

ANNUAL REPORT OF THE
LOWER MAINLAND REGION - 1969



INDEX

PAGE

ADMINISTRATION

ENFORCEMENT	1
FUR TRADE	4
GUIDE & TRAP-LINES	7
INFORMATION CENTRE	8
PREDATOR CONTROL	8
REVENUE	10

FISHERIES MANAGEMENT

INTRODUCTION	11
ANGLER LICENCE SALES	15
CREEL CENSUS	17
FISH LIBERATIONS	20
REGULATIONS	23
LAKE AND STREAM SURVEY	23
STEELHEAD MANAGEMENT	25
PROTECTION	27
HABITAT IMPROVEMENT	33
MANAGEMENT REPORTS	34
FRASER RIVER STURGEON TAGGING	36
SUMMARY	47
RECOMMENDATIONS	48

WILDLIFE MANAGEMENT

INTRODUCTION	49
BIG GAME - GENERAL	49
DEER	50
MOUNTAIN GOATS	56
WATERFOWL	59
PHEASANTS	63

ADMINISTRATION
LOWER MAINLAND REGION

1969

ENFORCEMENT:

Prosecutions increased substantially over 1968, but the pattern remained very much the same. The Wildlife Ticket was introduced during the year, but too late to have any very marked effect. Some Conservation Officers seem to be a bit hesitant in adopting a new technique. With one exception, the Judges accepted the Wildlife Ticket readily, and in almost every case adopted a scale of penalties more realistic than the penalties that had been imposed previously. One Judge in the Region considers the Ticket to be defective, and will not allow it's use within his jurisdiction.

Notwithstanding, the Wildlife Ticket will undoubtedly become a valuable tool, that will lead to increased enforcement activity and efficiency, and at the same time be a decided convenience to the public.

Loaded firearms carried in vehicles continues to be the leading problem, although the increase this year is quite modest, approximately 12% as against 97.5% last year. Since we have no reason to suspect a lessening of enforcement diligence, it might very well be that active enforcement and more severe penalties are finally combining to bring this dangerous practice under control.

Prosecutions for hunting migratory birds during closed hours increased from 6 in 1968 to 27 in 1969. This increase was entirely the work of one Conservation Officer. For some reason, he received an increased number of complaints of this infraction, which he dealt with effectively.

The use of mobile radio was stepped up substantially. The Region now has eight vehicles with permanently installed two-way radios, a base station in a Conservation Officer's home for relaying telephone message, and one "portified" unit that can be used in any vehicle as required. It is not possible to express in numerical terms the advantages that accrue, but it is quite clear that the cost of the equipment is more than saved in direct efficiency, while as a bonus the men do a better job. Perhaps it's greatest value will be in building esprit de corps, and cohesion.

Following is a break-down of prosecutions, confiscations, licence cancellations, and accidents associated with hunting and fishing.

STATEMENT OF PROSECUTIONS
1969

SECTION	SUB-SECTION	DESCRIPTION	NO. OF OFFENCES
<u>MIGRATORY BIRDS ACT</u>			
9		Obstruct officer	2
<u>MIGRATORY BIRDS REGS.</u>			
4	1(a)	Hunt without permit	2
4	1(b)	Hunt in closed season	1
6		Possess in closed season	1
19	1	Shoot from power boat	1
22	1	Hunt after legal hours	27
<u>FIREARMS ACT</u>			
6		Loaded firearm in vehicle	51
<u>WILDLIFE ACT</u>			
3	3	Angling without licence	35
4	1(a)	Hunt game in sanctuary	2
4	1(c)	Hunt game in closed season	5
7	1	Hunt in prohibited hours	1
7	2(b)	Hunt with a light	1
9	1	Possess game in closed season	8
10		Destroy a bird	2
14	(b)	Trespass on cultivated land	2
16		Sell game meat	1
23		Fail to produce licence	1
<u>FISHERIES ACT</u>			
18		Unlawful possession of fish	3
33	(2)	Deleterious substance in water	1

PROSECUTIONS (CONT.)

FISHERIES REGS.

76	(2)	Take over limit of fish	1
80	1(b)	Use more than one rod	9
84		Angling in closed water	12
O.I.C. 519		Fail to record steelhead catch	2
		Fish steelhead without licence	1
		Special Regs. - Chilliwack River	2
		Fail to cancel game tag	1

GAME TAG REGS.

TRESPASS ACT

4		Trespass on enclosed lands	3
---	--	----------------------------	---

TOTAL 178

CONFISCATIONS:

Fishing rod, reel, etc.	2
.22 calibre rifles	4
.12 gauge shotguns	2
.303 cal. rifle	1
.300 Magnum Winchester	1
.300 Savage rifle	1

PROSECUTIONS DISMISSED:

Migratory Birds Regs.-Sec. 22 (1)	2
Fishery Act-Sec. 18	3
Wildlife Act-Sec. 4 (1)(a)	1

REFERRED CASES:

Court appearances for other Regions	19
-------------------------------------	----

INVESTIGATIONS:

Assistance to other Regions	8
-----------------------------	---

LICENCES CANCELLED:

Violations and accidents	13
--------------------------	----

FIREARMS HUNTING ACCIDENTS:

Not serious	1
-------------	---

NON-FIREARMS HUNTING ACCIDENTS:

Total (due to fall)	1
---------------------	---

FUR TRADE:

Total trapping effort, so far as this region is concerned, indicates a 6.7% increase over last year with a sharp rise in the number of beaver pelts taken.

Small pelts, such as squirrel and weasel, are simply not in demand today.

Average prices for this past year, generally, have shown a rise. Coast mink are not in demand and the average price for mink has dropped steadily this past few years. Certain long-hair types have been in great demand and a quick check of the accompanying charts will bear this out with substantially higher prices shown. Note prices for wolves, coyotes, wolverine, otter and fisher. Lynx and bobcat were in great demand also although the increase in price for these species is not as sharp as the other species mentioned.

The following table shows comparison of the furs shipped into Vancouver for the years 1968 and 1969.

TABLE I - Comparison of Furs Shipped into
Vancouver for the years 1968 - 1969

SPECIES	1968	1969	UP	DOWN
Mink	3,520	3,481		39
Beaver	16,504	22,476	5,972	
Fisher	482	485	3	
Red Fox	196	180		16
Cross Fox	26	50	24	
Silver Fox	9	11	2	
Lynx	759	881	122	
Bobcat	202	304	102	
Marten	5,113	5,307	194	
Muskrats	17,542	22,118	4,576	
Otter	737	632		105
Squirrel	70,094	67,802		2,292
Weasel	4,574	3,377		1,197
Wolverine	164	179	15	
Black Bear	202	291	89	
Grizzly Bear	15	8		7
Coyote	156	551	395	
Cougar	25	33	8	
Wolf	10	62	52	
Raccoon	309	516	207	
	<u>120,650</u>	<u>128,744</u>		

Total furs shipped to Vancouver during 1969 increased 6.7% although royalties collected decreased by 9.2%.

TABLE II - STATEMENT OF FURS SHIPPED OUT OF VANCOUVER
AREA DURING 1969, THEIR VALUES & ROYALTY COLLECTED

NUMBER OF PELTS	SPECIES	MARKET VALUE	AVERAGE PRICE PER PELT		ROYALTY COLLECTED 1969
			1969	1968	
6,574	Mink	50,933.37	7.75	9.85	1,664.00
24,755	Beaver	416,114.60	16.81	15.27	13,667.25
466	Fisher	7,700.25	16.52	12.73	488.00
649	Red Fox	7,092.66	10.93	-	66.50
72	Cross Fox	1,345.66	18.69	8.72	12.50
12	Silver Fox	141.60	11.80	8.26	3.00
1,503	Lynx	53,427.87	35.55	31.46	678.00
609	Bobcat	16,415.19	26.95	22.52	153.00
7,114	Marten	87,983.85	12.36	8.89	2,452.50
99,090	Muskrats	142,709.53	1.44	1.22	989.70
901	Otter	31,889.17	35.39	19.74	771.25
32,244	Squirrel	18,701.52	.58	.53	1,309.14
4,420	Weasel	5,127.20	1.16	1.14	170.55
166	Wolverine	9,328.50	56.20	34.72	149.25
237	Black Bear	7,153.49	30.18	27.46	-
7	Grizzly Bear	595.00	85.00	83.05	-
1,036	Coyote	15,798.98	15.25	2.22	-
22	Cougar	594.00	27.00	30.86	-
120	Wolf	6,022.46	50.19	21.71	-
1,326	Raccoon	10,269.75	7.74	7.58	-
<u>181,325</u>		<u>889,344.95</u>			<u>\$ 22,574.89</u>

GUIDE SUCCESS 1969

MGT. AREA	NO. OF GUIDES	NO. OF ASSIST.	NO. OF HTRS. R. NR.	MOOSE	GOAT	DEER	SHEEP	GRIZZLY BEAR	BLACK BEAR
2	4	1		NO RETURNS					
3	5	2	2 14			1			2
4	9	6	13 22	2	17	20			4

TRAP LINE STATUS - 1969

NO. AND TYPE OF LICENCES ISSUED

REGISTERED	MUNICIPAL & PR. PROPERTY	INDIAN LINES
129	105	6 Company 79 Individual
Plus 14 Juvenile Permits		

INFORMATION CENTRE:

Enquiries increased approximately 20% over the previous year, to a total of 59,053, of which 13,013 dealt directly with hunting and fishing. A substantial number of unsegregated enquiries dealt with other aspects of Branch work, such as employment, and Wildlife Review. A large and increasing problem is encountered when a school teacher gives a class an assignment to research and report on "pollution", "conservation" or other such broadly defined subjects. We are not well equipped to handle such enquiries, and perhaps an excellent opportunity to reach the public is neglected.

PERSONNEL:

During the year J. W. Walker, Conservation Officer stationed at Haney resigned from the Branch to accept employment with the Federal Government, in a position which he felt would offer more opportunity for advancement. He was replaced by Conservation Officer C. R. McIvor. W. J. Mason, Conservation Officer at Sechelt, retired after many years of service with the Provincial Government. He was a highly respected member of the Branch, and the esteem in which he was held by his fellow workers was suitably expressed. He was replaced by Conservation Officer H. D. Mulligan, who transferred down from Williams Lake.

Conservation Officers attended 80 meetings during the year, and other members attended a substantial number of additional meetings.

PREDATOR CONTROL:

A total of 290 recorded complaints were received concerning nuisance animals. Of these 114 concerned bear, 25 cougar, and 39 coyote, representing a decrease from last years total for these animals. Coyote continue to cause concern, because they are extremely destructive of domestic animals, and are very difficult to control in the settled areas they are now found in.

POISON STATIONS FOR 1969

West Pavilion	-	Vedder Mt. (2)
Bridge River	.	
Texas Creek		Hatzic Prairie
Fountain Valley		Chehalis
28 Mile		Agassiz
18 Mile		Stave Lake
Rosedale		

The following is a list of the nuisance animals and birds taken by Regional personnel because of complaints, or incidental to other work:-

NUISANCE ANIMALS AND BIRDS TAKEN 1969

Bear	44	Fox	22
Bobcat	4	Opossum	10
Cat	27	Raccoon	20
Cougar	4	Raven	16
Coyote	22	Skunk	8
Crow	75	Starling	8
Dog	24	Beaver	6

Stock losses were not severe, and among the more valuable domestics were 10 sheep, 5 calves, 3 goats, and 2 pigs. There were other losses of small animals, poultry, and beehives, as well as damage to crops.

