1986 KOOTENAY LAKE SOUTH ARM **STREAM** INVENTORY



sponsored by

CRESTON VALLEY ROD AND GUN CLUB

for



Province of British Columbia Ministry of Environment Fish and Wildlife Branch

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- Sheila Carpenter
- Gay Downing
- Kathy Frei
- Bob Hallam

for their data collection, and a special thanks to Sheila darpenter and Kathy Frei for their assistance in compiling the data.

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Project Manager

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AND



Emploi et Immigration Canada

CONTENTS

PAGE
ACKNOWLEDGEMENTS i
INTRODUCTION
- Background and Purpose iv
- Study Area v
- Methodology vii
- Presentation of Data ix
TRIBUTARIES SURVEYED
- Akokli Creek 1
- Boulder Creek 5
- Boundary Creek 14
- Corn Creek 19
- Cultus Creek 24
- Duck Creek 28
- Goat River 32
- Goat River Channel 37
- Goat River North Braid 40
- Goat River South Braid 42
- Gray Creek 44
- Indian Creek 48
- LaFrance Creek 51
- Lockhart Creek 55
- Mawson Lake 59
- Midge Creek 61
- Midgely Creek 65
- Newington Creek 69
- Next Creek 73
- Rykerts Creek 77
- Sanca Creek 81
- Shaw Creek 85
- Summit Creek 89
- Wilson Creek 94
KOKANEE INFORMATION 99
PECOMMENDATIONS AND CONCLUSIONS 114

INTRODUCTION

PURPOSE

This report and inventory was compiled to provide the Ministry of Environment Fisheries Staff with a base-line of information on available spawning and rearing habitat within streams tributary to the South Arm of Kootenay Lake.

BACKGROUND

Regional Fisheries Biologist, Harvey Andrusak identified the need for a base-line of information during the April 1985 Fisheries Management and Regulations Seminar held in Castlegar, B.C. Following this seminar, the Creston Valley Rod and Gun Club's Fisheries Committee began to develop a proposal whereby the Club could sponsor the needed inventory.

In October of 1985, Fisheries Committee Chairman, Mark Crawford, submitted the proposal to the Employment Development Branch for funding consideration. Funding was approved in February 1986. The grand received was substantially less than the amount applied for and the Creston Valley Rod and Gun Club voted to provide \$ 4,465.00 to ensure that the participants received adequate training.

A ten week intensive training programme, provided by
Robert O. Purdy and Associates was completed prior to the
field work. At this time, Harvey Andrusak provided the
"team" with the necessary equipment and permit to gather the
data for the base-line of information.

STUDY AREA

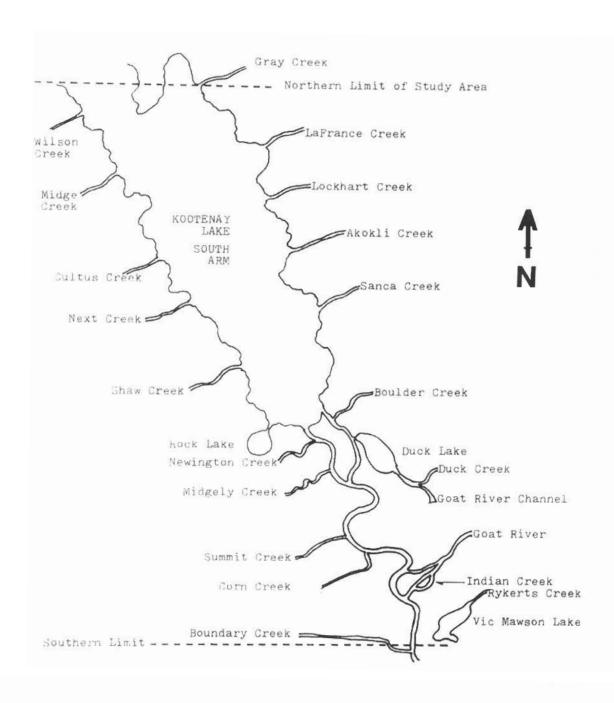
The study area for this report includes those streams tributary to the South Arm of Kootenay Lake and the Kootenay River which were deemed accessible to spawning Kokanee. Accessibility was determined by measuring the gradient and flow of the streams. This report includes only the portion of the streams below any barrier which would prohibit the passage of spawners.

The South Arm of Kootenay Lake was delineated as follows.

The Northern limit was designated by an East-West line crossing the lake at the confluence of Gray Creek. The Southern limit was the International Boundary near Rykerts, B.C. (see figure 1.)

Although the confluence of Boundary Creek is South of the study, it was included because of the length of stream which is within the study area.

Vic Mawson Lake and Rykerts Creek are included because of their potential for enhancement.



KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY STUDY AREA (not to scale)

FIGURE 1.

The project began with a ten week training programme covering stream survey techniques, basic limnology, stream mechanics, flora and fauna identification, and an introduction to the fish and aquatic insects found within the study area.

The entire length of stream deemed accessible to spawning Kokanee was walked by the research team. Based on observations, a portion of the stream which was representative of the stream as a whole, was chosen as a "typical reach" and surveyed.

Typical reaches were surveyed using a Ranger compass and 30 metre chain. All compass directions were verified by back-azimuths in accordance with commonly accepted survey procedures. All survey stations were established at the water's edge.

The following observations were recorded for each typical reach:

- -Turbidity: clarity of water
- -Substrate analysis: composition of streambed
- -Stream profile: (eg. "U" shaped bottom)
- -Armouring: stability of streambed
- -Riffle/Run/Pool ratios
- -Streambank cover: (eg. shrubs, grasses etc.)
- -Vegetation: (eg. moss, coniferous trees, reeds etc.)
- -Streambank analysis: (eg. sloping bedrock)

Surface velocity was determined by timing a styrofoam chip, floating on the water, over a measured distance. The standard formula (\underline{wdl}) was used where w = width, d = depth, l = length and t = time. Three times were obtained and the average was used for this report.

Gradients were determined by sighting upstream along the water's edge. The resulting gradient was verified by sighting downstream. All gradients were recorded as percentages. (ie. metres of rise per 100 metres of run).

Using kick-nets, aquatic insects were collected from a one square metre section of streambed. Insects were identified, to Order, on-site and the frequency recorded as sparse, moderate or abundant.

PRESENTATION OF DATA

Each stream in this report has an information page, a map of the typical reach and a photo inventory.

The information page was adapted from the stream inventory form used by the Department of Fisheries and Oceans. This page contains the pertinent information, benchmark data, geographical location of the confluence and identification of the photographs.

The typical reach page includes a map of the typical reach, compass orientation symbol and a comment section. The comment section contains information on physical characteristics, observations not listed on the information page and location of the barrier for each stream.

The photographs, unless otherwise noted on the information page appear in the following order:

- -Typical reach looking upstream
- -Typical reach looking downstream
- -Barrier
- -Confluence

Fish collection data begins on page 99. Kokanee were collected and measured for the following:

- -Number of fish observed at peak count
- -Number of eggs per gravid female
- -Length
- -Weight

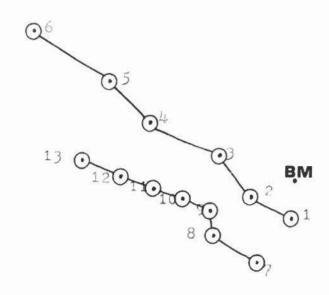
Photographs depicting comparisons, measurements, eggs and parasites follow the data pages.

					90				
1986	KOOTEN	AY LAKE	SOUTH	STREAM INVENTORY					
STREAM: AKOKLI CREEK					LOCATION: LONG116°45'20				
DATE: Nov. 5/86 TIME: 14:00 hr					LAT 49°25'35"				
TURBIC	DITY: Cry	stalline							
		°c.		AREAS OF COVER					
AIR TE	MP:10°C				abundant mod sparse oth				
			/sec.		logs				
GRADII	ENT: 2%				root wadsX				
SUBST	RATE: S	ilt_5 % s	and	15 %	rocksX				
gravel_	30 % s	tone 20 %	cobble_	15 %	undercuts				
rubble_	10 %bou	lder 5 %		,	other				
STREA	M PROF	ILE: 1	5-5	3 75	STREAM BANKS: steep Sloping				
#1			4	\$	undercut eroded rock X				
ARMO	URING: p	oor 🗌 fa	air 🗌		soil 🗌				
		good			SURROUNDING LAND USE:				
RUN_	60 % RI	FFLE 20	% POO	L_20 %	forest X rangeland				
SURRO	UNDING	VEGETA	TION:	1	suburban recreational X				
type:	abundar	nt mod s	sparse	none	farmland				
shrub			Х		PLANTS:				
conif				X	type: abundant moderate sparse				
decid	Х				poplar X				
grass		Х	.		knapweed X				
OBSTR	NOITON	S: height	locatio	on [grasses X				
dam					INSECTS: abundant mod sparse				
falls	a	pprox. 8m.	approx	120 m.	aquatic:				
culvert			above !	Hwy.3a	Ephemeroptera X				
logiam.			bridge		Plecopters X				
other_					Tricoptera X				
					land-				
					based				
		3							
COMM	ENTS:				The state of the s				
Benchma	ark= Pop	lar tree o	n North	bank					
at the	Cumming	s Resort C	Campsite	bridge					
Photo#1 Typical Reach looking upstream					m.				
#2 Typical Reach looking downstr					eam				
#3 Barrier									
#1	4 Confli	uence (aer	rial)						
n.b. I	otal ler	ngth of st	ream acc	cessible	e is approx. 2 km.				

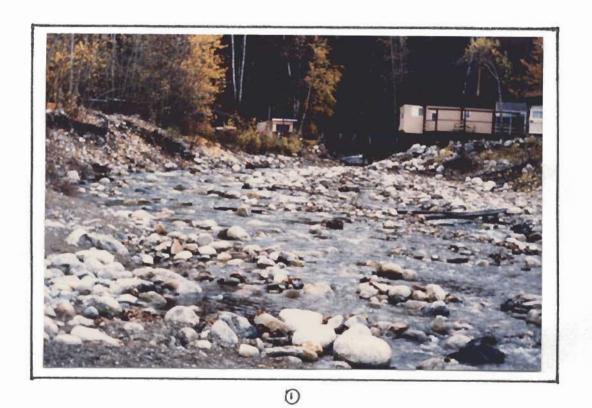
Stream Name: AKOKLI CRAZK

Scale:1cm-4m

N



Comments: Narrow, steep stream. Has few pools or areas of cover. Portion below bridge has been channelized and rip-rapped. Barrier is 120 meters above highway bridge.

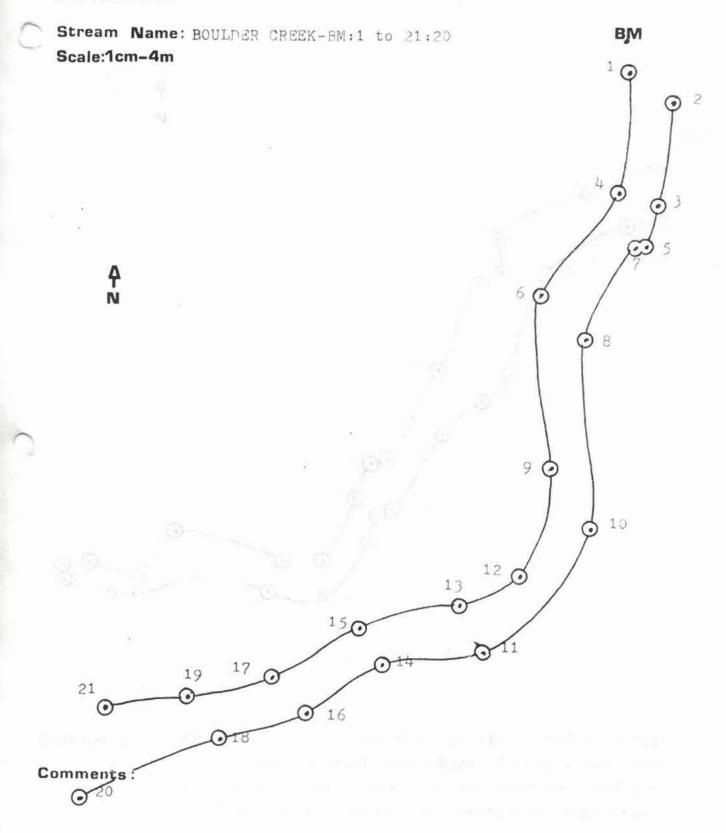




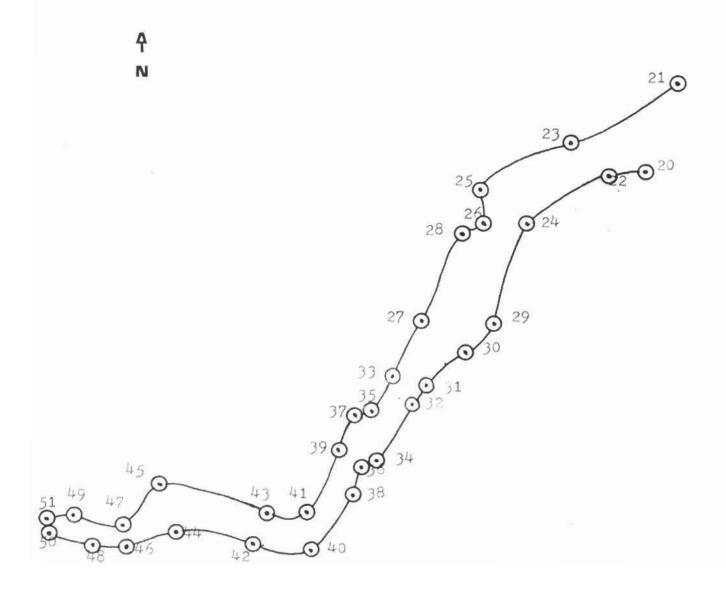




		SOUTH ARM				0	
STREAM: BOU	LDER CREEK	AN 1966A IS	LOCATION	:	LO	NG 116	09'30
DATE: July 10	0/86 TIME:_0	06:45 hr.			LA	T 49°1	5.45
TURBIDITY: C	lear						
WATER TEMP	:10°C.		AREAS	OF COV	/ER		
AIR TEMP: 1				bundani		sparse	oth
		sec.	logs			X	
GRADIENT:fre	om 1% to 6%		root wads.		Х		-
SUBSTRATE:	silt_,2 % sa	and 5 %	rocks			X	+
gravel%	stone, 13 %	cobble 30 %			X		+
rubble 30 %bo	ulder 10 %	2 5 1	other				1
STREAM PRO	FILE: 1	27 53 75	STREAM	BANKS	S: steep	X slo	oping
#1		4 %	undercut	X er	oded 2	rock	X
ARMOURING:	poor [fai	ir 🗌	soil X				
moderate X	. good	ŗ	SURROU	NDING	LAND	USE:	
RUN_30 %F	RIFFLE 30	% POOL 40 %		and the same of		-	
SURROUNDING	G VEGETAT	ION:	suburban	rec	reational		
type: abund	ant mod s	parse none	farmland				
shrub X			PLANTS:				
conif	X		type: abo	undant	modera	te s	parse
decid X			alder	Х			
grass		· X	poplar		Х		
OBSTRUCTION	NS: height	location	D.fir				X
dam			INSECTS	abunda	nt mo	d sp	arse
falls	approx.2.5m	approx. 100m					
culvert		above Hwy 3a	Ephemeron	tera			X
log j am		bridge	Odonata			X	
other			Diptera	X			
			land-				-
W.	*		based				
	*		Hymenopter	а			X
COMMENTS:			horseflies		2		
Benchmark= Ced	lar tree on	the North					
bank approx. 1	0 m. below	barrier					
Photo #1 Beave	er Dam						
#2 Aeria	al view of m	iddle portion	of creek a	nd mead	OW		
#3 Barri	er						
	uence (aeri						
.b. Total leng	th of stream	m accessible i	s approx 2	km.			

