

**Snowflake Lake
(180-374000-95200-41400-5280-7330-01)
02387FRAN**

**SECONDARY LAKE INVENTORY
1997 STUDIES**

**Ministry of Environment, Lands and Parks
Project No. IVBVS622 (FRBC)**

Prepared for:

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APRIL 1998

COVER PAGE

Lake Name: Snowflake Lake

Alias: -

Watershed Code: 180-374000-95200-41400-5280-7330-01

Waterbody Identifier: 02387 FRAN

Survey Date: September 23, 1997

Project Code: IVBVS622

Survey Objectives: to conduct secondary lakes inventories in the southern portions of the Morice and Lakes Forest Districts (Prince Rupert Forest Region)

Survey Type: Secondary Lakes Inventory

Survey Agency: CO60

Proponent: MELP

Inventory Program: FRBC

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- Appendix B Lake Outline Map
- Appendix C Air Photo Plate
- Appendix D Lake Survey Form
- Appendix E Fish Collection Form
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1.0 LAKE INVENTORY DATA

1.1 WATERBODY

Type:	Small lake (<400 ha)
Lake Name:	Snowflake Lake
Watershed Code:	180-374000-95200-41400-5280-7330-01
Waterbody Identifier:	02387FRAN
Map Reference:	093F.081 (1995)
Air photo Reference:	30BC 89042 No.29
Surface Area: 81 ha	Source: MELP
Elevation: 934 m	Source: TRIM
Biogeoclimatic Zone:	Sub-Boreal Spruce (SBS)

The lake is shown in Plates 1 and 2.

1.2 ACCESS

The lake was accessed by floatplane from Burns Lake, British Columbia. Flying time was approximately 15 minutes southwest of Burns Lake. Road access may be possible through a cut block located at the south end of the lake. This option was not pursued during the inventory survey due to the potential time delay, in the event difficulties were encountered carrying required equipment through heavy brush to the lake.

1.3 TERRAIN

The lake appears to be a glacial lake (GL), with a northwest aspect. It is situated on the valley floor (VF), and no signs of hillside coupling (DC) are evident. The land use in the immediate vicinity of the lake is comprised mostly of natural/none (80%) and to a lesser extent, forestry (20%).

1.4 SHORELINE

The shoreline is comprised of 75% marsh and 25% sand/gravel beach. Shoreline vegetative cover is moderate and consists primarily of grass and low-lying

shrubs. No recreational features (i.e. resorts, campsites, boat launches) were observed.

1.5 BATHYMETRY

An E-line survey was completed along the long axis of the lake using a Lowrance X-16 unit (equipped with continuous paper trace sounder rolls). The maximum recorded depth was 11.0 m. Based on the E-line survey, the estimated littoral area (% lake <6 m) is 75%. The maximum high water mark was observed at 0.3 m.

1.6 INLETS/OUTLETS

Four ephemeral inlets and one outlet have been identified for this lake. All inlet tributaries were previously mapped on the 1:20,000 TRIM map. One of the four tributaries had an existing watershed code; interim locational points (ILP) were used to identify the remaining three tributaries. No channel was evident during field observations of one of the previously mapped inlets and this has been recorded as nvc on the lake outline map.

Inlet (ephemeral)

w/s code: 180-374000-95200-41400-5280-7330-833

This channel is identified as a permanent tributary on the 1:20,000 TRIM map. In the field, this tributary was found to have an indistinct channel (approximately 0.2 m wide at the lake). The channel was difficult to find and was considered to be ephemeral since water was present intermittently and no flow was evident. No potential fish habitat was identified.

Inlet (ephemeral-nvc)

ILP # 01

Although previously mapped on the 1:20,000 TRIM map, no visible channel (nvc) was discernible upon completing a foot survey of the area. Further investigation may be required to confirm channel presence.

Inlet (ephemeral)

ILP # 02

This tributary is an indistinct channel. The channel was difficult to find and was considered to be ephemeral since water was present intermittently and no flow was evident.

