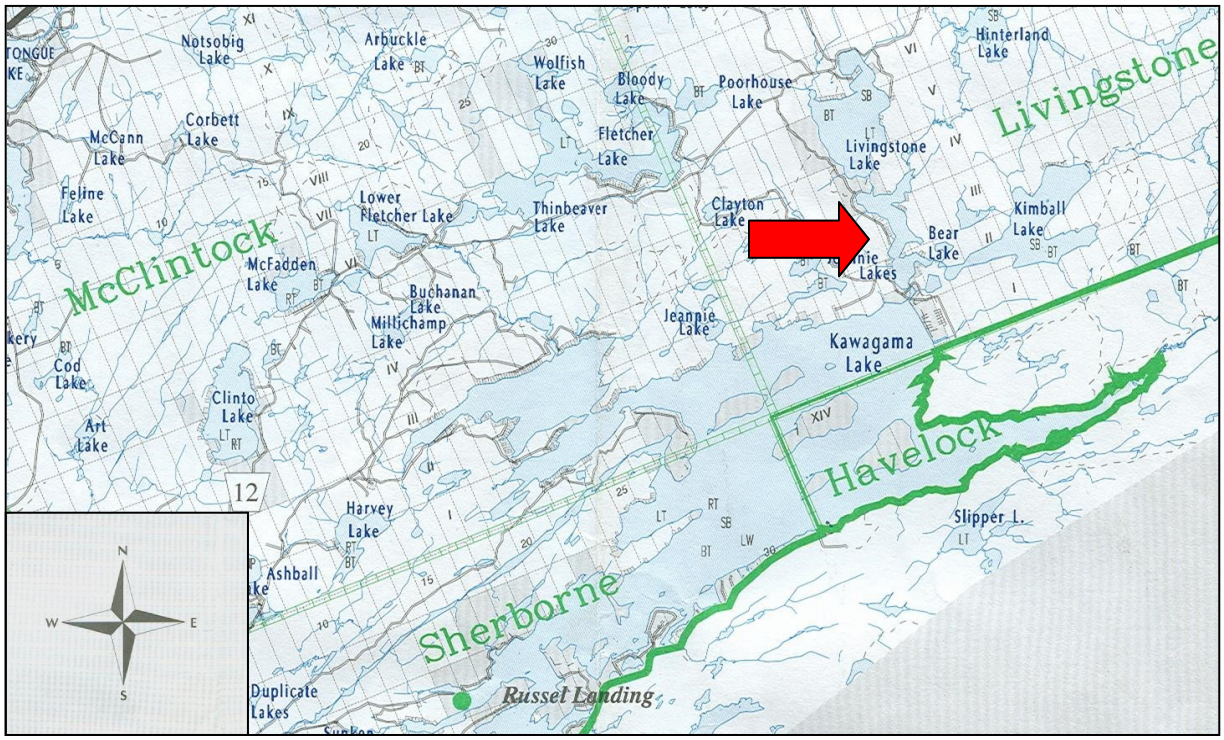
# BEAR LAKE




**LOCATION**

**County:** Haliburton
**Township:** Algonquin Highlands
**Geographic Township:** Livingstone
**Watershed:** Muskoka River
**Zone:** 17T
**Easting:** 679614
**Northing:** 5022627
**Topographic Sheet:** Kawagama Lake 31 E/7

**MORPHOMETRY**

**Surface Area:** 95 ha
**Watershed Area:** 11 023 ha
**Shoreline Length:** 9.74 km
**Maximum Depth:** 36.6 m
**Mean Depth:** 9.87 m
**Total Volume:** 9,340,000 $m^3$

