CATALOGUE OF SALMON SPAWNING STREAMS AND ESCAPEMENT POPULATIONS STATISTICAL AREA No. 1 PACIFIC REGION

ID FORESTRY

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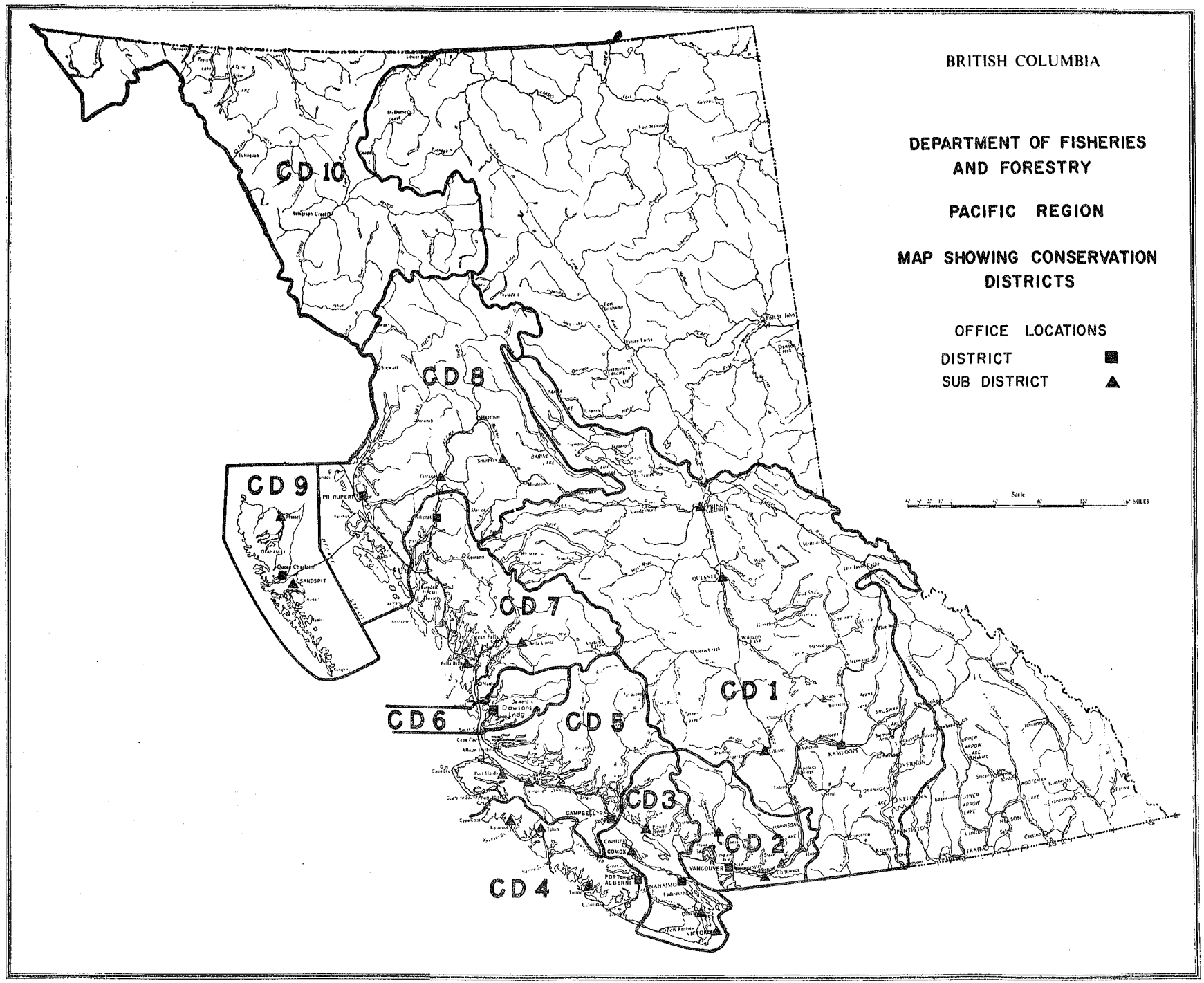
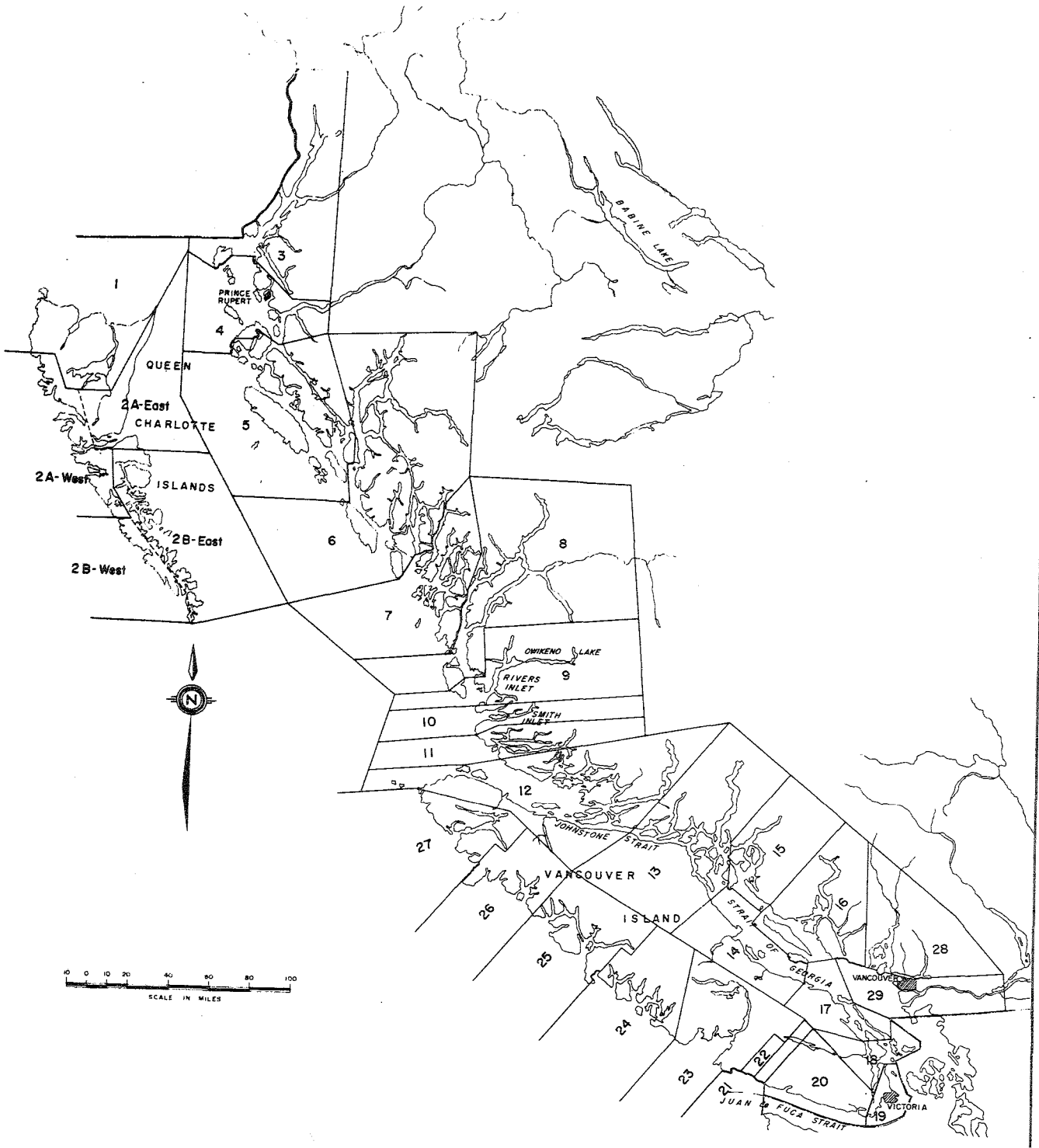
DEPARTMENT OF FISHERIES AND FORESTRY
VANCOUVER, B.C.
1971


BRITISH COLUMBIA
DEPARTMENT OF FISHERIES AND FORESTRY
PACIFIC REGION
MAP SHOWING CONSERVATION DISTRICTS
OFFICE LOCATIONS
DISTRICT
SUB DISTRICT
CD 10
CD 8
CD 9
CD 7
CD 6
CD 5
CD 1
CD 3
CD 2
CD 4
PR RUPERT
SANDSPIT
Dawsons Landg
KAMLOOPS
VERNON
KELOWNA
CAMPBELL R.
COMOX
PORT ALBERNI
NANAIMO
VANCOUVER
VICTORIA
Scale
MILES

STATISTICAL AREAS
PACIFIC REGION



CONTENTS

INTRODUCTION

This booklet reports on the streams and spawning populations in the northern region of Graham Island which, for salmon management purposes, is defined as Statistical Area I. Graham Island is a major part of the Queen Charlotte Island Group.

The Queen Charlotte Islands is a group of approximately 150 islands situated between latitudes 52° and 54° 10" and removed from 50 to 75 miles from the mainland. The two main islands, Graham and Moresby, represent nine-tenths of the combined land mass of 3,600 square miles. The islands can be divided into three physiographic units: (a) Queen Charlotte Ranges; (b) Skidegate Plateau; and (c) Queen Charlotte Lowlands (map, page 4).

The mountain ranges are rugged and much dissected; the highest peaks are 4,000 feet above sea level but generally the peaks are between 2,500 and 3,500 feet. The mountains cover practically all of the southern islands and extend into the south-west corner of Graham Island. The plateau area consists of table-topped hills and flat ridges. The lowland is undulating country of coniferous forests and raised bogs dissected by sluggish moving streams. The bogs are underlain by a mantle of unconsolidated glacial sands and silts.

The main distinguishing features of the climate are the very cool summers, very mild winters (freezing temperatures are rare) prevalence of cloudy skies and strong winds, and late fall and early winter rainfall. Annual precipitation varies from 200 inches on some western slopes to less than 50 inches on the eastern side of the mountains.

The majority of streams are located in the mountain range and, consequently, are relatively short, steep, and experience high maximum-minimum runoff ratios. The largest and most stable watersheds are located in the north-east area of Graham Island where gradient and rainfall are low. The intermediate type of streams are found in the plateau area.

The general development of the area has been based on logging and fishing and more recently (1960) on mining. However, the first natural resource of the area to be exploited was the sea otter, which was hunted to extinction within thirty years following discovery by European explorers in the 1780's. For three quarters century following the fur trade, prospectors occasionally visited the Queen Charlotte Islands, but no sustained industry resulted.

Logging initially got underway on somewhat of a large scale during the first world war when the sitka spruce was selectively logged and is now the principal industry. Since that time cutting has been less selective and, consequently, forests of western hemlock and red cedar as well as spruce have been

exploited. This is particularly so within the plateau area. However, stands of timber in the mountain range and lowland areas have also been cut. Following forest removal intensified flash flooding has left some small and steep gradient streams with bouldery beds, e.g. Pacofi, Dana and Chadsey. The low gradient streams containing gravelled banks have rehabilitated through natural processes and appear to be highly productive today (Mathers Creek, Sedgwick Bay Creek and Copper River). The effects of logging are very apparent in some watersheds as shown by broken stream banks, debris in the streams, and stream bed crossings. A harmful practice associated with this industry has been the removal of stream gravel for road construction (see report on page 86). Today, logging companies in this area are generally co-operating with the Department by placing some controls on their activities in order to protect the stream environment.

Commercial fishing has been carried on for one-half century. The chum and pink salmon account for approximately three-quarters of the Island catch (see report on page 81).

Mining on a big scale, is a relatively new industry, and has been centered on Jedway and Tasu. Operations were commenced here in 1962 and 1968 respectively. The Jedway operation was terminated in 1968.

The Islands are settled by approximately 5,000 persons who are largely concentrated in Queen Charlotte City, Masset and a number of industrial sites.

Biological studies carried out in the area are as follows:

1931 - 1940 - Fisheries Research Board; natural propagation of pink salmon at McClinton Creek and pink salmon transplantation experiments. (Tlell, McClinton).

1949 - 1950 - Fisheries Research Board; Masset Inlet, pink salmon fry emigration and timing (Mamin River, Datlamen River).

1961 - 1962 - Department of Fisheries; survey of more than 70 streams, lengths and scales taken on chum salmon spawners in Statistical Area 2B east.

1964 - 1969 - Department of Fisheries; assessment of the Yakoun River adult and juvenile pink salmon populations; gravel removal on the Mamin and Yakoun Rivers, spawner abundance and distribution observed on some of the important streams.

Fisheries development:

Naden River: two fishways were completed at Naden Falls in 1957 to provide improved access for sockeye, coho, pink and chum salmon.

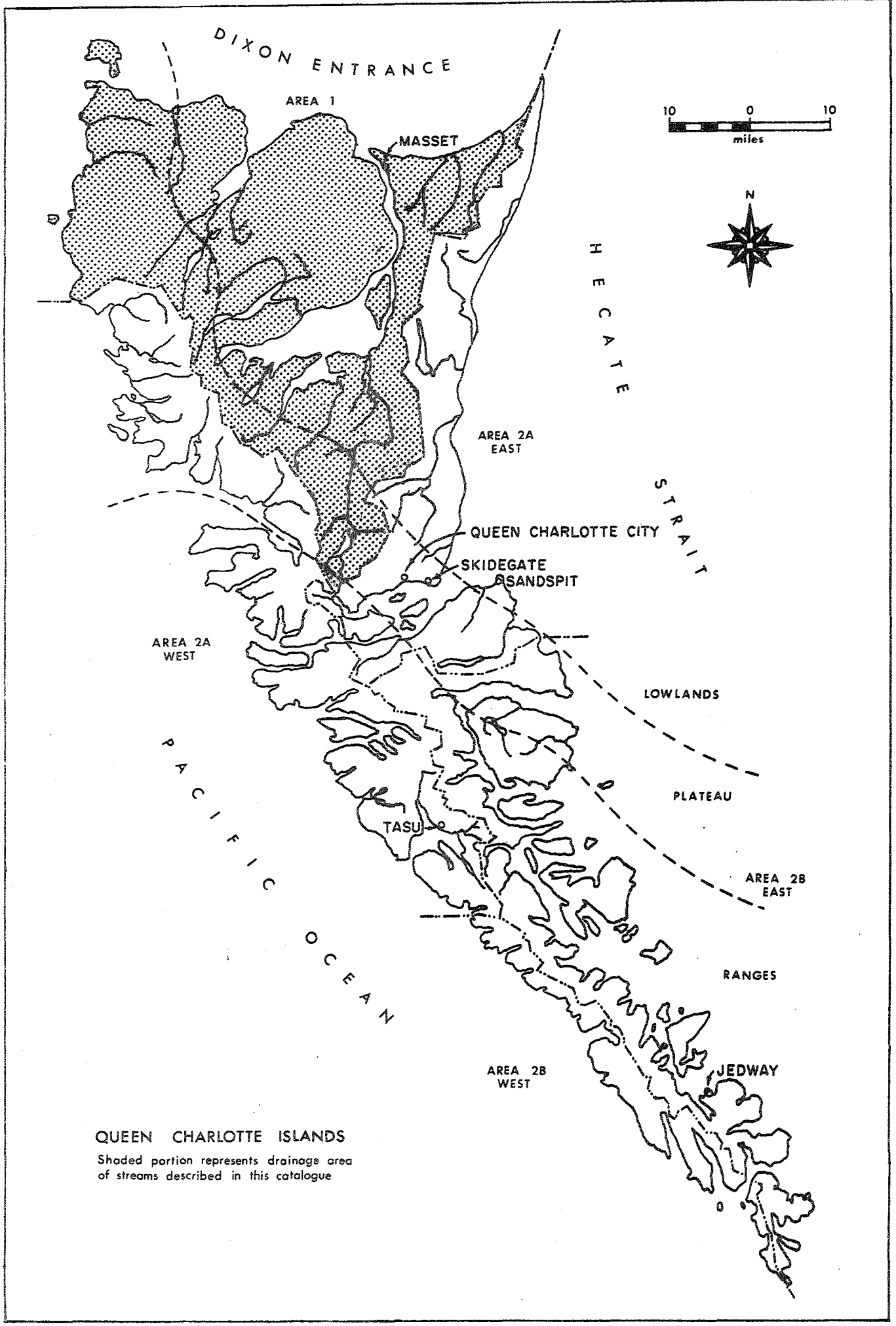
Sources of information:

Anon. 1961. The Prince Rupert-Smithers Bulletin Area. Bull. Province of British Columbia Lands Service 8:80 pp.

Brown, A. Sutherland, 1968. Geology of Queen Charlotte Islands, British Columbia. Bull. B. C. Department of Mines and Petroleum Resources 54:226 pp.

Calder, James A. and Roy L. Taylor. 1968 Flora of the Queen Charlotte Islands. Part 1. Monograph No. 4 Part 1. Can. Department of Agriculture 659 pp.

Holland, Stuart S. 1964. Landsforms of British Columbia. A physiographic outline. Bull. British Columbia Department of Mines and Petroleum Resources 48:138 pp.

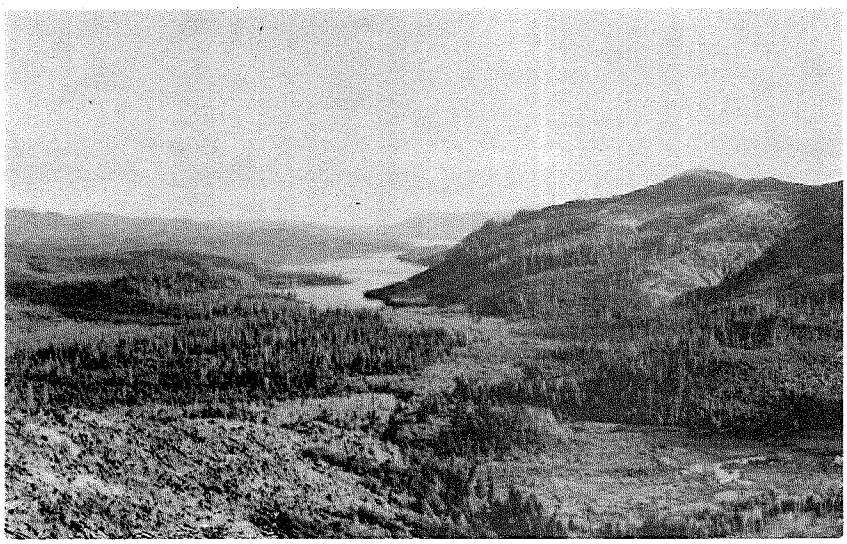


QUEEN CHARLOTTE ISLANDS

Shaded portion represents drainage area of streams described in this catalogue

PHYSIOGRAPHIC TYPES QUEEN CHARLOTTE ISLANDS

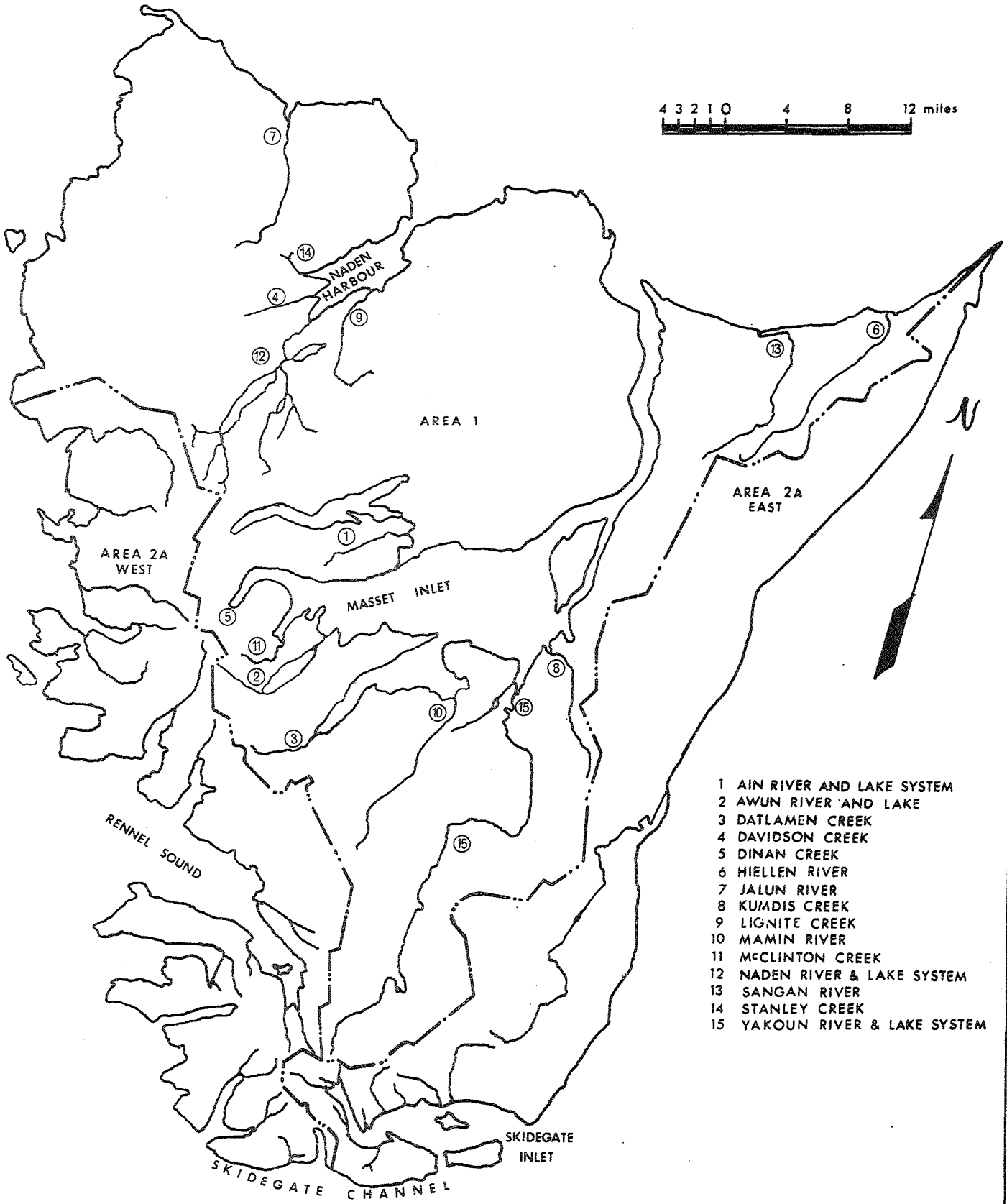
Lowland



Plateau

Mountain

SALMON SPAWNING STREAMS
STATISTICAL AREA 1



MAP REFERENCES

Roads:

hard surface, all weather — more than 2 lanes

hard surface, all weather — 2 lanes — Route No. 18 — less than 2

loose surface, all weather — 2 lanes wide or more

" *less than 2 lanes* — all weather — dry weather

Private Road, Trail — Private Road — Trail

Railways:

normal gauge, multiple track — Station

normal gauge, single track — Stop — Siding

abandoned, or under construction

narrow gauge, single track

Bridge, underpass or overpass

Tunnel

Boundary, International

" *Province*

" *County or District*

" *Township or Parish*

" *City or Town*

" *Reservation, Indian, Military, etc*

Power Transmission Line

Telephone or Telegraph, trunk route

Horizontal Control Point △

Boundary Marker ⊡

Bench Mark BM 5252

Spot Elevation, (in feet) · 4254

Mine or Pit

House, Building

School S

Church +

" *with conspicuous Tower or Spire*

Post Office P

Tower, Radio Mast, Lookout, etc. ⊙

Cemetery Cem

Quarry

Sand or Gravel Pit

Cliff

Cutting

Embankment

Saw Mill SM

Lighthouse

Wharf or Pier

Foreshore Flats — Sand — Mud

Swamp or Marsh

Lake or Pond, intermittent

Glacier or Snowfield

Stream, intermittent

Irrigation Canals, Ditches

Inundated Land, seasonal

Contours, elevation

" *depression*

" *approximate*

Roads:

hard surface, all weather — more than 2 lanes — 2 lanes

hard surface, all weather — less than 2 lanes

loose surface, all weather — 2 lanes or more — less than 2 lanes

loose surface, dry weather

winter; cart track — Winter road

trail or portage

Railways:

normal gauge, multiple track — Station

normal gauge, single track — Siding — Stop

narrow gauge, single track

abandoned or under construction

Bridges: road; railway

Boundaries:

international, with monument

township surveyed; unsurveyed

municipality

park, reserve, etc.

