banks to protect her house. The Streamkeepers will also do some riparian planting there. The logs that were placed on the golf course and the Brown Property have been checked several times over the winter and they have all remained securely in place.

F-6 Old Dutch Inn Culvert. Meetings are ongoing with Bob Weir of the Town of Qualicum Beach to try to replace this culvert with one that will be conducive to fish migration.

In general, since the projects outlined in the 1997 report were for the most part unfinished, the Qualicum Beach Streamkeepers will be continuing with the plans to increase instream cover and improve riparian vegetation on Beach Creek in 1998. We would expect to use up most of the the 1997 budget for this purpose.

PROJECT ACCOUNTING

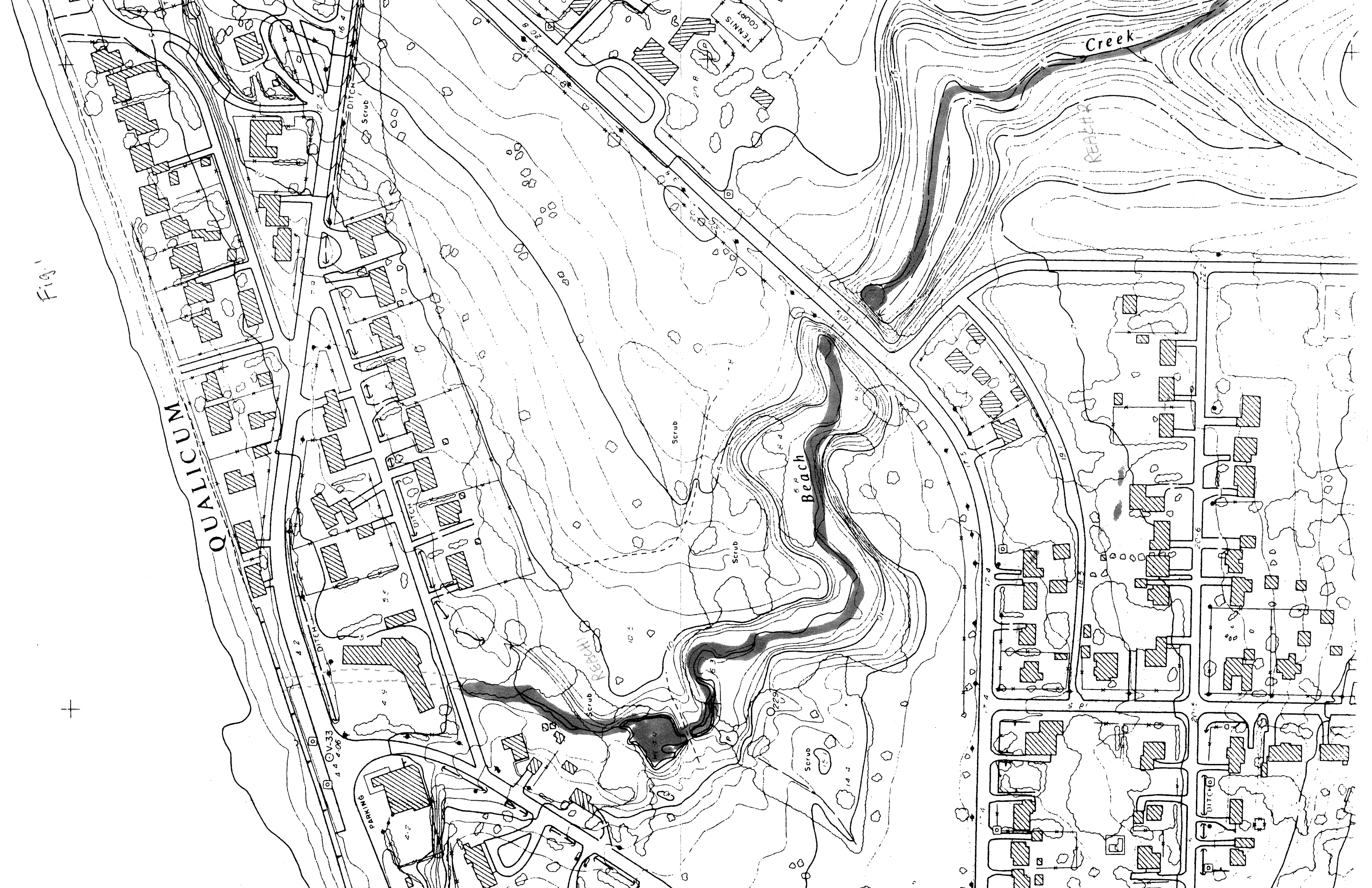
	USHP	Expenses	In Kind	Difference
Coordinator/Volunteers	0	0	\$1,500.00	0
Professional Services	\$3,000.00			\$1,907.68
DR Clough		\$ 495.05	\$1,225.00	
MB Labs		\$ 597.27	(Fig. 6)	
Administration Costs	\$ 650.00	\$ 380.17		\$ 269.83
Materials & Supplies	\$3,475.00	\$1,477.73	\$ 800.00	\$1,997.27
Other--Insurance	\$ 375.00	\$ 375.00		
Total	\$7,125.00	\$2,950.22	\$3,525.00	\$4,174.78



