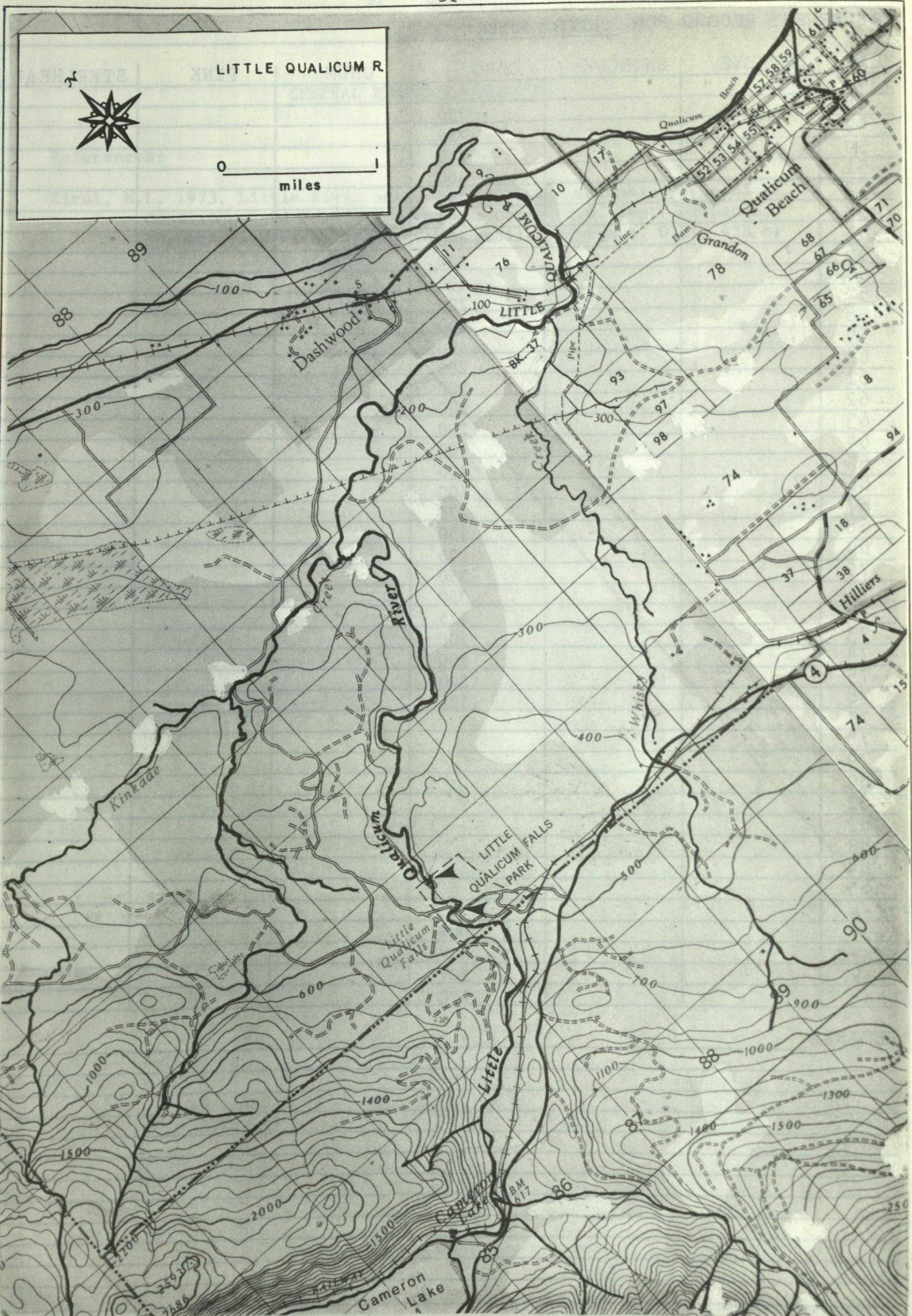


LITTLE QUALICUM R.



0 miles



NAME OF STREAM LITTLE QUALICUM RIVER
 CONSERVATION DISTRICT 3 STATISTICAL AREA 14
 LOCATION OF MOUTH Flows NE. and NW. into Str. of Georgia, W. of Qualicum Beach,
Newcastle Dist. POSITION 49 124 SE.
 LENGTH 7.2 MI. WIDTH 93 FT. DRAINAGE 96.0 SQ. MI.
 COMPOSITION: BEDROCK 3 BOULDER 8 COARSE 27 FINE 27
 SILT & SAND _____ UNCLASSIFIED pools 35

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	2.4 - 6.0 mi.
5.0 - 7.5	
7.5 - 10.0	0.0 - 2.4 mi.
> 10.0	6.4 - 7.2 mi.

WETTED AREA 392832 SQ. YD. SPAWNING AREA 209000 SQ. YD.

DISCHARGE 431 CFS MAX 11200 cfs (Inst.) 16/01/61 MIN 25 cfs (Inst.) 08/09/66

TEMPERATURE see table - page 110

BARRIERS OR POINTS OF DIFFICULT ASCENT

- Two series of impassable falls at 7.2 - 7.7 mi. Total drop estimated to be 200 ft.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	throughout - mainly in upper reaches
COHO	throughout - mainly in upper reaches
CHUM	throughout
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

- Cameron Lake (2 sq. mi.) and tributaries appear to have spawning and rearing potentials for coho and sockeye salmon production.

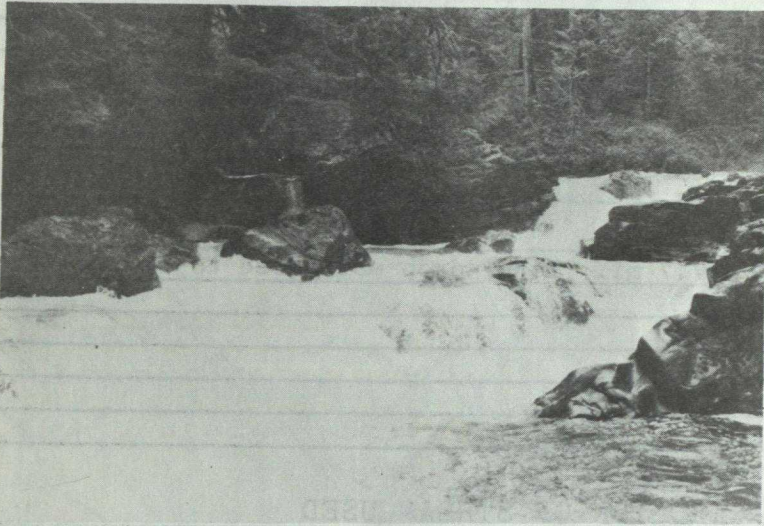
GENERAL REMARKS:

- The most impressive stream in Area 14 from the standpoint of high quality of spawning area.
- Due to intensive logging operations in the mountains adjacent to Port Alberni in the Upper Cameron River area, severe silting occurs during flood crests. The Cameron Lake buffer does not prevent this silt from reaching the main spawning grounds downstream from the Little Qualicum Falls Provincial Park. (1975) In the winters of 1973 and 1975, severe erosion, bank undercutting and silting occurred during floods.
- In 1972, the use of 200,000 imperial gallons of unmetered water was granted for the subdivision in the Little Qualicum Dashwood area. Fishery Officers believe that water requirements will increase as development increases in the future. They

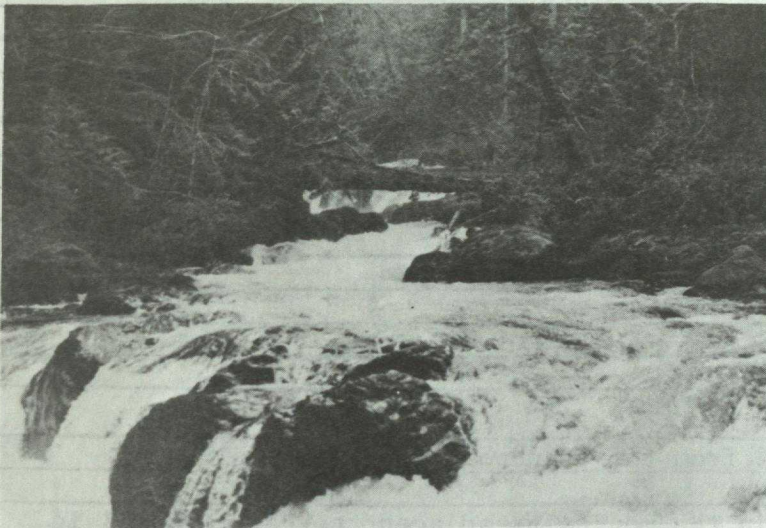
GENERAL REMARKS: (Cont'd)

suggest that these water requirements will have to be provided by other means than direct diversion from this important salmon and steelhead river system.

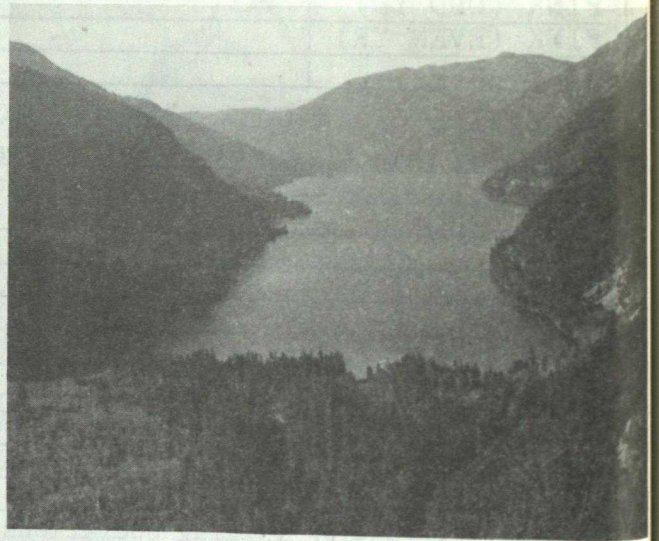
- Accessible tributaries: Kinkade Cr., Whiskey Cr.