STATEMENT OF REVENUE COLLECTED BY
PERSONNEL OF THE LOWER MAINLAND REGION
1969

R.A.L. (3.00)	1,166	3,498.00
R.A.L. (DUPLICATE)	53	53.00
R.H.L. (4.00)	700	2,800.00
R.H.L. (DUPLICATE)	64	64.00
R.T.L. (5.00)	217	1,085.00
RES. STEELHEAD	405	101.25
N.R.A.L. (10.00)	113	1,130.00
N.R.A.L. (3.50)	93	325.50
N.R.A.L. (1.00)	64	64.00
NON-RES. STEELHEAD	30	150.00
N.R.A.H.L. (25.00)	43	1,175.00
C.H.L. (15.00)	1	15.00
FUR TAX RECEIPTS	57	22,554.64
TROPHY FEES	26	1,535.00
FUR TRADERS (25.00)	9	225.00
FUR TRADERS (100.00)	1	100.00
PROV. RECEIPTS	26	129.45
GUIDES (1st Class)	5	75.00
GUIDES (2nd Class)	12	120.00
GUIDES (3rd Class)	13	65.00
MOOSE TAGS	202	1,212.00
GRIZZLY BEAR TAGS	48	480.00
BLACK BEAR TAGS	226	113.00
DEER TAGS	685	685.00
ELK TAGS	36	180.00
MT. GOAT TAGS	82	164.00
MT. SHEEP TAGS	25	125.00
CARIBOU TAGS	24	120.00

\$ 38,343.84

FISHERIES MANAGEMENT
LOWER MAINLAND REGION

1969

INTRODUCTION:

The Fraser Valley from Vancouver to Hope has six Fish and Wildlife detachments.

- 1) Hope - There are two prominent steelhead rivers in this area:
 - a) Coquihalla River
 - b) Silverhope Creek

The Coquihalla "runs" have been declining in recent years. This river has both summer and winter "runs" and is still fished by avid steelheaders. An estimated 259 steelhead were harvested in 1968.

Silverhope Creek steelhead fishery has also declined in recent years. The 1968 reported harvest was 252 steelhead.

The other quality river fishery in the Hope detachment area is the Skagit River. Rainbow trout, Dolly Varden, Eastern Brook, in all size categories, have been harvested. This fishery has maintained itself despite intense fishing pressure. However, the proposed further flooding of Ross Reservoir will destroy upstream spawning areas favored by the above species. A significant and dramatic decline can be expected if the area is flooded.

The lakes in this area are intensively angled during the summer months. Fish liberations are common practice in this area.

- 2) Chilliwack - The Chilliwack area is appreciated and utilized by all recreationalists.

Cultus Lake has become a popular summer resort area. Cultus Lake itself sustains a quality Rainbow trout, Dolly Varden fishery. However, the lake is now used primarily for various water sports and the interest in the lake fishing has declined.

Jones Lake provides an excellent kokanee-rainbow trout fishery. 1969 records indicate a catch of 5561 fish, in all size categories. With the improvement in access in 1967, the Jones Lake fishery has received fishing pressure which has necessitated the re-assessment of bag limits. In 1970, the kokanee bag limits on Jones Lake will be identical to those in other regions of B. C.

Chilliwack Lake and Chilliwack River. Chilliwack River is the more intensively fished. Chilliwack Lake does maintain populations of Rainbow trout, Cutthroat trout, Kokanee, and Dolly Varden. However, access facilities are limited. Future access improvements will promote greater fishing pressure which this lake can withstand.

The Chilliwack River is most noted for its quality steelhead fishery. An estimated 3728 steelhead were harvested in 1968. The upstream closed area of the Chilliwack River has sizeable populations of Rainbow trout, cutthroat trout and Dolly Varden.

3) Mission - Two large lakes, Harrison and Stave, are found in this area. Neither provides a significant fishery. Harrison Lake is subject to rapid changes in weather and boating conditions. Stave Lake, a man-made lake is inconsistently fished, as a result of the extensive areas of submerged timber, which makes angling and boating hazardous.

Chehalis Lake maintains a quality Rainbow trout, Dolly Varden, Whitefish fishery. The Chehalis River is also a quality steelhead river.

Most of the fishing pressure in this area is concentrated on 4 or 5 lakes which are intensively fished and regularly stocked. The lakes are Weaver, Hicks, Grace, and Wolf.

4) Haney - The North and South Alouette Rivers and the Coquitlam River provide the quality fishing in this area. The three rivers sustain sizeable steelhead runs although the Coquitlam run is declining. The estimated 1968 North Alouette was 58 steelhead. The estimated catch for the South Alouette was 519 steelhead and 229 were estimated for the Coquitlam.

The decline in the Coquitlam fishery is attributed to indiscriminate gravel removal and flood control operations on the river.

Alouette Lake is situated in Golden Ears Park. The park and lake receive a most intense recreational pressure. The fishing pressure, however, is limited due to the limited capabilities of Alouette Lake. This is a man-made lake with considerable draw-down

and low TDS. However, the lake is deep and consequently, in an attempt to improve the fishery, a 3 year program of lake trout stocking has been undertaken.

Pitt Lake is not heavily fished despite its size. The limited fishing pressure is related to problems of access and weather conditions.

Other lakes which also receive fishing pressure are Rolley, Buntzen Lake and Whonnock Lake.

5) Cloverdale - There are but a few lakes in this area. Mill Lake (Abbotsford) is 46 acres in area and is situated in the heart of Abbotsford. The leisure fishing pressure is satisfied by a put-take stocking program.

The Nicomekl, Serpentine and Little Campbell Rivers meet the demands of some of the Lower Mainland anglers. 112 steelhead were estimated to have been taken in the Nicomekl while 18 were estimated for the Serpentine.

The problems of this area relate to people management. There is a concentration of people and industry in this area.

The pollution problems of this area represent upwards of 80% of the total pollutions in the entire Lower Mainland region.

6) North Shore - The North Shore streams have suffered from urbanization and development. There are water storage dams on the Capilano River and Seymour River. However, these rivers do maintain steelhead runs. The Seymour River is the more prolific, 474 steelhead were estimated in 1968. 214 steelhead were angled in the Capilano and 128 were estimated in Lynn Creek.

The Lynn Creek runs have apparently diminished as a result of indiscriminate flood control and engineering practices.

The 4 Non Lower Mainland Area detachments are as follows.

7) Squamish-Pemberton - As a year-round recreational area, this area is comparable to the Chilliwack River area. The winter recreation is divided amongst the skiing public, the steelhead anglers on the Squamish-Cheakamus Rivers and outdoor enthusiasts.

An estimated 1667 steelhead were angled in the Squamish-Cheakamus system. This system also supports resident populations of Rainbow trout, Dolly Varden and Cutthroat trout.

Fishing, camping and sight-seeing are prevalent in this area in the summer period. The fishery in this area is primarily a put-take fishery. Daisy Lake (a man-made lake on the Cheakamus River) is one of the few self-recruiting lakes in the area.

This area is undergoing and will undergo rapid future development. Ski developments are inevitable. Population expansion towards Pemberton and D'Arcy is inevitable. Improved road access will hasten and "push" into these areas. Fishing pressure will further increase.

8) The Sechelt - "The Sunshine Coast" area is rapidly expanding as a general recreational area. Improvement in access facilities (ferry service) has resulted in the rapid increase in fishing pressure during the summer months. There are a limited number of lakes in the area. The majority of the lakes are small and are stocked regularly with Coastal Cutthroat trout. The two large lakes, Sakinaw and Ruby Lakes do sustain a quality Cutthroat fishery. In an effort to maintain this quality fishery under increasing fishing pressure, an artificial spawning channel has been constructed in the outlet of Ruby Lake. It remains to be seen if the lakes can recruit cutthroat populations large enough to maintain the high quality fishery.

Stream fishing is limited.

Salt-chuck fishing does relieve some of the fishing pressure on the Sechelt Peninsula.

9) Powell River - The Powell River area has one of the highest fishing potentials in the Lower Mainland Region. The fresh water fishery resource has yet to be significantly tapped as a result of:

- a) limited access (2 ferries from Vancouver)
- b) excellent salt chuck fishing

Quality angling is to be found in most lakes in this area. Cutthroat trout are native to this region. Cutthroat up to 4 lbs. have been recorded. Kokanee are also to be found in these lakes.

This area is heavily logged. Most of the problems concerning the fishery resource in the Powell River area are related to logging activities. Fortunately, liaison and co-operation between the Fish and Wildlife Branch and logging interests is excellent.

10) Lillooet-D'Arcy - This area is relatively inaccessible. The full potentials of this area have yet to be realized. Access from Pemberton or Lytton is restricted. Any access improvements will open this area to the angling public. Although very little is known about the Yalakom, Tyughton, Lillooet and Bridge Rivers, they apparently do sustain game fish populations. The Bridge River does have sizeable Spring Salmon and steelhead runs.

The lakes in this area which have been relatively untapped are: Downton, Seton, Carpenter, Anderson, Gun and Duffey.

The Lower Mainland Region is anticipating an increase in fishing pressure in this area. Consequently, a number of lakes are being stocked, e.g. Carpenter - 750,000 kokanee - 1970.

ANGLER LICENCE SALES:

Lower Mainland angler licence sales have remained uniform since 1966. The total licence sales for the Province, however, has been increasing regularly since 1960. The provincial angling licence sales for 1968-69 were 186,761. The angling licence sales for the Lower Mainland was 62,789. This represented a 0.5% decrease in sales from 1967-68.

Angling licence sale statistics for 1968-69 are recorded in Table 1.

Table 1 - The Sales of Licences for the Lower Mainland
Region* and the Province from 1960 to 1968

YEAR	NO. OF RES. ANGLER'S LICENCES, L. MAINLAND	% INCREASE OR DECREASE IN L. M. OVER PREVIOUS YEAR	NO. OF RES. ANGLER'S LICENCES, PROVINCE	% INCREASE PROVINCE	% LOWER MAINLAND OF PROV.
1960	53,587	-	139,383	-	38.4
1961	52,434	- 2.2	139,945	+ 0.40	37.4
1962	52,837	+ 0.8	144,090	+ 2.96	36.6
1963	53,053	+ 0.4	151,271	+ 4.98	35.0
1964-65	57,576	+ 3.5	154,665	+ 2.24	37.3
1965-66	57,090	- 0.8	166,340	+ 7.55	34.2
1966-67	62,787	+10.0	180,823	+ 8.71	34.7
1967-68	63,106	+ 0.3	183,964	- 1.74	34.3
1968-69	62,789	- 0.5	186,761	+ 1.52	33.5

* The Lower Mainland includes Management Areas 2, 3 and 4. Figures taken from sales records of Government Agents in Powell River, Vancouver, New Westminster, and Lillooet.

CREEL CENSUS:

The 1968-69 Creel Census was conducted on a casual basis. The 1968-69 census data in Table 2 has been edited to include the streams and lakes of importance in each detachment. Twenty-three lakes and streams have been omitted.

