

MEMORANDUM

To To the Reader

PARKS BRANCH  
DEPARTMENT OF RECREATION AND CONSERVATION

OFFICE OF W. G. Hazelwood  
Parks Biologist

2-4-6-42

October 25 76

RE: Trip to Kwadacha Provincial Park

This "trip report" is an observational record of a brief visit to a wilderness Provincial Park. Recommendations given are suggestions for management to consider - to accept and implement or to refuse and ignore. Other regional additional factors may be in effect of which the author is unaware at the time of the visit and subsequent documentation of his field activities within the Park. In short this is an informational report only on a little-known Park.

*W. G. Hazelwood*

W. G. Hazelwood  
October 1976

KWADACHA PARK 1976

By: W. G. Hazelwood

### Kwadacha Park Trip

An aerial and ground reconnaissance was carried out in Kwadacha Park, August 2 - 7 inclusive. The Park was surveyed in a Cessna 185 chartered from NT Air and piloted by Norm Marples. Ground work was carried out in the vicinity of the NE end of Haworth Lake. Further investigations were carried out by Milt Warren in the Chesterfield Lake - Bedaux Pass area from August 8 - 22 inclusive.

Other Park users encountered were a Cessna 185 with 3 hunters that landed on Haworth Lake on August 3 to look for mountain sheep (the only species season open at that time) and two Fort St. John hunters back-packing in the Mt. Grey - Dryas Peak area from August 1 to 11th. The latter two sheep hunters based out of the cabin at the northeast end of Haworth Lake. This cabin was built in 1974 by a Mr. Kemerer despite a Parks Branch refusal to allow its construction.

The weather was poor during the trip with rain occurring each day and night. The lake rose in level of approximately 6 inches during our stay, causing the firepit to be flooded out in our campsite.

Other use of the area was in evidence, as a moose-hunting campsite was located at the upper end of Haworth Lake. Evidence of a campsite on one of the alluvial fans was also found and trees on the edge of the gravel bar were topped in order to allow a wheeled or ski equipped aircraft to land near this campsite. An overturned boat was also observed at the trail leading over to Chesterfield Lake. This may be the property of Don Peck, guide-outfitter in the area, who also has a new large log cabin on the shore of Chesterfield Lake.

This cabin was locked and contains bunks for 4-5 people, gear, food and a rifle. Two boats are also padlocked to a chain on the



Milt Warren and Grant Hazelwood in camp on Haworth Lake with  
Llamberis Glacier beyond.



Avalanche track and fan on north end of Haworth Lake. This is good  
summer habitat for moose and bear.

shore. It should be placed under Park Use Permit.

Sheep hunters from Prince George were reportedly camped on the south side of Chesterfield Lake but were never encountered. They were also there in 1975 on a successful hunt.

Wildlife

The main animal populations in Kwadacha Park are mountain goat, moose and hoary marmots. Of incidental occurrence may be black bear, grizzly, caribou, stone sheep and Rocky Mountain elk. The latter two on the east and southeast margins of the Park. The following table contains some of the observations of this trip.

Mammals

| <u>Species</u> | <u>Numbers</u> |   |      |       | <u>Location</u>  |
|----------------|----------------|---|------|-------|--|
|                | ♂              | ♀ | imm. | uncl. |  |
| caribou        |                |   |      | 2     | Chesterfield Lake  |
| mountain goat  | 1              | 5 | 3    | -     | northwest of Llanberis Glacier                           |
| " "            | 1              | 3 | 2    | 6     | south of Stagnant Glacier                                |
| " "            | -              | - | -    | 7     | Dryas Peak   |
| " "            | -              | - | 4    | 13    | north of Haworth Lake between Grey Peak and Lupine Ridge |
| " "            |                |   |      | 9     | Mt. Chesterfield   |
| moose          | 1              |   |      |       | slough off Warneford River<br>1 mile                     |
| "              |                | 1 |      |       | above Quentin Lake/Aramis lake                           |
| "              | 1              | 1 |      |       | Chesterfield Lake  |
| wolverine      |                |   |      | 1     | alpine south of Survey Peak                              |
| Least Chipmunk |                | 1 | 1    |       | moraine of Llanberis Glacier                             |
| Deer Mouse     |                | 1 | 1    | 7     | cabin at northeast end of Haworth Lake                   |
| Hoary Marmot   |                |   |      | 5     | northwest of Llanberis Glacier                           |
| " "            |                |   |      | 2     | Cloudmaker Mountain                                      |
| " "            |                |   |      | 1     |  |
| " "            |                |   |      | 6     | Dryas Peak   |





Hedysarum boreale (wild sweet pea) grows on the moraine below the Llanberis Glacier.



The Least Chipmunk was harvesting a winter food supply (dryas drummondi) on the moraine.

| <u>Species</u> | <u>Numbers</u> |   |      |       | <u>Location</u>                            |
|----------------|----------------|---|------|-------|--|
|                | ♂              | ♀ | imm. | uncl. |  |
| Porcupine      |                |   |      | 2     | cabin on Chesterfield Lake,<br>Kwadacha R. |
| Weasel         |                |   |      | 1     | Chesterfield Lake                          |

\* Grizzly - tracks of a large and small bear were seen at Chesterfield Lake

Reptiles and Amphibians

Northwestern Toad - 1 unclassified - moraine of Llanberis Glacier

The 52 goats observed are likely only half or less of the total Park population. Tracks of goat were observed on Cloudmaker mountain above Chesterfield Lake but no animals were observed here. The parent rock of the mountains is mainly schist in the western slopes of the Rockies around the Park area. This rock is exceptionally slippery when wet - which is often in this glacially dominated area. It is not conducive to favoured goat habitat.

Moose generally have good habitat available in the wet swamps adjacent to the Warneford and Kwadacha rivers. A mineral lick was seen west of the Aramis lakes that appears to be utilized by moose in that area. The many slides in the steeply sided valleys are also utilized heavily by moose. Trails, beds, droppings and jousting trees are all evidence of summer and fall use. Browse evidence on the willow in particular is evident on the alluvial fans and bars of the many streams which indicate winter use of the lower slides and similar areas around the edges of the lakes and streams. Burn areas from recent forest fires in the confluence area of Chesterfield Creek

and Warneford River will also benefit local moose populations in future years. Moose trails in some areas are recent and heavily used.

Other animals not sighted but leaving track evidence of their presence are beaver, wolves, black bear, grizzly bear and packrat. The only amphibian species sighted was the one toad found on the glacial moraine.

