

DEPARTMENT OF FISHERIES AND OCEANS
ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATION

BULKLEY RIVER - UPPER

Year **2004**

AREA: 4 MAINLAND
LOCATION: BULKLEY / MORICE

Watershed Code: 460-000000
Waterbody Id: 0000_TEMP

ALIAS 1: BULKLEY RIVER - UPPER
ALIAS 2:

DATES of INSPECTION:

Jun 29

ABORIGINAL NAME 1:
ABORIGINAL NAME 2:

TIMING AND ESCAPEMENT

SPECIES	ARRIVAL IN STREAM	DATES of SPAWNING			# OF INSP. USED	EST. MTH.	EST. CLASS	REL.	ANNUAL ESTIMATE	ESTIMATE STAGE
		START	PEAK	END						
SOCKEYE					4				-2	Final
COHO					2	4		Medium	380	Final
PINK									-3	Final
CHUM									-4	Final
CHINOOK					2				-2	Final

Annual Estimate Rationale:

Sockeye:

On August 05 a survey was done from Maxan Lake to approximately 500m below Foxy Creek, then up Foxy Creek to the Forest Service road. Access to Maxan Lake was blocked by a beaver dam at the time. Water levels below the lake to Foxy Creek were very low and at 17.2 C. Below Foxy the water level was doubled and temperature at 13C. No fish were seen although the survey time coincided with historic records of sockeye spawning below Maxan Lake. On August 24, 12 sockeye were captured by Toboggan Hatchery crew near the confluence with McQuarrie Creek. Of the 12 caught 5 had been tagged at Moricetown. 16 sockeye were captured at the Houston counting fence of which two were tagged from Moricetown. A Bulkley River sockeye population does exist, an estimate of 100 total would be reasonable. However its relationship to the Maxan Lake population is not known.

Chinook - On August 20 a helicopter adult survey from Morice River Junction to Bulkley Falls was done for a count of 466. Ground truthing of the hel count was done in the McQuarrie/Richfield area and few fish were missed during the flight, estimate 530 adults .

Count by section was:

Above Bulkley Falls - N/I
Richfield Creek - 95
Below McQuarrie Ck. - 113
In Buck Creek - N/I

Meanwhile Creek - 14
Perow Station - 97
Below Knockholt - 0

Topley - 8
McQuarrie Creek - 45
Houston - 94

A total of 124 chinook were sampled during broodstock collection and recorded as 35% adipose clipped, 65% wild and 70% male. As of April 2005 over 69,000 chinook fry from the 2004 egg take were doing well at the Toboggan Creek Hatchery. During the egg take (early August) water temperatures were recorded to be 24 degrees Celsius. Many fish died unspawned and it is estimated that only 20 to 30 females above Knockholt successfully spawned. General size of the fish suggested a good portion of 4 year olds, lower than normal 5 year olds and some large females that could have been 6 year olds. No estimate for chinook is given because of the unknown but considerable prespawn mortality from the exceptionally warm water.

Coho - The counting fence near Houston operated from August 19 to Oct. 25th. The count through the fence was 380 with 105 coho being adipose/CWT as fry and 44 were adipose Right Maxillary/CWT from smolt tagging. Panels were pulled Sept 24th and again Oct 12 to 18th because of high water and debris. During the time the panels were down staff did visual counts and recorded 40 going over the fence. Counting was also done during the night under lights, however no fish were seen and the counts evolved to a 7:30 am to 7 pm shift on days the panels were down. The fish did not seem to start moving until 10:30 am. Due to high water during peak spawning times surveys below the fence were not done, so the 380 estimate is the count of fish that went above the fence only. (Note the 40 overfence are included in the 380).

The egg take used 13 female and 11 males and took approximately 36,130 eggs.

Unusual Fish Conditions:

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Note all sockeye captured in 2004 appear to be stream spawners.
 See Rationale for chinook.

Unusual Stream Conditions

See rationale for chinook for comments about warm water conditions.

General Comments:

Sockeye - DNA samples collected from the Houston fence indicate that the Bulkley sockeye are not strays from Nanika or an other known stock. Fish access was explored this year. None of the beaver dam complexes seemed impassable although low water levels at Bulkley Falls likely prevented migration into either Maxan or Bulkley Lakes. It is hoped that adult surveys will continue and possibly smolt trapping at the mouth of Maxan Lake. Juvenile surveys would be confounded by a large kokanee population.

Chinook - Brood stock collection used 19 females and 85 males. As of November the hatchery had approximately 70,000 alevins from 2004 egg take.

<u>Days of the Month:</u>	<u>Estimate Method:</u>	<u>Estimate Classification:</u>	<u>Reliability:</u>	<u>Annual Estimate:</u>	<u>Estimate Stage:</u>
1 - 10 = A	1 = Peak Live Plus Dead	Type 1 = True Abundance, high resolution	Low	-1 = N.O. (None Observed - Stream inspected but	P = Preliminary
11 - 20 = B	2 = Peak Live Plus Cumulative Dead	Type 2 = True Abundance, medium resolution	Medium	no fish observed, even though conditions	NF = Near Final
21 - 31 = C	3 = Area Under the Curve	Type 3 = Relative Abundance, high resolution	High	would permit enumeration)	F = Final
	4 = Fixed Site Census	Type 4 = Relative Abundance, medium resolution		-2 = UNK (Unknown - information not adequate	
	5 = Expert Opinion	Type 5 = Relative Abundance, low resolution		to estimate escapement, (ie. Too few	
	6 = Redd Count	Type 6 = Presence or Absence		inspections, poor counting conditions, etc.)	
	7 = Lake Expansion			-3 = N.I. (Species Not Inspected)	
	8 = Mark and Recapture - Petersen			-4 = D.N.S. (Does Not Spawn - Species not known	
	9 = Mark and Recapture - Jolly-Seber			to spawn in this system)	
	10 = Addition/Subtraction				
	11 = Multiplication/Division				
	12 = Other				

Affiliation: North Coast Stock Assessment Division

CreatedBy: B. Finnegan

February 14, 2005 14:47

UpdatedBy: Dan Wagner

April 21, 2005 11:14

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STREAM IDENTIFICATION
 Watershed Code: 46-0000-000-000-000-99
 Stream Name: BULKLEY RIVER - UPPER

Year: 2003 Location: BULKLEY / MORICE
 Area: 4

DATES of INSPECTION	
Aug 15	Dec 31

SPAWNING RUN TIMING and ESTIMATED NUMBER
 Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other
 Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING			(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUND	(8) OPTIMUM ESCAPE.
			START mth. day	PEAK mth. day	END mth. day					
SOCKEYE							10		UNK	300
COHO							10		2126	7500
PINK						0			N/I	500
CHUM						0			-4	0
CHINOOK							14	2	1280	2000

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:

PHYSICAL CONDITION of SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected:
- (B) Particulars of scouring of spawning beds or change in stream course :
- (C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars affecting distribution by species. Note changes from normal :
- (E) Comments on predators (numbers compared to other years) :
- (F) Evidence of digging up eggs (location, severity) :
- (G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

CHINOOK:

Chinook spawner assessment was carried out by helicopter Aug. 19 for a total count of 1020 chinook observed between the Morice River junction and Bulkley Falls. Over 79% occupied the section between Richfield Creek mouth and Knockholt. The fish were well distributed in this major

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spawning area. A total of 266 different chinook were sampled during egg collection this year. This sample was composed of 55% wild and 45% adipose clipped fish.

Visibility during the assessment flight was very good in most sections. Chinook that were spawning were clearly visible with the exception of the Richfield section where over hanging trees were a problem. As in previous years a comparative ground count was done in the vicinity of McQuarrie and Richfield Creeks to verify accuracy of the aerial count. From the flight and ground count information the chinook spawning stock of four to six year olds was estimated at 1280. Very few jacks were seen. The four year old component was much weaker than last year with five year olds being dominate in the population. The fish were large this year because of the large 5 year old component and the cool water conditions contributed to the general good condition of the fish.

Aerial count by section:

Above Bulkley Falls	not flown
Meanwhile Creek	51
Topley	37
Richfield Creek	34
Perow Station	213
McQuarrie Creek	69
Below McQuarrie Ck	445
Below Knockholt	1
Houston	170
in Buck Creek	not flown
Total for flight	1020

The chinook egg take was from 19 females for a total of 64,860 eggs. Sperm was collected from fifty nine males. All males were released back to the stream.

Note: An additional heli inspection was done (Aug 15) in areas which are usually not inspected for a count of 279 chinook. These fish are not accounted for in the estimate above. This was done to maintain comparability of estimate to past years.

COHO:

The Upper Bulkley Fence near Houston was operated from August 25 to Oct 24. The count was 1799 coho through the fence and 327 (as estimated from redd measurements not spawner counts) below the fence. Fence operation stopped after the 24th because of high water levels. It is estimate over 90% of the run was past the fence by then. Peak migration was around Sept 23 to 26 as in previous years. Number of CWT fish at the fence was 408.

The coho egg take was from 16 females for a total of 48,370 eggs. Sperm was taken from 32 different males.

Sockeye:

Three adult sockeye were also captured at the fence. DNA was taken from these fish and they were not Nanika and were not directly matched to any DNA baseline. They may have been part of the Bulkley/Maxan Lake stock.

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Year: 2002 Location: BULKLEY / MORICE
Area: 4

STREAM IDENTIFICATION
Watershed Code: 46-0000-000-000-000-000-99
Stream Name: BULKLEY RIVER - UPPER

DATES of INSPECTION

Dec 31

SPAWNING RUN TIMING and ESTIMATED NUMBER

Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other

Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING			(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUNDS	(8) OPTIMUM ESCAPE.
			START mth. day	PEAK mth. day	END mth. day					
SOCKEYE						0			N/I	300
COHO							10	2	990	7500
PINK						0			N/I	500
CHUM						0			-4	0
CHINOOK							14	2	1100	2000

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:
Coho enhancement and classroom incubation activities with Coho, Chinook and Sockeye. For more information contact the Smithers Community Advisor.

PHYSICAL CONDITION of SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected:
- (B) Particulars of scouring of spawning beds or change in stream course :
- (C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars affecting distribution by species. Note changes from normal :
- (E) Comments on predators (numbers compared to other years) :
- (F) Evidence of digging up eggs (location, severity) :
- (G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

The Upper Bulkley counting fence operated again this year from August 31 to Oct. 31 for a count of 990 (465 female & 525 Male) coho of which 297 (30%) were adipose clipped. Approximately 23% of the coho enumerated at the fence had been tagged by the Wet'suwet'en Coho Population Estimate Program at Moricetown. It was reported that the fence was never breached and there were no problems with fish not wanting to enter the

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live box and passing through the fence. However, by comparing survival to catch data(Upper Bulkley to Toboggan) from the Moricetown CWT sampling, and assuming this comparison is reflected in the escapement, it is estimated that 4000 Bulkley coho should have escaped to spawned. The number of spawners down stream of the fence would have been 3010 if the fence count is accepted as total. Some of these spawners may have migrated up the Morice to spawn, as has been noted in the past. There was some coho spawning noted below the fence in the Upper Bulkley River, however conditions for counting were not good so no count was done. Certainly what was seen below the fence gave no indication of 3000 plus spawners.

Coho egg take done, 40,000 approximately.

Two groups of coho fry (2001 brood) were released in the Upper Bulkley Oct. 2nd to 4th 2002. One group to Buck Creek with adipose fin clip and CWT and the other group to the Upper Bulkley designated as smolts with an adipose and right maxillary clip and CWT. The total number of fry released was 47,750 at 6.10 grams.

A helicopter count for chinook was done Aug. 19th for 673 visible spawners. Visibility during the assessment was fair to good. Spawning fish were clearly visible while chinook in deeper pools were more difficult to enumerate. Groundtruthing of the heli count was done the same day in the McQuarrie Creek area for a count of 134 chinook compared to 82 from the air. That resulted in the use of a correction factor of 1.63 for the entire survey area resulting in the escapement estimate of approximately 1100 chinook.

A chinook egg take was done with approx. 60,000 taken to the Toboggan Creek hatchery for incubation. A total of 15 females and 54 males were used for the egg take. Males were released live. 300 different chinook were sampled, 56% were wild, 39% adipose clipped and 5% ventral clipped.

Chinook count by section:

Above Bulkley Falls - 0	McQuarrie Creek - 48
Meanwhile Creek - 0	Below Mcquarrie Creek - 267
Topley - 2	Below Knockholt - 26
Richfeild Creek - 8	Houston - 94
Perow Station - 173	in Buck Creek 55

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STREAM IDENTIFICATION
 Watershed Code: 46-0000-000-000-000-99
 Stream Name: BULKLEY RIVER - UPPER

Year: 2001 Location: BULKLEY / MORICE
 Area: 4

DATES of INSPECTION

Dec 31

SPAWNING RUN TIMING and ESTIMATED NUMBER

Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other

Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING			(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUNDS	(8) OPTIMUM ESCAPE.
			START mth. day	PEAK mth. day	END mth. day					
SOCKEYE						10		UNK	300	
COHO						10	4	2200	7500	
PINK								UNK	500	
CHUM						0		-4	0	
CHINOOK						4	3	5600	2000	

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:

PHYSICAL CONDITION of SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected:
- (B) Particulars of scouring of spawning beds or change in stream course :
- (C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars affecting distribution by species. Note changes from normal :
- (E) Comments on predators (numbers compared to other years) :
- (F) Evidence of digging up eggs (location, severity) :
- (G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

Chinook - No hatchery brood stock taken this year. On August 17th a heli count of chinook was done. A total of 3343 (including 49 in Buck Creek) chinook were counted between the Morice junction and Bulkley Falls. Over 71% were observed between Richfield Ck. and Knockholt. Visibility during the flight was good. The chinook were actively spawning and were easy to count. Those holding in pools were more difficult. Two comparative ground counts were done near McQuarrie Creek & Richfield Creek to verify the aerial count accuracy. 503 chinook were sampled and

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another 438 were visually inspected for sex and marks. It is estimated that 76% of the run was wild, 25% adipose clipped. 55 adipose clipped heads were recovered. Only a few jacks this year. The four year old component of the run was much less than last year with most of the fish being five year olds. Over 50% of the run was female. The fish were healthy with very little pre-spawning mortality. (Info from Toboggan Ck Sal & Sthd Enhancement Society). 58 chinook were counted at the coho fence mentioned below.

Coho - The fence (located 6km up stream from the confluence with the Morice) was operated between August 21 (evening) and Oct. 31. The first coho through the fence was Aug. 24. The peak migration through the fence was between Sept. 24 to 26 with 741 coho. Four coho were captured and released above the fence on the last day of operations. The count was 2197 (1140 females, 1057 males). 53 females were used for hatchery brood stock, 163,085 eggs taken & sperm taken from 55 males. 2072 coho were released above the fence. The fence was not laid down at any time this year. Marks indicate that 65% of the run was hatchery stock. A few coho may have been below the fence after it was pulled. A Heli count of 36 coho between the Morice confluence and the fence was made Oct 24.

Sept. 27 heli count between McQuarrie Ck to falls - 43
Oct. 18 heli count between Morrice Confluence and fence - 87
Oct. 18 heli count between Richfield Creek and McKilligan Rd. - 226
Oct. 24 heli count between McKilligan Rd and Topley - 194
Oct. 24 heli count between Bulkley/Morice confluence to fence - 36

The coho estimate is a combination of the fence count and aerial inspections.

Pink - 14 pink counted at fence.
Sockeye - 3 sockeye counted at fence.
Sthd - 20 counted at fence.

The fence information is from the Smithers Community Advisor.
The coho heli enumerations are from Stock Assessment Nanaimo and the fence count information comes from the Community Advisor in Smithers.
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STREAM IDENTIFICATION
 Watershed Code: 46-0000-000-000-000-99
 Stream Name: BULKLEY RIVER - UPPER

Year: 2000 Location: BULKLEY / MORICE
 Area: 4

DATES of INSPECTION
 Dec 31

SPAWNING RUN TIMING and ESTIMATED NUMBER

Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other
 Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING			(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUNDS	(8) OPTIMUM ESCAPE.
			START mth. day	PEAK mth. day	END mth. day					
SOCKEYE						0			N/I	300
COHO							10	1	800	7500
PINK						0			N/I	500
CHUM						0			-4	0
CHINOOK							10	3	2560	2000

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:

PHYSICAL CONDITION of SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected:
- (B) Particulars of scouring of spawning beds or change in stream course :
- (C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars affecting distribution by species. Note changes from normal :
- (E) Comments on predators (numbers compared to other years) :
- (F) Evidence of digging up eggs (location, severity) :
- (G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

Chinook - Broodstock collection took place between Aug. 21 & 24. 66,167 eggs were taken from 18 females and sperm from 62 different males. Males were released after use. On August 21 a heli count of chinook was done. A total of 1929 were observed between the Morice junction and Bulkley Falls. Over 70% were observed between Richfield Ck and Knockholt. Visibility during the flight was good. Chinook that were actively spawning were easy to count. Those holding in pools were more difficult. Did two comparative ground counts around McQuarrie Creek to verify

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aerial assessment accuracy. Sampled 518 individual chinook, estimate 69% wild 31% adipose clipped. 65 adipose clipped heads recovered. Very few jacks this year. The four year old component of the run was very strong. 60% of the chinook captured this year were males.

Coho - There continues to be considerable discussion concerning the escapement to the Upper Bulkley. The following is a brief summary of the information available:

The fence count was 167 coho of which 47 were taken for hatchery brood stock. The fence was laid down twice due to high water for three hours each time. The area was observed during those periods and no fish were seen to pass.

On Sept. 27th a heli inspection counted 150 coho in the Upper Bulkley above the confluence.

On Oct. 11th Noast Coast Stock Assessment(Naniamo) did a heli inspection for coho and counted 552 coho below the fence. Of the 552 coho, 100 were down stream of the Bulkley/Morice confluence in the Lower Bulkley, 290 just at the confluence, 30 in the Upper Bulkley just upstream of the confluence and 132 in the Upper Bulkley above that.

It has also been confirmed that coho of Upper Bulkley origin migrated into both Toboggan and Kathlyn Creeks.

Using CWT and Alaskan catch information in comparison to Toboggan Creek, it is forecasted that 983 coho should have returned to the Upper Bulkley.

The 800 estimate assumes that 800 coho of Upper Bulkley origin returned and spawned. They may have gone above the fence unnoticed, spawned below the fence in the Upper Bulkley, some very likely spawned in Toboggan and Kathlyn Creeks and others may have spawned in other locations.

The coho egg take for incubation in the Toboggan Creek hatchery was 73,263. Surveys were done on both Richfield and Byman Creek. No coho seen in Richfield, saw 3 coho and 2 redds in Byman Creek(as reported by Nadina Community Futures).

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Year: 1999 Location: BULKLEY / MORICE
Area: 4 **DATES of INSPECTION**

STREAM IDENTIFICATION
Watershed Code: 46-0000-000-000-000-000-992
Stream Name: BULKLEY RIVER - UPPER

Aug 23	Oct 05	Oct 22	Oct 28
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SPAWNING RUN TIMING and ESTIMATED NUMBER

Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other
Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING			(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUND	(8) OPTIMUM ESCAPE.
			START mth. day	PEAK mth. day	END mth. day					
SOCKEYE						0			N/I	300
COHO							10	4	1550	7500
PINK						0			N/I	500
CHUM						0			-4	0
CHINOOK				Aug C		3	14	2	690	2000

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:

PHYSICAL CONDITION of SPAWNING GROUNDS

- (A) Evidence of erosion and silling. Give extent or percent of stream bed affected:
- (B) Particulars of scouring of spawning beds or change in stream course :
- (C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars affecting distribution by species. Note changes from normal :
- (E) Comments on predators (numbers compared to other years) :
- (F) Evidence of digging up eggs (location, severity) :
- (G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

The coho fence count and the chinook information comes from the either the Toboggan Ck, Salmon & Steelhead Enhancement Society or the Community Programs in Smithers. The heli coho inspections on Oct. 05 and 22 were done by Stock Assessment with counts of 57 and 160 respectively .

The coho counting fence operated without incident from Aug.31 to Nov. 02/99. 1073 coho were counted, 80% were hatchery stock. 128 coho had be

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tagged at Moricetown. Based on the survival to catch information (Bulkley CWT's at 40% of Toboggan CWT's in Alaska) and the male/female ratios (0.8:1 in Bulkley and 1.4:1 Toboggan) it appears that the Bulkley fence count missed the early portion of the run resulting in an estimated coho escapement of 1550. The estimate of 1550 appears in column 7 "Tot. On Grounds" no adjustment was made for the 39 coho seen in Buck Creek. The Buck Creek "Tot. On Grounds" reads as Unk. The 39 Buck Creek coho therefore are included in the 1550!!!! The year 2000 should see a new fence installed just upstream of the present fence. 140,000 coho egg take was completed.