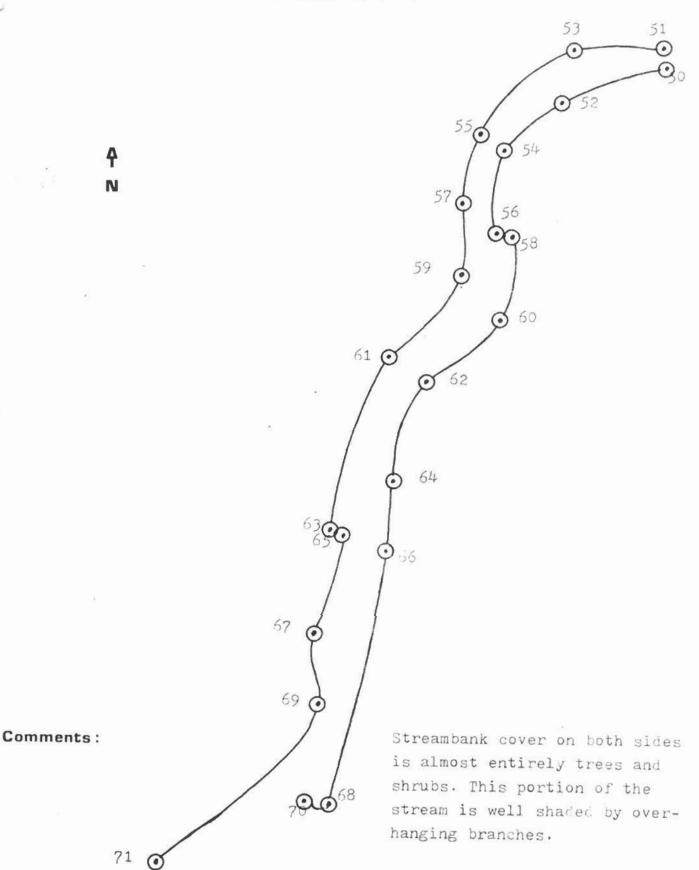


Stream Name: BOULDER CREEK-21:20 to 50:51



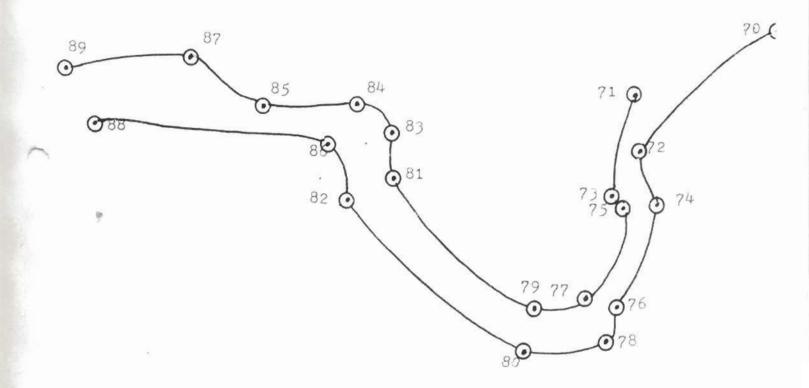
Comments: Streambank cover on both sides is almost entirely trees and shrubs with a small percentage of grass. The Southwest side has several undercuts and root wads and the entire reach is well shaded by overhanging branches.

Stream Name: BOULDER CREEK-50:51 to 70:71



Stream Name: BOULDER CREEK-70:71 to 88:89

A

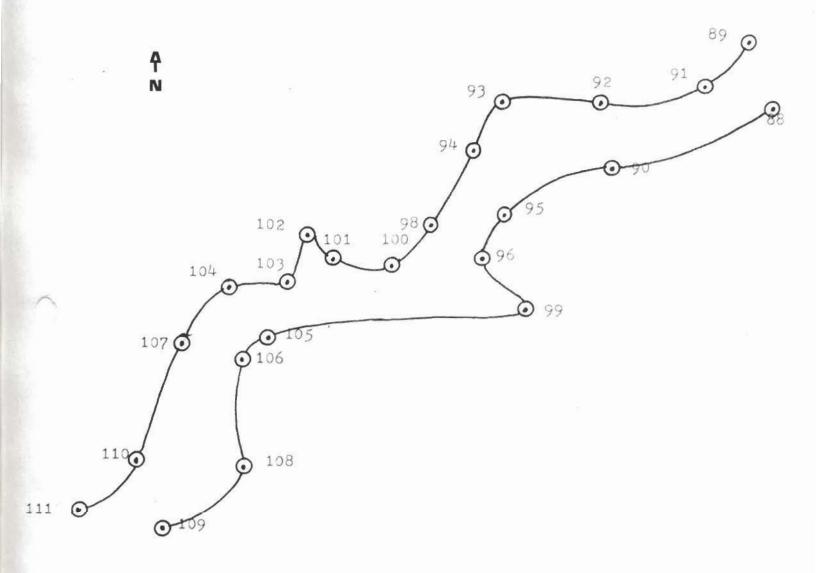


Comments: Substrate is 20% sand, 40% gravel and 40% stone.(approx)

North side of streambank cover is grasses and shrubs

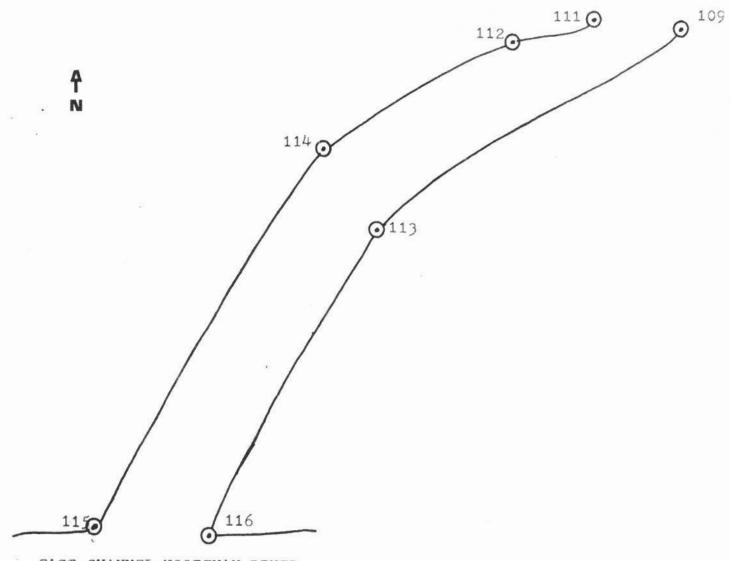
with a few trees. South side is mostly shrubs and trees
but some grass and thistle is present.

Stream Name: BOULDER CREEK-88:89 to 109:111



Comments: There is no gravel below station 88:89. Substrate is is all silt and sand. North side of streambank cover is grass with undercuts for cover. South side is mostly grass and thistle with a few shrubs. The Diptern population was very dense; mostly mosquitos.

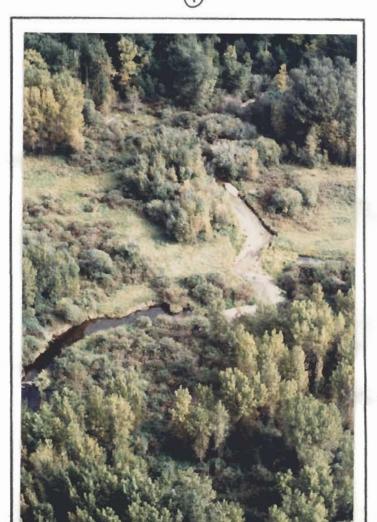
Stream Name: BOULDER CREEK-109:111 to Kootenay River Channel

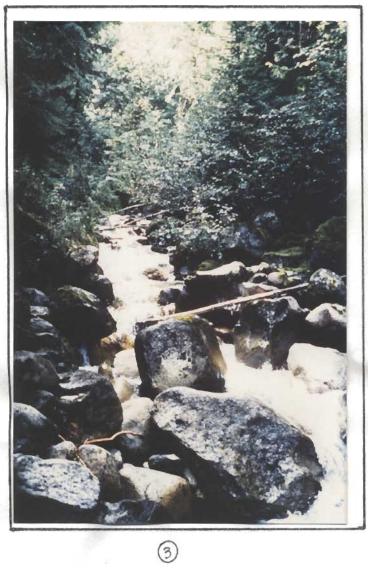


EAST CHANNEL-KOOTENAY RIVER

Comments: Beavers are evident along this reach. There is a beaver dam at station 109:111 that may be an obstacle, but it may not be tall enough to constitute a barrier. No Kokanee were evident in this stream.





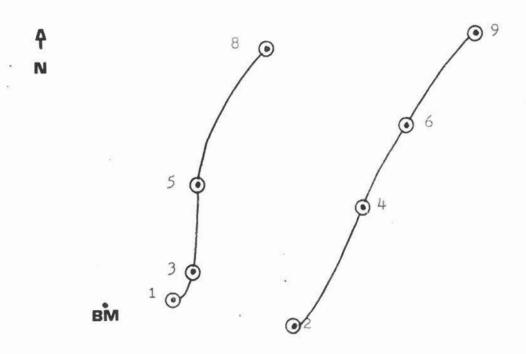




1986	KOOTE	NAY LAKE /	SOUTH ARM	SIREAW	HAVEIVI	JK1	44.00-011
STREAM: BOUNDARY CREEK DATE: Oct. 16/86 TIME: 16:40 hr.				LOCATIO	ON:	LONG	116°30'15 49°00'06"
			16:40 hr.			LAT .	49 00 05
TURBIC	ITY: C1	ear					
WATER	TEMP	:4.5°C.		AREAS	OF CO		
AIR TE	MP:1	3.5°C.				t mod sp	
FLOW:	surfac	ce) 1.33 m.	/sec.	logs		1	X
GRADII	ENT:_2	2%	0 1 0/	root wa	ds	X	X
SUBST	RATE:	silt 8 % s	and 2.5 %	underci	uts		Х
			cobble 2.5 %	other_	1		
		oulder 20 %	1 5 V			S: steep	sloping
		OFILE: 1	253 N	SINEA	IVI BAINK	oded	nck X
#1			4 5	-		bueu	00 K
		poor L fa		soil L		LAND	C.F.
modera	te L	good X	<u>%</u> POOL <u>10</u> %			LAND U	SE.
				rorest	an Des	reational	1
		G VEGETAT		farmla		reacional L	•
type:	abund	lant mod s	x none	100			
shrub		- X		PLANT		moderate	sparse
conif decid	. X			poplar	abundant X	moderate	Sparse
grass			х.	alder		Х	
-	UCTIO	NS: height		D. fir			Х
dam		To morgane	10000000		TS: abunda	ant I mad	sparse
falls	77-24-37-47-57-47-	approx. 2m	. approx 12 km		1	iiit iiiou	Sparse
culvert			from	Ephemer		Х	
log jam.			confluence	Plecopt	era	Х	
other_				Tricopt	era	Х	
				land-			
	(9			based			
		2		horsefl	ies	X	
COMM	ENTS	:		spiders	x X		
Benchma	ark= Ce	edar tree be	tween old	millipe	des		X
bridge	and tr	colley cable	near "America	n Corral	Ü.		
Photo #	1 Typ	oical Reach	looking upstre	am			
A	2 Pyp	oical Reach	looking downst	ream			
#	3 Bar	rier (aeria	1)				
#	4 Con	fluence					

Stream Name: BOUNDARY CREEK

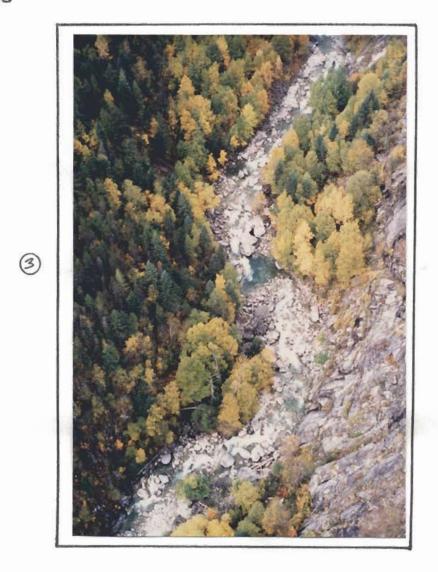
Scale: 1cm-4m

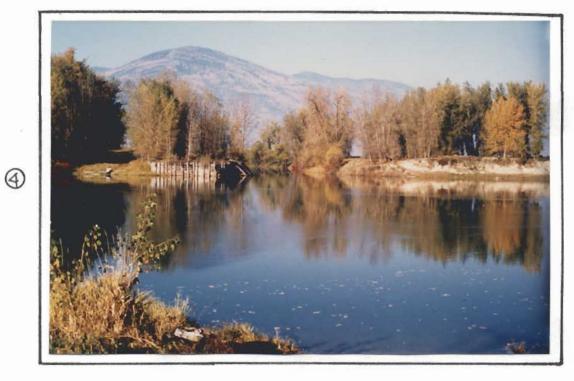


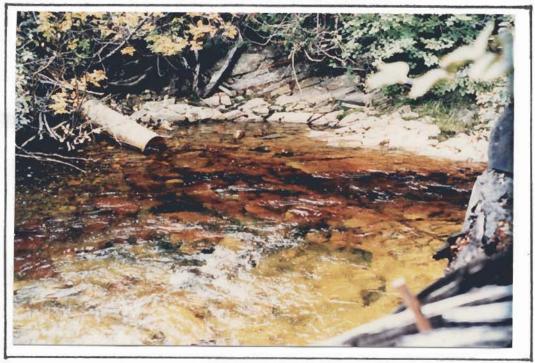
Comments: Water level and clarity vary greatly with substantial rainfalls and thaws. Stream bank cover, trees and shrubs. Few pools, undercuts, etc. Lower 1.5 km very slow and deep with steep banks. No stream bank cover.