Base of obstruction

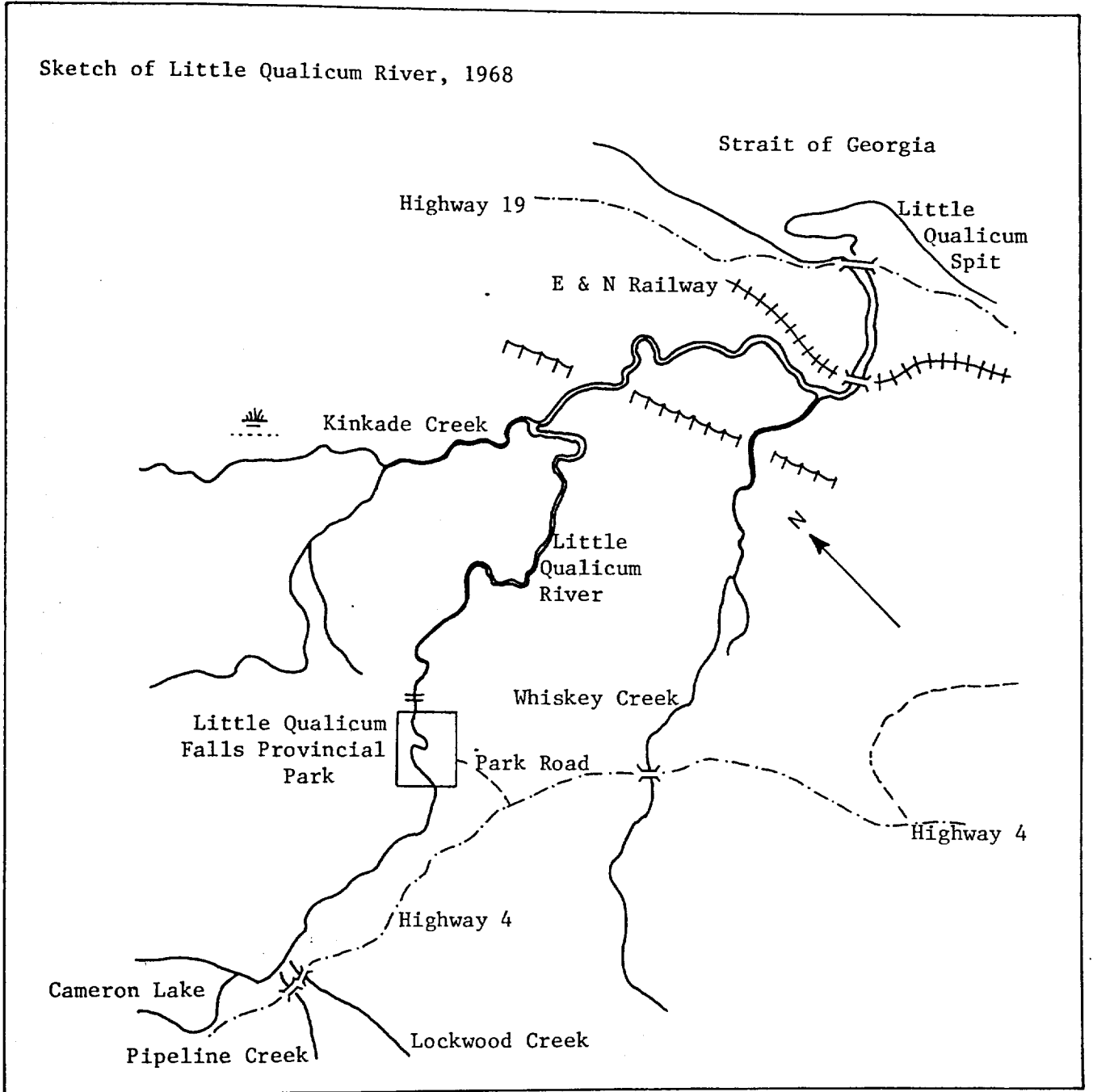


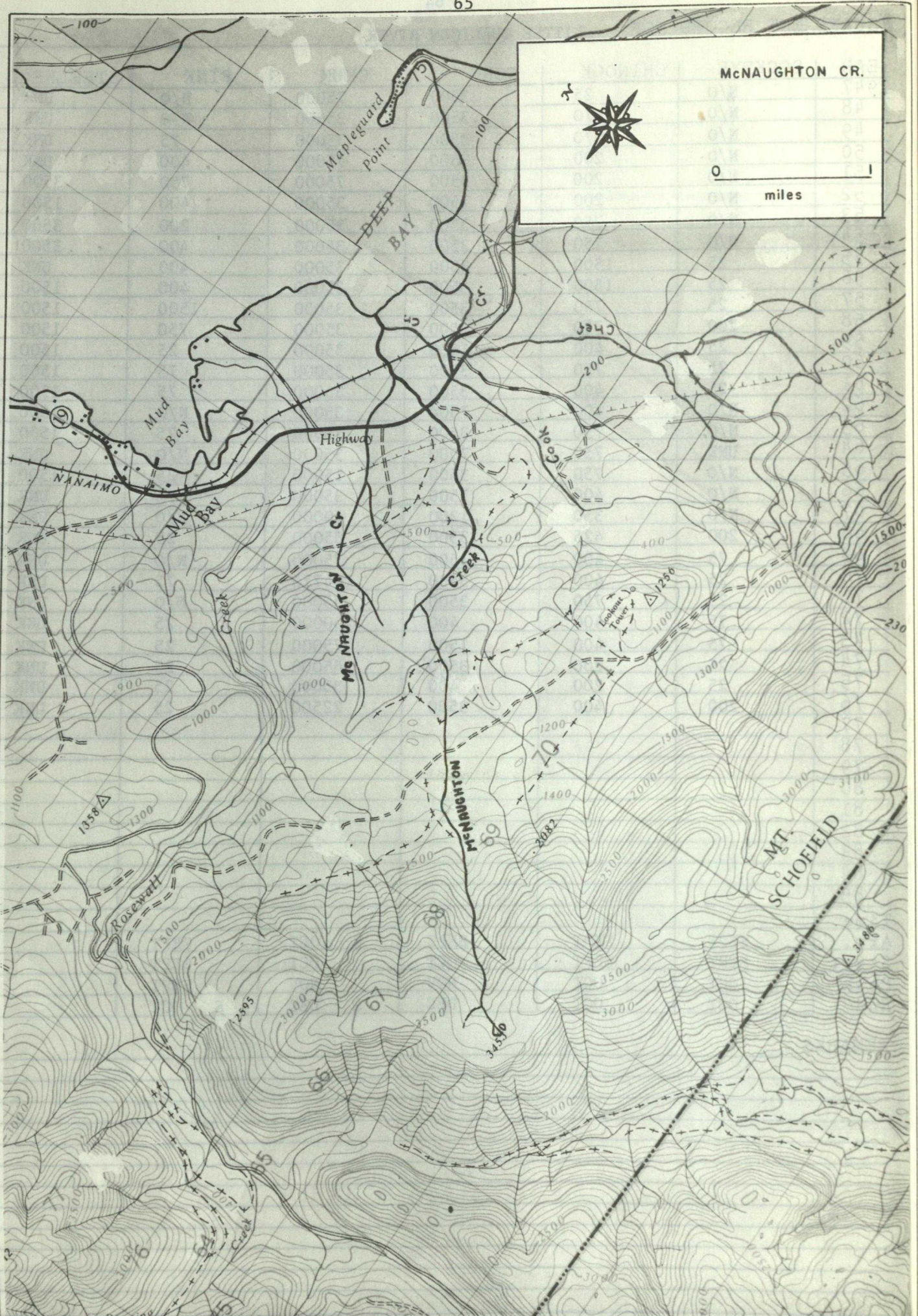
Second step of obstruction



Cameron Lake

Sketch of Little Qualicum River, 1968





McNAUGHTON CR.

0 1
miles

NAME OF STREAM McNAUGHTON CREEK

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows NE. into Cook Cr., Newcastle Dist.

POSITION 49 124 SW.

LENGTH 1.5 MI. WIDTH 30 FT. DRAINAGE 3.4 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER 37 COARSE 29 FINE 29

SILT & SAND _____ UNCLASSIFIED pools 5

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	throughout

WETTED AREA 26400 SQ. YD. SPAWNING AREA 15000 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

- Impassable falls at 2 mi.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	mainly lower reaches & inter-tidal area
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- Changes in channel occur occasionally from high flows and logging operations; stream clearance work may be beneficial in some years.
- Stream bed below the highway usually dries in the summer and late fall. (1975)

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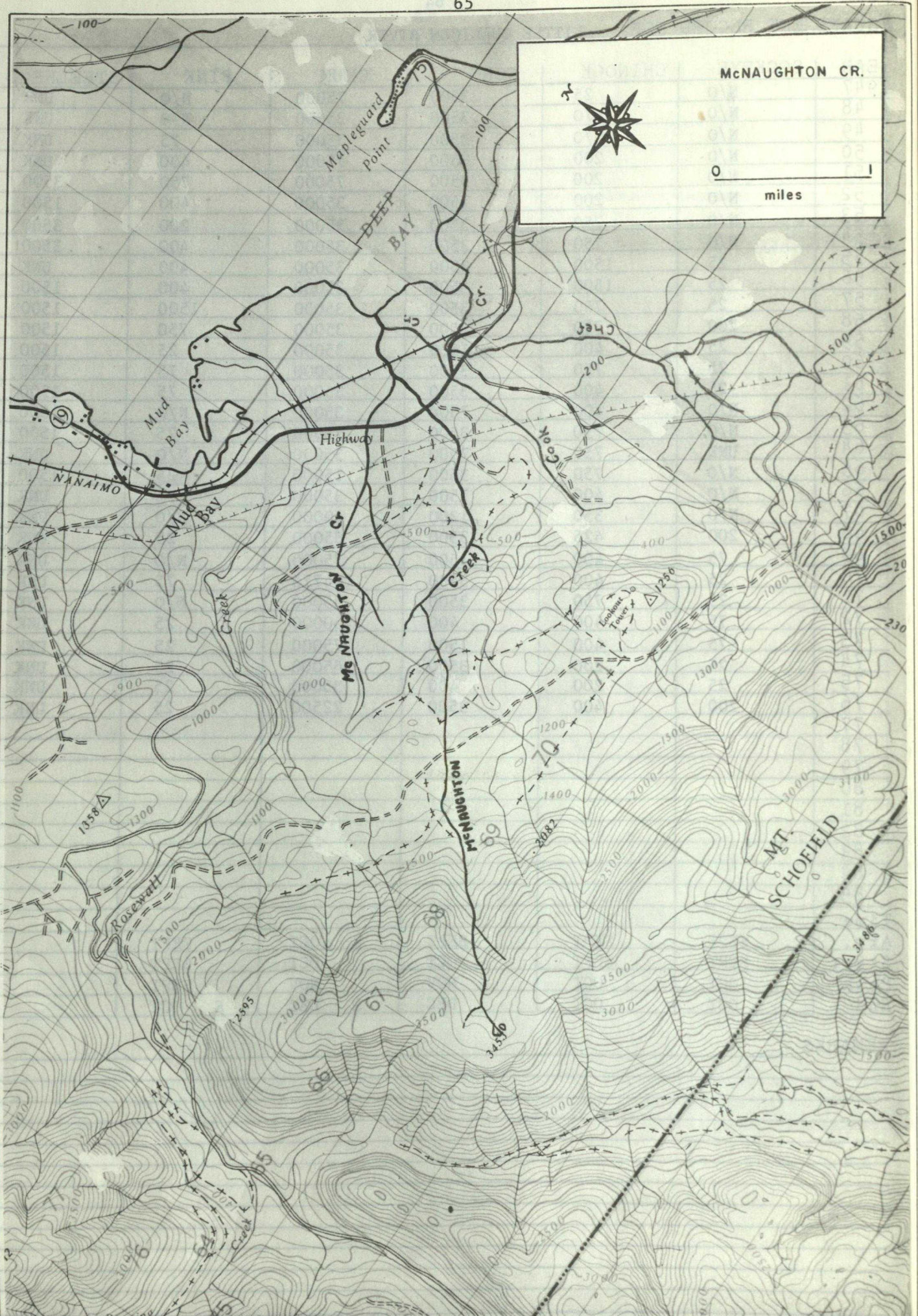
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McNAUGHTON CR.

0 1
miles

This inset box contains a compass rose with eight points and a scale bar indicating a distance of 1 mile. The title 'McNAUGHTON CR.' is positioned at the top of the box.

NAME OF STREAM NILE CREEK
 CONSERVATION DISTRICT 3 STATISTICAL AREA 14
 LOCATION OF MOUTH Flows NE. into Qualicum Bay, Newcastle Dist.
 POSITION 49 124 SW.
 LENGTH 3.3 MI. WIDTH 26 FT. DRAINAGE 7.0 SQ. MI.
 COMPOSITION: BEDROCK _____ BOULDER 5 COARSE 35 FINE 35
 SILT & SAND _____ UNCLASSIFIED pools 25

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	throughout

WETTED AREA 50297 SQ. YD. SPAWNING AREA 35000 SQ. YD.DISCHARGE 35.1 CFS MAX 659 cfs 03/02/63 MIN 2.3 cfs all/08/61

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

- Series of impassable falls at 3.3 mi., falling from mountain side.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	scattered throughout
CHUM	mouth to railroad bridge (.75 mi.)
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- An experiment on the survival of chum and pink salmon spawn within controlled sections and the natural stream was carried out by the Fisheries Research Board of Canada in 1947-48.

References:

Wickett, W.P. 1952. Production of Chum and Pink Salmon in a Controlled Stream. Pacific Progress Report, Fisheries Research Board of Canada, No. 93, 1952, p 7-9.

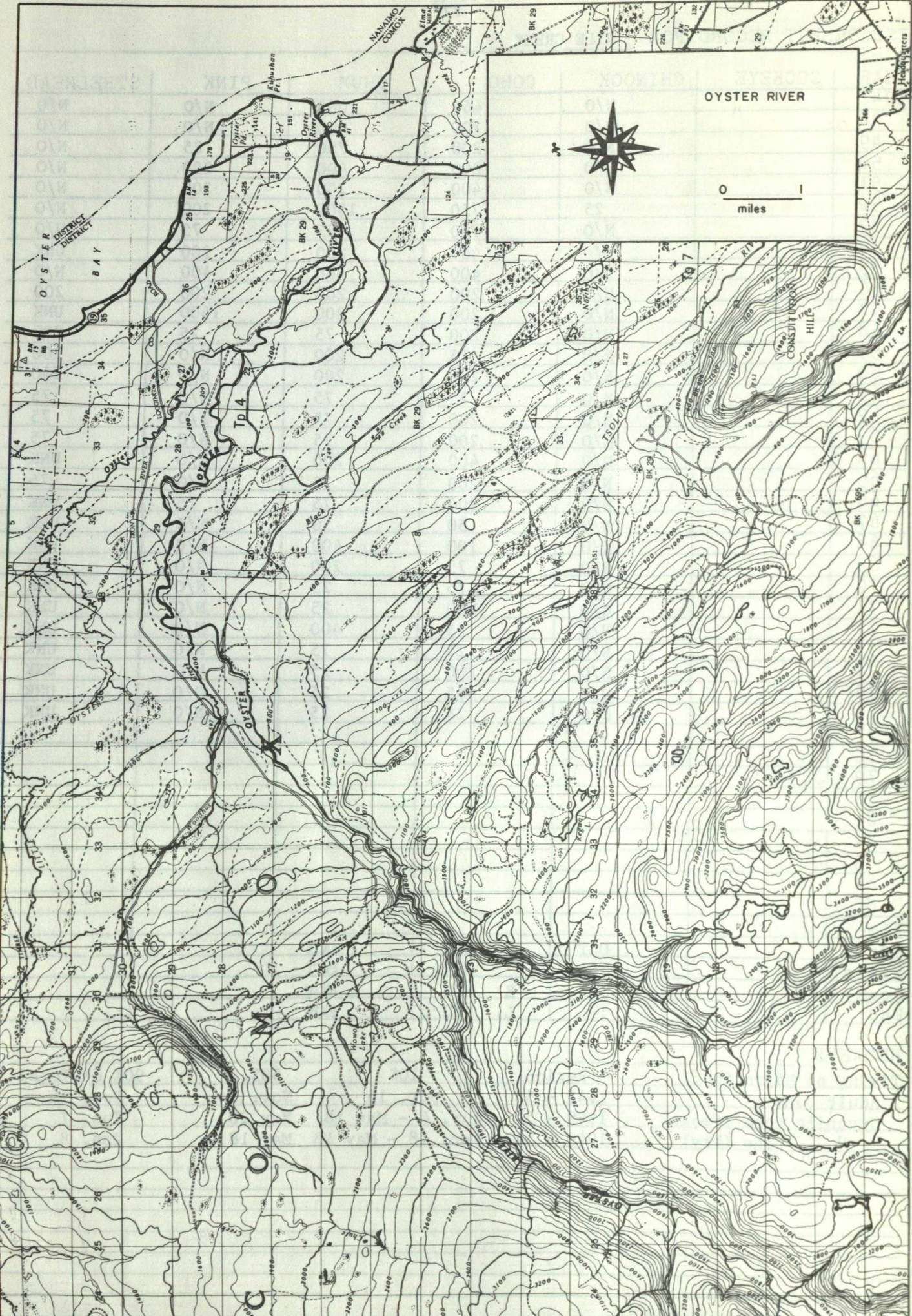
Wickett, W.P. 1951. The Coho Salmon Population of Nile Creek. Progress Reports of the Pacific Coast Stations of the Fisheries Research Board of Canada, No. 89, Dec. 1951, p 88-89.

ESCAPEMENT RECORD FOR NILE CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947		N/O	463	1009	N/O	N/O
48		N/O	200	400	N/O	N/O
49		N/O	200	750	25	N/O
50		N/O	200	400	200	N/O
51		N/O	400	200	200	N/O
52		25	750	1500	200	N/O
53		N/O	750	25	75	N/O
54		N/O	400	200	200	UNK
55		N/O	400	400	400	N/O
56		N/O	200	200	200	200
57		N/O	200	200	1500	UNK
58		N/O	200	75	25	200
59		N/O	75	200	N/O	200
60		N/O	200	200	N/O	200
61		N/O	75	75	N/O	75
62		N/O	200	75	N/O	75
63		N/O	200	75	N/O	75
64		N/O	400	200	N/O	UNK
65		N/O	200	75	N/O	75
66		N/O	200	75	75	UNK
67		N/O	50	50	N/O	UNK
68		N/O	100	400	N/O	UNK
69		N/O	75	200	N/O	UNK
70		N/O	75	25	N/O	UNK
71		N/O	200	25	N/O	UNK
72		N/O	25	400	N/O	UNK
73		N/O	25	75	N/O	UNK
74		N/O	200	25	N/O	UNK
75		N/O	25	25	N/O	UNK
76		N/O	25	25	N/O	UNK
77						
78						
79						
80						
81						
82						
83						
84						
85						
Time						
Arr.		OCT	OCT	OCT		
Start			OCT	OCT		
Peak			E NOV	NOV		
End			L DEC	NOV		

REMARKS

Timing of Migration:	Period	10%	50%	90% of Total
Adult Coho	1945 - 53	Oct. 15	Nov. 1	Nov. 16
Juvenile Coho (Smolt)	1949 - 54	Apr. 4 - May 18	May 20	Jun. 7
" Coho (Fry)	1949 - 54	Apr. 18 - May 13	May 18	Jun. 8



OYSTER RIVER

0 1
miles

This inset box contains a compass rose with eight points and a scale bar indicating a distance of 1 mile. The text 'OYSTER RIVER' is centered above the compass rose, and '0 1 miles' is centered below the scale bar.