Faye Smith, Coordinator

APPENDIX A. MAPS

Fig. 1





**APPENDIX B. WATER QUALITY, FISHERIES AND IN-KIND
DATA**

10/24/1997 11:57:50AM M. B. RESEARCH/LABS
 Qualicum Beach Streakkeepers
 Faye Smith
 221 Elizabeth Ave.
 Qualicum Beach, BC
 V9K 1G8

24Sep97 9:43a
 unknown
 water
 8

P1
 H36764

TEL: 250 752-9297
 FAX: 250 752-0531

Arrival temp.: 19.0C
 To be invoiced.

Fig 4

Site Code	Date	Time	CFU/100 ml		CFU/100 ml	
			TC	NC	FC	NC
Beach Creek Violetta	23Sep97	11:30a	120,000	6,440,000	6,200	12,400
Beach Creek E. Crescent Brown Prop	23Sep97	11:30a	3,000	260,000	36	38
Beach Creek Control	23Sep97	11:30a	2,000	180,000	2	344
Beach Creek Mouth	23Sep97	11:30a	4,600	100,000	36	120
Grandon Creek Hoylake Rd.	23Sep97	12:30p	6,000	40,000	12	14
Grandon Creek Arbutus Culvert	23Sep97	12:30p	2,800	100,000	8	196
Grandon Creek Control	23Sep97	12:30p	5,600	40,000	38	10
Grandon Creek Mouth	23Sep97	12:30p	10,600	60,000	68	1,800

TC = total coliform bacteria
 FC = fecal coliform bacteria
 NC = non-coliform bacteria

Comments:

For Results:

Total or Fecal Coliforms present greater than 0 CFU/100mL:
 Coliform numbers exceed safe limits for drinking water.
 Water is not suitable for drinking without treatment.

Total Non-coliform bacteria equal to or greater than 200 CFU/100mL:
 The number of organisms present exceed recommended guidelines for
 drinking water. Treatment is strongly recommended.

 E. K. Black
 Supervisor

 W. Riggs
 Microbiologist

M. B. LABS LTD
 Fax: 656-0443

10/24/1997 11:57:50AM M. B. RESEARCH/LABS
 Qualicum Beach Streakkeepers
 Faye Smith
 221 Elizabeth Ave.
 Qualicum Beach, BC
 V9K 1G8