### Birds

The bird population of the Park is surprisingly varied considering the rain forest habitat involved. There are many open deciduous slide and riparian habitats and these along with the lakes and streams themselves present the necessary diversity to support the bird life in the area. The following table is a list of the bird species sighted.

| <u>Species</u>         | <u>Location</u>                                |
|------------------------|--|
| Canada geese           | Warneford River above Quentin lake(30 or more) |
| Mallards               | Chesterfield Lake (7 females)                  |
| Goldeneye              | On Haworth and Chesterfield Lakes (3 young)    |
| Herring gull           | Haworth Lake, Chesterfield Lake                |
| Red-throated loon      | Haworth Lake                                   |
| Common loon (2 pair)   | Chesterfield Lake                              |
| Northern Shoveler      | Haworth, Chesterfield lakes (33 in all)        |
| Lesser yellowlegs      | Haworth Lake (30 in flock)                     |
| Long-billed dowitcher  | Haworth Lake (with above 30 yellowlegs)        |
| Least sandpiper        | shoreline of Haworth Lake                      |
| Solitary sandpiper     | " " " "  |
| Mountain chickadees    | arboreal forest Haworth Lake                   |
| Bohemian waxwings      | moraine of Llanberis Glacier                   |
| Golden-crowned sparrow | arboreal forest Haworth Lake                   |
| Warbling vireo         | " " " "  |
| Solitary vireo         | " " " "  |
| Pine siskin            | " " " "  |





Haworth Lake and the alluvial area with Cloudmaker Mtns. in rear.  
Note foreground slide area inhabited by both bears and moose in summer.



Chesterfield lake offers the only good fishing in Kwadacha Park.  
Mt. Crosby forms the backdrop.

| <u>Species</u>         | <u>Location</u>                          |
|------------------------|--|
| Dark-eyed junco        | arboreal forest Haworth Lake             |
| Olive-sided flycatcher | " " " "                                  |
| Vesper sparrow         | " " " "                                  |
| Wilson's warbler       | open slide fans " "                      |
| Pine grosbeak          | " " " " and Chesterfield Lk.             |
| Grey jay               | arboreal forest " "                      |
| Robin                  | open slide fans " "                      |
| Tree swallow           | open areas and over Haworth Lake         |
| Tree sparrow           | slide areas. Haworth Lake                |
| Yellow-rumped warbler  | arboreal forest Haworth Lake             |
| Rufous hummingbird     | alluvial fan " "                         |
| Spruce grouse          | " " " "                                  |
| Rock ptarmigan         | Lupine Ridge                             |
| Goshawk                | Llanberis Glacier - alpine area (1 pair) |
| Golden eagle           | Chesterfield Lake                        |
| Kingfisher             | " "                                      |

Of special interest were the feeding habits of the northern shovelers as fifteen of them formed a habit of feeding in the evening on surface detritus on Haworth Lake and then would fly up to the glacier and catch rising air currents to help them circle up and over to the Warneford river where they apparently spend the night. The closely knit flock fed in a triangle formation with 3-4 birds at the point, then after several moments they would drop back and 3-4 more would lead and feed. On several occasions they would also form a single line and parallel feed before closing up ranks again. Likely the lines of drift on the lake surface dictated these feeding patterns but pleasant hours of watching with the spotting scope were put in by this observer to try and decipher the feeding habits of this delightful species.

The grey jay, spruce grouse and ptarmigan were unexpectedly rare in the Haworth Lake area and the horned lark was conspicuous by its absence as well.

Fish

The fishery was not well explored during this trip. No fish were caught in Haworth Lake, Quentin Lake was not tested and Chesterfield Lake produced rainbow trout and Dolly Varden in the one to four pound range. Tapeworms were found in the body cavity of most fish caught.

FISH CAUGHT DURING TRIP

| <u>DATE</u>  | <u>DOLLY VARDEN</u>                 | <u>RAINBOW</u>              | <u>COMMENTS</u>   |
|--------------|-------------------------------------|-----------------------------|-------------------|
| Aug. 2, 1976 |                                     | female, 36.7 cm,<br>450 gr. | gut worms present |
| Aug. 7       | 1 (18")                             | 3 (14", 14", 15")           | all had tapeworms |
| Aug. 8       | 4 (1 pound each)                    | 7 caught                    |                   |
| Aug. 9       |                                     | 11 caught, 4 released       |                   |
| Aug. 11      |                                     | 1 caught                    |                   |
| Aug. 12      |                                     | 1 (1 1/2 lbs) 7 caught      |                   |
| Aug. 13      | 7 caught                            | 1 caught                    |                   |
| Aug. 14      | 5 caught                            |                             |                   |
| Aug. 16      |                                     | 3 caught                    |                   |
| Aug. 17      | 2 caught                            | 3 caught                    |                   |
| Aug. 18      |                                     | 1 small one caught          |                   |
| Aug. 19      | 4 (22, 19, 19 1/2 and<br>15 inches) | 8 (all about 15")           |                   |
| Aug. 20      | 3 (17, 18 1/2, and 20")             |                             |                   |
| Aug. 21      | 1 (22"), another<br>small one       |                             |                   |
| Aug. 22      | 1 (20")                             |                             |                   |

Vegetation

The vegetation is that of a subalpine rain forest.

Spruce and alpine fir dominate the forest canopy. The under-story on the alluvial bottoms is mainly willow and Sheperdia canadensis while under the deeper forest mosses and huckleberry predominate. A list of collected plants of the region is added to this report as an appendix.



The goat-inhabited ridges seen from Haworth lake with Mt. Glendower in a cloudbank.



Haworth lake and the inlet streams as seen from the above goat ridges in the rain.

## The Park

The area of the Park is 414,000 acres and much of it is under the Lloyd George icefield and its attendant glaciers. This glacial domination and the location of the Park on the west side of the high Rockies dictates heavy rainfall and a short growing season. The hanging glacier near Survey Peak was constantly advancing and calving off large chunks (some 30 tons or more) of ice from the toe of the glacier which self-destructed on the steep slopes below.

Llanberis Glacier is the most photogenic, located as it is on the northeast end of Haworth Lake. The braided stream and game trails make the two mile hike from lake to glacier an easy one.

The trip to the Stagnant Glacier from the lake is also easy if one finds the high moose trail on the west side of the stream canyon. The braided stream and extensive moraine over the lower glacier make easy scrambling if the schistose rock is not wet. If wet it is slick and treacherous as are the mountains in rain.

Also of photographic interest are the stream aspects from the glacier on Survey Peak. One stream has a 100 foot free fall and the other 200 yards away gushes out of the base of the cliff. Glacial silting of the "spring" water indicates a glacial origin from the same source as the waterfall stream.

The steep cliffs and chutes falling straight into the water on the northeast corner of Haworth Lake will not allow hikers to scramble from the end of the lake to the Chesterfield Lake trail or vice versa.

The trail system is generally quite good in Kwadacha Park. The Bedaux Trail from the Muskwa River headwaters, passes Fern Lake in the Bedaux Pass and continues down to Chesterfield Lake. The crossing of the North Kwadacha River is not possible to the hiker,



Quentin lake and its islands form the third large waterbody in the Park. The meandering floodplain is formed by the Warneford river and offers preferred summer habitat to waterfowl, beavers and moose.



only to horses. A cable bridge would be a great help to hikers' safety. It passes south of the lake and continues down the creek past the Aramis lakes and on down the Warneford River and Kwadacha River to Fort Ware. This is an excellent horse trail used regularly by the resident guide-outfitter. Game trails extend into many of the side valleys from this main trail through the Park, including a horse trail to the headwaters of the Warneford River.