section line and number — 18

lot line and number — L 48

Horizontal control point, with elevation — 454 △

Bench mark, with elevation — BM 157 →

Mine or Open cut ⚒ — Lighthouse

Building; Barn — School; Post Office — P

Church — Cemetery — C

Built up area

Power transmission line

Streams:

intermittent or dry

indefinite

Lake intermittent; indefinite

Inundated land, seasonal

Marsh or Swamp

Foreshore flats — Sand

Wharf or Pier; Breakwater

Rocky reef

Small island, rock bare or awash *

Contours:

elevation — 3000

depression

approximate

Cliff

Cutting; Embankment

Barriers and points of difficult ascent ➤

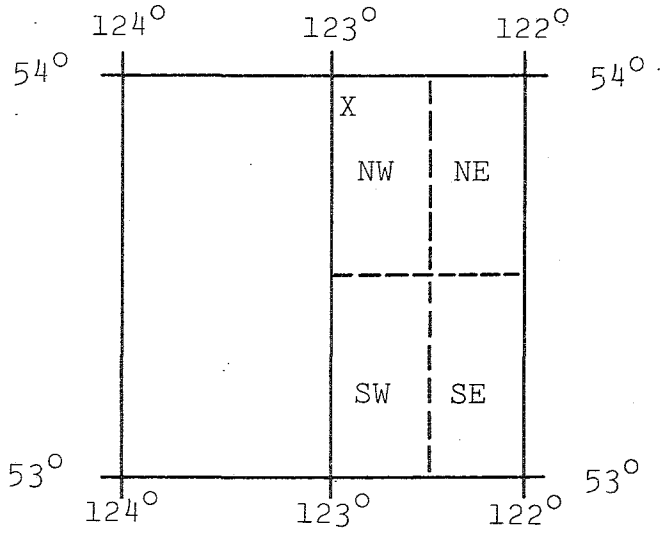
STANDARDS USED ON DESCRIPTION PAGE

NAME OF STREAM: Name given in Gazetteer of Canada - British Columbia; other names are added in lower case type.

CONSERVATION DISTRICT: As defined by the Conservation and Protection Service (APR 1965).

STATISTICAL AREA: As defined by Department of Fisheries statistical map (JUN 1957).

LOCATION OF MOUTH AND POSITION: Position is defined by quandrant indexing. Each geographical quadrilateral of the earth's surface of 1 degree in extent in latitude and longitude is divided into the SE, SW, NE and NW quarters. The south-east corner of each quadrilateral gives the initial point for the figures of reference (Gazetteer of Canada - British Columbia).



EXAMPLE "X"
53° 122° NW

LENGTH: Measured in miles and tenths of a mile from the mouth to a point beyond which 1% of the spawning population of any species fails to spawn profitably. Does not include tributary streams.

WIDTH: Average width, estimated to nearest foot, for the described length.

DRAINAGE: Area in square miles of the entire drainage basin feeding the stream.

COMPOSITION: Percentage occurrence of the listed categories for the wetted stream bed at average water levels within the described length.

Bedrock	bedrock
Boulder	>256 mm (>10")
Coarse	50.9 - 256 mm (2 - 10")
Fine	3.37 - 50.8 mm (1/8 - 2")
Sand & Silt	sand and silt
Unclassified	where bottom cannot be observed, e.g., log jams, pools, water colour, etc.

GRADIENT: Average vertical drop per thousand linear feet.

WETTED AREA: Number of square yards of stream bed under water at average flows within the described length.

SPAWNING AREA: Estimated number of square yards of stream bed suitable for salmon spawning within the described length. See following page.

DISCHARGE: Mean annual discharge near the mouth of the stream. Maximum and minimum values are either daily means or instantaneous discharges. The latter are identified by "inst" (Surface Water Data, Inland Waters Branch, DEMR). On streams lacking water records, estimates of flow at the time of spawning for the principal species and at the time of minimum summer runoff were obtained by survey crews.

WATER TEMPERATURE: As described on data page for individual stream.

BARRIERS AND POINTS OF DIFFICULT ASCENT: Complete and partial barriers to salmon, and their distance from the stream mouth. Species likely to be affected may be listed.

SPAWNING DISTRIBUTION: Distribution is indicated by comments on stream data page.

POTENTIAL OF INACCESSIBLE PORTION OF STREAM: Theoretical number of adult fish in the total return (catch and escapement) produced by the inaccessible area based on the following criteria:

Sockeye	10,000 fish per square mile of lake surface
Coho	700 fish per linear mile of lakes and streams
Chum	1½ fish per square yard of spawning area
Pink	3 fish per square yard of spawning area
Chinook	No estimates

GENERAL REMARKS: Emphasizes features of streams and of spawning populations. Also includes industrial activity, routes of accessibility, etc. .

ESCAPEMENT RECORD: The escapement represents the mid point of the coded range of escapement for each species. For example, 5,000 - 10,000 would be entered as 7,500. Where absolute numbers are provided by Department of Fisheries personnel, these numbers are entered. N.O. means no fish observed; UNK means some fish were seen but no estimate made.

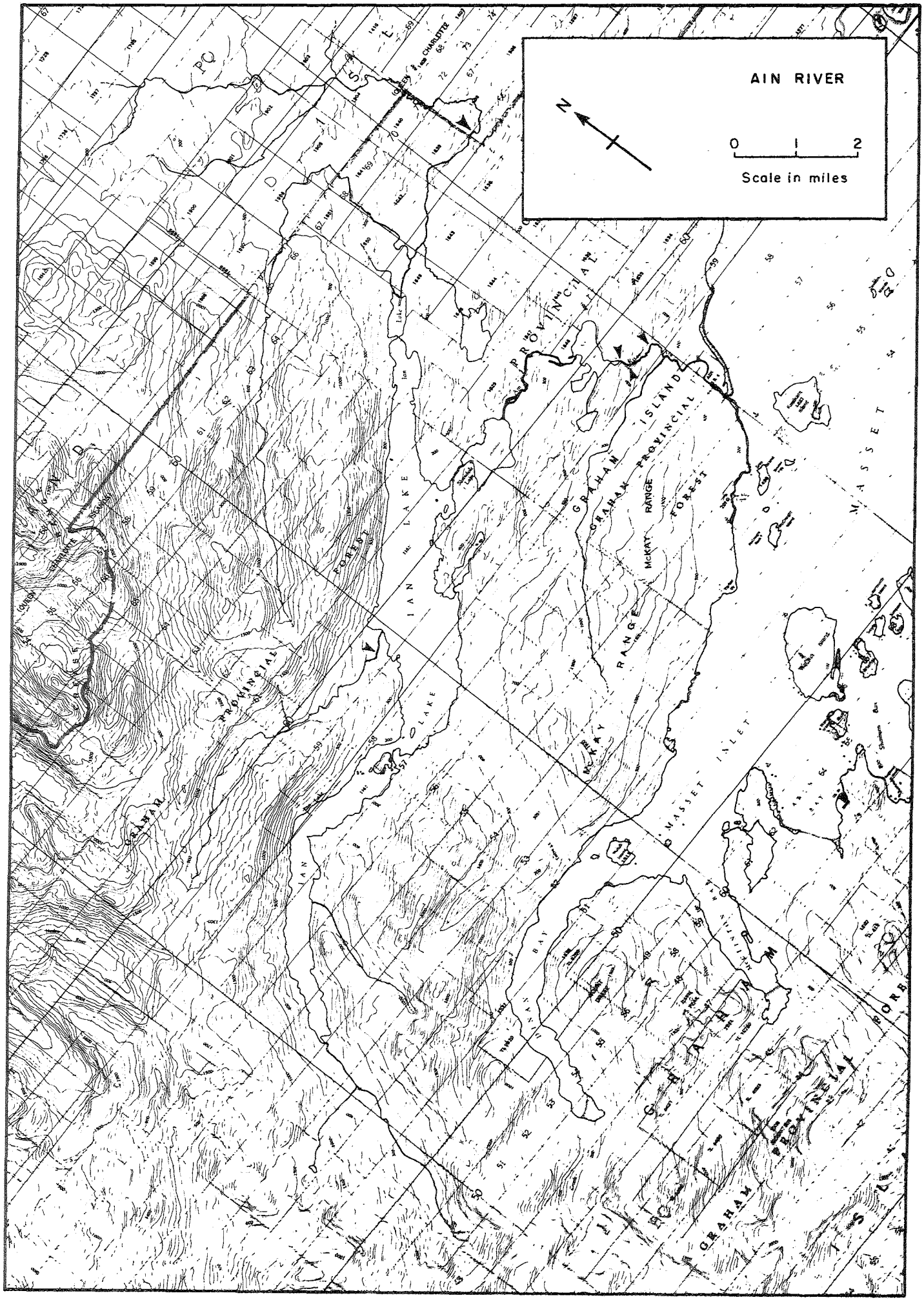
The timing is in reference to spawning.

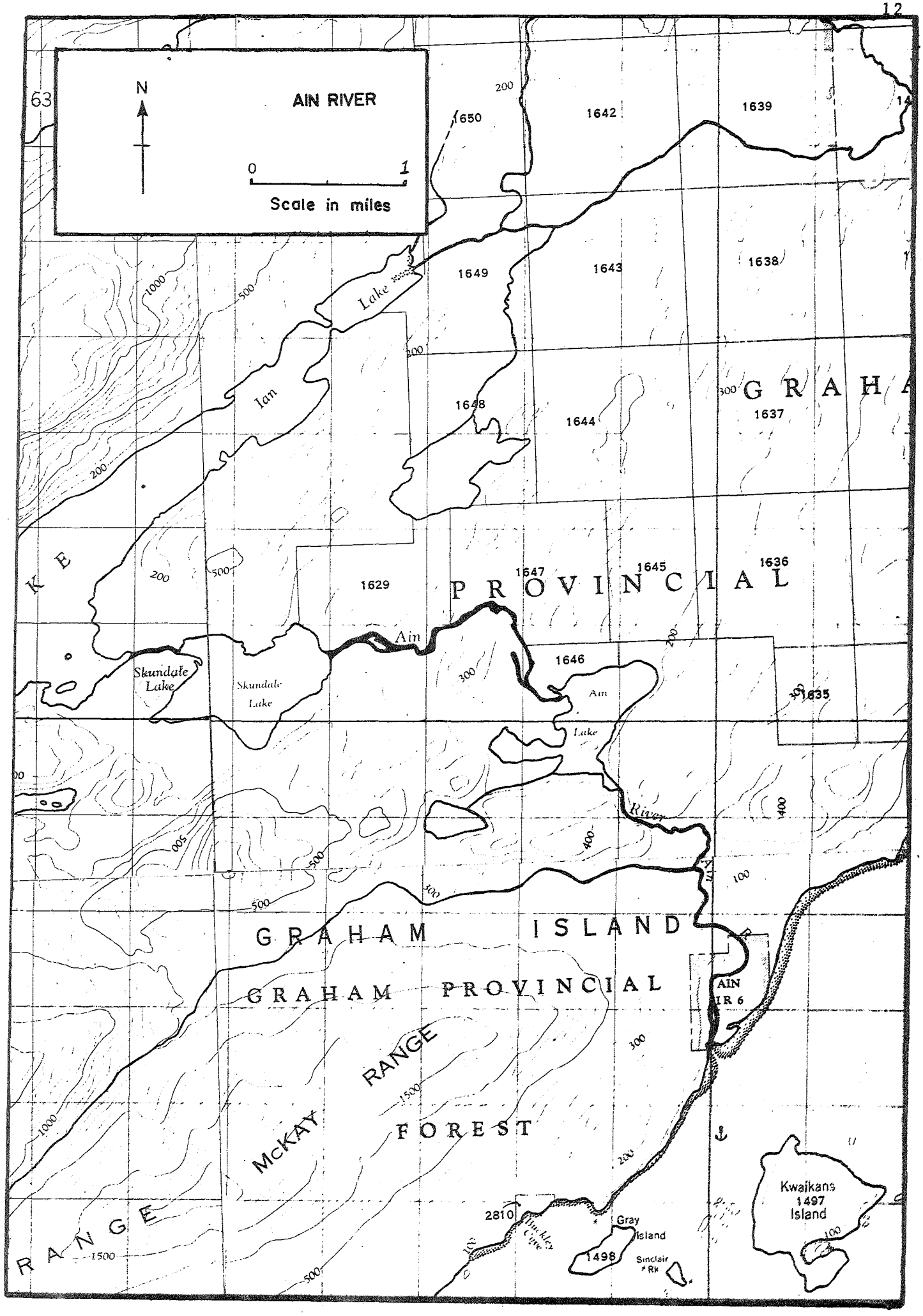
E - early (first 10 days of month)

M - middle of month

L - late (last 10 days of month)

NOTE RE SPAWNING AREA: The spawning area presented in this report cannot in some instances, be used to calculate the optimum spawning population for a given species for two reasons (1) species utilize specific areas of a stream for reproduction such as chinooks upstream, chums and pinks in lower reaches, and this has not been taken into account and (2) water levels affect the amount of wetted gravel very significantly, for example, Qualicum River, 1960: 33 cfs = 45,000 sq. yds., 110 cfs = 85,000 sq. yds. and 230 cfs = 115,000 sq. yds.


AIN RIVER
N
0 1 2
Scale in miles
PROVINCIAL
GRAHAM ISLAND
McKAY RANGE
FOREST
LAKE
MASSET
MASSET INLET
McKAY BAY
GRAHAM


63
N
AIN RIVER
0
1
Scale in miles
1650
1642
1639
1649
1643
1638
1648
1644
1637
1647
1645
1636
1629
1646
1635
Lake
Ian
Skundale Lake
Skundale Lake
Ain
Ain Lake
River
PROVINCIAL
GRAHA
KE
GRAHAM ISLAND
GRAHAM PROVINCIAL
AIN IR 6
RANGE
McKAY RANGE
FOREST
RANGE
2810
Gray Island
1498
Sinclair Rk
Kwaikans 1497 Island
200
500
1000
1500
300
400
100

NAME OF STREAM AIN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows SE. from Ain Lake into Masset Inlet, Queen Charlotte District POSITION 53 132 NE.

LENGTH 4.8 MI. WIDTH 90 FT. DRAINAGE 118.4 SQ. MI.

COMPOSITION: BEDROCK 20 BOULDER 20 COARSE 16 FINE 16

SILT & SAND UNCLASSIFIED Pools 28

GRADIENT: FALL IN FT/000	
0.0 - 2.5	1.25 - 4.8 mi. (Outlet of Ian Lake)
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	0.0 - 1.25 mi.

WETTED AREA 257000 SQ. YD. SPAWNING AREA 80000 SQ. YD.

DISCHARGE CFS MAX MIN

TEMPERATURE 03/08/62 73.0°F; 30/08/66 63.0°F.

BARRIERS OR POINTS OF DIFFICULT ASCENT Three falls in total: (1) 1.5 mi., 3.5 ft. vertical drop; (2) 2.0 mi., 4 ft. vertical drop; (3) 2.5 mi. (outlet of Ain Lake), 5 ft. drop over a horizontal distance of 4.5 ft. on right bank and a drop of 6 ft. over a distance of 15 ft. on left bank. These falls are passable to coho and sockeye with varying degrees of difficulty dependent upon water levels.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	Ian Lake and tributaries
CHINOOK	
COHO	Throughout system
CHUM	0.0-1.5 mi. (first falls)
PINK (ODD YR)	0.0-1.5 mi. (normally no odd-year pinks)
PINK (EVEN YR)	0.0-1.5 mi.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM The theoretical production levels for three lakes and their tributary streams are calculated to be: sockeye - 78000; coho - 17500 (catch plus escapement).

The factors limiting production at this time are unknown but the size of spawning populations must be considered as a major one. Obstructions and netting in the stream mouth by the personal use fishery may contribute to the small number of spawners.

GENERAL REMARKS: Spawning Area: Mouth to Ain Lake 60000 sq. yd. (lower half good gravel, upper half mostly bedrock and boulder); between lakes 20000 sq. yd.; Ian Lake tributaries 35000 sq. yd.

- Water: tea coloured
- Selectively logged for spruce 1914-18
- Personal use fishery carried on in mouth of Ain River
- Discharge: intermittent records June 1962 - March 1964, maximum recorded 05/01/64 2900 cfs, minimum recorded 29/08/63 67.5 cfs; random recordings 27/06/62 319 cfs, 25/07/62 146 cfs, 31/08/62 357 cfs, 30/09/62 1100 cfs.

GENERAL REMARKS: (continued)

Accessible tributaries, Ain River

Tributary, right bank (approximately 1.4 mi.): this stream as observed from aerial flight is heavily wooded and appears to be spawnable for at least 2.0 mi.

Watershed Lakes

Ian Lake: 12 miles long	7.2 sq. miles
Skundale Lake:	0.4 sq. miles
Ain Lake:	0.2 sq. miles
Total lake area:	7.8 sq. miles

Accessible tributaries, Ian Lake

North shore tributary: 43.0°F June 3, 1962 15-20 cfs; largest tributary, average width 20 feet, accessible distance approximately 0.75 mile (series of impassable falls ascending mountain side); low gradient; 60% of length has good gravel representing 4500 square yards; salmonid fry observed in stream 22/06/70; tea colour water; stream shows some scouring.

NE. Arm head stream: 42.0°F June 3, 1962 50-75 cfs; lower reaches marshy; falls (12 foot drop in 60 feet) located at 4 miles; gravel area to falls 20000 square yards; coho fry observed both above and below falls; area unlogged - a tributary entering this stream at approximately 0.6 mile appears to be very suitable for spawning. Falls were observed (from aircraft) approximately 2 miles upstream but not known if passable. Stream above this point looks good throughout.

Extreme west end tributary: average width 15-20 feet; tea coloured water; good gravel; salmon fry observed 22/06/70 to forks (1.1 mile).