24Sep97 9:43a
 unknown
 water
 8

P2
 W36764 P2

TEL: 250 752-9297
 FAX: 250 752-0531

Arrival temp.: 19.0C
 to be invoiced

SAMPLE	DATE	TIME	Alkalinity (ng/L)	NH3-N (ug/L)	E. C. (uS/cm)	TKN (ng/L)	NO3-N (ug/L)
Beach Ck Violetta	23Sep97	11:30a	103	12.6	265	0.356	502
Beach-E. Cres. Brown	23Sep97	11:30a	41.5	84.4	111	0.306	269
Beach Ck-Control	23Sep97	11:30a	71.0	25.0	173	0.345	501
Beach Ck-Control	DUP		n/a	n/a	n/a	0.453	n/a
Beach Ck-Mouth	23Sep97	11:30a	70.5	28.6	175	0.378	496
Grandon-Hoylake Rd	23Sep97	12:30p	75.0	32.4	178	0.306	273
Grandon-Arbutus Cul.	23Sep97	12:30p	133	19.4	282	0.267	247
Grandon Ck-Control	23Sep97	12:30p	68.5	14.3	168	0.474	157
Grandon Ck-Mouth	23Sep97	12:30p	70.5	27.7	170	0.424	164
Grandon Ck-Mouth	DUP		70.0	18.1	170	n/a	n/a
Lab Blank			ND	ND	2.90	0.100	3.10
So			0.100	0.254	0.300	0.115	0.300
REF. VALUE			200	20.0	147	1.00	100
STD ± 2SD			198 ± 16.4	20.1 ± 2.14	148 ± 8.60	1.02 ± 0.078	101 ± 10.4

.... /3

Faye Smith
 221 Elizabeth Ave.
 Qualicum Beach, BC
 V9K 1G8

unknown
 water
 8

TEL: 250 752-9297
 FAX: 250 752-0531

Arrival temp.: 19.0C
 to be invoiced

SAMPLE	DATE	TIME	NO2-N (ug/L)	Ortho-PO43-P (ug/L)	pH	TP043--P (ug/L)	TDS (ng/L)
Beach Ck Violetta	23Sep97	11:30a	15.2	28.8	7.75	26.5	190
Beach-E. Cres. Brown	23Sep97	11:30a	0.900	3.18	7.57	1.40	78.0
Beach Ck-Control	23Sep97	11:30a	29.6	13.7	7.81	16.0	121
Beach Ck-Control	DUP		n/a	13.7	n/a	16.5	n/a
Beach Ck-Mouth	23Sep97	11:30a	4.29	26.6	8.05	27.7	130
Grandon-Hoylake Rd	23Sep97	12:30p	4.99	39.9	7.79	39.4	124
Grandon-Arbutus Cul.	23Sep97	12:30p	1.15	16.3	8.03	21.0	190
Grandon Ck-Control	23Sep97	12:30p	1.05	35.6	7.83	38.6	117
Grandon Ck-Mouth	23Sep97	12:30p	4.79	32.6	---	30.9	115
Grandon CK-Mouth	DUP		n/a	n/a	n/a	n/a	115
Lab Blank			ND	0.168	ND	ND	ND
So			0.300	0.150		0.150	0.700
REF. VALUE			10.5	25.0	7.00	25.0	200
STD ± 2SD			10.5 ± 1.01	25.2 ± 2.28	7.01 ± 0.072	25.4 ± 2.06	200 ± 13.5

SD = standard deviation
 STD = secondary standard calibrated to primary standard reference material
 So = standard deviation at zero analyte concentration; method detection limit
 is generally considered to be 3x So value
 ND = none detected
 n/a = not applicable