Table 2 - Summary of Creel Census - 1969

LAKE OR STREAM	NO. OF ANGLERS	HOURS FISHED	SIZE			TOTAL FISH	C.U.E.
			0"-10"	10"-14"	Ov. 14"		
Alice Lake (Squamish)	183	222	67R	60R		127	0.57
S. Alouette (Haney)	249	731.5	1WF	5CT 1R	13SH 7CT	27	0.04
N. Alouette (Haney)	4	4	-	-	1SH	1	0.25
Alouette Lake (Haney)	57	206	22K 4CT	15K 14CT	1DV	65	0.32
Bertrand Creek (Cloverdale)	10	19	4R	-	-	4	0.21
Brohm Lake (Squamish)	43	45	11 CT	-	-	11	0.24
Browning Lake (Squamish)	38	44.5	5R	5R	-	10	0.22
Campbell River (Cloverdale)	3	7	-	-	-	-	-
Capilano River (North Shore)	112	238	-	1CT	2CT 5SH	10	0.04
Cheakamus River (Squamish)	772	3080	-	-	91SH 8DV	99	0.03
Chilliwack Lk. (Chilliwack)	430	1957	8R 11DV 26K 8CT	32R 19DV 1K 3CT	5R 11DV	122	0.06
Chilliwack River (Chilliwack)	15	47	7R 1K	1W	-	9	0.19
Coquitlam River (Haney)	34	73	-	1CT	1DV	2	0.03

Table 2 - Summary of Creel Census - 1969 (Cont.)

LAKE OR STREAM	NO. OF ANGLERS	HOURS FISHED	SIZE			TOTAL FISH	C.U.E.
			0"-10"	10"-14"	Ov. 14"		
Deer Lake (Harrison) (Mission)	23	117	33R	29R	5R	69	0.59
Fraser River	43	148.5	-	-	-	-	-
Garden Lake (Sechelt)	29	65.5	12CT	15CT	3CT	30	0.46
Grace Lake (Mission)	54	223	138R	10R	1R	149	0.67
Hicks Lake (Mission)	26	145	49R 9EBT	7R	3R	58	0.40
Hotel Lake (Sechelt)	39	83.5	5CT	18CT	14CT	37	0.44
Jones Lake (Chilliwack)	652	4038.5	513R 3992K	576R 437K	39R 4K	5561	1.4
Kawkawa Lake (Hope)	4	26	2K	3R	1R	6	0.23
Lindemann Lake (Chilliwack)	27	76.5	14R	6R	3R	23	0.30
Lucille Lake (Squamish)	8	23.5	2R	2R	-	4	0.17
Lynn Creek (North Shore)	65	106.5	-	1CT	2SH 1CT	4	0.04
Nicomekl River (Cloverdale)	60	82	2CT	4CT	3SH	9	0.11
North Lake (Sechelt)	14	29	4CT	7CT	2CT	13	0.45
Rolley Lake (Haney)	11	12.5	-	-	-	-	-
Ruby Lake (Sechelt)	115	278	31CT	41CT	20CT	92	0.33
Sakinaw Lake (Sechelt)	52	167	16CT 3K	40CT	10CT	69	0.41
Serpentine River (Cloverdale)	3	5.5	-	-	1CT	1	0.18
Seymour River (North Shore)	135	204	-	-	10SH	10	0.05

Table 2 - Summary of Creel Census - 1969 (Cont.)

LAKE OR STREAM	NO. OF ANGLERS	HOURS FISHED	SIZE			TOTAL FISH	C.U.E.
			0"-10"	10"-14"	Ov. 14"		
Squamish River (Squamish)	56	240	-	2DV	5SH	7	0.03
Stave River (Haney)	88	156	1CT 1R	1CT 1W	1CT	5	0.03
Vedder River (Chilliwack)	518	1244.5	1WF	6WF	52SH 13WF	72	0.06
Vedder Canal (Chilliwack)	82	41	-	-	1SH 1SPR 1CARP	9	0.21
Weaver Lake (Mission)	63	287	57R	18R	3R	78	0.27
Whonnock Lake (Haney)	16	24	-	2R 12EBT	-	14	0.58
Wolf Lake (Mission)	11	28	6R	9R	2R	17	0.60
TOTALS:	4171	14,565				6825	

FISH LIBERATIONS:

Fish liberations for the years 1964-69 are presented in Table 3.

Table 3 - Fish Liberations for Years 1964-69

YEAR	SPECIES	NO. OF LAKES STOCKED	FISH/LB.	NUMBER DISTRIBUTED
1964	Rainbow Trout	12	2-5	24,450
		2	9-12	3,285
		2	86-100	3,000
		<u>3</u>	2,500	<u>25,000</u>
		<u>19</u>		<u>55,735</u>
1965	Eastern Brook Trout	1	315	3,780
	Cutthroat Trout	6	90	66,240
	Rainbow Trout	1	1	500
		5	212	18,075
		<u>5</u>	3,400	<u>51,000</u>
		<u>18</u>		<u>139,595</u>
1966	Kokanee	1	58	14,470
	Eastern Brook Trout	1	1,000	9,750
	Cutthroat Trout	2	7-8	2,900
		6	13-15	52,190
	Rainbow Trout	2	14-24	3,700
		8	140-170	37,480
		2	750	12,750
		<u>1</u>	1,700	<u>15,300</u>
		<u>23</u>		<u>148,540</u>

Table 3 - Fish Liberations for Years 1964-69 (Cont.)

YEAR	SPECIES	NO. OF LAKES STOCKED	FISH/LB.	NUMBER DISTRIBUTED
1967	Rainbow Trout	10	2-6	30,585
		9	70-160	50,770
		6	1650-2500	100,000
	Cutthroat Trout	<u>4</u>	40	<u>34,000</u>
		29		215,355
		<u> </u>		<u> </u>
1968	Cutthroat Trout	1	15	5,000
		6	50-60	40,750
		3	75-100	84,650
	Rainbow Trout	8	3-10	22,665
		8	10-30	57,000
		2	70	10,080
		1	488	20,000
		2	2650	42,400
	Splake	2	627	26,180
	Lake Trout	<u>1</u>	184	<u>68,800</u>
		34		422,525
		<u> </u>		<u> </u>
1969	Cutthroat Trout	4	75	34,000
	Lake Trout	1	30	97,500
	Rainbow Trout	14	2-4	44,146
		3	12	21,628
		<u>3</u>	80-150	<u>12,615</u>
		25		209,889
		<u> </u>		<u> </u>

The fish distributions per lake in the Lower Mainland for 1969 is as follows:

Table 4 - 1969 Fish Distributions for
the Lower Mainland

CUTTHROAT (Coastal)

<u>LAKE</u>	<u>LOCALITY</u>	<u>NO./LB.</u>	<u>NUMBER</u>
Hotel	Pender Harbour	75	2,000
North	Pender Harbour	75	2,000
Ruby	Pender Harbour	75	10,000
Sakinaw	Pender Harbour	75	<u>20,000</u>
		TOTAL	34,000

LAKE TROUT

Alouette	Haney	30	97,500 ^K
----------	-------	----	---------------------

RAINBOW

Alice	Squamish	3	2,028
Alice	Squamish	3	2,040
Alice	Squamish	12	12,070
Blue	Boston Bar	3	2,040
Browning	Squamish	3	1,500
Como	Burquitlam	4	2,008
Como	Burquitlam	2	2,368
Gates	Squamish	3	2,025
Grace	Haney	4	1,750
Grace	Haney	3	1,755
Hicks	Harrison	2	2,555
Kawkawa	Hope	3	2,048
Kawkawa	Hope	4	2,960
Kawkawa	Hope	12	6,018
Lake of the Woods	Hope	3	2,040 ^a
Lucille	Squamish	90	4,975 ^a

Table 4 - 1969 Fish Distributions for
the Lower Mainland (Cont.)

<u>LAKE</u>	<u>LOCALITY</u>	<u>NO./LB.</u>	<u>NUMBER</u>
Marshall Creek	Abbotsford	80	2,640
Mill	Abbotsford	3	5,190
Mill	Abbotsford	2	1,160
Rolley	Haney	3	5,584
Rolley	Haney	12	3,540
Silver	Hope	4	2,500
Stanley	Squamish	3	1,515
Texas(Klahater)	Hope	2	1,080 ^a
Weaver	Harrison	150	<u>5,000</u>
TOTAL			78,389

a - Native stock of Rainbow

REGULATIONS:

There were no significant fisheries regulation changes in the Lower Mainland in 1968-69.

LAKE AND STREAM SURVEY:

Callaghan Lake (Brandywine Area)

Callaghan Lake is located at the proposed Powder Mountain Ski Development. Five inlet streams and one outlet stream were surveyed. Only two inlet streams have any spawning potential. The lake perimeter also had areas of spawning potential. The physical, chemical and biological factors which were studied suggested that this barren lake might support a fish population. In conjunction with the hatchery section, this lake is to be stocked with cutthroat trout in order to (a) provide a local fishery and (b) to establish an egg-take station.

Dickson Lake (Mission)

A netting program was undertaken, to determine if Eastern Brook trout were present. Dolly Varden char were the only species recovered. A total of 198 Dolly Varden ranging in size from 11-38 cm (mean length 18.1 cm) were recovered from a 3 net-overnight set. This appears to be a pure culture Dolly Varden lake.

Pitt Polder (Southern End of Pitt Lake)

A total of 240 specimens were netted. One hundred-sixty were brown bullhead and 40 were squawfish. Other species netted were black crappie, carp, coho, large-scale sucker. The number of different species and the total number of fish which were netted suggests that the emergent and submerged vegetation in this area may be being harvested by the resident fish population, rather than the duck population.

Powell River Lakes

Seven lakes in the Powell River area were netted to assess the fishing potential of this area.

Duck Lake was by far the most productive. The following fish species were recovered:

Cutthroat trout	63
Kokanee	13
Sculpin	2
Other	0

The largest cutthroat weighed 1500 grams and was 58 cm in length.

Inland and Haslam Lakes were the next most productive. Twenty-one cutthroat trout and 21 kokanee were the sports species recovered. The largest cutthroat was 48.5 cm in length and weighed 3 lbs. Priest and Kirk Lakes (Texada Island) were intermediate in their productivity. A total of 8 cutthroat were recovered with the largest at 41 cm and 800 grams. Sliammon Lake and West Lake (Nelson Island) were the least productive. Two kokanee, 1 cutthroat trout and 4 sculpins were recovered from Sliammon Lake while 2 Cutthroat, 123 peamouth chub, and 6 sculpins were recovered from West Lake.

The present lake surveys conducted by John Balkwill et al (Victoria) will be continued in the Lower Mainland. The following is the proposed lake survey list for 1970:

1) Powell River Area

Pierce	Hammil
Bob's	Duck
Priest	Cranberry
Sliammon	Haslam
Inland	Dodd

2) Squamish Area

Stump Lake
Callaghan Lake

3) Mission-Chilliwack Area

Dickson
Cranberry
Chehalis
Sasamat
Elbow

4) Sechelt Area

Brennan (Woodfibre)

STEELHEAD MANAGEMENT:

The steelhead fishery once again provided a summer and winter quality fishery in the Lower Mainland. The 1969 steelhead analysis is yet to be published. The results of the 1968 steelhead analysis of the Lower Mainland estimated a total catch of 10,289 steelhead.

The five most important Lower Mainland steelhead rivers and their provincial ranking:

<u>Stream</u>	<u>Estimated Catch</u>	<u>Ranking</u>
Vedder	3,728	1
Squamish	907	13
Cheakamus	760	17
South Alouette	543	21
Little Campbell	538	-

There are a number of inaccessible Lower Mainland Region streams which rank most favorably with the five above streams. The true potential of these streams will only be realized when these areas become more accessible.