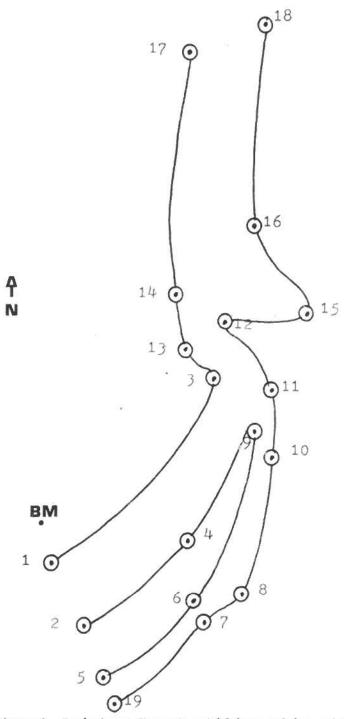


				STREAM INVE					
	STREAM: CORN	CREEK		LOCATION:		_LONG	116°36'40		
3	DATE: July 2/86					LAT	49008:55"		
	TURBIDITY: Clea	ir		-					
	WATER TEMP:	3°C.		AREAS OF	COVER				
	AIR TEMP: 130	2.		abun	dant n	nod sp	arse oth		
	FLOW: (surface		n./sec.	_ logs	-		X		
	GRADIENT: 2%			_ root wads			Х		
	SUBSTRATE: si	It 2 % s	and4	rocks		4			
	gravel6 % st	one, 14 %	cobble 45	½ undercuts					
	rubble 25 %bould	der_5 %	/	other					
	STREAM PROFI	LE: 1	5-223 S	STREAM BA	NKS: s	teep	sloping.		
	#1		4 5	undercut	erode	d 🔲 i	rock X		
	ARMOURING: po	or 🗌 fa	ir 🗌	soil 🗌					
	moderate 🖾 .	good]	SURROUNDI	SURROUNDING LAND USE:				
	RUN_35 % RIF	FLE_35	% POOL 30	% forest X rangeland					
	SURROUNDING	VEGETAT	ION:	suburban 🗌	suburban recreational X				
	type: abundan	mod s	parse none	farmland 🗓					
	shrub	Х		PLANTS:					
-	conif		х .	type: abunda	nt mod	derate	sparse		
	decid X		<u> </u>	poplar		Х			
	grass		Х	alder		X			
	OBSTRUCTIONS	: height	location	D.fir			X		
	dam			INSECTS: abu	ndant	mod	sparse		
	fallsar			aquatic:					
	culvert		from West	Ephemeroptera		Х			
	log j am		Creston brid	gePlecoptera		Х			
	other			Tricoptera		Х			
	0.			land-					
				based					
	,			Hymenoptera		Х	-		
	COMMENTS:			Horseflies		Х			
	Benchmark= South	end of l	og pile						
	approx 2 km. abo	ve West C	reston bridge	e (on the South	bank)				
	Photo #1 Typica	l Reach l	ooking downst	tream					
	#2 Typica	l Reach 1	ooking upstre	eam					
	#3 Barrie	r							
	#4 Unstab	le Clay B	anks approx.	1.5 km. below W	est Cre	eston b	ridge		
				.5 km. above Wes					
n	.b. Total length						ustile,		

Stream Name:

CORN CREEK

Scale: 1cm-4m



Comments: Although Rainbow Trout utilize this stream for spawning, there were no Kokanee evident. There is a braid of this stream which flows into the Kootenay Piver, but the main flow is into the Corn Creek Marsh and the Creston Valley Wildlife Management Area.









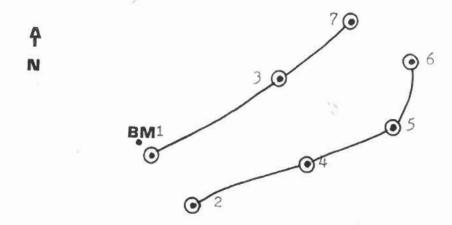
22



1986 KOOTENAY LAKE /S	DUTH ARM S	TREAM INVENTORY	
STREAM: CULTUS CREEK		LOCATION: LONG 116°4	1150
DATE: Sept 5/86 TIME:11:	30 hr.	LAT 49°19	45
TURBIDITY:Clear			
WATER TEMP: 13°C.		AREAS OF COVER	
^			oth
FLOW: (surface) 1.46 m./	sec.	logs.	
GRADIENT: 2.5%		root wads X	
SUBSTRATE: silt Ø % san	nd 1 %	rocksX	
gravel 4 % stone 2.5% c	obble 7.5 %		
rubble 45 %boulder 40 %		other	
STREAM PROFILE: 1	2 - 3 2 5	STREAM BANKS: steep Slop	ing
#1	$\frac{2}{4}$ $\frac{2}{5}$	undercut eroded rock	
ARMOURING: poor _ fair		soil 🗌	
moderate good X		SURROUNDING LAND_USE:	
RUN_ 40 % RIFFLE 40	% POOL	forest Trangeland L	
SURROUNDING VEGETATION	ON:	suburban recreational	
type: abundant mod spa	arse none	farmland	
shrub	Х	PLANTS:	
conif		type: abundant moderate spa	arse
decid	X '	poplar X	
grass	х.	p,Fir X	
OBSTRUCTIONS: height	location	alder	<u>X</u>
dam		INSECTS: abundant mod spa	rse
falls (tiered) approx. 2m.	approx 1.8km	aquatic:	
culvert	upstream from	Ephemeroptera X	
log j am	confluence	Plecoptera X	
other		Tricoptera X	
		land-	
		based	
		flies X	
COMMENTS:		spiders X	
Benchmark= Tree overhanging	g large		
granite boulder at the end	of tourist p	oath to creek	
Photo #1 Typical Reach lo	oking downstr	ream	
#2 Typical Reach lo	oking upstrea	ım	
#3 Barrier			
#4 Confluence			

Stream Name: CULTUS CREEK

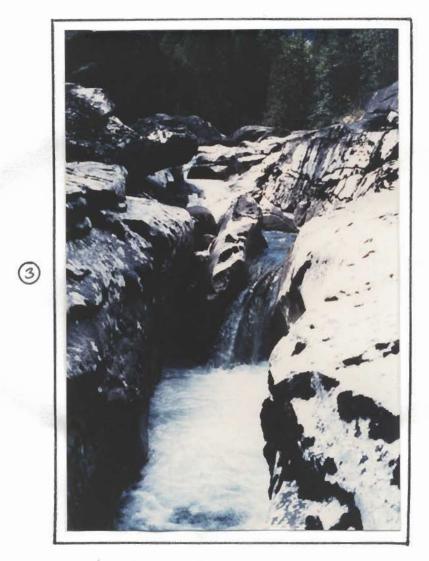
Sçale: 1cm-4m

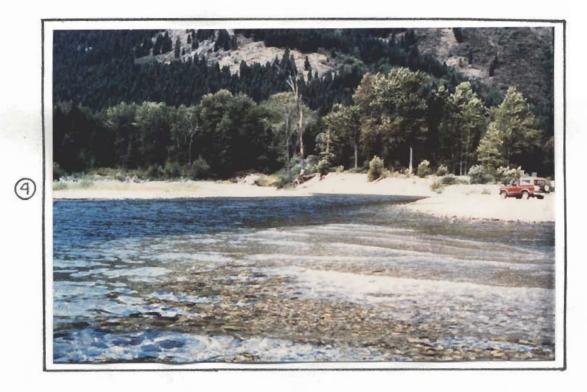


Comments: Broad delta at confluence. Heavily silted. Very little cover for rearing areas (pools). No resident fish evident.







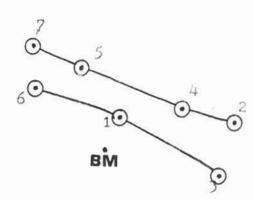


			STREAM INVENTOR			
STREAM: DU	CK CREEK		LOCATION:	LONG_116 06	10	
DATE: Nov. 5/8	86TIME:_1	5:00 hr.		LAT 49°12'	45	
TURBIDITY:_	Clear					
WATER TEMP	.6°c.		AREAS OF COVE	₹		
AIR TEMP:	10°C.		abundant	mod sparse	th	
FLOW: (surfa	ce) 2.04 m/s	:0C.	logs			
GRADIENT: 1	%		root wads	Х		
SUBSTRATE	silt 5 % sa	ind 10 %	rocks			
		cobble 15 %				
	oulder 8 %	15 \/	Other	ataon [7] alani		
STREAM PR	OFILE: 1	5223 3V2	STREAM BANKS:	The second secon		
#1		4 5	undercut 🗷 erod	ed L rock L	_	
And the second of the second o	: poor L fai		soil 🔲			
moderate			SURROUNDING LAND USE:			
			forest rangel			
1	IG VEGETAT		suburban recrea	itional 🗀		
	dant mod s	parse none	farmland X			
shrub	^	х	PLANTS:			
conif		x .	V	oderate spar	se	
decid	Х	A	alder		-	
grass L		L'action I	poplar			
	DNS: height	iocation	rosenip			
dam			INSECTS: abundant	mod spar	se	
falls	approx.1.5m	where Hwy 3a	aquatic:			
		crosses	EDITEMET OF GETA	X		
logjamother		stream	Plecoptera Tricoptera	A V		
other	-		land-			
,			based			
			Hymenoptera X			
COMMENTS	*					
	tone cairn on	South bank				
	he end of Wig	0 X-00 (1 2001) W0 + 0.17				
and the second of the second o	1901 - 10	ooking upstre	am			
10 1070.0	-	ooking downst				
Vetes	201		on the Goat River C	hannel.		
			d by spawning Kokane			
			hway 3a.(no Kokanee,			
			accessible; approx.			

Stream Name: DUCK CREEK

Scale:1cm-4m

4



Comments: Stream bank cover includes trees, shrubs, and grasses.

Several large undercuts and pools. Rainbow trout and

Dolly Varden utilize this stream for spawning; however, no

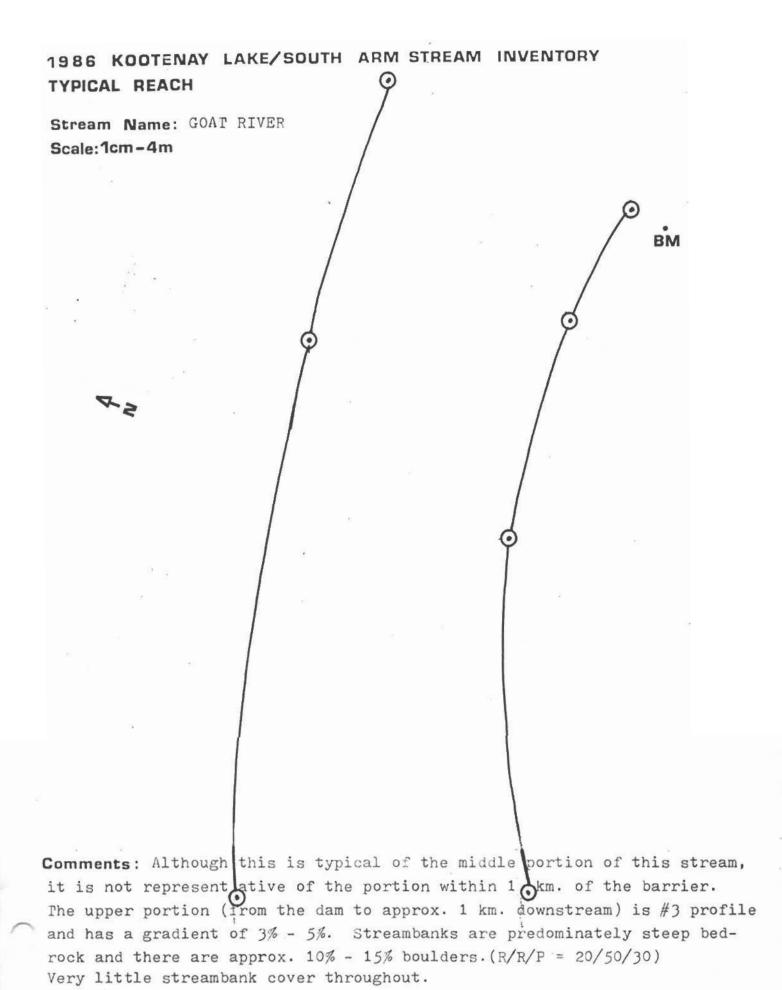
Kokanee since Goat River diversion.







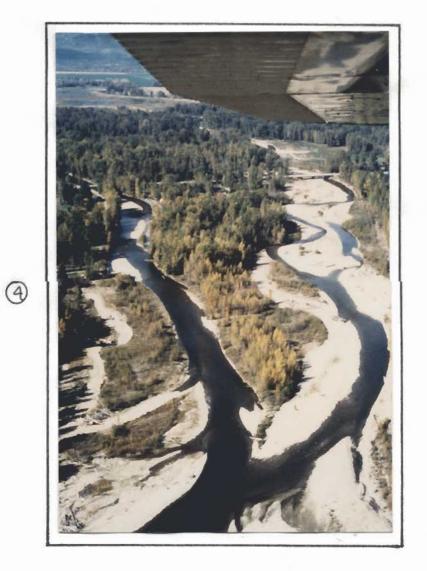
		SOUTH ARM S	TREAM INVENTORY	116005'00"		
	STREAM: GOAT RIVER	-	LOCATION:	LONG 110 00 00 104"		
	DATE: July 22/86 TIME:	07:40 hr	section. See Photo	#4)		
	TURBIDITY: Clear					
	WATER TEMP: 10° C.					
	AIR TEMP: 20° C.		abundant			
	FLOW: (surface) 1.73 m./	sec. ·	logs	X		
	GRADIENT: 1 %		root wads	X		
	SUBSTRATE: silt _2.5% sa	and 5 %	rocks	X		
	gravel 7.5 % stone, 50 %	cobble 25 %	undercuts			
	rubble 10 % boulder 8 %	2 5 1/	STREAM BANKS:			
	STREAM PROFILE: 1	£ 22 3 22	STREAM BANKS:	steep sloping A		
		A CONTRACTOR OF THE CONTRACTOR		ed rock		
	ARMOURING: poor L fai	•	soil			
	moderate good X		SURROUNDING L	AND_USE:		
	RUN_50 % RIFFLE 40	% POOL 10 %	forest Xrangel	and 🔲		
	SURROUNDING VEGETAT	ION:	suburban X recrea	ational		
	type: abundant mod s	parse none	farmland grave	l pit		
	shrub	Х	PLANTS:			
	conif	X	type: abundant m	oderate sparse		
>	decid		poplar	X		
	grass	X	alder	X		
	OBSTRUCTIONS: height	location	Willow	X		
	damapprox.10m	approx. 6.5km	INSECTS: abundant	mod sparse		
	falls	above Hwy 21	aquatic:			
	culvert	bridge	Ephemeroptera	X		
	log; am		Plecoptera			
	other	L	Pricontera			
			land-			
	0es		based			
	,					
	COMMENTS:					
	Photo # 1 Timical Basch 1	looking Unetwo				
	Photo # 1 Typical Reach 1	7 55 000 W				
	# 2 Typical Reach 1		ream			
	# 3 Log Jam on Sout					
	# 4 Beginning of Br	ralded section				
1	# 5 Goat River Dam	handa anno 2	less a bosse III and	S1 S		
			km. above Hwy. 21 H			
	n.b. Length of stream (s)					
			portions of the North and South			