The Chinook estimate is from one helli and two ground checks. The number of jacks was high. It is estimated that 62% were wild fish and 38 % hatchery. 95,955 chinook eggs were taken from 31 females and sperm from 81 males. All males were released back into the stream.

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Year: 1998 Location: BULKLEY / MORICE

STREAM IDENTIFICATION

Watershed Code: 46-0000-000-000-000-99 1

Area: 4

DATES of INSPECTION

Oct 14	Oct 18	Oct 19	Nov 07
Nov 10			

Stream Name: BULKLEY RIVER - UPPER

SPAWNING RUN TIMING and ESTIMATED NUMBER

Methods: 1 Walk, 2 Float, 3 Plane, 4 Helicopter, 5 Redd Counts, 6 Spot Check, 7 Strip Counts, 8 Dead Pitch, 9 Tag Recovery, 10 Other

Reliability: Low, 1, 2, 3, 4, 5, High

(1) SPECIES	(2) ARRIVAL IN STREAM mth. day		(3) DATES of SPAWNING START PEAK END mth. day mth. day mth. day				(4) # of OBS.	(5) MTH.	(6) REL.	(7) TOT. ON GROUNDS	(8) OPTIMUM ESCAPE.
SOCKEYE								10		UNK	300
COHO	SEPT	A						10	2	317	7500
PINK							0	104	1	N.O.	500
CHUM							0			(-4)	0
CHINOOK								4	3	1100	2000

UNUSUAL CONDITIONS

Enhancement activities, unusual mortality, obstructions, changes in habitat, unusual water levels, variations in sex ratio:
EGGS FROM 44 COHO FEMALES WERE TAKEN FOR HATCHERY BROOD STOCK. AVE. FECUNDITY IS 3200 EGGS PER FEMALE. EGGS WERE TAKEN FROM 24 CHINOOK AND SPERM FROM 68 DIFFERENT MALES. THAT MAKES A TOTAL OF 100,000 CHINOOK EGGS AND 140,000 COHO EGGS.

PHYSICAL CONDITION of SPAWNING GROUNDS

(A) Evidence of erosion and silting. Give extent or percent of stream bed affected:

(B) Particulars of scouring of spawning beds or change in stream course :

(C) Water levels flow, normal, abnormal. If abnormal, details should be given:

BIOLOGICAL CONDITIONS

(D) Particulars affecting distribution by species. Note changes from normal :

(E) Comments on predators (numbers compared to other years) :

(F) Evidence of digging up eggs (location, severity) :

(G) New Obstructions (location, nature and recommendations) :

GENERAL COMMENTS (brief description of final estimate calculation) :

THE BULKLEY RIVER FENCE WAS OPERATED FROM SEPT. 04 TO NOV. 10. LOCATED APPROX. 6KM UPSTREAM FROM THE CONFLUENCE WITH THE MORICE. WEATHER CONDITIONS AND IMPROVEMENTS TO FENCE PERMITTED THE FENCE TO REMAIN IN

Signature

Person Preparing Report

DEPARTMENT of FISHERIES and OCEANS
ANNUAL REPORT of SALMON STREAMS and SPAWNING POPULATION

PLACE CONTINUOUSLY. THE COHO ESTIMATE IS THE ACTUAL FENCE COUNT. AN UNKNOWN # OF COHO DID SPAWN IN THE 6KMS BELOW THE FENCE. FROM THE INFORMATION PROVIDED IT IS MORE THAN 8. ALSO IT IS POSSIBLE A FEW FISH WERE ABOVE THE FENCE BEFORE IT WAS INSTALLED. THIS IS WHAT IS KNOWN ABOUT THE 317 FENCE COUNTED COHO:

- SOME COHO SPAWNED IN TRIBUTARIES ABOVE THE FENCE. THE SYSTEMS CHECKED ARE: BUCK N/O, RICHFIELD 6 TO 8 REDDS, BARREN N/O, BYMAN 2 REDDS & MacQUARRIE N/O. MOST COHO SPAWN IN THE MAIN BULKLEY AND SEEM TO CONCENTRATE WHERE THE TRIBS. ENTER THE MAIN RIVER. 45 FEMALE COHO WERE RETAINED FOR HATCHERY BROOD HOWEVER ONE DIED. 43 MALE COHO WERE TAKEN FOR BROOD STOCK AND 24 MORE FOR GENE BANKING. 140,000 COHO EGGS WERE TAKEN FOR THE HATCHERY. THE MALES WERE RETURNED BACK TO THE RIVER LIVE WITH THE HOPE THEY WOULD SPAWN SOME MORE NATURALLY. OF THE WILD FISH 48% WERE FEMALE, 52% MALE. OF THE HATCHERY RETURNS 56% WERE FEMALE, 44% MALE. 69% OF THE FISH WERE HATCHERY AND 31 WILD. FOR FURTHER INFO. SEE THE "BULKLEY RIVER FENCE REPORT 1998" THE CHINOOK ESTIMATE COMES FROM THE TOBOGGAN CK. HATCHERY. THEY FLEW THE SYSTEM BY HELICOPTER FOLLOWED UP WITH GROUNDTRUTHING AND SAMPLED 377 DIFFERENT FISH TO ESTIMATE THAT 62% OF THE RUN WAS WILD. 2 SOCK. AND 14 STD WERE ALSO CAUGHT AT THE FENCE. 90,000 CHINOOK EGGS WERE TAKEN FOR THE HATCHERY. 24 FEMALES AND 68 MALES WERE USED IN THE CHINOOK EGG TAKE. MALES WERE RELEASED ALIVE ALL FEMALES WERE KILLED.

Signature

Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

Watershed code 46-0000-000-000-000-000-992
Gazetted Name (map name) Bulkley River(above Morice Confluence)
First Local Name
Flows into Bulkley River(lower)/Skeena River

Year 1997		
District No. 08	Subdistrict No	
Statistical Area 04	Subdistrict Name Smithers	

Date(s) Inspected

	Month	Day		Month	Day		Month	Day		Month	Day
1.	Nov	13	2.			3.			4.		
5.			6.			7.			8.		
9.			10.			11.			12.		

Spawning Run Timing And Estimated Escapement Numbers

1. Species	2. Arrival in Stream		3. Dates and Duration of Spawning						4. No. of Obser.	5. Methods	6. Reliability	7. Est Total on ground	8. Optimum Escapement
			Start		Peak		End						
			Month	Day	Month	Day	Month	Day					
SOCK											N/O	300	
COHO								see below	4, 10		Unk	7500	
PINK											N/O	500	
CHUM											(-4)		
CHIN								see below	1,4	3	764	2000	

Additional Comments

Physical Conditions of Spawning Grounds

A. Evidence of erosion and silting. Give extent or percent of stream bed affected. ⇒

B. Particulars of scouring of spawning beds or change in course of stream. ⇒

C. Water levels flow, normal, high, abnormal. If abnormal, details should be given. ⇒

Biological Conditions

D. Particulars of distribution of spawning salmon over the stream bed. ⇒

E. Comments on predators. ⇒

F. Evidence of digging up of eggs by later spawning fish. ⇒

G. New obstructions (nature and recommendations). ⇒

Comments on any other conditions affecting this stream or enumerations

H. A counting fence was in operation again this year during the coho migration but had to be pulled Oct. 15 due to high water. The chinook estimate is from a flight mid August and spot ground inspections. The results of the ground counts and the Heli. flight are compared to estimate total escapement. Also 336 chinook were sampled during the year approx. 46% were wild 54% wild. Chinook brood stock was taken 100,000 eggs from 37 females and 75 males. Males were released after use.

23 coho were counted at the fence near Houston. Only 5 were wild. 13 female coho were taken for hatchery(Taboggan) brood stock, 1 released. Males were partially milked and released. Byman and McQuarrie creeks were inspected for spawners several times by the local communittee group. No fish observed.

A mark recapture program was undertaken near Moricetown Canyon. Over 600 coho were tagged. It is estimated that 6000 to 8000 coho passed through the canyon. 25 of the taggs showed up at Toboggan Creek and 2 at the Houston fence. The destination of the other taggs was not determined however it is suspected that their is considerable main stem spawning in both the Bulkley & Morice Rivers.

Nov. 13 heli inspection (Morice confluence to Topley) 2 redds and 2 coho seen. Visibility poor in some areas.

Signature _____

DFO
Organization preparing report _____

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

Watershed code	46 - 0000 - 000 - 000 - 000 - 992
Gazetted Name (map name)	Bulkley River(above Morice Confluence)
First Local Name	
Flows into	Bulkley River(lower)/Skeena River

Year	1996	
District No.	08	Subdistrict No
Statistical Area	04	Subdistrict Name
		Smithers

Date(s) Inspected

	Month	Day		Month	Day		Month	Day		Month	Day
1.	Mid Aug		2.	See Below		3.			4.		
5.			6.			7.			8.		
9.			10.			11.			12.		

Spawning Run Timing And Estimated Escapement Numbers

1. Species	2. Arrival in Stream		3. Dates and Duration of Spawning						4. No. of Obser.	5. Methods	6. Reliability	7. Est Total on ground	8. Optimum Escapement
			Start		Peak		End						
			Month	Day	Month	Day	Month	Day					
SOCK										1	N/O	300	
COHO								see below	1,10	3	230	7500	
PINK											N/O	500	
CHUM													
CHIN								see below	1,4	3	1027	2000	

Additional Comments

Physical Conditions of Spawning Grounds

- A. Evidence of erosion and silting. Give extent or percent of stream bed affected. ⇒
- B. Particulars of scouring of spawning beds or change in course of stream. ⇒
- C. Water levels flow, normal, high, abnormal. If abnormal, details should be given. ⇒

Biological Conditions

- D. Particulars of distribution of spawning salmon over the stream bed. ⇒
- E. Comments on predators. ⇒
- F. Evidence of digging up of eggs by later spawning fish. ⇒
- G. New obstructions (nature and recommendations). ⇒.

Comments on any other conditions affecting this stream or enumerations

H. A counting fence was in operation again this year during the coho migration from approx. Sept. 02 to Nov.01. The fence had to be let down for two days during a high water even and problems with a build up of leaves. The chinook estimate is from a flight mid August and spot ground inspection. The results of the ground counts and the Heli. flight are compared to estimate total escapement. 818 chinook were counted from the air between the Morice junction and Bulkley Falls. Also 357 fish were sampled during the year approx. 60% were wild fish. Chinook brood stock was taken between Aug 19 & 21.

34 steelhead were counted past the fence. This is the first recorded count of steelhead above the fence.

170 coho were counted at or just below the fence. 61 were wild and 109 were hatchery. The estimated escapement comes from comparing coded-wire tags sampled in Canadian troll and net fisheries and comparing them to Toboggan Creek returns. 50,00 coho eggs were taken for brood stock.

Signature _____

DFO
Organization preparing report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION Watershed code: _____ Gazetted name (mapname): <u>Bulkley River (upper)</u> First local name: _____ Second local name: _____ Flows into: <u>(Lower Bulkley) Skeena River</u>	Year: <u>1995</u> District No. <u>08</u> Subdistrict No. <u>40</u> Statistical Area: _____ Subdistrict Name: <u>Smithers</u>																				
DATES OF INSPECTION																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Month</th> <th>Day</th> <th>Month</th> <th>Day</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;"><u>Fence at Houston Sept 02 to Nov 02</u></td> </tr> <tr> <td colspan="4" style="text-align: center;"><u>Aug 18 bel. inspection</u></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		Month	Day	Month	Day	<u>Fence at Houston Sept 02 to Nov 02</u>				<u>Aug 18 bel. inspection</u>											
Month	Day	Month	Day																		
<u>Fence at Houston Sept 02 to Nov 02</u>																					
<u>Aug 18 bel. inspection</u>																					

SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

1 SPECIES	2 ARRIVAL IN STREAM	3 DATES OF DURATION OF SPAWNING				4 NO. OF ORSPR	5 METHODS	6 RELIA- BILITY	7 EST. TOT. NO. ON GROUNDS	8 OPTIMUM ESCAPEMENT	
		Start	Peak	End							
		Month	Day	Month	Day	Month	Day				
SOCKEYE	1							1,10	2	20	300
	2										
COHO	1							1,10	2	50	7500
	2										
PINK	1									110	500
	2										
CHUM	1										
	2										
CHINOOK	1										
	2							1	4	2	350

UNUSUAL CONDITIONS

MARK BOX FOR UNUSUAL CONDITIONS

(A) Enhancement or intense biological activities.

(B) Unusual mortalities.

(C) Obstructions or changes in habitat with recommendations.

(D) Large variations in sex ratio or unusual number of jacks.

(E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of erosion and silting. Give extent or percent of stream bed affected

(B) Particulars of scouring of spawning beds or change in course of stream

(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given

BIOLOGICAL CONDITIONS

(D) Particulars of distribution of spawning salmon over the stream bed

(E) Comments on predators

(F) Evidence of digging up eggs by later spawning fish

(G) New obstructions (nature and recommendations)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) 334 Chinook counted on one bel. inspection done by Tabogyan Creek hatchery. 244 Chinook were sampled, 52% were hatchery fish. 39 c. who were taken for band stock. The fish had to be taken below the fence at Houston. No cabs went past the fence. Low water conditions may have been a factor. 8 other cabs were

Signature
Fisher Officer / Person Preparing Report

INSTRUCTIONS FOR SPAWNING RUN COUNTING AND ESTIMATED NUMBER

- 1 Provision is made for two spawning runs per species. If only one run exists, use Line 1.
- 2 Date entry: a) Month: enter first three letters (Aug) or (Oct)
- 3 b) Day: enter date (12) or (04)
or enter letter codes as follows — (A) 1 - 10th (B) 11 - 20th (C) 21 - 31st
- 4 Number of times each species is present in stream during inspection.
- 5 Inspection method used. Enter up to 4 methods per species.

<input type="checkbox"/> Walk	<input type="checkbox"/> Helicopter	<input type="checkbox"/> Strip Counts
<input type="checkbox"/> Float	<input type="checkbox"/> Redd counts	<input type="checkbox"/> Dead Pitch <input type="checkbox"/> Other
<input type="checkbox"/> Plane	<input type="checkbox"/> Spot Check	<input type="checkbox"/> Tag Recovery
- 6 Reliability of spawning population estimate (based on conditions and number of stream visits).

Low	1	2	3	4	5	High
-----	---	---	---	---	---	------
- 7 a) If the stream has been inspected, enter best estimate of total annual escapement.
 b) If the stream has been inspected, but no fish were seen even though water conditions would permit enumeration, enter N.O. (None Observed).
 c) If juvenile fish only were observed, enter J.P. (Juveniles Present).
 d) If the enumerator(s) observed indications that an inspected stream was frequented by fish, but were unable to make an estimate because of water conditions, enter U.K. (Unknown).
 e) If the stream was not inspected, for whatever reason, enter N.I. (Not Inspected).
- 8 Enter if available.

Observed by the Houston volunteer group during 3 or 4 inspections below the fence to the Morise River confluence. Mission creek a local name for a creek near the confluence of the Bullley/Morise was inspected 4 times on foot by the Houston volunteer group under the direction of the community ecologist. No coho were observed.

*109,820 ch eggs taken to Taboggan Creek Hatchery
 60,000 co " " " " " "*

DEPARTMENT OF FISHERIES AND OCEANS ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION		Year: <u>1994</u>	
Watershed code		District No. <u>08</u>	Subdistrict No.
Gazetted name (mapname)		Statistical Area	Subdistrict Name <u>Smelters</u>
First local name <u>Upper Bulkley River</u>		DATES OF INSPECTION	
Second local name		Month	Day
Flows into <u>Lower Bulkley River</u>		<u>Aug</u>	<u>17</u>
		<u>Periodical by hatchery crew from Toboggan</u>	

SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

1 SPECIES	2 ARRIVAL IN STREAM		3 DATES OF DURATION OF SPAWNING				4 NO. OF OBSER.	5 METHODS	6 RELIA-BILITY	7 EST. TOT. NO. ON GROUND	8 OPTIMUM ESCAPEMENT
	Month	Day	Start Month	Start Day	Peak Month	Peak Day					
SOCKEYE 1 2								<u>10, 4</u>	<u>1</u>	<u>N/D -</u>	<u>300</u>
COHO 1 2								<u>10, 7</u>		<u>unk.</u>	<u>7500</u>
PINK 1 2								<u>10, 4</u>	<u>1</u>	<u>N/D -</u>	<u>500</u>
CHUM 1 2											
CHINOOK 1 2							<u>1</u>	<u>10, 4</u>	<u>1</u>	<u>400 -</u>	<u>2000</u>

UNUSUAL CONDITIONS

MARK BOX FOR UNUSUAL CONDITIONS

(A) Enhancement or intense biological activities.

(b) Unusual mortalities.

(C) Obstructions or changes in habitat with recommendations.

(D) Large variations in sex ratio or unusual number of jacks.

(E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of erosion and silting. Give extent or percent of stream bed affected

(B) Particulars of scouring of spawning beds or change in course of stream

(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given

BIOLOGICAL CONDITIONS

(D) Particulars of distribution of spawning salmon over the stream bed

(E) Comments on predators

(F) Evidence of digging up eggs by later spawning fish

(G) New obstructions (nature and recommendations)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) 135 Coho were counted past the fence. However the fence was
non-effective. Fesc. Unknown
65,000 eggs taken (Coho) & 129,000 Chinook. 65 ♂ & 32 ♀ approx
taken by Toboggan Creek hatchery.

Signature

Fisher Officer / Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPawning POPULATIONS

STREAM IDENTIFICATION

Year 1993

Watershed code _____ District No. 08 Sub-Dist No. 10

Gazetted name Bulkley River upper Statistical Area _____ Sub-Dist. Name Smithers

First local name _____ Dates of Inspection

Second local name _____ Month Day Month Day

Flows into Bulkley River lower 08 : 18 / _____ : _____

Skeena River 08 : 28 / _____ : _____

_____ : _____ / _____ : _____

_____ : _____ / _____ : _____

SPawning RUN TIMING AND ESTIMATED NUMBER

SPECIES	ARRIVAL		< SPAWNING >				MTHDS	RELIA-BILITY	EST. TOT. ON GRDS.
	IN STREAM		START	PEAK	END				
	Month	Day	Mth	Day	Mth	Day			
SOCKEYE	1	_____	_____	_____	_____	_____	4	2	N.O.
	2	_____	_____	_____	_____	_____	_____	_____	_____
COHO	1	_____	_____	_____	_____	_____	*10	3	100
	2	_____	_____	_____	_____	_____	_____	_____	_____
PINK	1	_____	_____	_____	_____	_____	4	2	N.O.
	2	_____	_____	_____	_____	_____	_____	_____	_____
CHUM	1	_____	_____	_____	_____	_____	_____	_____	_____
	2	_____	_____	_____	_____	_____	_____	_____	_____
CHINOOK	1	_____	_____	_____	_____	_____	4	3	1,100
	2	_____	_____	_____	_____	_____	_____	_____	_____

OPTIMUM ESCAPEMENTS

SOCKEYE 300 / COHO 7,500 / PINK 500 / CHUM _____

CHINOOK 2,000 /

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected. None noted.
- (B) Particulars of scouring of spawning beds or change in course of stream. None noted.
- (C) Water levels flow, normal, high, abnormal. If abnormal, details should be given. "Above normal".

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed. Houston to Bulkley Falls; well scattered throughout system.
- (E) Comments on predators. _____
- (F) Evidence of digging up eggs by later spawning fish. _____
- (G) New obstructions (nature and recommendations). None noted, other than the Bulkley Falls.

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) Actual Counts: Chinook

August 18 677

August 28 474

A good portion of the fish counted on Aug. 28, are the same fish seen on Aug. 18. Sampling by Mike O'Neill (Toboggan Creek Hatchery, suggests the escapement figure closer to 1,100 fish. "Over 50% of these chinook were hatchery marked".

* Note: Enumerated by fence count at Houston, B.C.

Gary Cardinal
 Fishery Officer/Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPawning POPULATIONS

STREAM IDENTIFICATION

Year 1992

Watershed code, District No., Sub-Dist No., Gazetted name, Statistical Area, Sub-Dist. Name, First local name, Dates of Inspection, Second local name, Flows into

SPawning RUN TIMING AND ESTIMATED NUMBER

Table with columns: SPECIES, ARRIVAL IN STREAM, START, PEAK, END, MTHDS, RELIA-BILITY, EST. TOT. ON GRDS.

