# Reconnaissance Lake Inventory
# of
# Hanawald Lake

Waterbody Identifier 01381BABR
Map # 93M.065
UTM 09.623013.6173489

Prepared for:
Ministry of Environment, Lands and Parks
3726 Alfred Avenue
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V0J 2N0

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March 31, 1998

## Disclaimer

The Province has not accepted the contents of this product for the purposes of the Forest Practices Code, and reserves the right to dispute the validity of summarized results. The province does not necessarily agree with the classification assigned to any individual stream reach, for use in logging plans, silviculture prescriptions or any other application.

## Data Summary

### Project Reference Information

| | |
|---|---|
| MoELP Project Number | CSK3029 |
| FDIS Project Number | 06-LBIR-0010-0003-1998 |
| Forest Region | Prince Rupert |
| Forest District | Kispiox |
| MoELP Region | Skeena |
| Wildlife Management Unit | 6-7 |
| FRBC Region | Skeena-Bulkley |

### Watershed Information

| | |
|---|---|
| Higher Level Watershed Code | 480-241300 |
| Waterbody Identifier | 01381BABR |
| UTM at Lake Outlet | 09.623013.6173489 |
| Number of Tributaries on TRIM or FCM | 7 |
| Number of Tributaries observed in field | 6 |
| Magnitude | 28 |
| Elevation | 948 m |
| NTS Map | 93M/11 |
| TRIM Map | 93M.065 and 93M.066 |
| Biogeoclimatic Zone | ESSF |
| Air Photos | 30BCB92073 No. 173 |

### Lake Sampling Summary

| | |
|---|---|
| Fish Species Present | Rainbow Trout |
| Lake Survey Type | Secondary (1997 RIC Standards) |
| Water Surface Area | 50 ha |
| Max. Depth | 9 m |
| Secchi Depth | 2.5 m |
| Shoreline Perimeter | 4.6 km |
| Lake Length | 1 km |
| Number of Islands | 1 |

**Contractor Information**

| | | |
|---|---|---|
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| Data Entry by: | Names: | Michelle Prins |
| Report Prepared by: | Names: | Melinda Bahr |
| Report Edited by: | Names: | Glenn Grieve |
| Genetic sample analysis by: | Name: | Susan Pollard |
| | Address: | Fisheries Branch, 780 Blanshard St., Victoria, British Columbia, V8V 1X4 |
| | Phone: | (250) 387-4573 |

**Acknowledgments**

Funding for this inventory was provided by Forest Renewal BC.

We would like to thank Paul Giroux, Steve Gray, Sig Hatlevik, Steve Woodliffe and Doug Webb for their help with this inventory.

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## 1.0 Introduction

### *1.1 Project scope/Objectives*

The primary purpose of the reconnaissance inventory of Hanawald Lake was to gather information on the presence or absence of fish in the lake, and to gather preliminary data on biophysical attributes of the lake. Hanawald Lake was a secondary lake included in a secondary level reconnaissance inventory of 34 lakes located in the northern portions of the Kalum, Kispiox, Bulkley and Morice Forest Districts.

### *1.2 Location*

Hanawald Lake is located approximately 38 km northwest of Fort Babine on Babine Lake, 105 km north of Smithers Airport, 5 km southeast of Gunanoot Lake and approximately 55 km northeast of Kispiox, B. C. The latitude of Hanawald Lake is 55° 41' 29.7" and the longitude is 127° 02' 34.9".

#### 1.2.1 Access

The field crew reached this lake by helicopter. The flight to the lake from Smithers, B. C. takes about 45 minutes. Hanawald Lake was not accessible by road.

## 2.0 Resource Information

A thorough data search of Ministry of Environment lake files yielded no preexisting information about Hanawald Lake. This lake was pristine . None of the surrounding area of the lake had been logged and no preexisting campsites were observed.

### *2.1 Points of Interest*

This lake has high potential for recreational activities including hiking and camping and canoeing. The emergent and submergent aquatic vegetation around the lake was diverse which would be interesting for canoeists. Potentially good campsites are located in the riparian zone and on some bedrock outcroppings on the northeastern shore.