NAME OF STREAM OYSTER RIVER
 CONSERVATION DISTRICT 3 STATISTICAL AREA 14
 LOCATION OF MOUTH Flows E. into Str. of Georgia, S. of Kuhushan Pt., Comox Dist.
 POSITION 49 125 NE.
 LENGTH 13.0 MI. WIDTH 100 FT. DRAINAGE 70.0 SQ. MI.
 COMPOSITION: BEDROCK 36 BOULDER 36 COARSE 12 FINE 9
 SILT & SAND _____ UNCLASSIFIED pools 7

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	0.0 - 7.0 mi.
7.5 - 10.0	7.0 - 11.2 mi.
> 10.0	11.2 - 13.0 mi.

WETTED AREA 762590 SQ. YD. SPAWNING AREA 160000 SQ. YD.DISCHARGE 424* CFS MAX 4690* cfs 26/07/15 MIN 35* cfs 19/09/15

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT

- A 15 ft. drop (cascades and shutes) over a horizontal length of 65 ft. at 13.0 mi. -
 assessed to be impassable to all salmon species.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	lower 6 mi.
COHO	throughout - also Little Oyster (tributary to Oyster)
CHUM	
PINK (ODD YR)	mainly lower reaches
PINK (EVEN YR)	mainly lower reaches but as far as 12 mi.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

- Approx. 10 mi. of stream above obstruction appears to be suitable for rearing
 juvenile salmonids, logging roads exist throughout watershed, but at high elevations,
 thereby making access to stream very difficult.
 - Woodhus Cr. (Caribou) a tributary with a velocity barrier at confluence with Oyster,
 appears to be suitable for coho spawning and rearing.

GENERAL REMARKS:

- This stream has been very much affected by forest removal, flash floods have
 displaced the gravel in large parts and there appears to be little opportunity for
 replenishment through natural events.

- Accessible tributaries: Little Oyster R. It is reported that up to 40% of the
 Oyster R. coho ascend the Little Oyster R. Distribution is up to 6 mi.

* For years 1915-1917.

References:

Bishop, G.D. 1973. Woodhus Creek - Spring 1972. (installation of a migrant trap -
 catch figures from April 7 - August 3, /72). D.O.E., F.M.S., Pac. Reg.

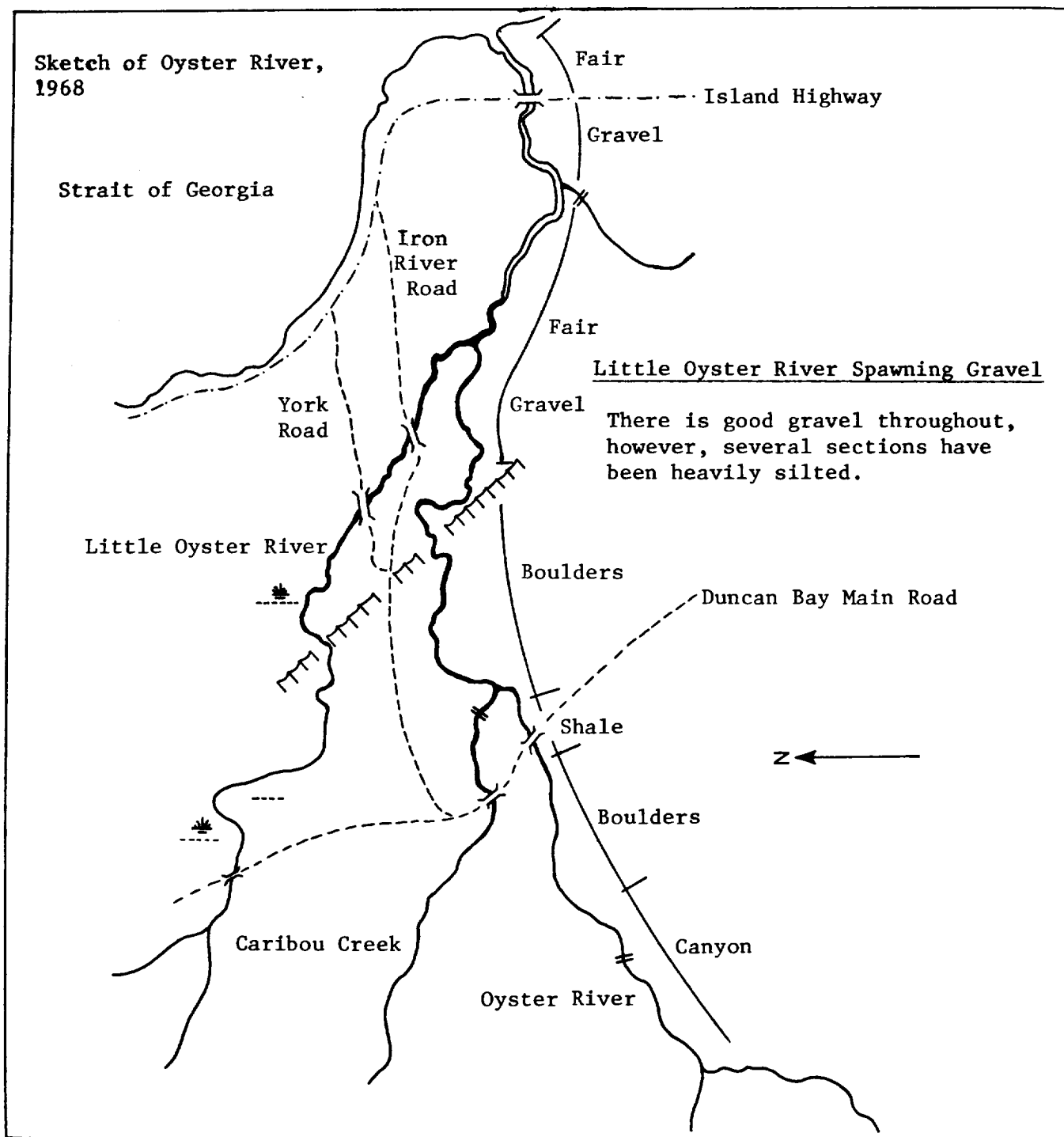
Memo. 31-3-01, 2p.

GENERAL REMARKS: (Cont'd)

References (Cont'd):

Goodman, G.D. 1974. "An Assessment of the Impact of a Proposed Access Channel & Breakwater on the Fisheries Resources of the Oyster River." D.O.E., F.M.S., Pac. Reg. PAC/T-74-7, 51p.

Tofsrud, L.W. 1973. Woodhus Creek Juvenile Coho Assessment Program. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-01, 3p.



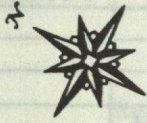
ESCAPEMENT RECORD FOR OYSTER RIVER

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947		25	7500	7500	7500	UNK
48		N/O	3500	1500	75000	UNK
49		25	3500	3500	15000	UNK
50		75	3500	3500	100000+	1500
51		25	7500	3500	3500	1500
52		25	35000	7500	100000+	750
53		200	15000	7500	15000	1500
54		25	15000	15000	100000+	1500
55		N/O	15000	3500	3500	1500
56		25	7500	750	35000	750
57		25	7500	3500	3500	750
58		N/O	15000	7500	75000	1500
59		25	15000	750	1500	750
60		N/O	7500	400	3500	750
61		N/O	7500	400	1500	750
62		N/O	7500	1500	750	750
63		25	7500	750	3500	750
64		N/O	15000	400	200	UNK
65		UNK	15000	75	750	UNK
66		UNK	15000	200	3500	N/O
67		N/O	4000	50	1200	N/O
68		N/O	5500	800	2150	N/O
69		N/O	3000	250	200	N/O
70		N/O	6000	200	1600	N/O
71		N/O	8000	100	1400	N/O
72		N/O	3500	850	1100	N/O
73		N/O	3500	250	1200	N/O
74		N/O	5000	500	850	N/O
75		N/O	3500	450	900	N/O
76		N/O	1500	450	800	N/O
77						
78						
79						
80						
81						
82						
83						
84						
85						
Time						
Arr.			E OCT	M AUG	M OCT	
Start			E OCT	E SEPT	L OCT	
Peak			L NOV	L SEPT	M NOV	
End			JAN	OCT	DEC	

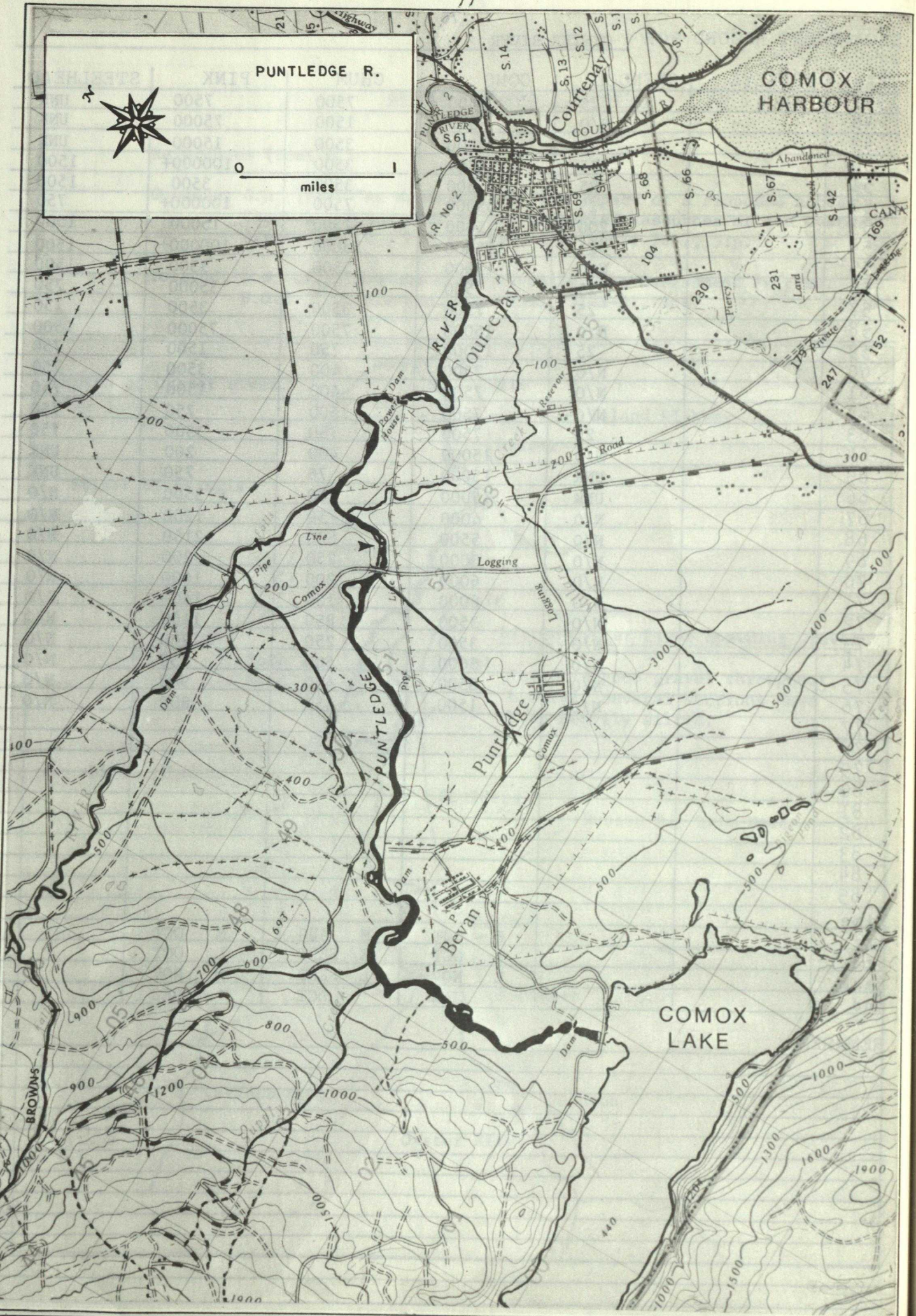
REMARKS

PUNTLIDGE R.

COMOX HARBOUR



0 miles 1



NAME OF STREAM PUNTLEDGE RIVER
 CONSERVATION DISTRICT 3 STATISTICAL AREA 14
 LOCATION OF MOUTH Flows NE. into Courtenay R., Comox Dist.

POSITION 49 124 NW.
 LENGTH 8.8 MI. WIDTH 195 FT. DRAINAGE 200.0 SQ. MI.
 COMPOSITION: BEDROCK 38 BOULDER 23 COARSE 8 FINE 5
 SILT & SAND _____ UNCLASSIFIED pools 26

GRADIENT:

FALL IN FT/000

0.0 - 2.5	0.0 - 2.8 mi. (2.5 ft./000)
2.5 - 5.0	2.8 - 3.8 mi. (5.0 ft./000), 6.4 - 8.8 mi.
5.0 - 7.5	
7.5 - 10.0	
> 10.0	3.8 - 6.4 mi.

WETTED AREA 1006720* SQ. YD. SPAWNING AREA 131000* SQ. YD.

DISCHARGE 1140 CFS MAX 13000 cfs 06/09/14 MIN 80 cfs 07/02/57

TEMPERATURE see table - page 110

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

- Passable falls at 4 mi. (Stotan Falls).
- Passable falls at 5 mi. (difficulty to salmon ascent varies - dependant on water levels).
- Rock work was carried out on Stotan Falls as early as 1923.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	summer run 6.8 mi., fall run 0-2.8 mi.
COHO	0-4 mi., also Morrison Creek tributary (map - Millard Cr.)
CHUM	0-4 mi., mainly below powerhouse (2.8 mi.)
PINK (ODD YR)	0-4 mi., mainly below powerhouse
PINK (EVEN YR)	0-4 mi., mainly below powerhouse
STEELHEAD	upper reaches

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

- The theoretical potential for the Puntledge River system exceeds by a wide margin that for any other stream in Area 14. The potential exists in the spawning and rearing opportunities in Comox Lake and tributary streams (upper Puntledge River and lakes and Cruikshank River system) for coho and sockeye salmon. The problems to be overcome to realize this potential are: migration of adult fish over Stotan & Nib Falls, migration of juvenile fish from diversion dam to lower stream. Successful transplantation of coho and sockeye salmon is a necessary part of realizing this potential.