OPTIMUM ESCAPEMENTS

SOCKEYE 300 / COHO 7,500 / PINK 500 / CHUM / CHINOOK 2,000

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected.
(B) Particulars of scouring of spawning beds or change in course of stream.
(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given.

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed.
(E) Comments on predators.
(F) Evidence of digging up eggs by later spawning fish.
(G) New obstructions (nature and recommendations).

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) Chinook Counts: Aug. 17 = 1,131, Aug. 27 = 1,113. Estimated 51.4% were hatchery clipped returns. 1987 brood returns made up 90% of this years returns.

{MAP, DIAGRAM, OR WHAT-NOT}

Signature: Gary Lardner, Fishery Officer/Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION

Year 1991

Watershed code _____ District No. 08 Sub-Dist No. 10

Casented name Bulkley River upper Statistical Area _____ Sub-Dist. Name Smithers

First local name _____

Second local name _____

Flows into Bulkley River lower Skeena River

Dates of Inspection

Month	Day	Month	Day
08	16	/	/
08	26	/	/
09	09	/	/
10	*28	/	/

SPAWNING RUN TIMING AND ESTIMATED NUMBER

SPECIES	ARRIVAL < SPAWNING >				MTHDS	RELIA-BILITY	EST. TOT. ON GRDS.	
	IN STREAM	START	PEAK	END				
	Month Day	Mth Day	Mth Day	Mth Day				
SOCKEYE 1	:	/	:	/			N.I.	
SOCKEYE 2	:	/	:	/				
COHO 1	09 :01	/	:	/	10	4	300	
COHO 2	:	/	:	/				
PINK 1	:	/	:	/			N.I.	
PINK 2	:	/	:	/				
CHUM 1	:	/	:	/				
CHUM 2	:	/	:	/				
CHINOOK 1	06 :15	/	08 :16	/	08 :26	/	09 :09	4 4 1.200
CHINOOK 2	:	/	:	/	:	/	:	

OPTIMUM ESCAPEMENTS

SOCKEYE 300 / COHO 7.500 / PINK 500 / CHUM _____
 CHINOOK 2,000 /

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected. _____
- (B) Particulars of scouring of spawning beds or change in course of stream. _____
- (C) Water levels flow, normal, high, abnormal. If abnormal, details should be given. _____

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed. _____
- (E) Comments on predators. _____
- (F) Evidence of digging up eggs by later spawning fish. _____
- (G) New obstructions (nature and recommendations). _____

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) Coho enumerated at counting fence in Houston, B.C.
 * Oct 28th helicopter flight from Bulkley/Morice confluence to counting fence in Houston est. 50 coho.
 Chinook estimates based on helicopter flights, and observation by Toboqan Creek hatchery staff during the summer.

{MAP, DIAGRAM, OR WHAT-NOT}

J. Gardiner / A. Stedje
 Fishery Officer / Person Preparing Report

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS
STREAM IDENTIFICATION Year 1990

Watershed code _____ District No. **08** Sub-Dist. # **10**

Gazetted name **Bulkley River (Upper)** Statistical Area _____ Sub-Dist. Name **Smithers**
The area above the Morice River

First local name _____ Dates of Inspection _____
 Second local name _____ Month _____ Day _____ Month _____ Day _____
 Flows into **Skeena River** Enumerated by the Houston Steelhead Society & SEP (counting fence at Houston, B.C.)

SPAWNING RUN TIMING AND ESTIMATED NUMBER

SPECIES		ARRIVAL (SPAWNING)				MTHDS	RELIA-BILITY	EST. TOT. ON GRDS.		
		IN STREAM		START	PEAK				END	
		Month	Day	Mth	Day	Mth	Day			
SOCKEYE	1	:	/	:	/	:	/	*10	4	0
	2	:	/	:	/	:	/			
COHO	1	:	/	:	/	:	/	*10	4	965
	2	:	/	:	/	:	/			
PINK	1	:	/	:	/	:	/	*10	4	0
	2	:	/	:	/	:	/			
CHUM	1	:	/	:	/	:	/			
	2	:	/	:	/	:	/			
CHINOOK	1	:	/	:	/	:	/	**6	3	300
	2	:	/	:	/	:	/			

OPTIMUM ESCAPEMENTS

SOCKEYE 300 / COHO 7,500 / PINK 500 / CHUM _____
 CHINOOK 2,000 /

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected. _____
- (B) Particulars of scouring of spawning beds or change in course of stream. _____
- (C) Water levels flow, normal, high, abnormal. If abnormal, details should be given. Normal.

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed. _____
- (E) Comments on predators. _____
- (F) Evidence of digging up eggs by later spawning fish. _____
- (G) New obstructions (nature and recommendations). _____

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) *Enumeration by the Steelhead Society & SEP counting fence at Houston, B.C.
 **Chinook est. provided by Toboggan Ck Hatchery.
 865 coho counted through the fence from Sept. 1st to Nov. 10/90, est. an additional 100 coho from fence to confluence of Morice Riv. (this is based on 12% of last years count found in this area).
 "Of the 865 coho counted, 364 were marked hatchery fish, 401 unmarked hatchery fish, with the remainder being wild returns"(Mike o'Neil).
 (MAP, DIAGRAM, OR WHAT-NOT) _____

Gary Cardinal
 Fishery Officer/Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION

Watershed code
Gazetted name (mapname) Bulkley River (Upper) - the area above the Morice River
First local name
Second local name
Flows into Skeena River

Year: 1989	
District No. 08	Subdistrict No. 10
Statistical Area	Subdistrict Name Smithers

DATES OF INSPECTION

Month	Day	Month	Day
Refer to tally sheet from fence counts.			

SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

1 SPECIES	2 ARRIVAL IN STREAM		3 DATES OF DURATION OF SPAWNING				4 NO. OF OBSER.	5 METHODS	6 RELIA-BILITY	7 EST. TOT. NO. ON GROUND	8 OPTIMUM ESCAPEMENT
	Month	Day	Start	Peak	End						
SOCKEYE 1								*10	4	9	300
SOCKEYE 2											
COHO 1								*10	4	1,500	7,500
COHO 2											
PINK 1								*10	4	2	500
PINK 2											
CHUM 1											
CHUM 2											
CHINOOK 1								*10	3	500	2,000
CHINOOK 2											

UNUSUAL CONDITIONS

- MARK BOX FOR UNUSUAL CONDITIONS
- (A) Enhancement or intense biological activities.
 - (b) Unusual mortalities.
 - (C) Obstructions or changes in habitat with recommendations.
 - (D) Large variations in sex ratio or unusual number of jacks.
 - (E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected
- (B) Particulars of scouring of spawning beds or change in course of stream
- (C) Water levels flow, normal, high, abnormal. If abnormal, details should be given ... Water levels near normal, but the hot summer may have affected egg survival.

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed
- (E) Comments on predators ... Some harassment by people in the Topley area.
- (F) Evidence of digging up eggs by later spawning fish
- (G) New obstructions (nature and recommendations) ... Beaver dams at Knockholt and McQuarrie Ck. area (uplands). Dams opened (at least 10) on Oct. 26th and 27th.

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

- (K) ... *The enumeration of this system was by mainly the SEP counting fence installed this year. The Chinook counts were provided by Toboggan Ck. Hatchery Staff. 1,339 coho were counted through the fence, while 161 were estimated from the fence down to the Morice R. (via canoe).

[Signature]
Signature

Fisher Officer / Person Preparing Report

BULKLEY RIVER FISH FENCE TOTALS/1989

H2O LEVEL	#	COHO	CHINOOK	STEELHEAD	SOCKEYE	PINK	WHITEFISH
26/8/89	11.00	1.00	4.00		3.00		
27/8/89	11.00	2.00	2.00		3.00		
28/8/89	11.00	0.00	5.00				
29/8/89	11.00	14.00	2.00				
30/8/89	11.00	11.00	1.00				
1/9/89	10.50	15.00					
2/9/89	10.50	0.00					
3/9/89	10.50	0.00					
4/9/89	10.75	0.00					
5/9/89	10.75	0.00					
6/9/89	11.00	34.00					
7/9/89	10.50	19.00					
8/9/89	9.50	22.00					
9/9/89	8.50	0.00					
10/9/89	8.25	0.00					
11/9/89	8.00	3.00				2.00	
12/9/89	7.75	0.00					
13/9/89	7.50	6.00				2.00	
14/9/89	7.25	0.00					
15/9/89	7.25	1.00				1.00	
16/9/89	7.00	0.00					
17/9/89	7.00	0.00					
18/9/89	7.25	1.00					
19/9/89	7.75	0.00					
20/9/89	7.50	57.00				1.00	
21/9/89	7.25	101.00				1.00	
22/9/89	6.50	136.00				3.00	
23/9/89	7.00	138.00					
24/9/89	6.50	10.00					
25/9/89	6.75	24.00					
26/9/89	6.75	1.00					
27/9/89	6.50	1.00					
28/9/89	6.50	1.00					
29/9/89	7.50	421.00					4.00
30/9/89	7.50	165.00				1.00	3.00
1/10/89	7.00	16.00					1.00
2/10/89	7.50	0.00					
3/10/89	7.25	0.00					
4/10/89	7.00	0.00					
5/10/89	7.50	13.00			1.00		
6/10/89	7.25	1.00					
7/10/89	8.00	21.00					
8/10/89	7.50	11.00					
9/10/89	7.50	0.00					
10/10/89	7.50	28.00					
11/10/89	7.50	1.00					
12/10/89	7.50	0.00					
13/10/89	7.50	0.00					
14/10/89	8.00	0.00					
15/10/89	8.50	0.00					
16/10/89	8.00	0.00					
17/10/89	8.00	0.00					
18/10/89	9.00	15.00					2.00
19/10/89	9.00	39.00					
20/10/89	11.00	0.00					4.00
21/10/89	10.00	2.00					5.00
22/10/89	10.00	0.00					
23/10/89	10.00	0.00					
24/10/89	10.00	3.00					
25/10/89	10.50	5.00					
26/10/89	10.50	0.00					
27/10/89	11.00	0.00					
28/10/89	11.75	0.00					
29/10/89	11.50	0.00					
30/10/89	11.25	0.00					
31/10/89	11.00	0.00					
1/11/89	11.00	0.00					2.00
2/11/89	11.00	0.00					21.00
AVERAGE H2O LEVEL	8.77	1,339.00	14.00	4.00	9.00	2.00	

Bob
Hopper (?)

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">watershed code</td> <td> </td> </tr> <tr> <td style="font-size: small;">Gazetted name (mapname)</td> <td style="text-align: center;">BULKLEY RIVER (UPPER)</td> </tr> <tr> <td style="font-size: small;">First local name</td> <td> </td> </tr> <tr> <td style="font-size: small;">Second local name</td> <td> </td> </tr> <tr> <td style="font-size: small;">Flows into</td> <td style="text-align: center;">Skeena River</td> </tr> </table>	watershed code		Gazetted name (mapname)	BULKLEY RIVER (UPPER)	First local name		Second local name		Flows into	Skeena River	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">Year:</td> <td colspan="2" style="text-align: center;">1988</td> </tr> <tr> <td style="font-size: small;">District No.</td> <td style="text-align: center;">08</td> <td style="font-size: small;">Subdistrict No.</td> <td style="text-align: center;">10</td> </tr> <tr> <td style="font-size: small;">Statistical Area</td> <td colspan="2" style="font-size: small;">Subdistrict Name</td> <td style="text-align: center;">Smithers</td> </tr> </table> DATES OF INSPECTION <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: x-small;">Month</th> <th style="font-size: x-small;">Day</th> <th style="font-size: x-small;">Month</th> <th style="font-size: x-small;">Day</th> </tr> </thead> <tbody> <tr> <td>Aug</td> <td style="text-align: center;">20</td> <td> </td> <td> </td> </tr> <tr> <td>Aug</td> <td style="text-align: center;">21</td> <td> </td> <td> </td> </tr> <tr> <td>Aug</td> <td style="text-align: center;">22</td> <td> </td> <td> </td> </tr> <tr> <td>Aug</td> <td style="text-align: center;">23</td> <td> </td> <td> </td> </tr> <tr> <td>Aug</td> <td style="text-align: center;">24</td> <td> </td> <td> </td> </tr> </tbody> </table>	Year:	1988		District No.	08	Subdistrict No.	10	Statistical Area	Subdistrict Name		Smithers	Month	Day	Month	Day	Aug	20			Aug	21			Aug	22			Aug	23			Aug	24		
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SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

SPECIES	1	2 ARRIVAL IN STREAM		3 DATES OF DURATION OF SPAWNING				4 NO. OF OBSER.	5 METHODS	6 RELIA- BILITY	7 EST. TOT. NO. ON GROUND	8 OPTIMUM ESCAPEMENT	
		START	PEAK	END	Month	Day	Month						Day
SOCKEYE	1										N.I.		
	2												
COHO	1										10		
	2												
PINK	1												
	2												
CHUM	1												
	2												
CHINOOK	1	Aug	1	Aug	5	Aug	15	Aug	30	4	1	4	1,000
	2												

UNUSUAL CONDITIONS

MARK BOX FOR UNUSUAL CONDITIONS

- (A) Enhancement or intense biological activities.
- (b) Unusual mortalities.
- (C) Obstructions or changes in habitat with recommendations.
- (D) Large variations in sex ratio or unusual number of jacks.
- (E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of erosion and silting. Give extent or percent of stream bed affected

.....

(B) Particulars of scouring of spawning beds or change in course of stream

.....

(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given

.....

BIOLOGICAL CONDITIONS

(D) Particulars of distribution of spawning salmon over the stream bed Meanwhile area 30, Richfield Cr., 80,
McQuarrie Cr., 120, Houston 50.

(E) Comments on predators

(F) Evidence of digging up eggs by later spawning fish

(G) New obstructions (nature and recommendations)

.....

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) Mike O'Neil, Toboggan Cr. Hatchery takes brood stock from Bulkley. Above figures
are taken from Mike's information.

Coho fence didn't function well, due to high water. Two coho counted, system check through
out September.

Peak spawning mid-August.

.....

Signature _____ Al Klopfenstein _____
 Fisher Officer / Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

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SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

1 SPECIES	2 ARRIVAL IN STREAM		3 DATES OF DURATION OF SPAWNING				4 NO. OF OBSER	5 METHODS	6 RELI- ABILITY	7 EST. TOT. NO. ON GROUNDS	8 OPTIMUM ESCAPEMENT
			START	PEAK	END						
	Month	Day	Month	Day	Month	Day					
SOCKEY	1		July		Aug		2	10	4	12	
	2										
COHO	1		Sept	15	Oct	15	2	10	3	18	
	2										
PINK	1		Aug		Aug		2	6		N.O.	
	2										
CHUM	1										
	2										
CHINOOK	1		Aug	15	Aug	30	2	1	4	250	
	2										

UNUSUAL CONDITIONS

MARK BOX FOR UNUSUAL CONDITIONS

- (A) Enhancement or intense biological activities.
- (b) Unusual mortalities.
- (C) Obstructions or changes in habitat with recommendations.
- (D) Large variations in sex ratio or unusual number of jacks.
- (E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of erosion and siltng. Give extent or percent of stream bed affected

.....

(B) Particulars of scouring of spawning beds or change in course of stream

.....

(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given

Water level was low during

August - September.

BIOLOGICAL CONDITIONS

(D) Particulars of distribution of spawning salmon over the stream bed

.....

(E) Comments on predators

.....

(F) Evidence of digging up eggs by later spawning fish

.....

(G) New obstructions (nature and recommendations) Beaver dam right in town of Houston. Approximately 100 Springs were held up. Local kids were jigging constantly. Angling closure should be implemented.

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) INSPECTION METHOD #10 MEANS:
 A counting fence was installed at beaver dam in Houston Sept 4 to early November.
 Local anglers monitored fence. Mike O'Neil took some ^{coho} eggs for Toboggan Hatchery.
 from 6 females and 12 males.

 Coho can enter this system at a late date.

Al Klopfenstein
Signature
Fisher Officer / Person Preparing Report

DEPARTMENT OF FISHERIES AND OCEANS

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

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SPAWNING RUN TIMING AND ESTIMATED NUMBER (Instructions on flip side)

1 SPECIES	2 ARRIVAL IN STREAM	3 DATES OF DURATION OF SPAWNING				4 NO. OF OBSER.	5 METHODS	6 RELIA- BILITY	7 EST. TOT. NO. ON GROUND	8 OPTIMUM ESCAPEMENT				
		Month	Day	Month	Day						Month	Day	Month	Day
SOCKEYE	1	July	-	July	-	July	-	Aug	-	0	1	1	NO	700
	2													
COHO	1	Sept	-	Sept	-	Oct	-	Nov	-	0	1,6	1	NO	1 000
	2													
PINK	1													
	2													
CHUM	1													
	2													
CHINOOK	1	July	-	Aug	15	Aug	20	Sept	10	2	1,4,6	4	450	2 000
	2													

UNUSUAL CONDITIONS

MARK BOX FOR UNUSUAL CONDITIONS

(A) Enhancement or intense biological activities.

(b) Unusual mortalities.

(C) Obstructions or changes in habitat with recommendations.

(D) Large variations in sex ratio or unusual number of jacks.

(E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of erosion and silting. Give extent or percent of stream bed affected

.....

(B) Particulars of scouring of spawning beds or change in course of stream

.....

(C) Water levels flow, normal, high, abnormal. If abnormal, details should be given

.....

BIOLOGICAL CONDITIONS

(D) Particulars of distribution of spawning salmon over the stream bed .. Chinook generally held between Houston..... and Knockholt in July. Chinook majority spawn Knockholt to Bulkley Falls

(E) Comments on predators

(F) Evidence of digging up eggs by later spawning fish

(G) New obstructions (nature and recommendations)

.....

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) One chinook observed entering Bulkley Lake on Sept. 4.

.....

.....

.....

 Signature Fisher Officer / Person Preparing Report

ANNUAL REPORT OF SALMON STREAMS AND SPAWNING POPULATIONS

STREAM IDENTIFICATION

Watershed code
46-0000-000-000-000-992

Gazetted name (mapname)
BULKLEY RIVER

First local name
BULKLEY RIVER ABOVE HOUSTON

Second local name
BULKLEY RIVER (ABOVE HOUSTON)

Flows into

District No. 8	Subdistrict No. 4D
Statistical Area 04	Management Area
Month: Day: Year:	
Date first inspected	1985
Date last inspected	
Total no. of inspections	

Note: Please correct any stream identification data that is wrong.

SPAWNING RUN TIMING AND ESTIMATED NUMBER (instructions on flip side)

SPECIES	ARRIVAL IN STREAM Month Day	DATES OF DURATION OF SPAWNING				NO. OF OBSER.	METHODS	RELIA-BILITY	EST. TOT. NO. ON GROUNDS
		START Month Day	PEAK Month Day	END Month Day	END Month Day				
SOCKEYE	1								
	2								
COHO	1								
	2								
PINK	1								
	2								
CHUM	1								
	2								
CHINOOK	1		08 20		08 20	1	F	350	
	2								
STEELHEAD	1								
	2								

CONDITIONS

Mark box for unusual conditions.

- (A) Enhancement or intense biological activities.
- (B) Unusual mortalities.
- (C) Obstructions or changes in habitat with recommendations.
- (D) Large variations in sex ratio or unusual number of jacks.
- (E) Unusually high or low water flow level during spawning period.

ADDITIONAL COMMENTS

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of erosion and silting. Give extent or percent of stream bed affected
- (B) Particulars of scouring of spawning beds or change in course of stream:
- (C) Water levels (low, normal, high, abnormal). If abnormal, details should be given:

BIOLOGICAL CONDITIONS

- (D) Particulars of distribution of spawning salmon over the stream bed.
-
- (E) Comments on predators.
-
- (F) Evidence of digging up eggs by later spawning fish.
-

OBSTRUCTIONS

- (G) Passable or impassable.
- If nil, indicate from mouth to furthest point of access.
- (H) Nature of obstruction.
-
- (I) Distance from mouth of stream.
-
- (J) Do you recommend that the obstruction be removed?
- If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

(K) Section 3 is date of actual count and may not be peak spawning time. Several walks were done during late August by SEP crew, looking for egg take of chinooks.