**SHORELINE DEVELOPMENT (2002)**

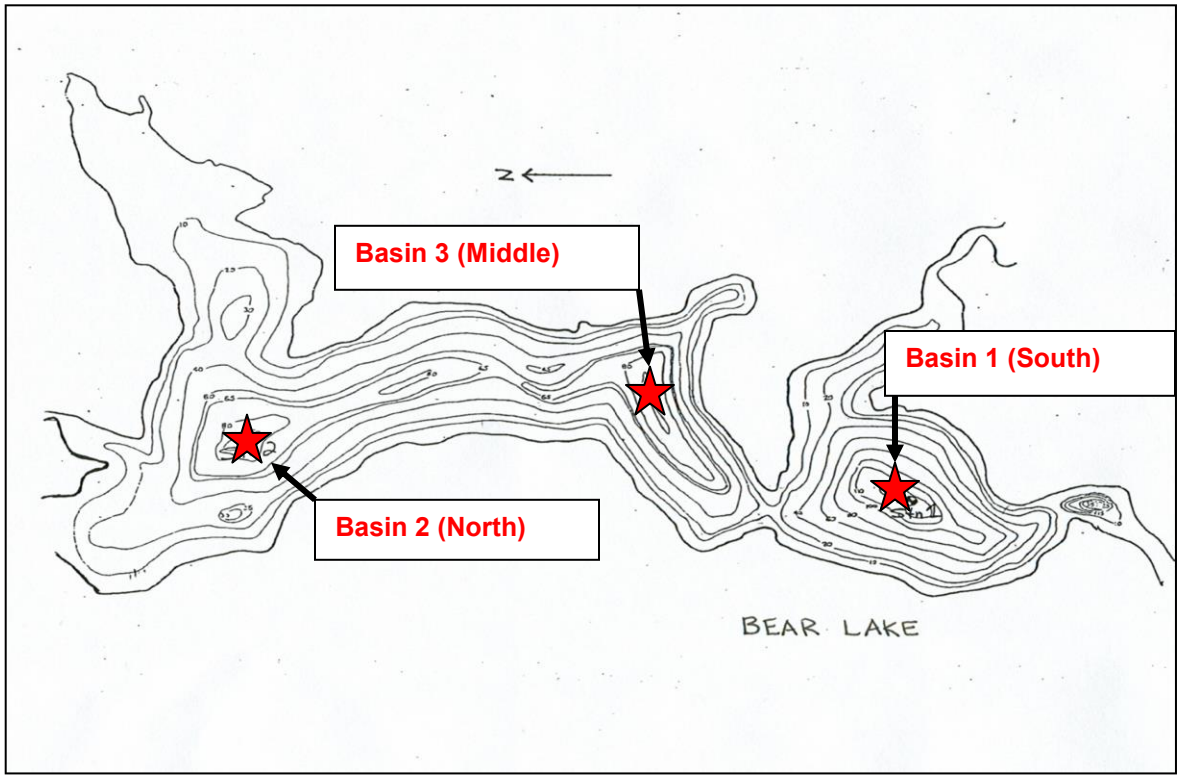
**Residences:**
Permanent: 2
Seasonal: 52
Vacant Lots of Record: 8

**Commercial Establishments:**

**Other:**

**% Crown Land** 35

**Figure 1. Bear Lake Bathymetry Map and Sampling Locations.**




## WATER CHEMISTRY

A summary of water quality data is presented in Tables 1 and 2.

Nitrogen and phosphorus are the two main nutrients that promote algae and macrophyte growth in lakes. Phosphorus is the limiting nutrient in that it is primarily elevated concentrations of phosphorus that result in algae blooms. Bear Lake has relatively high nitrate values compared to other lakes in the area but phosphorus concentrations are at levels that would likely preclude nuisance algae blooms from occurring. It is therefore important that best management practices are used on Bear Lake to keep phosphorus concentrations low.

The Secchi disk visibility for Bear Lake ranged from 3 meters to 5.75 meters indicating fair to good water clarity.

The DOC concentration ranges from 3.2 mg/L to 4.4 mg/L. This is a moderate amount, likely indicating some organic material input from the watershed.

Based on total alkalinity, Bear Lake is moderately sensitive to acidification.

Hardness values indicate that Bear Lake has soft water.