GENERAL REMARKS: _____

- * Wetted area and spawning area includes that portion of stream above diversion dam (6.8-8.8 mi.) and is not utilized at the present time. The wetted area and spawning area are approx. 274,560 sq. yds. and 90,600 sq. yds. respectively above the diversion dam.
- The Puntledge River is the site of a hydro power project dating to 1913. A further development scheme initiated in 1953 increased the hazards of salmon production. A spawning channel was constructed in 1965 as part of the program to protect the fishing resource (see diagram).
- In 1972, rearing ponds at the spawning channel were completed and a small temporary hatchery was set up in the old B.C. Hydro powerhouse building for the production of early and fall run chinook.

GENERAL REMARKS: (Cont'd)

- Accessible tributaries: Millard Cr.; Browns R. for 3/4 mi. (impassable falls) negligible spawning gravel. Has a water reservoir dam which is situated 2.5 mi. upstream from mouth (Courtenay Water Dist.).

References:

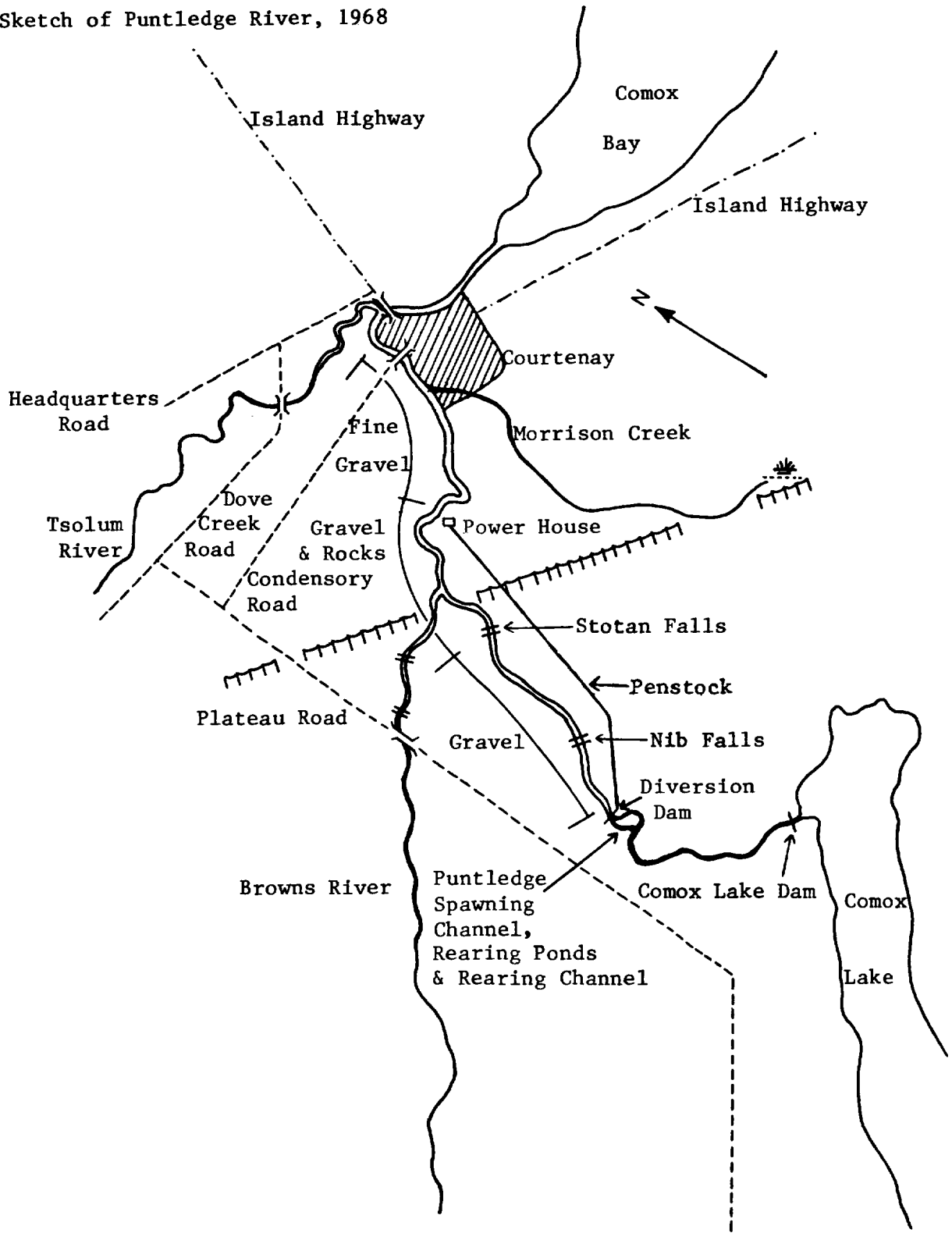
- Anon. 1958. The Fisheries Problems Associated with the Power Development of the Puntledge River, Vancouver Island, B.C. Rpt. Dept. of Fisheries, Pac. Reg.
- Anon. 1962. Brief Outlining the Need for Fish Protection Facilities at the Puntledge River Hydro Electric Development. Rpt. Dept. of Fisheries, Pac. Reg.
- Anon. 1963. Puntledge River Project Report. Dept. of Fisheries, Pac. Reg. Technical Report. 31-3-P1, 25p & Appendix.
- Anon. 1974. Puntledge River Project Report. D.O.E., F.M.S., Pac. Reg. Technical Report. 31-3-P1, 18p & Appendix.
- Holden, M.J. 1958. The Fisheries Problems Associated with the Power Development of the Puntledge River. Dept. of Fisheries, Pac. Reg. Memo. 31-3-P1, 19p.
- Hourston, W.R. 1962. Brief Outlining the Need for Fish Protection Facilities at the Puntledge River Hydro Electric Development. Dept. of Fisheries, Pac. Reg. Technical Report. 35p & Appendix.
- Lister, D.B. 1968. Progress Report on Assessment of the Puntledge River Spawning Channel, June 1965 - May 1968. Dept. of Fisheries, Pac. Reg. Technical Report. 17p.
- Marshall, D.E. 1970. Puntledge River Biological Program. Dept. of Fish. & Forestry, Pac. Reg. Memo. 31-3-P1, 16p & Appendix.
- Marshall, D.E. 1970. The 1969 Puntledge River Chinook Salmon Investigation and a Review of Previous Investigations. Dept. of Fish. & Forestry, Pac. Reg. Memo. 31-3-P1, 10p & Appendix.
- Marshall, D.E. 1972. Development Potential of the Puntledge River - Chinook, Coho & Steelhead Stocks. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 30p.
- Marshall, D.E. 1973. Remedial Work at Nib Falls & Puntledge River. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 3p.
- Marshall, D.E. 1973. Progress Report on the Puntledge River Program. D.O.E., F.M.S., Pac. Reg. Technical Report. 31-3-P1, 55p & Appendix.
- Marshall, D.E. 1974. Review of Minimum Fisheries Flow Requirements for the Puntledge River. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 14p.

GENERAL REMARKS: (Cont'd)

References (Cont'd):

- Tofsrud, L.W. 1973. Bevan Creek Juvenile Assessment Program. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 3p.
- Tofsrud, L.W. 1973. Puntledge River Egg-Take. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 6p.
- Tofsrud, L.W. 1974. Fish Passage at Nib Falls. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 3p & Appendix.
- Tofsrud, L.W. & D. Muir. 1974. Puntledge River Summer Run Chinook Migration Observations. D.O.E., F.M.S., Pac. Reg. Memo. 31-3-P1, 2p.

Sketch of Puntledge River, 1968



Spawning Channel

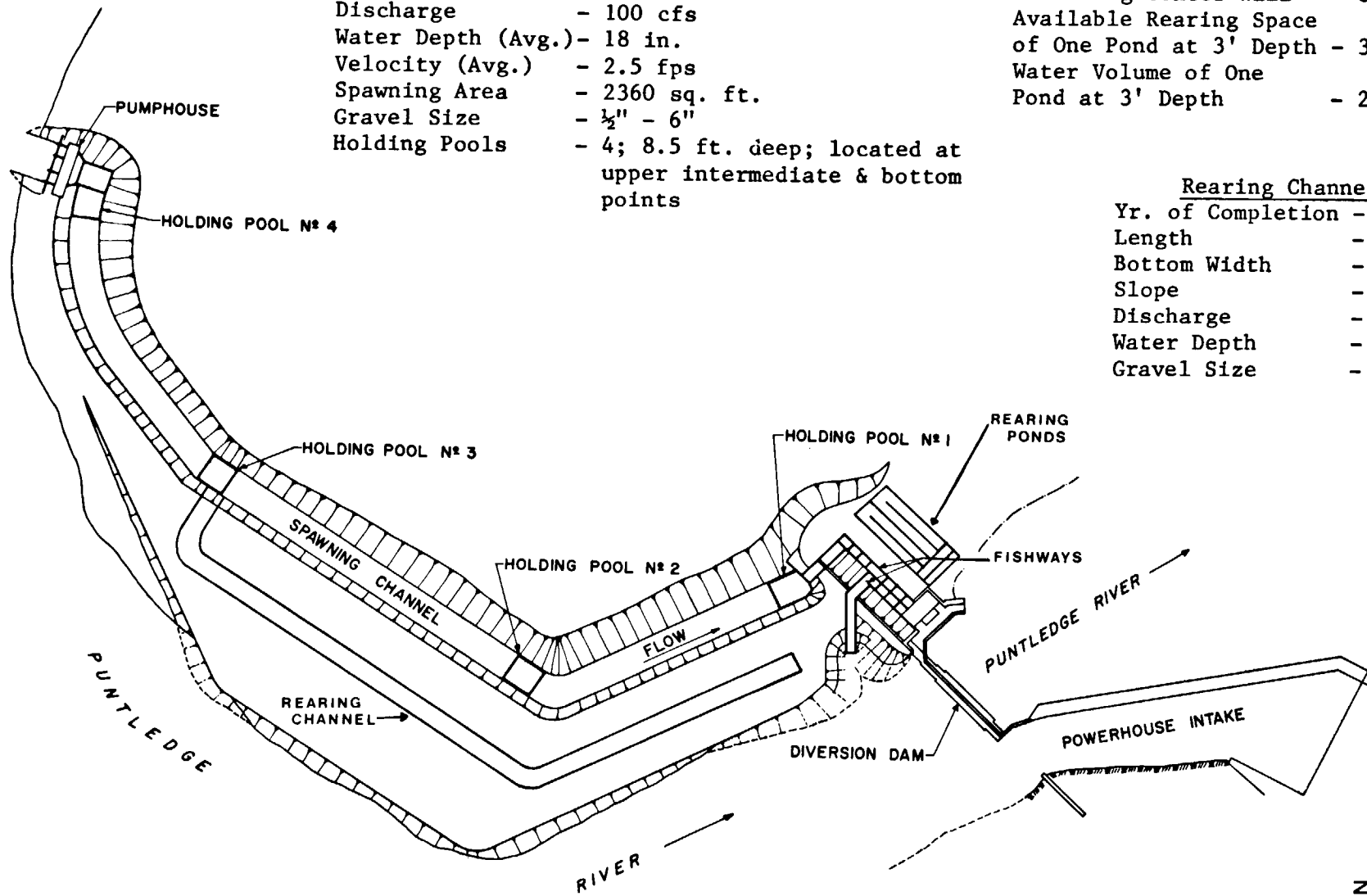
Yr. of Completion - 1965
 Length - 840 ft.
 Bottom Width - 25 ft.
 Slope - .0013
 Discharge - 100 cfs
 Water Depth (Avg.) - 18 in.
 Velocity (Avg.) - 2.5 fps
 Spawning Area - 2360 sq. ft.
 Gravel Size - 1/2" - 6"
 Holding Pools - 4; 8.5 ft. deep; located at upper intermediate & bottom points

Rearing Ponds

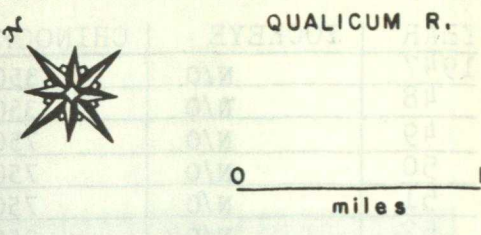
Yr. of Completion - 1971
 No. of Ponds - 2
 Interior Dimensions Excluding Center Wall - 37' x 75'
 Available Rearing Space of One Pond at 3' Depth - 3,600 cu. ft.
 Water Volume of One Pond at 3' Depth - 22,464 Imp. Gals.

Rearing Channel

Yr. of Completion - 1977
 Length - 580 ft.
 Bottom Width - 20 ft.
 Slope - .0011
 Discharge - 50 cfs
 Water Depth - 4.5 ft.
 Gravel Size - 1" - 3"



QUALICUM R.



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NAME OF STREAM QUALICUM RIVER (Big Qualicum River)

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows NE. into Str. of Georgia, S. of Qualicum Bay, Newcastle Dist. POSITION 49 124 SW.

LENGTH 6.5 MI. WIDTH 75 FT. DRAINAGE 58.0 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER 27 COARSE 23 FINE 23
SILT & SAND _____ UNCLASSIFIED pools 27

GRADIENT:

FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	0.0 - 3.5 mi.
7.5 - 10.0	
> 10.0	3.5 - 6.5 mi.

WETTED AREA 305100* SQ. YD. SPAWNING AREA 140300* SQ. YD.

DISCHARGE 278 CFS MAX 12000 cfs 02/12/58 MIN 13.7 cfs 28/08/61

TEMPERATURE see table - page 110

BARRIERS OR POINTS OF DIFFICULT ASCENT
- Impassable series of falls at 6.5 mi. Four falls totalling 190 ft.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	mainly above Hunts Cr. (3.0 mi.) preferring upper reaches
COHO	throughout - also Hunts Cr.
CHUM	mainly mouth to mid reaches - scattered in upper reaches
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM
- Horne Lake (3.0 sq. mi.) appears to have potential for rearing coho and sockeye salmon.

GENERAL REMARKS:

- * Includes wetted area and spawning area of spawning channel 2, see diagram for data.
- The Qualicum River is presently being developed by the Federal Government to increase the production of the indigenous stock of chum, coho and chinook salmon.
- The development project was directed initially to control the stream discharge and temperature. Artificial spawning channels, rearing ponds, rearing channels and a hatchery are an integral part of the scheme. Further development has resulted in improvements of the spawning grounds.
- Accessible tributaries: Hunts Cr.