Return this form to:
 Salmon Escapement System Co-ordinator
 Pacific Biological Station
 Nanaimo, B.C. V9R 5K6

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Fishery Officer/Person preparing report

Derry Turnbull
 Signature

INSTRUCTIONS For "Spawning Run Timing & Estimated Number"

- 1** Provision is made for two spawning runs per species. If only one run exists, use Line 1.
- 2** Date entry: a) Month: enter first three letters (Aug) or (Oct)
 b) Day: enter date (12) or (04)
- 3** or enter letter codes as follows - (A) 1-10th (B) 11-20th (C) 21-31st
- 4** Number of times each species is present in stream during inspection.
- 5** Inspection method used. Enter up to 4 methods per species.
 A - fixed wing A/C D - boat G - other (enter details in section (K))
 B - helicopter E - fence
 C - stream bank F - stream walk
- 6** Reliability of spawning population estimate (based on conditions and number of stream visits).
 A - high B - average C - low
- 7** a) Enter best estimate of total annual escapement.
 b) If species expected but none observed, enter: NO
 c) If species present but number unknown, enter: UNK

DISTRICT NO. 8

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1984

NAME OF STREAM (MAP NAME) Bulkley River (above Morice River) (LOCAL NAME)

FLOWING INTO Bulkley River DATES STREAM INSPECTED July 26, Aug 1, 2, 14, 21.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVT.	MED.	LT.		M	F	JACKS
SOCKEYE					N.O.							
SPRINGS					200			X				
COHOE					N.O.							
PINKS					N.O.							
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Nil

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Normal

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Scattered spawners from Forestdale Bridge to 3 km above Houston

(B) Comments re Predators Anglers,

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

OBSTRUCTIONS

(A) Passable or Impassable Passable
 If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?.....
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

July 26 count-no fish but some Lamprey near Falls

Aug 1 count-33 Chinook and many fry

Aug 2 count-23 Chinook just below Falls

Aug 14 count-3 Chinook near McQuarrie Creek

Aug 21 count-90 Chinook



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1983

NAME OF STREAM (MAP NAME) Bulkley River (above Morice River)	(LOCAL NAME)
FLOWING INTO Bulkley River	DATES STREAM INSPECTED Aug 19

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE					25 A							
SPRINGS					400 D		X					
COHOE					N.O.							
PINKS					N.O.							
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate numbers.

Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Nil

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Normal

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Sockeye were seen by F/W techn. around the Knockholt area

(B) Comments re Predators people, bears and birds

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

OBSTRUCTIONS

(A) Passable or Impassable Impassable
 If Nil, indicate from mouth to furthest point of access from Forestdale downstream

(B) Nature of Obstruction beaver dams

(C) Distance from Mouth of Stream 4-6 km downstream from Bulkley Lake

(D) Do you recommend that the Obstruction be removed? YES

(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Aug 19 - Spring Count

Aug 17 - Sockeye between 128-129 km on railway markers near Knockholt.

Jerry Turnbull
FISHERY OFFICER



DISTRICT NO. 8B.C.

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1982

NAME OF STREAM (MAP NAME) Bulkley River (above Morice River) (LOCAL NAME)

FLOWING INTO Bulkley River DATES STREAM INSPECTED

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE												
SPRINGS		Aug	Aug	Sept	6100			X				
COHOE		Aug	Sept	Oct	UNK							
PINKS												
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Nil.

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil.

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given LOW.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Scattered throughout

(B) Comments re Predators N.O.

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil.

OBSTRUCTIONS

(A) Possible or Impossible Passable
 If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

D. Durnbuli
 FISHERY OFFICER



DISTRICT NO. 8 B.C.

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1981

NAME OF STREAM (MAP NAME) _____ (LOCAL NAME) _____
 FLOWING INTO Bulkley River (above Morice River) DATES STREAM INSPECTED _____
BULKLEY RIVER (DOWN TO 100 ft.) NOT INSPECTED
 NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE					N.O.							
SPRINGS		<u>Aug.</u>	<u>Aug.</u>	<u>Sept.</u>	<u>C 250</u>			<u>X</u>	<u>A.</u>			
COHOE												
PINKS												
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:
 Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N
 - Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected slight

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Low

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Spawns scattered from knook 1/2 to 3 km. at above falls.

(B) Comments re Predators bear, wolf & birds light

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

OBSTRUCTIONS

(A) Passable or Impassable passable
 If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?.....
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM
Sketch on 1980 report.

Shane [Signature]
 FISHERY OFFICER

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1980

NAME OF STREAM (MAP NAME) Bulkley river (above Maurice river) (LOCAL NAME) Upper Bulkley river
 FLOWING INTO Bulkley river (below Maurice river) DATES STREAM INSPECTED Aug 14, 21 & 26, Sept 22,
 NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE												
SPRINGS												
COHOE		<u>Aug</u>	<u>Sept</u>	<u>Sept</u>	<u>D 500</u>			<u>A</u>				
PINKS												
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate numbers:
 Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N
 * Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected slight

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil.

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Spring scattered from Knockholt to Bulkley Falls.

(B) Comments re Predators Beaver, wolf, & birds. light.

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil.

OBSTRUCTIONS

(A) Passable or Impossible PASSABLE
 If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

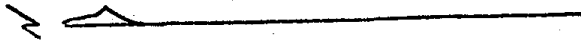
(D) Do you recommend that the Obstruction be removed?
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

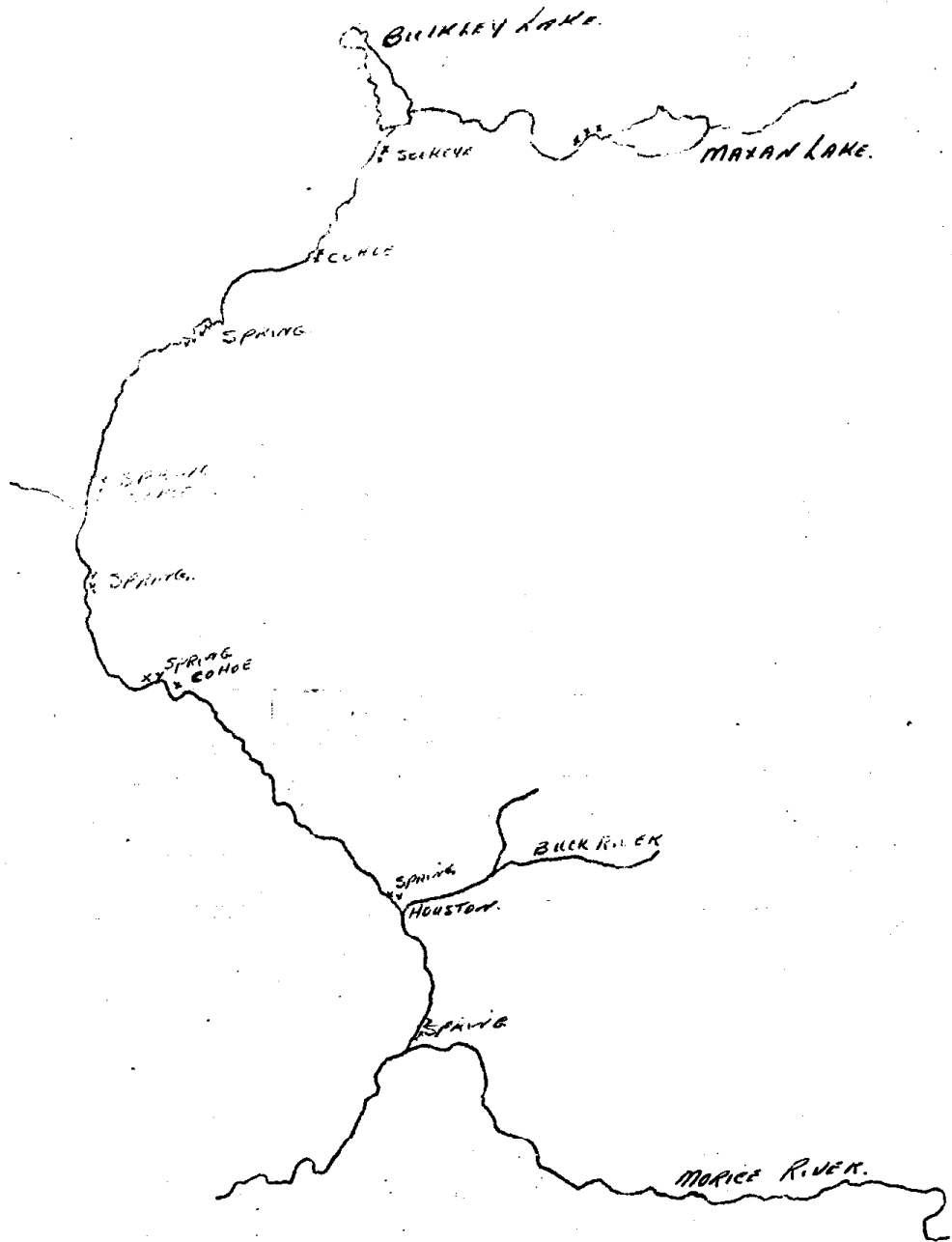
Sketch on reverse.

Heavy beaver activity on Upper Bulkley.

Residents report presence of spring and coho up to Bulkley Lake.



SCALE 1" = 4 MILES





Environment Canada / Environnement Canada
Fisheries / Pêches

DISTRICT NO. 8, B.C.

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1979

NAME OF STREAM (MAP NAME) Bulkley river (Above Houston) (LOCAL NAME)

FLOWING INTO Bulkley river (Below Houston) DATES STREAM INSPECTED Regularly by Guardian.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

Table with columns: SPECIES, ARRIVAL IN STREAM, DATES OF DURATION OF SPAWNING (START, PEAK, END), TOTAL NO. ON GROUNDS, SIZE OF RUN (HYV, MED, LT), BROOD YEAR SYMBOL, GIVE SEX RATIO IN (M, F, JACK). Rows include SOCKEYE, SPRINGS, COHOE, PINKS, STEELHEAD, CHUMS.

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:
Thus: 1 - 50 A, 50 - 100 B, 100 - 300 C, 300 - 500 D, 500 - 1000 E, 1000 - 2000 F, 2000 - 5000 G, 5000 - 10000 H, 10000 - 20000 K, 20000 - 50000 L, 50000 - 100000 M, * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Slight erosion
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil.
(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Low.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Sockeye below Bulkley lake Springs scattered throughout.
(B) Comments re Predators Bear, wolf & birds light.
(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil.

OBSTRUCTIONS

(A) Passable or Impassable Passable
If Nil, indicate from mouth to furthest point of access
(B) Nature of Obstruction Log jams and beaver dams
(C) Distance from Mouth of Stream Throughout
(D) Do you recommend that the Obstruction be removed? AS required each year.
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch on 1975 report.
Log jams removed this year by S.E.P. Bulldozer contract.
Leaver dams clipped by Guardians.



Environment Canada / Environnement Canada
Fisheries / Pêches

DISTRICT NO. B.C.
YEAR 1978

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley River above Houston (LOCAL NAME)

FLOWING INTO Bulkley below Houston DATES STREAM INSPECTED Regular by Guardian

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE		Aug	Aug	Sept	A 50			A	C			
SPRINGS		Aug	Aug	Oct	D 400			A	N.O.			
COHOE		Aug	Sept	Oct	F 1200	X			A			
PINKS		Aug	Aug	Sept	N.R.				N.O.			
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

Thus: 1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	* Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Hvy below Bulkley falls, tight curves and log jams

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream log jams & beaver dams numerous

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given normal low during Aug.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Sockeye to Maxam & Bulkley Lakes, spring & coho above and below Bulkley falls, pink scattered to Topley.

(B) Comments re Predators bear, wolf, birds light

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Passable or Impassable passable

If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction log jams & beaver dams

(C) Distance from Mouth of Stream scattered to bulkley falls

(D) Do you recommend that the Obstruction be removed? yes to enhance spawning areas

(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

sketch on 1975 report,

log jam removal by native hiring under S.E.P. this season, guardian constantly pulling out beaver dams.

F-3481 (REV. 10/71) F-381

FISHERY OFFICER

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1977

NAME OF STREAM (MAP NAME) Bulkley River above Houston (LOCAL NAME)

FLOWING INTO Bulkley River below Houston DATES STREAM INSPECTED Angler by Guardian positioned at Houston

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE		AUG	AUG	Sept	C 200			A	C			
SPRINGS		AUG	AUG	Sept	C 250			X	E			
COHOE		AUG	Sept	Nov	C 280			W	C			
PINKS		AUG	AUG	Sept	N.R.				N.O.			
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number

Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Hyv below Bulkley falls, tight curves and log jams causes bank erosion.

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Log jams and beaver dams numerous throughout

(C) Water Levels (Low, Normal, High, Abnormal), if Abnormal, details should be given Normal low in Aug.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Sockeye to Maxan Lake and Creek, spring and coho scattered above bulkley falls and below, pink up to Kopley.

(B) Comments re Predators Deer & wolf, nets and jigging by locals.

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Passable or Impassable Passable
 If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction Log jams and beaver dams

(C) Distance from Mouth of Stream Scattered between Houston and Bulkley falls

(D) Do you recommend that the Obstruction be removed? Yes to enhance river
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch on 1977 report.

Guardian reports many beaver activity, two log jams removed this season at a cost of \$2,100. near Upland Motor Hotel.

081-3-3481 (11/75)

[Signature]
FISHERY OFFICER

DISTRICT NO. 8, B.C.

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1976

NAME OF STREAM (ON MAP NAME) Bulkley R. above Houston to Kazan L. (LOCAL NAME) _____
FLOWING INTO Bulkley R. below Houston DATES STREAM INSPECTED Regular by Guardian
NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HYV.	MED.	LT.		M	F	JACKS
SOCKEYE		<u>AUG</u>	<u>AUG</u>	<u>SEPT</u>	<u>N.O.</u>				<u>C 300</u>			
SPRINGS		<u>AUG</u>	<u>AUG</u>	<u>SEPT</u>	<u>A 15</u>			<u>A</u>	<u>B 55</u>			
COHOE		<u>AUG</u>	<u>SEPT</u>	<u>NOV</u>	<u>A 22</u>			<u>X</u>	<u>F 1000</u>			
PINKS		<u>AUG</u>	<u>AUG</u>	<u>SEPT</u>	<u>N.H.</u>				<u>N.O.</u>			
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate numbers:
Thus: 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N
* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Hyv below bulkley falls, tight curves and log jams causes bank erosions

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Log jams and beaver dams from Knockholt to bulkley falls

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Normal this season due to continued rain during migrations

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed sockeyes to Kazan L. (Foxy Crk), springs and coho scattered above Bulkley Falls, pink scattered below falls

(B) Comments re Predators bears and local residence (nets & jigging)

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Possible or Impossible insane to Kazan with good water levels
If Nil, indicate from mouth to furthest point of access _____

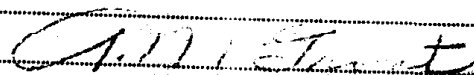
(B) Nature of Obstruction Log jams and beaver dams scattered

(C) Distance from Mouth of Stream between knockholt and bulkley falls

(D) Do you recommend that the Obstruction be removed? yes to enhance river
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM
Sketch on 1975 report.

1975 report indicated 32 beaver dams and 6 log jams between knockholt and bulkley falls the same conditions prevailed in 1976 as reported by the Guardian


FISHERY OFFICER



Environment Canada / Environnement Canada

Fisheries / Pêches

DISTRICT NO. 8, B.C.

YEAR 1975

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley river above Houston to Maxan lake. (LOCAL NAME)
 FLOWING INTO Bulkley river below Houston DATE STREAM INSPECTED Regular by Guardian.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUM			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		NOVY.	MED.	LT.		M	F	JACKS
SOCKEYE		Aug	Aug	Sept	B 64			X	N.O.			
SPRINGS		Aug	Aug	Sept	D 500			X	0			
COHOE		Aug	Sept	Nov	A 28			X	0			
PINKS					N.O.				D			
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

Thus: 1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected slight

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Scattered from Knockholt to Bulkley falls.

(B) Comments re Predators Wolves, birds and bear, light.

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil.

OBSTRUCTIONS

(A) Passable or Impassable Passable

If Nil, indicate from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

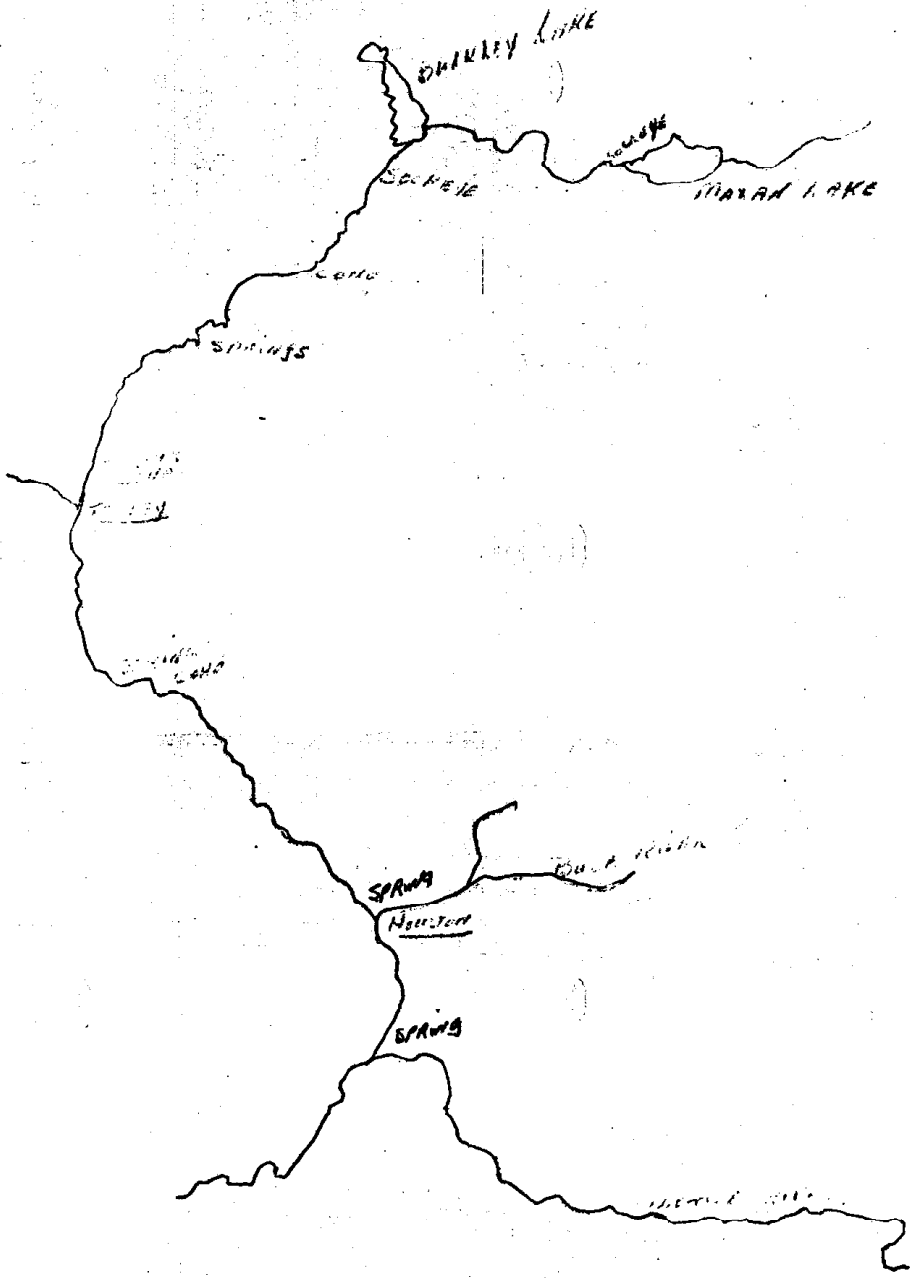
(D) Do you recommend that the Obstruction be removed?

(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch on reverse. There are 32 beaver dams and 6 log jams (not stoppages) between Knockholt and Bulkley lake.

Scale: 1" = 4 miles



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley river above Houston to Maxan Lake. (LOCAL NAME)

FLOWING INTO Bulkley river below Houston DATES STREAM INSPECTED Regular by Guardian.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO		
		START	PEAK	END		HVV.	MED.	LT.		M	F	JAE
SOCKEYE		Aug	Aug	Sept	0 200			X	A			
SPRINGS					N.O.				C			
COHOE		Aug	Sept	Nov.	0 200			X	E			
PINKS					N.O.				D			
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number.

Thus: 1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	* Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Siltation - Give Extent or % Stream Bed Affected causing bank washouts and diversions. Some, river meanders in tight curves.
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream. Some from diversions.
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given. Low

BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Stream Bed. Upper end only.
- (B) Comments re Predators. Wolves, bear and birds.
- (C) Evidence of Digging up of Eggs by Later Spawning Fish. Nil.