ESCAPEMENT RECORD FOR AIN RIVER

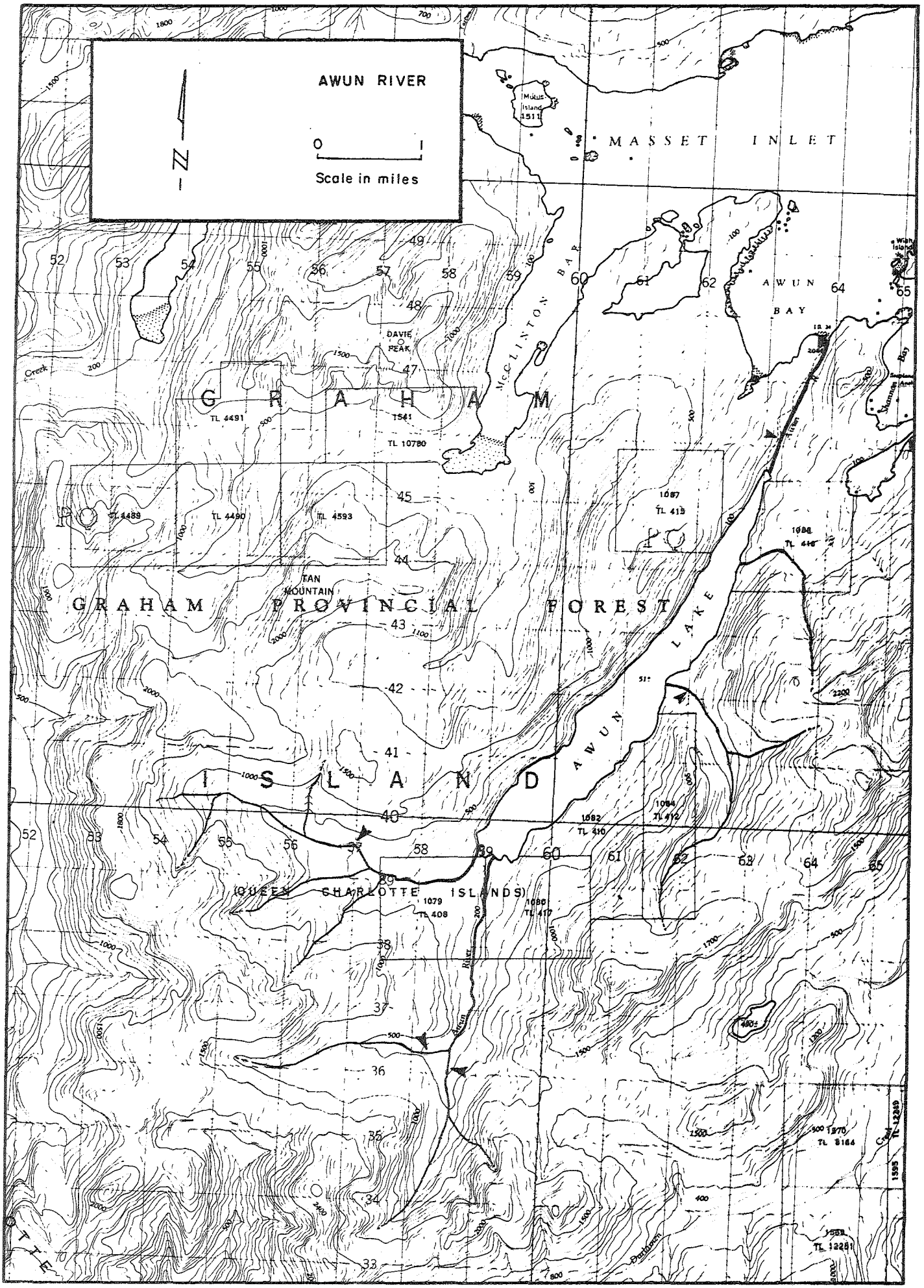
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	3500		400	3500		
48	2500		5000	3500	35000	
49				5000		
50			3500	7500	15000	
51	3500		3500	75000		
52				35000	75000	
53			400	75000		
54			3500	75000	7500	
55						
56			N.O.		7500	
57	400		3500	75000		
58	750		400	400	1500	
59	750		3500	7500		
60	1500		750	7500	750	
61	750		3500	7500		
62	3500		7500	3500	750	
63	1500		750	3500		
64	1500		7500	15000	3500	
65	750		7500	125000	400	
66	750			75000		
67	400		3500	15000		
68	750		1500	15000	1500	
69	7500			15000		
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start	M May		E Sep	L Sep	L Aug	
Peak	E Jun		L Sep	E Oct	E Sep	
End	L Jun		L Oct	M Oct	M Sep	

REMARKS

NOTES

Mid Section

Mouth


AWUN RIVER
N
0
1
Scale in miles
MASSET INLET
Mutus Island 1511
McCLINTON BAR
AWUN BAY
DAVIE PEAK
GRAHAM
TL 4491
TL 4541
TL 10780
TL 4488
TL 4490
TL 4593
TAN MOUNTAIN
GRAHAM PROVINCIAL FOREST
AWUN LAKE
ISLAND
(QUEEN CHARLOTTE ISLANDS)
1079 TL 408
1080 TL 417
1082 TL 410
1084 TL 412
1087 TL 413
1088 TL 416
1570 TL 8164
TL 12281
Creek
River

NAME OF STREAM AWUN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into South side of Masset Inlet, Queen Charlotte District POSITION 53 132 NW.

LENGTH 1.5 MI. WIDTH 75 FT. DRAINAGE 28.8 SQ. MI.

COMPOSITION: BEDROCK 25 BOULDER 25 COARSE 23 FINE

SILT & SAND UNCLASSIFIED

GRADIENT: FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	0.0 - 1.5 mi. (lake outlet)
7.5 - 10.0	
> 10.0	

WETTED AREA 66000 SQ. YD. SPAWNING AREA 15000 SQ. YD.

DISCHARGE CFS MAX MIN

TEMPERATURE 03/08/62 66.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Passable falls, 1.0 mi., 4 ft. vertical drop; may not be passable to pinks and chums under all flow conditions.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	Awun Lake and tributaries
CHINOOK	
COHO	Throughout
CHUM	0.0-1.0 mi.
PINK (ODD YR)	
PINK (EVEN YR)	0.0-1.0 mi.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

GENERAL REMARKS: Flows from Awun Lake to Masset Inlet almost entirely within a rock canyon.
- Water: tea coloured
- Estimated discharge: 03/08/62 30 cfs

GENERAL REMARKS: (continued)

Awun Lake: 4 miles long, 0.8 mile wide, 3.2 square miles; surrounded by steep mountains with little beach or shoreline.

Accessible tributaries, Awun Lake

Upper Awun River, head of Awun Lake: 15 cfs May 28, 1962; 15000 square yards of gravel, rest of stream bedrock; many coho fry observed; partly logged at one time; accessible for 2 miles, stream then forks and has impassable falls on each branch.

West Inlet Creek at head of Awun Lake: 10 cfs May 28, 1962; breaks into several small branches at one mile; width 18 feet; 6000 square yards gravel; main branch accessible for 1.6 miles, series of impassable falls and steep gradient above this point.

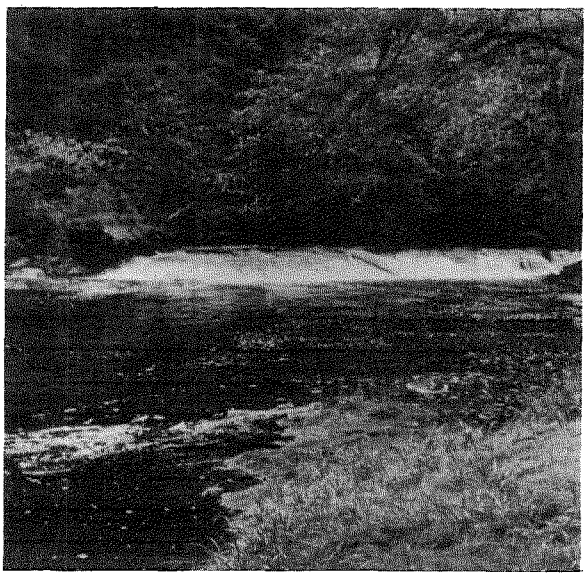
The other two tributaries flowing into Awun Lake are very small and have limited spawning area; impassable falls near the mouths.

ESCAPEMENT RECORD FOR AWUN RIVER

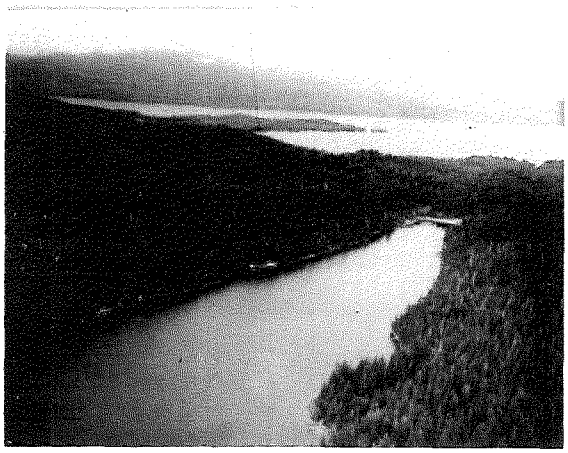
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	200		200	3500		
48	1500		400		15000	
49			400	400		
50			400	3500	7500	
51			400	7500		
52	400			15000	35000	
53	750		400	35000		
54	1500		750	15000	3500	
55			750	15000		
56			200	3500	3500	
57	400		750	35000		
58				7500	3500	
59	750		750	3500		
60			400	3500	200	
61	400		750	3500		
62	1500		1500	3500	3500	
63	750		400	3500		
64	1500		1500	3500	750	
65	400		1500	75		
66	400		200	3500	200	
67	200		200	1500		
68	400			7500		
69	7500		200	15000		
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start	M May		E Sep	L Sep	L Aug	
Peak	M Jun		L Sep	M Oct		
End	L Jun		L Oct	M Oct	M Sep	

REMARKS

NOTES



Passable obstruction,
1.25 miles, 4-5 foot drop.



Awun Lake. Masset Inlet
top center.

DATLAMEN CREEK
N
0 1/2
Scale in miles
Modeets Islands
TOWUSTASHIN HILL
JUSKATLA INLET
Datlamen Creek
TL-12249
1595
TL 6164
1570
1569
TL 12251
Datlamen
GRAH
500
1000
1500
2000
2100

NAME OF STREAM DATLAMEN CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Juskatla Inlet, Queen Charlotte District POSITION 53 132 NE.

LENGTH 4.5 MI. WIDTH 35 FT. DRAINAGE 24.0 SQ. MI.

COMPOSITION: BEDROCK 15 BOULDER 15 COARSE 30 FINE 40

SILT & SAND _____ UNCLASSIFIED _____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	1.0 - 3.0 mi.
> 10.0	0.0 - 1.0 mi.; 3.0 - 4.5 mi.

WETTED AREA 92000 SQ. YD. SPAWNING AREA 64400 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE 04/08/62 60.0°F; 23/10/70 44.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Impassable falls 4.5 miles (stream forks at this point and both branches are impassable). A one half mile long canyon at 0.75 mile has been reported as a block to chum salmon.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	Throughout
CHUM	0.0-0.75 mi. (canyon)
PINK (ODD YR)	
PINK (EVEN YR)	Up to 3.0 mi. at the most
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

GENERAL REMARKS: Was partially logged many years ago.

- High gravel content (70%) to 3.2 miles; above this point stream bed narrows to 60-70 feet and becomes bouldery with frequent windfalls and log jams.
- Estimated discharge: 04/08/62 8 cfs
- Accessible tributaries: 0.5 mile and 3.2 mile, both have impassable falls within one half mile from junction.
- Some signs of scouring.

Publications:

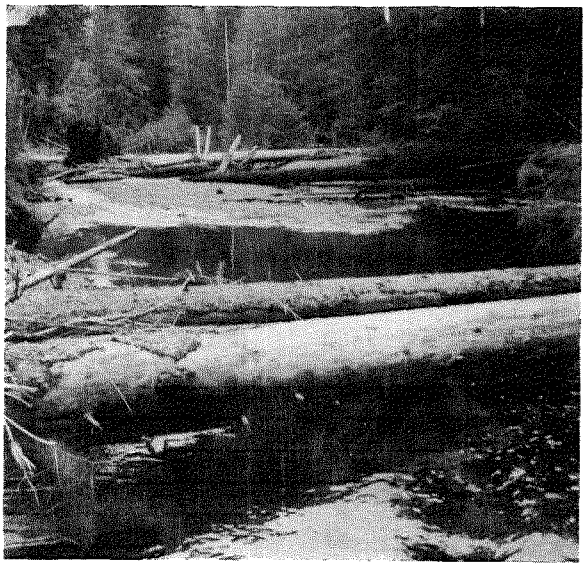
Neave, F. 1955. Notes on the seaward migration of pinks and chum salmon fry. J. Fish. Res. Bd. Canada. 12: 369-374.

ESCAPEMENT RECORD FOR DATLAMEN CREEK

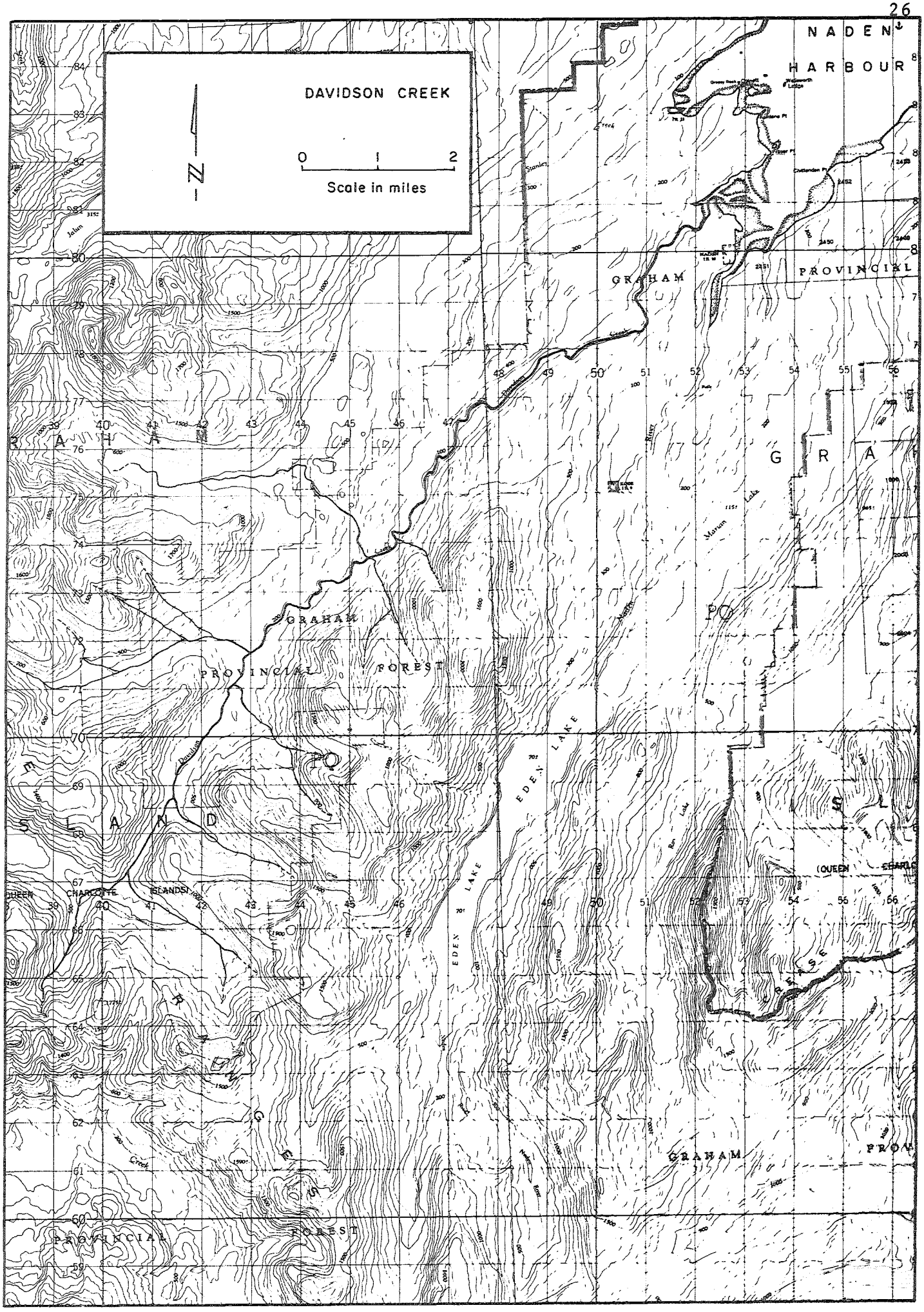
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			400	750		
48			1500	1000	75000	
49						
50			400		15000	
51			200			
52			400	200	35000	
53				75		
54			200		100000+	
55				75		
56			200		100000+	
57				75		
58			200		75000	
59			400			
60			200		3500	
61	25		200			
62	25					
63						
64			75		75	
65			75			
66			25		75000	
67			25			
68			25		75000	
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sep	E Oct	E Aug	
Peak	Jul		L Sep	E Oct	E Sep	
End			M Oct	M Oct	M Sep	

REMARKS

NOTES



Typical section, 2.5 miles.


DAVIDSON CREEK
N
0 1 2
Scale in miles
NADEN
HARBOUR
GRAHAM
PROVINCIAL
FOREST
QUEEN
CHARLOTTE
ISLANDS
EDEN LAKE
Marion Lake
Marion Creek
Eden Creek
Yakoun River

NAME OF STREAM DAVIDSON CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows N.E. into Naden Hr, O.C. Dist.

POSITION 53 132 NW

LENGTH 12.0 MI. WIDTH 42 FT. DRAINAGE 46.4 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE 25 FINE 25

SILT & SAND ____ UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	0.0-6.0 mi
5.0 - 7.5	6.0-9.2 mi
7.5 - 10.0	9.2-12.0 mi
> 10.0	

WETTED AREA 295600 SQ. YD. SPAWNING AREA 148000 SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE ____

BARRIERS OR POINTS OF DIFFICULT ASCENT ____

SPAWNING DISTRIBUTION:

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

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS: This stream as observed from an aerial flight appeared to be of excellent quality from a spawning standpoint. No obstructions were observed throughout its entire length and where the bottom could be observed, it appeared that at least 50 percent of the wetted area would be suitable for spawning.

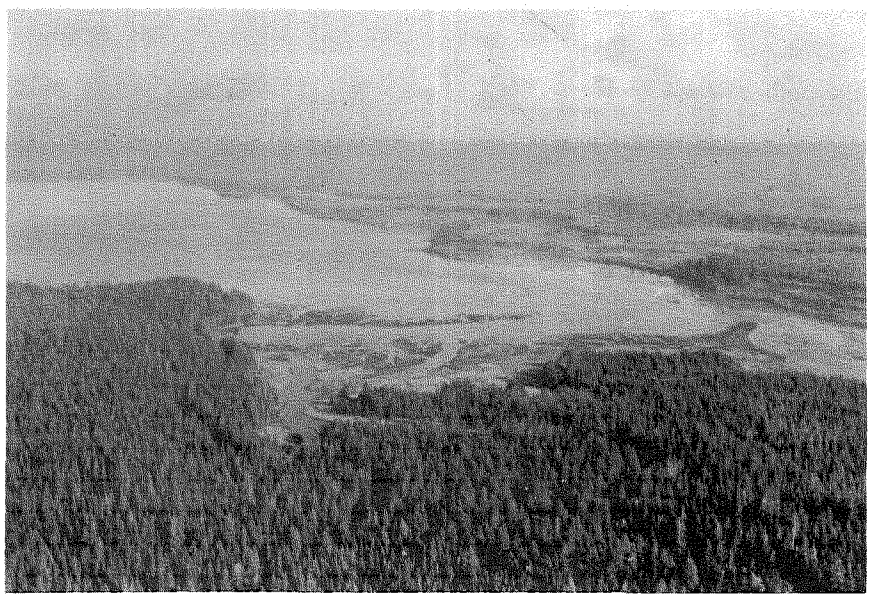
- Heavily timbered throughout

ESCAPEMENT RECORD FOR DAVIDSON CREEK

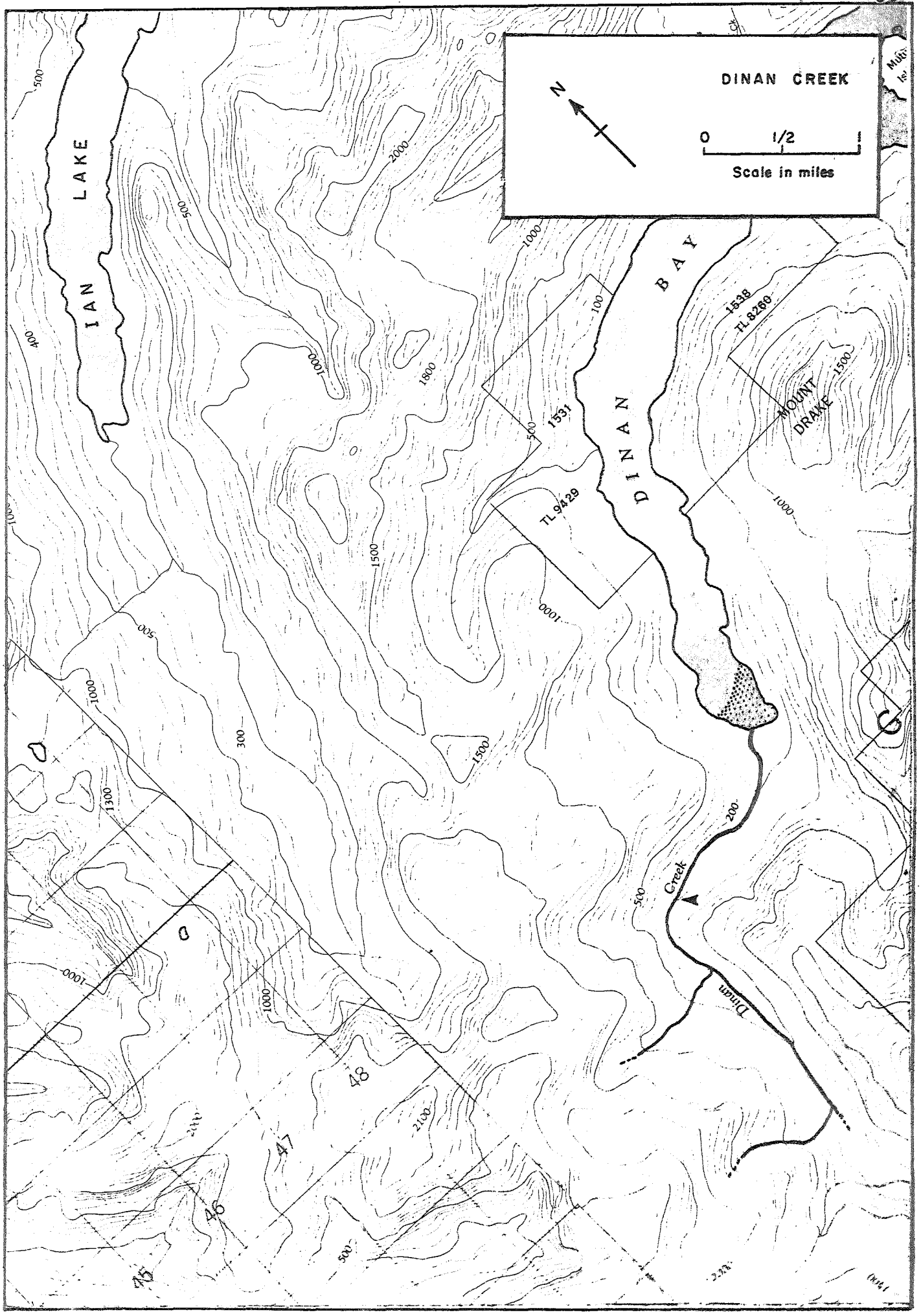
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947						
48			200	400	3500	
49						
50						
51						
52						
53						
54						
55						
56				No Records		
57						
58						
59						
60						
61						
62						
63						
64				25	1500	
65						
66				25	3500	
67						
68					7500	
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start						
Peak						
End						

REMARKS

NOTES



Naden Harbour. Davidson Creek outlet lower left. Naden River outlet right center.