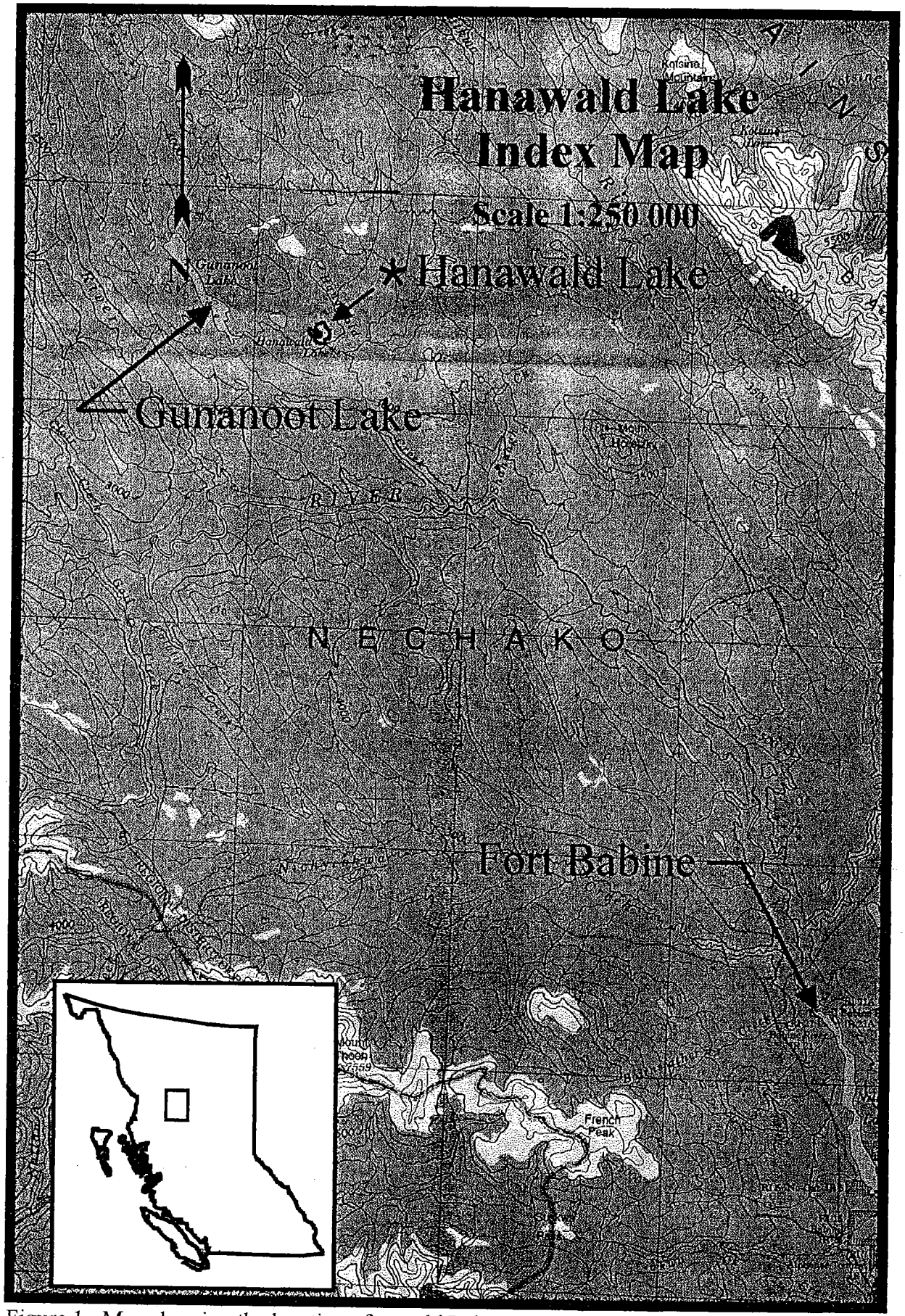



Figure 1. Map showing the location of nawald Lake, Watershed Code 480-241300-, Waterbody Identifier 01381BABR..

## 3.0 Methods

Methods used in the inventory of this lake were those described primarily in the Resource Inventory Committee of British Columbia (RIC) document entitled Reconnaissance 1:20 000 Fish and Fish Habitat Inventory Standards and Procedures, May 1997 for secondary lakes. In addition, the standards prescribed in the following documents were used:

- Fisheries Information Summary System: Data Compilation and Mapping Procedures. Federal/Provincial Fish Habitat Inventory and Information Program. February 1995.
- Lake and Stream Inventory: Standards and Procedures, RIC Draft, May 1995; to be replaced in March 1997 by: Reconnaissance (1:20 000) Fish and Fish Habitat Inventory: Standards and Procedures.
- Users Guide to the British Columbia Watershed/Waterbody Identifier System, Version 2.1, RIC Draft January 1997;
- Fish Collection Methods and Standards, RIC Draft January 1997;
- Field Key to Fresh Water Fishes of British Columbia, RIC Draft 1993;
- Bathymetric Standards for Lake Inventories, A: Fish and Fish Habitat, RIC Draft, January 1997;
- Aerial Photography and Videography Standards for Fish Habitat Channel Assessment, RIC 2nd Draft, March 1996;
- A Guide to Photodocumentation for Aquatic Inventory, RIC Draft, March 1996;
- Standards for Aquatic Mapping, RIC Draft, January 1997;
- Ambient Fresh Water and Effluent Sampling Manual, RIC Draft, July 1994;
- Identification Keys to the Aquatic Plants of British Columbia, RIC Draft 1994;
- BC Standards, Specifications and Guidelines for Resource Surveys Using Global Positioning Systems (GPS) Technology, RIC Draft, 1995.

Prior to landing on the edge of the lake, aerial photographs of the lake and its associated streams were taken from the helicopter. Upon landing on the edge of the lake, angling was attempted. If no fish were caught by angling, a multimesh, 92 m long floating gill net was set. The deepest part of the lake was then found using a Lowrance echosounder by measuring the depth along one e-line and then measuring the depth along one transect at right angles to the e-line and at the deepest point on the e-line. At the deepest point we measured the dissolved oxygen concentration and temperature at 1 metre intervals to either the bottom of the lake or 30 metres, whichever came first. The pH and conductivity of the surface water and a sample from 1 metre above the bottom were measured. The secchi depth was then determined at this location and photographs of the surrounding shoreline were taken. At this point, the floating gill net was checked for fish. If it was empty, a similar sinking gill net and five minnow traps were set. The shoreline was surveyed, locations of inlet and outlet streams were recorded and assessed visually for significant habitat from the boat, substrate was assessed, aquatic vegetation was mapped and the high water mark was estimated. The nets and minnow traps were then frequently checked and if nothing was caught, they were left to fish overnight. In the morning, nets and traps were hauled regardless of fish capture.

Equipment used in the Hanawald Lake inventory included the following:

- Lowrance X-16 echosounder was used to find the depth of the deepest spot in the lake to determine the limnological sampling site
- Eight foot Zodiac inflatable boat powered by a 2 hp Honda 4 cycle outboard motor was used for studying inlet and outlet streams, shoreline vegetation and substrate composition, and for setting minnow traps
- YSI Model 57 portable Oxygen Meter was used for dissolved oxygen and temperature measurements
- Oakton pH/mV/C meter was used for pH measurements
- LaMotte Conductivity Meter was used for conductivity measurements
- Eagle Explorer 12 Channel GPS Receiver or Garmin 12XL GPS handheld units were used for UTM measurements on the lake
- Pentax 35 mm single lens reflex (SLR) camera with a standard 35 mm focal length lens was used for all photography
- Microsoft Word 6.0 was used for production of the report, and Microsoft Excel 5.0 was used for data storage, calculations, and graphing
- CorelDRAW Graphics 6.0 was used for composition of lake outline, fishing, and index maps
- Ministry of Environment digital entry tools entitled Field Data Information System (FDIS) and Fish Collection Form (Fishcoll) were used for recording data

## 4.0 Results and Discussion

### *4.1 General Description*

Hanawald Lake is located on an interior plateau of generally low relief. The elevation of the lake was 948 metres and the surface area was 50 ha. The surrounding country has recreational potential for canoeing, hiking and camping.

### *4.2 Immediate Shoreline*

The shoreline of Hanawald Lake was a mixture of wetlands (60%) and low rocky shore (40%). Emergent and submergent vegetation each covered approximately 30% of the surface area of the lake. Macrophyte beds of yellow pondlily (*Nuphar spp.*) were found in the northern arms of the lake and a bed of ditchgrass (*Ruppia maritia*) was found extending between the southeastern shore and the northern peninsula. Other aquatic plants observed included marsh cinquefoil (*Potentilla palustris*), Potamogeton richardsonii and mare's tail (*Hippuris vulgaris*).

Substrate near the outlet consisted of gravel and cobble and organic fines were found near the wetland areas.

Terrestrial plants observed on the lake shore included; Willow *(Salix spp.)*, Fir *(Abies spp.)*, Trembling aspen *(Populus tremuloides)*, Alder *(Alnus spp.)*, Cottonwood *(Populus Balsamifera)* and Pine *(Pinus spp.)*.

### *4.3 Surrounding Country*

Hanawald Lake is surrounded by rolling hills of the Nechako Plateau and is within the ESSF biogeoclimatic zone. The majority of these hills are covered by coniferous forest with some deciduous trees dispersed throughout. No forest development had occurred in the immediate area. The closest mountain is Mount Horetzky, approximately 15 kilometres to the southeast. The Skeena Mountains are also visible by looking to the east. Photos of the surrounding area are found on CD#4 photos 34, 35, and 45.