There is no evidence to support the contention that the commercial salmon fishery in Georgia Strait and the Fraser River is reducing the steelhead spawning stocks. Only 1,100 returning adult steelhead were caught commercially in 1969. Assuming a 50-50 male-female distribution, only 550 females were lost. This total is furthermore divided amongst the many steelhead streams.

In 1969, the Greater Vancouver Water District continued to transport returning adult steelhead above Cleveland Dam (Capilano River). The 1969 steelhead counts are shown in Table 5.

Table 5 - The Number of Steelhead Transported
Above Cleveland Dam - Capilano River.

Month	1962	1963	1964	1965	1966	1967	1968	1969
January	-	-	-	-	-	-	3	-
February	-	-	-	-	-	-	-	-
March	-	-	6	-	-	-	-	-
April	-	-	52	-	9	24	24	-
May	-	39	35	8	29	33	14	17
June	9	33	13	6	5	-	9	12
July	23	15	14	14	24	51	17	10
August	1	1	15	8	8	1	11	19
September	2	-	17	3	1	7	6	2
October	3	4	2	8	2	6	1	2
November	-	4	2	2	2	3	2	2
December	10	-	-	-	4	2	-	-
TOTALS	48	96	156	49	84	127	87	64

The steelhead tagging program initiated in 1967-68 by the Chilliwack and Kingfisher Rod and Gun Clubs was continued in 1968-69. The effort expended by the clubs did not meet with a paralleled increase in success. There was a decrease in number of tagged fish

from 78 to 70 and a decrease in the number of recovered tagged fish from 17 to 9. An effort was made to improve the program. The river was rezoned from 9 to 16 zones of approximate equal length and a greater percentage of the fish were tagged below Vedder Crossing. The program is still far from satisfactory. No conclusions could be arrived at because of the limited nature of the 1968-69 program. The program will continue in 1969-70.

PROTECTION:

a) Pollution and Obstructions

i Surrey-Langley

The rapid population growth, increased industrialization and urbanization are bringing more people into conflict with their environment in the Lower Mainland area. The area most affected in the Lower Mainland is the Surrey-Langley-Cloverdale-Abbotsford area. This area is heavily populated, heavily industrialized and heavily farmed. The water systems most affected are the Nicomekl and Serpentine and their tributaries. This area is crossed with ditches etc., and it is indeed impossible to detect, let alone enforce, every pollution problem which arises. However, known offenders are under constant surveillance. The Fish and Wildlife Branch is also most fortunate in the liaison which has been established in this area. This facilitates co-operation between the Fish and Wildlife Branch and any potential future polluters.

ii Chilliwack

Paleface Creek (tributary to Chilliwack Lake) is the major kokanee spawning stream of this lake (650,000 eggs - 1969). There are 2 logging operations on Paleface Creek. The more extensive operation commences 1/2 mile upstream of the mouth of the creek. The creek is inaccessible to kokanee in the area of this operation, thus, although the logging of this area will affect water flows, this

operation is not as critical as the downstream logging operation in its immediate effects upon the spawning area. Fortunately, an excellent liaison was established with the local contractor. Only dead and downed timber will be removed. Green timber will be left. Furthermore, the local contractor has agreed to assist the Fish and Wildlife Branch in further improving the stream upstream of the present spawning areas (windfall and boulder removal). The Forest Service have been most co-operative and have assisted the local C/O immeasurably.

b) Pollution Control Branch

Four examples of applicants to the Pollution Control Board are listed. The significant facts are arranged in point form.

1) Corporation of the Town of Mission City

- to discharge effluent into Fraser River
- the discharge will be continuous
- average 24 hr. discharge will be 2.1 million Imperial gallons
- treatment before discharge; aerated stabilization ponds
- Effluent: - suspended solids - 200 ppm
 - total solids - 500 ppm
 - BOD - 120 ppm
 - PH - 6.5 - 7.5
 - Coliform bacteria - 5×10^6 (M.P.N. per 100 ml)

2) Corporation of the District of Surrey

- amendment of Permit #54 (1956)
- expansion of present lagoon facilities to 13.6 acres from 6.6 acres
- effluent - 334,000 gallons per day
- suspended solids - 70 ppm
- BOD - 40 ppm
- Coliform MPN - 100,000 per 100 ml.

Permit to be reviewed in 3 years.

3) Mamac Holdings

- to discharge effluent into Bertrand Creek from a Mobile Home Park at Matsqui, B. C.
- maximum 24 hr. discharge - 33,000 gallons (continuous)
- suspended solids - 40 ppm
- total solids - 500 ppm
- BOD - 60 ppm

Secondary treatment (rough screening, extended aeration)

4) Mount Garibaldi Glacier Resorts Ltd.

- to discharge effluent into unnamed creek tributary to Brohm River
- average 24 hr. discharge - 154,000 gallons
- suspended solids - 60 ppm
- total solids - 550 ppm
- BOD - 60 ppm
- Coliform bacteria 10×10^6

Treatment - comminution, aeration and clarification (chlorination if required.)

This is a heavily used recreation area. The water flow in the unnamed creek would be such that in the summer time, nitrogen levels would be high, aquatic plant growth would almost be a certainty, oxygen levels would be critically low and chlorine effluent would prove to be harmful.

c) Placer Mining Leases and Water Use Licences

Three Placer Mining Leases were granted in 1969.

Table 6 lists Water Use Applications/detachment area for 1964-69. Twenty-eight applications were processed by the Lower Mainland Region in 1969.

Table 6 - Water Use Licence Application Investigations

AREA		IRRIGATION AND DOMESTIC USE	INDUSTRY	FISH CULTURE	LAND IMPROVEMENT
Abbotsford	1964	-	-	-	-
	1965	7	-	-	-
	1966	10	-	-	-
	1967	1	-	-	-
	1968	5	-	-	-
	1969	1	-	-	1
Chilliwack	1964	5	-	-	-
	1965	5	1	1	1
	1966	3	1	-	-
	1967	8	-	1	-
	1968	7	-	-	-
	1969	-	-	-	1
Haney	1964	2	-	-	-
	1965	3	-	-	1
	1966	2	-	-	-
	1967	-	1	-	-
	1968	3	1	1	-
	1969	-	1	1	2
Hope	1964	-	1	-	-
	1965	5	1	-	-
	1966	2	-	-	-
	1967	3	1	-	-
	1968	1	-	-	-
	1969	1	1	-	-

Table 6 - Water Use Licence Application Investigations (Cont.)

AREA		IRRIGATION AND DOMESTIC USE	INDUSTRY	FISH CULTURE	LAND IMPROVEMENT
Langley- Cloverdale	1964	3	-	-	-
	1965	7	-	1	-
	1966	12	-	1	1
	1967	12	-	5	-
	1968	11	-	1	3
	1969	7	-	-	1
Lillooet	1964	10	1	-	-
	1965	5	-	-	-
	1966	9	-	2	-
	1967	3	-	-	-
	1968	2	3	-	-
	1969	2	-	-	-
Mission	1964	4	-	3	-
	1965	4	-	-	-
	1966	3	2	3	2
	1967	2	1	3	1
	1968	3	2	-	2
	1969	2	-	3	1
Sechelt	1964	1	1	-	-
	1965	3	1	1	-
	1966	1	1	-	-
	1967	2	-	2	-
	1968	-	3	1	-
	1969	-	2	-	-

Table 6 - Water Use Licence Application Investigations (Cont.)

AREA		IRRIGATION AND DOMESTIC USE	INDUSTRY	FISH CULTURE	LAND IMPROVEMENT
Squamish- Vancouver-Pemberton	1964	1	1	1	-
	1965	-	1	1	2
	1966	7	1	-	1
	1967	1	-	-	-
	1968	4	-	1	1
	1969	-	-	-	-
Powell River	1964	-	1	-	-
	1965	2	2	-	-
	1966	3	2	-	-
	1967	2	-	-	-
	1968	1	-	-	-
	1969	-	2	-	-
TOTALS	1964	26	5	4	-
	1965	41	6	3	4
	1966	52	7	6	4
	1967	34	3	11	1
	1968	37	9	4	6
	1969	13	6	4	6

Most Fish and Wildlife investigations concern water use applications for irrigation and domestic use. There is no evident trend in water use applications for 1964-69 totals.

HABITAT IMPROVEMENT:

1) Ruby Creek Outlet Spawning Channel

This habitat improvement project was completed in 1968. In July of 1969, gabions were installed to create side channels. The side channels were constructed as rearing and holding areas for emergent fry even under minimal water flows.

Alder and evergreens have been planted along the stream to improve upon the limited natural cover.

Resume of 1968-69 observation and field work

- October 22 - Dec. 23 (1968) - 12 redds distinguished, 15 fish counted
- most redds in upper part of channel
- February (1969) - emergent fry sighted
- April-May (1969) - netting results did not suggest major April-May spawning.
- peamouth chub observed spawning in inlet stream
- August (1969) - fish which were netted showed signs of sexual maturation
- Cutthroat fry observed in inlet stream
- October 24 - Dec. 11 (1969) - 23 cutthroat sighted
- 13 redds sighted, another 13 possible redds
- 500 kokanee (8 inches) spawning in inlet stream
- fecundity studies - 16.5 inch ^o - 948 eggs
- 21.5 inch ^o - 2053 eggs
- average female (19 inches) - 1400 eggs

2) Alice Lake Project

Surveyed by G. D. Taylor and M. Galbraith.

This project involves the reconstruction of the outlet stream to improve the spawning facilities. The improvement requires the removal of boulders and logs. The bed itself must be built up with proper sized gravel.

3) Widow Creek Project

Surveyed by G. D. Taylor and M. Galbraith.

Widow Creek is a tributary to Daisy Lake, a man-made lake used for hydro electric storage purposes. Widow Creek has an upper and lower falls which are impassible to fish. However, only the upper falls act as an obstruction because the lower falls are inundated by rising water levels during the period of fish activity. The habitat improvement section has suggested that the upper falls may be bypassed by blasting a side channel with a more favorable grade. The stream is then to be diverted through the channel. Extensive excellent spawning areas are present in Widow Creek.

Three further habitat improvement projects are planned for 1970.

MANAGEMENT REPORTS:

1) Alouette Lake Report

Alouette Lake has been stocked with Lake trout. This unproductive man-made lake (TDS - 20 ppm) was stocked in 1968 with 68,800 Lake trout at 184/lb. In 1969, a total of 97,500 Lake trout were introduced; 39,262 were 33.5/lb. and 58,405 weighed 28.4/lb. Unfortunately, the stock for 1970 stocking has been lost because of 100% hatchery mortality. A netting program will, however, continue for 2 to 3 years.

2) Callaghan Lake Report

Callaghan Lake is situated at the proposed ski development at Powder Mountain. The lake was surveyed to assess the spawning potential of the 5 inlet streams and 1 outlet one, furthermore, to assess the carrying capacity of this lake. Physical, chemical

and biological factors were also measured. The lake is to be stocked with cutthroat trout in an effort to establish a cutthroat egg station and recreational fishery.

3) Chilliwack River Experimental Opening

The closed area of the Chilliwack River was opened to the angling public from July 19 - 27 (1969). A comparison of the totals of the 1969 and 1959 openings shows the following:

	<u>1959</u>	<u>1969</u>
No. of Anglers	634	1797
Total Hours	2592	5485
Total Fish	3747	4138
Legal Fish	714	1012 (908 Rainbow)
Sub-legal Fish	3033	3126

Only flies and lures were permitted as terminal gear.

More time (% increase) was spent angling during the week-days in 1969 compared to 1959 (70% - 1959 and 91% - 1969).