GENERAL REMARKS: (Cont'd)

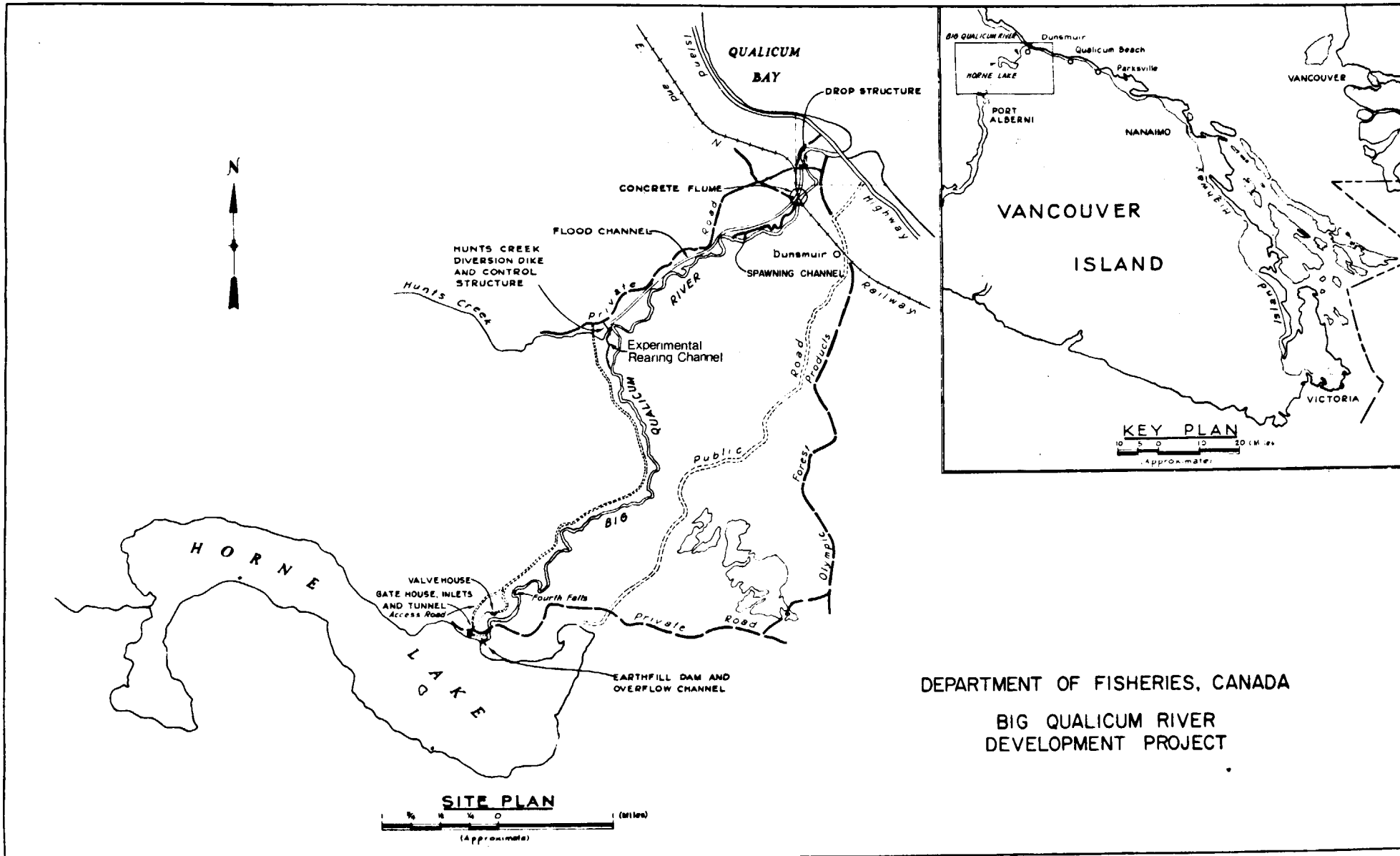
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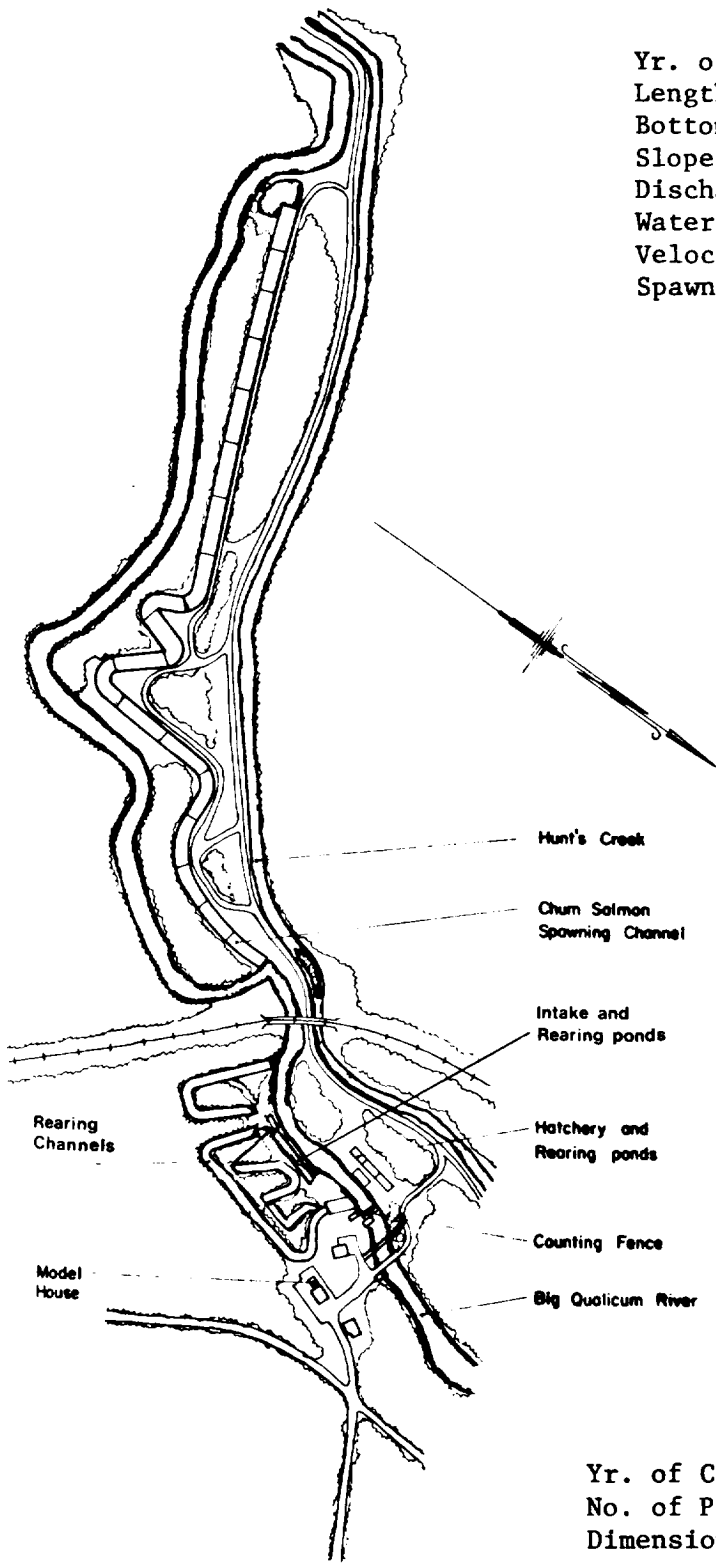
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GENERAL REMARKS: (Cont'd)

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Spawning Channel

Yr. of Completion	- 1967
Length	- 3400 ft.
Bottom Width	- 40 ft.
Slope	- .002
Discharge	- 97 cfs
Water Depth	- 1.0 ft.
Velocity	- 2.25 fps
Spawning Area	- 129,000 sq. ft.

Rearing Channels

Yr. of Completion	- 1977
Length	- 900 ft.
Bottom Width	- 15 ft.
Slope	- .001
Discharge	- 15 cfs
Water Depth	- 3 ft.
Velocity	- .27 fps

Yr. of Completion	- 1977
Length	- 600 ft.
Bottom Width	- 15 ft.
Slope	- .001
Discharge	- 15 cfs
Water Depth	- 3 ft.
Velocity	- .27 fps

Rearing Ponds

Yr. of Completion	- 1968
No. of Ponds	- 3
Dimensions	- 17' x 50' x 3'6" deep

Yr. of Completion	- 1977
No. of Ponds	- 2
Dimensions	- 220' x 15' x 5' deep

ESCAPEMENT RECORD FOR QUALICUM RIVER (BIG)

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	N/O	N/O	3500	75000	N/O	UNK
48	N/O	N/O	3500	100000+	N/O	UNK
49	N/O	200	1500	35000	N/O	UNK
50	N/O	750	3500	35000	N/O	400
51	N/O	400	3500	75000	400	1500
52	N/O	200	3500	35000	200	1500
53	N/O	750	3500	35000	75	3500
54	N/O	750	3500	35000	200	1500
55	N/O	1500	3500	35000	25	UNK
56	N/O	1500	3500	15000	200	750
57	N/O	1500	3500	35000	1500	750
58	N/O	750	3500	35000	25	750
59 *	25	2411	3624	98500	11	1500
60	25	1569	2562	60000	25	1500
61	N/O	1111	2286	13800	1	750
62	N/O	787	4223	46700	N/O	1500
63	N/O	619	4500	37900	1	1500
64	N/O	602	4859	36400	N/O	UNK
65	N/O	1118	3817	18800	75	1500
66	N/O	870	4324	53400	11900	UNK
67	N/O	764	1346	46600	4	UNK
68	N/O	830	2325	139900	2500	UNK
69	N/O	939	1821	81337	N/O	137
70	25	1660	5293	132000	25	UNK
71	25	750	8500	75000	25	UNK
72	25	750	1500	75000	25	UNK
73	25	636	2428	157755	25	UNK
74	N/O	770	18281	80620	N/O	45
75	UNK	1300	23592	109383	N/O	UNK
76	UNK	949	13477	92000	N/O	UNK
77						
78						
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84						
85						
Time						
Arr.	OCT	SEPT	SEPT	OCT	OCT	
Start	OCT	OCT	OCT	OCT	OCT	
Peak	OCT	M OCT	NOV	NOV	OCT	
End	NOV	L OCT	DEC	L DEC	OCT	

REMARKS *Commencing in 1959, enumeration has been arrived at with the aid of a counting fence:

Timing of Migration	Period	10%	50%	90% of Total
Adult Chinook	1960-68	Sep. 10	Oct. 9	Nov. 7
Adult Coho	1959-68	Oct. 4	Nov. 1	Dec. 14
Adult Chum	1959-68	Nov. 8	Nov. 27	Dec. 23
Juvenile Chinook (E. Grp)	1960-67	Mar. 5	Mar. 5-Apr. 26	May 17
Juvenile Chinook (L. Grp)	1960-67	May 4	May 29-Jun. 10	Jun. 29
Juvenile Coho'	1960-67	Mar. 20	May 3-May 21	Jun. 21
Juvenile Chum	1960-67	Apr. 10	Apr. 29-May 19	May 30

' Fry and Smolt

1973, 75-76 escapements do not include Jack Coho and Jack Chinook.

NAME OF STREAM ROSEWALL CREEK

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows NE. into Mud Bay, W. of Deep Bay, Newcastle Dist.

POSITION 49 124 SW.

LENGTH 2.4 MI. WIDTH 48 FT. DRAINAGE 17.5 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER 31 COARSE 27 FINE 27

SILT & SAND _____ UNCLASSIFIED pools 15

GRADIENT:

FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	throughout

WETTED AREA 67584 SQ. YD. SPAWNING AREA 36000 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT

- Impassable falls at 2.4 mi. - 70 ft. drop over a 300 ft. horizontal distance.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	lower reaches
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- A field station of the Fisheries Research Board of Canada was established adjacent to the stream in 1968.
- The fine gravel (pea size) is constantly shifting in this stream.

ESCA

YEAR

1947

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Time

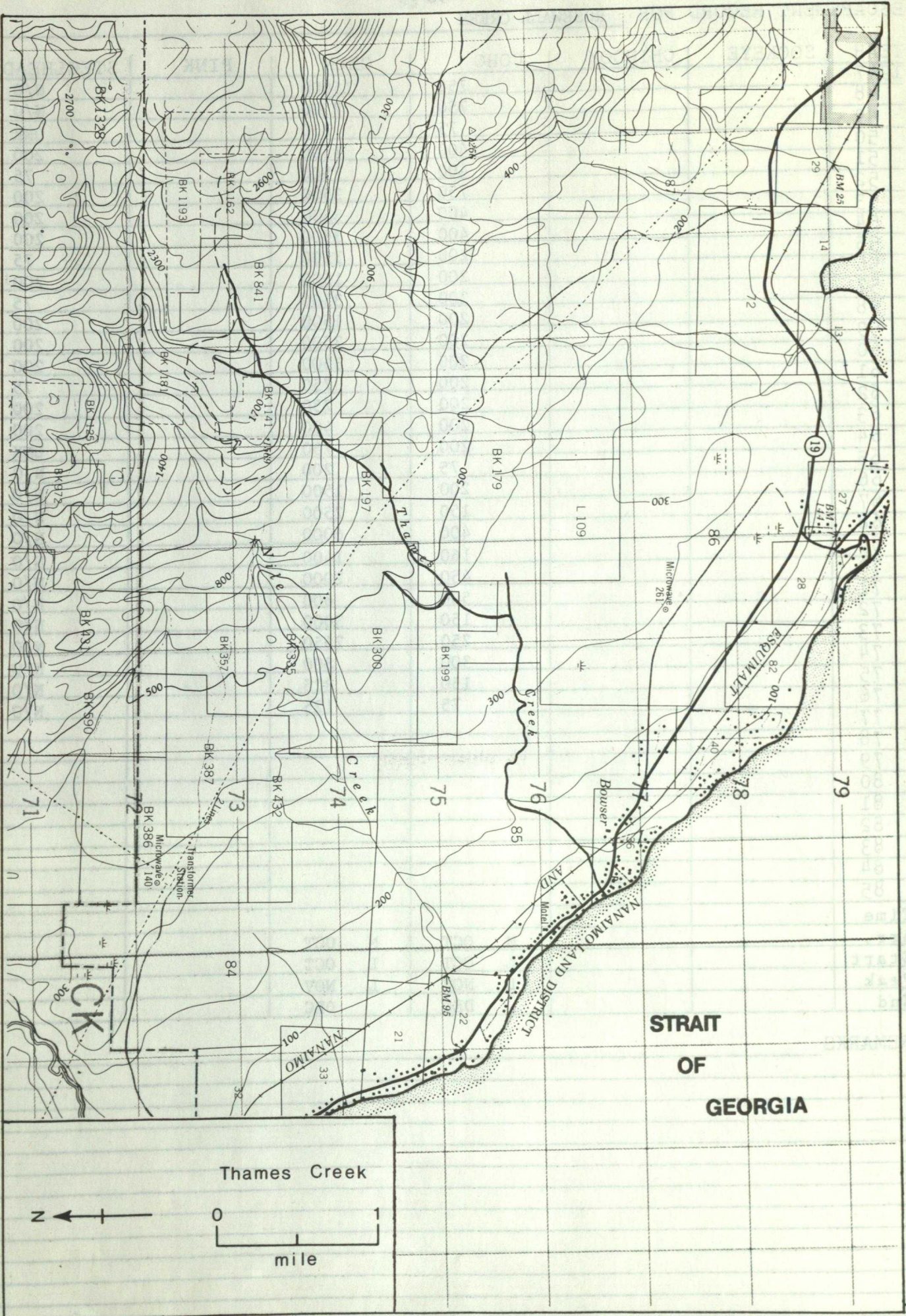
Arr.