### *4.4 Summary of Data Collection*

The data collected was recorded in digital files written by the Ministry of Environment in Microsoft Access 2.0 under the name Field Data Information System (FDIS). The specific file name is fdisdat.mdb and contains all of the habitat information. In a similar digital entry tool called Fish Collection Form (Fishcoll), all information relating to fish and fish sampling effort was recorded in a file named fishcoll.mdb. The information in these files is contained in an appendix in hardcopy form and is also provided on a 3 1/2 inch diskette at the back of this document.

#### 4.4.1 Annotated Air Photo

An annotated air photo of Hanawald Lake showing limnological station, fish sampling sites and inlet and outlet streams is given in Figure 2.

#### 4.4.2 Lake Outline Map

An outline map of Hanawald Lake showing limnological station, fish sampling sites, inlet and outlet streams and photograph locations and directions is given in Figure 3.

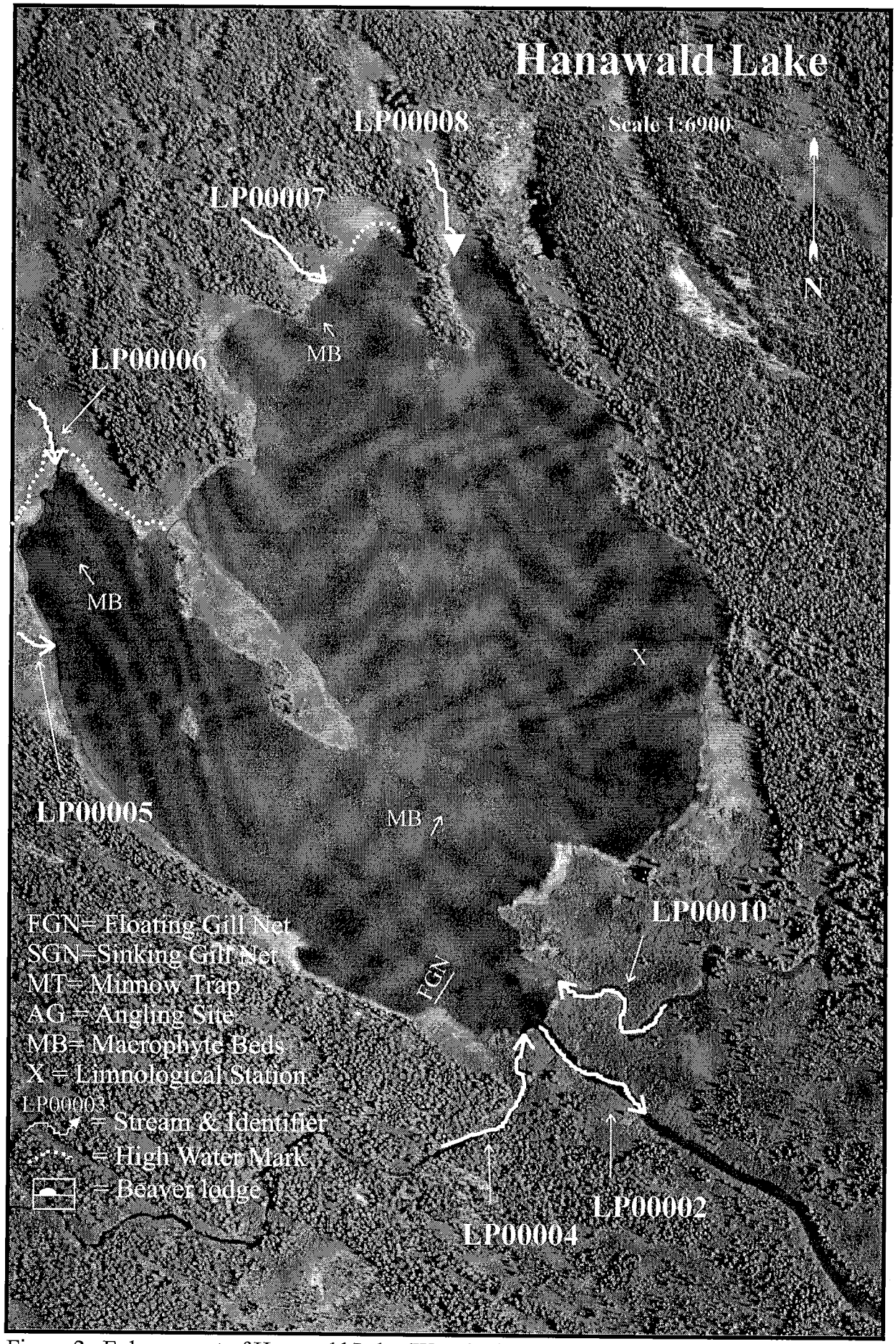



Figure 2. Enlargement of Hanawald Lake (Waterbody Identifier 01381BABR) from aerial photograph 30BCB92073 No. 173.