DINAN CREEK
N
0 1/2
Scale in miles
LAKE
IAN
DINAN
BAY
MOUNT
DRAKE
1538
TL 8260
1531
TL 9429
Creek
Dinan
45
46
47
48

NAME OF STREAM DINAN CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Dinan Bay,

Queen Charlotte District POSITION 53 132 NW.

LENGTH 1.25 MI. WIDTH 45 FT. DRAINAGE 6.4 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE 14 FINE 13

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 22000 SQ. YD. SPAWNING AREA 6000 SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE 03/08/62 57.0°F; 20/10/69 48.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Passable series of cascades over bedrock, 1 mile, total of 12 feet through 150 feet, largest single drop 5 feet; impassable falls, 1.25 miles, series of drops totalling 170 feet.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	0.0-1.25 mi.
CHUM	0.0-1.0 mi.
PINK (ODD YR)	
PINK (EVEN YR)	0.0-1.0 mi.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS:

Estimated discharge: 03/08/62 10 cfs; 20/10/69 50 cfs

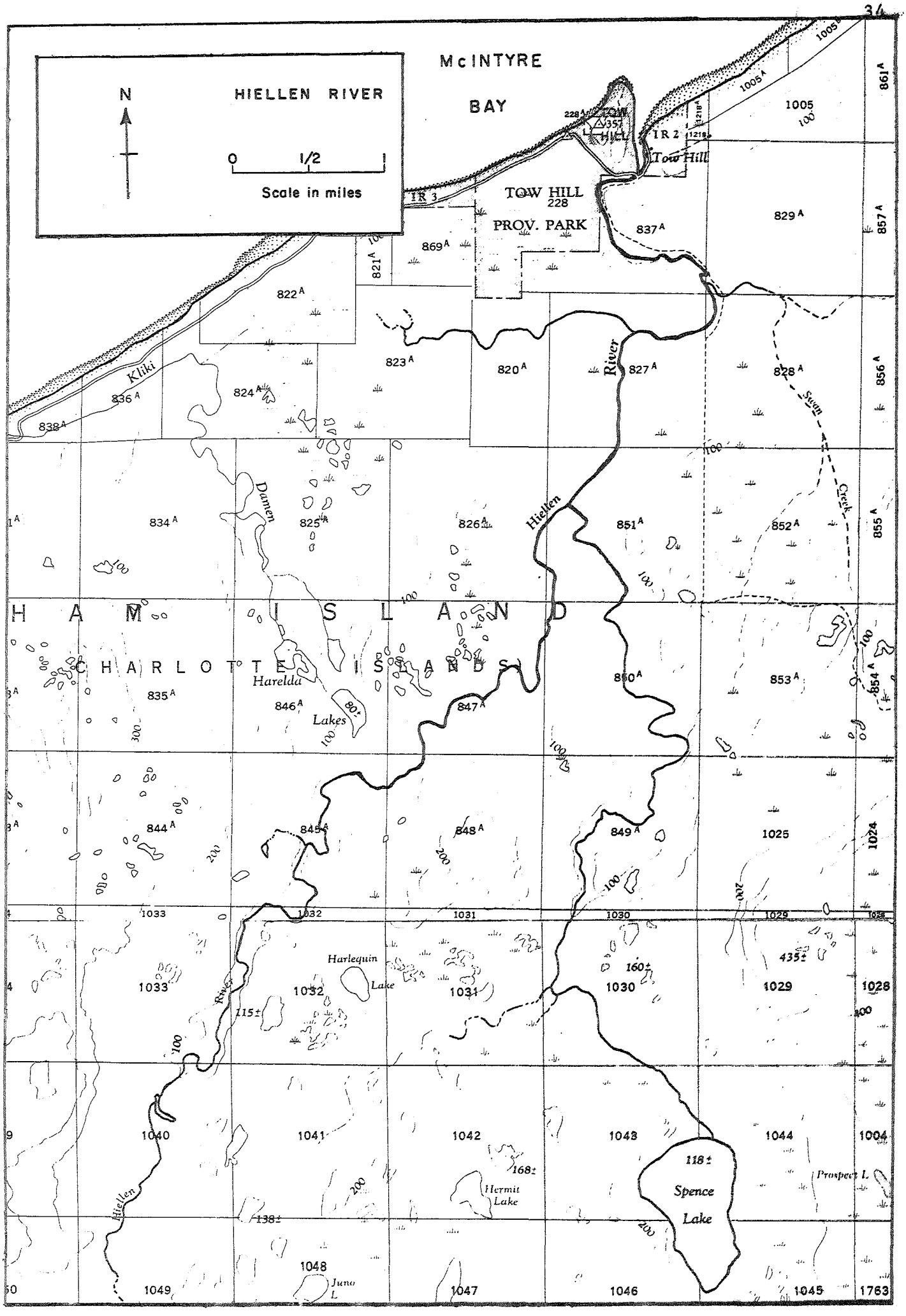
Water: tea coloured

ESCAPEMENT RECORD FOR DINAN CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			200	75		
48			400	200	7500	
49			200			
50			400		7500	
51			400			
52			400		35000	
53			200			
54			200		200	
55			200			
56			75		15000	
57			200			
58			400		7500	
59			400			
60			75		200	
61			400			
62			400			
63			200			
64			200			
65			200			
66			200		75	
67			75			
68			75			
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sep			
Peak			E Oct			
End			M Oct			

REMARKS

NOTES


McINTYRE
BAY
HIELLEN RIVER
N
0 1/2
Scale in miles
TOW HILL
228
PROV. PARK
TR 2
TR 3
Tow Hill
Kliki
River
Swan
Creek
Damen
Hielen
H A M I S L A N D
C H A R L O T T E I S L A N D S
Harelda
Lakes
Harlequin
Lake
River
Hielen
Hermit
Lake
Spence
Lake
Prospect L.
Juno
L.
1005
1005A
861A
857A
856A
855A
854A
1024
1025
1028
1029
1030
1031
1032
1033
1040
1041
1042
1043
1044
1004
1045
1046
1047
1048
1049
1763
821A
822A
823A
824A
825A
826A
827A
828A
829A
834A
835A
836A
837A
838A
844A
845A
846A
847A
848A
849A
851A
852A
853A
860A
869A
80±
115±
138±
160±
168±
435±
118±

NAME OF STREAM HIELLEN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into McIntyre Bay,
Queen Charlotte District POSITION 54 131 SW.

LENGTH 10.0 MI. WIDTH FT. DRAINAGE 59.2 SQ. MI.

COMPOSITION: BEDROCK BOULDER COARSE FINE
SILT & SAND UNCLASSIFIED

GRADIENT: FALL IN FT/000	
0.0 - 2.5	1.0 - 10.0 mi.
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

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	
CHUM	
PINK (ODD YR)	Within one mile of mouth
PINK (EVEN YR)	Within one mile of mouth
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

GENERAL REMARKS:

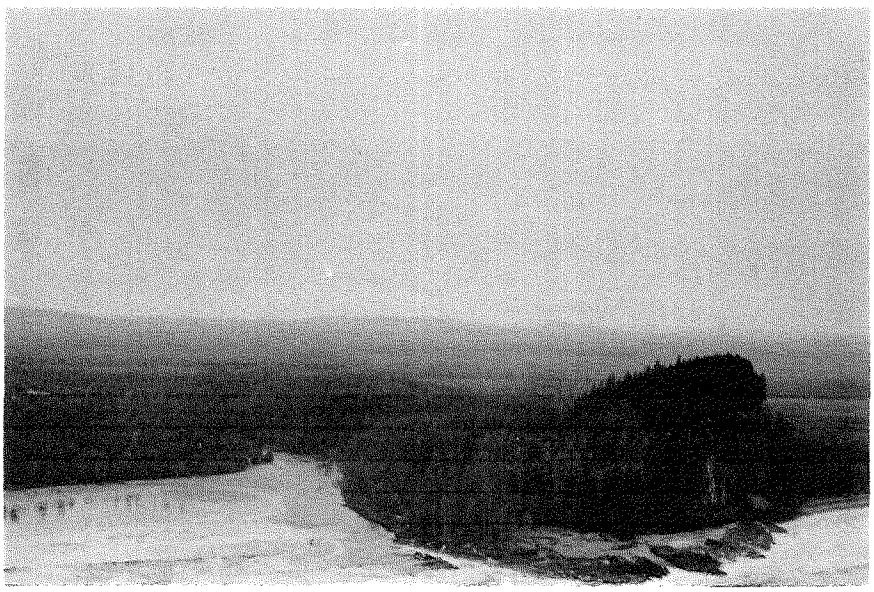
Main spawning area is located near the mouth.
- Drains large muskeg area
- Water: coffee coloured
- Silty in upper area

ESCAPEMENT RECORD FOR HIELLEN RIVER

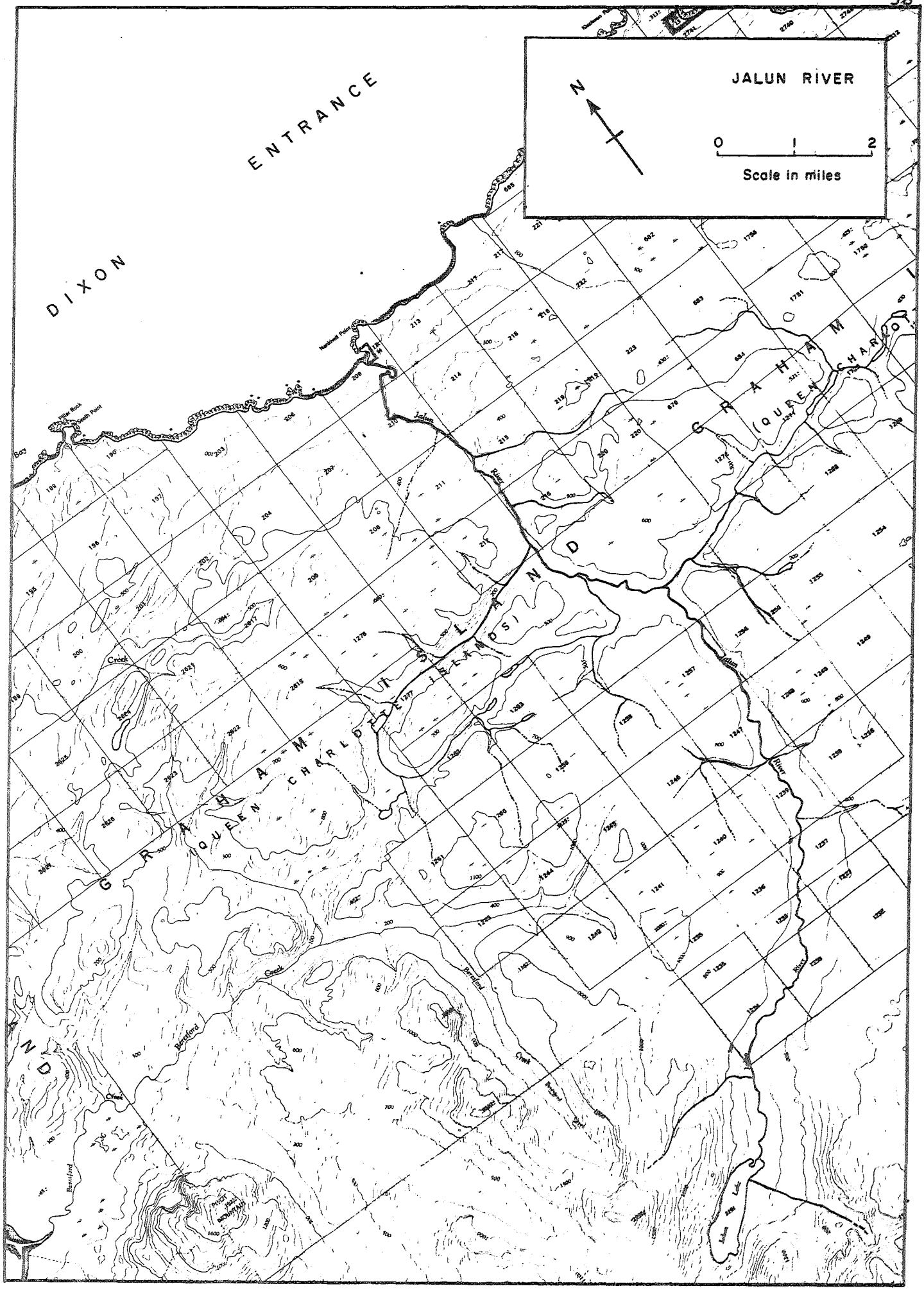
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			200		1500	
48			7500		3500	
49					3500	
50					3500	
51					3500	
52					7500	
53					3500	
54						
55						
56						
57			1500		7500	
58					7500	
59			3500		3500	
60			750		3500	
61			3500		7500	
62			3500		7500	
63			750		3500	
64			3500		7500	
65			7500		7500	400
66			1500		3500	200
67			400			200
68			400		1500	400
69			750			75
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sep		E Aug	
Peak			L Sep		L Aug	
End			E Oct		M Sep	

REMARKS

NOTES



Mouth


JALUN RIVER
N
0 1 2
Scale in miles
DIXON ENTRANCE
GRAHAM ISLAND
QUEEN CHARLOTTE ISLANDS
Pillar Rock
Smith Point
Nasibwet Point
Jalun River
Barnard Creek
Barnard Mountain

NAME OF STREAM JALUN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Dixon Entrance West of Nakivell Point, Queen Charlotte District POSITION 54 132 SW.

LENGTH 14.5 MI. WIDTH 50 FT. DRAINAGE 78.4 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	4.4 - 14.5 mi.
7.5 - 10.0	0.0 - 4.4 mi.
> 10.0	

WETTED AREA 425000 SQ. YD. SPAWNING AREA ____ SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE ____

BARRIERS OR POINTS OF DIFFICULT ASCENT ____

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	Throughout - mainly upper reaches and tributaries
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	Lower to upper reaches
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS: From aerial observation it would appear that suitable conditions for spawning exist throughout the entire length of this river.

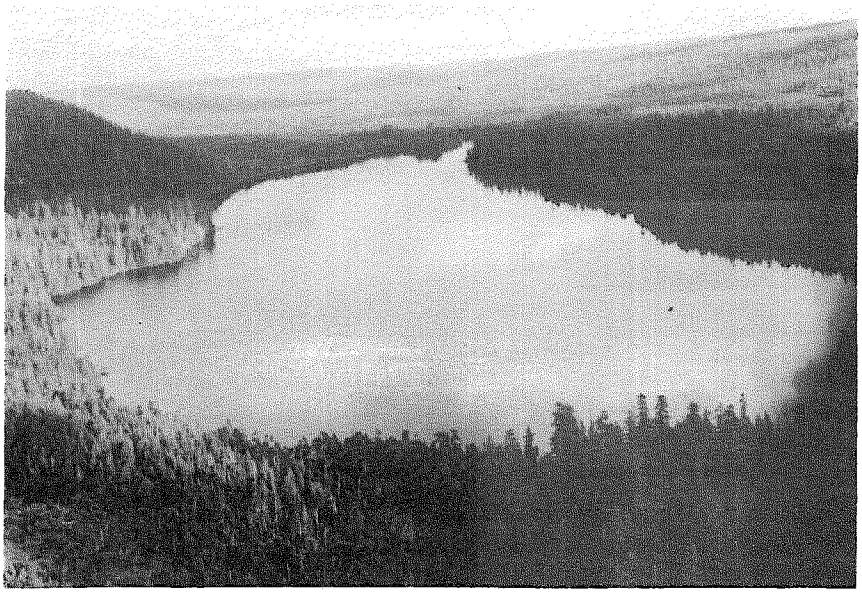
- Mid reaches bouldery
- Water: coffee coloured
- Accessible tributaries: left bank 4.0 miles, suitable for at least 1.0 mile; right bank, 6.0 miles, gravel looks good from junction to headwater lake (3.0 miles).

ESCAPEMENT RECORD FOR JALUN RIVER

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947						
48						
49						
50					15000	
51	3500					
52					15000	
53	750					
54						
55						
56					7500	
57					7500	
58					7500	
59					3500	
60			1500		15000	
61					3500	
62					35000	
63			1500		7500	
64			3500		35000	
65	75		15000		7500	
66					35000	
67			3500		75	
68					75000	
69	3500				200	
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start	E Jul		E Sep		E Aug	
Peak	M Jul		L Sep		L Aug	
End	M Aug		L Oct		E Sep	

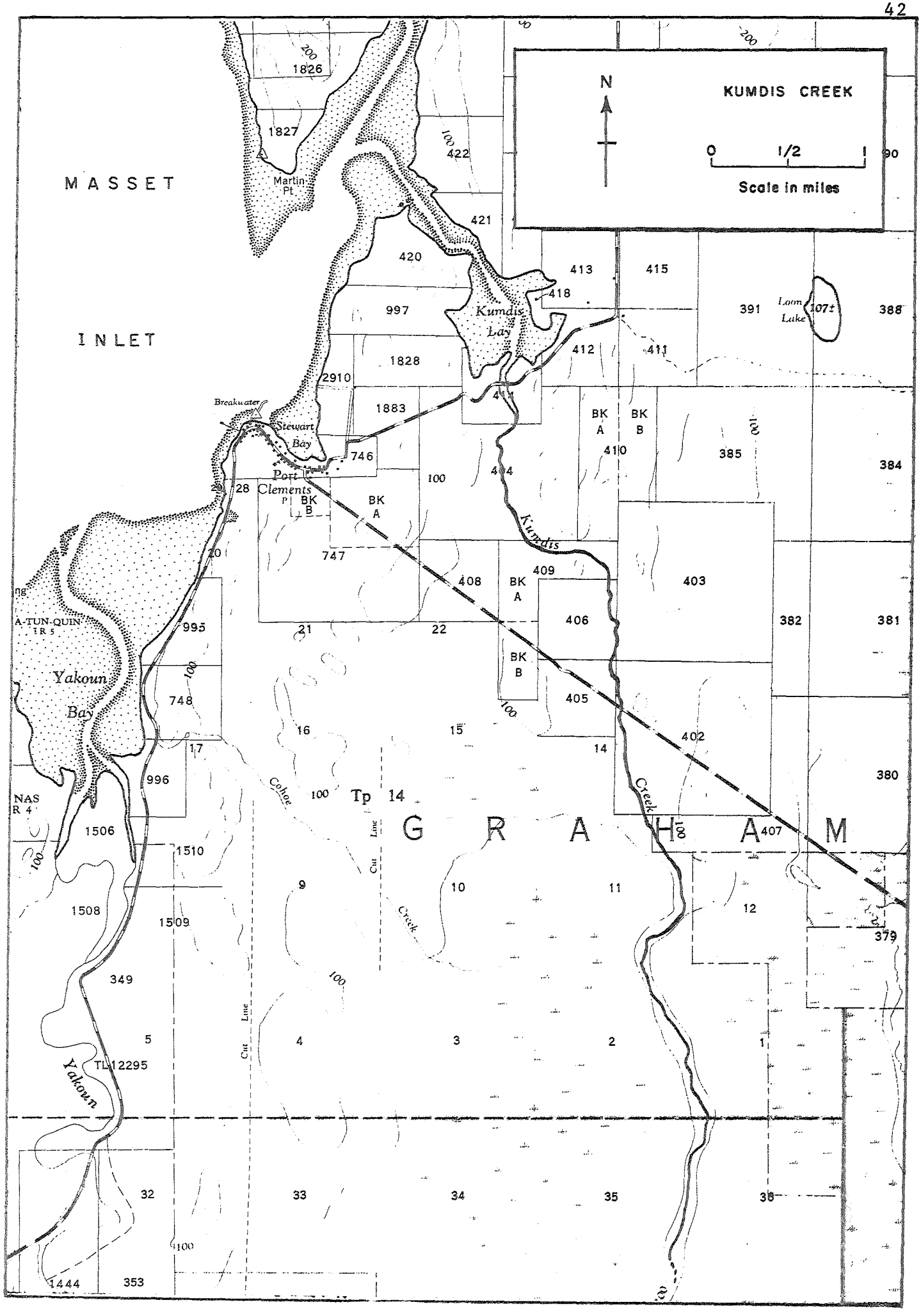
REMARKS

NOTES



Jalun Lake

Mouth


KUMDIS CREEK
N
0 1/2 1
Scale in miles
MASSET
INLET
Martin Pt
Kumdis Bay
Loon Lake
Breakwater
Stewart Bay
Port Clements
A-TUN-QUIN IR 5
Yakoun Bay
NAS R 4
Yakoun
Kumdis
Cohoe Creek
Cut Line
Tp 14
GRAHAM
TL 12295
1826
1827
422
421
420
997
1828
2910
1883
746
747
748
995
996
1506
1510
1508
1509
349
1444
353
413
415
418
391
388
412
411
410
385
384
404
408
409
403
406
382
381
405
402
407
380
379
BK A
BK B

NAME OF STREAM KUMDIS CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Kumdis Bay,

Queen Charlotte District POSITION 53 132 NE.