OBSTRUCTIONS

- (A) Passable or Impassable. Passable.
- If Nil, indicate from mouth to furthest point of access.
- (B) Nature of Obstruction. Scattered log jams and beaver dams.
- (C) Distance from Mouth of Stream. Between Knocknolt and Bulkley Falls.
- (D) Do you recommend that the Obstruction be removed? May change with spring floods.

(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch of 1970 13, 1971.

[Signature]
FIELD OFFICER

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

YEAR 1973

NAME OF STREAM (MAP NAME) Bulkley river above Houston to Haxan Lake
FLOWING INTO Bulkley river below Houston
DATES STREAM INSPECTED Frequently by fishery officers and Guardian from Donalds Ldg.
NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

Table with columns: SPECIES, ARRIVAL IN STREAM, DATES OF DURATION OF SPAWNING (START, PEAK, END), TOTAL NO. ON GROUNDS, SIZE OF RUN (MAY, JUN, JUL), BROOD YEAR SYMBOL, GIVE SEX RATIO IN % (M, F, JACKS).

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:
Thus: 1 - 50 A, 50 - 100 B, 100 - 300 C, 300 - 500 D, 500 - 1000 E, 1000 - 2000 F, 2000 - 5000 G, 5000 - 10000 H, 10000 - 20000 K, 20000 - 50000 L, 50000 - 100000 M, * Over 100000 N

* Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected 35% between Bulkley Falls and Houston, river meanders in tight curves causing bank washouts and overflows.
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Log jams heavy from Knockholt Station to Bulkley Falls.
(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given High during spring run off, low during migrations August and September.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Sockeye to Haxan Lake and Foxy Creek, spring and coho scattered in upper areas above falls, pinks scattered to Bulkley Falls in lower stream above Houston.
(B) Comments re Predators olves, bear and birds.
(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil.

OBSTRUCTIONS

(A) Passable or Impassable Passable with good water levels.
If Nil, indicate from mouth to furthest point of access
(B) Nature of Obstruction Log jams, beaver dams scattered.
(C) Distance from Mouth of Stream between Knockholt Station to Bulkley Falls.
(D) Do you recommend that the Obstruction be removed? Yes.
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

sketch on 1970 report.
Heavy beaver activity in area above Bulkley Falls to Bulkley Lake.

B.C. 23

SALMON STREAM OBSTRUCTION REPORT

Complementary information concerning obstruction reported in Bulkley River
Above Houston between Knockholt C.R.R. Station and Bulkley Falls creek or
 river flowing into Bulkley River below Houston.

by Inspector A.L. Groat in "Salmon Stream Spawning Report F.381"
 dated January 7th, 1974, as follows Heavy log jams (17) counted during 1973 in
area as above, 3 destroyed by fire and remaining debris pulled out with
tractor, 1 removed by tractor and 1 diversion cut through, 1 diversion at
arrow pushed out with tractor and river diverted. Done work to protect
railway bed near arrow.

(1) Description of obstruction including length, width, depth, composition,
 etc. Log jams mostly cottonwood trees fallen in from bank washout up to 200 feet in length
and piled up to 20 feet in height. Heavy beaver dams across river up to 7 feet in height
scattered throughout to Bulkley Lake across river.

(2) Benefits that would result from the removal of the obstruction (immediate
 long term---) salmon enhancement for 4 species of salmon, bouye-cho-ink-erine,
the river has been neglected for past 20 years will take a long time however to improve the
condition.

(3) Location of obstruction in relation to accessible roads or tidewater as
 the case may be Highway 16 in many cases and side roads, C.R.R. will assist with gas
car on railway in many areas when required.

(4) Facilities for transporting men and equipment to location of the
 obstruction trucks and C.R.R. gas car on railway.

(5) Can work be done by hand labour and explosives or is heavy equipment
 necessary? If latter, give type best suited labour, burning, and explosives,
18 or 9 caterpillar tractor for diversions of stream too to cut off some curves.

B.C. 23

(6) Is the necessary equipment readily available in the locality for this work? Yes

(7) What would be the most suitable time to have the work in hand from standpoint of loss of fish in the egg, fry and adult stage? August when river is at it's lowest water condition for burning and diversions.

(8) Estimated cost of removal under headings "Rental of equipment, material and labour" (details under heading of "labour" should include number of men required).

Labour - 4 or 5 men engaged in burning to work fire fighting equipment during August if forestry allows and equipment - vert. power saw.	4,000
Rental equipment - tractor	2,000
Material - dynamite, tools, food and lodgings if required	4,000
	10,000

(9) Estimated time it will take to complete the work: one year or over 2 or 3 years due to limit of approx. 1 month per year to ensure lowest water conditions.

Date: January 7th, 1974 (Signed) [Signature]
Place: Smithers, B.C. (Title) Fishery Officer.
(Address) _____

Comment on observation by District Supervisor:

(Signed) _____



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley river above Houston	(LOCAL NAME)
FLOWING INTO Bulkley river below Houston	DATES STREAM INSPECTED Periodically

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN		
		START	PEAK	END		RVY.	MED.	LT.		M	F	JACKS
SOCKEYE		Sept.	Sept.	Sept.	C 300			x	HR			
SPRINGS		Aug.	Aug.	Sept.	B 55			x	C	50	50	
COHOE		Sept.	Oct.	Nov.	D 2500		x		F	50	50	
PINKS		Aug.	Sept.	Sept.	D 450	x			GR	50	50	
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number: Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	*Over 100000 N

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected 2%

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream slight by log jams.

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low.

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Scattered throughout.

(B) Comments re Predators birds light.

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil.

OBSTRUCTIONS

(A) Passable or Impassable passable.
If Nil, indicate distance from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch on 1970 report.



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley river above Houston (LOCAL NAME)

FLOWING INTO Bulkley river below Houston DATES STREAM INSPECTED Periodically

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACK
SOCKEYE					N.O.							
SPRINGS												
COHOE		Aug.	Aug.	Sept.	C 100				C	50	50	
PINKS		Sept.	Oct.	Nov.	B 600				F	50	50	
STEELHEAD		Aug.	Aug.	Sept.	C 100				N.R.			
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

- Thus
- 1 - 50 A
- 50 - 100 B
- 100 - 300 C
- 300 - 500 D
- 500 - 1000 E
- 1000 - 2000 F
- 2000 - 5000 G
- 5000 - 10000 H
- 10000 - 20000 K
- 20000 - 50000 L
- 50000 - 100000 M
- *Over 100000 N

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected 5%

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream none

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Scattered throughout

(B) Comments re Predators Birds medium

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Possible or Impossible passable
If Nil, indicate distance from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Sketch on 1970 report.



DEPARTMENT OF FISHERIES
PACIFIC REGION

DISTRICT NO. B.C.
YEAR 1970

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley River above Houston (LOCAL NAME)

FLOWING INTO Bulkley river below Houston DATES STREAM INSPECTED Frequently during season

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS — (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE	Aug.	Sept	Sept	Sept	A 50			X	B RR	50	50	
SPRINGS	Aug.	Aug.	Aug.	Sept.	C 150			X	D E	50	50	
COHOE	Aug.	Sept	Oct.	Nov.	E 600			X	E	50	50	
PINKS												
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:

Thus			2000 - 5000 G	20000 - 50000 L
1 - 50 A	300 - 500 D		5000 - 10000 H	50000 - 100000 M
50 - 100 B	500 - 1000 E		10000 - 20000 K	*Over 100000 N
100 - 300 C	1000 - 2000 F			

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected 20% bank erosion

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed Springs and Coho scattered to lake.

(B) Comments re Predators Birds light

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Passable or Impossible passable

If Nil, indicate distance from mouth to furthest point of access

(B) Nature of Obstruction Leaver and log jams scattered throughout to lake.

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed? yes
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM
10% of jams and dams removed by winter works stream clearance project.

FISHERY OFFICER



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Bulkley River above Houston (LOCAL NAME)

FLOWING INTO Lower Bulkley River DATES STREAM INSPECTED repeatedly during spawning.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JAC.
SOCKEYE												
SPRINGS												
COHOE		<u>August</u>	<u>August</u>	<u>Sept.</u>	<u>1200</u>			<u>X</u>	<u>64</u>	<u>21</u>		
PINKS		<u>Sept.</u>	<u>Oct.</u>	<u>Oct.</u>	<u>1500</u>			<u>X</u>	<u>65</u>	<u>50</u>		
STEELHEAD		<u>August</u>	<u>August</u>	<u>Sept.</u>	<u>200</u>			<u>X</u>	<u>21</u>	<u>11</u>		
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate numbers:

- Thus
- 1 - 50 A
- 50 - 100 B
- 100 - 300 C
- 300 - 500 D
- 500 - 1000 E
- 1000 - 2000 F
- 2000 - 5000 G
- 5000 - 10000 H
- 10000 - 20000 K
- 20000 - 50000 L
- 50000 - 100000 M
- *Over 100000 N

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected 20%
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Log jams numerous throughout
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Normal

BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Stream Bed Pinks scattered, coho to lake, springs scattered.
- (B) Comments re Predators birds light
- (C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

- (A) Passable or Impossible impossible
If Nil, indicate distance from mouth to furthest point of access
- (B) Nature of Obstruction log jams
- (C) Distance from Mouth of Stream scattered throughout to lake.
- (D) Do you recommend that the Obstruction be removed? yes.
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

leaver dams in upper reaches, log jamming problem by children and local natives using nets.

[Signature]
FISHERY OFFICER



ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) <u>Upper Bulkley River Area 1</u>	(LOCAL NAME)
FLOWING INTO <u>Lower Bulkley River</u>	DATES STREAM INSPECTED <u>Weekly during season</u>

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS — (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVV.	MED.	LT.		M	F	JACKS
SOCKEYE												
SPRINGS	<u>Aug. 10</u>	<u>Aug. 25</u>	<u>Sept. 5</u>	<u>Sept. 15</u>	<u>1 125</u>				<u>63 F</u>	<u>40</u>	<u>40</u>	<u>20</u>
COHOE	<u>Sept. 15</u>	<u>Oct. 1</u>	<u>Oct. 15</u>	<u>Nov. 15</u>	<u>1 1000</u>				<u>65 B</u>	<u>45</u>	<u>45</u>	<u>10</u>
PINKS	<u>Aug. 15</u>	<u>Aug. 20</u>	<u>Sept. 10</u>	<u>Sept. 30</u>	<u>0 150</u>				<u>66 A</u>	<u>50</u>	<u>50</u>	
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number: Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	*Over 100000 N

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil

(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given normal

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed good

(B) Comments re Predators nil

(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

OBSTRUCTIONS

(A) Passable or Impossible passable with good water levels
If Nil, indicate distance from mouth to furthest point of access _____

(B) Nature of Obstruction _____

(C) Distance from Mouth of Stream _____

(D) Do you recommend that the Obstruction be removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction) _____

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM
quite a few beaver dams

FISHERY OFFICER

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 8,3.C. FISHERY OFFICER L.J. Gelley YEAR 1967

NAME OF STREAM Bulkley River Upper I FLOWING INTO Bulkley River Lower II
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Weekly during season

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Cohoe	Pinks	Steelhead	Chums
1. Dates of duration) Start	Aug. 15	Oct. 1	Aug. 25			
of run) Peak	" 30	" 18	Sept. 15			
) End	Sept. 10	Nov. 10	" 31			
2. Total number of grounds	c 200	B600	C 250			
3. Size of run - hvy. med. lt.	lt.	med	lt.			
4. Compare with total number for brood year using symbol	B	E	A			
5. Give sex ratio in) Male	45%	50%	50%			
percentages) Female	45%	50%	50%			
Jacks	10%					

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil.
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil.
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given low at start of season but normal after fall rains.

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed good
- (B) Comments re Predators _____
- (C) Evidence of Digging up of Eggs by Later Spawning Fish nil.

8. OBSTRUCTIONS

- (A) Passable or Impassable n.a.
- (B) Nature of Obstruction _____
- (C) Distance from Mouth of Stream _____
- (D) Do you Recommend that the Obstruction be Removed? _____
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Due to low water springs only got to Knockholt but with fall rains coho reached Bulkley Lake.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	* Over 100000 N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.



DEPARTMENT OF FISHERIES
PACIFIC REGION

DISTRICT NO. B.C.C.

YEAR 1967

ANNUAL REPORT OF SALMON STREAM AND SPAWNING GROUNDS

NAME OF STREAM (MAP NAME) Upper Bulkley River Area # 1 (LOCAL NAME)

FLOWING INTO Lower Bulkley River DATES STREAM INSPECTED Weekly during season.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream portions of stream bed where spawning occurs, etc., its location in relation to some known point. These sketches should be brought up to date every five years.

PARTICULARS OF SPAWNING & SPAWNING CONDITIONS - (Draw lines through names of salmon that do not frequent this stream.)

SPECIES	ARRIVAL IN STREAM	DATES OF DURATION OF SPAWNING			TOTAL NO. ON GROUNDS	SIZE OF RUN			BROOD YEAR SYMBOL	GIVE SEX RATIO IN %		
		START	PEAK	END		HVY.	MED.	LT.		M	F	JACKS
SOCKEYE												
SPRINGS	<u>Aug 15</u>	<u>Aug 15</u>	<u>Aug 30</u>	<u>Sept 10</u>	<u>C 200</u>			<u>X</u>	<u>62 P</u> <u>63 P</u>	<u>45</u>	<u>45</u>	<u>10</u>
COHOE	<u>Oct 1</u>	<u>Oct 1</u>	<u>Oct 18</u>	<u>Nov 10</u>	<u>E 600</u>			<u>X</u>	<u>64 C</u>	<u>50</u>	<u>50</u>	<u>N11</u>
PINKS	<u>Aug 25</u>	<u>Aug 25</u>	<u>Sept 15</u>	<u>Sept 30</u>	<u>C 250</u>			<u>X</u>	<u>65 D</u>	<u>50</u>	<u>50</u>	<u>N11</u>
STEELHEAD												
CHUMS												

NOTE: Estimate Number of Parent Fish on Spawning Grounds and indicate by placing letter in Column provided to show approximate number:
Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	Over 100000 N

*Where letter "N" used it is requested approximate number of fish on spawning grounds be shown.

PHYSICAL CONDITION OF SPAWNING GROUNDS

(A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Nil

(B) Particulars of Sealing of Spawning Beds or Change in Course of Stream Nil

(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given
low until fall rains, then Normal

BIOLOGICAL CONDITIONS

(A) Particulars of Distribution of Spawning Salmon over the Stream Bed good

(B) Comments re Predators Nil

(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

OBSTRUCTIONS

(A) Passable or Impassable Passable with good water levels only
If Nil, indicate distance from mouth to furthest point of access

(B) Nature of Obstruction

(C) Distance from Mouth of Stream

(D) Do you recommend that the Obstruction be removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction)

COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Due to low water levels during summer springs only reached Knockholt, with fall rains Cohoe reached Bulkley Lake

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. S. 220 FISHERY OFFICER L.J. Colley YEAR 1966
NAME OF STREAM Bulkley River about Houston) FLOWING INTO Lower Bulkley River
Map Name Local Name
DATES ON WHICH STREAM INSPECTED Weekly during spawning season.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

Table with columns for Sockeye, Springs, Coho, Pinks, Steelhead, Chums. Rows include: 1. Dates of duration (Start, Peak, End), 2. Total number of grounds, 3. Size of run (hvy, med, lt), 4. Compare with total number for brood year using symbol (F, E, B), 5. Give sex ratio in percentages (Male, Female, Jacks).

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil
(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given normal

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed fair
(B) Comments re Predators a few birds
(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

8. OBSTRUCTIONS

- (A) Passable or Impassable passable
(B) Nature of Obstruction
(C) Distance from Mouth of Stream
(D) Do you Recommend that the Obstruction be Removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Upper falls is a block or a delay at low water levels. Large log jams and heavy beaver population.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

Grid for estimating parent fish numbers with columns A-N and rows for number ranges (1-50, 50-100, 100-300, 300-500, 500-1000, 1000-2000, 2000-5000, 5000-10000, 10000-20000, 20000-50000, 50000-100000, Over 100000).

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. FISHERY OFFICER YEAR 1965
NAME OF STREAM (above Houston) FLOWING INTO (below Houston)
Map Name Local Name
DATES ON WHICH STREAM INSPECTED

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

Table with columns: Sockeye, Springs, Cohoe, Pinks, Steelhead, Chums. Rows include: 1. Dates of duration (Start, Peak, End), 2. Total number of grounds, 3. Size of run - hvy. med., 4. Compare with total number for brood year using symbol, 5. Give sex ratio in percentages (Male, Female, Jacks).

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream
(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed
(B) Comments re Predators
(C) Evidence of Digging up of Eggs by Later Spawning Fish

8. OBSTRUCTIONS

- (A) Passable or Impassable
(B) Nature of Obstruction
(C) Distance from Mouth of Stream
(D) Do you Recommend that the Obstruction be Removed?
(if so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Heavy beaver population on headwaters.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

Legend table for parent fish counts: 1-50 A, 50-100 B, 100-300 C, 300-500 D, 500-1000 E, 1000-2000 F, 2000-5000 G, 5000-10000 H, 10000-20000 K, 20000-50000 L, 50000-100000 M, * Over 100000 N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2 FISHERY OFFICER O.M. Bussey YEAR 1964

NAME OF STREAM Bulkley (above Houston) FLOWING INTO Skeena River
 Map Name Local Name

DATES ON WHICH STREAM INSPECTED Regular weekly inspections.

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Cohoe	Pinks	Steelhead	Chums
1. Dates of duration) Start	Aug 10	July 26	Aug 10			
of run) Peak	Aug 26	Aug 10	Sep 6			
) End	Sep 15	Sep 10	Oct 1			
2. Total number of grounds	G(300)	F(2000)	G(200)			
3. Size of run - hvy. med. lt.	lt	med	med			
4. Compare with total number for brood year using symbol	c	e	no			
5. Give sex ratio in) Male	50	50	50			
percentages) Female	50	50	50			
Jacks						

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected all
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream all
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given _____

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed even
- (B) Comments re Predators all
- (C) Evidence of Digging up of Eggs by Later Spawning Fish all

8. OBSTRUCTIONS

- (A) Passable or Impassable _____
- (B) Nature of Obstruction _____
- (C) Distance from Mouth of Stream _____
- (D) Do you Recommend that the Obstruction be Removed? _____
 (If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

It is suspected there is a very high incident of illegal fishing and distribution of Spring salmon from this area. Estimated loss as suggested by the local B.C. Conservation Officer would indicate that only 50% of the total escapement is realized with the other 50% (2000 Springs) being taken and disposed of.


