

## Executive Summary

## Lavoie Lake 2000

A stocking assessment was conducted at Lavoie Lake in 2000 to determine the status of the fishery. Lavoie Lake is a relatively shallow and productive wild rainbow trout lake, 225.4 ha in size and is situated 62 km South West of Vanderhoof BC. Lavoie Lake has good two-wheel drive public access to a Ministry of Forests recreation site at the lake with a launch suitable for both car-top and boats on trailers. The management goal for Mackenzie Lake is to maintain an above average quality fishery for wild rainbow trout.

Two sinking gill net sets were completed at the same site on June 5 and 6, 2000. The total sampling effort was 22 hours resulting in a gillnet catch per unit effort (CPUE) of 2.05 fish per net hour. As similar assessment in 1973 had slightly higher catch rate of 2.75 fish per net hour. The rainbow trout sampled during the 2000 assessment were reaching sizes suitable to provide for an average quality angling experience. Mean fish size in the net catch was approximately 30 cm in both years. Maximum fish size in 2000 was 51 cm with an estimated age of four years.

Multiple anecdotal reports to Ministry staff have suggested that the proportion of large fish in the fishery may have declined over the years as the result of over fishing. However, at present, there is considerable uncertainty as to whether this fishery has produced substantial numbers of larger fish (> 40cm). Both the 1973 and 2000 gillnet assessments produced very comparable results in terms of catch rate, lengths at age, and maximum fish sizes. It is possible that variability in recruitment between wet/dry years may be the primary factor for driving differences in the presence of large, trophy rainbows in this lake between sample years, rather than high harvest. However, to be conservative, new regulations were implemented in 2004 with the objective of improving average fish and increasing the proportion of trophy fish in the fishery. The new regulations include: 1) single barbless hook 2) bait-ban 3) daily quota of 3 fish 4) catch and release over 40 cm 5) winter closure. November 1- April 30.

To assess the results of the new regulations it is recommended that Lavoie Lake be re-evaluated in 2008 to: 1) monitor changes in length frequency of fish greater than 40 cm 2) monitor for ages greater than 5 to evaluate the new slot limit. 3) Assess angling effort in aerial surveys or ground boat counts to help determine if effort levels are approaching the productive capacity of the lake.



Figure 1. Lavoie Lake Forest Recreation Site: Inset Photo: Example of typical angler catch.

**OMINECA REGION  
LAKE STOCK ASSESSMENT REPORT**

**LAKE NAME:** Lavoie      **ALIAS:** Lavoie      **BC WBID:** 00981CHIL

**LAKE LOCATION:**      *Nearest center:* 62 km SSW Vanderhoof      *Drainage:* FRASER  
*UTM:* 10.409456.5928150

**LAKE ATTRIBUTES:**      *Surface Area:* 225.4 Ha      *Elevation:* 992 m  
*Littoral Area:* 206.3 Ha      *T.D.S.:* 150 ppm  
*Max Depth:* 7.3 m      *Mean depth:* 3.4 m

**MANAGEMENT OBJECTIVE (mean length in gillnet (cm)):**

- Objective 1      Family Fishery (High CPUE <30 cm)
- Objective 2      Average Quality (30-40 cm)
- Objective 3      Above Average (40-50 cm)
- Objective 4      Trophy ( 20% > 50 cm for RB, 20% > 40 cm for EB)

**MANAGEMENT/SURVEY HISTORY :**

Previous gill net assessment(s):      no       yes       Burns and Klein- M.O.E. Lakes File  
 Year(s) Surveyed:      1973

**STOCKING DATA:**

*Current Stocking Rate*      0      Fish/Ha      Wild Fishery  
*Stock Type*      **Wild Lake**  
*Species*      RB mixed  
*Previous Stocking Rate*      0

**SURVEY METHODS:**

| Method   | Date (yy.mm.dd)     | Survey Agency         | Crew                         |
|----------|---------------------|-----------------------|------------------------------|
| Fish     | SGN      2000-07-05 | Carrier Sekani Tribal | Margo French & Lawrence Ward |
| Chem.    | n/a                 |                       |                              |
| Physical | n/a                 |                       |                              |
| Temp.    | n/a                 |                       |                              |

**Netting Specs:**      *Net type:* Standard Experimental      *Net length:* 90m (3x30m)  
*Setting:* Sinking or Floating      *Panel Mesh:* Fill in for non-standard sets.