LENGTH 6.4 MI. WIDTH 20 FT. DRAINAGE 11.2 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE ____ FINE ____

SILT & SAND ____ UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	Throughout
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	

WETTED AREA 75000 SQ. YD. SPAWNING AREA ____ SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE ____

BARRIERS OR POINTS OF DIFFICULT ASCENT ____

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	2.0 mi. to upper reaches
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

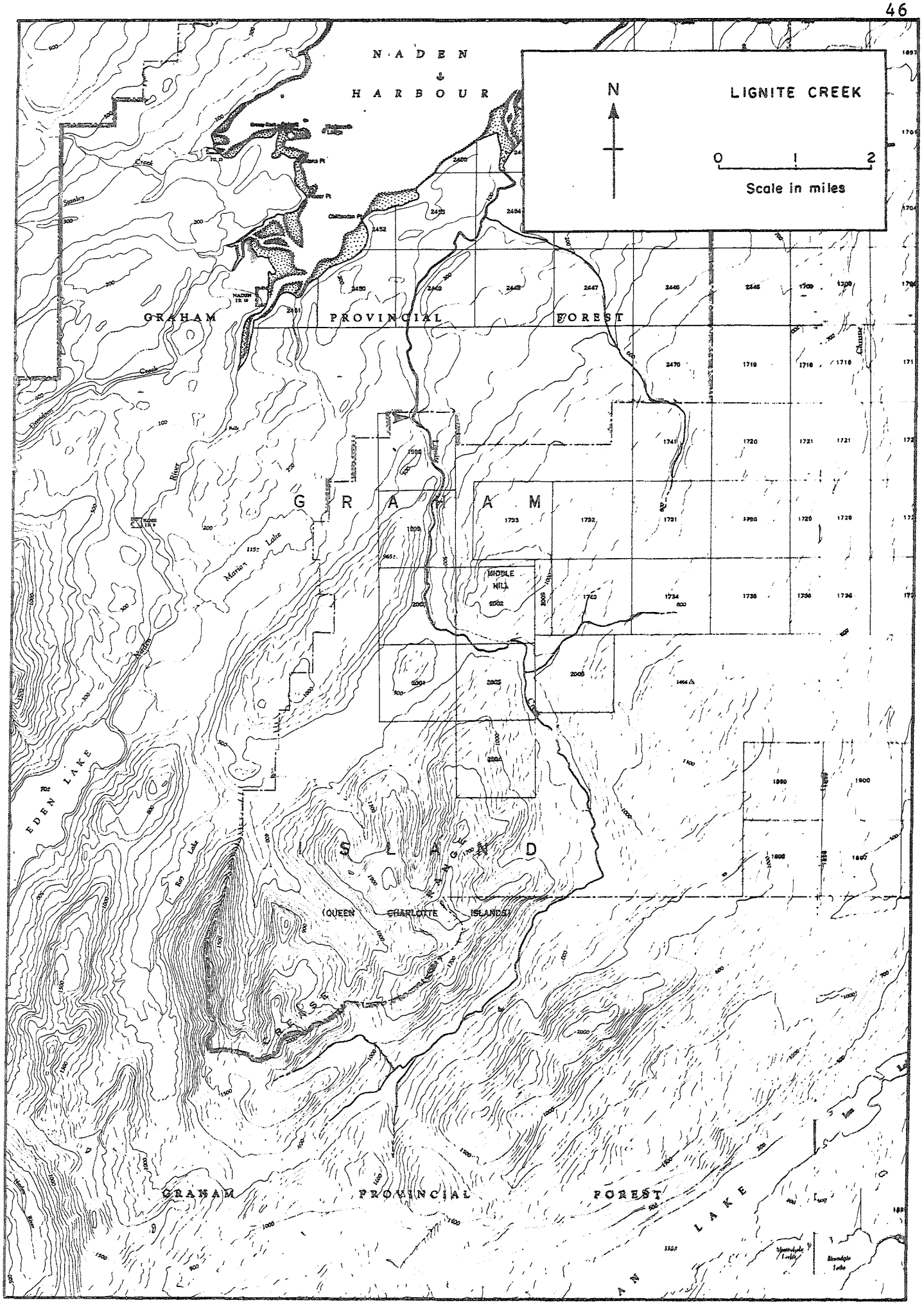
GENERAL REMARKS: This stream for its size is probably the best coho producer in the area. It is typically a muskeg stream draining a huge area of bog near the centre of Graham Island. At all times of the year the water is very discoloured being black during high precipitation in the fall. The spawning beds are composed of very fine gravel and begin about two miles from tidewater. The land on either side of the stream near the mouth is mainly swamp and further inland is flat and entirely muskeg with clumps of small trees scattered about.

ESCAPEMENT RECORD FOR KUMDIS CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			400			
48			7500			
49			400			
50			400			
51			200			
52			200			
53						
54			1500			
55			400			
56						
57			3500			
58			1500			
59			750			
60			1500			
61			3500			
62			3500			
63			1500			
64			7500			
65			7500			
66			1500			
67			750			
68			750			
69			400			
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			E Sep			
Peak			L Sep			
End			M Oct			

REMARKS

NOTES


N
LIGNITE CREEK
0 1 2
Scale in miles
N A D E N
HARBOUR
GRAHAM
PROVINCIAL
FOREST
G R A M A M
MOSLE HILL
EDEN LAKE
Marion Lake
Nan Lake
(QUEEN CHARLOTTE ISLANDS)
GRAHAM
PROVINCIAL
FOREST
LAKE

NAME OF STREAM LIGNITE CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Naden Harbour, Queen Charlotte District POSITION 53 132 NW.

LENGTH 4.2 MI. WIDTH 30 FT. DRAINAGE 51.2 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE 32 FINE 33

SILT & SAND 35 UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	7.1 - 11.5 mi.
5.0 - 7.5	11.5 - 15.1 mi.
7.5 - 10.0	0.0 - 4.2 mi.; 4.7 - 7.1 mi.
> 10.0	4.2 - 4.7 mi.

WETTED AREA 74000 SQ. YD. SPAWNING AREA 48000 SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE 01/08/62 59.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Series of falls at 4.2 miles appear to be impassable to all species of salmon (aerial observation).

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	0.0-4.2 mi. (falls)
CHUM	Few observed some years; scattered throughout
PINK (ODD YR)	
PINK (EVEN YR)	0.0-4.2 mi. (falls)
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM From aerial observation it would appear that suitable spawning and rearing conditions exist for 10 miles above the obstruction. The gradient is moderate (5-10 feet/000) and the gravel appears to be of good quality and quantity throughout. The potential based on spawning area, would seem to exceed that of the area below the obstruction.

GENERAL REMARKS:

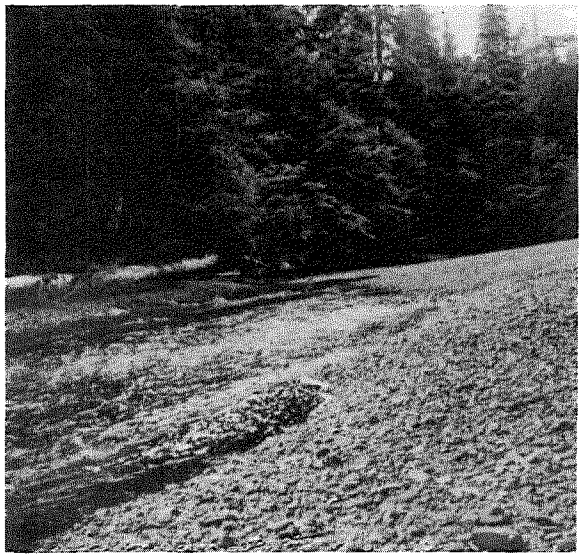
- Water: tea coloured
- Lowest 1.5 miles of stream bed is mud and sand
- Much debris on stream from windfalls
- Estimated discharge: 01/08/62 10 cfs
- Logged near mouth (west side of river)

ESCAPEMENT RECORD FOR LIGNITE CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			75			
48			200		3500	
49						
50					35000	
51						
52					3500	
53						
54					3500	
55						
56					3500	
57			200			
58			400	200	3500	
59			400			
60			200		3500	
61			400			
62			750		15000	
63			400			
64			1500		7500	
65			3500		25	
66			200	200	15000	
67			200		75	
68			400		100000	
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sep	M Aug	M Aug	
Peak			L Sep	E Sep	E Sep	
End			L Oct	E Oct	M Sep	

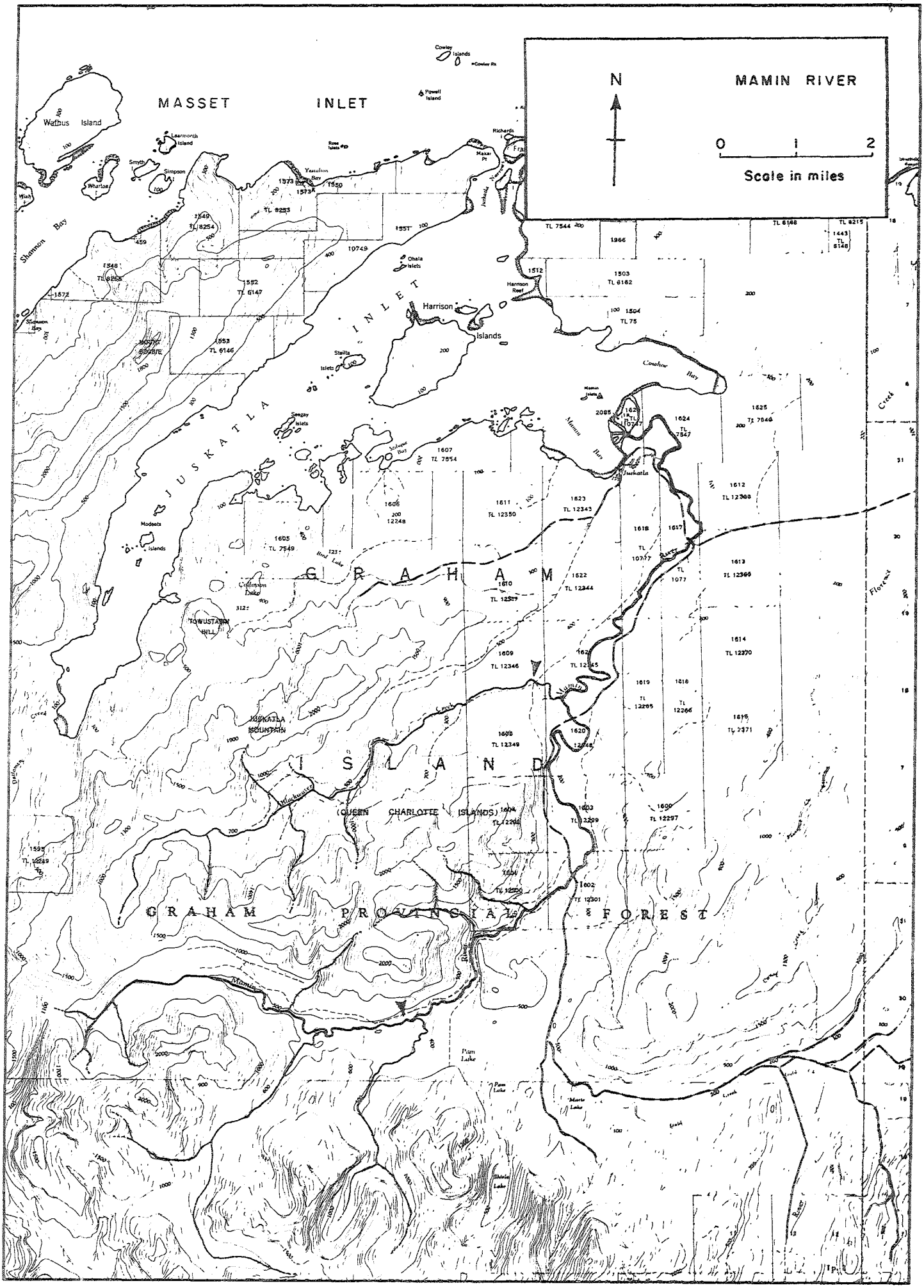
REMARKS

NOTES



One mile above mouth

Mouth


MASSET INLET
MAMIN RIVER
N
0 1 2
Scale in miles
Wathus Island
Learmonth Island
Smyth
Simpson
Wharton
Yatulton Bay
Richards
Maxan Pt
Shannon Bay
Ohaia Islets
Harrison Reef
Harrison Islands
JUSKATLA INLET
Stella Islets
Cowlitz Bay
Mamin Islets
Seagay Islets
Juskatla Bay
Juskatla
Modeets Islands
Collinson Point
TOWUSTAWN HILL
JUSKATLA MOUNTAIN
GRAHAM ISLAND
(QUEEN CHARLOTTE ISLANDS)
GRAHAM PROVINCIAL FOREST
Mamin River
Plum Lake
Marie Lake
Florence Creek

NAME OF STREAM MAMIN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Juskatla Inlet,

Queen Charlotte District POSITION 53 132 NE.

LENGTH 13.0 MI. WIDTH 60 FT. DRAINAGE 51.2 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE ____ FINE ____

SILT & SAND ____ UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	2.8 - 10.8 mi.
2.5 - 5.0	
5.0 - 7.5	0.0 - 2.8 mi.
7.5 - 10.0	10.8 - 13.0 mi.
> 10.0	

WETTED AREA 457000 SQ. YD. SPAWNING AREA ____ SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE 04/08/62 67.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Impassable falls, 13.0 miles

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	Up to 13 mi. on Mamin River, to falls on Cedar Creek
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	Up to 13 mi.; see general remarks
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS: This water shed has been subjected to heavy logging and gravel removal practices.
- Very large log jam at mouth.
- Canyon area commences 2.75 miles from mouth and extends for 1.5 miles
- Estimated discharge: 04/08/62 15 cfs

GENERAL REMARKS: (continued)

Pink salmon spawner distribution in 1966 based on 50000 fish was as follows:

Area	Percent Occurrence
From mouth to 1st bridge (2.75 mi.)	20
1st bridge (2.75 mi.) to 2nd bridge (7 mi.)*	12
2nd bridge (7 mi.) to 3rd bridge (10 mi.)	60
3rd bridge (10 mi.) to falls (13 mi.)	6
Cedar Creek (tributary)	2

*Includes 1.5 mile long canyon area which is of little importance.

Accessible tributaries, Blackwater Creek (Cedar)
Impassable falls, 0.5 mile, 20 feet vertical drop.

Publications:

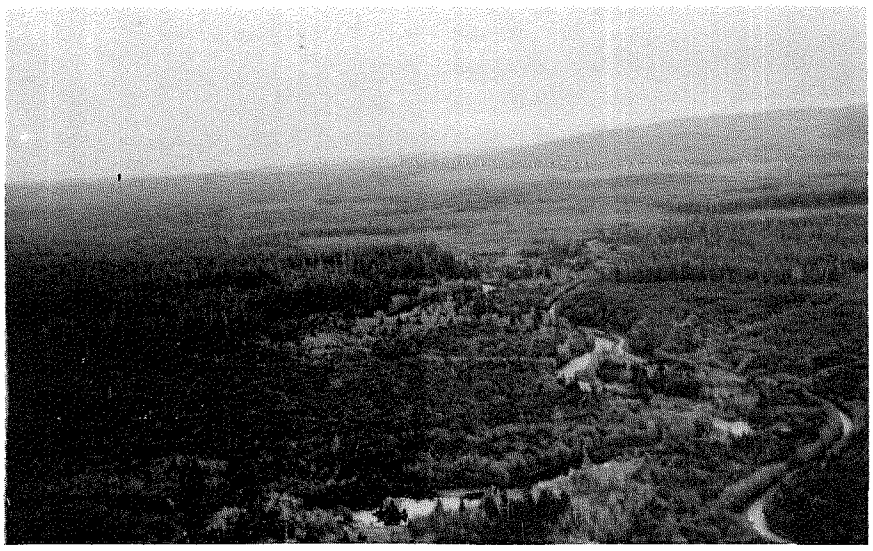
Neave, F. 1955. Notes on the seaward migration of pink and chum salmon fry. J. Fish. Bd. Canada, 12: 369-374.

ESCAPEMENT RECORD FOR MAMIN RIVER

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			400			
48			5000		150000	1000
49			3500			
50			3500		75000	
51			1500			
52			750		100000+	
53						
54					75000	
55						
56					100000+	
57			400			
58	75				35000	
59						
60	750		200		25	
61	75		200			
62	75		75		25	
63			75			
64			1500		7500	
65	25		1500			750
66	25		1500		100000+	400
67	25		3500			400
68	750		1500		75000	750
69			200			400
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start	L Aug		M Sep		M Aug	
Peak	E Sep		E Oct		M Sep	
End	M Sep		L Oct		M Sep	

REMARKS

NOTES



Area immediately above mouth, looking upstream

Mouth. Juskatla in upper right.

McCLINTON CREEK
0 1/2
Scale in miles
N
MASSET INLET
AWUN BAY
McCLINTON BAY
DAVIE PEAK
1541
TL 10780
Creek
McClinton
TL 4593
TL 4490
TAN MOUNTAIN
PROVINCIAL FOREST
HAMILTON ISLANDS
1087
TL 415
1088
TL 416
1082
TL 410
1084
TL 412
1080
TL 417
1079
Shannon Bay
Graham Island
IR #
208
100
300
500
900
1000
1100
1500
2000

NAME OF STREAM McClinton Creek

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows East into McClinton Bay, Queen Charlotte District POSITION 53 132 NW.

LENGTH 2.5 MI. WIDTH 45 FT. DRAINAGE 8 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	Throughout

WETTED AREA 66000 SQ. YD. SPAWNING AREA 30000 SQ. YD.

DISCHARGE _____ CFS MAX _____ MIN _____

TEMPERATURE 03/09/62 58.0°F; 23/10/70 44.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Impassable falls. 2.5 miles. 20 foot drop.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	Throughout, mainly upper half
CHUM	Generally up to 2.0 mi.
PINK (ODD YR)	
PINK (EVEN YR)	Throughout
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS: Best spawning area located from 0.5 mile to 1.5 mile from mouth where 80 percent suitable gravel exists.
- Estimated discharge: 03/09/62 5 cfs; 23/10/70 100 cfs

GENERAL REMARKS: (continued)

Publications:

Neave, F. 1955. Notes on the seaward migration of pink and chum salmon fry. J. Fish. Res. Bd. Canada, 12: 369-374.

Pritchard, A.L. 1931. A report of the pink salmon investigations in British Columbia. Prog. Rept. Biol. Bd. Canada, 10: 5-9.

_____ 1937. Variation in the time of run, sex proportions, size and egg content of adult pink salmon (Oncorhynchus gorbuscha) at McClinton Creek, B. C. J. Fish. Res. Bd. Canada, 3(5): 403-416.

_____ 1938. Transplantation of pink salmon (Oncorhynchus gorbuscha) into Masset Inlet, British Columbia in the barren years. J. Fish. Res. Bd. Canada, 4(2): 144-150.