Recreation Values

The main recreation is hunting, both guided and non-guided, and fishing. Recreational hiking from the lake access is also good if one chooses the right campsite on the right lake. Boats (3 of them) owned by the guide are locked up and available only to his clients which must frustrate others to extremes. The open-door policy of the northland is fast fading in the face of abuse and mischief from some uncaring members of the urban public who exhibit latent rip-off tendencies on short wilderness trips. During our stay at Haworth Lake August 2 - 7 the lock was broken off the cabin on Chesterfield and thrown into the lake.

AIRCRAFT USE OF PARK

| <u>DATE</u> | <u>LOCATION</u>  | <u>AIRCRAFT &amp; PEOPLE</u>  |
|-------------|------------------|---|
| Aug. 1      | Haworth Lake     | Cessna 185 - dropped off two hunters                                  |
| Aug. 2      | " "              | " " - author & two companions arrive                                  |
| Aug. 3      | " "              | " " - 3 people (hunters) - meet Parks Br. biologist and leave         |
| Aug. 7      | Park             | Twin Otter, flew low overhead Chesterfield Lake                       |
| Aug. 7      | Haworth Lake     | Beaver took author to Spatsizi; moved companions to Chesterfield Lake |
| Aug. 8      | Chesterfield Lk. | Cessna 185 - 3 people fishing left same day                           |
| Aug. 10     | " "              | " " - 3 people 2 stayed   |
|             |                  | Seabee pusher plane 1 person, left same day                           |
| Aug. 18     | " "              | Two people picked out by Cessna 185                                   |



View of Survey Peak from the braided stream draining the valley of the Stagnant Glacier.



The Stagnant Glacier is covered with rubble for two miles of its length.



One hundred foot waterfall  
and snowbridge in middle  
foreground. This is a glacier  
run-off stream. Goats utilize  
the cliffs and slope on right.



Milt Warren and snowbridge over turbulent waterfall stream. The  
danger of using these thin bridges is very high.





The second stream 200 yards from the waterfall issues directly from the base of the cliff. Its source is also the glacier above the cliffs.

| <u>DATE</u> | <u>LOCATION</u>  | <u>AIRCRAFT &amp; PEOPLE</u>   |
|-------------|------------------|--|
| Aug. 19     | Chesterfield Lk. | Helicopter - Geological Survey of Canada based in Laurier Pass. Came fishing.              |
| Aug. 20     | " "              | Beaver on floats flew over to Fort Ware and back overhead - likely based at Tuchodi Lakes. |
| Aug. 21     | " "              | Wheeled plane flew over low  |
| Aug. 22     | " "              | Cessna 185 - Lifted out Milt Warren to Mackenzie.  |

Fishing is apparently only viable in Chesterfield Lake. Haworth Lake appears barren and Quentin, Fern and the Aramis lakes are unknown quantities at present. The presence of the red-throated loon on Haworth Lake may indicate fish are present in the lake. Goldeneye were also observed feeding on invertebrates in the lake so there is a food chain present. Suitable spawning areas are minimal as the schist bedrock degenerates into flat cobbles unsuitable for good spawning use, and the inlet glacial streams are 3°C which is too cold for successful spawning. The lake outlet, above the falls may provide marginal spawning habitat for a small population of fish.

Spawning potential is apparently good at Chesterfield Lake since good populations of rainbow and Dolly Varden exist in the lake.

### Conclusions

Kwadacha Park is our most remote park as far as access from roads is concerned. Hunting, hiking, mountain climbing and photography are the main recreational features that would serve as public attractants. Mountain goat and moose are the most numerous and visible of the larger wildlife species inhabiting the park.

Bird life is varied and interesting along the lake shorelines and riparian habitat particularly where avalanche fans intercept the above two habitats. This avalanche habitat is also seasonally occupied by

moose and bears as evidenced by the fresh beds and trails encountered in these areas. It is expected that occasional sightings of stone sheep and elk may take place in the headwaters of the Tuchodi and Muskwa river systems which form the eastern margin of the park. Caribou could also be encountered here on an irregular basis similar to grizzly bear sightings. In fact if the eastern side of the Rockies is not also schist rock then it may be more favourable as wildlife habitat than the west side.

#### Recommendations

1. The Haworth Lake cabin be removed as it was constructed in trespass after being forbidden.
2. The guides cabin on Chesterfield be placed under P.U.P. and a key made available to Parks Branch.
3. The Bedaux trail crossing of the North Kwadacha River be provided with a cable crossing for hikers.

#### Acknowledgement

I would like to acknowledge the experience, companionship, expertise and effort of Milt Warren, Information and Education Officer of the Fish and Wildlife Branch, who devoted part of his holidays to this trip. To him I am deeply grateful.

*W. G. Hazelwood*

W. G. Hazelwood  
Parks Biologist  
August, 1976



CHESTERFIELD LAKE

| SPECIES      | LENGTH  | WEIGHT  | SEX | AGE | REMARKS  |
|--------------|---------|---------|-----|-----|--|
| Rainbow      | 37.5 cm | 500 gm  | M   |     | good condition   |
| Trout        | 37.5 cm | 450 gm  | M   |     | thin, gut worms  |
|              | 36.7 cm | 450 gm  | F   |     | tapeworms present  |
| Dolly Varden | 36.0 cm | 425 gm  | F   |     | excellent condition, filled with eggs                              |
|              | -       | 1590 gm | F   |     | caught off a rock bluff, N.E. end of lake                          |
|              | 52.5 cm | 1590 gm | F   |     | bait: rainbow head, ground squirrel in stomach                     |
|              | 56.0 cm | 1800 gm |     |     | best Dolly seen from lake, very good shape - used bait - 1:30 p.m. |

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BRANCH LABORATORY REQUISITION-REPORT

11/8/76

ENVIRONMENTAL LABORATORY  
WATER RESOURCES SERVICE

Parks Branch  
SUBMITTING AGENCY

LABORATORY USE ONLY

16.03.13A.F

SAMPLING SOURCE -

Quentin Lake

SAMPLED BY -

G. Hazelwood

| 8  | 10 | 19 | 21 | 23 | START OF SAMPLING |     |      | 33 | FINISH OF SAMPLING |      |       | 43 | 47 | 48 | 49 |     |      |
|----|----|----|----|----|-------------------|-----|------|----|--------------------|------|-------|----|----|----|----|-----|------|
|    |    |    |    |    | MONTH             | DAY | HOUR |    | MINUTES            | YEAR | MONTH |    |    |    |    | DAY | HOUR |
| W1 |    | 0  | 1  | 9  | 11                | 7   | 6    | 0  | 8                  | 10   | 2     | 1  | 2  | 00 |    |     |      |