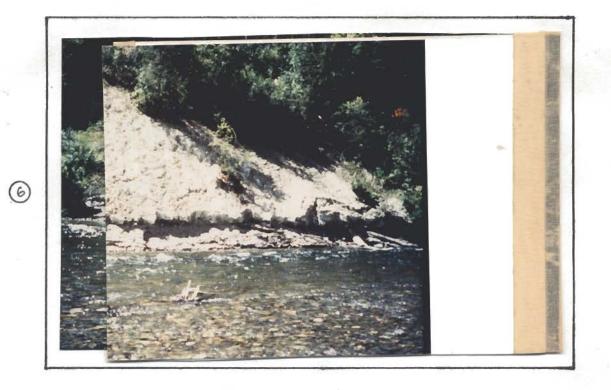








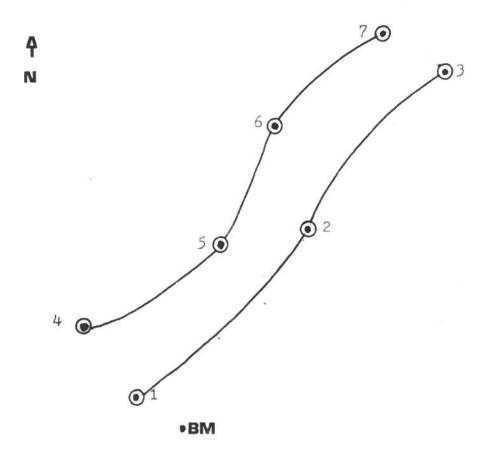




1986 KOOTENAY LAN		STALAM MEETE		0				
STREAM: GOAT RIVER	CHANNEL	LOCATION:	LON	3116°33'40				
DATE: July 15/86 TIM			LAT	49°05'25"				
TURBIDITY:Clear		_						
WATER TEMP: 18°C.		_ AREAS OF CO	VER					
AIR TEMP: 1900.		abunda	nt mod s					
FLOW: (surface) 0.5	L m./sec.	_ logs		X				
GRADIENT: less than	1 1 %	_ root wads	X					
SUBSTRATE: silt 50	% sand50	% rocks	Х					
gravel \$ % stone \$	% cobbleø	% undercuts						
rubble 8 %boulder 8	%	other weed beds	X					
STREAM PROFILE:	7 2 3 3	STREAM BANK	(S: steep	X sloping				
#4	1 223 S	undercut e	roded _	rock 🔲				
ARMOURING: poor X		soil X						
moderate . good		SURROUNDING	LAND					
RUN_ Ø % RIFFLE_	Ø % POOL 100	% forest rai	% forest rangeland X					
SURROUNDING VEGE		suburban 🗌 re						
type: abundant mod	sparse none	farmland 🗓						
shrub	Х	PLANTS:						
conif	. X	type: abundant	moderate	sparse				
decid X		aquatid	X					
grass X		rushes	Х					
OBSTRUCTIONS: heig	ht location	poplar	I X					
dam		INSECTS: abund	ant mod	1602560				
2 25 20 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			CITTO ITTO	Sparse				
falls		aquatic:	dire iniou	sparse				
falls	approx 0.5 k	aquatic:		sparse				
culvert	approx 0.5 k South of Duc	aquatic: Diptera		Sparse				
		aquatic: Diptera		Sparse				
logjam	South of Duc	aquatic: Diptera Odonata Hemiptera	X	Sparse				
culvertlogjamother_Dyke N/A	South of Duc Lake Road	aquatic: Diptera Odonata Hemiptera	X	Sparse				
logjam	South of Duc Lake Road	aquatic: Diptera Odonata Hemiptera	X	Sparse				
culvertlogjamother_Dyke N/A	South of Duc Lake Road	aquatic: Diptera Odonata Hemiptera land- based	X	Sparse				
culvertlogjamother_Dyke N/A	South of Duc Lake Road Intersection	aquatic: Diptera Odonata Hemiptera land- based grasshoppers	XXX	Sparse				
culvertlogjamother_Dyke N/A	Lake Road Intersection esting box	aquatic: Diptera Odonata Hemiptera land- based grasshoppers spiders	XXXX	Sparse				
culvertlogjamother_Dyke N/A COMMENTS: Benchmark=Wood Duck ne	Lake Road Intersection esting box k Lake) pumping	aquatic: Diptera Odonata Hemiptera land- based grasshoppers spiders station intake ch	XXXX	Sparse				

Stream Name: GOAT RIVER CHANNEL (between Duck Creek & Duck Lake)

Scale: 1cm-4m



Comments: Rainbow trout and Dolly Varden utilize this channel to access spawning gravel within Duck Creek. No Kokanee evident.

Local history states that since the Goat River diversion no Kokanee run here.

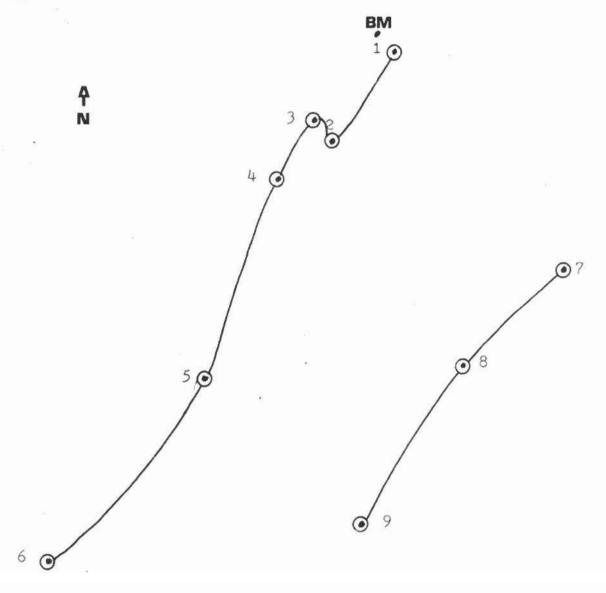






Stream Name: GOAT RIVER / NORTH BRAID

Scale: 1cm-4m



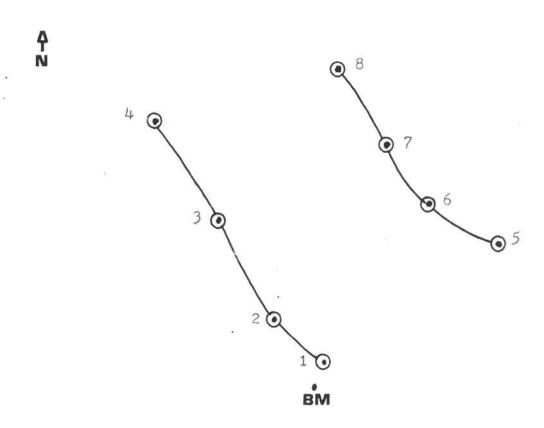
Comments: Well-channelized. During spawning run, no Kokanee observed below 1/2 km from Highway 21 bridge, lower 75% silt/clay bottom. No substantial stream bank cover.





Stream Name: GOAT RIVER / SOUTH BRAID

Scale: 1cm-4m



Comments: Well channelized. During spawning run, no Kokanee observed below 1/2 kilometer from Highway bridge. Lower 75% silt/clay bottom. No substantial stream bank cover. One massive log jam, approximately 40 meters by 1.5 kilometers.



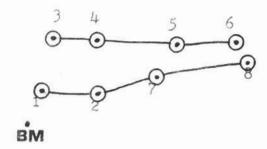


			SOUTH ARM	The state of the s			
STRE	M: GRA	Y CREEK		LOCATION:_		LONG	3116°47'45
			1:00 hr.			LAT	49°34'50"
	DITY:_C			_			
				AREAS OF	COVER	?	
	MP: 14				ndant	mod Is	parse oth
FLOW	surface	e) 1.09 m./	sec.	A STATE OF THE PARTY OF THE PAR			Х
							Х
			and 5 %			Х	
			cobble 20 %				Х
rubble	20 %bc	oulder 15 %		other			
		DFILE: 1	2-3-3	STREAM B	ANKS:	steep [sloping
#:			-4-6	undercut [erode	ed 🗌	rock X
ARMO	URING:	poor 🗌 fa	ir 🗌	soil 🗌			
modera	ate 🗌	good X]	SURROUND	ING L	AND L	ISE:
		_	% POOL 33	forest	rangela	and 🗌	
SURRO	NIDNU	G VEGETAT	ION:	suburban] recrea	tional [
type:	abund	ant mod s	parse none	farmland [
shrub			X	PLANTS:			
conif			Х	type: abunc	ant mo	derate	sparse
decid			Х ,	moss		Х	
grass			. X	dogwood			Х
OBST	RUCTIO	NS: height	location	alder			Х
dam				INSECTS: at	oundant	1 mod	sparse
falls_			approx.300m.	aquatic:			- Sparse
culver	t		above Hwy.3a	Ephemeropter	а	X	
logiam			bridge	Plecoptera		Х	
other_				Pricoptera		Х	
				land-			
				based		-	
		,		horsefly			Х
COMM	IENTS	:					1
Bench	nark= c	rack in curl	oing of the Hw	y			
3a br	idge on	the South	side.				
			looking upstr	eam			
			looking downs				
	Thirties to	rrier					
	W 450	nfluence (ae	erial)				
	A 10 100 1		outh of campsi	te # 19. 01d	Crow Cam	pground	1.
n.b.			ream accessibl				
		37.76			The state of		

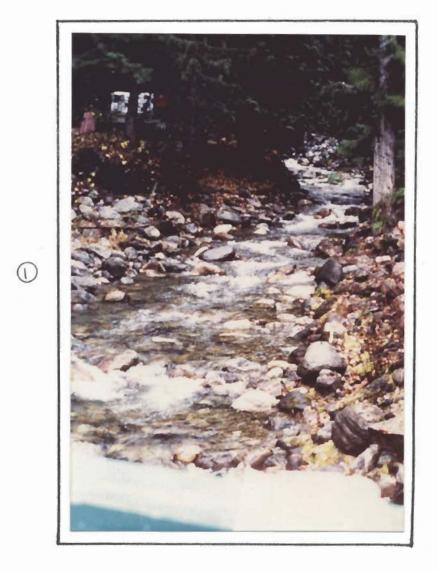
Stream Name: GRAY CREEK

Scale:1cm-4m

N

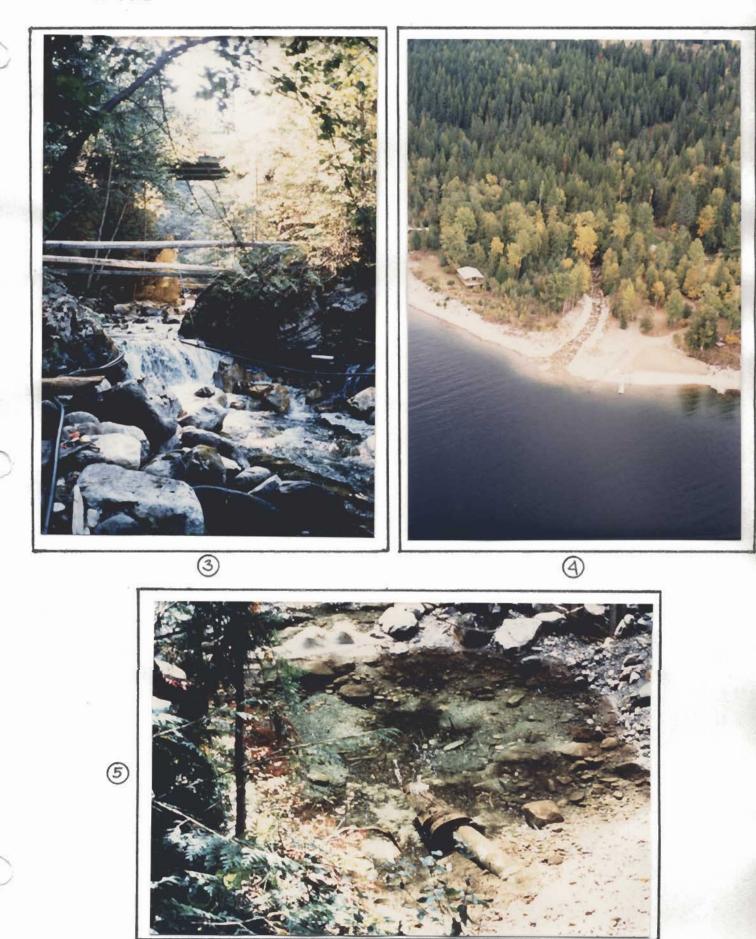


Comments: Very little stream bank cover. Few undercuts, pools, or root wads. Large pool for irrigation intake pipe (south of campsite #19, Old Crow Campground), provided a resting/spawning area for at least 70 Kokanee. Mineral rich bed rock made it very difficult to obtain credible compass readings.





1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS

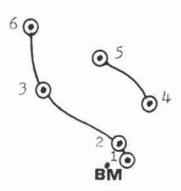


1986	KOOTE	MAY LAKE									
STREA	M: INDI	AN CREEK			LOCATI	ON:			_row	NG116°3	3,30
DATE:	July 17	/86 TIME	: 11:00 h	r.					LAT	49005	25"
TURBIL	DITY: C1	ear									
	CHARLESTON ATTENDED	10°C.			AREAS	o F	COV	/ER			
AID TE	MP:140	С.				abu	ndant	m	od	sparse	oth
		e) 0.21			logs			_			
GRADI	ENT: le	ss than 1	76		root wa	ds		_	-	X	
SUBST	RATE:	silt 90 9	sand	8 %	rocks_			-			
gravel.	2 %	stone, Ø	% cobble	g %	underc	uts		-	-	X	-
rubble.	Ø %bo	ulder_Ø	<u>%</u>		other_					-	
STREA	M PRO	FILE: 1	ر ک <u>ر </u>	-3	STREA	M B	ANK	3 : st	teep	X slo	ping
A company of the comp			4	5	under	ut [er	odeo	X	rock	
ARMO	URING:	poor X	fair 🗌		soil 🗌						
		good			SURRO	סמטכ	ING	LA	ND	USE:	
		HFFLE	77.0	OL 40 9	forest		rang	gelar	nd [X	
	SURROUNDING VEGETATION:				suburban recreational						
type:	abunda	ant mod	sparse	none	farmla	nd X]				
shrub	Х	•			PLANT						
conif				^ X	[type:	abund	ant	mod	erat	e sp	arse
decid				. х	sedges						
grass	Х				alder	9			Х		
OBSTR	UCTION	VS: heigh	t locat	ion	grasse	s X					
dam					INSEC	TS: ab	unda	nt	mo	d Ispa	arse
falls					aquati						
culvert	-				Odonata	a			Х		
log jam.		N/A	1 km.	below	Diptera	a			Х		
other_			Hwy 21	bridge							
					land-		,		,		
	(4				based						
		,			grassh	oppers	X				
COMM	ENTS:				spiders	s	Х				
Benchm	ark= No	rthwest b	ank near	cattle							
bridge	on the	L.K.I.B.	Reserve								
Photo	#1 Typ	ical Read	h lookin	g upstre	am						
	#2 Typ.	ical Read	h lookin	g downst	ream						
		ength of				prox.	3.5	km.			

Stream Name: INDIAN CREEK

Scale:1cm-4m

A N



Comments: Tributary of south braid of Goat River. Deeply channelized clay. Stream bank cover predominantly grasses. Less than 200 square meters gravel. Very slow flow. Chub and suckers observed.

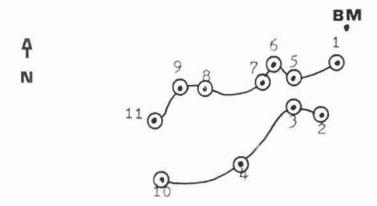




1986 KOOTENAY LAKE / SOUTH ARM	SIREAW INVENTION	150
STREAM: LAFRANCE CREEK	LOCATION: LONG 116°47	201
DATE: Aug. 26/86 TIME: 08:00 hr.	LAI 37.	
TURBIDITY: Clear		
	AREAS OF COVER	
AIR TEMP: 16°C.	abundant mod sparse c	oth
FLOW: (surface) 2.19m./sec.	. logsX	
GDADIENT: 3.5%	root wads	
SUBSTRATE: silt # % sand 15 %	rocks	
gravel 10 % stone 10 % cobble 25 %	undercuts	
rubble 25 %boulder 5 %	otherslen	ina
STREAM PROFILE: 1 27 53 7	STREAM BANKS: steep Slop	
#1 4 5	undercut eroded rock	
ARMOURING: poor L fair	soil 🔲	
moderate good X	SURROUNDING LAND USE:	
RUN_33 % RIFFLE 33 % POOL 33	forest X rangeland	
SURROUNDING VEGETATION:	suburban recreational	
type: abundant mod sparse none	farmland	
shrub	PLANTS:	
conif X	type: abundant moderate spa	rse
decid	noss X X	
grass X	Dregon grape X	
OBSTRUCTIONS: height location	Salmonderry	
dam	[INSECTS: abundant mod spar	'se
falls	aquatic:	
culvert	Ephemeroptera X	
logjam approx 4 km. from Hwy. 3a	Tricoptera X	
other (CHUTE) approx 1.5mbridge	Plecoptera X	
	land-	
5	based	
7	horseflies X	
COMMENTS:		
Benchmark= Log across creek 2 km. fro	om.	
Highway 3a turnoff.		
Photo #1 Typical Reach looking upstr	ream	
#2 Typical Reach looking downs		
#3 Confluence (aerial)	r w mi no meddil	
n.b. No photo of barrier available	1	
Total length of stream accessib	le 1s approx. 5 km.	