**Table 1. Bear Lake: Basin 1 (South) Water Chemistry, 2002 - 2009 (all values mg/L unless noted).**

| PARAMETER | 28-May-02 | 09-Jul-02 | | 04-Sep-02 | | 10-Sep-03 | | 28-Sep-04 | | 12-Sep-05 | | 20-May-09 | 08-Sep-09 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin 1 (South) | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | Basin 1 (South) | |
| | EUP | EUP | MOB | EUP | MOB | EUP | EUP | EUP | MOB | EUP | MOB | EUP | EUP | MOB |
| Secchi Disk (m) | 5.5 | 3 | | 5.75 | | 5.5 | | 4 | | 4.4 | | 4.1 | 3.4 | |
| Total Phosphorus | 0.006 | 0.006 | 0.006 | 0.005 | 0.015 | 0.005 | 0.018 | 0.005 | 0.016 | 0.008 | 0.015 | 0.003 | 0.004 | 0.02 |
| Ammonia + Ammonium - Nitrogen | 0.002 | 0.012 | 0.006 | 0.009 | 0.03 | 0.013 | 0.276 | 0.023 | 0.035 | 0.029 | 0.013 | 0.01 | 0.004 | 0.311 |
| Nitrite-Nitrogen | 0.001 | 0.004 | 0.002 | 0.006 | 0.017 | 0.001 | 0.007 | 0.001 | 0.004 | 0.003 | 0.004 | 0.001 | 0.002 | 0.01 |
| Nitrate + Nitrite - Nitrogen | 0.147 | 0.064 | 0.151 | 0.052 | 0.258 | 0.089 | 0.031 | 0.091 | 0.258 | 0.057 | 0.301 | 0.131 | 0.01 | 0.01 |
| Total Kjeldahl Nitrogen | 0.2 | 0.25 | 0.24 | 0.23 | 0.33 | 0.28 | 0.78 | 0.23 | 0.28 | 0.24 | 0.29 | 0.19 | 0.21 | 0.7 |
| Dissolved Organic Carbon | 3.8 | 4 | 3.9 | 3.2 | 4 | 4.4 | 5.7 | 4 | 4.2 | 3.9 | 4 | 3.6 | 3.9 | 4.7 |
| Dissolved Inorganic Carbon | 1.2 | 1 | 1.6 | 0.5 | 2.3 | 0.7 | 3.4 | 1 | 2.2 | 0.8 | 2.6 | 0.1 | 1 | 3.7 |
| pH (none) | 6.53 | 6.66 | 6.44 | 6.65 | 6.69 | 6.6 | 6.7 | 6.84 | 7.03 | 6.56 | 6.53 | 6.52 | 6.82 | 6.61 |
| Total Alkalinity | 4 | 4.5 | 5.8 | 4.8 | 10.2 | 5.2 | 13.6 | 5.5 | 8.2 | 5.2 | 9.1 | 4.2 | 5.5 | 12.7 |
| Conductivity (uS/cm) | 22 | 22 | 24 | 24 | 32 | 26 | 35 | 25 | 32 | 24 | 31 | 22 | 22 | 32 |
| Calcium | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2 | 2.4 | 2 | 2.4 | 1.7 | 1.75 | 2.6 |
| Magnesium | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.68 | 0.82 | 0.66 | 0.82 | 0.58 | 0.62 | 0.92 |
| Hardness | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 7.8 | 9.4 | 7.8 | 9.4 | 6.8 | N/A | N/A |
| Total Suspended Solids | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.5 | 5.7 | 0.7 | 1.4 | 18.6 |
| Total Dissolved Solids | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 15 | 20 | 14 | 14 | 21 |

EUP = composite water sample from the surface to a depth equal 2X the Secchi depth.
MOB = Discrete water sample from one metre above the lake bottom at deepest point in the designated basin.
N/A = not analyzed

**Table 2. Bear Lake: Basin 2 (North) and Basin 3 (Middle) Water Chemistry, 2002 - 2009 (all values mg/L unless noted).**

| PARAMETER | 04-Sep-02 | | 28-Sep-04 | | 12-Sep-05 | | 20-May-09 | 08-Sep-09 | |
|---|---|---|---|---|---|---|---|---|---|
| | Basin 2 (North) | | Basin 2 (North) | | Basin 3 (Middle) | | Basin 2 (North) | Basin 2 (North) | |
| | EUP | MOB | EUP | MOB | EUP | MOB | EUP | EUP | MOB |
| Secchi Disk (m) | 5.25 | | 4 | | 4.5 | | 4.4 | 3.1 | |
| Total Phosphorus | 0.006 | 0.009 | 0.008 | 0.014 | 0.004 | 0.009 | 0.003 | 0.007 | 0.011 |
| Ammonia + Ammonium - Nitrogen | 0.015 | 0.005 | 0.01 | 0.008 | 0.017 | 0.002 | 0.012 | 0.005 | 0.006 |
| Nitrite-Nitrogen | 0.006 | 0.011 | 0.001 | 0.002 | 0.004 | 0.003 | 0.001 | 0.001 | 0.004 |
| Nitrate + Nitrite - Nitrogen | 0.1 | 0.262 | 0.211 | 0.332 | 0.096 | 0.271 | 0.125 | 0.01 | 0.221 |
| Total Kjeldahl Nitrogen | 0.24 | 0.26 | 0.22 | 0.26 | 0.22 | 0.22 | 0.25 | 0.25 | 0.28 |
| Dissolved Organic Carbon | 3.4 | 3.6 | 4.2 | 4.4 | 3.9 | 3.7 | 4 | 4.1 | 3.9 |
| Dissolved Inorganic Carbon | 0.4 | 0.9 | 1 | 1.8 | 0.9 | 1.8 | 0.2 | 0.6 | 0.9 |
| pH (none) | 6.62 | 6.47 | 6.75 | 6.69 | 6.52 | 6.49 | 6.63 | 6.83 | 6.45 |
| Total Alkalinity | 4.9 | 5.7 | 5.2 | 5.6 | 5.1 | 7.4 | 4.8 | 5.7 | 5.8 |
| Conductivity (uS/cm) | 25 | 28 | 26 | 28 | 24 | 29 | 22 | 21 | 25 |
| Calcium | N/A | N/A | 2.1 | 2.2 | 2.05 | 2.45 | 1.75 | 1.8 | 1.9 |
| Magnesium | N/A | N/A | 0.7 | 0.76 | 0.68 | 0.86 | 0.6 | 0.64 | 0.72 |
| Hardness | N/A | N/A | 8.2 | 8.6 | 7.8 | 9.6 | 6.8 | N/A | N/A |
| Total Suspended Solids | N/A | N/A | N/A | N/A | 0.5 | 1.4 | 1 | 1.5 | 2.2 |
| Total Dissolved Solids | N/A | N/A | N/A | N/A | 16 | 19 | 14 | 14 | 16 |