RESULTS OF FIELD TESTS

| 8    | BAROMETRIC PRESSURE (ins.Hg.)                 |   |   |   | OXYGEN DISSOLVED (mg/l)   |   |   |   | SPECIFIC CONDUCTANCE (µmhos/cm) |   |   |   |   |   |   |  |  |
|------|---|---|---|---|---------------------------|---|---|---|---------------------------------|---|---|---|---|---|---|--|--|
| W301 | 0   | 0 | 0 | 1 | 7                         | 0 | 0 | 0 | 1                               | 4 | 0 | 0 | 0 | 1 | 1 |  |  |
| 02   | FLOW  |   |   |   | pH (units)                |   |   |   | TEMPERATURE AT SAMPLING (°C)    |   |   |   |   |   |   |  |  |
|      | 0   | 0 | 0 | 1 | 8                         | 0 | 0 | 0 | 0                               | 4 | 0 | 0 | 0 | 1 | 3 |  |  |
| 03   | ALKALINITY: TOTAL (CaCO <sub>3</sub> ) (mg/l) |   |   |   | CHLORINE: RESIDUAL (mg/l) |   |   |   | EXTINCTION DEPTH (ft.)          |   |   |   |   |   |   |  |  |
|      | 0   | 0 | 1 | 0 | 2                         | 0 | 0 | 0 | 1                               | 6 | 0 | 0 | 0 | 1 | 9 |  |  |
| 04   |   |   |   |   |                           |   |   |   |                                 |   |   |   |   |   |   |  |  |

DATE REPORTED

| YEAR | MONTH | DAY |
|------|-------|-----|
| 72   |       |     |

REMARKS -

SIGNATURE

NO. OF TESTS  
78

FIELD PREPARATION OF SAMPLES (REFER TO WATER RESOURCES CHEMISTRY LABORATORY INFORMATION MANUAL.)

BOTTLE CODE

CHECK

A.  GENERAL IONS

B.  B.O.D.

UNFILTERED, UNPRESERVED.

SEPARATE BOTTLE: KEPT COOL: AIR EXCLUDED

QUANTITY

4500 ml

1250 ml

500

IS SAMPLE CHLORINATED?

YES

NO

REMARKS -

IS SAMPLE TAKEN IN SALT OR ESTUARINE WATER?

YES

NO

COPIES OF THIS REPORT ARE TO BE SENT TO -

CHECK

SUBMITTER (AS ABOVE)

POLLUTION CONTROL BRANCH, VICTORIA

OTHER (PLEASE SPECIFY)

G. Hazelwood

INSTRUCTIONS FOR COMPLETING FORM APPEAR ON THE REVERSE OF THE LAST SHEET



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BRANCH LABORATORY REQUISITION-REPORT

11/8/76

ENVIRONMENTAL LABORATORY  
WATER RESOURCES SERVICE

LABORATORY USE ONLY

Parks Branch

6.0.3.1.2AF

SAMPLING SOURCE -

Chesterfield Lake

SAMPLED BY: G. Hazelwood  
E.J. Osmond Jones

| 8  | 10 | PERMIT OR SITE NUMBER | SAMPLE TYPE | SUBMITTING AGENCY | START OF SAMPLING |       |     |      |         | FINISH OF SAMPLING | SAMPLING DEPTH | SAMPLE COMP. LOCATION | LOWER DEPT. VERT. COMP. |
|----|----|-----------------------|-------------|-------------------|-------------------|-------|-----|------|---------|--------------------|----------------|-----------------------|-------------------------|
|    |    |                       |             |                   | YEAR              | MONTH | DAY | HOUR | MINUTES |                    |                |                       |                         |
| W1 |    |                       | 01          | 911               | 76                | 08    | 02  | 120  | 00      |                    | 01             |                       |                         |

RESULTS OF FIELD TESTS

| 8    | 12  | BAROMETRIC PRESSURE (ins.Hg.) | 27                           | OXYGEN DISSOLVED (mg/l) | 42 | SPECIFIC CONDUCTANCE (µmhos/cm) |
|------|---|-------------------------------|------------------------------|-------------------------|----|---------------------------------|
| W301 |   | 00017                         |                              | 00014                   |    | 00011                           |
| 02   | FLOW  | pH (units)                    | TEMPERATURE AT SAMPLING (°C) |                         |    |                                 |
|      | 00018   | 00004                         | 00013                        |                         |    |                                 |
| 03   | ALKALINITY: TOTAL (CaCO <sub>3</sub> ) (mg/l) | CHLORINE: RESIDUAL (mg/l)     | EXTINCTION DEPTH (ft.)       |                         |    |                                 |
|      | 00102   | 00016                         | 00019                        |                         |    |                                 |
| 04   |   |                               |                              |                         |    |                                 |

DATE REPORTED  
YEAR MONTH DAY  
72

SIGNATURE

REMARKS -

NO. OF TESTS  
78

FIELD PREPARATION OF SAMPLES (REFER TO WATER RESOURCES CHEMISTRY LABORATORY INFORMATION MANUAL.)

BOTTLE CODE CHECK

A.  GENERAL IONS UNFILTERED, UNPRESERVED. QUANTITY 4500 ml

B.  B.O.D. SEPARATE BOTTLE: KEPT COOL: AIR EXCLUDED. QUANTITY 1250 ml

IS SAMPLE CHLORINATED?  YES  NO

IS SAMPLE TAKEN IN SALT OR ESTURINE WATER?  YES  NO

REMARKS -

COPIES OF THIS REPORT ARE TO BE SENT TO -

CHECK

- SUBMITTER (AS ABOVE)
- POLLUTION CONTROL BRANCH, VICTORIA
- OTHER (PLEASE SPECIFY)

G. Hazelwood



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BRANCH LABORATORY REQUISITION-REPORT

11/8/76

ENVIRONMENTAL LABORATORY  
WATER RESOURCES SERVICE

LABORATORY USE ONLY

Panlas Branch

1603.1.A.F

SAMPLING SOURCE -

Haworth Lake

SUBMITTING AGENCY

SAMPLED BY -

G. Hazelwood

| B  | PERMIT OR SITE NUMBER | SAMPLE TYPE | SUBMITTING AGENCY | YEAR | START OF SAMPLING |     |      |         | YEAR | FINISH OF SAMPLING |     |      |         | SAMPLING DEPTH FEET | SAMPLE LOCATION | COMP. SAMPLE | LOWER DEPT. VERT. COMP. |
|----|-----------------------|-------------|-------------------|------|-------------------|-----|------|---------|------|--------------------|-----|------|---------|---------------------|-----------------|--------------|-------------------------|
|    |                       |             |                   |      | MONTH             | DAY | HOUR | MINUTES |      | MONTH              | DAY | HOUR | MINUTES |                     |                 |              |                         |
| W1 |                       | 01          | 911               | 76   | 08                | 02  | 12   | 00      |      |                    |     |      | 0       | 11                  |                 |              |                         |

RESULTS OF FIELD TESTS

| B    | BAROMETRIC PRESSURE (ins.Hg.)                 | OXYGEN DISSOLVED (mg/l)   | SPECIFIC CONDUCTANCE (µmhos/cm) |
|------|---|---------------------------|---------------------------------|
| W301 | 0.0017  | 0.004                     | 0.0011                          |
| B    | FLOW  | pH (units)                | TEMPERATURE AT SAMPLING (°C)    |
| 02   | 0.0018  | 0.004                     | 0.0013                          |
| B    | ALKALINITY: TOTAL (CaCO <sub>3</sub> ) (mg/l) | CHLORINE: RESIDUAL (mg/l) | EXTINCTION DEPTH (ft.)          |
| 03   | 0.0102  | 0.0016                    | 0.0019                          |
| 04   |   |                           |                                 |

DATE REPORTED  
YEAR MONTH DAY  
72

SIGNATURE

REMARKS -

NO. OF TESTS  
78

FIELD PREPARATION OF SAMPLES (REFER TO WATER RESOURCES CHEMISTRY LABORATORY INFORMATION MANUAL.)