Inlet (ephemeral)

ILP # 03

This tributary is an indistinct channel. The channel was difficult to find and was considered to be ephemeral since water was present intermittently and no flow was evident.

Outlet

w/s code: 180-374000-95200-41400-5280-7330

The outlet channel was observed to be flowing. Gravel and cobble substrate was identified in this channel downstream of a wetland area immediately below the lake and provides potential spawning habitat. There was also good stream cover including large woody debris. Beaver dams at the lake outlet may be obstructions to fish from downstream locations.

1.7 AQUATIC FLORA

At the time of the survey, small amounts of emergent vegetation (20%) and submergent vegetation (<10%) were present. Submerged species included *Hippuris spp.*, and *Elodea canadensis*, while emergent vegetation included *Nuphar lutea* (yellow pond-lily), and *Caryx spp.* Floating algae were not observed.

1.8 WILDLIFE

During the survey, bear signs and beaver activity were observed.

1.9 LIMNOLOGICAL SAMPLING

The limnological sampling site was located at the deepest point (11.0 m). Dissolved oxygen (mg/l) and temperature (C) were measured with a YSI meter (model 85). A thermocline was evident approximately 6.0 m below surface. Oxygen levels were 6-8 mg/l above the thermocline and close to 0 mg/l between approximately 8 m and the bottom (for profile results, refer to Appendix D). The Secchi disc was visible at 4.0 m; water colour was brown. The pH was measured using a hand held Hanna pH meter. The surface pH measurement was 8.2 (no bottom pH or H₂S was measured due to the malfunction of the water sampler).

1.10 SURVEY COMMENTS

1.10.1 Problems

No field problems were encountered.

1.10.2 Fish Comments

No fish were captured during fish sampling. One floating gillnet was set perpendicular to shore for approximately 3 hours. Three rainbow trout were captured in nearby Moss Lake during a three hour gillnet set. Elsewhere during the same lake inventory, as many as thirty-three fish were captured during two to three hour gillnet sets. Fish species included rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), redbside shiner (*Richardsonius balteatus*), longnose sucker (*Catostomus catostomus*), largescale sucker (*Catostomus macrocheilus*) and mountain whitefish (*Prosopium williamsoni*).

Lake and outlet stream habitat quality was good in Snowflake Lake. Habitat in tributary streams may be available seasonally. It is not known whether a downstream barrier prevents fish access to the lake, though beaver dams at the outlet may impede passage. Oxygen data suggest that levels may be seasonally poor for fish use.

1.10.3 Habitat Comments

No inlet spawning habitat was observed. Potential spawning habitat was observed along the shore as well as at the outlet. The inlets were considered to be ephemeral and may provide seasonal rearing habitat; however, at the time of the study, suitable inlet habitat was not found. There was a moderate amount of shoreline grasses, which could provide fish cover.

1.10.4 Rehabilitation/Enhancement Comments

Enhancement efforts may include the removal or circumvention of any barriers (i.e. beaver dam, log jam) that are preventing fish movement upstream into the lake, if barriers are confirmed to impede fish movement to the lake as part of a subsequent survey.

1.10.5 Follow-up Sampling

Follow-up sampling is recommended prior to further near shore development in order to confirm fish absence in the lake. Further surveys should include identification of possible downstream barriers and the closest presence of fish downstream from the lake

1.10.6 Other Concerns/Interest Points

None.

2.0 PROJECT- SPECIFIC RESULTS DISCUSSION

Fish were not captured during the current survey. Snowflake Lake is located on a tributary to Takysie Lake, a popular sport fishing lake. Rainbow trout were captured in nearby Moss Lake.

No spawning habitat was identified in inlets to Snowflake Lake; potential spawning and rearing habitat was observed at the outlet. Significant amounts of gravel are situated along the shoreline and may be suitable as lake spawning habitat. Several beaver dams at the lake outlet may obstruct fish movement. Follow-up sampling is recommended to confirm fish absence and if necessary the closest fish presence and possible fish barriers. Enhancement efforts may include the removal of any barrier, if identified. Otherwise, all other habitat features suggest the lake would support fish populations.