**SURVEY RESULTS:**

**Catch**

|             | RB | EB | RSC | LKC | LSU | CSU | NSC | CAS | BT | LT |
|-------------|----|----|-----|-----|-----|-----|-----|-----|----|----|
| <b>2000</b> | 45 | 0  | 0   | 14  | 366 | 0   | 0   | 12  | 0  | 0  |
| <b>1973</b> | 33 | 0  | 0   | 68  | 292 | 0   | 0   | 5   | 0  | 0  |
| -           | 0  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0  | 0  |
| -           | 0  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0  | 0  |

| Survey Year  | 2000 | 1973 | - | -           |
|--------------|------|------|---|-------------|
| Effort Hours | 22   | 12   |   |             |
| RB CPUE:     | 2.05 | 2.75 |   | RB/Net Hour |
| EB CPUE:     | 0.00 | 0.00 |   | EB/Net Hour |
| # of Sets:   | 2    | 1    |   |             |

**Next Assessment 2008**

Omineca Region Lake Assessment Report

**SURVEY CONCLUSIONS:**

| Objective        | Objectives Achieved      |                                     | Reason   |
|------------------|--------------------------|-------------------------------------|--|
|                  | Yes                      | No                                  |  |
| 1. Family        | <input type="checkbox"/> | <input type="checkbox"/>            |  |
| 2. Average       | <input type="checkbox"/> | <input type="checkbox"/>            |  |
| 3. Above Average | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 22 percent of sample was larger than 40 cm       |
| 4. Trophy        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | only 2.2 percent of sample was larger than 50 cm |

**RECOMMENDATIONS:**

**Assessment:** Re-assess in 2008- monitor changes in length frequency of fish greater than 40 cm and monitor for ages greater than 5 to evaluate the new slot limit. Assess effort in aerial surveys/ground boat counts to help determine if effort levels are approaching the productive capacity of the lake.

**Management:** Following assessment in 2008, consider revising regulations to return the daily quota to the regional quota after assessment of effort. Use otoliths in future as primary ageing structure to reduce improve ageing accuracy.

**Comments:** Wild lake with resort. Regulations changed in 2004 due to public concerns that the proportion of large trophy fish in the fishery has declined. New regulations- Single barbless hook, bait-ban. 3 fish under 40 cm may be retained. Winter closure. November 1- April 30.

**Uncertainties:** Maturity data reported as reported for 2000 are unreliable. Weights data for 1973 unreliable, poor length weight relationship and incorrect. Variable natural recruitment between wet/dry years may be the primary factor for limiting the presence of large/ trophy RB in this lake, rather than high harvest. The length frequency distribution between sample year appears to be different, however the sample sessions occurred in different months and may be a reflection of seasonal growth differences.

**Recent Brood Request Comments:**

Not applicable

**History of Angling Regulations**

New regulations- April 1, 2004: Winter closure: no fishing Nov. 1- April 30. Rainbow trout daily quota=3, none over 40 cm; bait ban, single barbless hook.