 R. Jones
 Supervisor

 H. Hartmann
 Analytical Chemist

M. B. LABS LTD
 Fax: 656-0443

French Creek PCC Water Analysis

Total and Fecal Coliform Bacteria Tests

Dec-97

Date	Representing	Bottle #	Location	Total Coli (24hr)	Fecal Coli (24hr)
9-Dec	Parksville	S1	Martindale Rd	300/100 ml	0/100 ml
9-Dec	Parksville	S2	Blower Rd	300/100 ml	0/100 ml
9-Dec	Parksville	S3	Allsbrook Rd	400/100 ml	100/100 ml
9-Dec	Parksville	CR1	Island Hwy	200/100 ml	100/100 ml
9-Dec	Parksville	CR2	Springwood Park	200/100 ml	0/100 ml
9-Dec	Parksville	CR3	Alard Pit	400/100 ml	100/100 ml
9-Dec	Parksville	MS1	East Morningstar	200/100 ml	100/100 ml
9-Dec	Parksville	MS2	West Morningstar	300/100 ml	0/100/ ml
9-Dec	Parksville	MS3	Lee Rd	400/100 ml	300/100 ml
9-Dec	Parksville	MS4	Lowry's Rd	800/100 ml	700/100 ml
9-Dec	Parksville	G1	Bayview Park Creek	0/100 ml	0/100 ml
9-Dec	Parksville	G2	Wall Beach	100/100 ml	0/100 ml
9-Dec	Parksville	G3	Errington School	100/100 ml	0/100 ml
9-Dec	Parksville	G4	Errington Road	500/100 ml	0/100 ml
9-Dec	Parksville	G5	1700 Grafton	200/100 ml	0/100 ml
9-Dec	Parksville	G6	Coombs-French Creek	0/100 ml	0/100 ml
9-Dec	Parksville	G7	Whiskey Creek	200/100 ml	0/100 ml
9-Dec	Parksville	G8	Barclay Rd-French Creek	200/100 ml	100/100 ml
10-Dec	Parksville	MS1	West Morningstar Creek	100/100 ml	0/100 ml
10-Dec	Parksville	MS2	East Morningstar Creek	0/100 ml	0/100 ml
10-Dec	Parksville	MS3	Morningstar Creek-Lee Rd	400/100 ml	400/100 ml
10-Dec	Parksville	MS4	Morningstar Creek-Lowry Rd	2300/100 ml	1300/100 ml
11-Dec	Parksville	CR1	Island Hwy	100/100 ml	100/100 ml
11-Dec	Parksville	CR2	Springwood Park	100/100 ml	0/100 ml
11-Dec	Parksville	CR3	Alard Pit	100/100 ml	0/100 ml
11-Dec	Parksville	S1	Martindale Rd	100/100 ml	100/100 ml

French Creek PCC Water Analysis

Dec-97

Total and Fecal Coliform Bacteria Tests

Date	Representing	Bottle #	Location	Total Coli (24hr)	Fecal Coli (24hr)
11-Dec	Parksville	S2	Blower Rd	100/100 ml	100/100 ml
11-Dec	Parksville	S3	Allsbrook Rd	100/100 ml	100/100 ml
12-Dec	Parksville	S1	Martindale Rd	0/100 ml	0/100 ml
12-Dec	Parksville	S2	Blower Rd	0/100 ml	0/100 ml
12-Dec	Parksville	S3	Allsbrook Rd	1400/100 ml	200/100 ml
12-Dec	Parksville	CR1	Island Hwy	1200/100 ml	700/100 ml
12-Dec	Parksville	CR2	Springwood Park	200/100 ml	0/100 ml
12-Dec	Parksville	CR3	Allard Pit	100/100 ml	100/100 ml
12-Dec	Parksville	1	West Morningstar	300/100 ml	0/100 ml
12-Dec	Parksville	2	East Morningstar	100/100 ml	0/100 ml
12-Dec	Parksville	3	Lee Rd	600/100 ml	400/100 ml
12-Dec	Parksville	4	Lowry's Rd	1100/100 ml	2000/100 ml
12-Dec	Parksville	CB3	Craig Bay	100/100 ml	100/100 ml
12-Dec	Parksville	CB7	Craig Bay	700/100 ml	0/100 ml
12-Dec	Parksville	CB8	Craig Bay	0/100 ml	0/100 ml
12-Dec	Parksville	CB9	Craig Bay	0/100 ml	0/100 ml
12-Dec	Parksville	CB10	Craig Bay	0/100 ml	0/100 ml
15-Dec	Parksville	WCO1	Whiskey Creek	0/100 ml	0/100 ml
15-Dec	Parksville	WCO2	Whiskey Creek	100/100 ml	100/100 ml
15-Dec	Parksville	WCO3	Whiskey Creek	1000/100 ml	400/100 ml
15-Dec	Parksville	WCO4	Whiskey Creek	0/100 ml	100/100 ml
16-Dec	Parksville	WCO1	Whiskey Creek	0/100 ml	100/100 ml
16-Dec	Parksville	WCO2	Whiskey Creek	900/100 ml	100/100 ml
16-Dec	Parksville	WCO3	Whiskey Creek	2500/100 ml	900/100 ml
16-Dec	Parksville	WCO4	Whiskey Creek	0/100 ml	0/100 ml
16-Dec	Parksville	CB3	Craig Bay	2500/100 ml	1100/100 ml