Star

Peak

End

REMA



NAME OF STREAM THAMES CREEK

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows E. into Str. of Georgia at Bowser, Newcastle Dist.

POSITION 48 123 SE.

LENGTH MI. WIDTH FT. DRAINAGE SQ. MI.

COMPOSITION: BEDROCK BOULDER COARSE FINE

SILT & SAND UNCLASSIFIED

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	

WETTED AREA SQ. YD. SPAWNING AREA SQ. YD.

DISCHARGE CFS MAX MIN

TEMPERATURE

BARRIERS OR POINTS OF DIFFICULT ASCENT

- A 10 ft. diameter culvert at Highway 19 is passable in suitable water flows.

SPAWNING DISTRIBUTION:

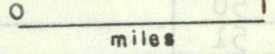
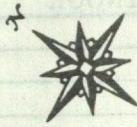
SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	lower 2.5 mi.
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

GENERAL REMARKS:

- This creek is subject to drying during summer. (1976)

TRENT RIVER



COMOX HARBOUR

Gertley Point

Royston Creek

Trent River

Camberland

RIVER

TRENT

Blusweg

Private

Abandoned

Bloedel Creek

Bloedel Lake

L. 17

L. 16

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NAME OF STREAM TRENT RIVER

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows NE. into Comox Hr., Nelson Dist.

POSITION 49 124 NW.

LENGTH 5.6 MI. WIDTH 54 FT. DRAINAGE 25.2 SQ. MI.

COMPOSITION: BEDROCK 45 BOULDER 45 COARSE 5 FINE 5

SILT & SAND _____ UNCLASSIFIED _____

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	0.0 - 2.4 mi.
> 10.0	2.4 - 5.6 mi.

WETTED AREA 177408 SQ. YD. SPAWNING AREA 17700 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

- Impassable falls at 5.6 mi. - 60 ft. vertical drop.

SPAWNING DISTRIBUTION:

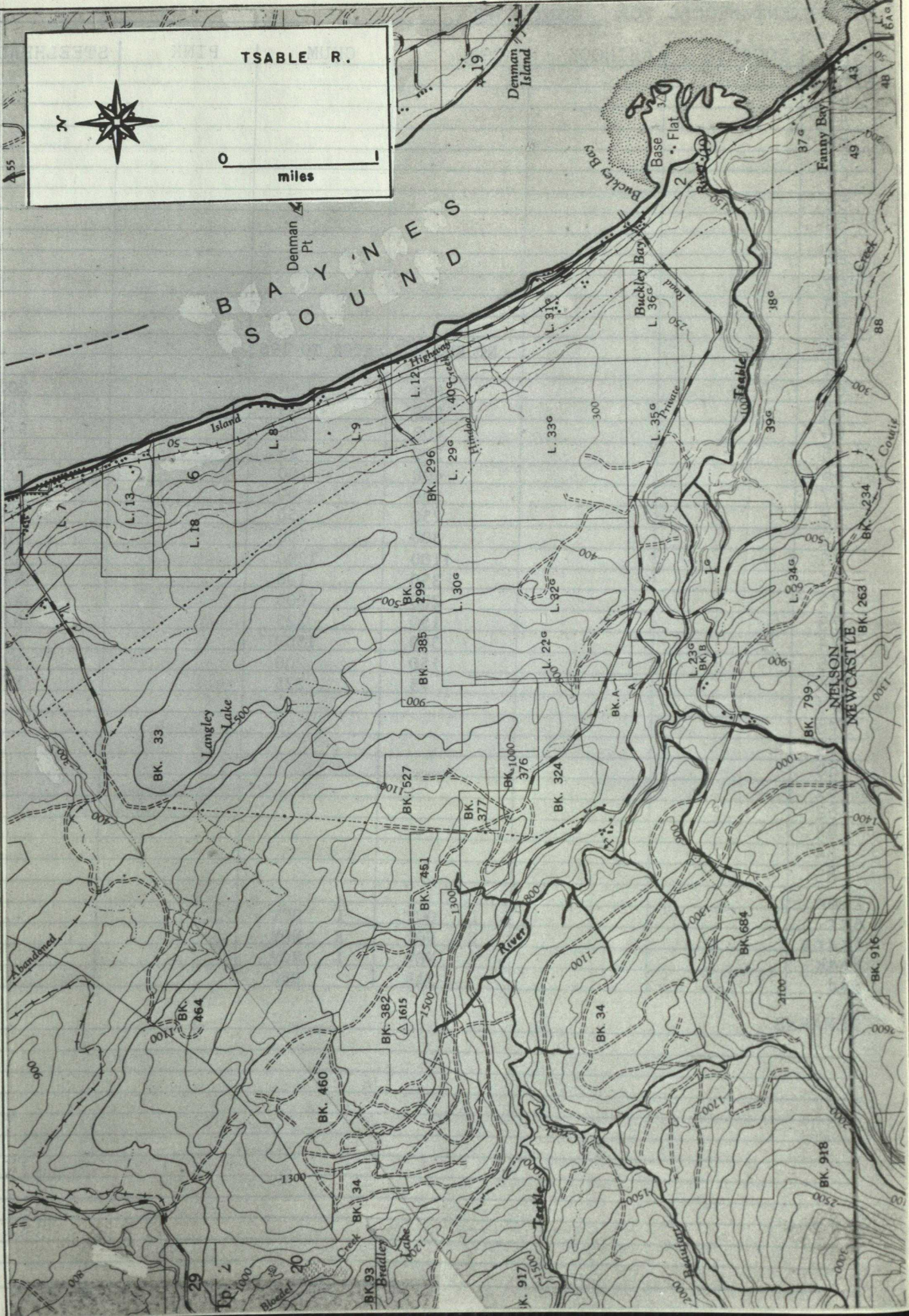
SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	mainly lower reaches
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

- Possibly has potential for rearing juvenile salmon for approx. 5 mi. above falls.

GENERAL REMARKS:

- Upper levels of watershed have been clear logged recently.
- Quote: Salmon Spawning Stream Report F381, 1962. "Several decades ago this stream was poisoned by coal mine effluent which either wiped out or greatly decimated the fish runs."
- Accessible tributaries: Skit Cr., Bloedel Cr.



NAME OF STREAM TSABLE RIVER
 CONSERVATION DISTRICT 3 STATISTICAL AREA 14
 LOCATION OF MOUTH Flows E. into Baynes Sd., Nelson Dist.
 POSITION 49 124 NW.
 LENGTH 3.2 MI. WIDTH 75 FT. DRAINAGE 42.0 SQ. MI.
 COMPOSITION: BEDROCK _____ BOULDER 56 COARSE 19 FINE 19
 SILT & SAND _____ UNCLASSIFIED pools 6

GRADIENT:

FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	0.0 - 2.6 mi.
7.5 - 10.0	
> 10.0	2.6 - 3.2 mi.

WETTED AREA 140800 SQ. YD. SPAWNING AREA 53500 SQ. YD.
 DISCHARGE 277 CFS MAX 8100 cfs 12/12/60 MIN 8.5 cfs 29/08/61

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT

- Impassable falls at 3.2 mi. - 20 ft. vertical drop.

SPAWNING DISTRIBUTION:

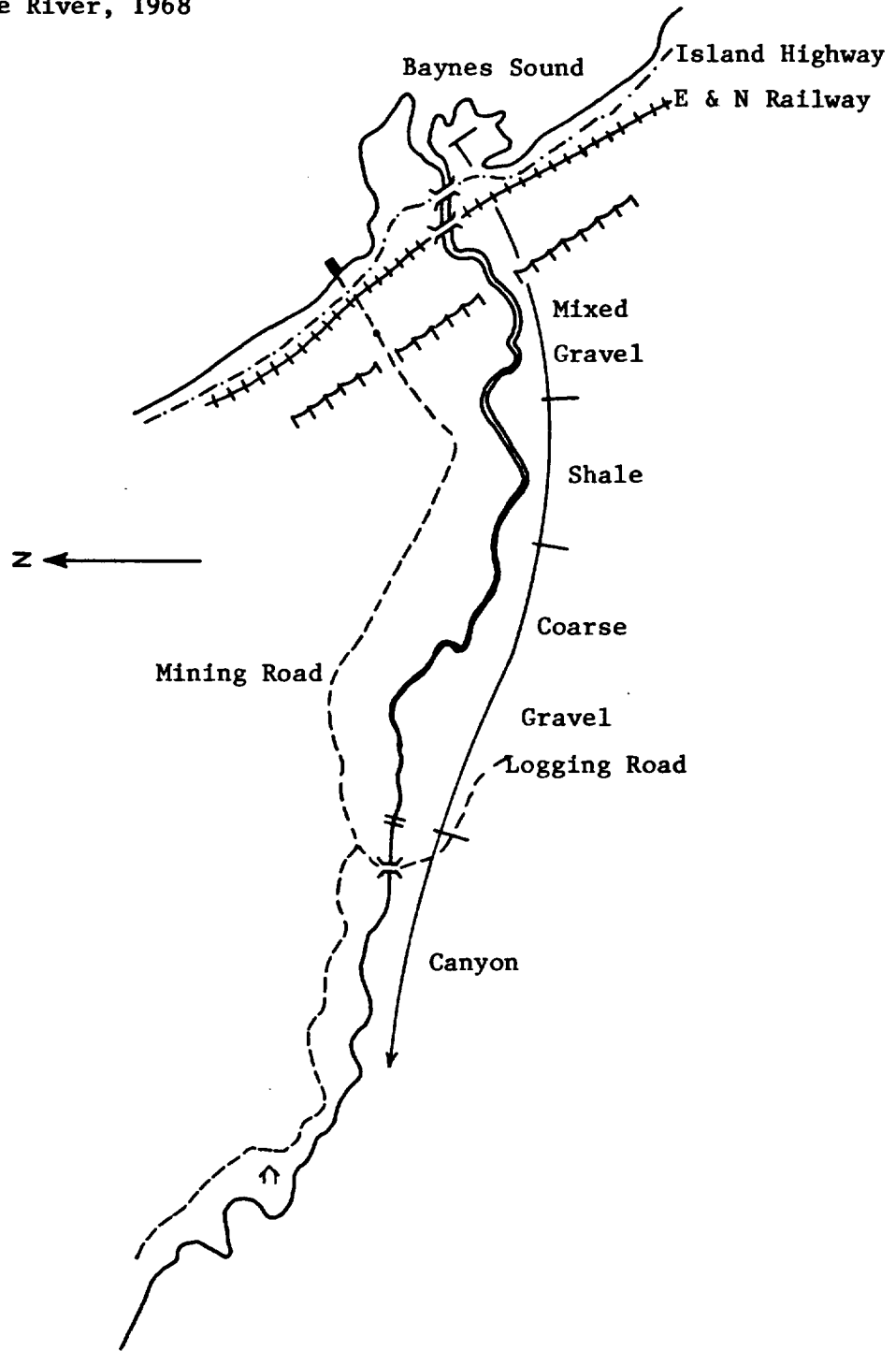
SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	mouth to mid reaches
PINK (ODD YR)	mouth to mid reaches
PINK (EVEN YR)	mouth to mid reaches
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

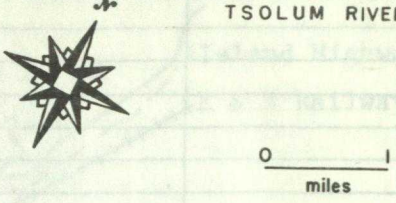
GENERAL REMARKS:

- Headwaters are located in former coal mining area, effluent from mine operation was reported to enter stream at one time, but amount was not sufficient to affect water quality in the lower stream. (files)
- In the fall of 1975 floods caused heavy scouring. Much of the pink and chum spawn and some coho spawn was lost.