**Reported by:** Cory Williamson

**Date:** Jun-05

**Table 1. Summary of rainbow trout physical attributes for sample year 2000 by age:**

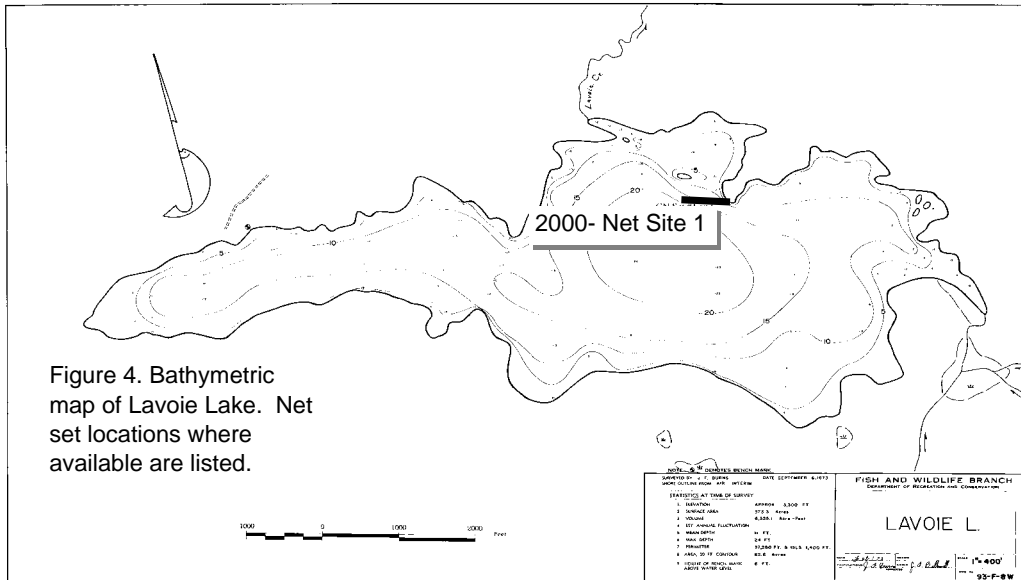
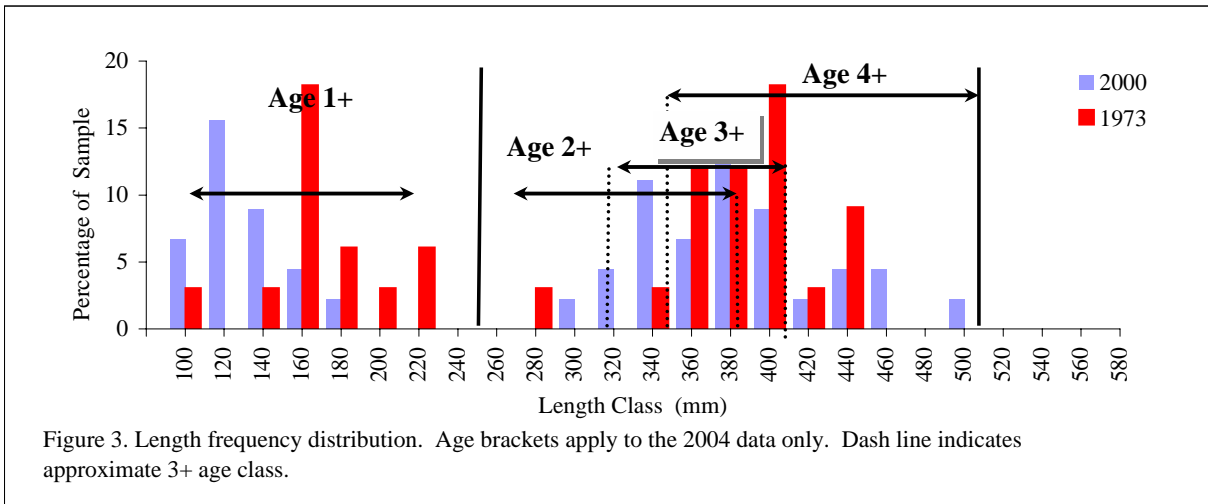
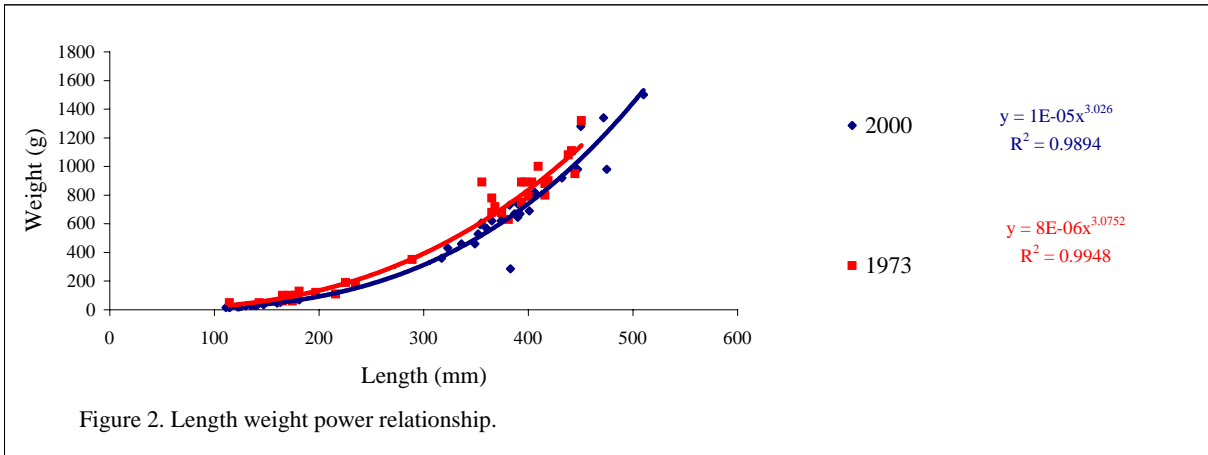
| Sample Year | Sample Age | Sample Size | Length (mm) |     |     |        | Weight (g) |      |      |        | Condition (k) |      |      |        |      |
|-------------|------------|-------------|-------------|-----|-----|--------|------------|------|------|--------|---------------|------|------|--------|------|
|             |            |             | Mean        | Min | Max | StdDev | Mean       | Min  | Max  | StdDev | Mean          | Min  | Max  | StdDev | Var  |
| 2000        | 1          | 17          | 139         | 111 | 181 | 21.2   | 34         | 16.1 | 71.8 | 17.4   | 1.17          | 1.04 | 1.40 | 0.1    | 0.01 |
| 2000        | 2          | 10          | 367         | 323 | 392 | 20.1   | 617        | 430  | 730  | 80.3   | 1.25          | 1.11 | 1.35 | 0.1    | 0.01 |
| 2000        | 3          | 11          | 380         | 317 | 406 | 30.5   | 623        | 285  | 820  | 186.2  | 1.12          | 0.51 | 1.25 | 0.2    | 0.04 |
| 2000        | 4          | 7           | 448         | 349 | 510 | 50.4   | 1066       | 460  | 1500 | 344.6  | 1.15          | 0.91 | 1.40 | 0.2    | 0.02 |