Fisheries Assessment Data

Fig. 5

Stream Name Beach Watershed Code 920-000 Field Crew Carswell, Michalski, Reid
 Reach Number one Site location (m) Golf Course Capture Method Electrofishing Date: Oct. 7, 97
 Site One Treated

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)	Site Width	Site length
Coho					2.2	7.3
.						
.						
Averages						

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
Cutthroat	150.00	48.40	110.00	20.00
.				
.				
Averages	150.00	48.40	110.00	20.00

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
.				
.				
Averages				

Species Population
 Coho
 Cutthroat
 Total Pop. 0.00

Fisheries Assessment Data

Stream Name Beach
 Reach Number one Site location (m) Golf Course Field Crew Carswell, Michalski, Reid
 Site Two treated Capture Method Electrofishing Date: Oct. 7, 97

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)	Site Width	Site length
Coho					2.6	7.4
.						
.						
Averages						

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
Cutthroat	130.10	27.20	110.00	15.30
.				
.				
Averages	130.10	27.20	110.00	15.30

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
.				
.				
Averages				

Species Population
 Coho
 Cutthroat
 Total Pop. 0.00

Fisheries Assessment Data

Stream Name Beach Watershed Code 920-000 Field Crew: Carswell, Michalski, Reid
 Reach Number one Site location (m) Golf Course Capture Method Electrofishing Date: Oct. 7, 97
 Site Three treated

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)	Site Width	Site length
Coho	52.00	2.70			3.1	4.6
.						
.						
Averages	52.00	2.70				

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
Cutthroat	108.00	20.20	64.00	3.50
.	58.00	2.40	125.00	22.80
.			98.00	10.20
Averages	82.00	11.30	95.67	12.17

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
.				
.				
Averages				

Species Population
 Coho 0.07
 Cutthroat -0.28
 Total Pop. -0.21

Stream Name: Beach Creek Site location (m) Golf Course Field Crew Carswell, Michalski, Reid
 Reach Number one Site location (m) Golf Course Capture Method Electrofishing Date: Oct. 7, 97
 Site Four Untreated

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)	Site Width	Site length
Coho					2.3	9.7
.						
.						
Averages						

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
Cutthroat	65.00	3.80		
.	68.00	4.30		
.	55.00	2.00		
.	79.00	5.90		
.	50.00	1.70		
.	158.00	40.60		
Averages	62.67	3.37		

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
.				
.				

Fisheries Assessment Data

Averages				
-----------------	--	--	--	--

Species Population
 Coho
 Cutthroat 0.13

 Total Pop. 0.13

Stream Name Beach Watershed Code 920-000 Field Crew Carswell, Michalski, Reid
 Reach Number one Site location (m) Golf Course Capture Method Electrofishing Date: Oct. 7, 97
 Site Five Untreated

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)	Site Width	Site length
Coho					1.8	12.8
.						
.						
Averages						

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
Cutthroat	69.00	4.40		
.	104.00	16.40		
.				
Averages	86.50	10.40		

Species	First Pass Length (mm)	Weight (grams)	Second Pass Length (mm)	Weight (grams)
.				
.				
Averages				

Species Population
 Coho
 Cutthroat 0.09

 Total Pop. 0.09

Fig. 6

DAILY SUMMARY: D. CLOUGH			TIME	TRAVEL
DATE		ACTIVITY	HRS.	KM.
26-Aug	Field	Place habitat logs in Beach Creek.	4	0
27-Aug	Field	Mtg property owners about habitat sites	2	0
13-Sep	Field	Beach Creek log habitat work at Golf Course	7	112
21-Sep	Field	Beach Creek habitat; gravel placement	6.00	71.00
Jan 18,19,28		USHP data and application for report	7.50	0.00
			Total Hours:	13.50
			Days(7.5 hrs):	1.80
				Tot. Travel
				71.00