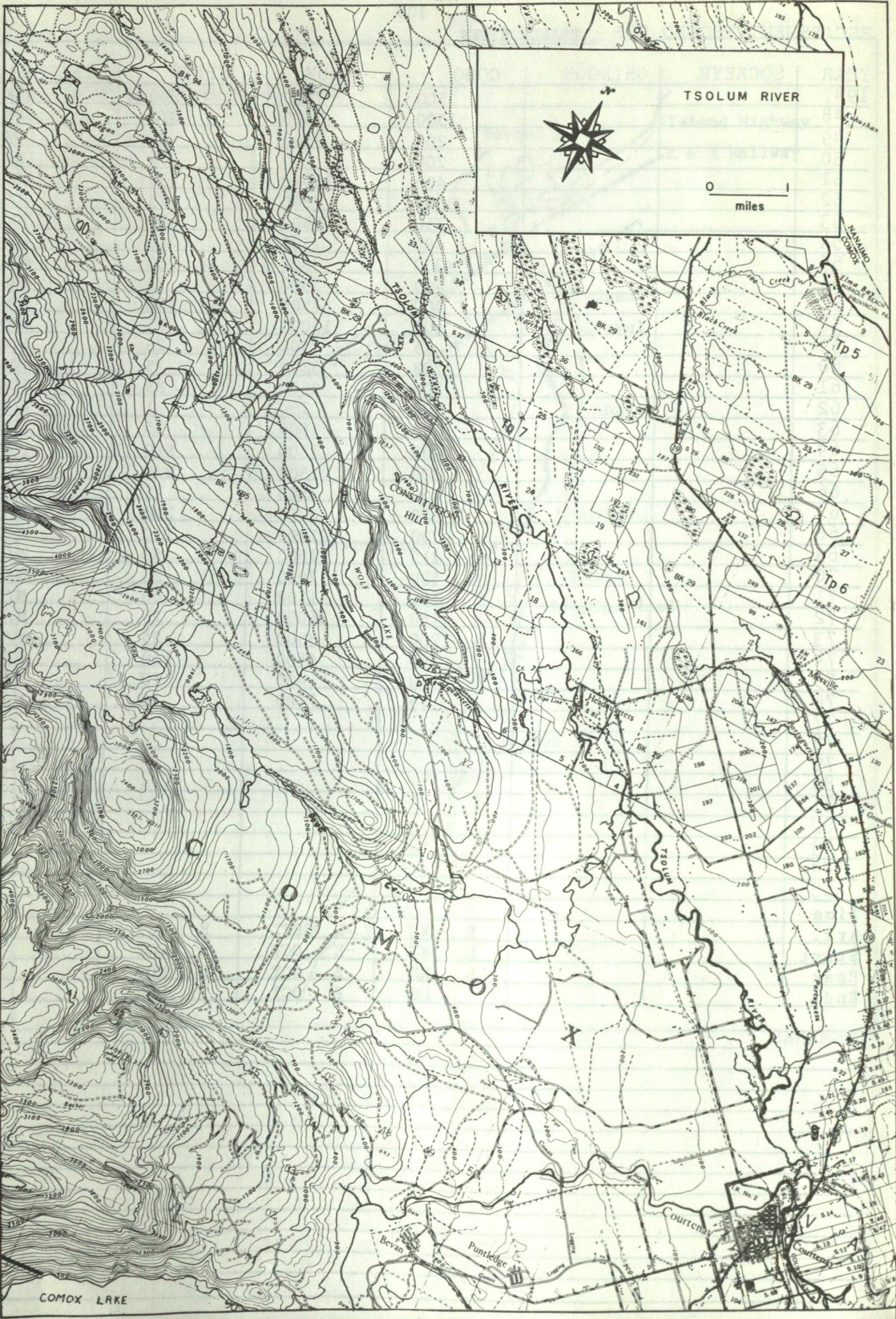
Sketch of Tsable River, 1968



TSOLUM RIVER



0 1
miles



COMOX LAKE

NAME OF STREAM TSOLUM RIVER

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows SE. into Courtenay R., in Courtenay, Comox Dist.

POSITION 49 124 NW.

LENGTH 18.0 MI. WIDTH 72 FT. DRAINAGE 98.0 SQ. MI.

COMPOSITION: BEDROCK 5 BOULDER 38 COARSE 16 FINE 16
 SILT & SAND 1 UNCLASSIFIED pools 24

GRADIENT:

FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	0.0 - 6.5 mi., 9.7 - 16.1 mi.
5.0 - 7.5	6.5 - 9.7 mi.
7.5 - 10.0	
> 10.0	16.1 - 18.0 mi.

WETTED AREA 760320 SQ. YD. SPAWNING AREA 244000 SQ. YD.

DISCHARGE 472 CFS MAX 7340 cfs (inst.) 03/12/65 MIN 0.8 cfs (inst.) 09/08/65

TEMPERATURE see table - page 110

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	
CHUM	lower reaches
PINK (ODD YR)	
PINK (EVEN YR)	mouth to Headquarters and Headquarters Creek (Wolf)
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- The Tsolum River unlike the other main streams in Area 14 flows parallel to the coastal plain and because of this no falls exist on the mainstem. The lower 3 mi. of stream has some flood plain, with a bed composition of gravel and rock compacted by sand and silt. From 3 - 9 mi. very little stable gravel is found with boulders and bedrock predominating. The major gravel deposits are located upstream of 9 mi. Several tributaries draining the higher slopes contain very limited gravel areas. The stream environment has, according to accounts, been severely modified due to various activities of man and rehabilitation by natural processes in the lower half of the watershed does not appear to be possible. Principal problems are: extreme flows, water diversions for domestic and agricultural purposes, lack of good quality

GENERAL REMARKS: (Cont'd)

gravel areas in lower reaches (gravel was removed from the lowermost three miles in 1943 and 1944 for the construction of the Comox Airport) and bank erosion. Low flows occurring in August and September have been observed to inhibit the upstream migration of adult fish resulting in significant mortality in some years. The low flow problem was complicated by the use of some water for the irrigation of adjacent farm land. Restrictive clauses entitling the operator to draw water only in the period of April 1 - July 31 is written into some licences. High flows occurring in the late fall and winter months are reported to scour the stream.

- A concrete dam and control works were installed at the outlet of Wolf Lake, a tributary to the Tsolum River, in 1964 to release up to 25 cfs for six weeks and thus supplement the Tsolum River runoff during the migration and spawning of the pink salmon population. The Wolf Lake flow enters the Tsolum River 10 mi. from the estuary of the Tsolum River.
- The Fisheries Research Board of Canada commenced a hatchery research program on Wolf (Headquarters) Cr., a tributary of the Tsolum River in 1968 to evaluate incubation techniques. Operations ceased in 1972.
- Accessible tributaries: Portuguese Cr., Headquarters Cr., Dove Cr., L. Tsolum River.

References:

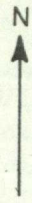
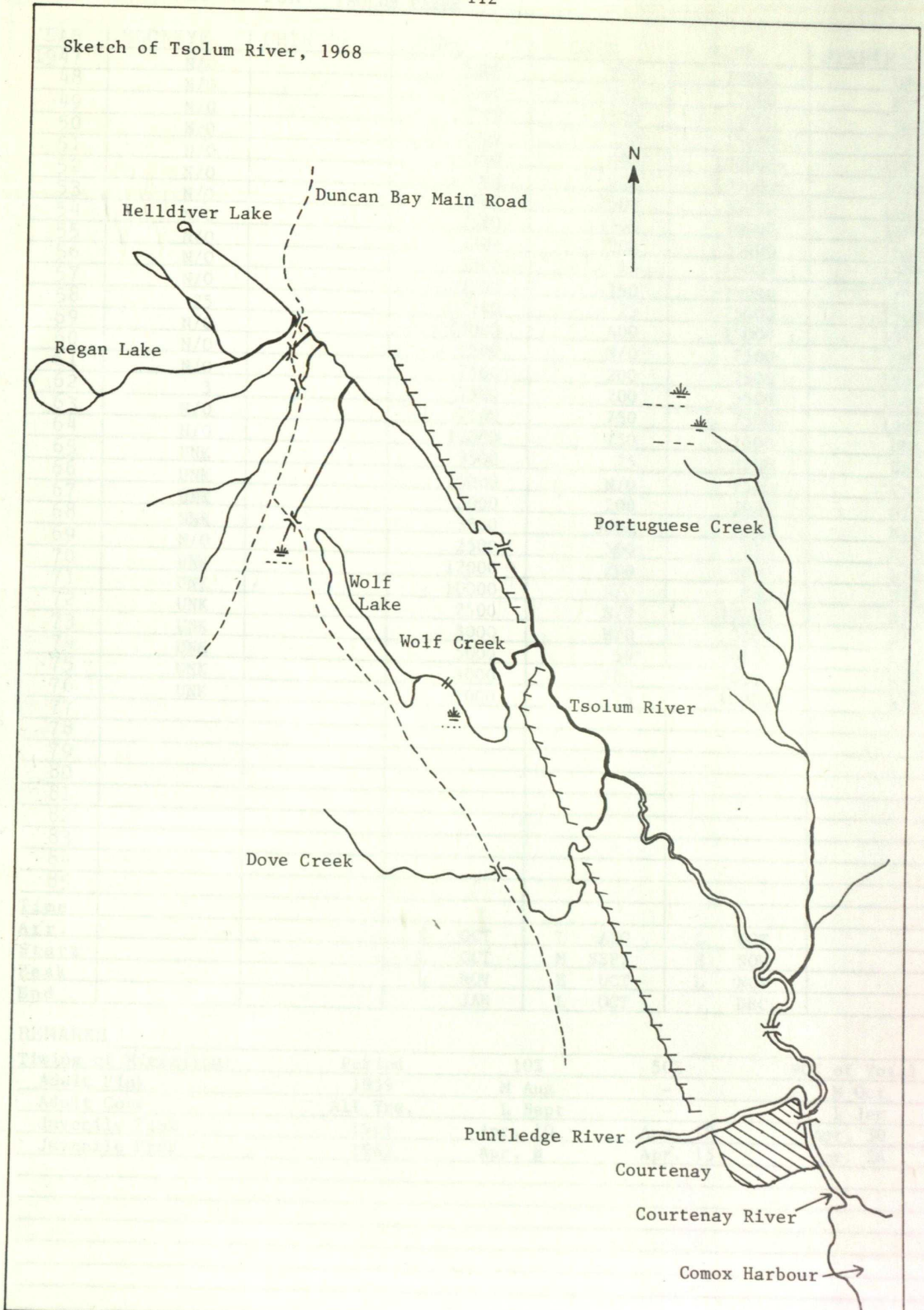
Bams, R.A. MS 1973. Evaluation of gravel incubators on first "hatchery" generation Tsolum River pink salmon, 1970-1972. Part I: Evaluation at the fry stage. Fish. Res. Board Can. Tech. Rep. 364: 18p.

MS 1973. Evaluation of gravel incubators on first "hatchery" generation Tsolum River pink salmon, 1970-1972. Part II: Evaluation at the adult stage. Fish. Res. Board Can. Tech. Rep. 405: 17p.



Stream sections between 2 and 3 miles from mouth

Sketch of Tsolum River, 1968



Helldiver Lake

Duncan Bay Main Road

Regan Lake

Portuguese Creek

Wolf Lake

Wolf Creek

Tsolum River

Dove Creek

Puntledge River

Courtenay

Courtenay River

Comox Harbour

ESCAPEMENT RECORD FOR TSOLUM RIVER

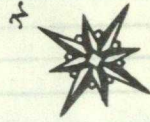
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	N/O		7500	750	75000	UNK
48	N/O		3500	750	15000	UNK
49	N/O		7500	1500	15000	UNK
50	N/O		7500	750	15000	750
51	N/O		7500	400	100000+	1500
52	N/O		15000	400	100000+	1500
53	N/O		7500	1500	35000	1500
54	N/O		7500	1500	75000	3500
55	N/O		3500	200	35000	1500
56	N/O		7500	75	15000	1500
57	N/O		7500	750	75000	750
58	25		7500	25	75000	1500
59	N/O		15000	400	15000	1500
60	N/O		7500	N/O	7500	UNK
61	N/O		7500	200	7500	1500
62	3		7500	200	3500	1500
63	N/O		7500	750	7500	1500
64	N/O		15000	750	1500	UNK
65	UNK		3500	75	3500	UNK
66	UNK		15000	N/O	7500	UNK
67	UNK		3000	200	3000	N/O
68	UNK		3800	5000	5525	N/O
69	N/O		2500	500	200	N/O
70	UNK		12000	200	6880	N/O
71	UNK		10000	N/O	800	N/O
72	UNK		2500	N/O	10000	N/O
73	UNK		3000	N/O	3368	N/O
74	UNK		5000	50	10100	N/O
75	UNK		3000	200	10000	N/O
76	UNK		1000	75	10000	N/O
77						
78						
79						
80						
81						
82						
83						
84						
85						
Time						
Arr.			E OCT	L AUG	L OCT	
Start			L OCT	M SEPT	E NOV	
Peak			L NOV	E OCT	L NOV	
End			JAN	L OCT	DEC	

REMARKS

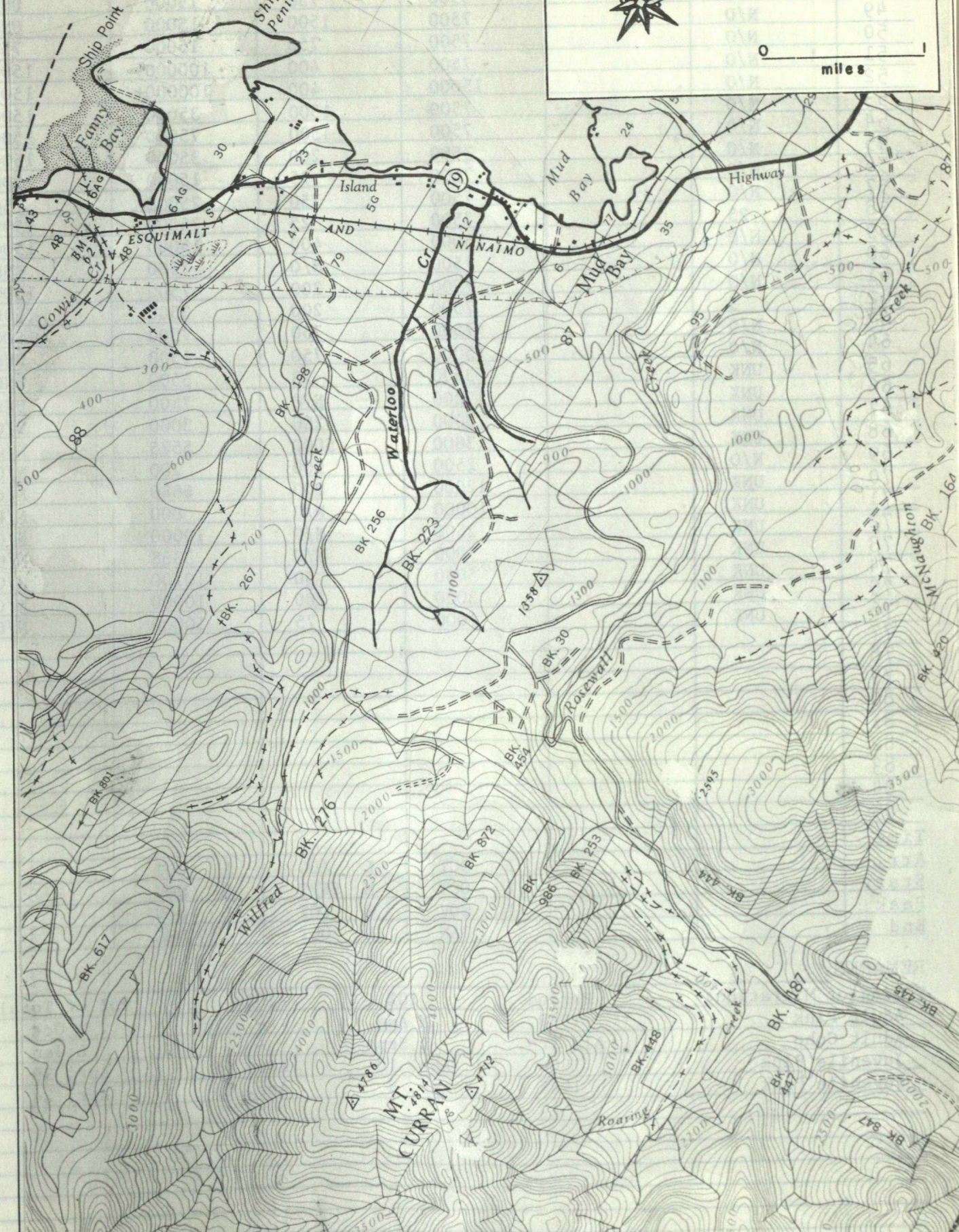
Timing of Migration:	Period	10%	50%	90% of Total
Adult Pink	1959	M Aug	-	M Oct
Adult Coho	All Yrs.	L Sept	-	L Jan
Juvenile Pink	1964	Apr. 10	Apr. 18	Apr. 30
Juvenile Pink	1965	Apr. 8	Apr. 15	Apr. 24

BAYNES SOUND

WATERLOO CR.