**Table 2. Catch summary for all sample years.**

| Sample Year | Sample Size | Length (mm) |     |     |        | Weight (g) |     |      |        | Condition (k) |      |      |        |      |
|-------------|-------------|-------------|-----|-----|--------|------------|-----|------|--------|---------------|------|------|--------|------|
|             |             | Mean        | Min | Max | StdDev | Mean       | Min | Max  | StdDev | Mean          | Min  | Max  | StdDev | Var  |
| 2000        | 45          | 297         | 111 | 510 | 129.7  | 468        | 16  | 1500 | 407.5  | 1.17          | 0.51 | 1.40 | 0.14   | 0.02 |
| 1973        | 33          | 311         | 114 | 451 | 129.7  |            |     |      |        |               |      |      |        |      |

**Table 3. Proportion of Catch (by survey year)**

| Survey Year         | 2000   | 1973   | - | - |
|---------------------|--------|--------|---|---|
| Less than 250 mm    | 37.8 % | 39.4 % | % | % |
| Between 250-350 mm  | 8.9 %  | 3.0 %  | % | % |
| Between 350-400 mm  | 40.0 % | 30.3 % | % | % |
| Greater than 400 mm | 22.2 % | 30.3 % | % | % |
| Greater than 500 mm | 2.2 %  | 0.0 %  | % | % |