EUP = composite water sample from the surface to a depth equal 2X the Secchi depth.
MOB = Discrete water sample from one metre above the lake bottom at deepest point in the designated basin.
N/A = not analyzed

The oxygen and temperature profiles are presented in Tables 4 and 5, and Figures 2 - 7. The temperature profile indicates that Bear Lake has well defined stratified temperature layers. The dissolved oxygen profiles generally show oxygen enrichment in the metalimnion. This is a common variation referred to as a positive heterograde, and is likely due to thermally trapped algae that can still photosynthesize because of good water clarity. The September 28, 2004 profile for Basin 1 and 2, as well as the September 8, 2009 profile all show oxygen depletion in the metalimnion. This is also a common variation referred to as a negative heterograde, and was likely caused by the decomposition of settling organic material that accumulates in the metalimnion as a result of a thermally induced water density gradient.

By the late summer/early fall critical period the mean hypolimnetic dissolved oxygen concentration (MVWHDO) were generally above the 7 mg/L criterion except for Basin 1 on September 10, 2003, and Basin 2 on September 28, 2004. The MVWHDO concentrations have been summarized in Table 3. Under these conditions, it is not likely that the lake trout populations are stressed, except for the years where the MVWHDO is below 7 mg/L. In those cases, the lake trout populations are likely to be slightly stressed. Historical values have also been above the 7 mg/L criterion, with the MVWHDO being 7.73 mg/L on September 2, 1986.

**Table 3. Summary of MVWHDO Calculations, 2002 - 2009 (all values mg/L).**

| Date | Basin 1 (South) | Basin 2 (North) | Basin 3 (Middle) |
|---|---|---|---|
| **04-Sep-02** | 8.17 | 7.38 | N/A |
| **10-Sep-03** | 6.18 | N/A | N/A |
| **28-Sep-04** | 7.37 | 6.54 | N/A |
| **12-Sep-05** | 8.87 | N/A | 8.35 |
| **08-Sep-09** | 8.84 | 7.35 | N/A |

**Table 4. Bear Lake: Basin 1 (South) Temperature (Temp) and Dissolved Oxygen Concentration (DO) Profiles, 2002 – 2009.**