BOTTLE CODE CHECK

A  GENERAL IONS  
B  B.O.D.

UNFILTERED, UNPRESERVED.  
SEPARATE BOTTLE: KEPT COOL; AIR EXCLUDED.

QUANTITY  
4500 ml  
1250 ml  
500

IS SAMPLE CHLORINATED?  YES  NO

IS SAMPLE TAKEN IN SALT OR ESTUARINE WATER?  YES  NO

REMARKS -

COPIES OF THIS REPORT ARE TO BE SENT TO -

- CHECK
- SUBMITTER (AS ABOVE)
  - POLLUTION CONTROL BRANCH, VICTORIA
  - OTHER (PLEASE SPECIFY)

G. Hazelwood



**ENVIRONMENTAL LABORATORY  
BRANCH LABORATORY REQUISITION-REPORT**

11/8/76

ENVIRONMENTAL LABORATORY  
WATER RESOURCES SERVICE

Parks Branch

LABORATORY USE ONLY

60311AB

SAMPLING SOURCE -

Haworth Lake

SAMPLED BY -

G. Harwood

| 8  | 10 | PERMIT OR SITE NUMBER |  |  | 19 | 21 | 23 | START OF SAMPLING |       |     |      | 33 | FINISH OF SAMPLING |      |       |     | 43 | 47 | 48 | 49 |
|----|----|-----------------------|--|--|----|----|----|-------------------|-------|-----|------|----|--------------------|------|-------|-----|----|----|----|----|
|    |    | TYPE                  |  |  |    |    |    | YEAR              | MONTH | DAY | HOUR |    | MINUTES            | YEAR | MONTH | DAY |    |    |    |    |
| W1 |    |                       |  |  | 0  | 19 | 17 | 04                | 04    | 12  | 00   |    |                    |      |       |     |    |    |    |    |

| 8    | 12 | ALKALINITY: PHENOLPHTHALEIN (CaCO <sub>3</sub> ) |   |   |  | 27                           | OXYGEN: BIOCHEMICAL DEMAND (5 DAY) |       |     |  | 42 | RESIDUE: NON FILTERABLE (105° C) |      |       |     |      |         |   |
|------|----|--|---|---|--|------------------------------|------------------------------------|-------|-----|--|----|----------------------------------|------|-------|-----|------|---------|---|
|      |    | TYPE   |   |   |  |                              | YEAR                               | MONTH | DAY | HOUR                                     |    | MINUTES                          | YEAR | MONTH | DAY | HOUR | MINUTES |   |
| W301 |    | 1  | 0 | 1 |  | 1                            | 1                                  | 5     |     |  |    | 0                                | 0    | 8     |     |      |         |   |
|      |    | ALKALINITY: TOTAL (CaCO <sub>3</sub> )           |   |   |  | OXYGEN: DISSOLVED (mg/l)     |                                    |       |     | RESIDUE: VOLATILE NONFILTERABLE (550° C) |    |                                  |      |       |     |      |         |   |
| 02   |    | 1  | 0 | 2 |  | 0                            | 1                                  | 4     |     |  |    | 0                                | 1    | 0     |     |      |         |   |
|      |    | CALCIUM: DISSOLVED (Ca)                          |   |   |  | pH (units)                   |                                    |       |     | SETTLABLE MATTER                         |    |                                  |      |       |     |      |         |   |
| 03   |    | 2  | 5 | 4 |  | 3                            | 1                                  | 0     | 0   | 4  | 0  | 1                                | 0    | 1     | 6   |      |         |   |
|      |    | CHLORIDE: DISSOLVED (Cl)                         |   |   |  | RESIDUE TOTAL (105° C)       |                                    |       |     | SPECIFIC CONDUCTANCE (µmhos/cm)          |    |                                  |      |       |     |      |         |   |
| 04   |    | 1  | 0 | 4 |  | 0                            | 0                                  | 5     |     |  |    | 3                                | 1    | 0     | 1   | 1    | 0       | 1 |
|      |    | FLUORIDE: DISSOLVED (F)                          |   |   |  | RESIDUE TOTAL FIXED (550° C) |                                    |       |     | TURBIDITY (units)                        |    |                                  |      |       |     |      |         |   |
| 05   |    | 1  | 0 | 6 |  | 0                            | 0                                  | 6     |     |  |    | 0                                | 1    | 5     |     |      |         |   |
|      |    | HARDNESS: TOTAL (CaCO <sub>3</sub> )             |   |   |  | RESIDUE: FILTERABLE (105° C) |                                    |       |     |  |    |                                  |      |       |     |      |         |   |
| 06   |    | 1  | 0 | 7 |  | 3                            | 1                                  | 0     | 0   | 7  | 1  | 7                                | 0    | 1     | 1   | 2    | 9       |   |

|    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

NOTE - UNLESS OTHERWISE INDICATED ALL MEASUREMENTS ARE IN MILLIGRAMS PER LITER.

DATE REPORTED  
YEAR MONTH DAY  
76 10 8 13

*[Signature]*

SIGNATURE

REMARKS (LABORATORY USE ONLY)