Data analysis indicates that most fish in most size categories favour the upper reaches of the closed area, i.e. the area nearest the lake.

There was no evidence to indicate that a) the smolt migration was interfered with and b) the pre-migratory population had been disturbed to any appreciable extent.

4) Texas Lake Report

Texas Lake is 6 miles north of Hope. A rehabilitation program is proposed for 1970. Eastern brook trout (5/lb.) are to be introduced in 1971. A program to evaluate the total number entering the creel, the growth rate, spawning success and recruitment is to be undertaken.

5) Stump Lake Report

Stump Lake was stocked with Splake trout in 1968. 16,180 at 627/lb. were planted in May of 1968. In a netting of Stump Lake in 1969, the fish had grown to 13.3/lb. and an average length of 16 cm. There have been reports of 9-10 inch splake angled in 1970.

FRASER RIVER STURGEON TAGGING:

The Fraser River sturgeon tagging program was continued in 1969. The 1969 tagging program proved more fruitful. A total of 319 sturgeon were tagged (Dennison anchor type tag). This fish ranged in size from 13 inches to 45 inches. In 1968, only 125 sturgeon were tagged.

The size breakdown for 1969 tagged sturgeon is as follows:

SIZE RANGE	NUMBER OF FISH TAGGED	SIZE RANGE	NO. OF FISH TAGGED
12-14 inches	2	30-32 inches	56
14-16 "	1	32-34 "	36
16-18 "	3	34-36 "	15
18-20 "	11	36-38 "	7
20-22 "	12	38-40 "	2
22-24 "	42	40-42 "	-
24-26 "	43	42-44 "	-
26-28 "	55	44-46 "	1
28-30 "	57		

A fin clipping program was begun in 1969. The left pectoral fin-spine from each sturgeon is clipped 1/2 inch from its base. Micro-thin cross sections are prepared and read under the microscope. The age of the sturgeon is represented by the number of annular growth rings. The results of this aspect of the sturgeon tagging for 1969 have yet to be completed.

The tagging results are listed in the following Table.

A total of 14 tagged sturgeon have been caught in 1969. Nine were landed by commercial fishermen and five were landed by sports anglers. The pertinent information concerning ten sturgeon is as follows:

Sturgeon Tagging Program - 1969

Tag No. & Year	Length (Inches)		Location		Movement
	Tagged	Recapture	Tagged	Recapture	
0-13 (1968)	33.5(68)	35 (1969)	Yale	Yale	-
0-38 (1968) (Sept. 22)	26.5(68)	26.5(68)	Mission	Albion Drift (Sept. 24)	Downstream (13 miles)
C-50 (1968) (Aug. 17)	29 (68)	29 (68)	Vedder R.	Douglas Is. (Aug. 25)	Downstream (33 miles)
L-32 (1968) (Aug. 8)	24 (68)	24 (68)	Harrison R.	Hope R. (Nov. 16)	Downstream (3 miles)
00058(1969) (July 4)	33.5(69)	33.5(69)	McDonald's Landing	Dewdney Slough (July 28)	Downstream (3 miles)
00093(1969) (July 19)	25 (69)	25 (69)	"	Albion (July 21)	Downstream (21 miles)
00124(1969) (July 6)	25.5(69)	25.5(69)	Mission Bridge	Canoe Pass (July 24)	Downstream (42 miles)
00223(1969) (July 9)	36.25(69)	36.25(69)	Vedder R.	1 Mile Upstream of Vedder (Aug. 17)	Upstream (1 mile)
00240(1969) (Aug. 3)	25 (69)	25 (69)	Hunter Crk	Hunter Crk. (Aug. 10)	No Movement
00249(1969) (July 17)	35.75(69)	35.75(69)	Vedder R.	Vedder R. (Aug. 2)	No Movement
00315(1969) (Aug. 2)	30 (69)	30 (69)	McDonald's Landing	Ft. Langley ?	Downstream (22 miles)
00360(1969) (Aug. 15)	30 (69)	30 (69)	"	Mission Br. (Aug. 17)	Downstream
00368(1969) (Aug. 16)	31 (69)	31 (69)	"	Agassiz Br. (Sept. 14)	Upstream (14 miles)
00400(1969) (Aug. 24)	28.5(69)	28.5(69)	"	Albion (Aug. 26)	Downstream (21 miles)

A greater number of sturgeon moved downstream after tagging. This may be a seasonal phenomenon. Future recaptures should permit a more intensive analysis.

STURGEON TAGS - 1969

J. L. DeLair

Tag No.	Date	Total Length Size (Inc.)	Area
00176	Aug. 10	22 $\frac{1}{2}$	Emory Creek
00177	"	20	"
00178	"	22 $\frac{3}{4}$	"
00179	Aug. 12	19 $\frac{1}{2}$	Texas Creek
00180	Aug. 13	26 $\frac{3}{4}$	Clinton "C" (1 mi. N. of Union Bar)
00181	Aug. 18	24 $\frac{1}{2}$	Hunter Creek
00182	"	22 $\frac{1}{4}$	"
00183	"	25 $\frac{1}{2}$	"
00184	Aug. 24	24	Hills Bar
00185	Aug. 25	22	Riv. Tow
00186	Aug. 26	31 $\frac{1}{2}$	Yale
00187	"	33 $\frac{1}{2}$	Yale
00188	Aug. 31	17	Riv. Tow
00189	"	18 $\frac{1}{2}$	"
00190	"	23 $\frac{3}{4}$	"
00191	Sept. 2	27	"
00192	Sept. 14	18 $\frac{1}{4}$	Emory Creek
00193	"	19 $\frac{1}{2}$	"
00194	"	25	"
00195	"	27 $\frac{1}{2}$	"
00196	"	27 $\frac{1}{2}$	"
00197	Sept. 15	24	American Creek
00198		13 $\frac{1}{2}$	
00199		13	
00200		22 $\frac{1}{4}$	
00201	Sept. 20	34	Emory Creek
00211	Tag Destroyed		
00212	June 29	27	Union Bar Coq. Mouth
00213	Tag Destroyed		
00214	July 1	20 $\frac{1}{2}$	Gordon Creek
00215	"	19 $\frac{1}{2}$	Emory Creek
00216	July 2	37	Chapmans
00217	"	24 $\frac{1}{4}$	Yale
00218	"	30	"
00219	"	29 $\frac{3}{4}$	"
00220	July 5	22 $\frac{1}{2}$	Emory Creek
00221	July 7	45 $\frac{1}{4}$	Silver Creek
00222	July 8	30	Emory Creek

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (inc.)	Area
<u>J. L. DeLair (Cont.)</u>			
00223	July 9	36 $\frac{1}{4}$	Vedder River
00224	"	30 $\frac{1}{2}$	"
00225	July 10	24	"
00226	"	37 $\frac{1}{2}$	"
00227	July 13	22 $\frac{3}{4}$	Hunter Creek
00228	"	22	Emory Creek
00229	"	27	"
00230	Tag Destroyed		
00231	July 13	28	Emory Creek
00232	"	28	"
00233	July 21	30	Hunter Creek
00234	July 26	28	Emory Creek
00235	"	18	"
00236	July 27	21 $\frac{1}{4}$	Union Bar
00238	July 28	18 $\frac{1}{2}$	Emory Creek
00239	Aug. 1	34	Haig
00240	Aug. 3	25	Hunter Creek
00241	Tag Destroyed		
00242	Aug. 3	17	"
00243	Aug. 8	27 $\frac{1}{4}$	"
00244	Tag Destroyed		
00245	Aug. 10	20 $\frac{1}{2}$	Emory Creek

J. T. Lay

00106	May 5	40	Mission
00107	"	36	"
00108	May 7	24	"
00109	"	34	"
00110	May 16	30	"
00111	June 30	28	"
00112	July 5	27	"
00113	July 5	28	"
00114	July 6	32	"
00115	"	24	"
00116	"	31	"
00117	"	33 $\frac{1}{2}$	
00118	Tag Destroyed		
00119	July 6	32	
00120	"	27	
00121	"	34 $\frac{1}{2}$	McDonald
00122	"	23 $\frac{3}{4}$	

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (inc.)	Area
---------	------	-----------------------------	------

J. T. Lay (Cont.)

00123	July 6	25 $\frac{1}{4}$	
00124	"	25 $\frac{1}{2}$	
00125	"	32 $\frac{1}{4}$	
00126	"	32	
00127	"	35	
00128	"	32 $\frac{1}{2}$	
00129	"	29	
00130	"	33	
00131	"	33 $\frac{1}{4}$	
00132	"	35	
00133	"	25	
00134	"	29	Mission
00135	"	25	"
00136	"	23	"
00137	July 14	37 $\frac{1}{2}$	"
00138	"	36 $\frac{1}{2}$	"
00139	"	28	"
00140	Tag Destroyed		
00141	Tag Destroyed		
00142	July 15	37	"
00143	July 16	33	Vedder