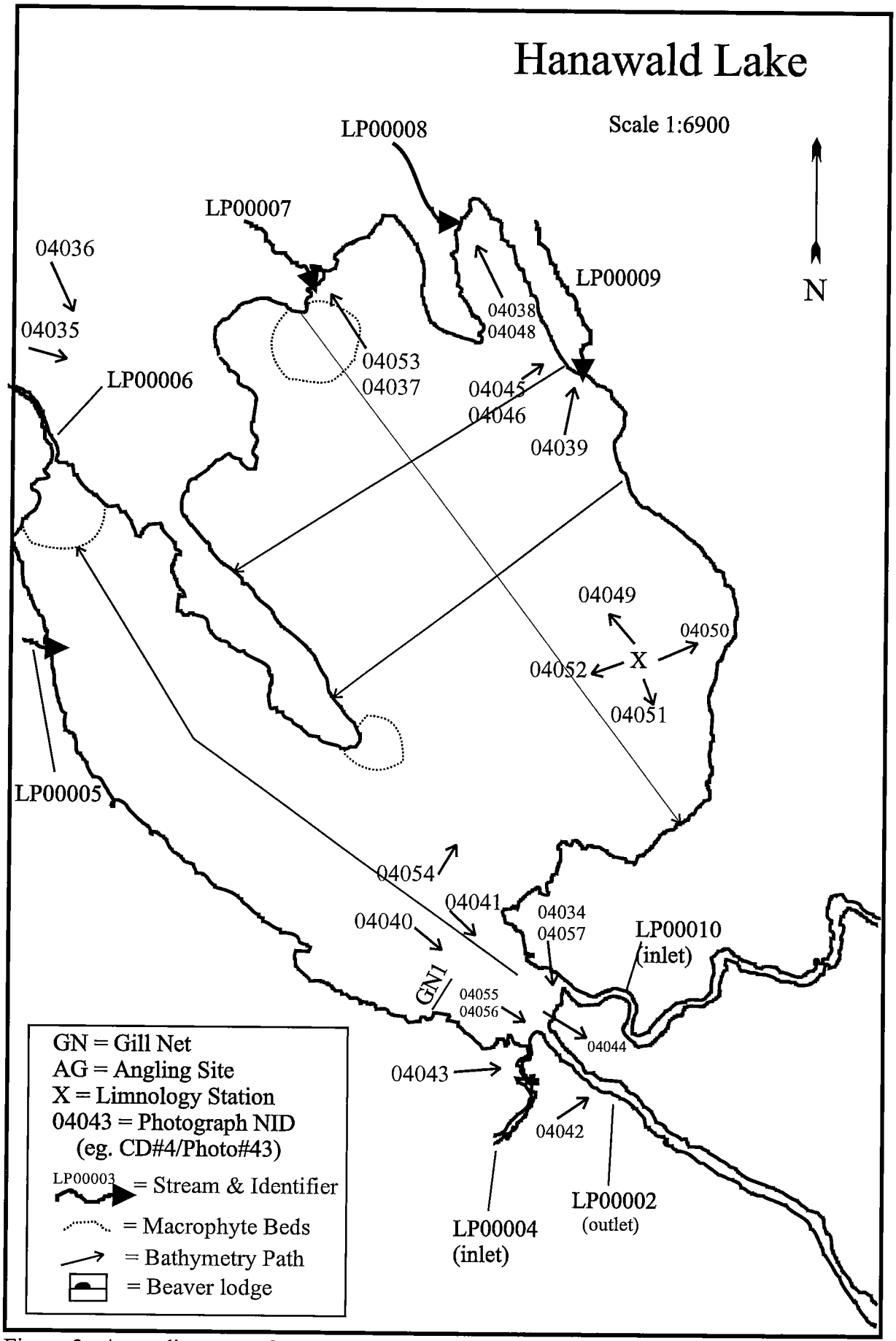



Figure 3. An outline map of Hanawald Lake (Waterbody Identifier 01381BABR) showing limnological station, fish sampling sites, inlet and outlet streams, photograph locations and directions.

### 4.4.3 Streams

**Table 1. A list of streams associated with Hanawald Lake.**

Table 1 lists streams that were shown on the 1:20 000 TRIM and Forest Cover Maps as flowing into or out of Hanawald Lake. All but one of these streams were found in the field. LP numbers are interim location point numbers assigned to each stream pending replacement with unique watershed codes.

| Map Number | Project ID | Interim Location Point Number | Found in Field | UTM Zone | Easting | Northing | High Level Watershed Code | Comments |
|---|---|---|---|---|---|---|---|---|
| 93M.066 | 06-LBIR-0010-0003-1998 | LP00002 | Yes | 9U | 629100 | 6165900 | 480-241300 | Hanawald Lake Outlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00004 | Yes | 9U | 623075 | 6173000 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00005 | Yes | 9U | 622950 | 6173500 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00006 | Yes | 9U | 622500 | 6173700 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00007 | Yes | 9U | 622800 | 6174000 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00008 | Yes | 9U | 622920 | 6174100 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00009 | No | 9U | 623200 | 6174000 | 480-241300 | Hanawald Lake Inlet; |
| 93M.065 | 06-LBIR-0010-0003-1998 | LP00010 | Yes | 9U | 623100 | 6173900 | 480-241300 | Hanawald Lake Inlet; |

#### 4.3.4.1 Streams Surveyed

Detailed comments on the individual streams observed can be found on the Lake Survey Form.

LP00002. The outlet stream is influenced by a breached beaver dam 150 metres downstream from Hanawald Lake. Spawning gravel was present coupled with abundant instream vegetation cover and adequate water volume.

LP00004. This inlet stream had a riffle-pool morphology and flowed over gravel substrate. The two metre wide channel had a depth of 20 centimetres and provided good spawning habitat.

Six of the seven inlets recorded on TRIM and Forest Cover Maps were found in the field.

### 4.4.4 Limnological Sampling

Limnological sampling was conducted at 1610 hours on September 21, 1997. This site is marked X on the accompanying annotated air photo map and lake outline map. Field data was recorded on the Lake Survey Form, a copy of which can be found in the appendix.

#### *4.4.4.1 Stratification*

Hanawald Lake was not distinctly thermally stratified. Temperature decreased gradually with increasing depth. Dissolved oxygen was strongly stratified with the oxycline starting at approximately 6 metres. Hanawald Lake appeared to be eutrophic.

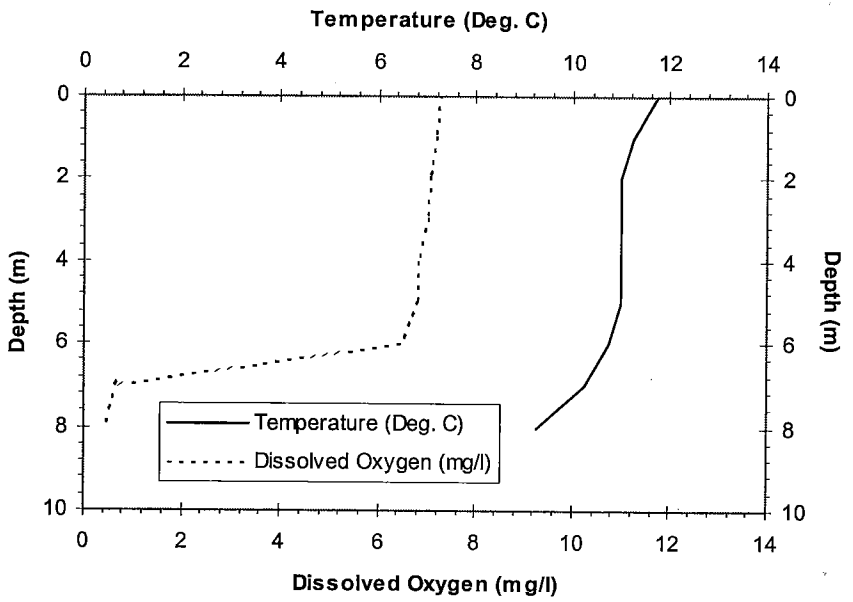



**Figure 4. Temperature and dissolved oxygen profiles for Hanawald Lake on September 21, 1997.**

### 4.4.5 Photographs

Photographs taken at this lake are recorded on Compact Disk #765(CD #4), one of a duplicate set of six CD's produced during the overall project assessing 34 lakes.