Stream Name: LaFRANCE CREEK

Scale:1cm-4m

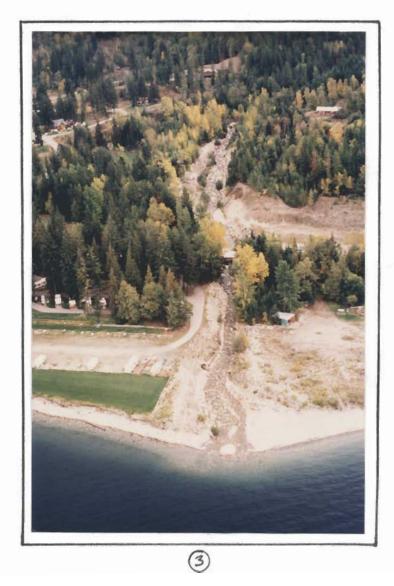


Comments: Portion of creek above highway bridge well-shaded by overhanging trees and shrubs. Portion below highway bridge very little stream bank cover. Very little silt evident.





1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS

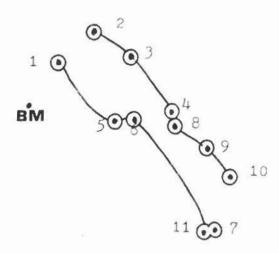


1986 KUUTENAT LAKE/SUUTH AR						
STREAM: LOCKHART CREEK	LOCATION: LONG 116°47'07					
DATE: Aug. 26/86 TIME: 09:30 hr.						
TURBIDITY: Crystalline						
WATER TEMP: 11°C.	AREAS OF COVER					
AIR TEMP: 17.5°C.	abundant mod sparse oth					
FLOW: (surface) 1.6 m./sec.	logs					
GRADIENT: 2%	root wads X					
SUBSTRATE: silt Ø % sand 2.5	70 COCKS					
gravel 2.5 % stone 20 % cobble 45	70 Undercoos					
rubble 25 %boulder 5 %	other					
STREAM PROFILE: 1 27 53	7.5 STREAM BANKS: steep Sloping					
#14	5 undercut eroded rock					
ARMOURING: poor fair	soil 🔲					
moderate good X	SURROUNDING LAND USE:					
RUN 30 % RIFFLE 40 % POOL 3	% forest X rangeland					
SURROUNDING VEGETATION:	suburban recreational X					
type: abundant mod sparse non	farmland L					
shrub X	PLANTS:					
conif	type: abundant moderate sparse					
decid	poplar					
grass X	alder					
OBSTRUCTIONS: height location	moss					
dam	INSECTS: abundant mod sparse					
falls approx. 2m. 1.5 km. a	aquatic: X					
culvert Hwy.3a br	idge Ephemeroptera X					
log j am	Plecoptera					
other	Tricoptera					
	land-					
	based					
8	cabbage whites X					
COMMENTS:	butterflies X					
Benchmark= Large Ponderosa Pine at	70					
campsite # 12, Lockhart Creek Prov						
Photo #1 Typical Reach looking ups						
#2 Typical Reach looking down	nstream					
#3 Barrier						
#4 Confluence (aerial)						
n.b. Total length of stream access	sible is approx. 2.2 km.					

Stream Name: LOCKHART CREEK

Scale:1cm-4m

A



Comments: Upper 75% of accessible stream is well-shaded by overhanging trees and shrubs. Lower 25%, no stream bank cover.







Vic Mawson Lake is a man-made impoundment near the international boundary at Rykerts, B.C. The lake and property surrounding it is owned by the Creston Valley Rod and Gun Club. It is included in this inventory because of the Creston Valley Rod and Gun Club's desire to enhance and develop the area. Due to the relatively small volume of water feeding the lake, and the lack of spawning habitat, Vic Mawson Lake does not appear to be well suited for the stocking and rearing of Salmonidae.

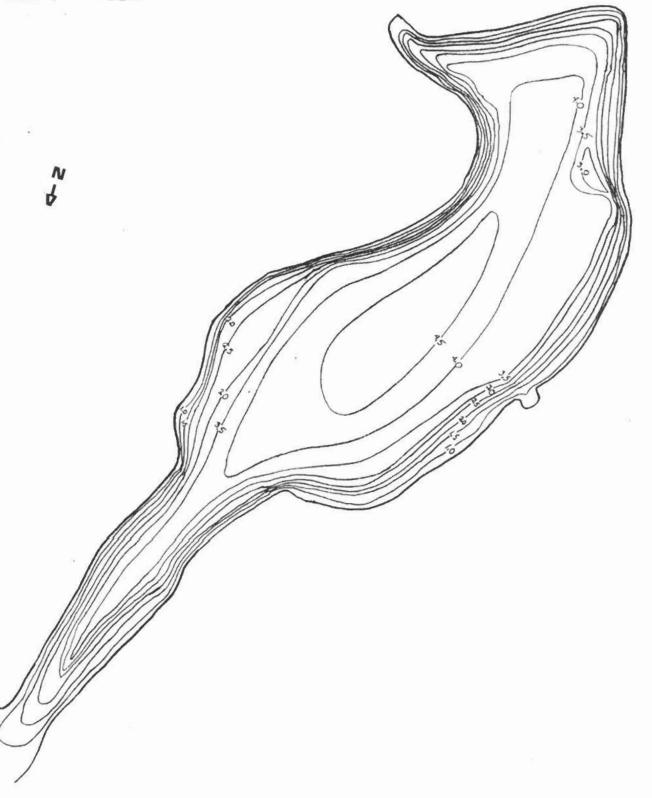
Fish now found in the lake include Black Bullheads, Yellow Perch, Squawfish, Bluegills and a few stocked trout.

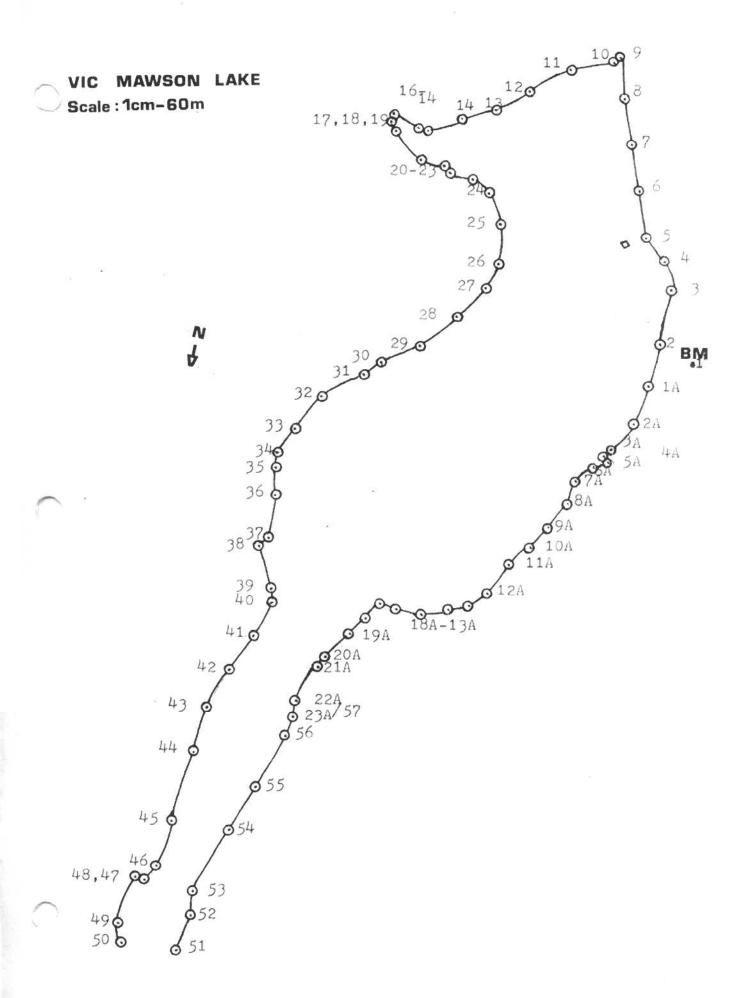
An abundance of Odonatae and Dipterns was noted within the lake around the shoreline.

Lake bottom is entirely silt, sand and clay with an abundance of aquatic vegetation providing cover for resident fish. The entire shoreline is very steep and well shaded by Coniferous and Deciduous trees and shrubs as well as tall grasses and rushes. The Southwest portion of the shoreline has a moderate to sparse covering of shrubs but grasses are abundant.

VIC MAWSON LAKE DEPTHS

Scale: 1cm-60 m







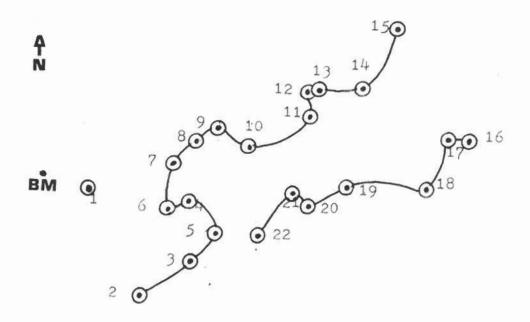




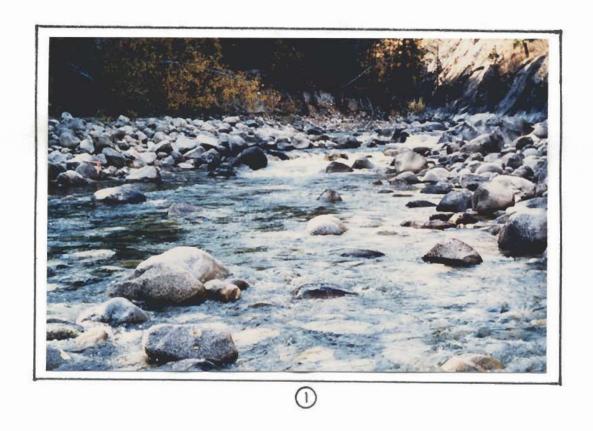
				AKE	SOUTH	ARM	STREAM	ת ור	MAFWIL	HY	1	16048115		
STRE	AM:	MIDG	E CR	EEK			LOCATI	ON:			LONG	10 20 130"		
DATE	. Oct	.21/8	36_T	IME :	11:50 h	r					LAT	.16°48'15 19°22'30"		
TURB														
				C.			AREAS		F COV			21		
AIR T	FMP	·140	3.				abundant mod sparse oth							
FLOW	: (·su	rface	2) 2	.1 m./	/sec.		root wads							
CDAD	IEN	r. 4%												
CHEC	TDA	TE	eile.	2.5%	and	2.5 %	rocks			1 2		· ·		
grave	gravel 5 % stone 5 % cobble 5 %					under	uts		-	_	X			
rubble						other_								
STRE					3	$-\frac{3}{3}$	STREA	M	BANK	3: st	еер	sloping		
	#1				- 2	5	under	cut	er er	oded		sloping		
ARM	OUR	NG:	poor	☐ fa	air 🗌		soil							
mode	rate		. go	ood 2	()				DING			SE:		
RUN_	40	% R	IFFLE	40	% POC	DL 20	6 forest	X	ran	gelan	id 📙	,		
					TION:	î	subur	ban	rec	reati	onal 🖟	}		
type:	al	bunda	nt	mod	sparse	none	farml	and						
shrub	_				X		PLAN	TS:						
conif	_				Х	•	type:	abu	ndant	mod	erate	sparse		
decid				Х			poplar		Х					
grass	L					Х	alder	_			X			
OBST	RUC	TION	IS:	height	locat	ion	P.pine				Χ			
dam_							INSEC	TS	abunda	nt	mod	sparse		
falls_			appr	ox. 2n	appro:	x. 5km.	aquat	ic:						
culve	rt				from		Epheme	ropt	era		Х			
logian	n				conflu	lence	Plecop	tera			X			
other							Tricop	tera			X	1		
		3					land-							
	8		3				based					+		
			,									-		
COM	MEN	ITS:										-		
Bench	mark	= sma	ill C	edar t	ree on	the						1		
North	ban	k app	rox	500 m.	from (D.P. P.	ridge.							
Photo	#1	Гурі	cal !	Reach	looking	g upstre	am							
	#2	Гурі	cal	Reach	looking	g downst	ream							
	#3	Barr	ier	(aeria	11)									
	#4	Conf	luen	ce (ae	erial)									

Stream Name: MIDGE CREEK

Scale: 1cm-4m

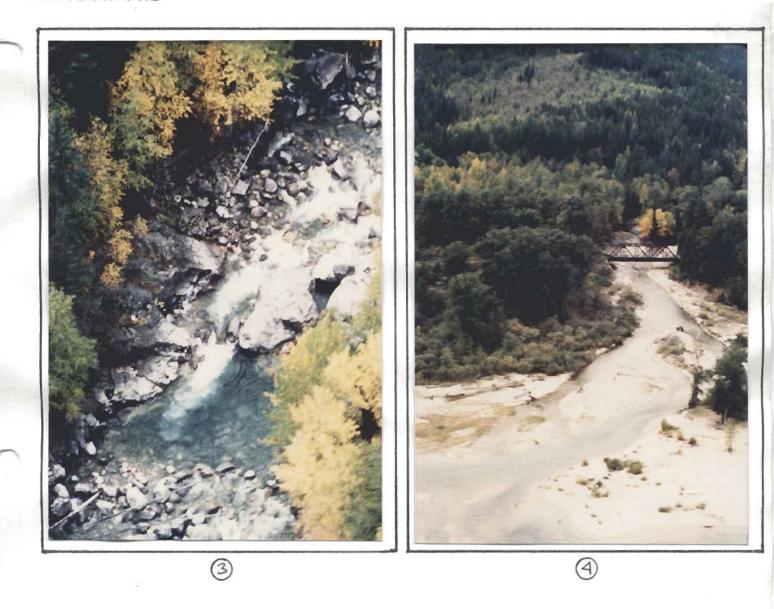


Comments: Very little stream bank cover; however, there are several pools and back eddies. 15% bedrock stream bed.