| Depth (m) | 09-Jul-02 | | 04-Sep-02 | | 10-Sep-03 | | 28-Sep-04 | | 12-Sep-05 | | 08-Sep-09 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | | Basin 1 (South) | |
| | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) |
| 0 | 23.6 | 8 | 21.5 | 7.9 | 19.3 | 7.6 | 17.6 | 8.82 | 19.9 | 8.63 | 22.24 | 8.99 |
| 1 | 23.5 | 8.3 | 21.5 | 7.9 | 19.2 | 7.59 | 17.5 | 8.91 | 19.8 | 8.63 | 21.18 | 9.27 |
| 2 | 23.4 | 8 | 21.4 | 8 | 18.9 | 7.69 | 17.5 | 8.95 | 19.8 | 8.59 | 20.89 | 9.3 |
| 3 | 22.2 | 8.5 | 21.4 | 8 | 18.8 | 7.64 | 17.5 | 8.97 | 19.7 | 8.58 | 20.67 | 9.4 |
| 4 | 16.1 | 11.1 | 21.2 | 7.9 | 18.8 | 7.64 | 17 | 8.75 | 19.1 | 8.68 | 19.6 | 9.68 |
| 5 | 11.8 | 12.4 | 17.4 | 10.5 | 18.6 | 7.66 | 15 | 7.97 | 14 | 11.44 | 17.52 | 10.43 |
| 6 | 9.9 | 12.9 | 12.9 | 11.5 | 12.2 | 10.23 | 10.9 | 7.26 | 9.5 | 10.25 | 13.55 | 11.2 |
| 7 | 8.4 | 12.1 | 10.5 | 11 | 9.2 | 10.03 | 8.5 | 6.65 | 7.3 | 9.12 | 10.06 | 10.13 |
| 8 | 7.7 | 12 | 8.2 | 9.9 | 7.4 | 8.51 | 6.6 | 7.32 | 6 | 9.34 | 8.11 | 9.85 |
| 9 | 6.9 | 11.9 | 7.1 | 9.5 | 6.2 | 7.54 | 5.8 | 7.78 | 5.3 | 9.4 | 6.79 | 10.05 |
| 10 | 6.3 | 11.8 | 6.5 | 9.2 | 5.6 | 7.23 | 5.2 | 8.34 | 4.8 | 9.7 | 6.21 | 10.09 |
| 11 | 5.7 | 11.3 | 6.2 | 9.3 | 5.1 | 7.17 | 4.7 | 8.58 | 4.5 | 9.74 | 5.6 | 10.09 |
| 12 | 5.3 | 11 | 5.6 | 9.5 | 4.7 | 7.15 | 4.4 | 8.72 | 4.2 | 9.78 | 5.09 | 10.18 |
| 13 | 5.1 | 11.4 | 5.3 | 9.5 | 4.5 | 7.17 | 4.3 | 8.71 | 4 | 9.75 | 4.88 | 10.24 |
| 14 | 4.8 | 11.1 | 4.9 | 9.2 | 4.3 | 7.4 | 4 | 8.64 | 3.8 | 9.99 | 4.64 | 10.26 |
| 15 | 4.6 | 11.2 | 4.7 | 8.8 | 4.1 | 7.5 | 3.8 | 8.37 | 3.6 | 10.05 | 4.44 | 10.26 |
| 16 | 4.5 | 11 | 4.6 | 8.5 | 4 | 7.3 | 3.7 | 8.12 | 3.5 | 10.03 | 4.33 | 10.31 |
| 17 | 4.4 | 10.3 | 4.4 | 7.8 | 4 | 6.87 | 3.6 | 8.08 | 3.5 | 9.68 | 4.25 | 10.08 |
| 18 | 4.3 | 10 | 4.4 | 7.3 | 4 | 6.55 | 3.6 | 8.08 | 3.5 | 9.43 | 4.22 | 9.82 |
| 19 | 4.2 | 8.6 | 4.3 | 6.7 | 4 | 6.02 | 3.4 | 6.78 | 3.5 | 9 | 4.22 | 9.18 |
| 20 | 4.2 | 8.5 | 4.2 | 6.4 | 4 | 5.8 | 3.4 | 6.1 | 3.4 | 8.08 | 4.21 | 7.84 |
| 21 | 4.1 | 7.7 | 4.2 | 6.1 | 4 | 5.25 | 3.4 | 5.81 | 3.4 | 7.71 | 4.19 | 6.91 |
| 22 | 4.1 | 7.1 | 4.2 | 5.7 | 3.9 | 4.75 | 3.4 | 5.13 | 3.4 | 7.15 | 4.18 | 6.13 |
| 23 | 4.1 | 6.7 | 4.1 | 5.3 | 3.9 | 3.77 | 3.4 | 4.8 | 3.4 | 6.7 | 4.17 | 5 |
| 24 | 4.1 | 6 | 4.1 | 4.7 | 3.9 | 3.11 | 3.4 | 3.97 | 3.4 | 6 | 4.15 | 3.71 |
| 25 | 4.1 | 5.8 | 4.1 | 4.2 | 4 | 2.4 | 3.4 | 3.2 | 3.4 | 5 | 4.14 | 2.9 |
| 26 | 4.1 | 5.5 | 4.2 | 3.4 | 4 | 1.5 | 3.4 | 2.88 | 3.4 | 4.57 | 4.14 | 2.16 |
| 27 | 4.1 | 5.1 | 4.2 | 3.1 | 4 | 0.83 | 3.4 | 2.22 | 3.4 | 3.86 | 4.13 | 1.71 |
| 28 | 4.1 | 4.8 | N/A | N/A | 4 | 0.4 | 3.4 | 1.5 | 3.4 | 3.05 | 4.13 | 1.39 |
| 29 | 4.1 | 4.6 | N/A | N/A | 4 | 0.36 | 3.4 | 1.81 | 3.4 | 2.24 | 4.13 | 1.15 |
| 30 | 4.1 | 4.3 | N/A | N/A | 4 | 0.26 | 3.4 | 0.64 | 3.4 | 1.31 | 4.13 | 0.93 |
| 31 | 4.1 | 3.8 | N/A | N/A | 4 | 0.2 | 3.4 | 0.36 | 3.4 | 0.84 | 4.13 | 0.82 |
| 32 | 4.1 | 3.6 | N/A | N/A | 4 | 0.16 | N/A | N/A | 3.4 | 0.7 | 4.13 | 0.7 |
| 33 | 4.1 | 3.2 | N/A | N/A | 4 | 0.15 | N/A | N/A | 3.4 | 0.64 | 4.13 | 0.62 |
| 34 | 4.1 | 2.4 | N/A | N/A | 4 | 0.15 | N/A | N/A | N/A | N/A | N/A | N/A |
| 35 | 4.1 | 0.6 | N/A | N/A | 4 | 0.14 | N/A | N/A | N/A | N/A | N/A | N/A |
| 36 | N/A | N/A | N/A | N/A | 4.1 | 0.13 | N/A | N/A | N/A | N/A | N/A | N/A |