Dissolved oxygen and temperature measurements indicated a thermocline at approximately 6.0 m below the surface. Dissolved oxygen levels were suitable for fish (between 6-8 mg/l) above the thermocline; values typically fell sharply below the thermocline. Oxygen values approached zero close to the lake bottom.

Recreational features were not observed, nor were there any signs of recent visitors to the lake.

3.0 REFERENCES

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- Anonymous. 1997. Users Guide to the British Columbia Watershed/Waterbody Identifier System. Resources Inventory Committee Manual, Province of British Columbia. Draft, January 1997.
- BC Ministry of Environment, Lands, and Parks. Fisheries Branch Inventory Unit. Stream Information Summary System (SISS) and Fisheries Inventory Summary System (FISS) - Data Files and Maps.
- McPhail, J.D., and R. Carveth. 1994. Field Key to the Freshwater Fishes of British Columbia. BC Ministry of Environment, Lands and Parks. Fisheries Branch. (Resources Inventory Committee Manual)

Scott, W.B. and E.J. Crossman, 1973. Freshwater Fishes of Canada. Fisheries Research Board of Canada, Ottawa. 966 p.

Plates

Plate 1 Aerial view of lake looking southwest.



Plate 2 View of southwest shoreline from near lake centre.



Photographic index for southern lakes secondary lake survey 1997.

Lake	Watershed Code	Roll	Pic#	CD	Image	Neg	Dir.	Comment
L1	180-374000-95200-41400-5280-7330-1	21	1	0820	1	9350	SW	Aerial view
L1	180-374000-95200-41400-5280-7330-1	21	2	0820	2	9350	Dn	Inlet ILP2
L1	180-374000-95200-41400-5280-7330-1	21	3	0820	3	9350	Up	Inlet ILP2
L1	180-374000-95200-41400-5280-7330-1	21	4	0820	4	9350	Dn	Inlet ILP3
L1	180-374000-95200-41400-5280-7330-1	21	5	0820	5	9350	Up	Inlet ILP3
L1	180-374000-95200-41400-5280-7330-1	21	6	0820	6	9350	NW	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	7	0820	7	9350	NW	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	8	0820	8	9350	N	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	9	0820	9	9350	E	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	10	0820	10	9350	SE	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	11	0820	11	9350	S	Panoramic view of lake
L1	180-374000-95200-41400-5280-7330-1	21	12	0820	12	9350	Dn	Comment: Inlet -95200-4140-5280-7330-833
L1	180-374000-95200-41400-5280-7330-1	21	13	0820	13	9350	Up	Comment: Inlet -95200-4140-5280-7330-833
L1	180-374000-95200-41400-5280-7330-1	21	14	0820	14	9350	Up	Comment: Outlet -95200-41400-5280-7330
L1	180-374000-95200-41400-5280-7330-1	21	15	0820	15	9350	Up	Upstream from outlet
L1	180-374000-95200-41400-5280-7330-1	21	16	0820	16	9350	SE	Marshy lake attached to main lake
L1	180-374000-95200-41400-5280-7330-1	21	17	0820	17	9350	Dn	At barrier looking Dn at outlet creek.
L1	180-374000-95200-41400-5280-7330-1	21	18	0820	18	9350	N	Aerial view of lake
L1	180-374000-95200-41400-5280-7330-1	21	19	0820	19	9350	E	Aerial view of lake
L1	180-374000-95200-41400-5280-7330-1	21	20	0820	20	9350	W	Aerial view of lake
L1	180-374000-95200-41400-5280-7330-1	21	21	0820	21	9350	SE	Aerial view of lake