J. P. Rissling

00001	April 12	22 $\frac{1}{2}$	McDonald's
00002	"	26	Landing
00003	"	21 $\frac{1}{4}$	"
00004	May 5	26 $\frac{1}{2}$	"
00005	"	24	"
00006	Tag Destroyed		
00007	May 5	28	"
00008	"	32	"
00009	"	21	"
00010	May 7	31	"
00011	"	30	"
00012	"	24	"
00013	May 25	21 $\frac{1}{2}$	"
00014	"	29	"
00015	June 2	27 $\frac{1}{2}$	Cook's Slough
00016	"	27	"
00017	"	32 $\frac{1}{2}$	"
00018	"	25 $\frac{1}{2}$	"
00019	"	30	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (Inc.)	Area
<u>J. P. Rissling (Cont.)</u>			
00020	July 2	26	Cook's Slough
00021	"	28 $\frac{1}{2}$	"
00022	July 8	24	"
00023	July 14	31	Mission
00024	July 15	30	Mouth of Harrison R.
00025	July 15	31 $\frac{1}{2}$	"
00026	"	21	"
00027	"	28	"
00028	July 22	24 $\frac{1}{2}$	Gifford Ld.
00029	"	27 $\frac{1}{2}$	"
00030	"	24	"
00031	"	30	"
00032	"	32	"
00033	July 24	31 $\frac{1}{2}$	Glen Valley
00034	July 27	23	McDonald's Landing
00035	"	28	"
00036	"	35 $\frac{1}{2}$	"
00037	"	32	"
00038	"	32	"
00039	July 28	39	"
00040	"	34	"
00041	"	34	"
00042	"	31 $\frac{1}{2}$	"
00043	"	31	"
00044	"	33	"
00045	"	32	"
00046	June 28	30 $\frac{1}{2}$	"
00047	"	36	"
00048	"	27	"
00049	"	27	"
00050	June 29	34	"
00051	"	28	"
00052	"	32 $\frac{1}{2}$	"
00053	"	22 $\frac{1}{2}$	"
00054	"	30 $\frac{1}{2}$	"
00055	"	24 $\frac{1}{2}$	Ridgedale Bar
00056	"	33 $\frac{1}{2}$	"
00057	"	15	Yoe Mans Ld.
00058	July 4	33 $\frac{1}{2}$	McDonald's Landing
00059	"	23	"
00060	"	34	"
00061	"	23 $\frac{1}{2}$	"
00062	"	27 $\frac{1}{2}$	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (Inc.)	Area
<u>J. P. Rissling (Cont.)</u>			
00063	July 4	29 $\frac{1}{2}$	McDonald's Landing
00064	"	30	"
00065	"	32	"
00066	"	22	"
00067	"	26 $\frac{1}{2}$	"
00068	"	33 $\frac{1}{2}$	"
00069	July 12	25	"
00070	"	29 $\frac{1}{2}$	"
00071	"	25 $\frac{1}{2}$	"
00072	"	23 $\frac{1}{2}$	"
00073	"	31	"
00074	"	26	"
00075	"	24 $\frac{1}{2}$	"
00076	"	28 $\frac{1}{2}$	"
00077	"	27	"
00078	"	28 $\frac{1}{2}$	"
00079	"	31	"
00080	"	27 $\frac{1}{2}$	"
00081	"	29 $\frac{1}{2}$	"
00082	Tag Destroyed		
00083	July 12	34 $\frac{1}{2}$	"
00084	"	26	"
00085	"	30	"
00086	"	29 $\frac{1}{2}$	"
00087	July 13	32	"
00088	"	24 $\frac{1}{2}$	"
00089	"	31 $\frac{1}{2}$	"
00090	"	30	"
00091	July 19	28	Mission Bridge
00092	"	34 $\frac{1}{2}$	Hatzic Slough
00093	"	25	McDonald's Landing
00094	"	30 $\frac{1}{2}$	"
00095	"	28	"
00096	"	33 $\frac{1}{2}$	"
00097	"	29 $\frac{1}{2}$	"
00098	"	26 $\frac{1}{2}$	"
00099	"	30	"
00100	"	33	"
00101	July 23	31 $\frac{1}{2}$	Mission Bridge
00102	"	24	"
00103	July 26	31	McDonald's Landing
00104	"	33 $\frac{1}{2}$	"
00105	"	35	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (in.)	Area
<u>J.P. Rissling (Cont.)</u>			
00246	July 12	24 $\frac{1}{2}$	Hatzic
00247	Tag Destroyed		
00248	July 12	29	Hatzic
00249	July 17	35 $\frac{3}{4}$	McGillvray
00250	"	31 $\frac{1}{2}$	"
00251	July 27	30	Harrison
00252	Tag Destroyed		
00253	July 28	20	"
00254	Tag Destroyed		
00255	July 28	26	"
00256	Tag Destroyed		
00257	July 28	23	"
00258	Tag Destroyed		
00259	July 30	30	Agassiz
00260	"	24	"
00261	"	23	"
00262	"	24	"
00263	"	23 $\frac{1}{2}$	"
00264	July 31	33	Harrison
00265	Aug. 8	31	"
00266	"	26	"
00267	Aug. 10	32	Ruby Creek
00268	Aug. 11	26	"
00269	"	23	"
00270	Aug. 11	31	"
00271	"	29	Jones Hill
00272	"	32 $\frac{1}{2}$	"
00273	Aug. 21	32	"
00274	Aug. 22	29	"
00281	Tag Destroyed		
00282	Tag Destroyed		
00283	July 26	29	McDonalds Landing
00284	"	26	"
00285	"	23	"
00286	"	28 $\frac{1}{2}$	"
00287	"	34	"
00288	"	28	"
00289	"	27	"
00290	"	26	"
00291	"	31 $\frac{1}{2}$	"
00292	"	22 $\frac{1}{2}$	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (inc.)	Area
<u>J. P. Rissling (Cont.)</u>			
00293	July 26	26 $\frac{1}{2}$	McDonald's Landing
00294	"	33	"
00295	Tag Destroyed		
00296	July 26	34	"
00297	Tag Destroyed		
00298	July 26	28	"
00299	July 28	29 $\frac{1}{2}$	"
00300	"	31	"
00301	"	33	"
00302	"	29	"
00303	"	26	"
00304	"	31	"
00305	"	30 $\frac{1}{2}$	"
00306	"	24	"
00307	July 29	28	Hatzic Slough
00308	Aug. 2	34 $\frac{1}{2}$	McDonald's Landing
00309	"	33	"
00310	"	27 $\frac{1}{2}$	"
00311	"	30 $\frac{1}{2}$	"
00312	"	29	"
00313	"	30 $\frac{1}{2}$	"
00314	"	31	"
00315	"	30	"
00316	"	26	"
00317	"	23	"
00318	"	32	"
00319	Aug. 4	26	"
00320	"	25	"
00321	"	34	"
00322	"	23	"
00323	"	29	"
00324	"	28	"
00325	Aug. 9	23 $\frac{1}{2}$	"
00326	Aug. 4	31 $\frac{1}{2}$	"
00327	Aug. 9	29	"
00328	"	34	"
00329	"	30	"
00330	"	31	"
00331	"	29	"
00332	"	35 $\frac{1}{2}$	"
00333	"	36	"
00334	"	25 $\frac{1}{2}$	"
00335	"	25	"
00336	"	26	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (In.)	Area
<u>J. P. Rissling (Cont.)</u>			
00337	Aug. 9	36 $\frac{1}{2}$	McDonald's Landing
00338	"	29 $\frac{1}{2}$	"
00339	"	29	"
00340	"	32	"
00341	"	29	"
00342	Aug. 10	25 $\frac{1}{2}$	"
00343	"	27 $\frac{3}{4}$	" Last yr. C-20
00344	Aug. 15	33	Mission Bridge
00345	"	28	"
00346	"	29	"
00347	"	31	McDonald's Landing
00348	"	30	"
00349	"	28 $\frac{1}{2}$	"
00350	"	33 $\frac{1}{2}$	"
00351	"	27	"
00352	"	31 $\frac{1}{2}$	"
00353	"	31 $\frac{1}{2}$	"
00354	Aug. 16	29 $\frac{1}{2}$	"
00355	Aug. 15	27	"
00356	"	34	"
00357	"	31 $\frac{1}{2}$	"
00358	"	24	"
00359	"	26 $\frac{1}{2}$	"
00360	"	30	"
00361	"	28	"
00362	"	29	"
00363	"	24	"
00364	"	32	"
00365	Aug. 15	30 $\frac{1}{2}$	"
00366	"	24	"
00367	Aug. 16	27	"
00368	"	31	"
00369	"	23	"
00370	"	29	"
00371	TAG Destroyed		
00372	Aug. 17	24	Mission Bridge
00373	Aug. 16	26 $\frac{1}{2}$	McDonald's Landing
00374	Aug. 17	25 $\frac{1}{2}$	Mission Bridge
00375	"	34 $\frac{1}{2}$	"
00376	"	34 $\frac{1}{2}$	McDonald's Landing
00377	"	30	"
00378	"	27	"
00379	"	32	"
00380	"	32	"

STURGEON TAGS - 1969 (Cont.)

Tag No.	Date	Total Length Size (in.)	Area
<u>J. P. Rissling (Cont.)</u>			
00381	Aug. 17	22	McDonald's Landing
00382	"	29	"
00383	"	32	"
00384	Aug. 22	26	"
00385	Tag Destroyed		
00386	Aug. 22	19	"
00387	"	30	"
00388	"	25	"
00389	"	25	"
00390	"	34	"
00391	"	25 $\frac{1}{2}$	"
00392	"	27 $\frac{1}{2}$	Hatzic Slough
00393	Aug. 23	31	McDonald's Landing
00394	"	26 $\frac{1}{2}$	"
00395	"	28	"
00396	"	30	"
00397	"	30	"
00398	"	28	"
00399	Aug. 24	24	"
00400	"	28 $\frac{1}{2}$	"
00401	"	25 $\frac{1}{2}$	"
00402	"	29 $\frac{1}{2}$	"
00403	Aug. 31	28	"
00404	"	27	"
00405	"	28	"
00406	"	32	"
00407	"	21	"
00408	"	29	"
00409	"	29	"
00410	"	32	"
00411	Sept. 6	25	Frenchmans Bar
00412	"	28	Ridgedale Bar

SUMMARY:

No drastic changes in fisheries management occurred in 1969 in the Lower Mainland Region. Recognized Fisheries Management policies were continued.

The immediate Lower Mainland valley offers a unique challenge to a fisheries manager. The problem no longer becomes one of fisheries management but people management.

The Fraser Valley in turn differs from the Powell River area. The lakes of Powell River are very productive. However, there is a minimal fishing pressure due to the ease of access to the salt chuck and the relative inaccessibility of the Powell River area, due to limited ferry facilities.

The Sechelt area is now experiencing a rapid growth in tourist traffic. The limited number of lakes on the peninsula are being exposed to an ever increasing fishing pressure. The stocking policies of the Lower Mainland reflect this trend.

The Squamish-Cheakamus River Valley is now experiencing the most intensive year-round recreational pressure of any area in the Lower Mainland region. The Valley is easily accessible from Vancouver for a) limited lake fishing,

- b) a highly prized steelhead fishery
- c) outdoor recreationists (hikers, skiers)
- d) the hunting public

The area receiving limited fishing pressure is the Pemberton-Lillooet area. A number of large lakes are to be found in this area, e.g. Anderson Lake, Seton Lake, Carpenter Lake and Lillooet Lake. There are also a number of productive smaller lakes and some productive rivers, e.g. Lillooet River and Birkenhead River. With access improvements this hitherto isolated area will experience an increase in recreational and fishing pressure. Fortunately, this area is inherently more capable of handling such increases.

RECOMMENDATIONS:

- i. The past stocking policies will be maintained in the Lower Mainland region. However, a number of Lower Mainland lakes will be receiving Eastern Brook trout stocks. Studies will determine if:
 - (a) the Eastern Brook trout successfully fully exploit the total environment available to them.
 - (b) the Eastern Brook trout may spawn and thereby provide some recruitment to what were previously only put-take lakes. This will lighten the hatchery load.
- ii. The Squamish-D'Arcy area is developing rapidly. The Squamish-Pemberton area is being developed extensively both as (a) a ski area and (b) a year-round recreational area.

The pollution potential of this area is great. There will also be an increased demand for the water resource, consequently, the greater part of the 1970 effort is to be directed to the assessment of all stream systems in the Squamish-D'Arcy area.

The other area receiving serious consideration for 1970 is the Lillooet-Pemberton area. The area will be developed in the near future. An assessment of the fisheries resources in this area should receive priority.

WILDLIFE MANAGEMENT
LOWER MAINLAND REGION

1969

INTRODUCTION:

Lengthy summaries and analyses of wildlife management data for the Lower Mainland Region were prepared and presented in the 1966 and 1968 Annual Reports. This year it is my intention to summarize briefly only the important data which were collected in 1969 so that these will be available for incorporation into another major report in 1971. The goal, therefore, is to produce a major summary report every third or fourth year.

The 1968 Annual Report incorporated some information gathered early in 1969. It is unnecessary therefore, to repeat an analyses of deer, goat and pheasant carry-over information, or to summarize major activities associated with waterfowl habitat improvement projects. Only the highlights of harvest and pre-season counts for deer, mountain goats, waterfowl and pheasants will be dealt with at this time.

As in previous years, the able assistance of many people has contributed to the amalgamation of this information. Special thanks go to Peter Caverhill, Technician, who has diligently summarized much of the field information. The work of the Conservation Officers in collecting field information, and the assistance of the Canadian Wildlife Service, who provided student assistance for waterfowl road checks, are gratefully acknowledged.

BIG GAME - GENERAL:

Deer investigations included the continued study of deer numbers in the Skagit River flood basin. Tagging success was poor this year because of delayed spring weather and sharply reduced numbers as a result of harsh winter weather. However, the results confirmed that a substantial deer population will be displaced by the proposed hydro-electric development. This information, along with data on other game and fur resources, and recreational and aesthetic losses, is being incorporated into a special report.