**Table 5. Bear Lake: Basin 2 (North) and Basin 3 (Middle) Temperature (Temp) and Dissolved Oxygen Concentration (DO) Profiles, 2002 – 2009.**

| Depth (m) | 04-Sep-02 | | 28-Sep-04 | | 12-Sep-05 | | 08-Sep-09 | |
|---|---|---|---|---|---|---|---|---|
| | Basin 2 (North) | | Basin 2 (North) | | Basin 3 (Middle) | | Basin 2 (North) | |
| | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) | Temp (°C) | DO (mg/L) |
| **0** | 21.5 | 7.7 | 17.7 | 8.97 | 20.2 | 8.45 | 21.23 | 8.67 |
| **1** | 21.5 | 7.8 | 17.8 | 8.95 | 19.8 | 8.58 | 21.12 | 8.68 |
| **2** | 21.5 | 7.8 | 17.8 | 8.97 | 19.7 | 8.57 | 20.87 | 8.73 |
| **3** | 21.5 | 7.8 | 17.7 | 8.93 | 19.7 | 8.59 | 20.22 | 8.86 |
| **4** | 21.4 | 7.8 | 16.5 | 8.37 | 19.6 | 8.63 | 19.62 | 8.82 |
| **5** | 16.3 | 9.9 | 14.6 | 7.02 | 14.4 | 10.24 | 17.56 | 8.7 |
| **6** | 12.8 | 10.6 | 10.5 | 6.27 | 9.9 | 9 | 12.97 | 8.21 |
| **7** | 9.9 | 7.6 | 7.3 | 5.92 | 7.5 | 8.6 | 10.02 | 7.26 |
| **8** | 8.3 | 7 | 6.2 | 6.27 | 6.2 | 8.45 | 8.45 | 6.91 |
| **9** | 7 | 7.5 | 5.5 | 7.21 | 5.3 | 8.59 | 6.94 | 7.02 |
| **10** | 6.6 | 8 | 5.1 | 7.62 | 4.8 | 8.8 | 6.14 | 7.27 |
| **11** | 6.4 | 8.1 | 5 | 7.5 | 4.6 | 8.88 | 5.83 | 7.5 |
| **12** | 6.2 | 8.3 | 4.9 | 7.47 | 4.5 | 8.72 | 5.62 | 7.82 |
| **13** | 6.1 | 8 | 4.9 | 7.47 | 4.4 | 8.84 | 5.5 | 8.05 |
| **14** | 6 | 7.9 | 4.8 | 7.38 | 4.4 | 8.85 | 5.39 | 8.16 |
| **15** | 5.9 | 7.9 | 4.8 | 6.67 | 4.3 | 8.79 | 5.27 | 8.1 |
| **16** | 5.8 | 7.6 | 4.7 | 6.23 | 4.2 | 8.65 | 5.19 | 7.98 |
| **17** | 5.8 | 7.1 | 4.6 | 5.89 | 4.1 | 8.61 | 5.14 | 7.8 |
| **18** | 5.7 | 6.4 | 4.6 | 5.48 | 4.1 | 8.63 | 5.1 | 7.66 |
| **19** | 5.7 | 6.2 | 4.6 | 5.46 | 4 | 8.49 | 5.05 | 7.31 |
| **20** | 5.7 | 6.2 | 4.6 | 5.26 | 4 | 8.34 | 5 | 6.94 |
| **21** | 5.7 | 6.1 | 4.6 | 5.09 | 4 | 8.23 | 4.98 | 6.68 |
| **22** | 5.7 | 5.9 | 4.6 | 4.55 | 3.9 | 8.1 | 4.97 | 6.27 |
| **23** | 5.9 | 6 | 4.6 | 4.47 | 3.9 | 7.85 | 4.95 | 6.19 |
| **24** | 5.7 | 5.7 | 4.6 | 4.4 | 3.8 | 7.13 | 4.92 | 6.01 |
| **25** | 5.7 | 5.4 | 4.6 | 3.99 | 3.8 | 7.19 | 4.9 | 5.35 |
| **26** | N/A | N/A | N/A | N/A | 3.8 | 6.79 | 4.88 | 4.56 |
| **27** | N/A | N/A | N/A | N/A | 3.7 | 5.03 | 4.86 | 4.26 |
| **28** | N/A | N/A | N/A | N/A | 3.7 | 4.44 | N/A | N/A |
| **29** | N/A | N/A | N/A | N/A | 3.7 | 4.06 | N/A | N/A |
| **30** | N/A | N/A | N/A | N/A | 3.7 | 1.9 | N/A | N/A |
| **31** | N/A | N/A | N/A | N/A | 3.7 | 0.71 | N/A | N/A |