Appendix A
Lake Outline Map

Appendix B

Air Photo Plate

Appendix C

Lake Survey Form

Appendix D

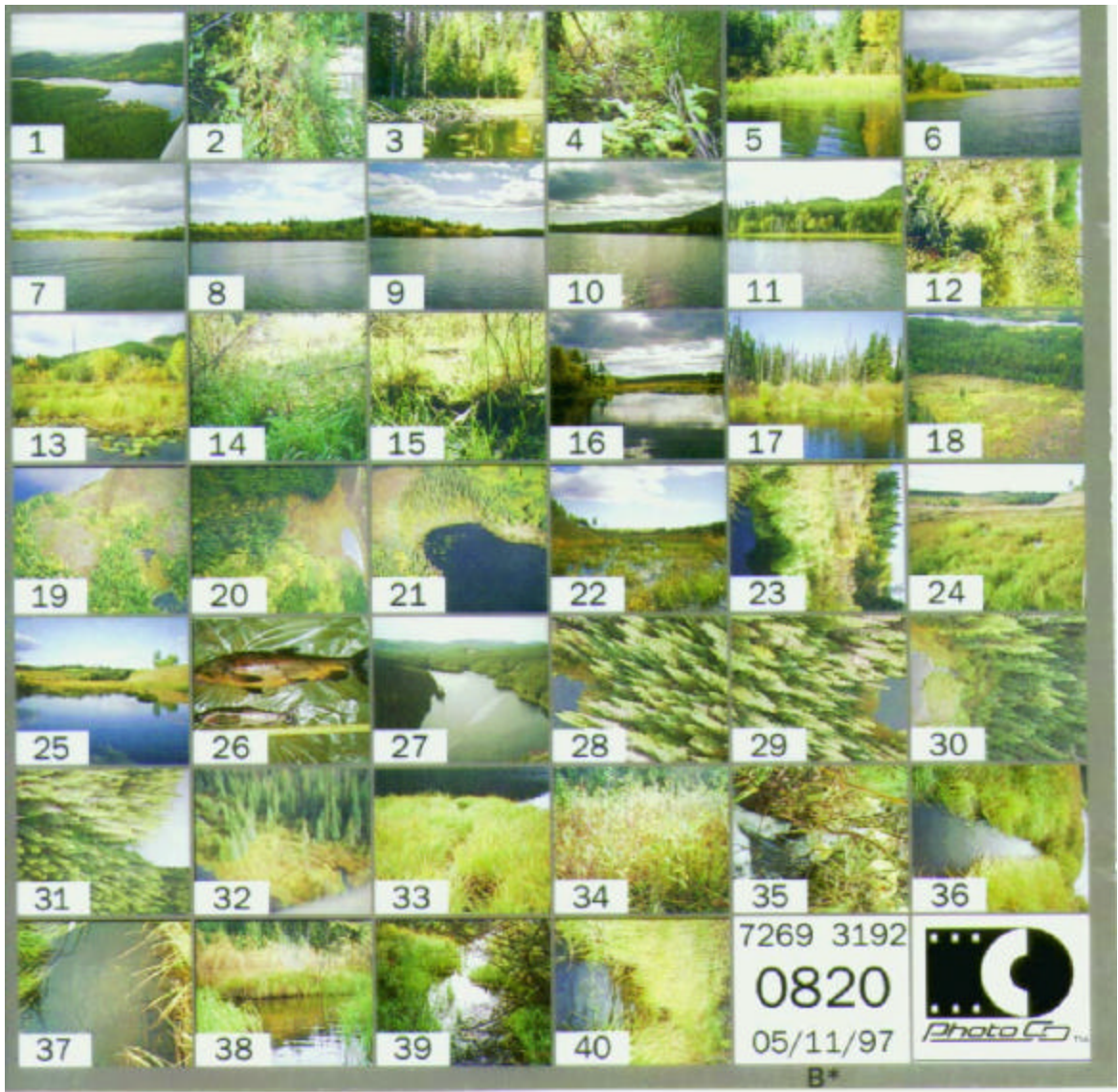
Fish Collection Form

Appendix E

**Dissolved Oxygen/
Temperature Profiles**

Appendix F

Photograph Contact Sheets



B*

Appendix G

E-line Trace