1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS



					STREAM I							
STREAM	: MIDGE	ELY CREEK			LOCATION		LONG	116 39'2				
DATE: Aug	27/86	TIME :_	08:30 1	nr.	21		LAT	49 12. 05				
TURBIDI	TY: Slig	chtly Clo	udy		•							
WATER 1	TEMP: 11	.°C.			AREAS	OF COV	ER					
AIR TEM	P: 17°	· .			0.77			parse oth				
FLOW: (surface)	less t	han 1 m	./min.	logsX							
	GRADIENT: less than 1%					-						
SUBSTRATE: silt 80 % sand 15 % gravel 5 % stone 6 % cobble 6 %					rocks							
gravel	5 % st	one <u>, ø</u> 9	6 cobble	ø %	undercuts							
rubble	%bould	der Ø %	•	,	other aqu							
STREAM	PROFI	LE: 1	2 5	3 7	STREAM	BANKS	: steep	Sloping				
#2			4	5	undercut	ero	ded	rock 🔲				
ARMOUR	RING: po	or 🗓 fa	air 🗌		soil X							
		good			SURROU							
RUN	% RIF	FLE5	<u>%</u> POO	L 90	forest	forest angeland X						
SURROUI	NDING	VEGETA	TION:		suburban recreational							
type:	abundan	mod s	sparse	none	farmland							
shrub			Х		PLANTS:							
conif				type: abu	indant	moderate	sparse					
decid				Х	reeds		X					
grass	X				rushes		Х					
OBSTRU	CTIONS	: height	locati	on	grasses	Х						
dam			-		INSECTS	abundar	it mod	sparse				
falls			-		aquatic:							
culvert_			-		Diptera	X						
logjam	- 00	or flow	Mideely	,	Odonata		Х					
other	lpo	or volum	eWeadow		Hemiptora			X				
					land-							
	9				based		-	X				
		2			spiders		X					
COMME	NTS:				flies	Х		1				
					dewworms							
Photo #1	W											
#2		y Meadow										
#3		area ju										
#4	Typica	l Reach	through									

Stream Name: Midgely Creek

Scale:1cm-4m

Comments: Because the volume of water and the accessible streambed did not appear to be sufficient to support a spawning run of Kokanee, we did not deem it necessary to survey a typical reach. Photo # 3 is 100% clay bottom. Photo # 4 shows middle reach which is 12-14 cm. deep and less than 1 metre average width.









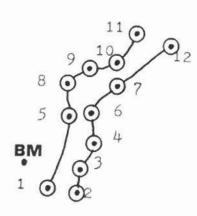
	A STATE OF THE STA					H ARM							
	STREA	M: NEW	ING	TON CRE	EK		LOCAT	ION:_			LONG	11604	0'40
1	DATE:	oct. 2/8	36	_TIME:	08:00hr	`.				ı	LAT	49013	20
	TURBIC	DITY: Cl	ear										
		TEMP:					AREA	S OF	COV	ER			
	AIR TE	MP:9	o _C .					abu	ndant	mo	d sp	arse	oth
	FLOW:	(surface	e) :	1.35m./	sec.		logs					Х	
	GRADII	ENT: fr	om :	1%-12%			root w	ads		Х			
	SUBST	RATE:	silt	ø %	sand	2.5 %	rocks			X			
	gravel 2.5% stone 5 % cobble 5 %						under	uts_		Х	-		
	rubble_	15 %bo	ulde	er 70 9	6		other_						
	STREAM PROFILE: 1 2-53 3					STREA	M B	ANKS	: ste	ер	slo	ping	
	#1 \ \frac{1}{4} \ \frac{1}{5}					under	cut [er	oded		rock	A	
	ARMO	URING:	poc	or 🗆 1	air 🗌		soil [
		te 🗌					SURR	OUND	ING	LAN	ם ע	SE:	
	RUN 45 % RIFFLE 40 % POOL 15 %					forest	X	rang	eland				
		UNDING						suburban recreational					
	type:	abunda	ant	mod	sparse	none	farml	and [
	shrub				Х		PLAN	TS:					
	conif	Х					[type:		lant	mode	rate	spa	arse
9	decid			X			mushro		X				
	grass					Х	moss		Χ				
	OBSTR	UCTIO	NS:	height	loca	tion							
	dam						[INSECTS: abundant mod sparse						rse
	falls(±	iered)	ap	prox. 2	m appr	approx 1 km.		ic:					
	culvert				West	of	Plecop	tera			X		
	logiam.				conf	luence	Dipter	a			Х		
	other_	- 1					Tricop	tera			X		
							land-						
		2					based						
			*										
	COMM	ENTS										1	
	Benchma	ark= Ce	dar	tree a	pprox 3	30 m.							
					orth bar								
	Photo #	1 Typi	cal	Reach	looking	downstr	eam						
	Photo #1 Typical Reach looking downstream #2 Typical Reach looking upstream												
	#3 Barrier												
		+ Conf											
	100	130											

Stream Name:

Newington Creek

Scale:1cm-4m

A

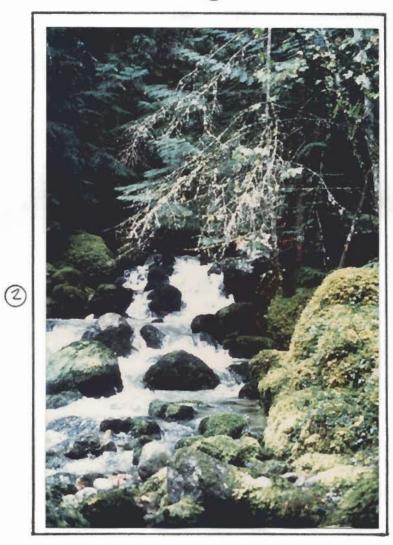


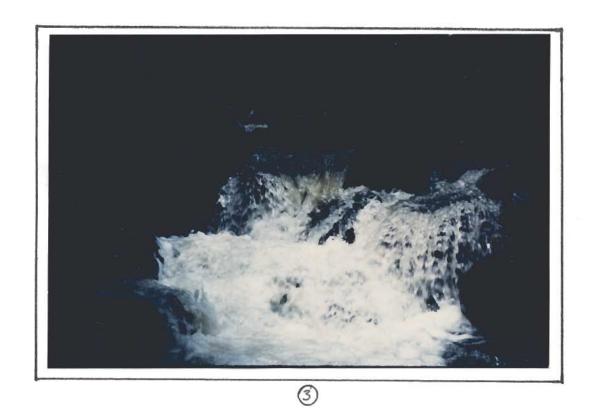
Comments: Very few holding areas, boulders, etc. Lower 100 meters

predominantly fine gravel and sand.

1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS









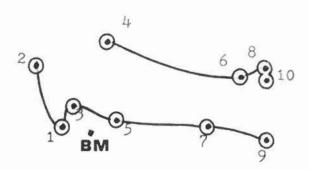
			WAT LAKE						.0				
						LOCATION: LONG 116°45'2							
	The state of the s		/86TIME:	10:00 h	ır		9	LA	T 49°1	8'10"			
10	TURBIC	DITY: C1	rystalline										
	WATER	TEMP	4°C.			AREA	S OF COL	/ER					
	AIR TE	MP: 20	o°c.				abundanı	mod	sparse	oth			
	FLOW:	surfac	e) 0.93m./s	sec.		logs							
			.5%						X	-			
	SUBST	RATE:	silt_2.5 %	sand	2.5 %	rocksX							
					12.5 %	undercuts							
	rubble_	25 %bo	ulder 50 %	<u> </u>		other_				-			
	STREA	M PRO	FILE: 1	2-7 (-3 7.5	STREA	M BANKS	3: steep	p X slo	ping			
	#1			4	\sim	undercut eroded rock X							
			poor [f			soil]						
			good L				OUNDING		-				
	RUN	25 %	RIFFLE 60	% PO	OL 15 9	forest X rangeland Suburban recreational							
	SURRO	NIGNU	G VEGETA	TION:	1								
	type:	abund	ant mod	sparse	none	farmla	and 🔲						
	shrub			Х		PLAN	TS:						
	conif		Х			type:	abundant	modera	te S	oarse			
	decid		Х			Alder		Х					
	grass			X	L	Moss		Х					
	OBSTR	UCTIO	NS: height	locat	location			Х	X				
	dam					INSEC	TS: abunda	nt m	od Isp	arse			
	falls ti	ered)	3-4 m.	appro	x. 1.5	aquati	The second secon						
	culvert			km. f	rom	Epheme	roptera		Х				
	log jam_			confl	uence	Plecop	tera		Х				
	other_					Tricop	tera		Х				
		×				land-							
		х				based							
						gnats			Х				
	COMM	ENTS	:										
	Benchma	ark= La	rge Cedar	approx.	120 m.								
	below 1	barrier	on North	bank.									
	Photo#:	1 Typic	al Reach 1	ooking	upstream	1							
	# 2	2 Typic	al Reach 1	ooking	downstre	am							
	# 3	3 Surve	y Area										
	#1	4 Confl	uence (aer	ial)									
	# 5	5 Confl	uence (loo	king No	rth from	beach)							

1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY

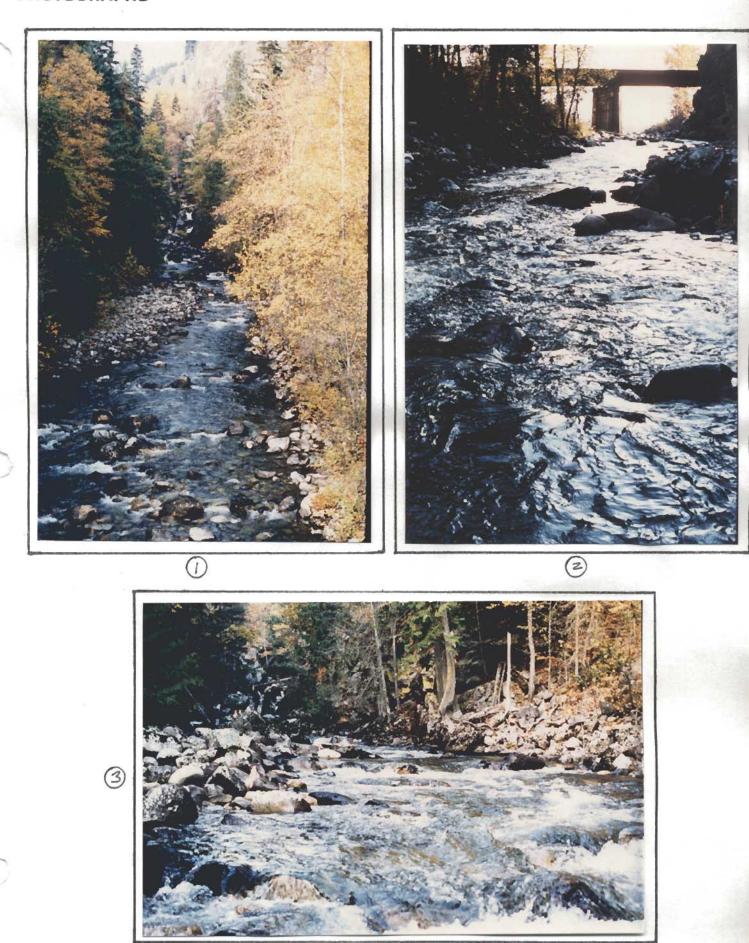
Stream Name: NEXT CREEK

Scale:1cm-4m

A N



Comments: It appears to be more suitable spawning gravel in delta than in entire length of stream accessible. Very little stream bank cover, few pools. Because of steep canyon walls, most of stream is shaded.







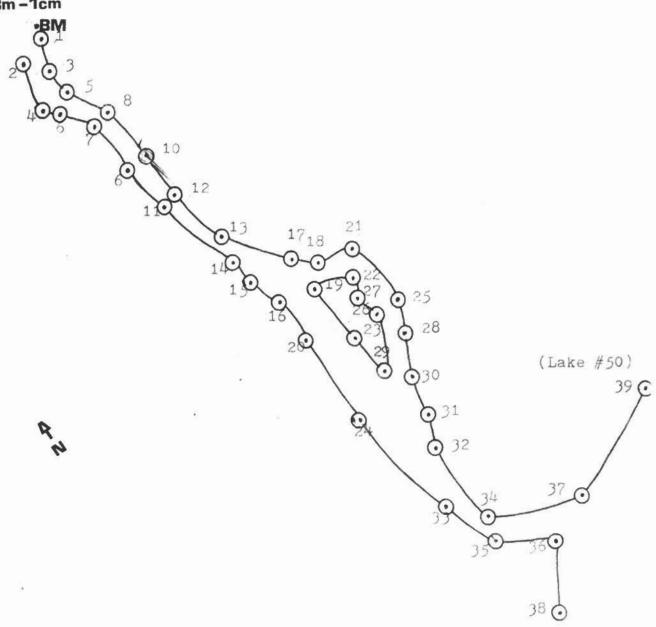
1986	KOOTEN	MAY LAKE	750011	AHIVI	SIREAM			2111		11/0001	
STREA	M: RYKE	ERTS CREEK			LOCATI	ON:			LONG.	116°29'50 49°00'06	
DATE:	June 12/	/86 TIME:	06:00 h	r.					LAT .	49-00-06	
TURBIC	DITY: Sli	ightly Tur	bid		6						
	1	15°C.			AREA	S OF	COV	/ER			
AIR TE	MP: 14	5°C			01	abur	ndan	mo	d sp	arse oth	
		2.94 m.						-		v	
GRADII	ENT: 39	6			rootw	ads		-	-	Х	
SUBST	RATE:	silt 15 %	sand	10 %		ŧ		-		X	
gravel_	gravel 10 % stone, 5 % cobble 10					uts anging		-	-	<u></u>	
rubble	30 %bou	ılder 20 9	6		other grasses X						
	M PRO		- 2- C	-3	STREA					sloping	
#1		8 80004	4	5	under	cut [] er	oded		ock X	
ARMO	URING:	poor 🔲 1	air 🗌		soil X						
modera	te X	good]		SURR	OUND	ING	LAN	יט_ ם ו	SE:	
RUN	30 % R	IFFLE 45	% PO	DL 25				geland	-		
SURRO	UNDING	VEGETA	TION:	1	subur	oan 🗀	rec	reatio	nal X]	
		1 1		1	1 1927 - 10		7				
type:	abunda	nt mod	sparse	none	farmla	and LX	1				
type: shrub	abunda	nt mod	sparse	none	farmi		1				
	abunda		sparse			TS:		mode	erate	sparse	
shrub	abunda	. Х	sparse		PLAN type: alder	TS:		mode	rate	sparse	
shrub conif		. Х	sparse ,		PLAN	TS:		mode		sparse	
shrub conif decid grass	X X	. Х			PLAN type: alder	TS: abund	ant	mode	X	sparse	
shrub conif decid grass	X X	. X			PLAN type: alder birch grasse	TS: abund	ant		Х		
shrub conif decid grass OBSTR	X	. X			PLAN type: alder birch grasse	TS: abund s X	ant		Х	sparse	
shrub conif decid grass OBSTR	X	. X	locat	ion	PLAN type: alder birch grasse INSEC	TS: abund s X TS: ab	ant		Х		
shrub conif decid grass OBSTR dam falls culvert	X	X X X	. locat	ion secon-	PLAN type: alder birch grasse INSEC	TS: abund s X TS: ab ic:	ant		X X mod		
shrub conif decid grass OBSTR dam falls	X	X X X	m. under	ion secon-	PLAN type: alder birch grasse INSEC aquat Plecop	TS: abund s X TS: ab ic: tera	ant		X X mod		
shrub conif decid grass OBSTR dam falls culvert	X	X X X	m. under	ion r secon-	PLAN type: alder birch grasse INSEC aquat Plecop	TS: abund s X TS: ab ic: tera	ant		X X mod	sparse	
shrub conif decid grass OBSTR dam falls culvert	X	X X X	m. under	ion r secon-	PLAN type: alder birch grasse INSEC aquat Plecop Dipter	TS: abund s X TS: ab ic: tera	ant		X X mod	sparse	
shrub conif decid grass OBSTR dam falls culvert	X	X X X	m. under	ion r secon-	PLAN type: alder birch grasse INSEC aquat Plecop Dipter Odonat	TS: abund s X TS: ab ic: tera	ant		X X mod	sparse	
shrub conif decid grass OBSTR dam falls culvert logjam_other	X	X X X	m. under	ion r secon-	PLAN type: alder birch grasse INSEC aquat Plecop Dipter Odonat	TS: abund s X TS: ab ic: tera	ant		X X mod	sparse	
shrub conif decid grass OBSTR dam falls culvert log;am_ other	X X UCTION	X X X	m. under dary	secon- road at	PLAN type: alder birch grasse INSEC aquat Plecop Dipter Odonat	TS: abund s X TS: ab ic: tera	ant		X X mod	sparse	

Photo #1 Typical Reach looking downstrea #2 Typical Reach looking upstream

1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY

Stream Name: RYKERTS CREEK

Scale: 3m -1cm

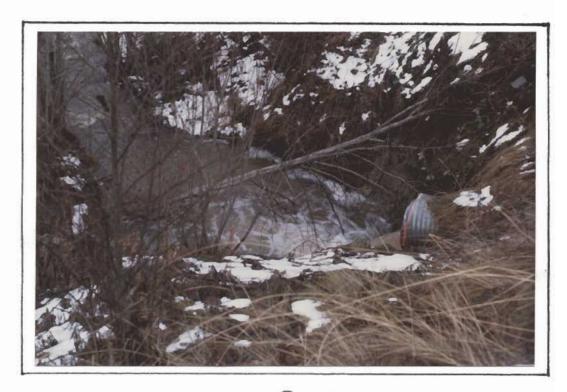


Comments: This stream is tributary to Vic Mawson Lake. There were numerous dead Squawfish with eggs in them along the edges of the stream and on the gravel bar.(early June) Streambank cover on Northern half is abundant trees and shrubs; Southern half is entirely grasses and rushes. The animal effluent from several large dairy farms flows into Rykerts before its entry into Mawson Lake; with obvious discolouration and odour during peak thaw and heavy rains.