**Figure 2. Bear Lake Basin 1 (South): Temperature Profiles.**

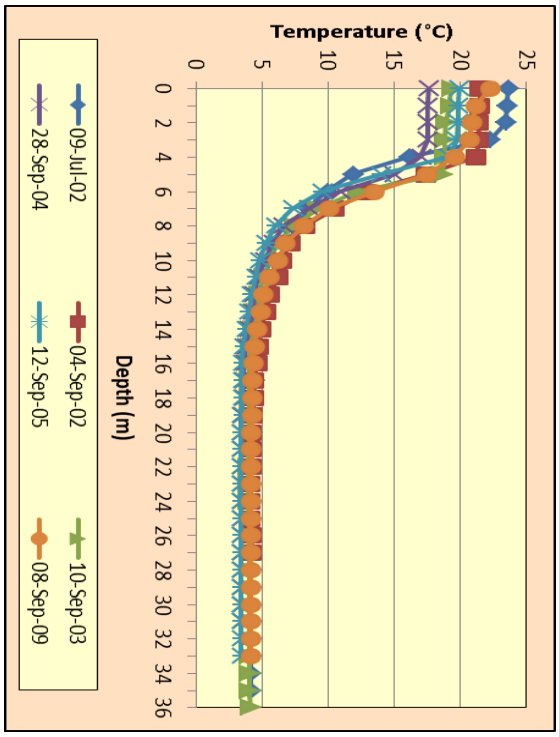



**Figure 3. Bear Lake Basin 1 (South): Dissolved Oxygen Profiles.**

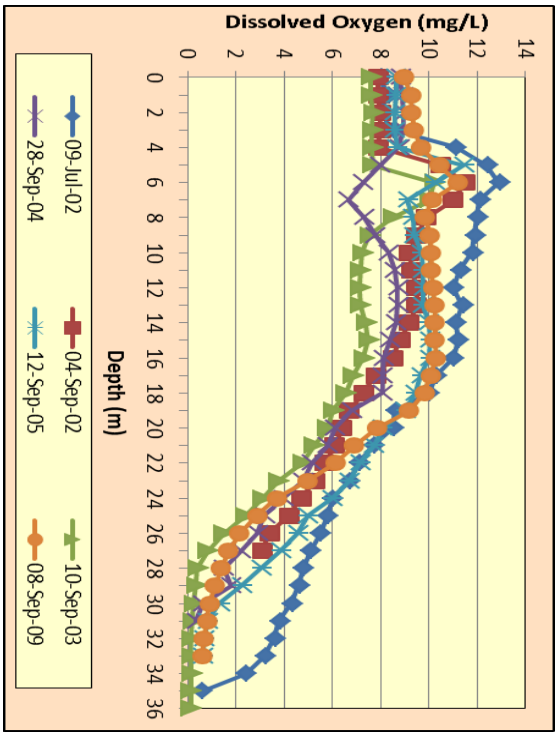



**Figure 4. Bear Lake Basin 2 (South):Temperature Profiles.**

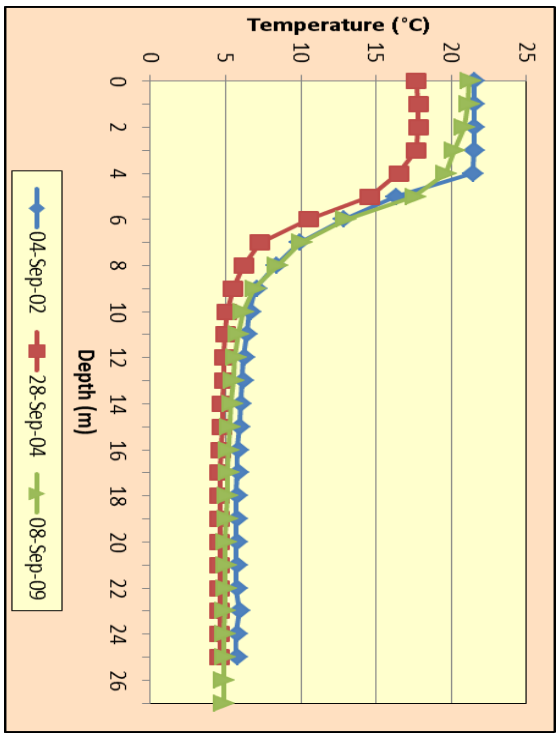



**Figure 5. Bear Lake Basin 2: Dissolved Oxygen Profiles.**

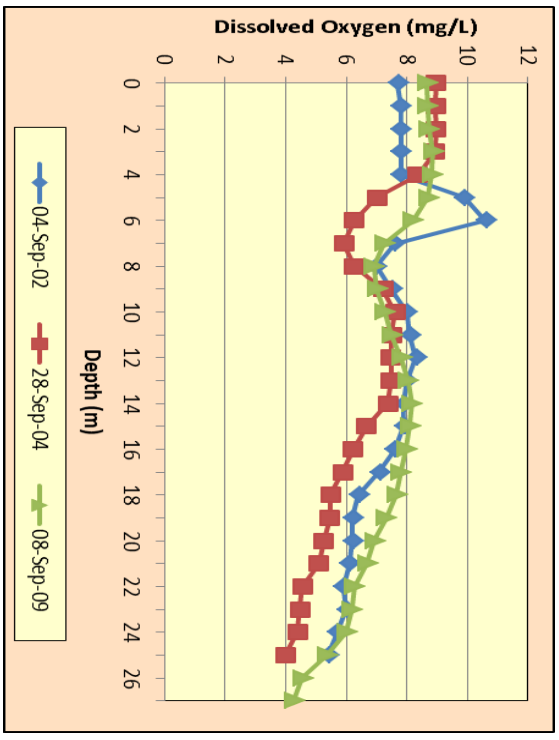


**Figure 6. Bear Lake Basin 3 (Middle): Temperature Profile.**

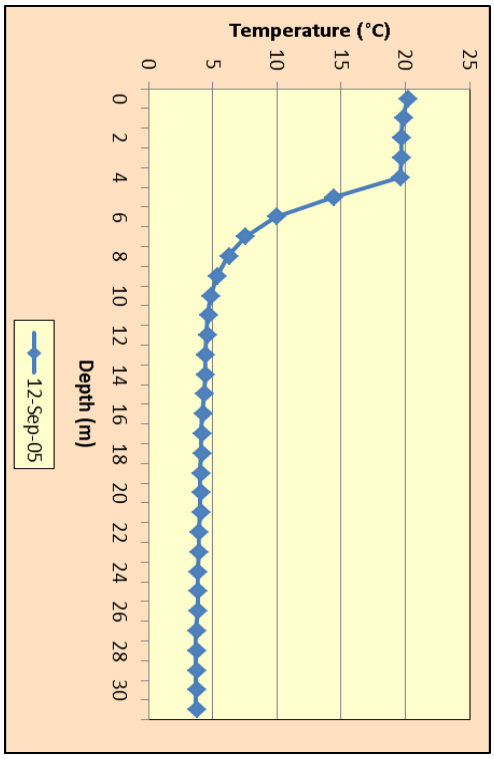
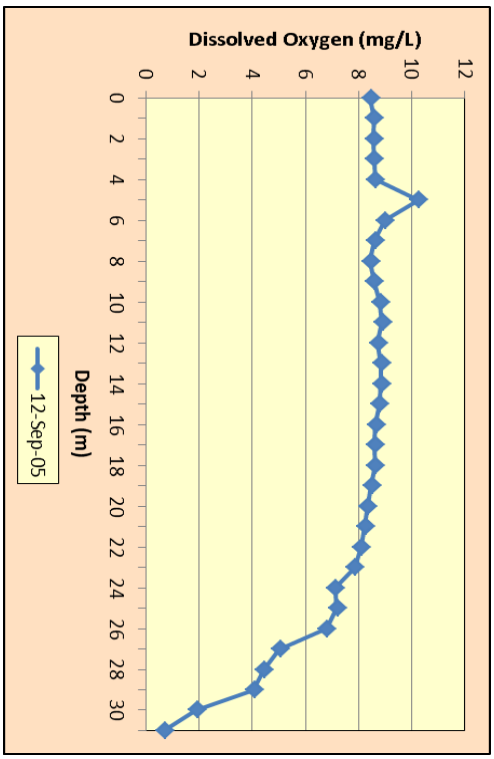



**Figure 7. Bear Lake Basin 3 (Middle) Dissolved Oxygen Profile.**




## FISHERIES SUMMARY

Major fish species in Bear Lake include lake trout, brook trout, round whitefish, yellow perch, smallmouth bass, and burbot. Other fish species in Bear Lake include blacknose shiner, white sucker, brown bullhead, golden shiner, creek chub, and bluntnose minnow.

Bear Lake has a fairly good temperature-oxygen profile and provides suitable habitat to support a small reproducing lake trout population. Movement of lake trout between Bear Lake and Kawagama Lake is thought to be occurring. Observations indicate a limited amount of spawning occurs in Bear Lake, suggesting that the population is supported, or at least supplemented by immigration from Kawagama Lake. As the two are connected by a navigable channel, they should probably be managed as a single lake, at least, from a regulatory perspective.

Results from 1997 SLIN estimated 61% of the lake trout population is native. Based on these considerations, supplemental stocking was discontinued after 1997 and special fishing regulations were imposed commencing with the start of the 1996 fishing season.

Fishing regulations include a protected slot size of 40-55cm and one winter fishing line only.