10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in

Column Provided to Show Approximate Number: Thus

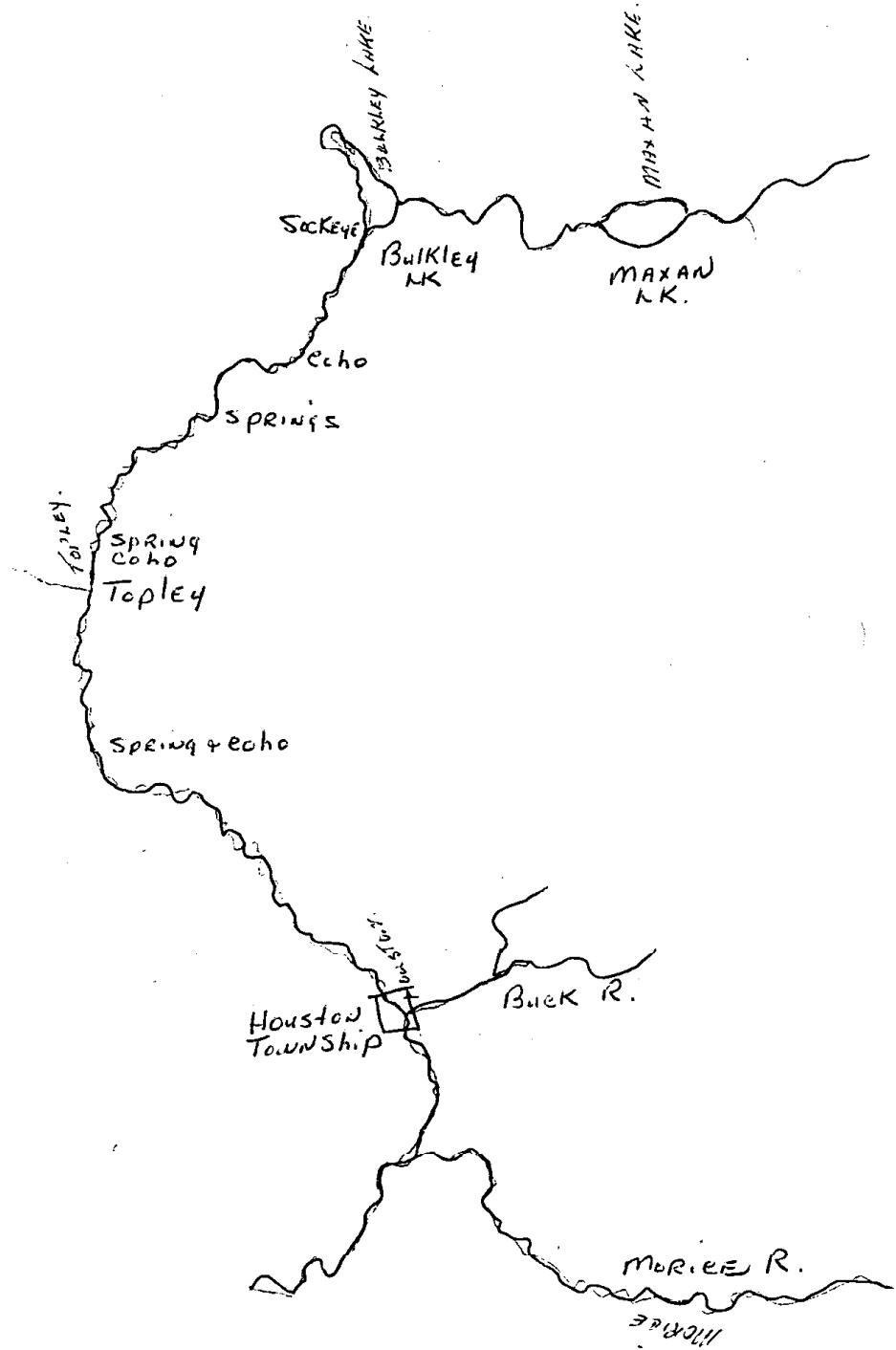
1 - 50	A	300 - 500	D	2000 - 5000	G	20000 - 50000	L
50 - 100	B	500 - 1000	E	5000 - 10000	H	50000 - 100000	M
100 - 300	C	1000 - 2000	F	10000 - 20000	K	* Over 100000	N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.



N.  1 in = 4 mi

Scale 1 inch = 4 miles



SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2 BC FISHERY OFFICER OM Bussey YEAR 1963

NAME OF STREAM Bulkley River (Above Houston) FLOWING INTO Lower Bulkley
 Map Name Local Name

DATES ON WHICH STREAM INSPECTED Regular inspections throughout season.

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Cohoe	Pinks	Steelhead	Chums
1. Dates of duration) Start	<u>Aug 10</u>	<u>Aug 1</u>	<u>Oct 1</u>			
of run) Peak	<u>Sep 10</u>	<u>Sep 18</u>	<u>Nov 15</u>			
) End		<u>Sep 30</u>	<u>Dec 15</u>			
2. Total number of grounds	<u>8 (600)</u>	<u>7 (2000)</u>	<u>6 (300)</u>			
3. Size of run - hvy. med. lt.	<u>l t</u>	<u>med</u>	<u>med</u>			
4. Compare with total number for brood year using symbol	<u>nr</u>	<u>nr</u>	<u>G</u>			
5. Give sex ratio in) Male	<u>50</u>	<u>50</u>	<u>50</u>			
percentages) Female	<u>50</u>	<u>50</u>	<u>50</u>			
Jacks						

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given _____

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed even
few sockeye below Hagan Creek entrance. Spring appeared at Bulkley Falls.
- (B) Comments re Predators nil
- (C) Evidence of Digging up of Eggs by Later Spawning Fish nil

8. OBSTRUCTIONS

- (A) Passable or ~~impassable~~ Bulkley Canyon. Passable during certain water levels.
- (B) Nature of Obstruction Falls (approximate 15 feet).
- (C) Distance from Mouth of Stream _____
- (D) Do you Recommend that the Obstruction be Removed? yes
 (if so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Water level variations can impede progress of sockeye and springs over Bulkley Falls. Spring escapement exposed to severe exploitation by Indians this year. Considered illegal fishery. Preventative measures taken but effectiveness not known.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

1 - 50	A	300 - 500	D	2000 - 5000	G	20000 - 50000	L
50 - 100	B	500 - 1000	E	5000 - 10000	H	50000 - 100000	M
100 - 300	C	1000 - 2000	F	10000 - 20000	K	* Over 100000	N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2, B. C. FISHERY OFFICER G. W. Dussey YEAR 1962

NAME OF STREAM Bulkley River (above Spout) FLOWING INTO Lower Bulkley River
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Regularly Throughout season.

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

Table with columns for Sockeye, Springs, Cohoe, Pinks, Steelhead, Chums. Rows include: 1. Dates of duration (Start, Peak, End), 2. Total number of grounds, 3. Size of run - hvy. med. lt., 4. Compare with total number for brood year using symbol, 5. Give sex ratio in percentages (Male, Female, Jacks).

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil
(C) Water Levels (low, Normal, High, Abnormal). If Abnormal, details should be given

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed Springs concentrated below Bulkley Falls while Coho from Forestdale to Laxen Lake, Sockeye, Laxen Lake,
(B) Comments re Predators nil
(C) Evidence of Digging up of Eggs by Later Spawning Fish nil

8. OBSTRUCTIONS

- (A) Passable or Impassable Passable during 1962 water levels.
(B) Nature of Obstruction Falls and Beaver dams.
(C) Distance from Mouth of Stream Along stream
(D) Do you Recommend that the Obstruction be Removed? Not immediate necessity.
(if so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Although beaver dams and Bulkley Falls represent some hazardous migration difficulties during extremely low water conditions, there was no impediment offered this year with stream migrations. Water levels were consistently higher during the entire migration period than had been experienced for some years and salmon were not retarded.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

Grid for estimating parent fish numbers with columns A through N and corresponding ranges (1-50, 50-100, 100-300, 300-500, 500-1000, 1000-2000, 2000-5000, 5000-10000, 10000-20000, 20000-50000, 50000-100000, Over 100000).

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2,3,C. FISHERY OFFICER L.J. Golley YEAR 1961
(Above Houston)

NAME OF STREAM Bulkley River FLOWING INTO Lower Bulkley River
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Several times during salmon run.

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

- | | Sockeye | Springs | Cohoe | Pinks | Steelhead | Chums |
|--|---|---------|---------------|-------|-----------|-------|
| 1. Dates of duration) Start | Stream to low to allow salmon entrance. | | | | | |
| of run) Peak | _____ | | | | | |
|) End | _____ | | | | | |
| 2. Total number of grounds | _____ | | | | | |
| 3. Size of run - hvy. med. lt. | _____ | | | | | |
| 4. Compare with total number for brood year using symbol | _____ C _____ | | _____ G _____ | | | |
| 5. Give sex ratio in) Male | _____ | | | | | |
| percentages) Female | _____ | | | | | |
| Jacks | _____ | | | | | |

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected _____
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream _____
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given _____
Very low due to a hot dry summer

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed _____
- (B) Comments re Predators _____
- (C) Evidence of Digging up of Eggs by Later Spawning Fish _____

8. OBSTRUCTIONS

- (A) Passable or Impassable _____ In good water levels only
- (B) Nature of Obstruction _____ N.A.
- (C) Distance from Mouth of Stream _____
- (D) Do you Recommend that the Obstruction be Removed? _____
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Beaver dams are plentiful on this stream.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in

Column Provided to Show Approximate Number: Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	* Over 100000 N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2 B.C. FISHERY OFFICER H.J. Engelson YEAR 1960

NAME OF STREAM Bulkley R. Above Houston FLOWING INTO Bulkley R.
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Various times during the season.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Cohoe	Pinks	Steelhead	Chums
1. Dates of duration) Start						
of run) Peak	<u>Aug 18</u>	<u>Aug 18</u>	<u>Oct. 20</u>			
) End	<u>Sept 10</u>	<u>Sept. 5</u>	<u>Nov. 10</u>			
2. Total number of grounds	<u>0</u>	<u>8</u>	<u>0</u>			
3. Size of run - hvy. med. lt.	<u>Lt</u>	<u>Lt</u>	<u>Lt</u>			
4. Compare with total number for brood year using symbol	<u>N11</u>	<u>F</u>	<u>E</u>			
5. Give sex ratio in) Male	<u>40%</u>	<u>20</u>	<u>80%</u>			
percentages) Female	<u>60%</u>	<u>80%</u>	<u>20%</u>			
Jacks			<u>100%</u>			

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Nil
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Abnormal low, except early and late.

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed Sockeye just below mouth of Hagan Lake, 700 Spring below Fox Creek. (Spring and Sockeye in early.)
- (B) Comments re Predators None observed.
- (C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

8. OBSTRUCTIONS

- (A) Passable or Impassable During low water, salmon did not enter, water too warm
- (B) Nature of Obstruction
- (C) Distance from Mouth of Stream
- (D) Do you Recommend that the Obstruction be Removed?
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

First time sockeye observed here in many years and they entered early when there was plenty of water.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

1 - 50 A	300 - 500 D	2000 - 5000 G	20000 - 50000 L
50 - 100 B	500 - 1000 E	5000 - 10000 H	50000 - 100000 M
100 - 300 C	1000 - 2000 F	10000 - 20000 K	* Over 100000 N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2, B.C. FISHERY OFFICER H.J. Engelson YEAR 1959

NAME OF STREAM Bulkley R. above Houston FLOWING INTO Bulkley River
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Many times during the season

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

Table with columns for Sockeye, Springs, Coho, Pinks, Steelhead, Chums and rows for dates of duration, total number of grounds, size of run, sex ratio, etc.

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected nil
(B) Particulars of Scouring of Spawning Beds or Change in Course of Stream nil
(C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Normal

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed Springs spawned mostly below the Falls while the coho spawned vicinity of Portdale and
(B) Comments re Predators Lower Max on Creek. few Mergansers and bear near Falls
(C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

8. OBSTRUCTIONS

- (A) Passable or Impassable The water conditions allowed fish to go over Falls above Topley
(B) Nature of Obstruction The many old beaver dams were no hindrance to the salmon.
(C) Distance from Mouth of Stream
(D) Do you Recommend that the Obstruction be Removed? Will have to be watched low waters (if so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Many miles of good spawning ground not used - no salmon.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Numbers; Thus

Table with columns for approximate number ranges (1-50, 50-100, 100-300, 300-500, 500-1000, 1000-2000, 2000-5000, 5000-10000, 10000-20000, 20000-50000, 50000-100000, Over 100000) and corresponding letters (A-L, M, N).

Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2, B.C. FISHERY OFFICER L. J. Galley for W.K. Elliott YEAR 1968

NAME OF STREAM Bulkley River above Houta FLOWING INTO Main Bulkley River
Map Name Local Name

DATES ON WHICH STREAM INSPECTED Many times during season.

NOTE:

A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Coho	Pinks	Steelhead	Chums
1. Dates of duration) Start	<u>nil</u>	<u>Aug 17</u>	<u>Oct 20</u>	<u>nil</u>	<u>nil</u>	
of run) Peak			<u>Nov 10</u>			
) End		<u>Sept 10</u>	<u>Dec 15</u>			
2. Total number of grounds		<u>00(400)</u>	<u>P</u>			
3. Size of run - hvy. med. lt.		<u>LT</u>	<u>LT</u>			
4. Compare with total number for brood year using symbol		<u>E</u>	<u>G</u>			
5. Give sex ratio in) Male		<u>even</u>	<u>even</u>			
percentages) Female						
Jacks						

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected Some changes around log jams affected area very small
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream Nil
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given Very low but high in the late fall

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed spring few pair on riffles near Forestdale. Coho on riffles below Bulkley
- (B) Comments re Predators A few eagles Lake
- (C) Evidence of Digging up of Eggs by Later Spawning Fish Nil

8. OBSTRUCTIONS

- (A) Passable or Impassable Passable at normal water levels
- (B) Nature of Obstruction Some log jams and beaver dams form obstructions at low
- (C) Distance from Mouth of Stream Along stream. water levels.
- (D) Do you Recommend that the Obstruction be Removed? Yes
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

In a plane flight over area this fall it was noted that beaver were very numerous through out the length of stream it is hoped that some epidemic reduces numbers or price of pelts goes up as the beaver cuttings combined with log jams in the area has just about sealed it off from salmon migration.

10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus

1 - 50	A	300 - 500	D	2000 - 5000	G	20000 - 50000	L
50 - 100	B	500 - 1000	E	5000 - 10000	H	50000 - 100000	M
100 - 300	C	1000 - 2000	F	10000 - 20000	K	* Over 100000	N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

Box 578,
Smithers, B.C.
Aug. 11th. 1956.


The District Supervisor of Fisheries,
Box 218,
Prince Rupert, B.C.

Lamprey - For commercial purposes. Kind attention Insp. Strachan.

Lamprey are found at Moricetown Canyon at varying times of the year and in varying numbers. Usually the main run passes through the canyon in July and beginning of August. However there have been years in which Lamprey have been observed under the ice in the middle of the winter. I should not like to hazard a guess as to the numbers passing up stream as I have never attempted to make any sort of a count of them. The difficulties of fishing them commercially here would be the fact that it is on an Indian reserve and that I would doubt if permission could be received from the Indians to use those places most convenient to fish which are on the reserve. The Indians do fish them a certain amount for their own use.

There are several other main spawning grounds for Lamprey. There is a good run into the Upper Bulkley River and numbers are often seen at Bulkley Falls about half way between Topley and Forestdale. They could easily be taken here, except that it is sort of remote (35 mins walk.)

They are also found in varying amounts in almost all tributaries of the Bulkley but possibly the largest numbers ascend Lamprey Creek (flows into Morice River about 30 miles above Houston) They would however be quite difficult to capture.


W.K. Elliott,
Fishery Officer.

Copy for Mr Elliott for information.



OUR FILE NO.

YOUR FILE NO. 2-3

SSN.

DEPARTMENT OF FISHERIES

OFFICE OF District Biologist,
 Prince Rupert, B.C.
 July 18, 1957.

Mr. G. S. Reade,
 Supervisor of Fisheries,
 Department of Fisheries,
 Prince Rupert, B.C.

In reply to your letter of the 17th regarding lampreys and their effect on migrating adult salmon, I find there is not too much information on hand dealing with this topic. There are some known facts which may answer some of your queries.

As far as is known, lampreys are not believed to prey upon salmon while both are migrating upriver to their respective spawning grounds. The lamprey assumes its predatory nature while developing in the ocean, and when it enters the river en route to its spawning grounds, feeding ceases. The cases of lampreys recorded as being attached to salmon may appear to be an act of predation, but possibly it could be only a method of transportation. In this connection, it would be of interest to examine a salmon with a lamprey attached to determine the condition of the salmon, specially in the region where the lamprey attached itself to the side of the fish.

Another point to consider when mentioning the Great Lakes problem, is that these are two different types of lampreys and two different species.

I shall look further into this question for further information and advise if there is any additional data that may be of value.

John W. Stokes,
 District Biologist.

SALMON STREAM SPAWNING REPORT - PACIFIC AREA

DISTRICT NO. 2, B.C. FISHERY OFFICER W.K. Elliott YEAR 1957

NAME OF STREAM Bulkley River (above Houston) FLOWING INTO Bulkley River main stream.
Map Name Local Name

DATES ON WHICH STREAM INSPECTED many times during the season.

NOTE: A sketch of this stream is required on the back of this form, showing in addition to relevant data such as location of obstructions, general outline of topography along the stream, portions of stream bed where spawning occurs, etc., its location in relation to some known point. When such sketch has once been made available, it may be referred to in following reports.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	Sockeye	Springs	Cohoe	Pinks	Steelhead	Chums
1. Dates of duration) Start		Aug. 15	Nov. 3	None	None	
of run) Peak			12	observed	Observed	
) End		Sept. 15	30			
2. Total number of grounds		C	E			
3. Size of run - hvy. med. lt.		lt.	lt.			
4. Compare with total number for brood year using symbol		E	H			
5. Give sex ratio in) Male		45	40			
percentages) Female		45	46			
Jacks		10	14			

NOTE: Draw lines through names of salmon that do not frequent this stream.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) Evidence of Erosion and Silting - Give Extent or % Stream Bed Affected This stream changes course quite often, for various reasons.
- (B) Particulars of Scouring of Spawning Beds or Change in Course of Stream _____
- (C) Water Levels (Low, Normal, High, Abnormal). If Abnormal, details should be given High becoming very low and then back to normal.

7. BIOLOGICAL CONDITIONS

- (A) Particulars of Distribution of Spawning Salmon over the Streambed at top of riffles scattered over many miles of river.
- (B) Comments re Predators very few
- (C) Evidence of Digging up of Eggs by Later Spawning Fish nil

8. OBSTRUCTIONS

- (A) Passable or Impassable Passable at normal or high water.
- (B) Nature of Obstruction Log jams, many beaver dams, Falls between Topley & Forestdale.
- (C) Distance from Mouth of Stream _____
- (D) Do you Recommend that the Obstruction be Removed? Falls have been surveyed by C.N.R.
(If so, attach report stating your reasons and describe nature and extent of the spawning grounds above obstruction.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Spring inspection was very difficult because of high water, Coho entered River before the Beaver did too much dam building.

- 10. NOTE: Estimate Number of Parent Fish on Spawning Grounds and Indicate by Placing Letter in Column Provided to Show Approximate Number: Thus
 1 - 50 A 300 - 500 D 2000 - 5000 G 20000 - 50000 L
 50 - 100 B 500 - 1000 E 5000 - 10000 H 50000 - 100000 M
 100 - 300 C 1000 - 2000 F 10000 - 20000 K * Over 100000 N

* Where letter "N" used it is requested approximate number of parent fish on spawning grounds be shown.

Bulkley River.

Box 578,
Smithers, B.C.
July 16th. 1957.


The District Supervisor of Fisheries,
Prince Rupert, P.C.

Re. Pacific Lamprey.

Each Year there are numerous Pacific Lamprey ascending the Bulkley River system to spawn. They can be found hanging to the rocks in the Moricetown Canyon and on the rocks of Bulkley Falls situated between Topley and Forestdale.

As the lamprey in the Great Lakes are causing considerable attention, I feel that it would be a good idea to have some study made of these Lamprey. It is known they attach themselves to Salmon and Steelhead but in what numbers I do not know. Both Moricetown and the Bulkley Falls would be quite easy to place traps or control posts should it be deemed necessary.

Each year I have enquiries about these Lamprey and I should like to have some expert opinion about controlling them. Personally I have found about a dozen salmon with Lamprey attached. This does not show too much predation but it is sufficient for the public to begin asking questions.


W.K. Elliott
Fishery Officer.

District Supervisor,
Prince Rupert, B.C.,
July 17, 1957.

F. C. Withler
J. W. Stokes

Pacific Lampreys in Skeena River System

Attached please find copy of letter from Inspector Elliott on the above-mentioned subject.

Clemens and Willy state that these lamprey attack salmon and trout, and we have numerous examples of the dice marks left by the lamprey.

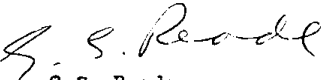
Presumably in these cases the fish survived the attack.

You will note Inspector Elliott has record of about a dozen salmon with lamprey actually attached.

The question seems to be; can a pacific lamprey kill a salmon, and if so, is the mortality rate great?

If Inspector Elliott can find lamprey feeding on salmon it would be interesting to trap the lamprey and the salmon to see if the lamprey attack is fatal or not.

Please advise.


G.S. Roade,
DISTRICT SUPERVISOR OF FISHERIES.

Encl.

✓ c.c. W.K. Elliott

B.C.16

SALMON STREAM SPAWNING REPORT

49

DISTRICT NO. 2, B.C. FISHERY OFFICER W.K. Elliott YEAR 1956.

NAME OF STREAM BULKLEY RIVER (Above Houston) FLOWING INTO Bulkley River main stream.
MAP NAME LOCAL NAME

DATES ON WHICH STREAM INSPECTED Many times during the season.