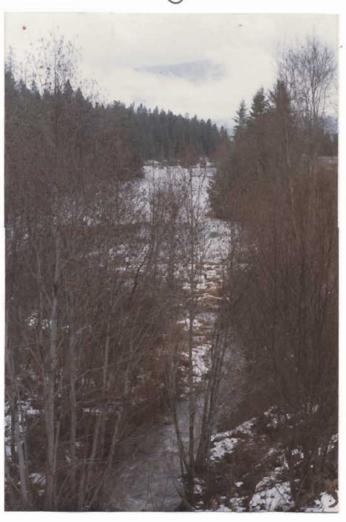




1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS



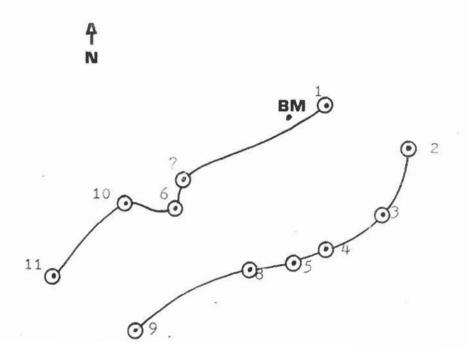




	1986 KUUTENAT LAKE/SUUTH ARIVI S	•					
	STREAM: SANCA CREEK	LOCATION:LONG_116°43'4					
	DATE: Aug. 13/86 TIME: 08:30 hr.	LAT 49°22'25					
7	TURBIDITY:Clear						
	WATER TEMP: 6°C.	AREAS OF COVER					
	AIR TEMP: 14° C.	abundant mod sparse oth					
	FLOW: (surface) 1.22 m./sec.	logs					
	GRADIENT: 3.5%	root wadsX					
	SUBSTRATE: silt Ø) % sand 5 %	rocks					
	gravel 15 % stone, 5 % cobble 5 %	undercuts					
	rubble 20 %boulder 50 %	other					
	STREAM PROFILE: 1 25 53 5 C	STREAM BANKS: steep X sloping					
	#1 4 S	undercut eroded rock					
	ARMOURING: poor _ fair _	soil 🗌					
	moderate good X	SURROUNDING LAND USE:					
	RUN 45 % RIFFLE 45 % POOL 10 %	forest X rangeland					
	SURROUNDING VEGETATION:	suburban recreational					
	type: abundant mod sparse none	farmland					
	shrub	PLANTS:					
	conif	type: abundant moderate sparse					
	decid						
	grass X.						
	OBSTRUCTIONS: height location						
	dam	INSECTS: abundant mod sparse					
	fallsapprox. 2m. approx 4 km.	aquatic:					
	culvert from	Ephemeroptera X					
	logiam confluence						
	other						
	4	land-					
	×	based					
	*	ants X					
	COMMENTS:	bees X					
	Benchmark= Cedar tree 2.5 km. above	wasps X					
	Highway 3a bridge overhanging a huge g	ranite boulder on the North bank.					
	Photo #1 Typical Reach looking upstream						
	#2 Typical Reach looking downst						
	#3 Barrier	E					
	#4 Confluence (aerial)						
	(4 delial)						

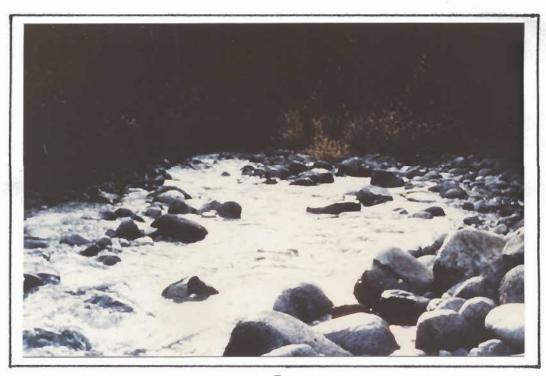
Stream Name: SANCA CREEK

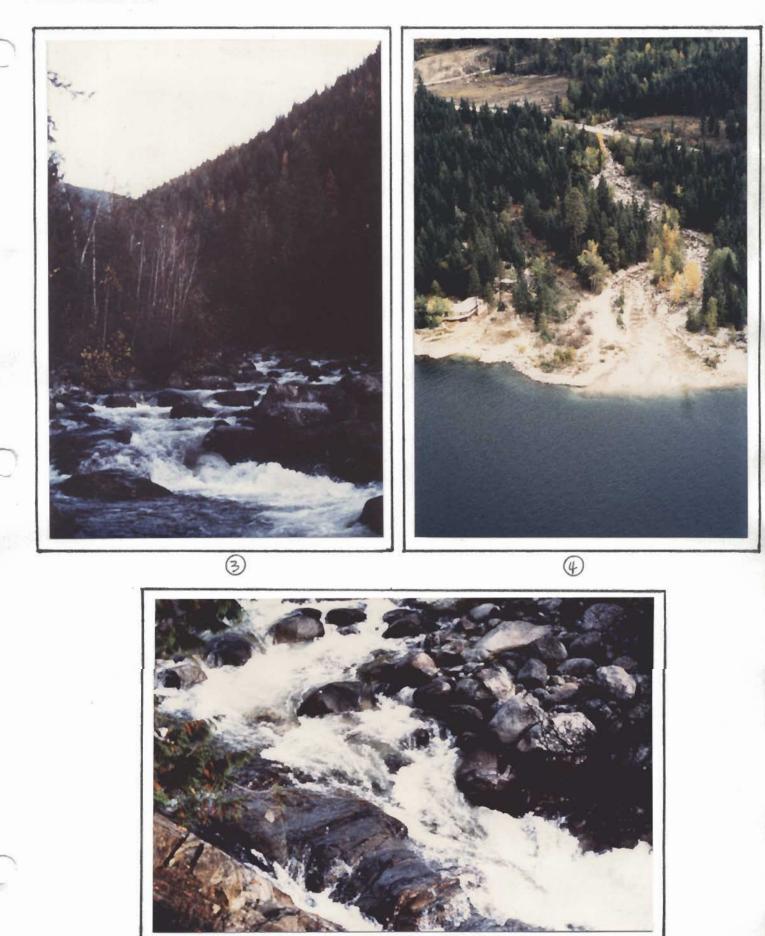
Scale: 1cm - 4m



Comments: Very little stream bank cover. Few pools, undercuts, etc.





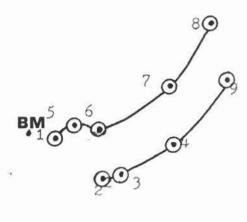


1986 KOOTENAY LAKE /	SOUTH ARM	STREAM INVENT	JRY					
STREAM: SHAW CREEK		LOCATION: LONG 116°42 LAT 49°15						
DATE: 0ct. 2/86 TIME: 1	11:00 hr.		LAT	49 15 40				
TURBIDITY: Clear								
WATER TEMP: 7.5°C.		AREAS OF CO	/ER					
AIR TEMP: 13.5°C.		abundant mod sparse ot						
FLOW:(surface) 1.4 m./s	sec.	logs						
GRADIENT: 3-5%								
SUBSTRATE: silt / % si								
gravel Ø % stone 1.5 %	cobble 5 %	undercuts	-	X				
rubble 80 %boulder 12.5%	/	other						
STREAM PROFILE: 1	27 -3 7 5	STREAM BANK	S: steep X	sloping				
#1	$\frac{2}{4}$ $\frac{2}{5}$	undercut er	oded r	ock X				
ARMOURING: poor fa	ir 🗌	soil 🗌						
moderate good X]	SURROUNDING	LAND US	SE:				
RUN_45 %RIFFLE 45	% POOL 10 %	forest Tangeland						
SURROUNDING VEGETAT	ION:	suburban 🔲 rec	reational					
type: abundant mod s	parse none	farmland						
shrub	Х	PLANTS:						
conif	Х	type: abundant	moderate	sparse				
decid X		alder X						
grass	х	cedar	Х					
OBSTRUCTIONS: height	location	D. Fir	Х					
dam		INSECTS: abunda	int mod	sparse				
falls approx. 3m.	approx. 1.5	aquatic:	Х					
culvert	km from	Ephemeroptera	X					
log i am	confluence	Plecoptera	Х					
other		Tricoptera						
3		land-						
		based		-				
4		spiders		Х				
COMMENTS:								
Benchmark= tree at thebas	se of the path							
under the C.P.R. bridge of	on the North b	ank.						
Photo #1 Typical Reach loc	oking upstream							
#2 Typical Reach loc		am						
#3 Barrier								
#4 Aerial photo show	wing Confluenc	e, Barrier and Rea	ach					
2.70								

Stream Name: Shaw Creek

Scale:1cm-4m

AN

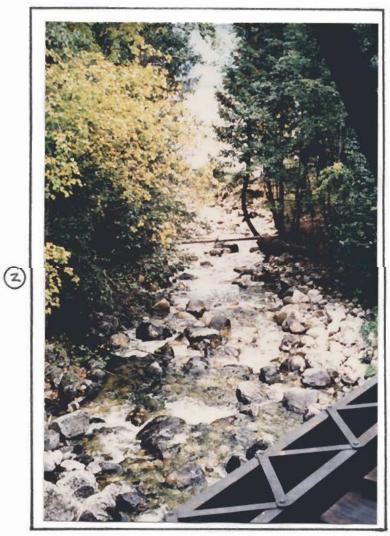


Comments: Has very little gravel. Creek is sharply tiered. The short run between confluence and barrier is man-influenced

along entire north side.

1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS





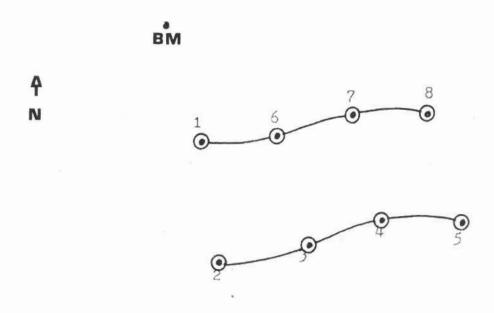




						STREAM								
	STREAM	: SUMMIT	CREEK			LOCATION	l:	LO	NG 1160	38'00				
	DATE: 0	ct. 23/8	6 TIME:	11:00	hr.			LA	T 49°0	9'05				
1	TURBIDI	TY:Clear												
	WATER	TEMP: 5°	c.			AREAS	OF COV	ER						
	AIR TEM	P: 130					abundant	mod		oth				
						logs	-		X					
	GRADIEN	UT: 1%				root wads		Х	Λ.	-				
	SUBSTR	ATE: sil	t_6.5%	sand	3.5 %	rocks								
					1e 40 /	undercocs								
	rubble_5			* \ \	\vee	other								
	STREAM		LE: 1	5-5	53 W	STREAM undercut	BANKS	: steep	SIC SIC	ping				
	#1		\Box		5	(Contract)	: Lero	oded L) rock					
	ARMOUR			Personal		soil X		v ranavana						
	moderate		-		0/	SURROU			-					
	SURROU				JOL 20 4	forest [and the same of th		-					
	1					suburban recreational X								
		abundanı	mod	X	none									
	shrub		X		-	PLANTS	10							
	conif		X		1.	type: ab		modera	te sp	arse				
	grass			X.		Cedar Alder	Х	Х						
	OBSTRU	CTIONS	: height	Linca	tion I	Poplar		X						
	dam		. Horgin	1.000	0.011		del de							
	falls		m.	2 km	. above	aquatic:		nt me	ou spa	arse				
	culvert_					Ephemero			X					
	log j am					Plecopte			(
	other					Tricopte			ζ					
						land-								
		74				based								
		,				spiders				λ				
	COMME	NTS:												
	Benchmar	k=Large	st Cedar	tree	on North									
					3 bridge									
					g downstr									
					g upstrea									
				above	Hwy. 3 br	idge								
		Conflue												
		Barrie		x										
			r(aerial											
	n.b. Po	tal leng	gth of s	tream a	accessible	e is appro	x. 5 km.							

Stream Name: SUMMIT CREEK

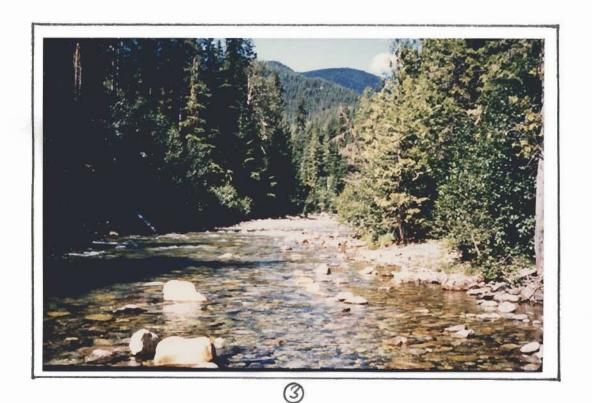
Scale: 1cm-4m



Although the barrier as indicated in this report appeared to be more of an obstacle than a barrier, no Kokanee were found Comments: above this point (3 km above highway bridge). Several pools and moderate stream bank cover of trees and shrubs. Portion within Summit Creek Park deviating constantly. One-half kilometer portion below log bridge rip-rapped on north side, but erosional zone is on south side; here to confluence slow and deep, clay bottom. There are portions which are slow and well-shaded, and may afford rearing habitat.