Deer hunting conditions were greatly affected by winter mortality. What is described as the Lower Mainland's worst winter in history took a great toll of coastal deer. Hunting success was 30 to 50 percent below average.

Spring mountain goat surveys in Bute Inlet indicated that this species also suffered as a result of winter weather, but densities there are still high. Autumn flights in the Chilliwack-Hope area resulted in fewer goat sightings than in similar flights in Aug., 1968.

DEER:

Harvest:

Although final harvest estimates are not yet available from the hunter sample analyses, it is obvious from field data that 1969 was one of the poorest hunting years on record. This is particularly true of M.A. 2 and much of M.A. 3 (the coast forest zone). The interior dry forest zone of M.A. 4 produced an average harvest.

Table 1-D compares hunter success for the antlerless season of 1969 with the average for the previous four years (1965-68) on important deer ranges. With the exception of Texada Island and the Bridge River-Yalakom area all show success figures substantially below the norm. Particularly disappointing were the low success ratios in the Chilliwack and Silver-Skagit ranges, the latter of which is known to harbour a very large, under-harvested deer herd.

Management area and regional comparisons are also given in Table 1-D. Regional success averaged 5.9 deer/100 hunters compared with the 4 year mean of 8.6 deer/100 hunters (31% below average). M.A. 2 hunters averaged only 2.8 deer/100 hunters (53% below the mean), while M.A. 4 hunters averaged 14.0 deer/100 hunters (3% below the mean). M.A. 3 success appears to have been slightly above the mean, but this is a reflection of the fact that a larger proportion of the sample was taken from Texada Island this year than in past years.

TABLE 1-D - Comparison of the 1969 A/L Season Hunter Success Ratios with the Four-Year Average (1965-68) for a Few Heavily Hunted Ranges. (Expressed as the Number of Deer per 100 Hunters, and per 100 Hunter-Days Checked)

AREA	1969		AVER. 1965-68
	D/100 H.	D/100 HD	D/100 H
Squamish-Pemberton	4.8	4.5	6.9
Harrison	1.4	1.4	7.7
Chehalis- Suicide	3.0	3.0	4.9
Chilliwack	1.2	1.2	5.6
Silver-Skagit	1.6	1.3	4.6
Texada Island	42.4	26.4	36.7
Bowen Island	16.4	16.4	22.2
Sechelt Peninsula	2.2	2.2	8.1
Bridge R.-Yalakom	16.0	10.5	15.6
M.A. #2 (Average)	2.8	2.5	5.8
M.A. #3 (Average)	19.2	15.6	13.6
M.A. #4 (Average)	14.0	9.5	13.2
Region (Average)	5.9	5.4	8.2

Antlered bucks made up 44% of the antlerless kill this year and 42% last year. The notable exception was the Lillooet area where bucks made up only 33% of the kill.

The real effect of last winter's weather are reflected in the percentage of yearlings in the harvest; on the opening week-end of antlerless deer, the percentages were 21% this year and 42% last year; for the entire antlerless season the figures were 18% this year and 30% last year. Thus a 40-50% reduction in yearling availability was noted in 1969, undoubtedly owing to winter losses of fawns.

Table 2-D compares season long hunter success for 1969 with 4-year means on the same important deer ranges. Only on Texada Island was the average success (on the basis of per 100 hunters checked) above the 4-year mean, and only Texada and Bowen Islands, and the Bridge River-Yalakom area

demonstrated reasonably high season-long success ratios. When analysed on the basis of deer taken for every 100 Hunter-days of effort, these figures are depressed substantially and demonstrate very poor hunting opportunity when compared with the normal situation for the Province. Management area and regional success averages for 1969 (Table 2-D) are all below the previous 4-year mean and likewise demonstrate relatively poor hunting success.

Results for the Canadian Forest Products Chehalis-Suicide logging area are only slightly below last years poor average. In the five November week-ends this year, 928 hunters took 28 deer (3.0 deer/100 hunter-days) while in the five November week-ends last year, 1244 hunters took 41 deer (3.3 deer/100 hunter-days).

TABLE 2-D - Comparison of the 1969 Deer Season Hunter Success Ratios with the Four Year Average (1965-68) for a Few Heavily Hunted Ranges. (Expressed as the Number of Deer Per 100 Hunters, and per 100 Hunter-Days Checked)

AREA	1969		AVER. 1965-68
	D/100 H.	D/100 HD	D/100 H
Squamish-Pemberton	3.0	2.7	8.0
Harrison	1.3	1.3	7.5
Chehalis-Suicide	2.8	2.8	4.6
Chilliwack	1.3	1.3	4.5
Silver-Skagit	1.5	1.2	4.7
Texada Island	39.8	25.4	31.8
Bowen Island	10.0	10.0	18.2
Sechelt Peninsula	3.9	3.9	6.6
Bridge R.-Yalakom	11.8	7.4	13.5
M.A. #2 (Average)	2.4	2.2	5.7
M. A.#3 (Average)	10.5	9.6	11.8
M.A. #4 (Average)	10.2	6.4	11.8
Region (Average)	4.9	4.3	7.9

The extremely poor 1969 success is attributed, at least partially, to the damaging effects of the past winter. Records show that the Lower Mainland, in the latter part of December, 1968 and the entire month of January, 1969, experienced the worst snow and temperature combinations in history. Snow depths and temperatures were particularly bad in the coast forest zone, the effects of which are aptly demonstrated by the results of the subsequent deer harvest. Although temperatures were far below normal in M.A. 4, snow depths were negligible.

The poor season must also be attributed to the mild snow-free weather experienced during the entire season. From no area was a report received of a snowfall heavy enough to force deer down to low ranges, and in most areas virtually no lasting snow fell below 4,000 feet elevation. This, together with the indications of a reduced hunting pressure, (as examples, 25% fewer hunters in the Chehalis-Suicide throughout the season, and 21% fewer hunter-days of effort in the Silver-Skagit during the antlerless season) augers well to a rapid return to normal deer densities.

A rather interesting relationship between the harvest of fawn and yearling deer in the Lower Mainland and Vancouver Island regions has been uncovered through an analysis of past harvest data. Table 3-D compares the sex ratio of fawns taken during the antlerless season. On the Mainland the ratio has averaged 84 males : 100 females, while on Vancouver Island the reverse is true - 118 males : 100 females. No logical reason for this difference can be presented, and it must be presumed that the ability of checking staff to properly sex a fawn deer is very accurate. There is no reason, therefore, to dispute these figures.

Table 4-D shows the number of yearling deer of each sex recorded at road checks during the same A/L seasons.

In both areas, the average sex ratio indicates a preponderance of males (154 males : 100 females on the Lower Mainland, and 170 males : 100 females on Vancouver Island.

TABLE 3-D - Sex Ratios of Fawns Harvested
on the Lower Mainland and on
Vancouver Island (A/L Seasons)

(a) Lower Mainland

YEAR	NO. OF MALES	NO. OF FEMALES
1962	19	17
1963	30	23
1964	39	51
1965	38	48
1966	57	56
1967	42	57
1968	39	55
1969	<u>14</u>	<u>23</u>
Eight Year Total	278	330 = 608
Sex Ratio	84 Males : 100 Females	

(b) Vancouver Island

Twelve Year Total	1,880	1,533 = 3,413
Sex Ratio	118 Males : 100 Females	

TABLE 4-D - Sex Ratios of Yearling Deer Harvested
During the A/L Season, Lower Mainland
and Vancouver Island

(a) Lower Mainland

YEAR	NO. OF MALES	NO. OF FEMALES
1962	29	17
1963	33	25
1964	79	30
1965	70	64
1966	83	49
1967	71	57
1968	100	56
1969	<u>20</u>	<u>17</u>
Eight Year Total	485	315 = 800

Sex Ratio 154 Males : 100 Females

(b) Vancouver Island

Eleven Year Total	2,104	1,238 = 3,342
Sex Ratio	170 Males : 100 Females	

At least two inferences can be drawn from these results:

- (1) It appears that, on the Lower Mainland, female fawns are more vulnerable to the gun than male fawns. A reversal of behaviour then occurs at the yearling stage, leaving males more vulnerable than females. On Vancouver Island, males appear to be more vulnerable at both the fawn and yearling stages.
- (2) Vancouver Island males, in their first two hunting seasons, are being much more heavily cropped than females. The same may not be so true for the Lower Mainland. This conclusion is supported by Hunter Sample

estimates which indicate a 75% male and 25% antlerless harvest on Vancouver Island, and a 65% male and 31% antlerless harvest on the Lower Mainland.

These comparisons will continue to be made for the next few years to learn if the trends become even more persistent. It is an interesting relationship, and one which can appear only after many years of a standardized data collection program.

MOUNTAIN GOATS:

General:

A detailed discussion of spring carry-over counts for this species was presented in the 1968 Annual Report. There is need here to discuss only the 1969 goat harvest and pre-season aerial survey data.

Harvest:

Road and casual hunter checks for 1969 resulted in a continued reduction in the number of bagged goats tallied (Table 1-G).

TABLE 1-G - Bagged Mountain Goats
Checked in the Lower
Mainland Region

Year	M.A. 2	M.A. 3	M.A. 4(15)	TOTAL
1963	4	2	4	10
1964	2	1	13	16
1965	45	3	28	76
1966	27	5	27	59
1967	30	-	21	51
1968	23	1	22	46
1969	21	-	8	29

The greatest change occurred in M.A. 4 (Lillooet-Bridge River) where only 8 goats were recorded, compared with 21

or more in each of the past four years. Traditionally, most of these goats are checked at Cayoosh Creek on opening week-end. This year, opening week-end checking effort at Cayoosh was reduced by about 50% as hunting pressure was noted to be down considerably. This accounts in part for the reduction.

Also contributing were the changed bag limit (1 goat per hunter rather than 2), and a one week reduction at the beginning of the season, in M.A. 2. The Hunter Sample Analysis will provide the most reliable measure of total harvest for the region, but from most reports it now appears that success was significantly below average. Since relatively few yearling goats are taken (hunters tending to be selective for large adults), the probable effects of the 1968-69 winter on that years kids (see 1968 Annual Report) cannot necessarily be implicated in the reduced success ratios.

Pre-Season Aerial Census:

The 1969 segment of the continuing program to record densities and distribution of Mt. goats in this region was disappointing. A total of 6 $\frac{1}{2}$ hrs. of helicopter search time (Bell 206 Turbine) was devoted to the Lower Fraser Canyon, Silver Creek and Chilliwack ranges, with only 48 goats recorded - an average of seven goats per search hour.

Summaries for each range unit are presented below:

A. Fraser Canyon:

	Range Unit	
	<u>Flood-Spuzzum(West)</u>	<u>Fraser-Coquihalla</u>
Goats Observed	10	3
Flying Time	1 hr. 20 min.	1 hr. 35 min.
Search Time	1 hr.	1 hr. 5 min.
Goats per search hour	7.5	2.9
Observed Population	-	-
Structure(Billies/100 Nannies-Ylgs./kids)		
Percentage kids	-	-

	Range Unit	
	Lower Silver Creek	Chilliwack-Jones (2 Flights)
Goats Observed	6	29
Flying Time	1 hr. 10 min.	3 hr. 25 min.
Search Time	50 min.	2 hr. 15 min.
Goats per Search Hour	7.2	12.9
Observed Population Structure	-	23 Ad. - 3 K. - 3 U/C
Percentage Kids	-	11.5%

In all but the Silver Skagit Unit, indices of density (goats per search hour) are below any recorded in this region since the program began in 1966. The Chilliwack-Jones index is 50% below that of last year. Sixty-six goats were recorded there during the Sept. 1968 flights, while only 29 were recorded during a slightly longer flight in 1969.