NOTE:

A SKETCH OF THIS STREAM IS REQUIRED ON THE BACK OF THIS FORM, SHOWING IN ADDITION TO RELEVANT DATA SUCH AS LOCATION OF OBSTRUCTIONS, GENERAL OUTLINE OF TOPOGRAPHY ALONG THE STREAM, PORTIONS OF STREAM BED WHERE SPAWNING OCCURS, ETC., ITS LOCATION IN RELATION TO SOME KNOWN POINT. WHEN SUCH SKETCH HAS ONCE BEEN MADE AVAILABLE, IT MAY BE REFERRED TO IN FOLLOWING REPORTS.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	SOCKEYE	SPRINGS	COHOE	PINKS	STEELHEAD	CHUMS
1. DATES OF DURATION) START		<u>Aug. 20</u>	<u>Oct 10</u>	<u>None</u>	<u>None</u>	
OF RUN) PEAK				<u>Observed</u>	<u>Observed.</u>	
) END		<u>Sept. 20</u>	<u>Nov. 30</u>			
2. TOTAL NUMBER OF GROUNDS		<u>F.</u>	<u>H</u>			
3. SIZE OF RUN:HY.MED.LT.		<u>Med</u>	<u>Lt.</u>			
4. COMPARE WITH TOTAL NUMBER FOR BROOD YEAR USING SYMBOL		<u>B</u>	<u>H</u>			
5. GIVE SEX RATIO IN) MALE		<u>45</u>	<u>40</u>			
PERCENTAGES) FEMALE		<u>45</u>	<u>46</u>			
) JACKS		<u>10</u>	<u>14</u>			

NOTE: DRAW LINES THROUGH NAMES OF SALMON THAT DO NOT FREQUENT THIS STREAM.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) EVIDENCE OF EROSION AND SILTING - GIVE EXTENT OR % STREAM BED AFFECTED. nil
- (B) PARTICULARS OF SCOURING OF SPAWNING BEDS OR CHANGE IN COURSE OF STREAM. This stream changes course, when a log jam makes the water cut a new channel.
- (C) WATER LEVELS (LOW, NORMAL, HIGH, ABNORMAL). IF ABNORMAL, DETAILS SHOULD BE GIVEN. Low becoming normal at end of season.

7. BIOLOGICAL CONDITIONS

- (A) PARTICULARS OF DISTRIBUTION OF SPAWNING SALMON OVER THE STREAMBED. at the top of riffles scattered over many miles.
- (B) COMMENTS RE PREDATORS. very few
- (C) EVIDENCE OF DIGGING UP OF EGGS BY LATER SPAWNING FISH.

8. OBSTRUCTIONS

- (A) PASSABLE OR IMPASSABLE. passable at high water levels.
- (B) NATURE OF OBSTRUCTION. Log jams, and many beaver dams. Falls between Topley & Forestdale
- (C) DISTANCE FROM MOUTH OF STREAM.
- (D) DO YOU RECOMMEND THAT THE OBSTRUCTION BE REMOVED? Falls have been surveyed by C.N.R.
(IF SO, ATTACH REPORT STATING YOUR REASONS AND DESCRIBE NATURE AND EXTENT OF THE SPAWNING GROUNDS ABOVE OBSTRUCTION.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

Springs were able to ascend to the Maxan lake area with comparative ease. Coho were definitely held back by Beaver Dams, with the result that very few Coho were observed from a point about 2 miles below the falls to the upper reaches, Beaver dams had just held them back. There was sufficient spawning grounds available for the salmon without crowding.

10. NOTE: ESTIMATE NUMBER OF PARENT FISH ON SPAWNING GROUNDS AND INDICATE BY PLACING LETTER IN COLUMN PROVIDED TO SHOW APPROXIMATE NUMBER: THIS

1-50	A	300-500	D	2000-5000	G	20000-50000	L
50-100	B	500-1000	E	5000-10000	H	50000-100000	M
100-300	C	1000-2000	F	10000-20000	K	OVER 100000	N

B.C.15

SALMON STREAM SPAWNING REPORT

40

DISTRICT NO. 2, B.C. FISHERY OFFICER W.K. Elliott YEAR 1955

NAME OF STREAM BULKLEY RIVER (Above Houston) FLOWING INTO Bulkley River Main stream.
MAP NAME LOCAL NAME

DATES ON WHICH STREAM INSPECTED many times during season.

NOTE:

A SKETCH OF THIS STREAM IS REQUIRED ON THE BACK OF THIS FORM, SHOWING IN ADDITION TO RELEVANT DATA SUCH AS LOCATION OF OBSTRUCTIONS, GENERAL OUTLINE OF TOPOGRAPHY ALONG THE STREAM, PORTIONS OF STREAM BED WHERE SPAWNING OCCURS, ETC., ITS LOCATION IN RELATION TO SOME KNOWN POINT. WHEN SUCH SKETCH HAS ONCE BEEN MADE AVAILABLE, IT MAY BE REFERRED TO IN FOLLOWING REPORTS.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	SOCKEYE	SPRINGS	COHOE	PINKS	STEEL-HEAD	CHUMS
1. DATES OF DURATION) START OF RUN		<u>Aug.22</u>	<u>Oct.6.</u>	<u>None</u>	<u>none</u>	
) PEAK			<u>Oct 26</u>	<u>observed</u>	<u>observed.</u>	
) END			<u>Nov.30</u>			
2. TOTAL NUMBER OF GROUNDS		<u>E.(900)</u>	<u>G.(8,000)</u>			
3. SIZE OF RUN(HVY.MED.LT.)		<u>Med.</u>	<u>Lt.</u>			
4. COMPARE WITH TOTAL NUMBER FOR BROOD YEAR USING SYMBOL		<u>E.</u>	<u>G</u>			
5. GIVE SEX RATIO IN) MALE PERCENTAGES		<u>50</u>				
) FEMALE		<u>50</u>				
) JACKS						

NOTE: DRAW LINES THROUGH NAMES OF SALMON THAT DO NOT FREQUENT THIS STREAM.

6. PHYSICAL CONDITION OF SPAWNING GROUNDS

- (A) EVIDENCE OF EROSION AND SILTING - GIVE EXTENT OR % STREAM BED AFFECTED. nil
- (B) PARTICULARS OF SCOURING OF SPAWNING BEDS OR CHANGE IN COURSE OF STREAM nil
- (C) WATER LEVELS (LOW, NORMAL, HIGH, ABNORMAL). IF ABNORMAL, DETAILS SHOULD BE GIVEN Normal becoming low at end of coho spawning.

7. BIOLOGICAL CONDITIONS

- (A) PARTICULARS OF DISTRIBUTION OF SPAWNING SALMON OVER THE STREAMBED at the top of riffles scattered over many miles.
- (B) COMMENTS RE PREDATORS very few
- (C) EVIDENCE OF DIGGING UP OF EGGS BY LATER SPAWNING FISH

8. OBSTRUCTIONS

- (A) PASSABLE OR IMPASSABLE passable.
- (B) NATURE OF OBSTRUCTION Beaver dams, Log jams, Bulkley falls.
- (C) DISTANCE FROM MOUTH OF STREAM Log jams all the way, beaver dams steadily increasing all the way, falls between Topley and Forestdale.
- (D) DO YOU RECOMMEND THAT THE OBSTRUCTION BE REMOVED? falls have been surveyed by C.N.R. (IF SO, ATTACH REPORT STATING YOUR REASONS AND DESCRIBE NATURE AND EXTENT OF THE SPAWNING GROUNDS ABOVE OBSTRUCTION.) for possible removal.

- 9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM Beaver are becoming a detriment to ascent of salmon in this stream. Several dams were removed this year but were rebuilt soon after.

10. NOTE: ESTIMATE NUMBER OF PARENT FISH ON SPAWNING GROUNDS AND INDICATE BY PLACING LETTER IN COLUMN PROVIDED TO SHOW APPROXIMATE NUMBER: THIS

1-50	A	300-500	D	2000-5000	G	20000-50000	L
50-100	B	500-1000	E	5000-10000	H	50000-100000	M
100-300	C	1000-2000	F	10000-20000	K	OVER 100000	N

B.C. 16

SALMON STREAM SPAWNING REPORT

41

DISTRICT NO. 2, B.C. FISHERY OFFICER W.K. Elliott YEAR 1964

NAME OF STREAM BULKLEY RIVER above Houston FLOWING INTO Bulkley River.
MAP NAME LOCAL NAME

DATE(S) WHEN STREAM INSPECTED many times during the season.

NOTE:

A SKETCH OF THIS STREAM IS REQUIRED ON THE BACK OF THIS FORM, SHOWING IN ADDITION TO RELEVANT DATA SUCH AS LOCATION OF OBSTRUCTIONS, GENERAL OUTLINE OF TOPOGRAPHY ALONG THE STREAM, PORTIONS OF STREAM BED WHERE SPAWNING OCCURS, ETC., ITS LOCATION IN RELATION TO SOME KNOWN POINT. WHEN SUCH SKETCH HAS ONCE BEEN MADE AVAILABLE, IT MAY BE REFERRED TO IN FOLLOWING REPORTS.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	SCOTCHE	SPRINGS	CORRE	PINKS	STEELHEAD	CHIN
1. DATES OF (SEASON) START OF RUN			Oct 10	None	None	
) PEAK		Aug 20	Nov. 1	observed	observed.	
) END			Nov. 10			
2. TOTAL NUMBER OF GROUNDS		F.	R			
3. SIZE OF RUN-IMPAIRED, LT.		Med	Med			
4. COMPARE WITH TOTAL NUMBER FOR DRYED YEAR USING SYMBOL		R	O			
5. GIVE SEX RATIO IN: (MALE PERCENTAGES)		even.	even.			
) FEMALE						
) JACKS						

NOTE: DRAW LINES THROUGH NAMES OF SALMON THAT DO NOT FREQUENT THIS STREAM

6. PHYSICAL CONDITIONS OF SPAWNING GROUNDS

- (A) EVIDENCE OF EROSION AND SILTING - GIVE EXTENT OR % STREAM BEDS AFFECTED nil
- (B) PARTICULARS OF SCOURING OF SPAWNING BEDS OR CHANGE IN COURSE OF STREAM nil
- (C) WATER LEVELS (LOW, NORMAL, HIGH, ABNORMAL). IF ABNORMAL, DETAILS SHOULD BE GIVEN Very high and dirty all summer.

7. ECOLOGICAL CONDITIONS

- (A) PARTICULARS OF DISTRIBUTION OF SPAWNING SALMON OVER THE STREAMS at the top of riffles scattered over many miles.
- (B) COMMENTS RE PREDATORS very few
- (C) EVIDENCE OF DIGGING UP OF EGGS BY LATER SPAWNING FISH

8. OBSTRUCTIONS

- (A) PASSABLE OR IMPASSABLE Pass able.
- (B) NATURE OF OBSTRUCTION Log jams and Bulkley Falls. Beaver dams.
- (C) DISTANCE FROM MOUTH OF STREAM Log jams all the way; Falls between Topley & Forestdale.
- (D) DO YOU RECOMMEND THAT THE OBSTRUCTION BE REMOVED? Falls have been surveyed by C.N.R. for possible removal.
(IF SO, ATTACH REPORT STATING YOUR REASONS AND DESCRIBE NATURE AND EXTENT OF THE SPAWNING GROUNDS ABOVE OBSTRUCTION.)

- 9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM Spring salmon moved up through the Bulkley River into Maxan Cr. It is not usual for such a number to go so far. Extremely high water changed many of the spawning areas.

10. NOTE: ESTIMATE NUMBER OF PARENT FISH ON SPAWNING GROUNDS AND INDICATE BY PLACING LETTER IN COLUMN PROVIDED TO SHOW APPROXIMATE NUMBER: THIS

1-50	A	300-500	D	2000-5000	G	20000-50000	L
50-100	B	500-1000	E	5000-10000	H	50000-100000	I
100-300	C	1000-2000	F	10000-20000	J	OVER 100000	K



CANADA

DEPARTMENT OF FISHERIES

OUR FILE No.

YOUR FILE No.

OFFICE OF

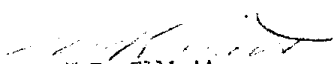
Box 578,
Smithers, B.C.
December 15th, 1954.The District Supervisor of Fisheries,
Prince Rupert, B.C.

UPPER BULKLEY RIVER.

Water conditions in this stream have been very high all season, Log jams have not caused any hold up of salmon as far as can be ascertained. The water over Bulkley Falls has been of such a level that salmon have surmounted it without trouble.

The Canadian National Railways have done some survey work by the falls but as yet have not been informed of results or what their intentions are concerning its removal.

A further inspection of this stream is proposed for this winter when it can be inspected by snow shoe.


W.E. Elliott
Fishery Officer.

4D

B.C. 16

SALMON STREAM SPAWNING REPORT

DISTRICT NO. 21 B.C. FISHERY OFFICER W.E. Elliott YEAR 1953

NAME OF STREAM BULKLEY RIVER above Houston. FLOWING INTO Bulkley River.
MAP NAME LOCAL NAME

DATE(S) ON WHICH STREAM INSPECTED many times during the season.

NOTE:

A SKETCH OF THIS STREAM IS REQUIRED ON THE BACK OF THIS FORM, SHOWING IN ADDITION TO RELEVANT DATA SUCH AS LOCATION OF OBSTRUCTIONS, GENERAL OUTLINE OF TOPOGRAPHY ALONG THE STREAM, PORTIONS OF STREAM BED WHERE SPAWNING OCCURS, ETC., ITS LOCATION IN RELATION TO SOME KNOWN POINTS. WHEN SUCH SKETCH HAS ONCE BEEN MADE AVAILABLE, IT MAY BE REFERRED TO IN FOLLOWING REPORTS.

PARTICULARS OF SPAWNING AND SPAWNING CONDITIONS

	SOCKEYE	SPRINGS	COHO	PINKS	ATHEMALS	CHUMS
1. DATED (OR DURATION) START OF RUN		<u>Aug. 5.</u>	<u>Oct 8.</u>			
) PEAK		<u>Aug. 15</u>	<u>" 20</u>			
) END		<u>Sept. 15</u>	<u>Nov.</u>			
2. TOTAL NUMBER OF GROUNDS		<u>8. (800)</u>	<u>H. (5000)</u>	<u>B. (1000)</u>		
3. SIZE OF RUN-RIVY, MED. LT.		<u>Med.</u>	<u>med.</u>	<u>lt.</u>		
4. COMPARE WITH TOTAL NUMBER FOR ENTIRE YEAR USING SYMBOL		<u>B.</u>	<u>F.</u>	<u>nil</u>		
5. GIVE SEX RATIO IN: MALE PERCENTAGES		<u>68%</u>	<u>63%</u>			
) FEMALE		<u>45%</u>	<u>40%</u>			
) JACKS		<u>2%</u>	<u>1%</u>			

NOTE: DRAW LINES THROUGH NAMES OF SALMON THAT DO NOT FREQUENT THIS STREAM.

6. PHYSICAL CONDITIONS OF SPAWNING GROUNDS

- (A) EVIDENCE OF EROSION AND SILTING - GIVE EXTENT OR % STREAM BED AFFECTED. nil
- (B) PARTICULARS OF SCOURING OF SPAWNING BEDS OR CHANGE IN COURSE OF STREAM. nil
- (C) WATER LEVELS (LOW, NORMAL, HIGH, ABNORMAL). IF ABNORMAL, DETAILS SHOULD BE GIVEN. Normal.

7. BIOLOGICAL CONDITIONS

- (A) PARTICULARS OF DISTRIBUTION OF SPAWNING SALMON OVER THE STREAM BED. At the top of almost every riffle scattered over many miles of stream bed.
- (B) COMMENTS RE PREDATORS. very few.
- (C) EVIDENCE OF DIGGING UP OF EGGS BY LATER SPAWNING FISH. nil

8. OBSTRUCTIONS

- (A) PASSABLE OR IMPASSABLE. Fairly passable because of normal to high water.
- (B) NATURE OF OBSTRUCTION. Log jams and Bulkley Falls.
- (C) DISTANCE FROM MOUTH OF STREAM. Log jams all the way; Falls between Topley and Forestdale.
- (D) DO YOU RECOMMEND THAT THE OBSTRUCTION BE REMOVED? Falls could be improved easily.
(IF SO, ATTACH REPORT STATING YOUR REASONS AND DESCRIBE NATURE AND EXTENT OF THE SPAWNING GROUNDS ABOVE OBSTRUCTION.)

9. COMMENTS ON ANY OTHER CONDITIONS AFFECTING THIS STREAM

The Upper Bulkley improved slightly with Springs and Coho. Pinks were very poor. Water conditions were mostly high with many freshets which made visibility very poor. Salmon seemed to be able to surmount the falls this year with only minor difficulty.

10. NOTE: ESTIMATE NUMBER OF PARENT FISH ON SPAWNING GROUNDS AND INDICATE BY PLACING LETTER IN COLUMN PROVIDED TO SHOW APPROXIMATE NUMBER: THIS

1-50	A	300-500	D	2000-5000	G	20 00-50000	L
50-100	B	500-1000	E	5000-10000	H	50 00-100000	M
100-300	C	1000-2000	F	10000-20000	K	100 00-200 000	N

Smithers, B.C.
October 22nd, 1949

G.S. Reade, Esq.,
Regional Supervisor of Fisheries,
Prince Rupert, B.C.

The Following is the completion of the report of the conditions of log jams etc. on the Bulkley River.

On October 1st. Inspector Galley and I started out to carefully inspect the balance of the Bulkley River and this time we decided to walk because of the low water in the Bulkley River. It took us two days to inspect this river which is about 30 to 40 miles by river and only 25 miles by road.

The following is the final summary of the number, type & size of the log jams etc. for total river. Bulkley River to Junction of Morice and Bulkley Rivers.

1.	Group of logs across river	17
2.	Small jam	13
3.	Medium Jam	4
4.	Large Jam	9
5.	Almost Impossible	2
6.	Considered Impossible	1
7.	Beaver Dams	6
8.	Falls	<u>1</u>
Total of		53 obstructions

This river is a difficult question and would like to list a few of the points for your information and guidance.

1. It is not ~~navigatable~~ navigable
2. To clear this stream as has been done by stream clearers in the Babine Lake area would cost a tremendous amount.
3. I have shown 53 obstructions which are scattered over approx. 60 miles of stream which is not entirely accessible. Transport would be very difficult.
4. The actual removal of these jams would be very difficult as well because of the nature of the country.
5. This year the Coho are getting by all these obstructions and are spawning in Maxan Creek.
6. Should the Moricetown Fishway be put in then the Pink Salmon should come up. This stream is a likely place for them to spawn but would be unable to get very far up it because of their inability to get over difficult obstructions.
7. The falls, between Topley and Forestdale seems to be the about the worst place for them to get over and I should like to see some work done to make this easier for them.
8. Should the Aluminum Co. decide to take all the water out of the Hanika River then it might be necessary that Sockeye use the Bulkley River, this is only theory on my part but should be considered. As yet I have not seen any sockeye in this stream.

I should not like to make a recommendation for this work without an engineer going over the whole stream together with a Biologist to make an estimate of the cost and if this stream would take enough more salmon to warrant this expense.

W.K. Elliott
W.K. Elliott
Fisheries Inspector.



CANADA

DEPARTMENT OF FISHERIES
OFFICE OF THE SUPERVISOR OF FISHERIES

File: 27-10

AT Prince Rupert, B. C.
August 29th, 1949.

19

W. K. Elliott,
Fisheries Inspector,
Smithers, B. C.

Please reference your report on condition of Bulkley River from Bulkley Lake to Topley.

When this inspection is completed please make specific recommendations for stream clearance so that the work can be planned for next year if it is not possible for the Fish Culture Development Branch to do it this year.

It would seem a job for a stream clearing crew and since these crews are now under the Fish Culture Development Branch the work should be under their direction and you should assume no responsibility in this respect.

It is considered that your responsibility is to locate points where work is needed, make recommendations through this office for stream clearance, and report to this office on completion of the work, whether or not it is considered satisfactory.

It will be appreciated that now this Branch has been established with qualified engineers in charge that they must assume responsibility for the funds expended.

G. S. Roade,
A/Supervisor of Fisheries.

Smithers, B.C.
Aug. 15th. 1949.

G.C. Boudo, Esq.,
Regional Supervisor of Fisheries,
Prince Rupert, B.C.

The following is a short report of the conditions of log jams in the Bulkley River from Bulkley Lake to Topley, a distance along the C.N.R. Railway of about 11 miles, or about double that distance by river.

On July 14th. Inspector Gelliey and myself started out for Bulkley Lake to examine this stream. By the time we were ready to start it was almost 4 P.M. However we started out and continued until unable to see and camped for the night. Mosquitoes terrific.