_____ 1938. The findings of the British Columbia pink salmon investigation. Prog. Rept. Fish. Bd. Canada, 35: 14-17.

_____ 1939. Natural propagation of pink salmon in Masset Inlet, British Columbia. Prog. Rept. Fish. Res. Bd. Canada, 41: 6-9.

_____ 1939. Homing tendency and age at maturity of pink salmon (Oncorhynchus gorbuscha) in British Columbia. J. Fish. Res. Bd. Canada, 4(4): 233-251.

_____ 1941. The recovery of marked Masset Inlet pink salmon during the season 1940. Prog. Rept. Fish. Res. Bd. Canada, 48: 13-17.

_____ 1944. Physical characteristics and behaviour of pink salmon fry at McClinton Creek, B. C. J. Fish. Res. Bd. Canada, 6(3): 217-227.

_____ 1948. Efficiency of natural propagation of the pink salmon (Oncorhynchus gorbuscha) in McClinton Creek, Masset Inlet, B. C. J. Fish. Res. Bd. Canada, 7(5): 224-236.

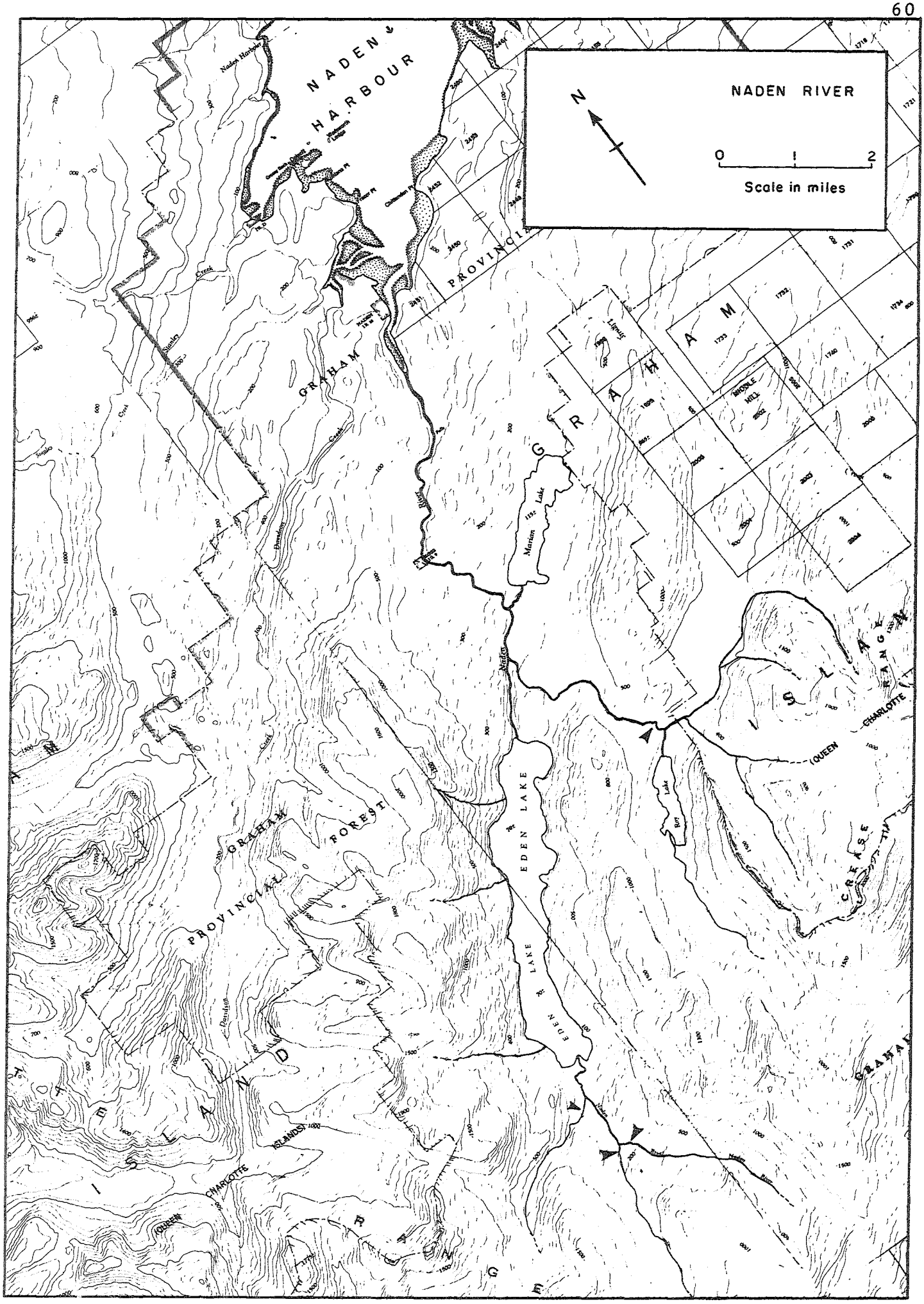
ESCAPEMENT RECORD FOR Mc CLINTON CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947			200	400		
48			1500		35000	
49			200			
50			400		7500	
51			200	1500		
52			200	400	35000	
53			200	3500		
54			750	750	15000	
55			200	75		
56			200	200	3500	
57						
58				200	7500	
59				25		
60			75	25	400	
61			200			
62			75		400	
63				200		
64			25			
65			75			
66			200	25	400	
67			75			
68			400			
69			75			
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sept.	E Oct.	E Sept.	
Peak			L Sept.	E Oct.	M Sept.	
End			M Oct.	M Oct.	L Sept.	

REMARKS

Timing of Migration:	Period	10%	50%	90% of Total
Adult Pink	1930	Aug. 30		Sept. 29
	1932	Aug. 27		Sept. 16
	1934	Aug. 18		Oct. 10
	1936	Aug. 8		Oct. 5
Juvenile Pink	1933	Apr. 20	May 10	May 25

NOTES


NADEN RIVER
N
0
1
2
Scale in miles
NADEN HARBOUR
GRAHAM
PROVINCIAL
FOREST
TOTEM ISLAND
QUEEN CHARLOTTE ISLANDS
EDEN LAKE
MARION RANGE
CHARLOTTE
QUEEN
Marion Lake
Marion River
Eden Lake
Eden River
Naden Harbour
Middle Hill

NAME OF STREAM NADEN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Naden Harbour, Queen Charlotte District POSITION 53 132 NW.

LENGTH 7.0 MI. WIDTH 85 FT. DRAINAGE 68.8 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE 30 FINE 30

SILT & SAND ____ UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	Throughout
2.5 - 5.0	
5.0 - 7.5	
7.5 - 10.0	
> 10.0	

WETTED AREA 350000 SQ. YD. SPAWNING AREA 210000 SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE 01/08/62 62.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT Two fishways were installed 3.5 miles from the mouth in 1957 to provide improved access for sockeye, coho, pink and chum salmon.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	Eden Lake and tributaries
CHINOOK	
COHO	Throughout system including lake tributaries
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	Throughout Naden River; see general remarks
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS: Fourth largest watershed on Queen Charlotte Islands; excellent salmon stream.

- Largest producer of chum salmon in statistical area 1.
- Lower 1.5 mile of stream lie in tidal influence: no spawning here.
- Estimated discharge: 01/08/62 40 cfs
- Area presently being logged (Eden Lake and Naden River).
- Logging road now exists from mouth to Eden Lake outlet, left bank.

GENERAL REMARKS: (continued)

Accessible tributaries, Naden River

Marian Lake: drains into Naden River via a very small creek; has no known salmon population.

Roy Lake: drains into Naden River via unnamed creek, junction with Naden approximately 5.75 miles from mouth; two sets of impassable falls, approximately 3.0 miles from mouth; gravel looks good to falls; creek forks just above falls, south branch flowing from Roy Lake and north branch draining mountain valley; some gravel areas on north fork.

Eden Lake: 4.4 miles long, 0.5 miles wide, 2.2 square miles.

Accessible tributaries, Eden Lake

Upper Naden River: stream forks into two branches approximately 2.0 miles from lake; impassable falls just above split on both branches; 9500 square yards of good gravel; average width 30 feet; estimated discharge 15 cfs; a tributary entering on left bank 0.25 miles upstream from lake has a series of impassable falls over bedrock 0.25 mile from mouth, <1000 square yards of good gravel.

Other tributaries entering Eden Lake: small; limited spawning areas; high gradients; impassable falls near mouths.

Spawning distribution of pink salmon on September 12, 1966 based on 42,000 fish was as follows:

Area	Percent Occurrence
From mouth to upper fishway (3.5 mi.)	15
Fishway to Marion Creek (4.25 mi.)	35
Marion Creek to upper tributary (5.25 mi.)	30
Upper tributary to outlet of Eden Lake (6.5 mi.)	20

In 1968 high density spawning by pink salmon was observed at the outlet of Eden Lake.

ESCAPEMENT RECORD FOR NADEN RIVER

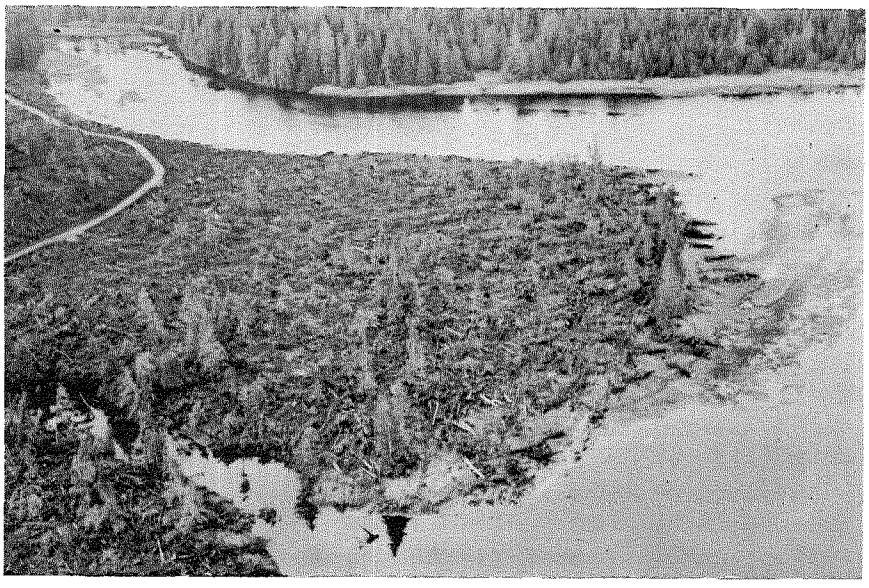
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	3500		3500	35000		
48	3500		3500	35000	175000	
49				15000		
50					100000+	
51	7500		3500	35000		
52	3500		3500		100000+	
53	3500			7500		
54						
55			3500	7500		
56	3500		3500		100000+	
57	1500		3500	35000		
58	35000		1500	15000	75000	
59	3500		3500	7500		
60	3500		3500	3500	35000	
61	7500		7500	15000		
62	15000		7500	7500	75000	
63	3500		3500	3500	75	
64	7500		15000	75000	75000	
65	1500		15000	35000	25	
66	750		7500	15000	35000	
67	400		3500	15000		
68	3500		1500	15000	250000	
69	15000		3500	15000		
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start	M Jul		E Sep	M Sep	M Aug	
Peak	L Jul		L Sep	L Sep	E Sep	
End	E Sep		M Oct	M Oct	M Sep	

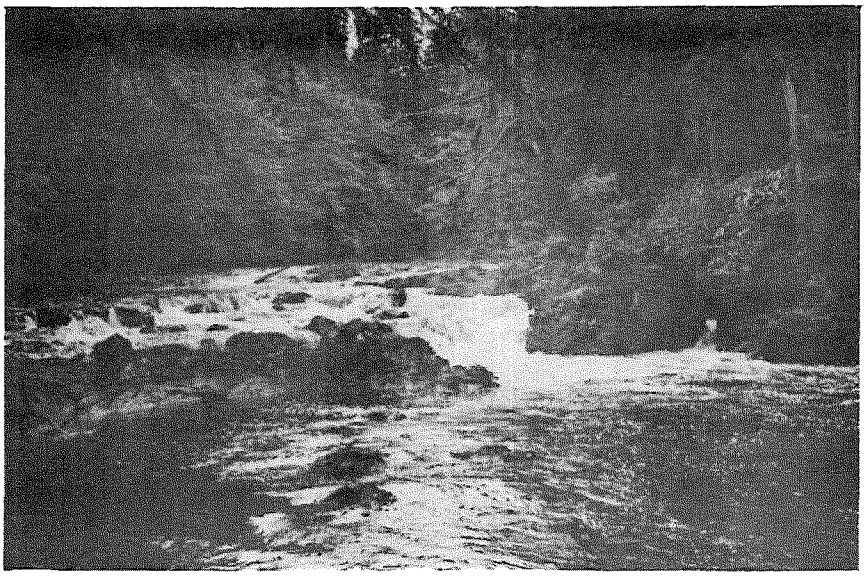
REMARKS

NOTES

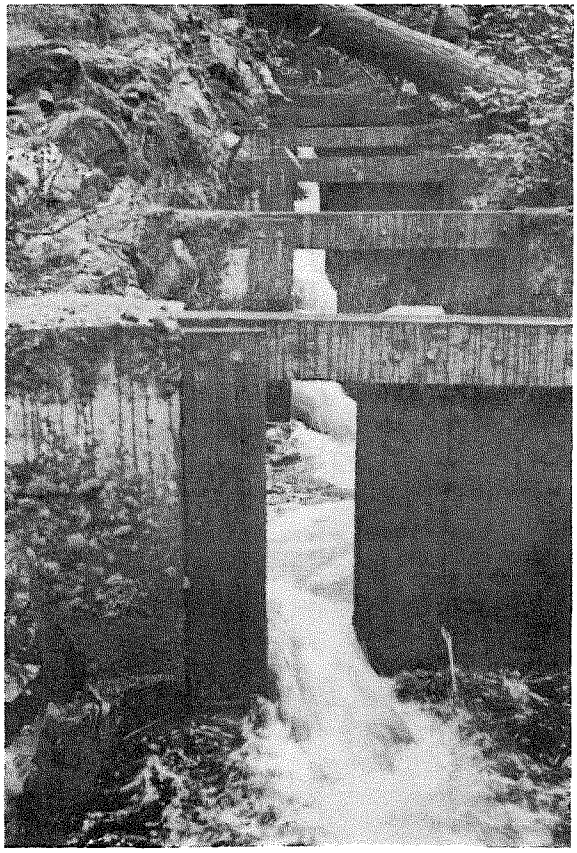
Typical mid section

Mouth

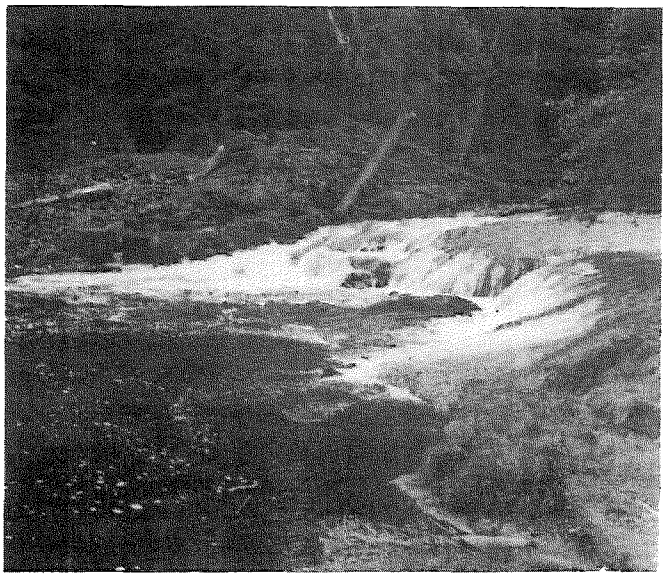




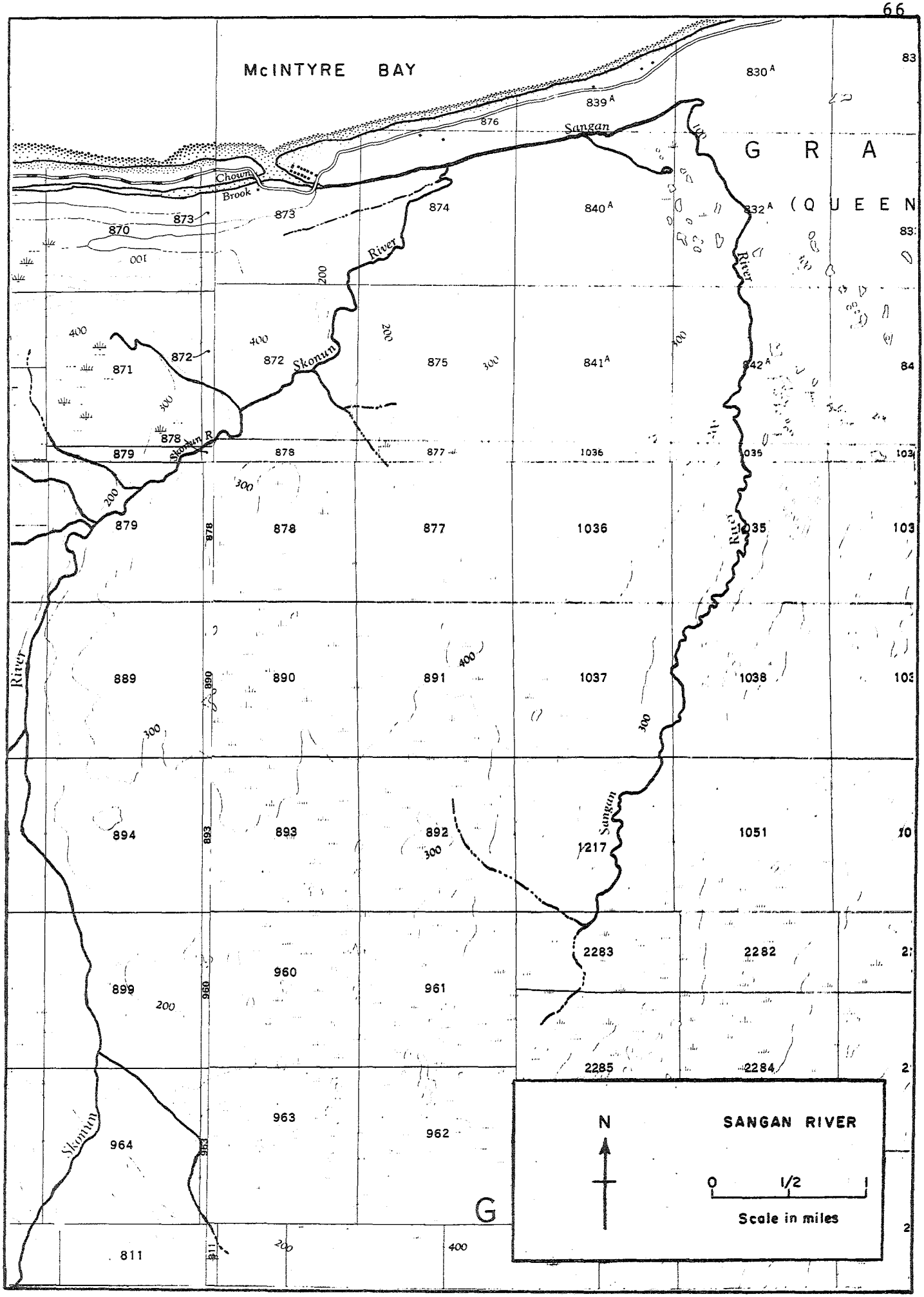
Upper falls. Fishway right center.



Fishway



Lower falls. Fishway left center.


McINTYRE BAY
Chown Brook
Sangan River
Skonun River
Skonun R
G R A
(QUEEN
830A
839A
840A
841A
842A
870
871
872
873
874
875
876
877
878
879
889
890
891
892
893
894
899
960
961
962
963
964
811
1036
1037
1038
1051
1217
2283
2282
2285
2284
N
SANGAN RIVER
0 1/2 1
Scale in miles

NAME OF STREAM SANGAN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into McIntyre Bay, Queen Charlotte District POSITION 54 131 SW.

LENGTH 10.0 MI. WIDTH _____ FT. DRAINAGE 59.2 SQ. MI.