**Table 4. Stocking History for Lavoie Lake.**

| Release Date              | Species Name | Fish Count | Stock | Mark | Average Size (gm) | Life Cycle Stage |
|---------------------------|--------------|------------|-------|------|-------------------|------------------|
| Not Stocked- wild fishery |              |            |       |      |                   |                  |

**Table 5. Dissolved Oxygen/ Temperature Profile**

| 05-Jul-00 |      |          | Station UTM N/a |         |         |          |    |             |
|-----------|------|----------|-----------------|---------|---------|----------|----|-------------|
| Depth (m) | DO   | Temp. °C | Depth (m)       | DO mg/L | DO %sat | Temp. °C | pH | Cond (25°C) |
| 0         |      | 17       | 0               |         |         |          |    |             |
| 1         | 11.6 | 16       | 1               |         |         |          |    |             |
| 2         | 10.4 | 16       | 2               |         |         |          |    |             |
| 3         | 9.7  | 15.5     | 3               |         |         |          |    |             |
| 4         | 8.8  | 15.5     | 4               |         |         |          |    |             |
| 5         |      |          | 5               |         |         |          |    |             |
| 6         |      |          | 6               |         |         |          |    |             |
| 7         |      |          | 7               |         |         |          |    |             |
| 8         |      |          | 8               |         |         |          |    |             |
| 9         |      |          | 9               |         |         |          |    |             |
| 10        |      |          | 10              |         |         |          |    |             |
| 11        |      |          | 11              |         |         |          |    |             |
| 12        |      |          | 12              |         |         |          |    |             |
| 13        |      |          | 13              |         |         |          |    |             |
| 14        |      |          | 14              |         |         |          |    |             |

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**Table 6. Stock Assessment Data for 2004 (see lake files for additional survey data).**