**Table 2. Index to photographs.**

| Roll # | Frame | CD/Photo Number | Direction | NID Map | NID | UTM Zone | Easting | Northing | Comment |
|---|---|---|---|---|---|---|---|---|---|
| 59 | 1 | 4/034 | S | 93M.065 | 4034 | 9U | 622350 | 6174400 | overview from the air |
| 59 | 10 | 4/043 | E | 93M.065 | 4043 | 9U | 623075 | 6173000 | LP00003 from the air |
| 59 | 11 | 4/044 | X | 93M.065 | 4044 | 9U | 623050 | 6173100 | rainbow GN1 (floater) |
| 59 | 12 | 4/045 | E | 93M.065 | 4045 | 9U | 623050 | 6173850 | scenic beauty |
| 59 | 13 | 4/046 | E | 93M.065 | 4046 | 9U | 623050 | 6173850 | bedrock |
| 59 | 14 | 4/047 | E | 93M.065 | 4047 | 9U | 623200 | 6173750 | typical riparian |
| 59 | 15 | 4/048 | N | 93M.065 | 4048 | 9U | 622920 | 6174100 | LP00007 mouth |
| 59 | 16 | 4/049 | N | 93M.065 | 4049 | 9U | 623174 | 6173448 | NW from limnology station |
| 59 | 17 | 4/050 | N | 93M.065 | 4050 | 9U | 623174 | 6173448 | E from limnology station |
| 59 | 18 | 4/051 | S | 93M.065 | 4051 | 9U | 623174 | 6173448 | SE from limnology station |
| 59 | 19 | 4/052 | S | 93M.065 | 4052 | 9U | 623174 | 6173448 | looking W from limnology station |
| 59 | 2 | 4/035 | E | 93M.065 | 4035 | 9U | 622200 | 6173950 | overview from the air |
| 59 | 20 | 4/053 | N | 93M.065 | 4053 | 9U | 628000 | 6174000 | LP00006 mouth |
| 59 | 21 | 4/054 | E | 93M.065 | 4054 | 9U | 622950 | 6173350 | aquatic vegetation plugging middle |
| 59 | 22 | 4/055 | S | 93M.065 | 4055 | 9U | 623075 | 6173000 | LP00003 mouth |
| 59 | 23 | 4/056 | S | 93M.065 | 4056 | 9U | 623075 | 6173000 | LP00003 mouth |
| 59 | 24 | 4/057 | E | 93M.065 | 4057 | 9U | 623100 | 6173900 | LP00009 mouth |
| 59 | 3 | 4/036 | S | 93M.065 | 4036 | 9U | 622500 | 6173700 | LP00005 from the air |

| Roll # | Frame | CD/Photo Number | Direction | NID Map | NID | UTM Zone | Easting | Northing | Comment |
|---|---|---|---|---|---|---|---|---|---|
| 59 | 4 | 4/037 | N | 93M.065 | 4037 | 9U | 622800 | 6174000 | LP00006 from the air |
| 59 | 5 | 4/038 | N | 93M.065 | 4038 | 9U | 622920 | 6174100 | LP00007 from the air |
| 59 | 6 | 4/039 | N | 93M.065 | 4039 | 9U | 623200 | 6174000 | LP00008 from the air |
| 59 | 7 | 4/040 | S | 93M.065 | 4040 | 9U | 623075 | 6173000 | LP00003 from the air |
| 59 | 8 | 4/041 | S | 93M.065 | 4041 | 9U | 623100 | 6173900 | LP00009 from the air |
| 59 | 9 | 4/042 | N | 93M.065 | 4042 | 9U | 623100 | 6173010 | LP00001 from the air |

N.B. The NID is the Numerical Identifier of a feature, in this case, a photograph. The first digit of the NID represents the CD number and the last three digits represent the photo number.
X = Direction not relevant N, E, S, W = Compass Directions
All photographs taken with standard 35 mm focal length lens.

4.4.6 Sampling Summary

**Table 3. Fish sampling effort summary for Hanawald Lake and its associated streams on September 21, 1997.**

| Fishing Effort Summary | | | | | | | |
|---|---|---|---|---|---|---|---|
| Site No. | Method | Depth at sampling | Set | | Pull | | Species |
| | | | Date | Time | Date | Time | |
| 1 | Floating Gill Net | 2 m | Sept. 21 | 1500 | Sept. 21 | 1505 | RB |

RB=Rainbow Trout

### *4.5 Summary of Fish Captured*

**Table 4. Summary of data from fish sampled in Hanawald Lake, September 21, 1997.**

| Lake Name | Spp. | Number of fish | Mean length (mm) | Range of Lengths (mm) |
|---|---|---|---|---|
| Hanawald Lake | RB | 1 | 245 | N/A |

RB = Rainbow Trout

## *4.6 Fisheries Observations*

### 4.6.1 Fish

One rainbow trout (*Oncorhynchus mykiss*) was captured in the floating gill net with an effort of five minutes.

### 4.6.2 Habitat

The habitat for fish in this lake appeared to be good. There was an abundance of submergent and emergent aquatic vegetation which could provide cover. The outlet had two breached beaver dams and good spawning habitat.

#### *4.6.2.1 Fisheries Sensitive Zones*

All of the streams associated with this lake passed through wetlands that could be considered Fisheries Sensitive Zones.

#### *4.6.2.2 Restoration and Rehabilitation Opportunities*

There were no opportunities for restoration or rehabilitation at Hanawald Lake as it was pristine.

## *4.7 Logistics*

There were no significant problems in the field work component of this inventory.

Data entry in this report was done using a program called Field Data Information System (FDIS) produced by Ministry of Environment, Lands and Parks of British Columbia. There were multiple releases of this data entry tool throughout production of this report and this caused a loss of significant time. In addition, the Lake Survey Form component of this program was not released until the project was nearly finished causing undue delays.

## References

### Section A. Standards Documents

The following documents were used as guidelines in conducting this project.

Anon. (1997) Bathymetric Standards for Lake Inventories. British Columbia Ministry of Environment, Lands and Parks, 42 pp.

Anon. (1995) Fisheries Information Summary System: Data Compilation and Mapping Procedures. British Columbia Ministry of Environment, Lands and Parks, and Department of Fisheries and Oceans, 105 pp.

Anon. (1996) A Guide to Photodocumentation, Resources Inventory Committee Manual, Province of British Columbia.

Anon. (1996) Field Key to the Freshwater Fishes of British Columbia, Resources Inventory Committee Manual, Province of British Columbia.

Anon. (1997) User's Guide to British Columbia's Watershed/Waterbody Identifier System, version 2.1, Resources Inventory Committee, Province of British Columbia.

Anon. (1997) Field Data Information System Users Manual. British Columbia Environment, Lands and Parks.

Anon. (1997) Reconnaissance (1:20 000) Fish and Fish Habitat Inventory: Standards and Procedures.

Anon. (1997) Fish Collection Methods and Standards. Ministry of Environment, Lands and Parks' Fish Inventory Unit in consultation with Gordon Haas of UBC Fish Museum.

Anon. (1997) Standards for Fish and Fish Habitat Mapping. Fisheries Section, Resources Inventory Branch, Resources Inventory Committee

### Section B. List of Contacts

The following individuals were contacted during the course of this study.

Deleeuw, D. (1997) Senior Habitat Biologist. Ministry of Environment, Terrace, British Columbia. Personal Communication.

Facchin, Angelo. (1997-1998) Ministry of Environment, Lands and Parks, Victoria, British Columbia. Field Data Information System. Personal Communication.

Giroux, Paul. Fisheries Inventory Specialist. Ministry of Environment. Smithers, British Columbia. Personal Communication.

Hatlevik, Sig. Senior Fisheries Technician. Ministry of Environment. Smithers, British Columbia. Personal Communication.

Hazelwood, G. (1997) Biologist. Terrace, British Columbia. Personal Communication.