							INVENT			0			
	STREAM	: WILSO	N CREEK			LOCATI	ON:	L	ONG.	116 51 10			
1	DATE:	Sept.19	<u>/8</u> 6TIME :0	9:30 hr				,L.	AT .	49°33'45			
	TURBIDI	TY: Clea	r										
	WATER	TEMP: 8	°C.			AREAS	OF CO	/ER					
	AIR TEN	1P: 18°C				abundant mod sparse oth							
						logs.							
	GRADIE	NT: 12 5	7.		root wa	ads	X	-					
	SUBSTR	ATE: si	lt5 % s	and	5 %	rocks_	Х	-	+	X			
	gravel_	5 % st	one, 5 %	cobble	5 %			1	+	-			
	rubble_1	0 %bould	der_ 65 %	2 ()	,	other_			-	1			
	STREAM	PROF	LE: 1	275	3 7.5		M BANK						
	#1	-	-	4	5	-	cut 🗌 er	oded		ock			
	ARMOU	RING: po	oor fa	ir 🗌		soil							
	moderat	e X	good L	Ţ		SURR	DUNDING	LAND	ישור	SE:			
					L 35 %		ran			7			
	SURROU	NDING	VEGETA	rion:		suburban recreational							
	type:	abundan	t mod s	_	none	farmla	and L						
	shrub		-	Х		PLANTS:							
Ť.	conif		-			type:	abundant	moder	ate	sparse			
	decid		X			cedar	X	-					
	grass L			Х,		alder				-			
	OBSTRU	CTIONS	: height	locati	on	noss	Х	L					
	dam			 		INSEC	TS: abunda	int in	nod	sparse			
	falls(tie		3 m.		1.5 km	aquatic:							
	culvert_			from		Ephemer			X				
	log jam			conflue	ence	Plecopt			X				
	other					Cricopt	era		X				
		(34)				land-							
		51	7			based		-		-			
		,				spider	`S			 			
	COMME		tree on	Nonth he	nle	-				+			
	Sericinial		cree on ,			L				1			
	Photo#1		Reach 1										
	15				8								
#2 Typical Reach looking #3 Aerial photo of Conflu						e alli							
	#4	Barrier		JOHLLUE	1100								
	7.4	Larrier											

Stream Name:

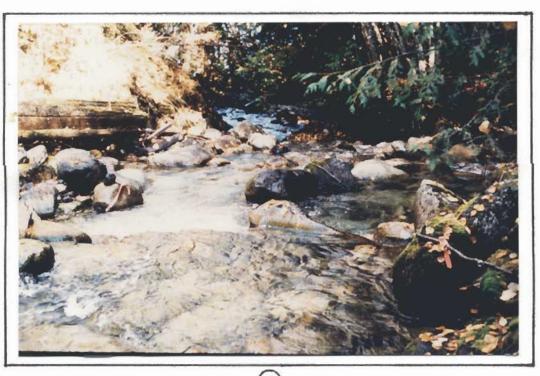
WILSON CREEK

Scale:1cm-4m

Comments: Accessible portion of stream quite steep; however, there are numerous holding pools. Numerous undercuts and root wads.

Stream well shaded by overhanging trees and shrubs.

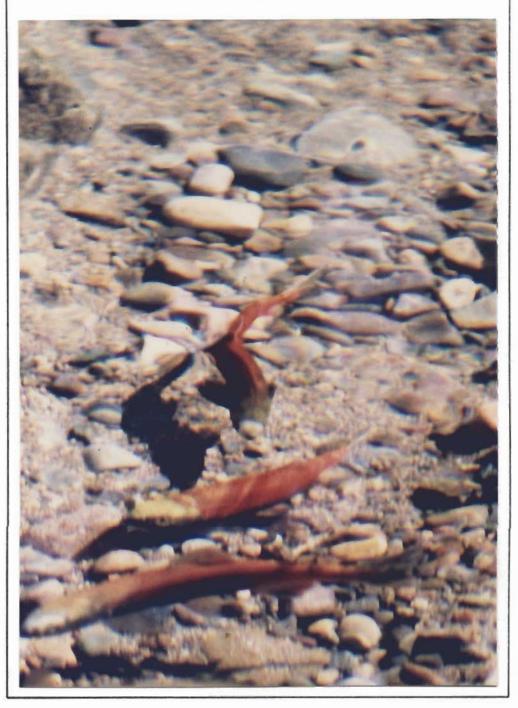




1986 KOOTENAY LAKE/SOUTH ARM STREAM INVENTORY PHOTOGRAPHS



KOKANEE INFORMATION



STR	EAM NAME	NUMBER	100.00	ENGTH	3,000,000	GHT	SEX	# EGGS
Goat	River	1	8.0	cm. 20.0	oz. 2.8	gm. 80	F	56
"	"	2	8.5	21.5	2.8	80	M	-
α	31	3	8.0	20.0	2.5	70	M	-
**	**	4	7.0	17.5	2.1	60	F	37
m	u:	5	7.0	17.5	2.1	60	M	-
	11	5	7.25	18.0	1.8	50	Ĭ∀Ĭ	-
	100	7	7.5	19.0	1.4	40	M	1.00
	all.	8	8.0	20.0	1.6	45	IV.	-
	11	9	7.5	19.0	1.4	40	Ni	-
0	900	10	7.5	19.0	1.6	45	25	93
**	**	11	6.75	17.0	0.4	12	M	-
Ter	10	12	7.25	18.0	1.8	50	М	-
्य	200	13	6.75	17.0	3.3	93	F	34
**		14	7.25	18.0	3.4	95	F	39
эк	м	15	7.5	19.0	3.0	86	F	57
**	**	16	7.25	18.0	1.9	55	is	96
311	11	17	7.25	18.0	1.9	55	F	58
900	211	18	7.5	19.0	2.4	67	Ţ.	47
**	11	19	7.5	19.0	2.1	60	M	-
111	D.	20	7.5	19.0	2.3	65	IV.	
916	n:	21	7.25	18.0	1.7	47	F	8

-Peak	Count	occurred	on	September	2nd,	1986
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-Average Peak Count; 3710 fish, includes 50

dead.

-Water Temperature at peak; 14.5° C.

-To obtain an estimate of the total number of Kokanee utilizing this stream in 1986, the peak live count was multiplied by 2.3

Count	F	1	3650
Count	4	2	3770
Averag	е		3710
Differ	en	ice	3.3%

⁻The total estimated Kokanee in the Goat River in 1986 is 8533.

⁻Skeins from most of the Kokanee examined, were not well developed

STREAM	NAME	NUMBER	LEN	GTH em.	WE:	IGHT gm.	SEX	# EGGS
Summit	Creek	1	7.75	19.75	2.3	65	M	
"	"	2	7.5	19.0	1.9	55	F	4
30	U	3	7.5	19.0	1.9	55	F	69
		4	8.25	20.75	3.2	90	M	-
		5	8.25	20.75	2.5	70	M	-
		6	7.5	19.0	2.1	60	F	7
-11	9	7	7.5	19.0	2.3	65	F	44
	90	8	7.75	19.75	2.5	70	M	-
9	u	9	7.25	18.0	1.8	50	F	1
n	00	10	7.5	19.0	1.9	55	F	4
ō	**	11	8.0	20.0	2.5	70	M	-
9	11.	12	7.5	19.0	1.9	55	I.	128
o	21	13	7.25	18.0	1.9	55	F	5
**		14	7.0	17.5	1.6	45	in.	14
11	11	15	7.75	19.75	2.1	60	M	-
.00		16	7.75	19.75	2.5	70	M	
10	24	17	8.25	20.75	2.5	72	M	-
er:	т.	18	7.5	19.0	2.1	60	F	269
1.0		19	7.5	19.0	2.5	70	M	12
14	**	20	7.5	19.0	2.3	65	M	
11	11	21	7.75	19.75	2.5	70	V^{ϵ}	-
eak Co	unt occ	curred o			1, 1986			
Peak Count occurred on September 3rd, 1986 Average Peak Count; 2375 fish, includes 10						Cot	int # 1	2250
dead						Cor	int # 2	2500
later Pemperature at peak; 15.0° C.						Ave	erage	2375
o obtain an estimate of the total number						Dif	ference	10 %
				ream in				
he pea	k live	count v	as mult	ciplied b	y 2.3			

⁻The total estimated Kokanee in Summit Creek in 1986 is 5460

⁻Skeins from most of the Kokanee examined, were not well developed

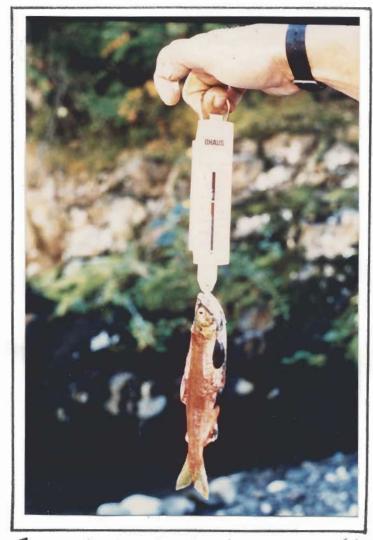
After the Peak Counts, we returned to Gray Creek to capture what we hoped would be spent females so we could photograph the undeveloped skeins for this report. Although the eggs were counted, it is believed that these fish had already spawned. M.C. (Date was September 17th)

		NUMBER	LENGTH		WEIGHT		SEX	# EGGS
		1	in.	cm.	oz.	gm.		
Gray	Creek	1	7.25	18.0	1.5	41	F	14
.000	-0	2	7.5	19.0	1.5	42	F	ø
**	n	3	7.75	19.75	1.75	50	F	6
10	346	4	7.25	18.0	1.5	42	F	3
**	**	5	7.5	19.0	1.75	49	म	4
11.	***	6	9:0	23.0	3.5	100	F.	12

Peak Count Data From East Side streams tributary to the South Arm of Kootenay Lake

STREAM NAME	DATE OF PEAK COUNT	WATER TEMP.	COUNT	ESTIMATED
Akokli Cr.	Sept. 4th	11°C.	13	30
Boulder Cr.	N/A			
Goat River	Sept. 2nd	14:5°C.	3710	8533
Gray Cr.	Sept. 9th	10°C.	204	469
LaFrance Cr.	Sept. 2nd	11°c.	38	88
Lockhart Cr.	Sept. 1st	11°C.	128	294
Sanca Cr.	Sept. 3rd	11°C.	40	92
				9506

West side streams were examined in late August but because of the very low numbers of Kokanee present, it was assumed at that time that the peak had already occurred. On a subsequent trip to the West side, this assumption was confirmed by the presence of even fewer Kokanee. For this reason, Summit Creek is the only West side stream documented for a Peak Count. M.C.



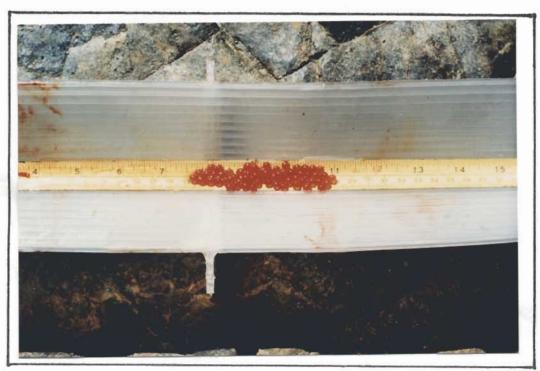
Typical 0, 7 3/4" - 2.47 oz. (19.7 cm. - 65 gm.)





Typical Q , 7 1/2" - 3.36 oz. (19 cm. - 55 gm.)





Eggs from fish #17, Goat River.







Gray Creek #1 Length



Gray Creek # 1 Weight



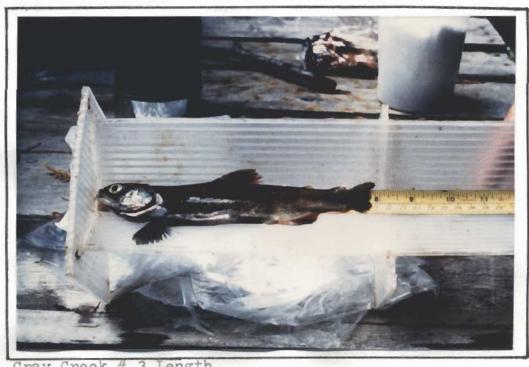
Gray Creek # 2 Weight



Gray Creek # 2 Length No Eggs Present



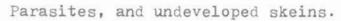
Gray Creek # 3 Weight

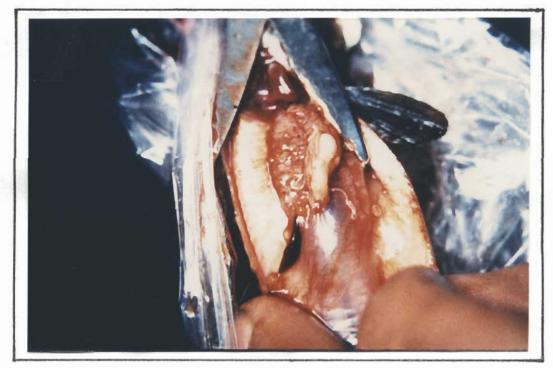


Gray Creek # 3 Length



Parasites, found in several Q Kokanee.





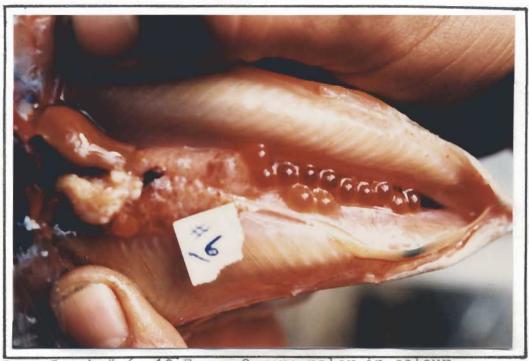


Comparison, undeveloped skeins and parasites.



Gray Creek, #3, eggs & undeveloped skeins.



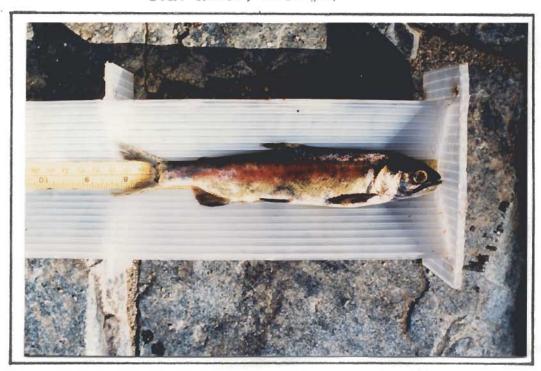


Gray Creek # 6 12 Eggs, 2 were paler in colour





Goat River, fish #17



RECOMMENDATIONS AND CONCLUSIONS

As with any first time effort, this project identified several suggestions that were not presented in the content of this report.

Survey teams of three people were most effective, and a minimum of two teams would facilitate data collection during the peak spawning runs. If stream surveys are to be done concurrently with enumeration, additional teams are recommended to insure adequate time for data collection

Equipment requirements were refined through trial and error. A 250 gram scale (spring type) was used but a more precise scale is suggested for future data collection due to the small size of fish sampled. Fiberglas tapes for the surveys were superior to their steel counterparts. Steel tapes cut fingers, hang up easily on substrate, rust and eventually break.

A new design of scale board was constructed for this project and proved to be very effective and durable. The design and materials used are included in the back of this report and a copy will be provided to the Fisheries Branch.

During the spawning runs, many local residents commented that, in their opinion, the numbers were lower than in 1985. If possible, the collection of enumeration data should be continued for at least three years to include all age classes of Kokanee, or for six years to provide comparison data on specific age classes.

The Creston Valley Rod and Gun Club would like to thank all of the agencies and individuals who contributed to the sucess of this project. A special thanks goes to the Regional Fisheries Staff whose insight, patience and confidence allowed the Club to complete this project. We are optimistic that the information provided in this report will be a useful contribution toward future management strategies for the South Arm of Kootenay Lake.

For additional information please contact:

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