Donated
Donated
Donated

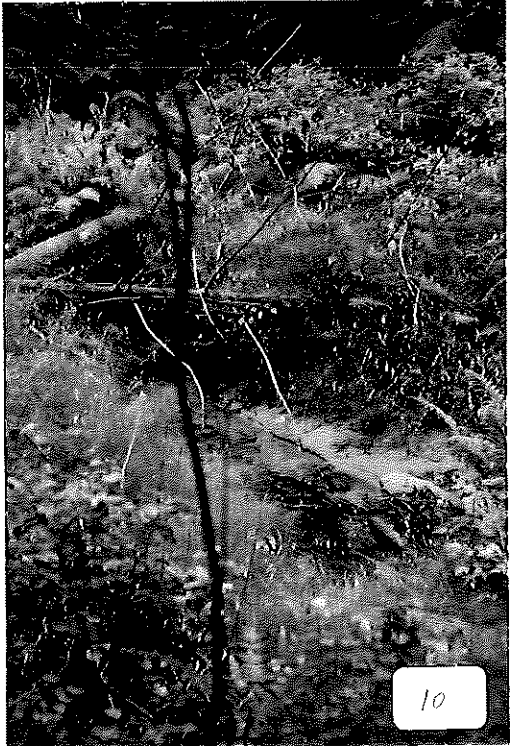
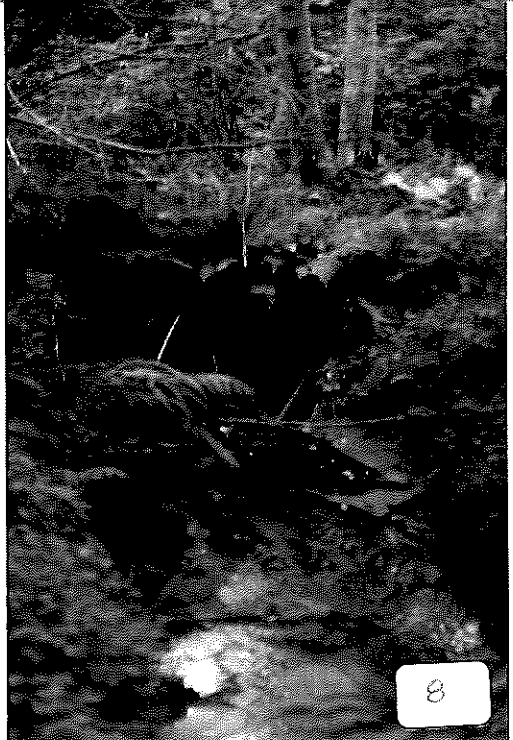
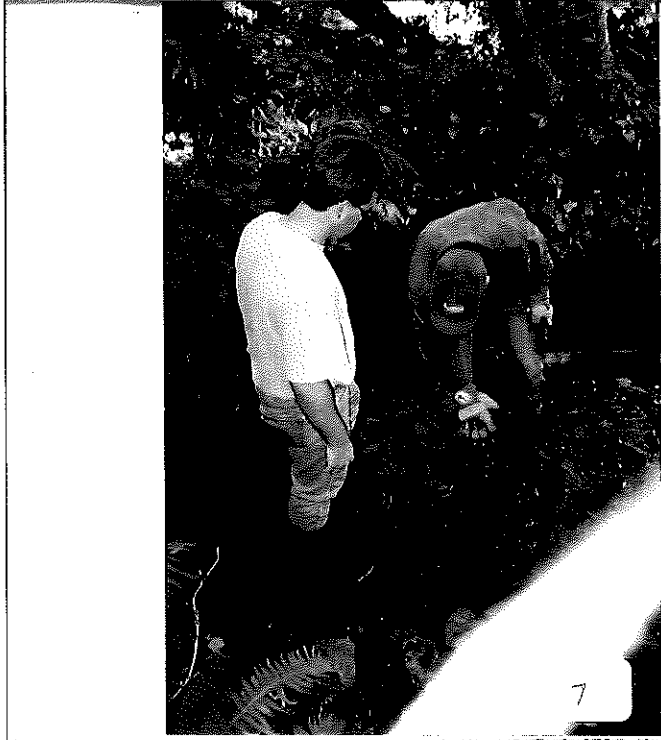
DAILY SUMMARY: John Ebell			TIME	TRAVEL
DATE	GRP/SITE	ACTIVITY	HRS.	KM.
2-Sep	Field	Beach Ck habitat prescriptions	7.00	40.00
9-Sep	Field	Fish removal at Grandon Hwy culvert	3	40
10-Sep	Field	Fish removal at Grandon Creek Culvert	1.5	40
13-Sep	Field	Beach Creek habitat	5.50	0.00
			0.00	0.00
			Total Hours:	12.50
			Days(7.5 hrs):	1.67
				Tot. Travel
				40