Although only a portion of the Silver-Skagit drainage was surveyed this year, the index was higher than that of 1968 (2.4 goats per search hour). Nevertheless, goat numbers in this unit are disappointingly low.

The same appears to be the case for the lower Fraser Canyon. Although the extent of ideal goat summer range in the canyon is limited, the 1969 flights leave an impression of understocked ranges. Thus, these flights should be duplicated within the next two years, in order to determine whether or not hot, dry weather experienced during the 1969 flights significantly influenced elevational distribution, and thus visibility of goats.

WATERFOWL:

A. Habitat Improvement and Protection

Conservation of waterfowl wintering areas, through habitat improvement, was the keynote of management in the Lower Mainland region this year. It has become obvious that if we wish to maintain our present numbers of birds staging and wintering in the Lower Fraser Valley, each acre of remaining wetland must be manipulated toward increased productivity. Industrial and urban development are rapidly consuming prime feeding lands throughout the Pacific Flyway.

Specific efforts were directed at the Pitt Polder public shooting marsh; the Serpentine Flats Reserve; and the Duck, Barber, and Woodward Island complex. Details of much of the 1969 work were given in the 1968 Annual Report. Activities occurring in the latter part of the year were as follows:

1. Serpentine Flats Reserve

Approximately 2500 lbs. of Shearex (75% Nitroglycerin), which were donated to the B. C. Waterfowl Society by Canadian Industries Ltd., were used to create 6 pothole complexes in the 50 acre southwest field. Average pothole dimensions of 100 ft. by 20 ft. by 4 ft. deep were achieved by placing approximately 10 lbs. of explosives in holes drilled in a zig-zag pattern 4 ft. deep and 8 to 10 ft. apart. Best results were achieved when 100 to 200 lbs. of explosives were detonated simultaneously.

Ground-water immediately filled all holes and remained all winter. The area was baited with barley, oats, millet and peanut hearts after the hunting season closed, in an effort to stimulate waterfowl use.

Subsequent to the blasting, the wildlife technician class at the B. C. Institute of Technology was given the task of accurately mapping the location and dimensions of the potholes. A base map was supplied to the Branch.

B. Road Checks

Four student assistants were hired by the Canadian Wildlife Service to assist provincial staff for the first two week-ends of waterfowl hunting. Two assisted at the Westham Island Bridge, one at Benson Road, and one at Sumas Prairie. Methods of data collection were unchanged from previous years so that comparability could be maintained. This hiring permitted a greater intensity of enforcement by allowing some Conservation Officers to conduct roving field checks. The remaining officers worked in a fashion similar to the previous four opening week-ends.

Virtually no hunter-check data were submitted after the second week-end of the season. Thus, the only comparisons possible are for the first two week-ends of the season.

C. Harvest of Waterfowl

A summary of hunter success ratios for the opening day of the 1969 waterfowl season is presented in Table 1-W. Best success was experienced at Mission (Nicomen Island), Sumas Prairie, and Westham Island, while Pitt River (public shooting areas) and Boundary Bay shooters fared poorest.

Average success in the upper Valley areas was higher than on the foreshore, and was 24% higher than the previous four-year mean. Foreshore, and total regional success ratios were 36% and 22% respectively below their previous 4-year means.

Success for the remainder of opening week-end showed the normal sharp decline and brought the averages for the 3-day week-end down (Table 2-W). The upper valley success ratio of 1.9 ducks/hunter day is a new record. The Delta and regional averages are well below both their previous highs and their 4-year means.

The reason for the high success ratios in Sumas and Mission is apparent from Table 3-W. Green Winged Teal were obviously very abundant in those areas, forming 49.9% of the opening week-end bag. They made up only 32.7% of the delta total.

TABLE 1-W - Summary by Area of Opening Day
Waterfowl Hunting Success, 1969

AREA	HUNTER DAYS	DUCKS BAGGED	SUCCESS		
			DUCKS PER HTR. DAY	PREVIOUS HIGH	4-YEAR MEAN
Lulu Is. & Sea Is.	78	85	1.1		
Ladner Marsh	26	51	1.9		
Westham Is. & Foreshore	152	382	2.5		
Canoe Pass - Tsawwassen	401	436	1.1		
E. Delta - B. Bay	284	210	.7		
<u>Total Fraser Delta</u>	941	1164	1.2	3.2	1.9
Sumas-Chilliwack	257	715	3.0		
Pitt River	145	58	.4		
Mission	60	211	3.5		
<u>Total Upper Valley</u>	462	984	2.2	2.2	1.8
<u>Regional Total</u>	1403	2148	1.5	2.9	1.9

Mallards remained the dominant species closer to the foreshore marshes, forming 35.9% of the harvest, and pintails were obviously less plentiful up river than near the mouth.

The distribution of widgeon appeared to be inverse to that of both pintails and mallards.

The four major species (mallard, pintail, widgeon and green winged teal) made up 96.9% of the opening week-end bag this year compared with a 9-year mean of 95.8%. Of the other species recorded, only wood ducks (primarily from Chilliwack-Sumas) and shovellers were important.

TABLE 2-W - Summary of Opening Week-end
Waterfowl Hunting Success - 1969

AREA	HTR. DAYS	DUCKS BAGGED	SUCCESS		
			DUCKS PER HTR.	PREVIOUS HIGH	4-YEAR MEAN
Fraser Delta Areas	1383	1454	1.0	2.7	1.6
Upper Valley Areas	697	1294	1.9	1.6	1.5
Regional Totals	2080	2748	1.3	2.2	1.5

TABLE 3-W - Species Composition of the Opening
Week-end Waterfowl Harvest, Lower
Mainland, 1969

		MAL.	PIN.	WID.	G.W.T.	OTHERS*	TOTAL CLASS'ED
Fraser Delta Areas	No.	465	205	166	424	36	1296
	%	35.9	15.8	12.8	32.7	2.8	
Upper Valley Areas	No.	243	81	267	642	53	1286
	%	18.9	6.3	20.8	49.9	4.1	
Regional Totals	No.	708	286	433	1066	89	2582
	%	27.4	11.0	16.8	41.3	3.4	

* Others include:

Wood Ducks	33 (1.3%)	Blue Winged Teal	1
Shovellers	27 (1.0%)	Ruddy Duck	1
Lesser Scaup	8	Scoter	1
Gadwall	3	Coots	7
Bufflehead	2	Mergansers	4
Canvasback	2		

PHEASANTS:

A. Pre-Season Count

Early morning ground fogs in the two weeks prior to the beginning of the pheasant season seriously curtailed pre-season road-side transect counts. Only three complete counts were obtained along the permanent 10.1 mile Delta Transect. The sum of these data, shown in Table 1-P, resulted in an average density index of 7.6 birds/mile, the highest ratio since prior to the record harvest of 1962.

TABLE 1-P - Pre-Season Population Index Counts
of Delta Pheasants, 1969

A. South Delta Transect

DATE	MILES	COCKS	HENS	U/C	TOTAL	BIRDS/MILE
Sept. 25	10.1	21	21	11	53	5.2
Oct. 7	10.1	44	7	-	51	5.1
Oct. 9	10.1	45	68	14	127	12.5
Totals	30.3	110	96	25	231	Mean 7.6

B. Westham Island

Oct. 7	3.0	56	21	9	86	28.6
--------	-----	----	----	---	----	------

As discussed in the 1968 Annual Report, pre-season roadside counts have proven to be a fairly reliable indicator of the subsequent harvest. The mean index of 7.6 birds/mile, therefore, if it represents an adequate sample, suggests that the 1969 harvest was somewhat between 16,000 and 20,000 pheasants.

The single count obtained on Westham Island, although also inadequate, follows the same trend found in the previous four years; densities at least three times those observed in the South Delta area. Road checks confirm that the Westham Island harvest is substantially greater than in any other part of the region.

B. Harvest

The 1969 season saw a slight improvement in pheasant hunting success, despite a previous winter which was expected to virtually eliminate the species from the lower Fraser Valley. Over-winter survival was remarkably good, and this, combined with fair to good nesting weather, resulted in a 30-40% increase in hunting success.

On opening day in Delta Municipality 789 hunters were checked with 85 cocks, or 1 cock for every 9.3 hunters. This is an improvement from the one bird in 14 hunters average of 1967 and 1968, and is equal to the 1965 and 1966 averages. The record year of 1962 produced 1 cock for every 2.1 hunters, but only those possessing compulsory pheasant tags were considered hunters. The following year, when tags were no longer compulsory, all pheasant and/or waterfowl hunters combined to average 1 cock for every 5.2 hunters. A downward trend continued each year thereafter, until this past season.

The October pheasant harvest statistics, since the first hen season of 1962, are given in Table 2-P. As with opening day, a slight improvement in success for 1969 is indicated, but pheasant hunting must still be considered very poor. This is particularly true of the upper valley areas where only 6 cocks were recorded in 460 hunter-days of effort. A hunting closure for the areas east of Langley Municipality will be considered for 1970, on the basis that numbers can no longer justify harvest.

Table 2-P also demonstrates the marked decrease in the percentage of hens in the October harvest when the hen season is delayed until the second week-end. Wariness on the part of the birds, combined with a greatly decreased hunting pressure, results in a negligible hen harvest. Relatively few complaints of hens shot illegally on opening week-end were received, and only one prosecution was obtained. For this reason, the second week-end hen season

will be recommended for the next few years. In this way the relationship between hen harvest and population trends may be further studied, while at the same time maintaining at least a limited hen season.

TABLE 2-P - Summary of October Pheasant Harvest Information Since the Institution of a Hen Season - Lower Mainland Region (Westham Island Included)

YEAR	NO.* HTRS.	COCKS	HENS	U/C	TOT.	BIRDS/ HTR.	HENS	LENGTH OF HEN SEASON (DAYS)
1962*	1819	513	270	35	818	-	34.5	First 9
1963	3034	340	236	-	576	0.19	41.0	First 9
1964	3355	258	134	18	410	0.12	34.2	First 9
1965	2458	171	58	8	237	0.10	25.3	First 7
1966	2562	124	58	2	184	0.07	31.9	First 7
1967	2570	193	56	-	249	0.10	22.5	First 7
1968	2941	140	6	-	146	0.05	4.1	2nd Week-end
1969	2571	170	6	5	181	0.07	2.2	2nd Week-end

* Includes only those hunters in possession of pheasant tags. All other years include all pheasant and/or waterfowl hunters.

C. Pesticide Research

Excessive levels of methyl-mercury residues in Alberta pheasants, which were traced to mercury-based fungicides used to treat seed-grain, resulted in an emergency pesticide study of Delta pheasants. The same methyl-mercury compounds used on the prairies (Agrox D.B. and Agrosol) were found to be used on approximately 50% of the seed-grain planted in the Fraser Valley.

A sample of 12 pheasants collected for analysis revealed harmless concentrations. A "trace" to 0.5 parts per million were recorded in the livers of adult birds only. Livers of

juvenile birds, and muscle tissue of both adults and juveniles contained no measurable residues of mercury. Similar monitoring tests are planned for 1970.

Alberta's problems have now become more complex, as excessive residues of Dieldrin and other chlorinated hydrocarbons have recently been recorded in a large number of pheasants sampled.