COMPOSITION: BEDROCK _____ BOULDER _____ COARSE _____ FINE _____

SILT & SAND _____ UNCLASSIFIED _____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	
2.5 - 5.0	3.5 - 10.0 mi.
5.0 - 7.5	0.0 - 3.5 mi.
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 _____

SPAWNING DISTRIBUTION:

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

POTENTIAL OF INACCESSIBLE PORTION OF STREAM _____

GENERAL REMARKS:

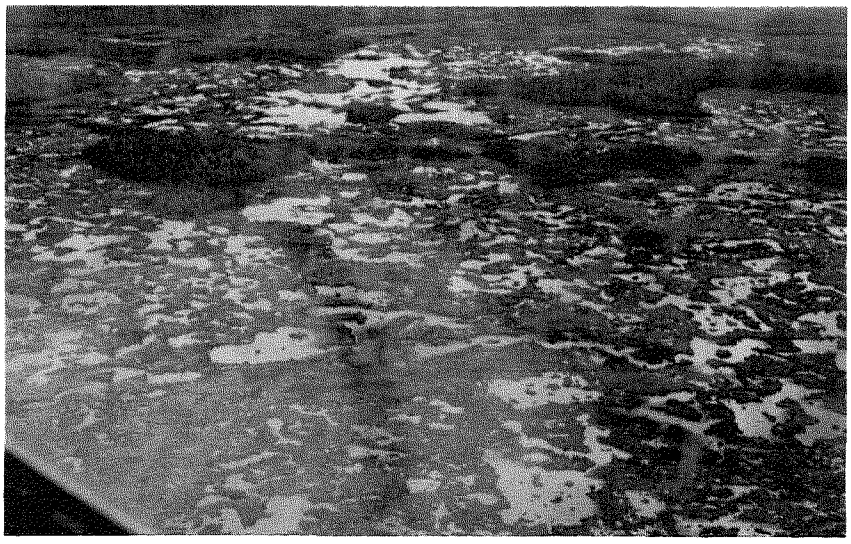
- Water: tea coloured
- Drains large muskeg area
- Logged near mouth
- Accessible tributaries: Skonun River; very low gradient (<2.5/000)

ESCAPEMENT RECORD FOR SANGAN RIVER

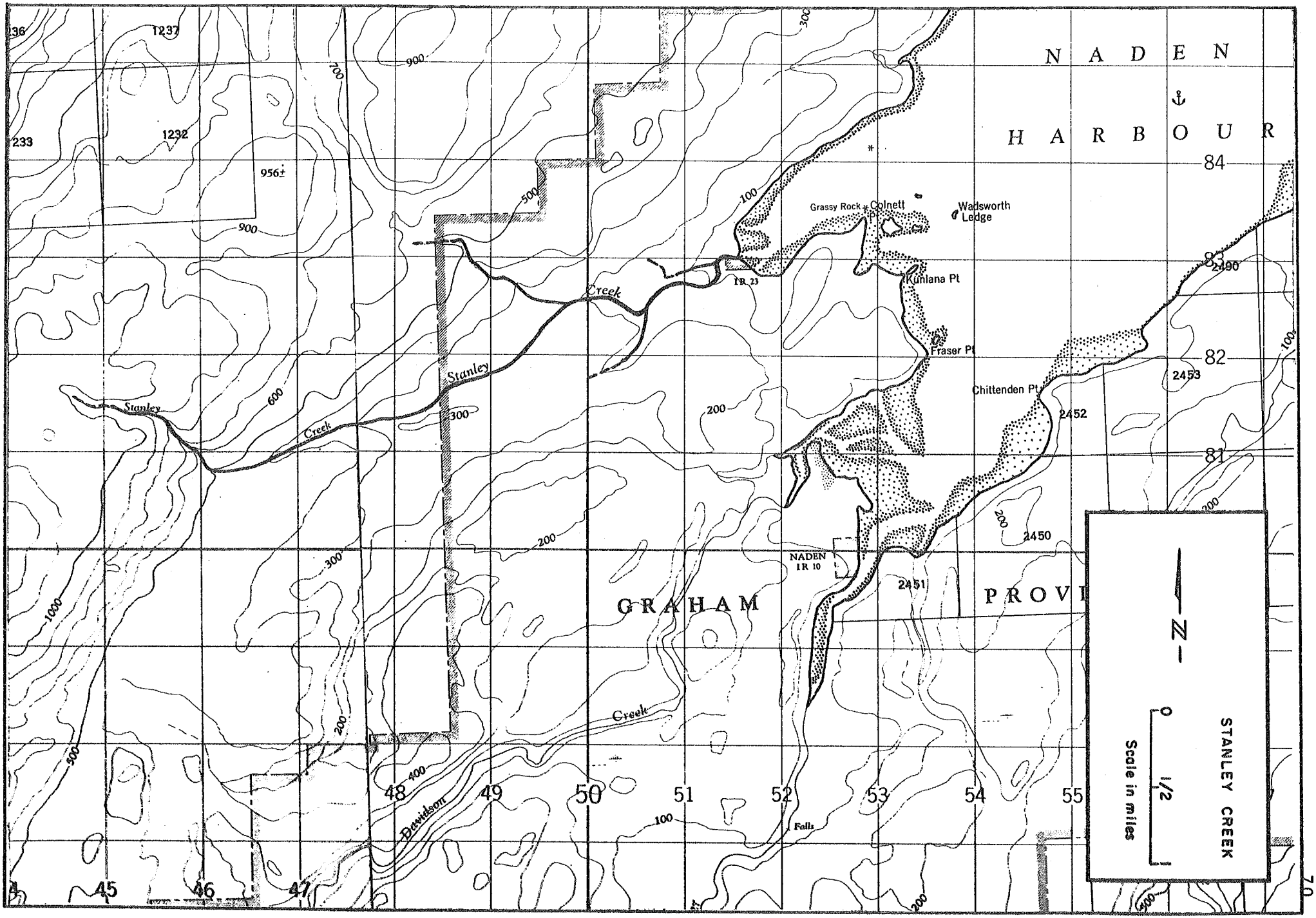
YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58			750		3500	
59			3500		3500	
60			1500		1500	
61			3500		1500	
62			3500		3500	
63			1500		1500	
64			3500		3500	
65			3500		3500	
66			200		750	
67			400			
68			200		400	
69			200			
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
Start			M Sep		M Aug	
Peak			E Oct		L Aug	
End			M Nov		M Sep	

REMARKS

NOTES



Typical headwater area east of Masset Inlet.
Sangan and Hiellen Rivers.


NADEN
HARBOUR
Grassy Rock
Colnett
Wadsworth Ledge
IR 23
Kunlana Pt
Fraser Pt
Chittenden Pt
2490
2453
2452
2450
2451
NADEN IR 10
GRAHAM
PROVI
Stanley Creek
Davidson Creek
Falls
1237
1232
956±
233
36
45
46
47
48
49
50
51
52
53
54
55
81
82
83
84
N
0
1/2
Scale in miles
STANLEY CREEK

NAME OF STREAM STANLEY CREEK

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows East into Naden Harbour,

Queen Charlotte District POSITION 53 132 NW.

LENGTH 3.6 MI. WIDTH 27 FT. DRAINAGE 9.6 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	Throughout

WETTED AREA 57000 SQ. YD. SPAWNING AREA ____ SQ. YD.

DISCHARGE ____ CFS MAX ____ MIN ____

TEMPERATURE 25/09/70 40.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	
CHINOOK	
COHO	
CHUM	Mouth - 1.4 mi.
PINK (ODD YR)	
PINK (EVEN YR)	Mouth - 1.4 mi.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM

GENERAL REMARKS:

- Water: tea coloured
- Salmon not observed above 1.4 mile
- Only stream in area with a population of "summer" chums
- No logging to date
- Estimated discharge: 25/09/70 50 cfs

ESCAPEMENT RECORD FOR STANLEY CREEK

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947						
48			200		3500	
49						
50						
51				200		
52				200	400	
53				400		
54						
55						
56						
57				200		
58				200		
59						
60				200		
61				25		
62				75		
63						
64				1500		
65				1500		
66				200		
67				75		
68						
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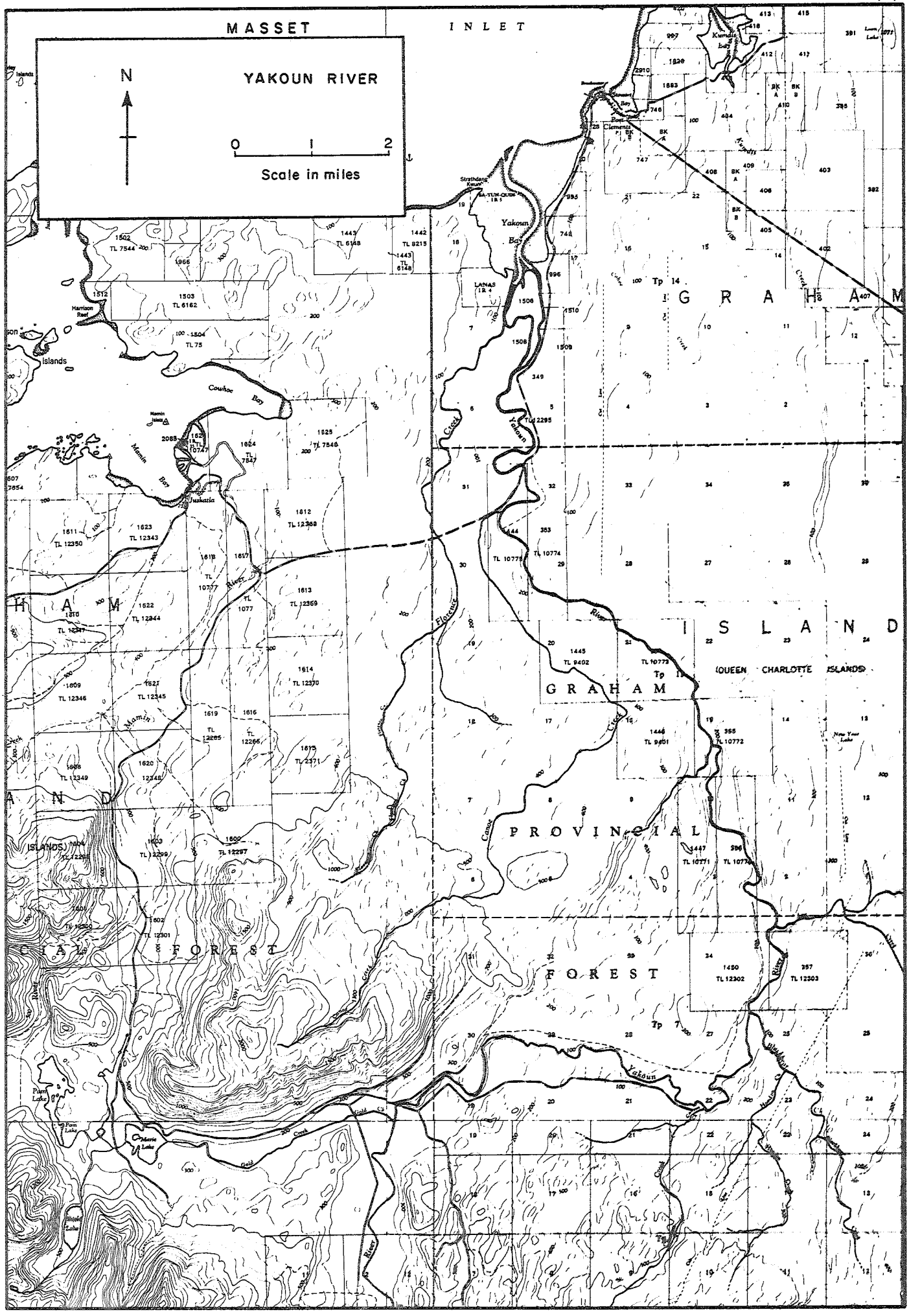
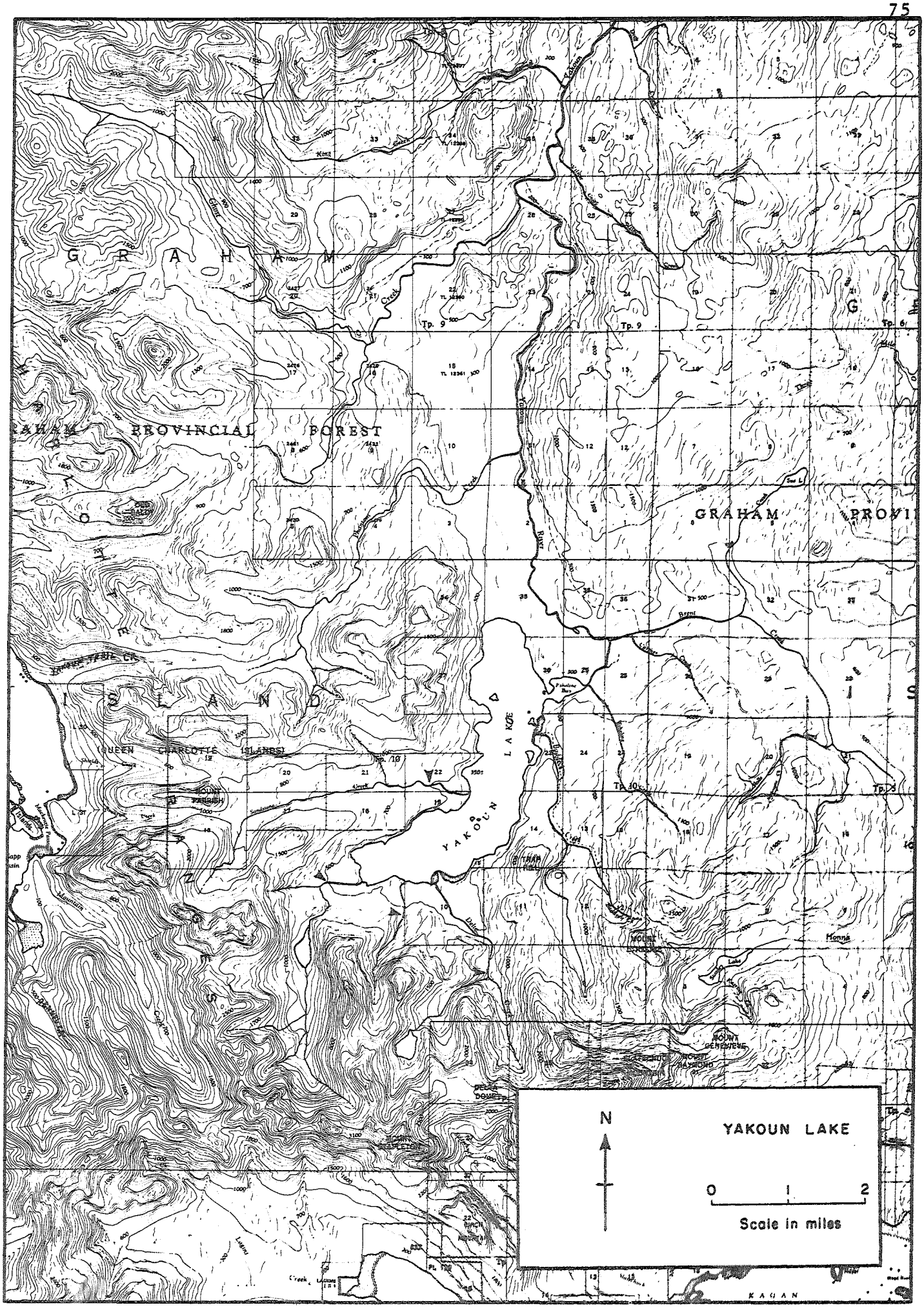
84						
85						
Start				M Aug		
Peak				E Sep		
End				M Sep		

REMARKS

NOTES


MASSET
INLET
N
YAKOUN RIVER
0 1 2
Scale in miles
Yakoun Bay
Cowhoe Bay
Mamin Bay
Juskatla
Harrison Reef
Islands
Strathdene Kwuna
GA-TLIN-GUDE I.R.
LANAS I.R.
Yakoun Creek
Florence River
Florence Creek
Canoe Creek
Mamin River
Gold Creek
Gold River
Yakoun River
Pierre Lake
Orbasin Lake
Shuttle Lake
GRAHAM ISLAND
QUEEN CHARLOTTE ISLANDS
PROVINCIAL FOREST
Tp 14
Tp 7


G R A H A M
PROVINCIAL FOREST
GRAHAM PROVI
Tp. 9
Tp. 9
Tp. 10
Tp. 3
Tp. 18
I S L A N D
QUEEN CHARLOTTE ISLANDS
YAKOUN LAKE
TRAP RIVER
MOUNT EXPEDITION
MOUNT GENEVIEVE
MOUNT RAYMOND
SKELETON
KAGAN
N
YAKOUN LAKE
0 1 2
Scale in miles

NAME OF STREAM YAKOUN RIVER

CONSERVATION DISTRICT 9 STATISTICAL AREA 1

LOCATION OF MOUTH Flows North into Yakoun Bay, Masset Inlet, Queen Charlotte District POSITION 53 132 NE.

LENGTH 37.0 MI. WIDTH 80 FT. DRAINAGE 201.6 SQ. MI.

COMPOSITION: BEDROCK ____ BOULDER ____ COARSE 19 FINE 19

SILT & SAND ____ UNCLASSIFIED ____

GRADIENT: FALL IN FT/000	
0.0 - 2.5	0.0 - 32.2 mi.
2.5 - 5.0	33.8 - 37.0 (Lake outlet)
5.0 - 7.5	
7.5 - 10.0	
> 10.0	32.2 - 33.8 mi.

WETTED AREA 1700000 SQ. YD. SPAWNING AREA 650000 SQ. YD.

DISCHARGE 1294 CFS MAX 28/11/63 21600 MIN 28/09/65 16.2

TEMPERATURE 16/10/70 48.0°F

BARRIERS OR POINTS OF DIFFICULT ASCENT None known, however, log jams in the main and tributary streams may present access problems at some flows.

SPAWNING DISTRIBUTION:

SPECIES	SECTION OF STREAM USED
SOCKEYE	Yakoun Lake and trib. Gold Creek (Marie Lake and trib.)
CHINOOK	Yakoun River between Phantom and Ghost Creeks
COHO	Throughout main stream, tributaries and Gold Creek
CHUM	
PINK (ODD YR)	
PINK (EVEN YR)	Throughout but mainly from King Cr. to Black Bear Cr.
STEELHEAD	

POTENTIAL OF INACCESSIBLE PORTION OF STREAM ____

GENERAL REMARKS: Largest watershed on Queen Charlotte Islands
- Watershed intensively logged
- Water: tea coloured
- From Yakoun Lake to King Creek largely a flowing stream.
  King Creek to Cannon Creek largely riffle and pool.
  Canyon Cr. to estuary largely deep pools with some riffle area.
- Large log jams prevalent throughout

Publications:

Walker, C. E. 1970. Enumeration of pink salmon fry in the Yakoun River in 1965. Tech. Rpt. 1970-8, Department of Fisheries and Forestry. 17 pp.

GENERAL REMARKS: (continued)

This is the largest river on the Queen Charlotte Islands and definitely the main spawning area for the Masset Inlet pink run. The escapement to this stream is more than all other streams in the area combined and also is the only river on the Queen Charlottes that has all five species of salmon.

There is no appreciable fall in the entire length of the river as the lake is three hundred fifty feet above sea level and the distance from Yakoun Lake to Masset Inlet via the river is about thirty seven miles.

There are approximately twenty five log jams in the river mainly between Gold Creek and Canyon Creek. Some of these jams are at least one mile in length composed of debris carried along by the river. None however are impassable to migrating salmon as the tremendous flow of water at periods of high water tend to cut the banks of the river away and by-pass any obstructions.

The spawning beds begin about six miles from the mouth of the river and the tide affects the river for about three miles. The spawning beds are composed of fine gravel with very few large rocks. There is only one rocky stretch of river where no spawning occurs and this is between Phantom and Ghost Creeks, and is about one mile in length.

Accessible tributaries, Yakoun River

Florence Creek: pink
Canoe Creek: coho
Log Creek: coho
Black Bear Creek: coho
Canyon Creek: coho
Gold Creek: pink, coho, sockeye (Marie Lake and trib.)
King Creek: pink
Wilson Creek: pink
Phantom Creek: pink and sockeye
Ghost Creek: pink; average width 15 feet; 19/10/70 44.0°F
Brent Creek: coho

Yakoun Lake: 3.2 square miles; 19/10/70 52.0°F

Accessible tributaries, Yakoun Lake

Baddick Creek: sockeye and coho
Delta Creek: sockeye and coho; impassable falls, 2 miles
Tributary 0.5 mile east of Delta Creek: sockeye and coho; impassable falls 1.0 mile.
Tributary, furthest southwest end of lake: sockeye and coho; impassable falls 1.0 mile.
Sandstone Creek: sockeye and coho; average width 15 feet; impassable falls 0.75 mile, 15 foot vertical drop; 19/10/70 44.0°F.

A study on the pink salmon population was commenced in 1964. In three brood years fresh water survival ranged from 12.5 to 18.0%; sea survival (fry-total adult return) appeared to range from 1.5 to 5.9%.