Donated
Donated

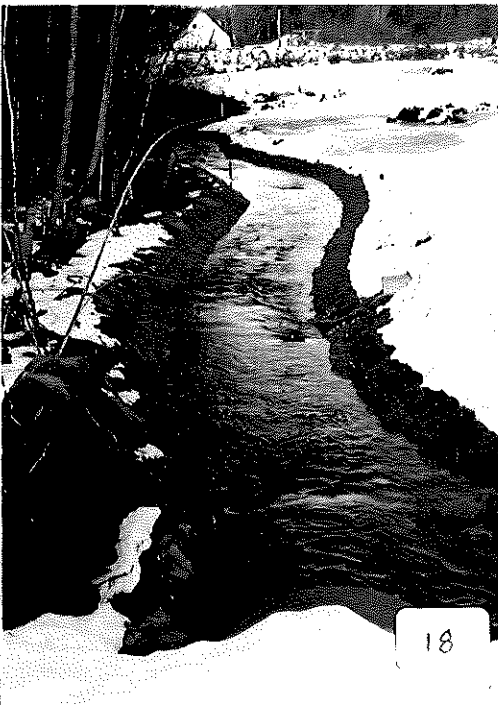
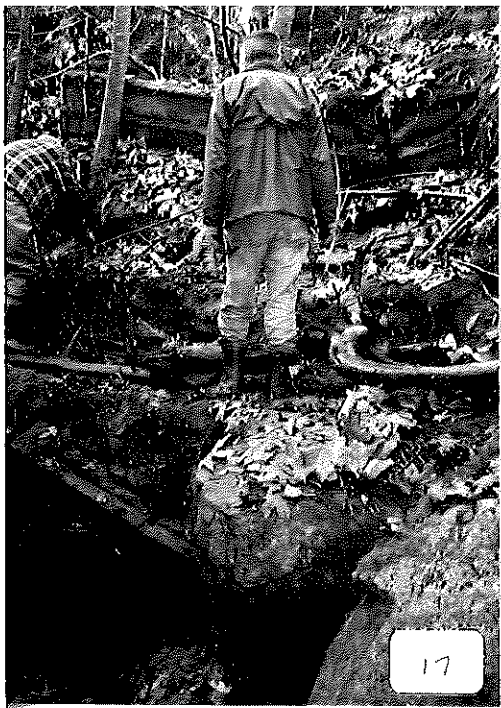
APPENDIX C. PHOTOGRAPHS