July 15th. Rain woke us up and we were on the river before 5 A.M. and continued on until about noon when we both were soaking wet and cold and hungry and decided to walk the 2 miles into Topley and have lunch. I found there a telegram asking me to be at Lytton on the 17th. which was impossible so I had to discontinue the examination and Inspector Gelliey brought the canoe around while I went back to Bulkley Lake for the truck. We both continued through to Smithers to arrange for our trip to the Lower Fraser to study dip net methods.

The following is a summary of the number type and size of log jams etc. found on this part of the Bulkley River.

1 Group of Logs across stream	10
2 Small Jam	9
3 Med. Jam	4
4 Large Jam	6
5 Almost impossible	2
6 Considered impossible	1
7 Beaver dams	5
8 Falls	1.
	<hr/>
Total of	58 obstructions.

Until date ~~xxxx~~ I have been unable to find sufficient time to continue this examination. And now have not got a canoe or other boat suitable to make this trip.

Engineer Lyson suggests that should the stream clearers at Babine Lake run out of work that I should put them to work on this stream.

W.K. Elliott
W.K. Elliott,
Fisheries Inspector.

REPORT ON THE OBSTRUCTION AT MORICETOWN FALLS

REPORT ON THE OBSTRUCTION AT MORICETOWN FALLSA Review of Conditions

From the preliminary studies of Moricetown Falls already made, both biological and engineering, it is now possible to make a rational approach to the problem of designing remedial measures and making a preliminary estimate of the cost of such measures.

It will be necessary first to review the biological data on hand so that a logical chain of reasoning will follow.

Dr. Milne states quite clearly in his report* that the migration of fish upstream through Moricetown Falls is delayed and in some cases completely blocked at certain water levels. He further states that lower water levels aggravate this condition, and more specifically he defines the danger point as "the critical low observed after August 20 in 1945."

As will be seen later, it is a fair assumption that all upstream migrants could be affected by comparable water levels, as such water levels have occurred in previous years at various intervals throughout the migration time of the sockeye, springs, coho, pinks and steelhead. It will be necessary, therefore, to design fishway facilities to pass, if necessary, the entire run, numbering, according to Milne, 124,000 sockeye and coho alone in 1946, plus an unknown quantity of springs, pinks, and steelhead.

* "Major Obstruction - Moricetown Falls" - Appendix IV. Skeena
River Report. By D.J. Milne

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Dr. Milne further states that the sockeye and spring runs commence about the beginning of July, continuing till after mid-August, at which time the coho, pink, and steelhead runs commence, continuing till approximately the end of September. At the periods of their peak intensity the sockeye runs reached as high as 8 per minute, or on a daily basis as many as 4,000 passing through in a ten hour day.

Suggested Remedial Measures

From the foregoing it will be seen that fishways at Moricetown must satisfy the following requirements:

- (1) They must pass fish successfully for all levels at or below the danger point occurring on August 20, 1945, and during the time the fish are migrating.
- (2) They must be sufficiently large to accommodate the peak of the run or approximately 8 fish per minute.
- (3) They must preferably be fishways that do not require the fish to jump between pools, as the pink salmon are notoriously poor jumpers.

In order to meet the requirements of (1) above, it is necessary to try and determine what water levels are likely to occur in a long period of years, and at what periods of time these levels are dangerous.

To do this, gauge readings at Moricetown Falls were related first to the new gauge at Smithers, and secondly to the

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old gauge at Hazelton, for which records exist over the period 1927 to 1942. Fortunately, simultaneous gauge readings at the Falls and at Smithers were taken in 1945, 1946, and 1947 by the Research Board Biologists and the Dominion Water & Power Bureau respectively. A good correlation is then obtainable between these two points, and with minor corrections between these two and Hazelton. (See attached graph, Fig. No. 1)

From these it is possible to say that the discharge of the Bulkley at the critical level on August 20, 1945, was approximately 4400 c.f.s. at Smithers, with limits of accuracy probably not exceeding ± 500 c.f.s. On the same day the discharge at Moricetown would have been 5000 c.f.s. approximately, and 6100 c.f.s. approximately at Hazelton. The latter, with similar limits of accuracy as at Smithers, is shown as the red band on the attached composite of discharges of the Bulkley at Hazelton. (Fig. No. 2). The lines falling within this area and the shaded green area beneath, represent years in which the water levels dropped dangerously low over the period 1927 to 1942.

It will be noted that in at least two years (1938 and 1941) the water was at block levels during the peak of the sockeye run early in August, and in more than half the years it was at block levels during the peak of the coho, pink and steelhead runs.

The fishways to be built, must, therefore, pass fish over the range of water levels indicated by the shaded portion on the composite hydrographs. A vertical slotted baffle or Denil

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type fishway eight feet in height would be required to provide a fishway that would automatically conform to this specification, and the slotted baffle type is the only one for which a practical, economical design exists at present. Fishways with 10 to 12 baffles each would be necessary to overcome the total drop of 10 to 12 feet through the canyon.

To meet the requirements under (2) above, a fishway on each bank, with pools six feet wide and ten feet long could pass approximately 5 fish per minute each without delay, or a total of 10 fish per minute. To meet this specified pool size, the fishways would have to be at least 150 ft. long, which would include entrance and exit channels.

In order to satisfy the requirements under (3) above, a vertical slotted fishway would be ideal. The pink salmon, and any others which preferred to, could swim through the fishway at any desired depth, with no necessity to surface at any time.

It becomes obvious then, that a fishway with vertical slotted baffles is the only practical fishway which satisfies all requirements, and it is recommended that this type of fishway, with the general dimensions stated above, be constructed at Moricetown Falls.

A sketch of the type of baffle and wall construction recommended is attached. (Fig. No. 3). The design is based on baffle dimensions tested in the Hydraulics Lab. of the University of B.C. by Professor E.S. Pretious, and in the field in the Farwell Canyon Fishways on the Chilcotin River. The baffle

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details are similar to those planned by the International Pacific Salmon Fisheries Commission for use in the Hell's Gate low-level fishway, and were so designed as to permit ease and economy of construction under arduous winter conditions.

Cost of Construction

Further reference to the composite hydrograph of the Bulkley will reveal the fact that the fishways will run dry at a discharge of approximately 2000 c.f.s. This limits the time of excavation of the lower parts of the fishway and the construction of the wall and baffle footings to the period January to April. This unfortunately corresponds to the period of cold weather in the area, and difficulties of working in sub zero weather will add considerably to the cost of the structures.

It is also emphasized that it is not at all certain that the water will be low enough during this period to allow the footings to be excavated and concrete poured, so that a small coffer dam might be required to ensure that this can be done. This again would add to the risk and cost of the project.

However, construction can be started early in the fall, and progress timed so that only the essential work on the low parts of the structures will have to be done during the cold weather. Then as the weather becomes milder work can be speeded up so that the structures can be completed by the time the freshet covers them.

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A summary of the approximate unit quantities involved in the structures follows; with approximate cost for each.

1.	Solid Rock Excavation:		
	1000 cu. yds. @ \$15.00		\$15,000.
2.	Forms:		
	7200 sq. ft. @ \$1.50		10,800.
3.	Concrete:		
	200 cu. yds. @ \$60.00		12,000.
4.	Aggregate:		
	400 cu. yds. @ \$5.00		2,000.
5.	Reinforcing Steel:		
	12,000 lbs. @ .20		2,400.
6.	Structural Steel:		
	46,400 lbs. @ .25		11,600.
7.	Access Roads - Preparing Site:		
	Lump Sum		5,000.
8.	Camp & Plant Costs:		
	Lump Sum		12,500.
9.	First Years Operating & Maintenance:		2,500.
10.	Contingencies (coffer dams, etc.)		<u>6,200.</u>
	Total		<u>\$80,000.</u>

It should be noted first that all unit prices such as steel and concrete are "in place" and include labor and operating costs.

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Secondly, if construction is started in the fall of any year, it will not be completed by the end of the fiscal year, so that the total should be broken into two parts, approximately \$60,000. being needed the first year and \$20,000. the following year.

Justification of Expenditure

In order to justify the expenditure of \$80,000. on fishways at Moricetown Falls, it must be demonstrated that the benefits derived would more than offset this outlay.

From the hydrographs it was shown that approximately one half of the sockeye run could be blocked twice in 14 years. Based on a four year cycle, this means that at least every second cycle could be depleted by almost one half. It could be safely assumed then that if any one cycle was affected thus it could not rebuild itself completely before a second period of depletion. This effect could be cumulative to the point where a complete cycle could be virtually wiped out. However, assuming for the moment that only one cycle is depleted by half, this could mean a loss of 20 - 40,000 fish every four years or an average of 5 - 10,000 per year. Being conservative, an annual loss of 5,000 fish would mean a loss to the industry of 416 cases having a value of \$8320. at \$20.00 per case. Capitalizing this figure at 3% would mean a capital loss of \$277,000. Thus the fishways could easily be justified on the basis of

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protection of sockeye alone, without taking into account the other species at all. The other species, however, arriving at the falls at what is almost invariably a lower water stage, can be assumed to be more seriously affected than the sockeye, and therefore, there seems to be no valid reason left for doubt as to justification of the forementioned expenditures.

It is therefore recommended that the money to construct these fishways as described be appropriated and construction commenced in the early fall of 1950.

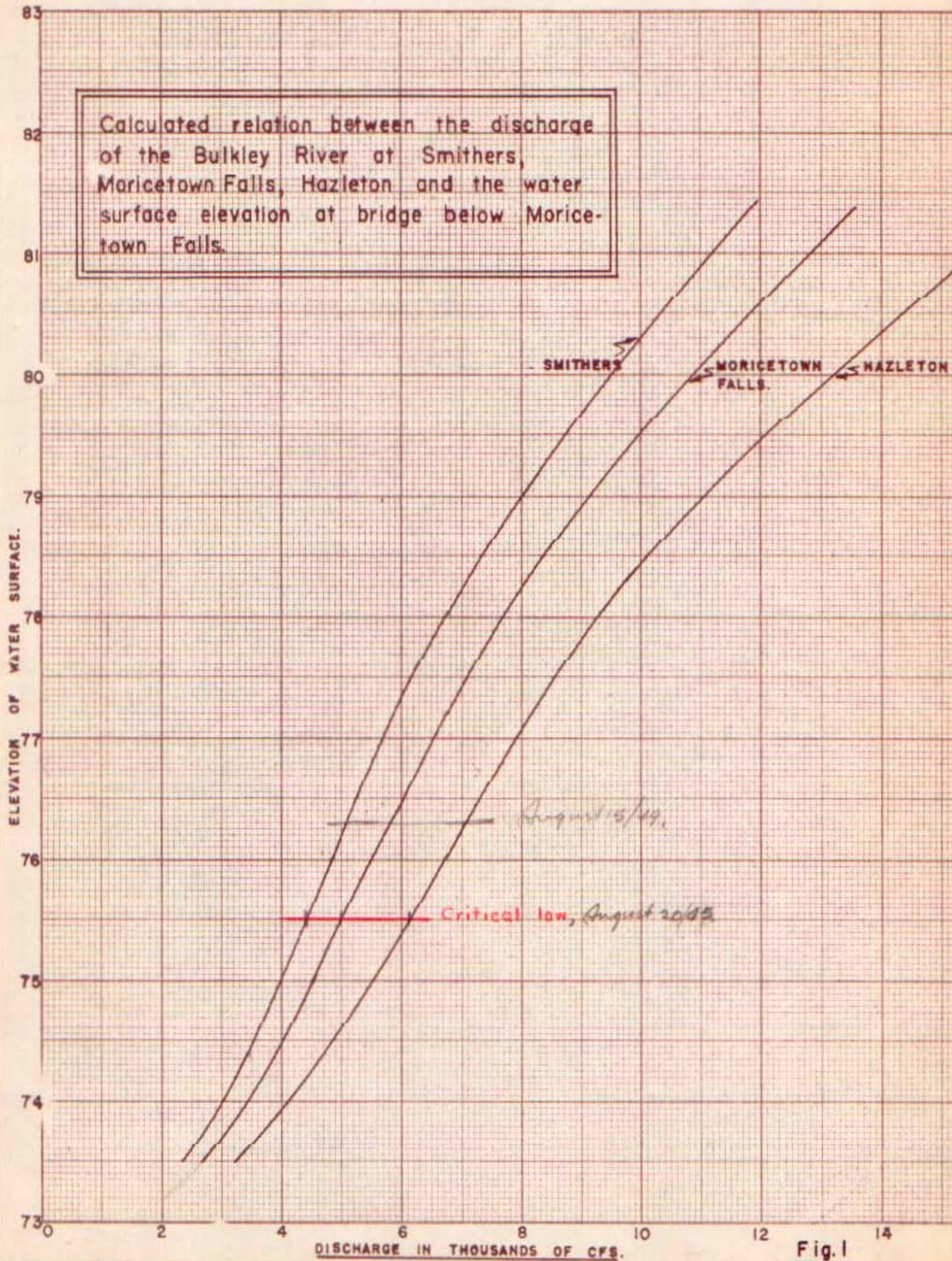
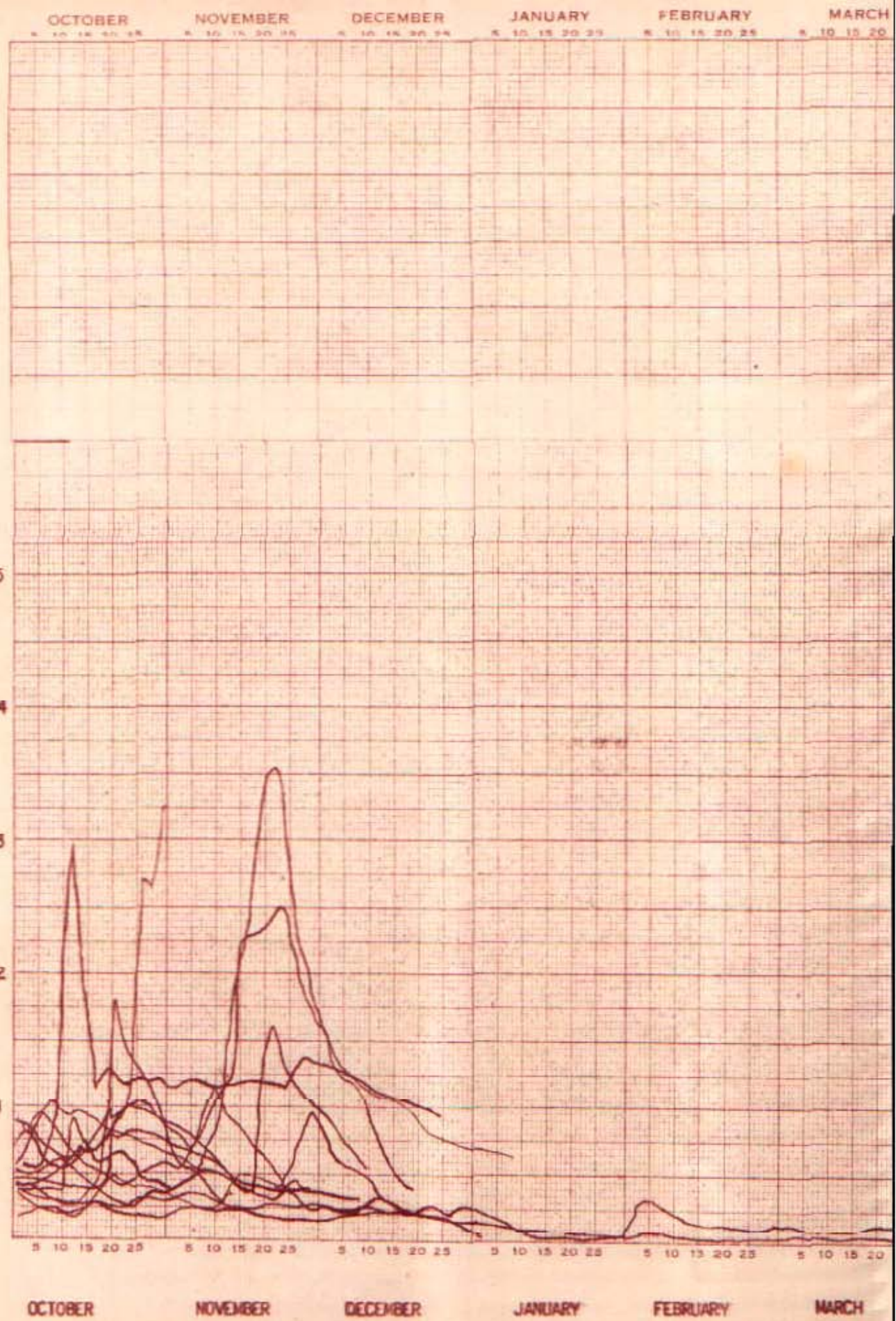


Fig. 1

DISCHARGE IN 10,000 C.F.S.



KEWELL & EMMETT U.S. No. 3, 360-1448
This Year by date. Any other Year
for this date apply to
MADE IN U.S.A.

OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH

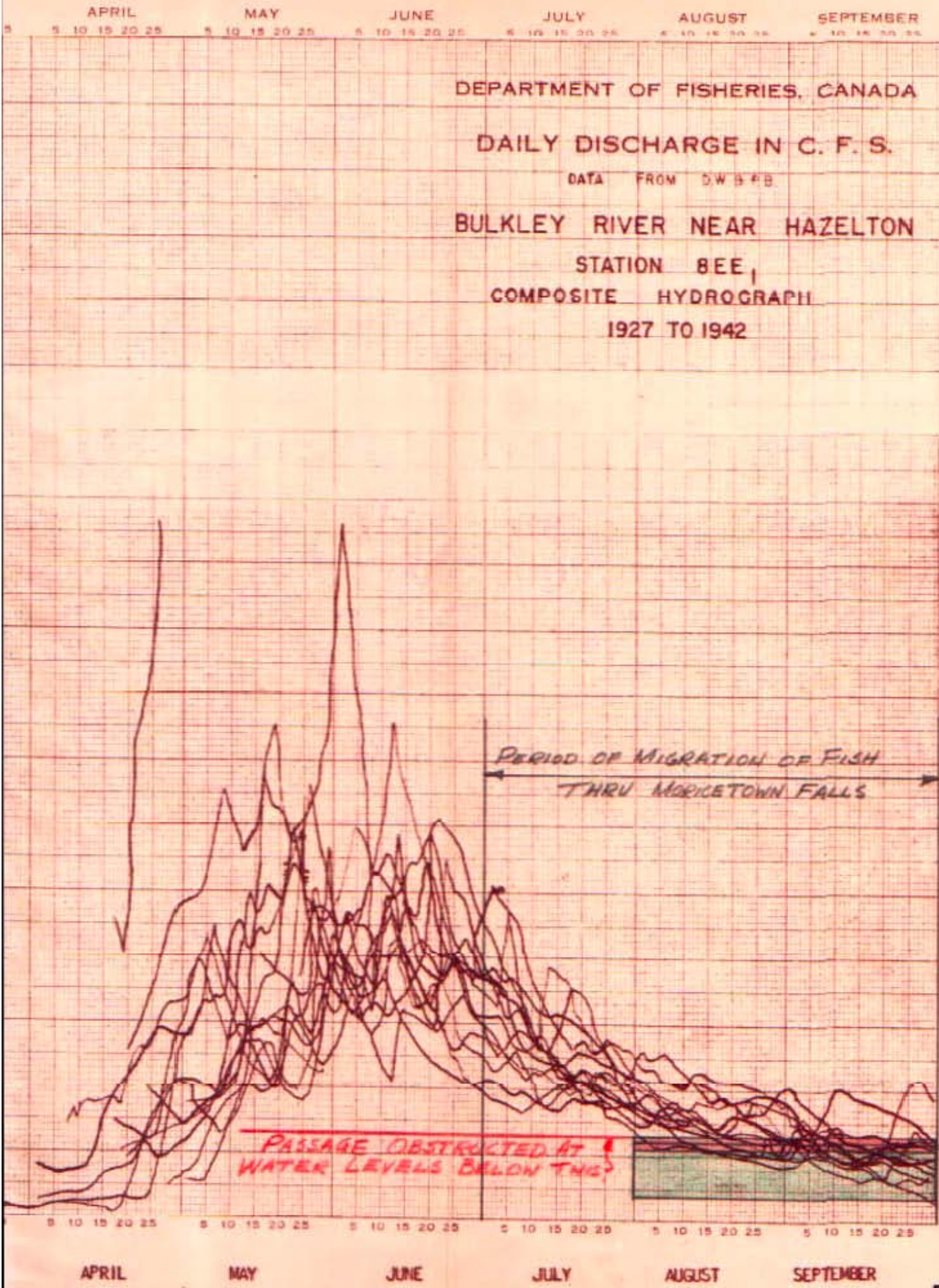


Fig. 2