Miers, Lynn. (1997-1998) Ministry of Environment, Lands and Parks, Victoria, British Columbia. Field Data Information System. Personal Communication.

Neis, P. (1997). Ministry of Environment, Lands and Parks, Smithers, British Columbia. Personal Communication.

Senka, J. (1997) Environmental Protection. Waste Management Branch, Ministry of Environment, Lands and Parks, Smithers, British Columbia. Personal Communication.

Stewart, R. (1997) Forest Ecosystem Specialist. Ministry of Environment, Kispiox Forest District, Hazelton, British Columbia. Personal communication.

**Section C. Field Guides**

The following field guides were used for this project.

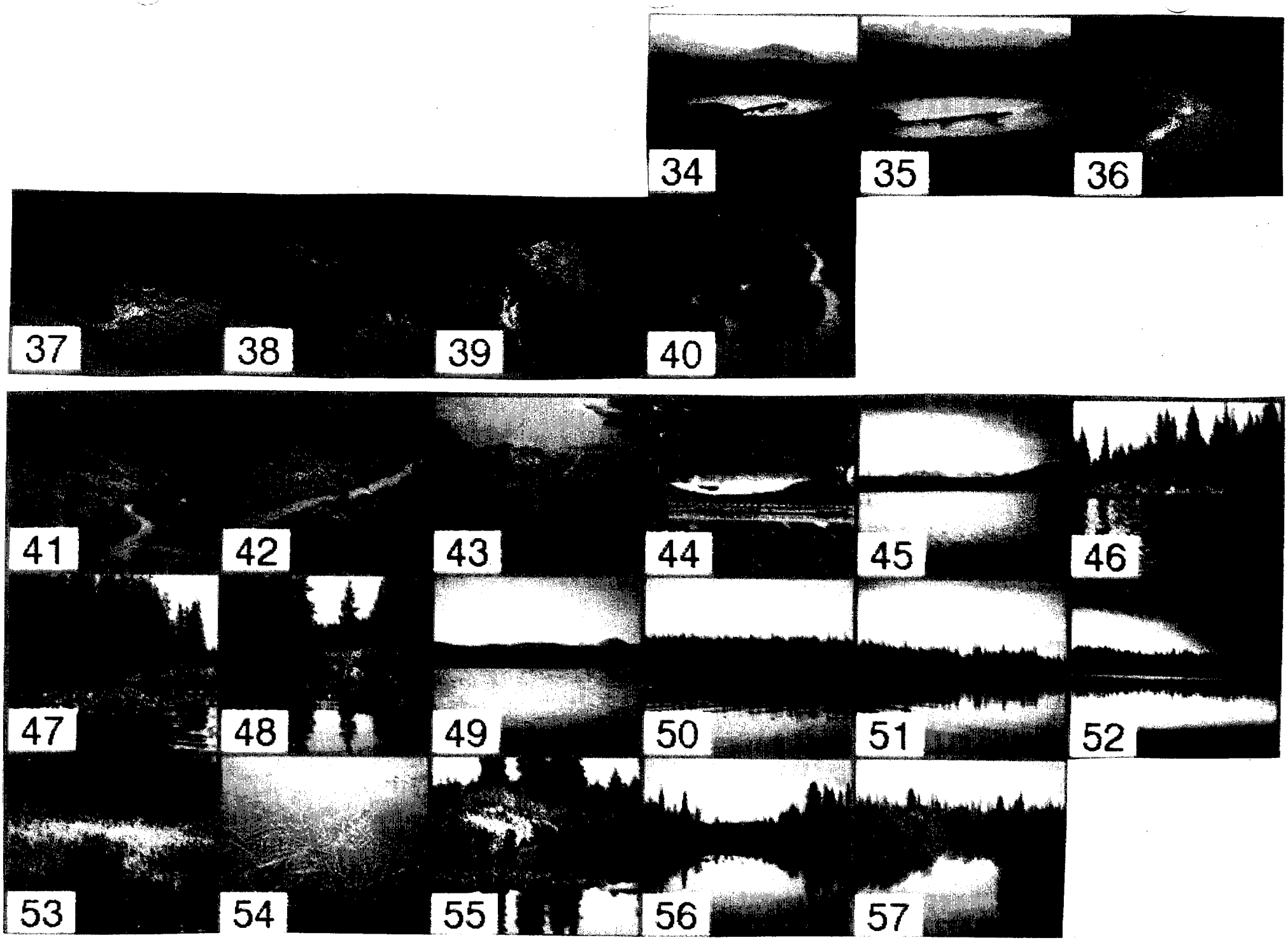
Scott, W. B. and Crossman, E. J. (1973) Freshwater Fishes of Canada. Fisheries Research Board of Canada, Ottawa. Published by Crown.

MacKinnon, Pojar and Coupe. (1992). Plants of Northern British Columbia. B. C. Ministry of Forests and Lone Pine Publishing, Vancouver, British Columbia.

Appendix 1. Photo CD Index Enlargement

The following page is a contact sheet to be used as an index to photographs stored on CD #4. This CD is one of a set of duplicate copies of six CDs that were supplied with the 34 separate lake reports which formed this project.

| CD/Photo Number | Direction | NID Map | NID | UTM Zone | Easting | Northing | Comment |
|---|---|---|---|---|---|---|---|
| 4/034 | S | 93M.065 | 4034 | 9U | 622350 | 6174400 | overview from the air |
| 4/043 | E | 93M.065 | 4043 | 9U | 623075 | 6173000 | LP00003 from the air |
| 4/044 | X | 93M.065 | 4044 | 9U | 623050 | 6173100 | rainbow GN1 (floater) |
| 4/045 | E | 93M.065 | 4045 | 9U | 623050 | 6173850 | scenic beauty |
| 4/046 | E | 93M.065 | 4046 | 9U | 623050 | 6173850 | bedrock |
| 4/047 | E | 93M.065 | 4047 | 9U | 623200 | 6173750 | typical riparian |
| 4/048 | N | 93M.065 | 4048 | 9U | 622920 | 6174100 | LP00007 mouth |
| 4/049 | N | 93M.065 | 4049 | 9U | 623174 | 6173448 | NW from limnology station |
| 4/050 | N | 93M.065 | 4050 | 9U | 623174 | 6173448 | E from limnology station |
| 4/051 | S | 93M.065 | 4051 | 9U | 623174 | 6173448 | SE from limnology station |
| 4/052 | S | 93M.065 | 4052 | 9U | 623174 | 6173448 | looking W from limnology station |
| 4/035 | E | 93M.065 | 4035 | 9U | 622200 | 6173950 | overview from the air |
| 4/053 | N | 93M.065 | 4053 | 9U | 628000 | 6174000 | LP00006 mouth |
| 4/054 | E | 93M.065 | 4054 | 9U | 622950 | 6173350 | aquatic vegetation plugging middle |
| 4/055 | S | 93M.065 | 4055 | 9U | 623075 | 6173000 | LP00003 mouth |
| 4/056 | S | 93M.065 | 4056 | 9U | 623075 | 6173000 | LP00003 mouth |
| 4/057 | E | 93M.065 | 4057 | 9U | 623100 | 6173900 | LP00009 mouth |
| 4/036 | S | 93M.065 | 4036 | 9U | 622500 | 6173700 | LP00005 from the air |
| 4/037 | N | 93M.065 | 4037 | 9U | 622800 | 6174000 | LP00006 from the air |
| 4/038 | N | 93M.065 | 4038 | 9U | 622920 | 6174100 | LP00007 from the air |
| 4/039 | N | 93M.065 | 4039 | 9U | 623200 | 6174000 | LP00008 from the air |
| 4/040 | S | 93M.065 | 4040 | 9U | 623075 | 6173000 | LP00003 from the air |
| 4/041 | S | 93M.065 | 4041 | 9U | 623100 | 6173900 | LP00009 from the air |
| 4/042 | N | 93M.065 | 4042 | 9U | 623100 | 6173010 | LP00001 from the air |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Appendix 2. Field Data Information System (FDIS)