| Lake   | Sample# | Site | Number | Species | Origin | Age | Length | Weight | Condition | Scale Age | Structure | Cond. | Clip | Sex | Maturity |
|--------|---------|------|--------|---------|--------|-----|--------|--------|-----------|-----------|-----------|-------|------|-----|----------|
| Lavoie | 1       | 1    | 1      | rb      |        | 2   | 382    | 730    | 1.3       | 2+        | s         | 1     |      | F   | mt       |
| Lavoie | 2       | 1    | 1      | rb      |        | 2   | 387    | 670    | 1.2       | 2+        | s         | 1     |      | M   | st       |
| Lavoie | 3       | 1    | 1      | rb      |        | 4   | 450    | 1280   | 1.4       | 4+        | s         | 1     |      | M   | st       |
| Lavoie | 4       | 1    | 1      | rb      |        | 2   | 360    | 570    | 1.2       | 2+        | s         | 1     |      | M   | st       |
| Lavoie | 5       | 1    | 1      | rb      |        | 3   | 395    | 730    | 1.2       | 3+        | s         | 1     |      | F   | st       |
| Lavoie | 6       | 1    | 1      | rb      |        | 3   | 390    | 645    | 1.1       | 3+        | s         | 1     |      | F   | st       |
| Lavoie | 7       | 1    | 1      | rb      |        | 2   | 374    | 660    | 1.3       | 2+        | s         | 1     |      | F   | mt       |
| Lavoie | 8       | 1    | 1      | rb      |        | 3   | 383    | 285    | 0.5       | 3+        | s         | 1     |      | M   | mt       |
| Lavoie | 9       | 1    | 1      | rb      |        | 4   | 447    | 980    | 1.1       | 4+        | s         | 2     |      | F   | st       |
| Lavoie | 10      | 1    | 1      | rb      |        | 3   | 406    | 820    | 1.2       | 3+        | s         | 1     |      | M   | st       |
| Lavoie | 1       | 1    | 2      | rb      |        | 1   | 114    | 16     | 1.1       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 2       | 1    | 2      | rb      |        | 1   | 140    | 30     | 1.1       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 3       | 1    | 2      | rb      |        | 1   | 115    | 18     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 4       | 1    | 2      | rb      |        | 1   | 124    | 20     | 1.0       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 5       | 1    | 2      | rb      |        | 1   | 122    | 20     | 1.1       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 6       | 1    | 2      | rb      |        | 1   | 147    | 36     | 1.1       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 7       | 1    | 2      | rb      |        | 1   | 163    | 51     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 8       | 1    | 2      | rb      |        | 1   | 178    | 72     | 1.3       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 9       | 1    | 2      | rb      |        | 1   | 126    | 24     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 10      | 1    | 2      | rb      |        | 1   | 111    | 16     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 11      | 1    | 2      | rb      |        | 1   | 138    | 32     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 12      | 1    | 2      | rb      |        | 1   | 141    | 33     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 13      | 1    | 2      | rb      |        | 1   | 160    | 48     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 14      | 1    | 2      | rb      |        | 1   | 146    | 44     | 1.4       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 15      | 1    | 2      | rb      |        | 1   | 181    | 70     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 16      | 1    | 2      | rb      |        | 1   | 135    | 28     | 1.2       | 1+        | s         | 3     |      | unk | im       |
| Lavoie | 17      | 1    | 2      | rb      |        | 1   | 130    | 26     | 1.2       | 1+        | s         | 1     |      | unk | im       |
| Lavoie | 18      | 1    | 2      | rb      |        | 4   | 349    | 460    | 1.1       | 4+        | s         | 2     |      | m   | st       |
| Lavoie | 19      | 1    | 2      | rb      |        | 2   | 392    | 670    | 1.1       | 2+        | s         | 1     |      | f   | mt       |
| Lavoie | 20      | 1    | 2      | rb      |        | 2   | 323    | 430    | 1.3       | 2+        | s         | 1     |      | f   | mt       |
| Lavoie | 21      | 1    | 2      | rb      |        | 2   | 354    | 595    | 1.3       | 2+        | s         | 1     |      | f   | mt       |
| Lavoie | 22      | 1    | 2      | rb      |        | 2   | 355    | 605    | 1.4       | 2+        | s         | 1     |      | m   | st       |
| Lavoie | 23      | 1    | 2      | rb      |        | 2   | 365    | 620    | 1.3       | 2+        | s         | 1     |      | f   | mt       |
| Lavoie | 24      | 1    | 2      | rb      |        | 3   | 401    | 690    | 1.1       | 3+        | s         | 1     |      | f   | st       |
| Lavoie | 25      | 1    | 2      | rb      |        | 3   | 352    | 530    | 1.2       | 3+        | s         | 1     |      | f   | mt       |
| Lavoie | 26      | 1    | 2      | rb      |        | 3   | 404    | 790    | 1.2       | 3+        | s         | 1     |      | f   | st       |
| Lavoie | 27      | 1    | 2      | rb      |        | 4   | 472    | 1340   | 1.3       | 4+        | s         | 3     |      | m   | st       |
| Lavoie | 28      | 1    | 2      | rb      |        | 4   | 510    | 1500   | 1.1       | 4+        | s         | 2     |      | f   | st       |
| Lavoie | 29      | 1    | 2      | rb      |        | 3   | 402    | 800    | 1.2       | 3+        | s         | 2     |      | f   | st       |
| Lavoie | 30      | 1    | 2      | rb      |        | 4   | 475    | 980    | 0.9       | 4+        | s         | 2     |      | f   | st       |
| Lavoie | 31      | 1    | 2      | rb      |        | 4   | 432    | 920    | 1.1       | 4+        | s         | 1     |      | m   | st       |
| Lavoie | 32      | 1    | 2      | rb      |        | 2   | 374    | 620    | 1.2       | 2+        | s         | 1     |      | m   | st       |
| Lavoie | 33      | 1    | 2      | rb      |        | 3   | 390    | 740    | 1.2       | 3+        | s         | 1     |      | f   | st       |
| Lavoie | 34      | 1    | 2      | rb      |        | 3   | 336    | 460    | 1.2       | 3+        | s         | 1     |      | m   | st       |
| Lavoie | 35      | 1    | 2      | rb      |        | 3   | 317    | 360    | 1.1       | 3+        | s         | 1     |      | unk | unk      |