0 miles



NAME OF STREAM WATERLOO CREEK

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows E. into Baynes Sd., N. of Mud Bay, Newcastle Dist.

POSITION 49 124 SW.

LENGTH 2.0 MI. WIDTH 18 FT. DRAINAGE 3.2 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER 75 COARSE 13 FINE 12

SILT & SAND _____ UNCLASSIFIED _____

GRADIENT:

FALL IN FT/000

0.0 - 2.5

2.5 - 5.0

5.0 - 7.5

7.5 - 10.0

> 10.0 throughout

WETTED AREA 21120 SQ. YD. SPAWNING AREA 5300 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT _____

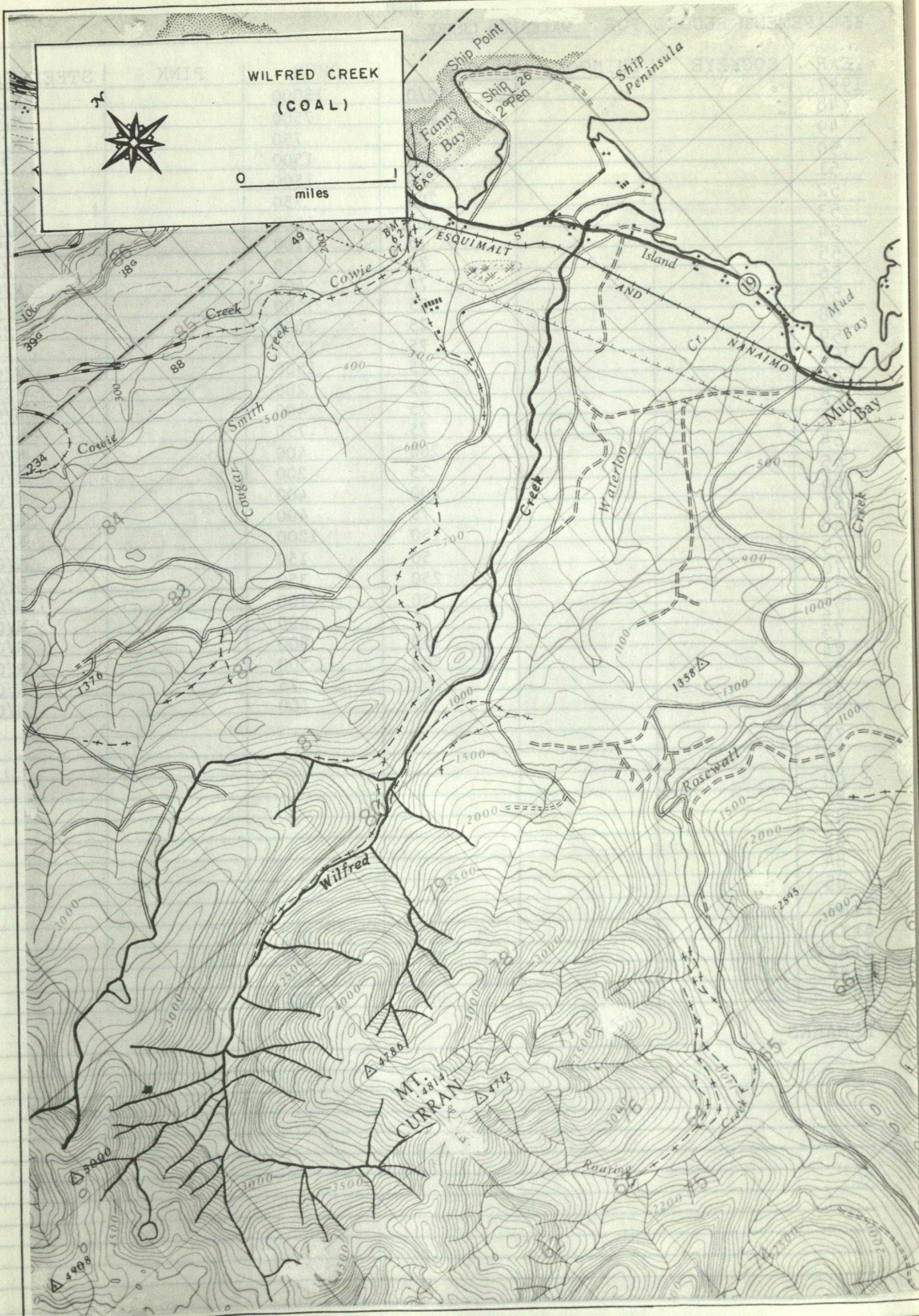
SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	mainly lower reaches - mouth to railroad bridge (.5 mi.)
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- In 1975, high floods moved considerable gravel and coho redds were washed out.
- The mouth of the stream bed is usually dry from summer until late Oct. (1975)



WILFRED CREEK
(COAL)



0 1
miles

ESQUIMALT

AND

CT. NANAIMO

MT. CURRAN

4786

4712

1538

4998

3000

1376

84

386

2

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

NAME OF STREAM WILFRED CREEK (Coal Creek)

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows NE. and SE. into Baynes Sd., N. of Mud Bay, Newcastle

Dist. _____ POSITION 49 124 SW.

LENGTH 2.4 MI. WIDTH 39 FT. DRAINAGE 12.8 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER 47 COARSE 27 FINE 23

SILT & SAND _____ UNCLASSIFIED pools 3

GRADIENT:

FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	throughout

WETTED AREA 54912 SQ. YD. SPAWNING AREA 27400 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE see table - page 110

BARRIERS OR POINTS OF DIFFICULT ASCENT
- Impassable falls at 2.4 mi. - 20 ft. vertical drop.

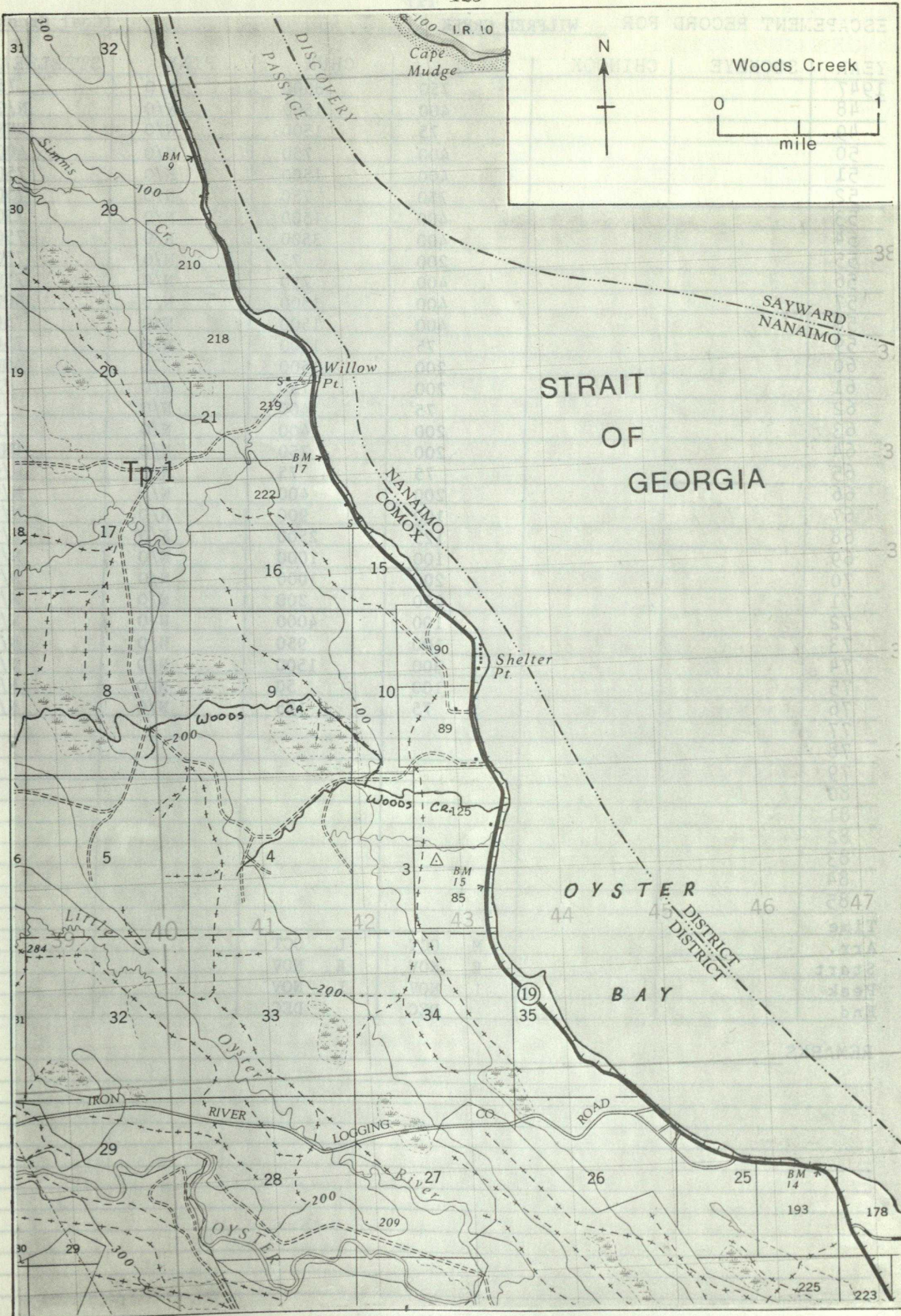
SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	mouth - 1.5 mi.
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- Site of a pink salmon transplant in 1958. Adult pinks were transferred from the Tsolum River and allowed to spawn naturally. Returns for the F1 generation were <.01 percent of the egg deposition.
- Usually acute low water flows each summer.



NAME OF STREAM _____ (Woods Creek)

CONSERVATION DISTRICT 3 STATISTICAL AREA 14

LOCATION OF MOUTH Flows E. into Oyster Bay, E. side of Vancouver I., Comox Dist.

POSITION 49 125 NE.

LENGTH 4.0 MI. WIDTH _____ FT. DRAINAGE _____ SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER _____ COARSE _____ FINE _____
SILT & SAND _____ UNCLASSIFIED _____

GRADIENT:

FALL IN FT/000

0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	

WETTED AREA _____ SQ. YD. SPAWNING AREA _____ SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE _____

BARRIERS OR POINTS OF DIFFICULT ASCENT

- Beaver dams and old logging debris .5 mi. and on upstream - broached as required.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	throughout
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

- Although water levels are extremely low and the stream bed is dry at the mouth during the summer, the fry survive in the swampy ponds. (1970-1974)
- Floods do little damage because of the low gradient of the stream bed. (1975)
- Remarks are also applicable to Storie Creek. (1972-1975)

ESCAPEMENT RECORD FOR WOODS CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Time						
Arr.			L	OCT		
Start			E	NOV		
Peak			L	NOV		
End				DEC		

NO RECORDS PRIOR TO 1970

300
350
250
200
300
200
75

REMARKS

- Escapement records from 1972 - 1976 include Storie Creek.

METRIC EQUIVALENTS

<u>Length</u>			<u>Area</u>		
cm.	=	.3937 in.	sq. cm.	=	.1550 sq. in.
meter	=	3.28 ft.	sq. m.	=	10.76 sq. ft.
meter	=	1.094 yd.	sq. m.	=	1.196 sq. yd.
kilometer	=	.621 mi.	sq. km.	=	.386 sq. mi.
inch	=	2.54 cm.	sq. in.	=	6.45 sq. cm.
foot	=	.3048 m.	sq. ft.	=	.0929 sq. m.
yard	=	.9144 m.	sq. yd.	=	.836 sq. m.
mile	=	1.61 km.	sq. mi.	=	2.59 sq. km.
			acre	=	.405 ha.
			hectare	=	2.47 acres
			acre	=	43560 sq. ft.

<u>Volume</u>			<u>Capacity</u>		
cu. cm.	=	.061 cu. in.	liter	=	.0353 cu. ft.
cu. m.	=	35.315 cu. ft.	liter	=	.21998 gal. (Br.)
cu. m.	=	1.308 cu. yd.	liter	=	61.023 cu. in.
cu. in.	=	16.38 cu. cm.	cu. in.	=	.0164 l.
cu. ft.	=	.028 cu. m.	cu. ft.	=	28.32 l.
cu. yd.	=	.7645 cu. m.	gallon	=	4.5459 l. (Br.)

Weight

gram	=	15.432 grs.	ounce	=	28.35 g.
gram	=	.0353 oz.	pound	=	.454 kg.
kilogram	=	2.2046 lbs.	ton (sht)	=	907.18 kg.
kilogram	=	.0011 ton (sht)	ton (sht)	=	.907 met. ton
met. ton	=	1.1025 ton (sht)	ton (sht)	=	2000 lbs.
grain	=	.0648 g.			

Degrees Centigrade = $5/9$ (Degrees Fahr. - 32)

Degrees Fahrenheit = $9/5$ (Degrees Cent.) + 32

WATER QUANTITIES AND FLOW MEASUREMENT

1 cubic foot per second (cfs) or second foot	=	373.2 gallons per min. (gpm)
1 cubic foot per second (cfs) or second foot	=	.537408 million gallons
1 second foot	=	approx. 2 acre-feet per day
1 second foot	=	86400 cubic feet per day
1 million gallons per day	=	1.86 cfs
1 acre-foot	=	43560 cubic feet or 271379 gal.
1 cubic foot of water	=	6.23 gal. and weighs 62.4 lbs.
1 cubic meter per second	=	35.31 cubic feet per second (cfs)
1 meter per second	=	3.28 feet per second
1233.5 cubic meters	=	1 acre-foot