# FDIS Lake Form

*16-Jul-98*

Reach # 1 | ILP Map # | ILP #

Watershed Code: 480-241300-00000-00000-0000-0000-000-000-000-000-000-000

## WATERBODY

**Waterbody Type** Secondary **Sample Type** Secondary **Project ID** 06-LBIR-0010-0850-1998

**Lake Name** **Local Name** Hanawald Lake (gaz.) (Ki35) Fish Form? ☒

**Watershed Code** 480-241300-00000-00000-0000-0000-000-000-000-000-000-000

**Reach #** 1 **Air Photo Ref.** 30BCB92073 173 **Ref. Comment**

**Waterbody ID** 01381BAB **ILP Map #** **ILP #** **Magnitude** 28

**NID Map #** **NID #** **UTM** 9 623013 6173489

| TRIM Map # | Year |
|---|---|
| 93M.065 | 1990 |
| 93M.066 | 1990 |

| | | Source | Method |
|---|---|---|---|
| **Surface Area** | 50 | O | O |
| **Elevation** | 948 | MAP | MAP |
| **Biogeoclimatic Zone** | | ESSF | |

## TERRAIN CHARACTERISTICS

**Setting** MP **Aspect** S

**Hillslope Coupling** DC **Basin Genesis** GL

| **LAND USE** | NO | AG | FB | FR | MI | PR | UD | OT |
|---|---|---|---|---|---|---|---|---|
| Percentage | 100 | | | | | | | |

## SHORELINE CHARACTERISTICS

| **Shoreline Type** | i | ii | iii | iv | v |
|---|---|---|---|---|---|
| Percentage | | 40 | | 60 | |

**Cover** ABUN

| | Resorts | Camps | Boatlaunch |
|---|---|---|---|
| **Rec. Features** | 0 | 0 | 0 |

## INLETS / OUTLETS

**# Inlets (Perm.)** 5 **Inlets (Other)** 2 **Outlets:** 1 **Spawning hab. present?** ☒

| I/O | Watershed Code | ILP Map # | ILP # | Comments |
|---|---|---|---|---|
| O | | 93M.066 | 2 | |
| I | | 93M.065 | 4 | |
| I | | 93M.065 | 5 | |
| I | | 93M.065 | 6 | |
| I | | 93M.065 | 7 | |
| I | | 93M.065 | 8 | |
| I | | 93M.065 | 9 | |
| I | | 93M.065 | 10 | |

## SURVEY INFORMATION

## ACCESS

# FDIS Lake Form

Reach # 1 | ILP Map # | ILP #

*16-Jul-98*

Watershed Code: **480-241300-00000-00000-0000-0000-000-000-000-000-000-000**

**Date** 1997-09-21 **to** 1997-09-21

**Agency** C074 **Crew** MB/DW

**AIR** ☐ FW ☒ H **ROAD** ☐ V2 ☐ V4 **Auto within**

**OFF ROAD** ☐ FT ☐ ATV ☐ V4 **Distance**

**TRAIL?** ☐ **Distance**

**Closest Community** Hazelton

**Comments**
No Comment

## AQUATIC FLORA

**EMERGENT VEG.** Sparse ☐ **OR** 30 %

**SUBMERGENT VEG.** Sparse ☐ **OR** 30 %

**Floating Algae?** ☐

**Voucher Specimen**

| Type | Dom. Species |
|---|---|
| EMERGENT | yellow pondlily |
| EMERGENT | cinquefoil |
| EMERGENT | potamogeton |
| SUBMERGENT | P. richardsonii |
| SUBMERGENT | dithgrass |
| SUBMERGENT | mare's tail |

## LAKE BATHYMETRY

**Type of Survey** EL **Littoral Area** 50 % **Method** O **Max. Depth** 9

**Benchmark Height** **Max Water Level** 0.4

**Benchmark Type/Location**

**Comments** note water? marks on rocks (photo 12)

## PHOTO DOCUMENTATION

| Photo (R/F) | Foc Lg | Dir | NID Map # | NID # | UTM (zone/easting/northing) | | | Method | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 59 / 1 | ST | S | 93M.065 | 4034 | 9 | 622350 | 6174400 | MAP | overview from the air |
| 59 / 10 | ST | E | 93M.065 | 4043 | 9 | 623075 | 6173000 | MAP | LP00003 from the air |
| 59 / 11 | ST | X | 93M.065 | 4044 | 9 | 623050 | 6173100 | MAP | rainbow GN1 (floater) |
| 59 / 12 | ST | E | 93M.065 | 4045 | 9 | 623050 | 6173850 | MAP | scenic beauty |
| 59 / 13 | ST | E | 93M.065 | 4046 | 9 | 623050 | 6173850 | MAP | bedrock |
| 59 / 14 | ST | E | 93M.065 | 4047 | 9 | 623200 | 6173750 | MAP | typical riparian |
| 59 / 15 | ST | N | 93M.065 | 4048 | 9 | 622920 | 6174100 | MAP | LP00007 mouth |
| 59 / 16 | ST | N | 93M.065 | 4049 | 9 | 623174 | 6173448 | GP3 | NW from limnology station |
| 59 / 17 | ST | N | 93M.065 | 4050 | 9 | 623174 | 6173448 | GP3 | E from limnology station |
| 59 / 18 | ST | S | 93M.065 | 4051 | 9 | 623174 | 6173448 | GP3 | SE from limnology station |
| 59 / 19 | ST | S | 93M.065 | 4052 | 9 | 623174 | 6173448 | GP3 | looking W from limnology s |
| 59 / 2 | ST | E | 93M.065 | 4035 | 9 | 622200 | 6173950 | MAP | overview from the air |