pH TOO LONG IN TRANSIT - VALUE REPORTED MAY NOT BE INDICATIVE OF SITE AT TIME OF SAMPLING - 8.1 units

NO. OF TESTS  
78 03

"X" IF ADD L. DATA FOLLOWS  
80

A P P E N D I X 1 - P L A N T L I S T

HAWORTH LAKE - Elevation:  
Date: August 1976

| <u>BOTANICAL NAME</u>                                      | <u>COMMON NAME</u>            |
|--|-------------------------------|
| 1. <i>Gentiana propinqua</i> Richards                      | Gentian                       |
| 2. <i>Senecio triangularis</i> hook                        | Groundsel                     |
| 3. <i>Arnica mollis</i> hook                               | Arnica                        |
| 4. <i>Pedicularis bracteosa</i> benth                      | Lousewort                     |
| 5. <i>Rubus pedatus</i> sm.                                | Trailing Rubus                |
| 6. <i>Rubus arcticus</i> subsp. <i>acaulis</i> focke       | Dew Berry                     |
| 7. <i>Listera cordata</i> (L.) R. Br.                      | Twayblade                     |
| 8. <i>Dryopteris disjuncta</i> (Ledeb.) Morton             | Oak Fern                      |
| 9. <i>Moneses uniflora</i> (L.) Gray                       | One Flowering Wintergreen     |
| 10. <i>Eriophorum angustifolium</i> honk                   | Cottongrass                   |
| 11. <i>Mertensia paniculata</i> G. Don.                    | Lungwort                      |
| 12. <i>Anemone multifida</i> poir                          | Cut Leaved Anemone            |
| 13. <i>Erigeron perigrinus</i> (pursh)                     | Green Mountain Daisy          |
| 14. <i>Smilacina stellata</i> (L.) Desf.                   | Star Flowered Solomon Seal    |
| 15. <i>Zigadenus elegans</i> pursh                         | Camas                         |
| 16. <i>Goodyera repens</i> (L.) R. Br.                     | Northern Rattlesnake Plantain |
| 17. <i>Pyrola secunda</i> L.                               | One Sided Wintergreen         |
| 18. <i>Pyrola asarifolia</i> michx.                        | Pink Wintergreen              |
| 19. <i>Polygonum viviparum</i> L.                          | Knotweed                      |
| 20. <i>Delphinium glaucum</i> S. Wats                      | Larkspur                      |
| 21. <i>Parnassia fimbriata</i> Koenig.                     | Grass of Parnassus            |
| 22. <i>Astragalus alpinus</i> L.                           | Alpine Milk Vetch             |
| 23. <i>Thalictrum occidentale</i> Gray                     | Meadow Rue                    |
| 24. <i>Solidago multiradiata</i> Var. <i>Artica</i> (D.C.) | Fern Goldenrod                |

*He.*

A P P E N D I X 1 - P L A N T L I S T

CHESTERFIELD LAKE - Elevation:  
Date: August 1976

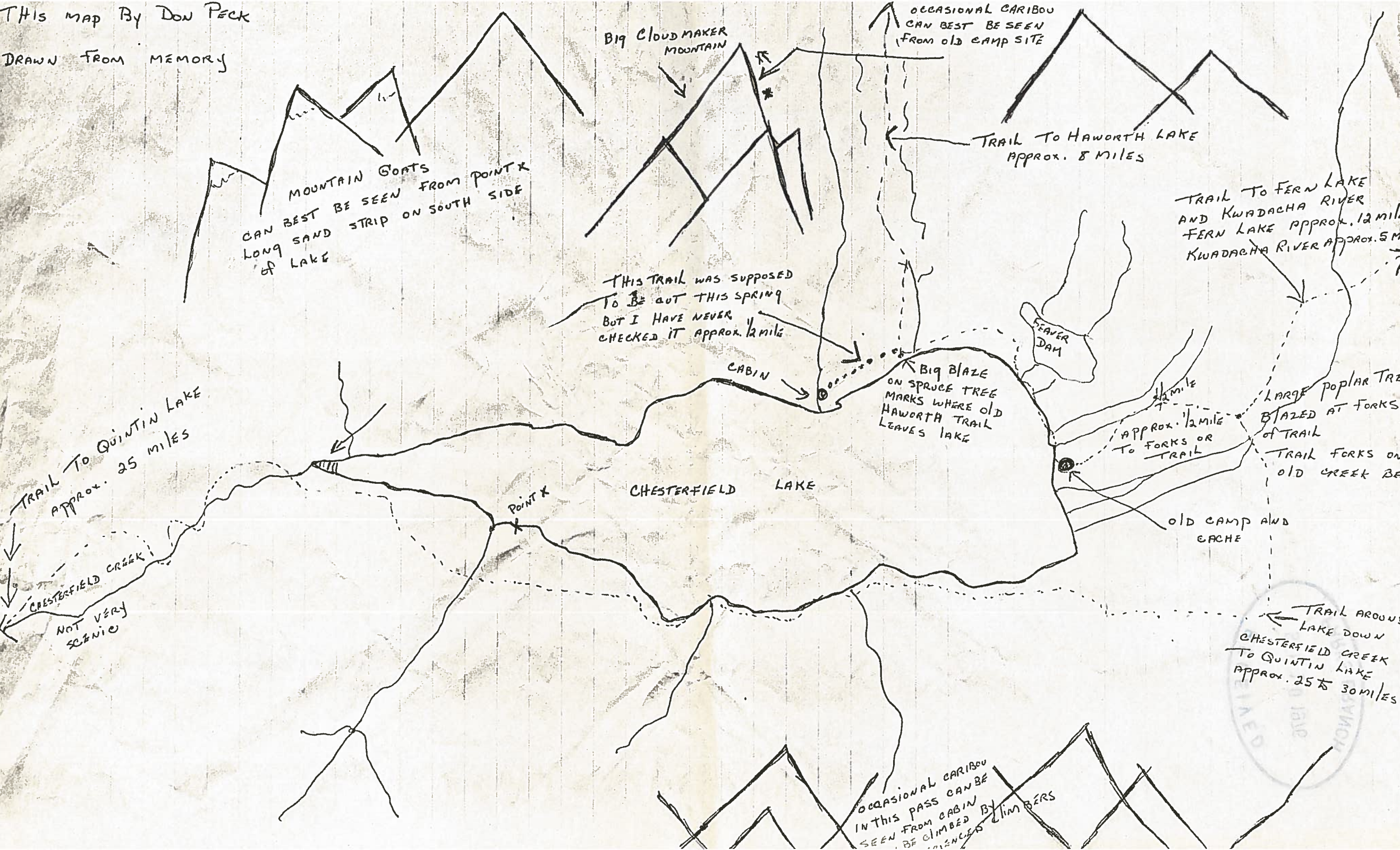
| <u>BOTANICAL NAME</u>                         | <u>COMMON NAME</u>        |
|---|---------------------------|
| 1. <i>Habenaria obtusata</i> (pursh) Richards | Small Northern Bog Orchid |
| 2. <i>Pyrola asarifolia</i> michx.            | Pink Wintergreen          |
| 3. <i>Pyrola secunda</i> L.                   | One Sided Wintergreen     |
| 4. <i>Moneses uniflora</i> (L.) Gray          | One Flowering Wintergreen |
| 5. <i>Gentiana propinqua</i> Richards         | Gentian                   |
| 6. <i>Artimesia michauxiana</i> Bess          | Wormwood                  |
| 7. <i>Melandrium attenuatum</i> (Far) Hara    | Nodding Pink              |
| 8. <i>Potentilla fruticosa</i> L.             | Shrubby Cinquefoil        |
| 9. <i>Pedicularis bracteosa</i> benth         | Lousewort                 |
| 10. <i>Aconitum columbianum</i> D.C.          | Monkshood                 |
| 11. <i>Saxifraga oppositifolia</i> L.         | Purple Saxifrage          |
| 12. <i>Saxifraga feruginea</i> Graham         | Coast Saxifrage           |
| 13. <i>Crepis nana</i> Richards               | Hawks Beard               |
| 14. <i>Ribes cereum</i> Lindl.                | Wild Currant              |