ESCAPEMENT RECORD FOR YAKOUN RIVER

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	3500	1500	7500			
48	3500	750	15000		1500000	4000
49						
50			7500		100000+	
51	7500		35000			
52	3500	1500	7500		100000+	
53						
54					100000+	
55						
56		750	3500		100000+	
57	750	1500		1500	3500	
58	3500				175000	
59	7500	3500	3500		7500	
60	7500	750	3500	400	35000	
61	3500	3500	3500		7500	
62	15000	1500	7500		35000	
63	7500		3500		7500	
64	15000	7500	15000		300000	
65	7500	15000	15000	25	15000	15000
66	3500	7500			800000	15000
67	7500	1500	7500			3500
68	7500	1500	3500		750000	3500
69	15000	1500	1500			7500
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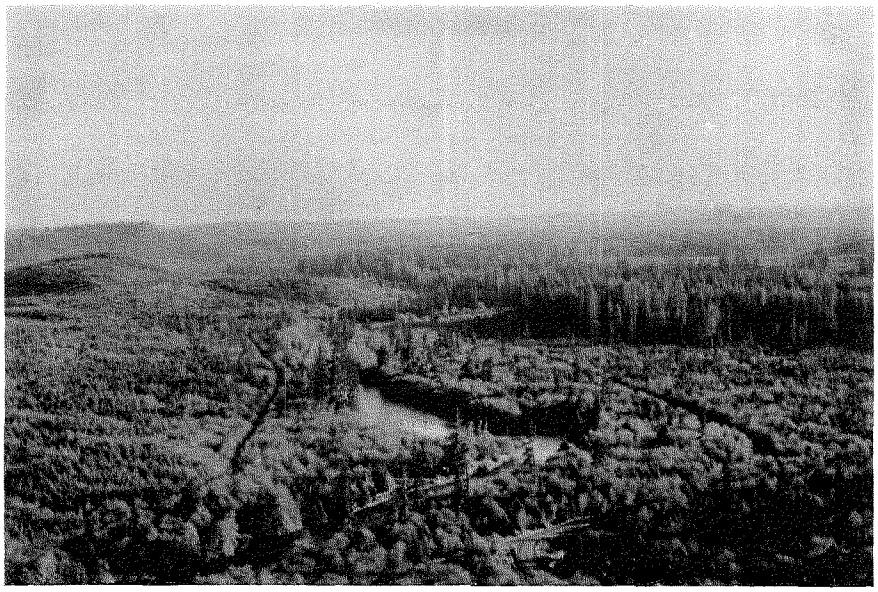
Start	E May	E Jul	M Sep	E Oct	L Aug	
Peak	M May	M Jul	E Oct	M Oct	M Sep	
End	L Jun	E Sep	L Oct	M Oct	M Sep	

REMARKS

Timing of Migration	Period	5%	50%	95%
Adult Pink	1964	Aug 26	Aug 29	Aug 30
	1966	Aug 16	Aug 19	Aug 27
	1968	Aug 19	Aug 23	Aug 29
Juvenile Pink	1965	Apr 19	Apr 23	Apr 28
	1967	Apr 18	Apr 29	May 6
	1969	Apr 25	May 6	May 11

NOTES



Mid Section

ESCAPEMENT RECORD FOR STATISTICAL AREA 1

YEAR	SOCKEYE	CHINOOK	COHO	CHUM	PINK	STEELHEAD
1947	10700	7500	13475	43325	1500	
48	11000	15000	47900	40100	2006500	
49			4700	20400	3500	
50		7500	16500	11000	381000	
51	22000	35000	44900	119200	3500	
52	7400	7500	12950	50800	541400	
53	5000		1200	121475	3500	
54	1500		6900	90750	304700	
55			5050	22650		
56	3500	3500	7675	3700	440500	
57	3050		13550	146775	18500	
58	39325		5150	23500	402000	
59	12500	3500	20200	18525	18000	
60	13250	3500	14150	15125	98575	
61	12250	3500	27150	26025	20000	
62	35100	7500	35800	14575	175675	
63	13250	3500	14075	10700	20075	
64	25500	15000	60300	95025	441825	
65	10250	15000	77850	161600	33950	
66	5425		13025	93950	1068425	
67	8525	7500	23625	166576	150	
68	12900	3500	10250	37500	1335900	
69	48500	1500	6825	45000	200	
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REMARKS

QUEEN CHARLOTTE ISLANDS SALMON STOCKS

The Queen Charlotte Islands are designated as Statistical Areas 1, 2AE, 2AW, 2BE and 2BW.

The chum is the most important salmon species in the Queen Charlotte Islands. In a 25 year span commencing in 1934, this species accounted for approximately 45 percent of the Queen Charlotte Islands catch. The pink salmon is next in importance contributing 25 percent of the catch. The pinks appear principally in the even numbered years. Coho, chinook and sockeye salmon follow in that order of importance. A significant part of the coho and chinook catch is taken by high seas troll and therefore is not necessarily fish migrating to streams on the Queen Charlotte Islands. The sockeye are largely caught in the native food fishery and are not commercially important.

In a 25 year span commencing 1930, the Island fishery accounted for an average of approximately 10 percent of the chum salmon pack in British Columbia (maximum of 32% in 1944) and approximately 20 percent of the pink salmon even-year pack (maximum of 31% in 1954).

Two general levels of abundance are indicated in the chum salmon data. From 1934 to 1954 the chum salmon population ranged from approximately 0.40 to 2.00 million fish with an average of 0.90 million fish.[1] Commencing 1955, a lower population level averaging approximately 0.30 million fish returned to the area. Since this time there has been a gradual increase toward the former stock size. Some regularity in high abundance appeared to exist at four year intervals 1936, 1940, 1944, and 1948, however this phenomenon has not been observed recently. The decrease in stock size in the mid 1950's of the Queen Charlotte Islands chums corresponded to changes measured in other British Columbia and Southeastern Alaska populations. The escapement to return ratio of the Queen Charlotte Islands chums has been estimated at 1:1.8.

The chum salmon reproduce in a multitude of streams. The majority of streams are small with high maximum-minimum runoff ratios. The species is not abundant in the large and more stable watersheds. Hence, the Queen Charlotte Islands chum stock is made up of numerous but small populations (Table I).

The pink salmon appear principally in the even numbered years; the ratio in stock abundance of the even numbered year population to the odd numbered year one approximates 20:1. Total

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[1]Total run, i.e. catch and escapement. Estimates of abundance arrived at by converting the catch data (CWT) to numbers of fish and adding the escapement.

populations in the "on" years have ranged, with one exception, from 1.0 to 3.0 million fish. The Yakoun River population is the principal one, however it has been subject to large changes in abundance. For example, the total run was in the order of 200,000 fish in 1960 and 1962, slightly less than 500,000 in 1964, and 2,000,000 in 1966. The estimated escapement to return over the long term for Queen Charlotte Islands pinks has been estimated at 1:2.3.

Pink salmon, in contrast to chum salmon, utilize principally the larger watersheds and consequently the Queen Charlotte Islands stock is one of relatively few but large units (Table I). The Yakoun River accounts for at least one half of the total Queen Charlotte Islands pink salmon population.

Coho salmon occupy all streams but production is highest in the plateau and lowland streams. The Queen Charlotte Islands lowlands may be the most productive coho area in British Columbia however the tea colouration of the water, the intensive networks of meandering streams and swamps/ponds, and the lack of access makes full assessment impossible at this time.

The migration and capture of Canadian fish within Southeastern Alaska waters has been demonstrated by various tagging experiments carried out since 1924. The finding of a small number of unattached U. S. tags on Queen Charlotte Islands stream-beds during the surveys of the 1960's indicate that Queen Charlotte Islands pinks, made up a part of those Canadian fish moving through Alaskan waters. Therefore, the actual productivity is greater than that indicated by the Queen Charlotte Islands catch and escapement data.

The local commercial fishery is one of seines and gillnets which operate in the bays and channels of the coast and as close to the stream mouths as regulation will permit. The fishing season may extend from early May to early October. The Queen Charlotte Islands pink salmon appear in the fishery in the month of August and, when regulation permits, in the first half of September; the peak of abundance generally occurs in the week commencing August 25. The chum salmon appear in the fishery in September and the first half of October.[2]

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[2]Aro, K. V. and M. P. Shephard. 1967. Salmon of the North Pacific Ocean - Part IV. Spawning populations of North Pacific Salmon. Pacific Salmon in Canada. Bull. Int. North Pacific Fish. Comm. 23: 225-327.

TABLE I. Composition of the Salmon Stocks in the Queen Charlotte Islands

Av. Spawning Populations	Number of Streams					
	Sockeye	Chinook	Coho	Chum	Pink Odd Yr.	Pink Even Yr.
200000-500000						1
100000-200000						1
50000-100000						6
20000-50000				2	1	5
10000-20000	1		3	8	1	5
5000-10000	2		3	15	1	4
2000-5000	3	1	6	26	2	11
1000-2000				36	1	5
Total						
Rank						
1	Copper	Yakoun*	Copper	Naden*	Copper	Yakoun*
2	Naden*		Tlell*	Pallant	Riley	Naden*
3	Yakoun*		Yakoun*	Deena	Tlell	Copper
4	Mercer		Mathers	Ain*	Yakoun*	Deena
5	Ain*		Naden*	Awun*	Pallant	Kaisun
6	Mathers		Hiellen*	Salmon	Mathers	Pallant
7			Jalun*	Mathers		Datlamen*
8			Kumdis*	Mercer		Tlell
9			Lignite*	Long Arm		Mamin*
10			Sangan*	Lagoon B.		Mathers

*Described in this booklet.

FISHERIES DEVELOPMENT POSSIBILITIES

This Department has successfully implemented flow control, spawning channel, fishway and stream improvement techniques and consequently the discussion of development possibilities is restricted to these four techniques. However this does not preclude the use of other techniques (fish farms, transplantation, lake fertilization, predator control and selective breeding) as they are researched and developed.

Flow Control and/or Spawning Channel

The watersheds draining the west coast of the Islands appear to be least desirable for fisheries development because: (1) the oceanic conditions pose serious problems in the catch and transport of fish; (2) the watersheds in general are small in area, have steep slopes, and lack storage possibilities; and (3) the salmon populations are small. The watersheds located in the southeast area are also considered to be poor risks for development for reasons 2 and 3 above. Because of favourable topography and the presence of reasonably sized salmon populations eight watersheds, all located in the north and northeast areas, appear to provide the best opportunities for flow control and spawning channel works. Possibilities for management of catch and escapement appear to be excellent also. Within Statistical Area I these are: Naden, Ain and Yakoun Rivers.

Fishways

In general, there are no recognized obstructions preventing access of salmon to area(s) with the potential to produce very significant sized salmon populations. Obstruction removal in the following streams may benefit local fisheries, however.

Ain: Fish passage facilities at three waterfalls located in the Ain River between Skundale Lake and Masset Inlet would provide unobstructed access for salmon to an extensive lake and tributary system. The lake system is now partially utilized by sockeye and coho salmon but spawning populations are estimated at less than 10 percent of optimum. The theoretical production levels (catch + escapement) of the entire Ain system based on 80,000 square yards of gravel below Ian Lake, 7.8 square miles of lake surface area, and 25 linear miles of lake and stream area as follows:

	Potential Population	Current Population
Sockeye	78,000	1,500
Coho	17,500	4,000
Chum	120,000	20,000
Pink	240,000	1,500

catch:escapement ratio 3:1

Lignite: A waterfall located within four miles of the mouth may exclude pink, chum and coho salmon from 12 miles of stream. An engineering/biological survey is required to evaluate the situation.

Stream Improvement

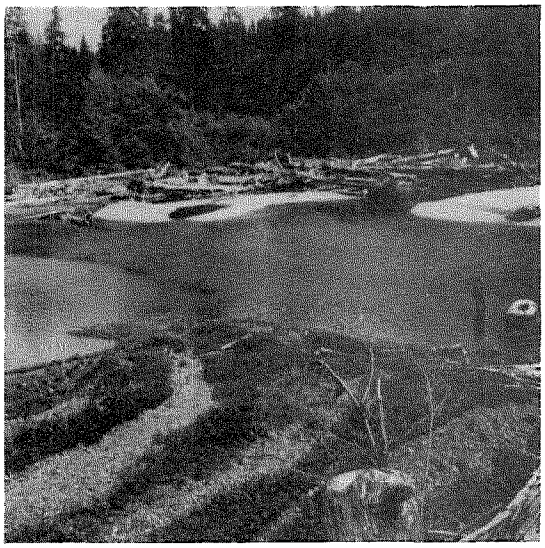
Mamin: This watershed was seriously affected by logging and gravel removal practises and some remedial work may be required to provide more favourable spawning situations. This may include grading to slope, channelling, and/or adding spawning gravel in selected sections, particularly the lowermost two miles of stream. An extensive log jam at the stream mouth deserves evaluation occasionally for fish passage opportunity.

Yakoun: Large log jams and beaver dams prevail in the system but these do not appear to affect the distribution of salmon at above-minimum flows. Superficially it appears that a critical point to migration may occur occasionally in a swamp-like area containing log jams and beaver dams within two miles of the outlet of Yakoun Lake. This situation should be observed frequently for fish passage success.

SOME EFFECTS OF LOGGING AND RELATED ACTIVITIES

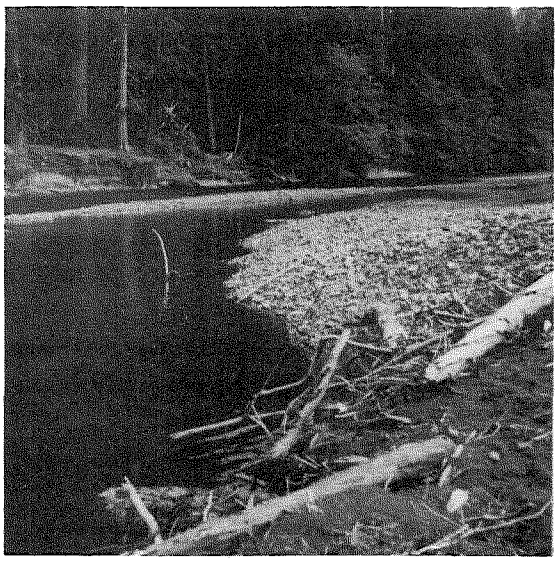
The following photographs illustrate some of the obvious effects from logging operations. An attached map locates the areas of gravel removal on the Yakoun and Mamin Rivers and provides estimates on the quantities of gravel involved. Since completion of the study the logging companies have co-operated with this department to protect the salmon resource in this area.

Yakoun River



Yakoun River

Accumulation of debris in stream

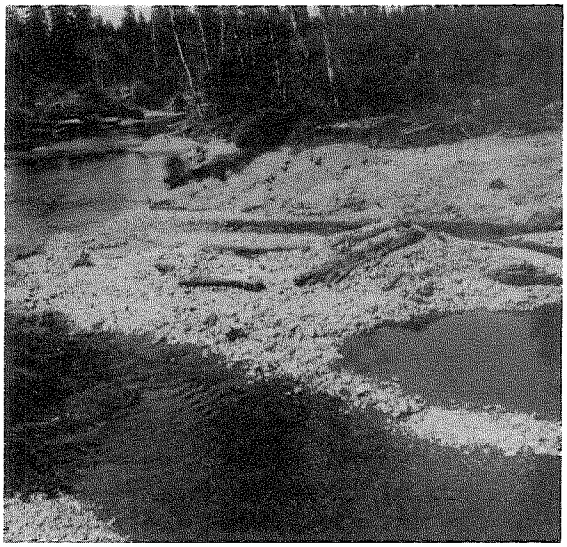


Yakoun River

Mamin River

Stream bank erosion

Yakoun River



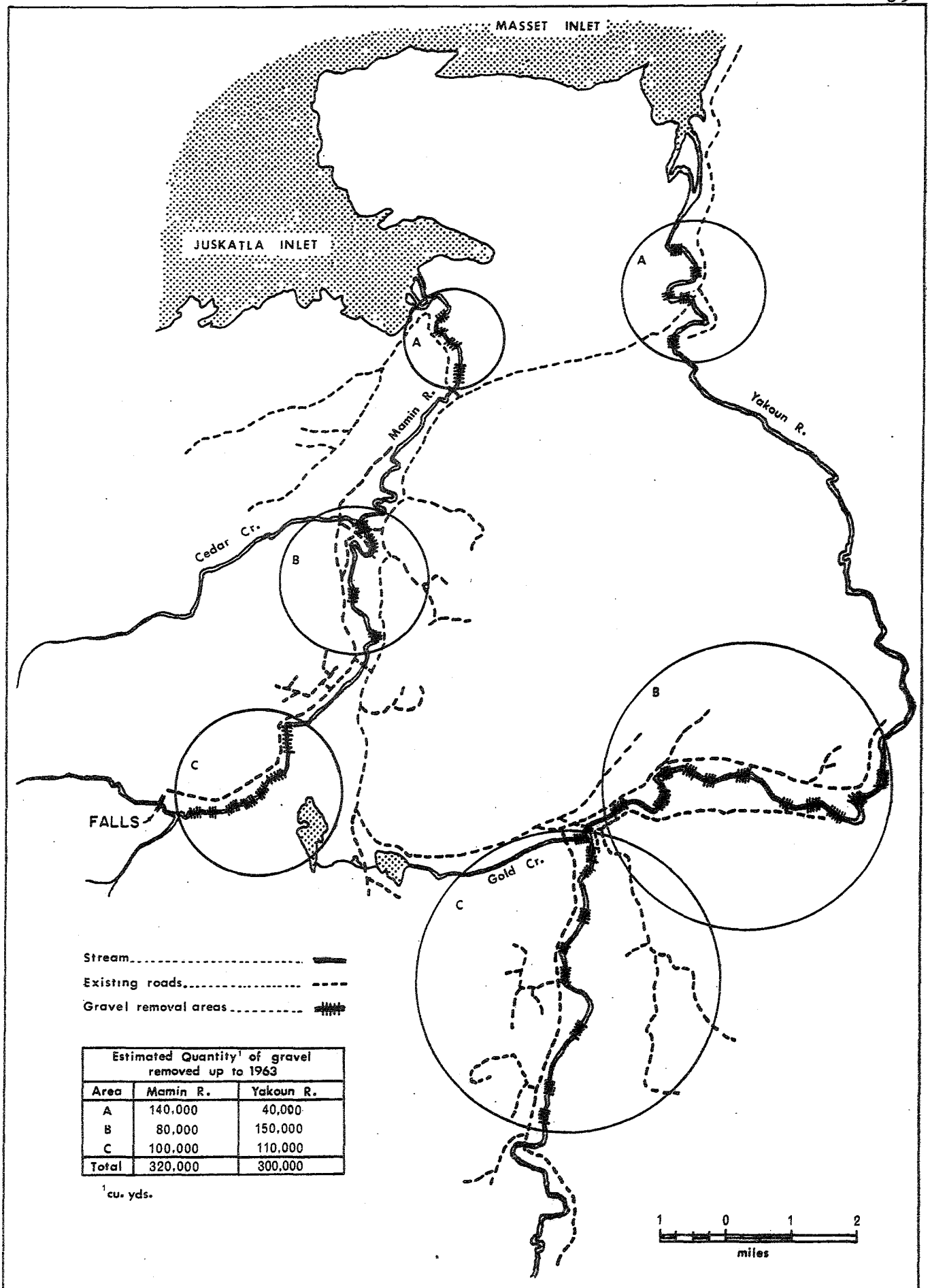
Mamin River

Potholes formed by gravel removal

Yakoun River

Mamin River

Formation of large pools from gravel removal



Estimated Quantity[1] of gravel removed up to 1963		
Area	Mamin R.	Yakoun R.
A	140,000	40,000
B	80,000	150,000
C	100,000	110,000
Total	320,000	300,000

[1] cu. yds.

GRAVEL REMOVAL AREAS IN THE MAMIN AND YAKOUN RIVERS

METRIC EQUIVALENTS

Length

Cm.	=	0.3937	In.
Meter	=	3.28	Ft.
Meter	=	1.094	Yd.
Kilom.	=	0.621	Mile
In.	=	2.54	Cm.
Ft.	=	0.3048	Meter
Yd.	=	0.9144	Meter
Mile	=	1.61	Kilom.

Area

Sq. Cm.	=	0.1550	Sq. In.
Sq. M.	=	10.76	Sq. Ft.
Sq. M.	=	1.196	Sq. Yd.
Sq. Kilom.	=	.386	Sq. Mi.
Sq. In.	=	6.45	Sq. Cm.
Sq. Ft.	=	.0929	Sq. M.
Sq. Yd.	=	.836	Sq. M.
Sq. Mi.	=	2.59	Sq. Kilom.
Acre	=	0.405	Hectare
Hectare	=	2.47	Acres
Acre	=	43560	Sq. Ft.

Volume

Cu. Cm.	=	.061	Cu. In.
Cu. M.	=	35.315	Cu. Ft.
Cu. M.	=	1.308	Cu. Yd.
Cu. In.	=	16.38	Cu. Cm.
Cu. Ft.	=	.028	Cu. M.
Cu. Yd.	=	.7645	Cu. M.

Capacity

Liter	=	.0353	Cu. Ft.
Liter	=	.21998	Gal. (Br.)
Liter	=	61.023	Cu. In.
Cu. In.	=	.0164	Liter
Cu. Ft.	=	28.32	Liter
Gal.	=	4.5459	Liter (Br.)

Degrees Centigrade = 5/9 (Degrees Fahr. - 32)
Degrees Fahrenheit = 9/5 (Degrees Cent.) + 32.

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1 cubic foot per second (cfs) = 373.2 ga. per min. (gpm)
1 cubic foot per second (cfs) = .537408 million gals. per day
1 million gallons per day = 1.86 cfs

ACKNOWLEDGEMENTS

Information and/or assistance in the collection of data were supplied by:

J. R. MacLeod - Organization Development Consultant
R. G. McIndoe - Assistant Chief, Conservation and Protection Branch
A. W. Domes - Administrative Officer
R. R. Mallory - Northern Marine Officer
F. B. Wheeler - Sub-District Officer
J. D. McCulloch - Sub-District Officer
A. C. Skipper - Fishery Officer

Recent biological data on the Yakoun River pink salmon population were provided by D. Harding, Biologist, Resource Development Branch.

Messrs. G. O. Nielsen and T. J. Tully, engineering section Resource Development Branch, provided information on the Ain River obstructions, and took part in watershed surveys in connection with fisheries development opportunities.