# FDIS Lake Form

Reach # 1 | ILP Map # | ILP #

*16-Jul-98*

Watershed Code: **480-241300-00000-00000-0000-0000-000-000-000-000-000-000**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 59 / | 20 | ST | N | 93M.065 | 4053 | 9 | 628000 | 6174000 | MAP | LP00006 mouth |
| 59 / | 21 | ST | E | 93M.065 | 4054 | 9 | 622950 | 6173350 | MAP | aquatic vegetation plugging |
| 59 / | 22 | ST | S | 93M.065 | 4055 | 9 | 623075 | 6173000 | MAP | LP00003 mouth |
| 59 / | 23 | ST | S | 93M.065 | 4056 | 9 | 623075 | 6173000 | MAP | LP00003 mouth |
| 59 / | 24 | ST | E | 93M.065 | 4057 | 9 | 623100 | 6173900 | MAP | LP00009 mouth |
| 59 / | 3 | ST | S | 93M.065 | 4036 | 9 | 622500 | 6173700 | MAP | LP00005 from the air |
| 59 / | 4 | ST | N | 93M.065 | 4037 | 9 | 622800 | 6174000 | MAP | LP00006 from the air |
| 59 / | 5 | ST | N | 93M.065 | 4038 | 9 | 622920 | 6174100 | MAP | LP00007 from the air |
| 59 / | 6 | ST | N | 93M.065 | 4039 | 9 | 623200 | 6174000 | MAP | LP00008 from the air |
| 59 / | 7 | ST | S | 93M.065 | 4040 | 9 | 623075 | 6173000 | MAP | LP00003 from the air |
| 59 / | 8 | ST | S | 93M.065 | 4041 | 9 | 623100 | 6173900 | MAP | LP00009 from the air |
| 59 / | 9 | ST | N | 93M.065 | 4042 | 9 | 623100 | 6173010 | MAP | LP00001 from the air |

## AQUATIC WILDLIFE OBSERVATIONS

| Group | Observations |
|---|---|
| BIR | hawk |
| BIR | loon |
| BIR | many ducks- 2 widgeons |
| BIR | raven |
| MAM | red squirrel |
| MAM | lots of moose tracks |

## LIMNOLOGICAL STATION WATER QUALITY

**Station No.** 1 **Date** 1997-09-21 **Time:** 16:10

**Location UTM** 9 623174 6173448 **EMS #**

| | METHOD USED | WATER SAMPLE |
|---|---|---|
| **Secchi Depth** | 2.5 | |
| **Water Color** | BROW | VE |
| **pH** (surf/bottom) | 7.6 | 7.1 |
| **Ice Depth** | | |

## DISSOLVED OXYGEN, TEMPERATURE PROFILE AND CONDUCTIVITY

| Depth | DO (d) | T(C) | DO (a) | T (C) | Cond. |
|---|---|---|---|---|---|
| 0.1 | 7.7 | 12 | 6.8 | 11.5 | 11 |
| 1 | 7.5 | 11.5 | 6.8 | 11 | |
| 2 | 7.3 | 11 | 6.8 | 11 | |
| 3 | 7.2 | 11 | 6.8 | 11 | |

# FDIS Lake Form

Reach # 1 | ILP Map # | ILP #

*16-Jul-98*

Watershed Code: 480-241300-00000-00000-0000-0000-000-000-000-000-000-000

| | | | | | |
|---|---|---|---|---|---|
| 4 | 6.9 | 11 | 6.7 | 11 | |
| 5 | 7 | 11 | 6.6 | 11 | |
| 6 | 7 | 11 | 5.9 | 10.5 | |
| 7 | 0.6 | 10.5 | 0.7 | 10 | |
| 8 | 0.4 | 9.5 | 0.4 | 9 | 11 |

**H2S:**

## EQUIPMENT USED

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **pH** | P2 | **Water Temp** | T2 | **Conductivity** | S4 | **Dis. Oxygen** | D2 |

## COMMENTS

| Section | Comments |
|---|---|
| WEATHER | sunny with a very high ceiling (air temp 15C) |
| OTHER | nice scenery-nice camping, canoeing, and fishing |
| INLETS/OUTLETS | LP00008-a 1m wide, .5m deep swampy inlet with no discernable flow. Sedge present on both sides. |
| INLETS/OUTLETS | LP00009-this inlet was not observed during the ground survey. |
| INLETS/OUTLETS | LP00007-a .5m wide, .3m deep swampy inlet with no discernable flow. Sedge present on both sides. |
| INLETS/OUTLETS | LP00006-this inlet flows into the lake through lilypads. It has a depth of .5m and a width of .5m. |
| INLETS/OUTLETS | LP00004-this inlet has good spawning habitat with riffle-pool morphology. The channel is 2m wide, and 20cm deep at the mouth, with audible flow. There is sedge and willow cover on both sides of the channel. |
| INLETS/OUTLETS | LP00002-a 10m wide outlet channel with a depth of 30cm. There is a beaver dam 150m downstream from the lake. Abundant instream vegetation and algae provide cover and there is spawning gravel present. |
| INLETS/OUTLETS | LP00005-this inlet channel was not observed during the ground survey. The prospective area is swampy. |
| INLETS/OUTLETS | LP00010-inlet with good spawning habitat. Channel width of 6m and depth from .3-1m. |

Appendix 3. Fish Data Collection Form

# Fish Data Collection Form



## A. Location Referencing

**Gazetted Name** HANAWALD LAKE **Alias** Ki35
**Watrshed Cod** 480-241300-00000-00000-0000-0000-000-000-000-000-0 **WBID #** 01381BABR
**Reach #** 1 **Interim Locational ID:** **Project ID** 06-LBIR-0010-0850-1998
**(BCGS/NTS) Map #** 93M.065 **Locational Point**

## B. Survey Information

**Survey Dat** 1997/09/21 **to** 1997/09/21 **Agency** C074
**Crew** MB /DW/ **Fish Collection Permit** 34770-20
**General Comments**
FISH SURFACING VARIOUS PLACES ON LAKE

## C. Station Identification and Conditions

| Site | Method | # | UTM Coordinates | Temp | Con | Vis | Turb |
|---|---|---|---|---|---|---|---|
| 1 | GN | 7 | | | | | |

## D. Fish Summary

| Site | Meth | # | H/P | Species | Stage | Age | Tot # | Min Lgth | Max Lgth | Fish Act |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GN | 7 | 1 | RB | A | | | | 245 | R |

## E. Gear Specifications

| Site | Meth | # | H/P | D In | T In | D Out | T Out | EF Sec | EF Lgth | EF Wdth | Encl | Nt Typ | Lgth | Dpth | Mesh | IN Sz | Set | Hab | Volt | Freq | Pul | Make | Model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GN | 7 | 1 | 09/21 | 1500 | 09/21 | 1505 | | | | | FL | 100 | 2 | ST | | SU | L | | | | | |

## F. Individual Fish Data

| Site | Meth | # | H/P | Species | Lgth | Wgt | Sex | Mat | Age Str | Age Smp # | Age | Vouch # | Gen Str | Gen Smp # | Comments | Roll | Fr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GN | 7 | 1 | RB | 245 | 120 | F | MT | SC | 1 | | | FR | 1 | | 109 | 11 |