*De.*



THIS MAP BY DON PECK

DRAWN FROM MEMORY



MOUNTAIN GOATS  
CAN BEST BE SEEN FROM POINT X  
LONG SAND STRIP ON SOUTH SIDE  
OF LAKE

Big CLOUD MAKER  
MOUNTAIN

OCCASIONAL CARIBOU  
CAN BEST BE SEEN  
FROM OLD CAMP SITE

TRAIL TO HAWORTH LAKE  
APPROX. 8 MILES

TRAIL TO FERN LAKE  
AND KWADACHA RIVER  
FERN LAKE APPROX. 12 MILE  
KWADACHA RIVER APPROX. 5 M

THIS TRAIL WAS SUPPOSED  
TO BE CUT THIS SPRING  
BUT I HAVE NEVER  
CHECKED IT APPROX. 1/2 MILE

CABIN

Big BLAZE  
ON SPRUCE TREE  
MARKS WHERE OLD  
HAWORTH TRAIL  
LEAVES LAKE

BEAVER  
DAM

APPROX. 1/2 MILE  
TO FORKS OR  
TRAIL

LARGE POPLAR TREE  
BLAZED AT FORKS  
of TRAIL  
TRAIL FORKS ON  
OLD CREEK BE

old CAMP AND  
CACHE

TRAIL TO QUINTIN LAKE  
APPROX. 25 MILES

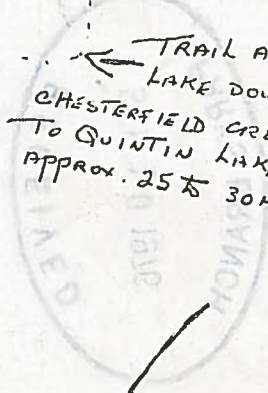
CHESTERFIELD CREEK  
NOT VERY  
SCENIC

CHESTERFIELD LAKE

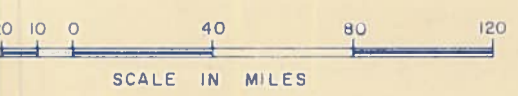
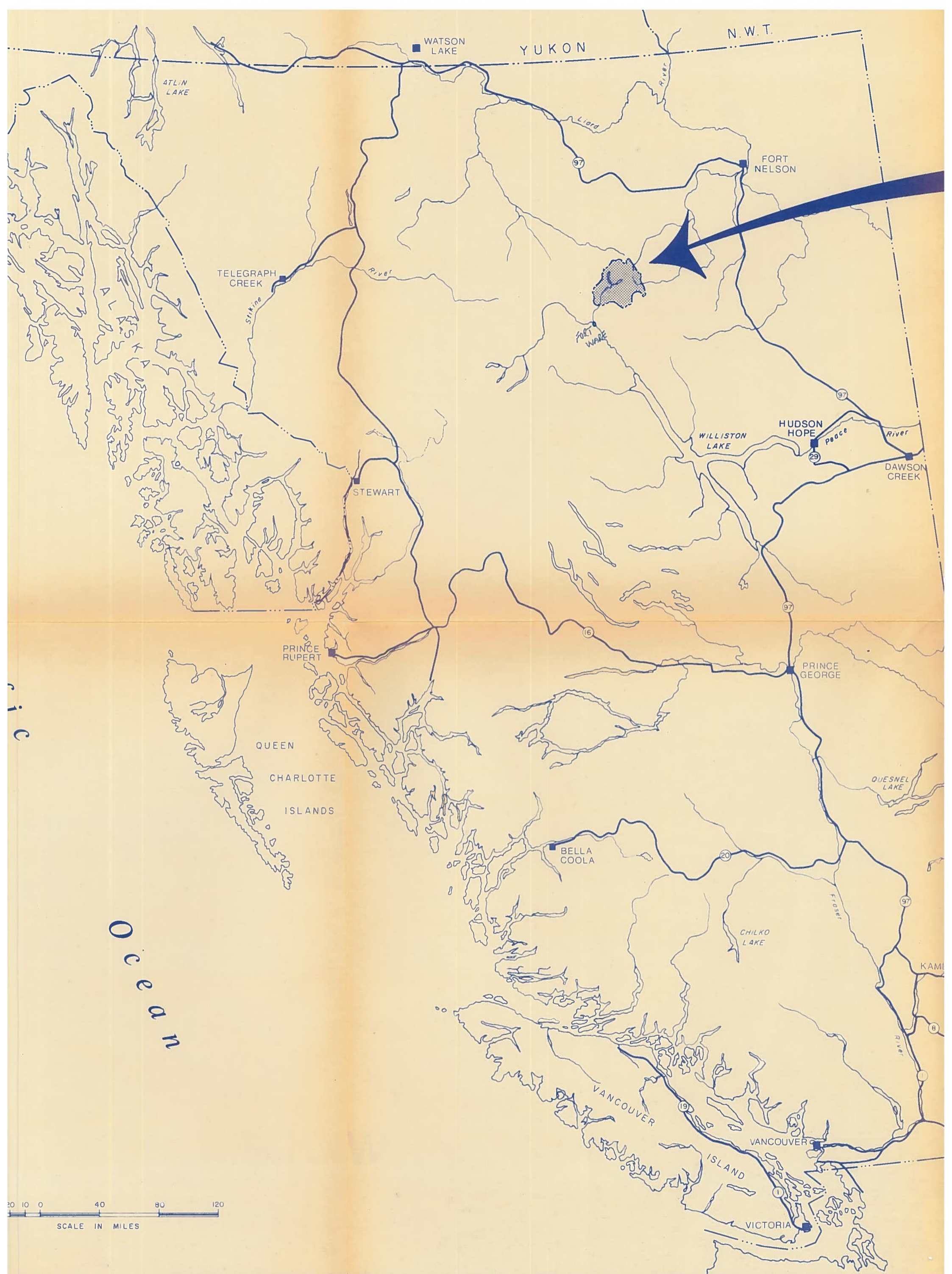
POINT X