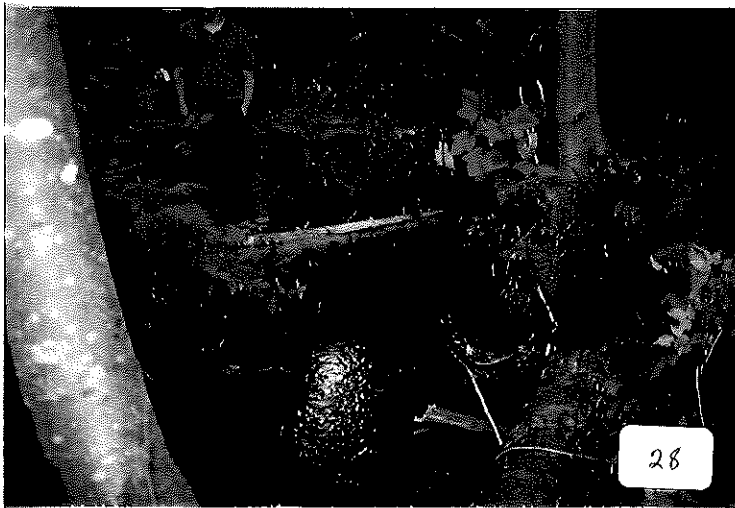
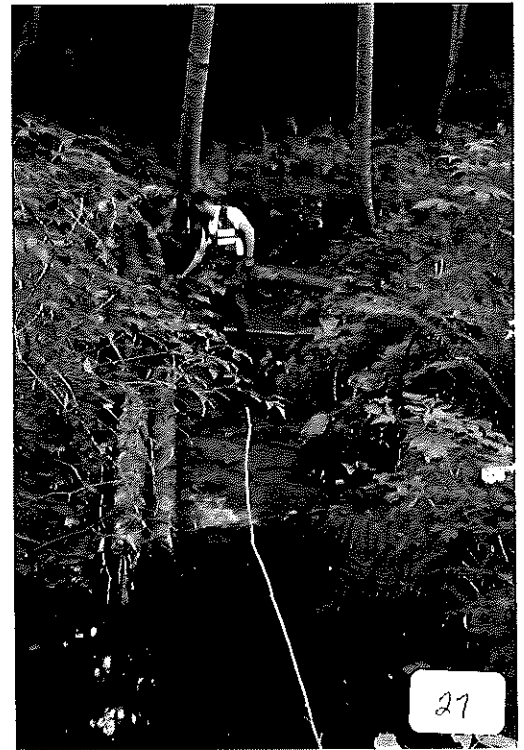
1. Hemsworth culvert plugged
2. Hemsworth culvert cleaned out
3. Memorial Golf Course--need for planting
4. Pond on KenDor property, upper Beach--need for planting
5. Ditch on Qualicum Road, upper Beach--need for planting
6. Fry salvaged from drying up puddles at Rupert Road culvert
7. Siting of gravel bed on Golf Course
8. Site for instream cover on Golf Course
9. Site for instream cover above Elizabeth Avenue
10. Site for instream cover on Brown Property
11. Culvert running under Hwy. 19a, Old Dutch Inn & Elizabeth Avenue
12. WQ site 2 on Brown Property
13. WQ site 3 at Violetta Creek inflow
14. WQ site 4 control upstream of Violetta Creek
15. Planting of conifers on Golf Course
16. Planting at Hemsworth culvert
17. Planting at Hemsworth culvert
18. Downstream of Mant Road & Railway (new culvert)--need for planting
19. Site for pool excavation on Doug Davidson's property
20. Gravel bed downstream of East Crescent on the Golf Course
21. Boulder clusters at Elizabeth Avenue
22. Boulder clusters at Elizabeth Avenue
23. Log placement on Golf Course
24. ditto
25. ditto
26. ditto
27. ditto
28. ditto
29. ditto
30. ditto
31. ditto
32. ditto
33. Cover logs on Brown property
34. Scour log on Brown property
35. Coho fry from French Creek Hatchery
36. Placing of fry in creek upstream of Village Way
37. Electrofishing on Golf Course
38. ditto
39. ditto
40. Site of spawning coho on Brown property at Violetta Creek entrance













31



31



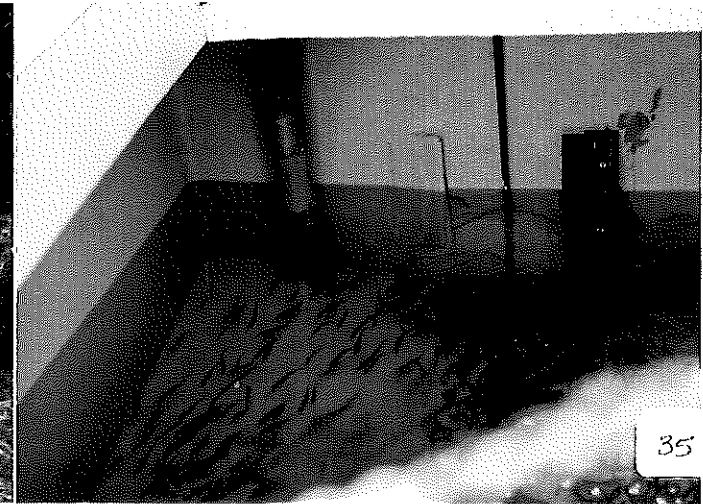
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