TRAIL AROUND  
LAKE DOWN  
CHESTERFIELD CREEK  
TO QUINTIN LAKE  
APPROX. 25 TO 30 MILES

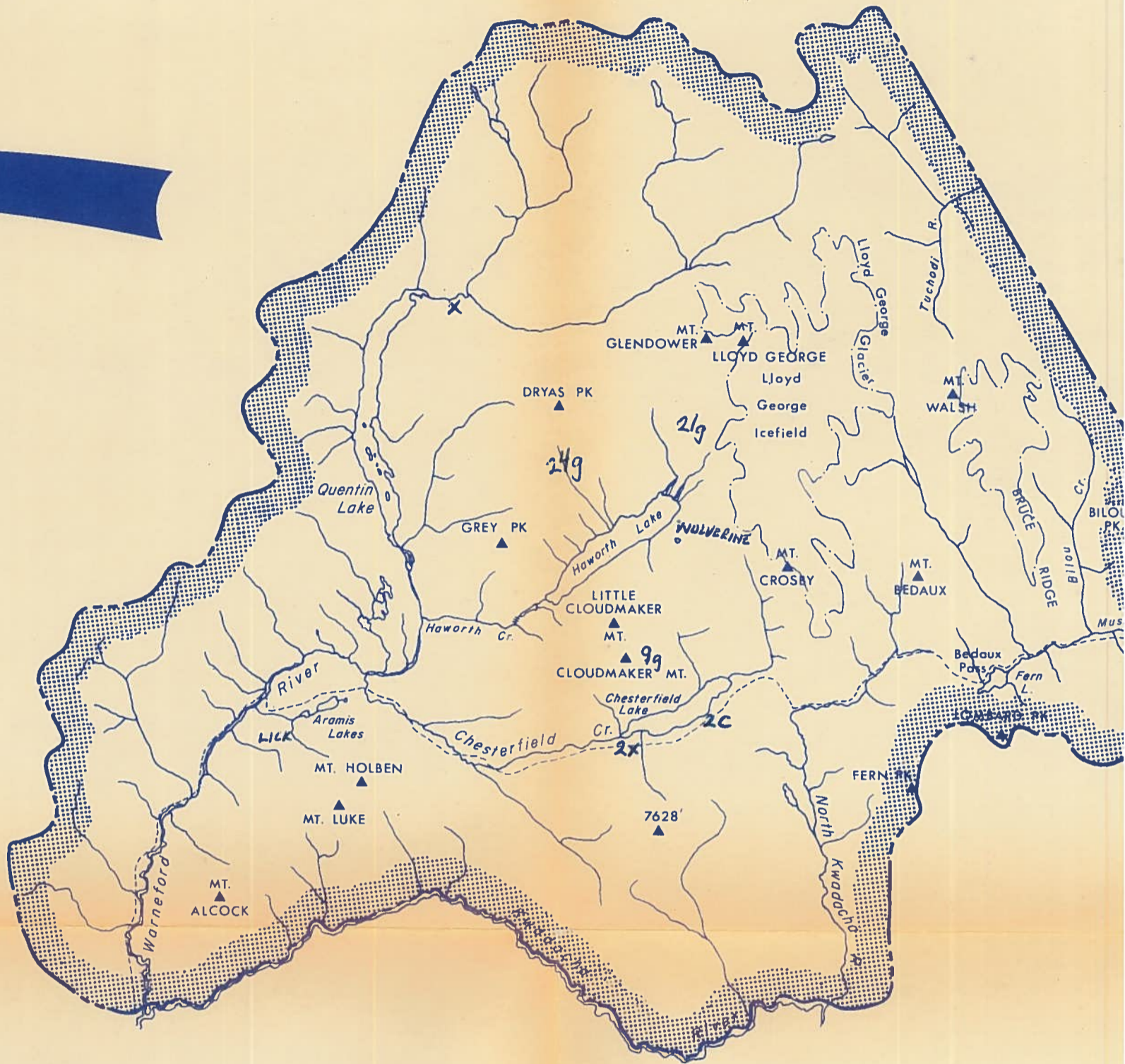
OCCASIONAL CARIBOU  
IN THIS PASS CAN BE  
SEEN FROM CABIN  
BE CLIMBED BY  
CLIMBERS



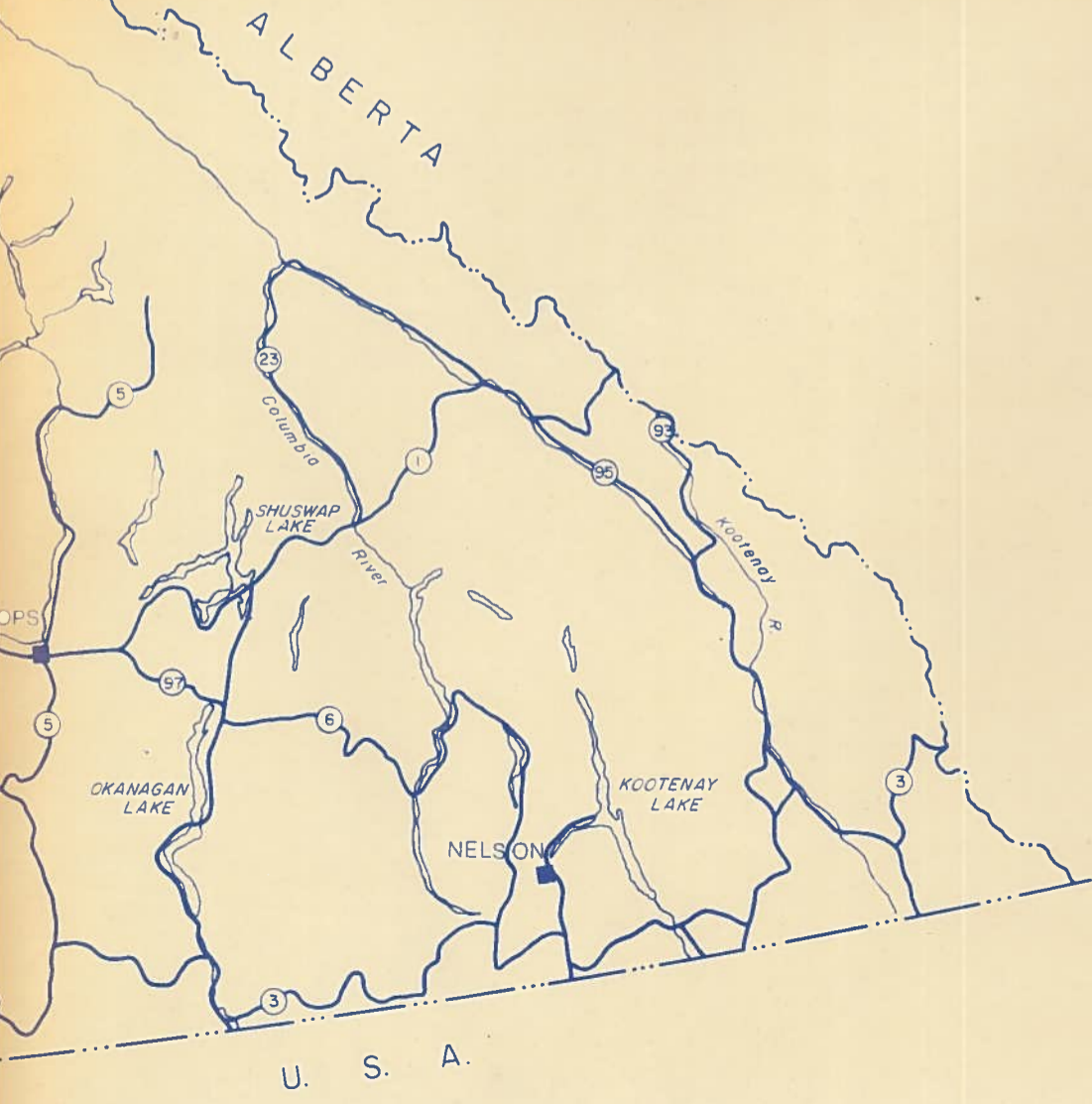








g = MTN. GOAT (54 SEEN)  
 x = MOOSE (3 SEEN)  
 c = CARIBOU (2 SEEN)  
 LICK = MINERAL LICK USED BY



# KWADACHA WILDERNESS