

# Summary of Activities

Date: August 13th, 2015

To: **Ian Kitch**  
**Fisheries Manager**  
**Western Region**

From: **Holly Urban & Brock Koutecky**  
**Swan Valley Sport Fishing Enhancement**

Contact: **svsfe@mymts.net**

Subject: *Caverly Lake*

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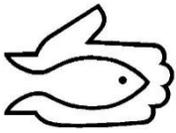
**Location: Caverly Lake, Duck Mountain Provincial Park, 369762 5740230**

**Research History:** In the mid-1980's and early 1990's Caverly Lake was stocked with both rainbow trout and brook trout. Following limited angling success fisheries branch conducted a test netting program in the fall of 1992. One standard gang was set for a duration of 22 hours which yielded no fish. Following this program, along with a winter dissolved oxygen reading earlier that year, regional technician Ken Kansas released a statement. The statement suggested that Caverly Lake "likely experiences winterkill and in terms of stocking trout to be a hit-or-miss situation". Kansas concludes with "I would recommend this activity cease at this time".

**Summary of Activities:** In early August 2015 SVSFE technicians assessed Caverly Lake to determine if the waterbody had potential for stocking game fish species for rearing and/or full introductions. The idea was to determine if Caverly could potentially host arctic char destined for Glad Lake during the summer months of 2016 and 2017, therefore increasing growth and survival. Pre-survey activities determined lake parameters using mapping software including lake area (7.2ha), lake shoreline (1,149m).

Lake surveys began on August 5<sup>th</sup>, 2015 with bathymetric mapping. The lake was mapped using 50 meter transects, the deepest basin located was 7 meters. Habitat maps were created on site. Modern bathymetric analysis and map creation is currently pending. The habitat map from 2015 can be viewed on page 3.

Fish sampling was conducted on August 5<sup>th</sup> and 6<sup>th</sup> 2015. One small mesh trap net was set on the south-east shore for a duration of 22 hours. No gill nets were set due to confidence that no game fish were prevalent in the lake. The fine mesh trap net catchment included 1,310 (62%) fathead minnow, and 793 (37.5%) stickleback, and 4 white suckers (0.5%). CPUE was calculated at 95.77 fish per hour.

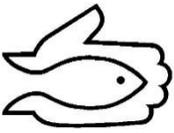


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Water sampling, benthic sampling, and late summer vegetation mapping was conducted on August 5<sup>th</sup> and 6<sup>th</sup> 2015. Water parameters documented include pH, total dissolved solids (TDS), conductivity, dissolved oxygen, alkalinity, nitrates, nitrites, and phosphate levels. Water stations were conducted in one location over the deep basin (7m) of the lake. Water samples were taken and analyzed in accordance to SVSFE water sampling protocol; 2m above bottom, mid-depth, and 2 meters below surface. Late summer dissolved oxygen and temperature were documented at every meter. As per protocol, weather, turbidity, and water colour was documented at each water station as well. Benthic samples were taken at the water sampling station, as well in two random littoral areas to determine benthic prevalence in more likely habitats. Eight vegetation transects (VT) were mapped where technicians would mark the beginning and end of both emergent and submergent vegetation using a Garmin echoMap 50s sonar. The average depth where submergent vegetation ceased was 3.8m. A accurate vegetation prevalence map for Caverly Lake using GIS is still pending. A satellite image, including scale and sample sites can be viewed on page 4, and the water testing results can be viewed on page 5.

**Current Recommendation:** SVSFE currently believes that Caverly Lake is a good candidate lake for rearing arctic char destined for Glad Lake. It would be ideal if the lake could support char overwinter, however this seems to be risky considering the lakes history of winterkill. It is recommended to collect winter DO's as there is only one year on file ('92). At current, it is believed that Caverly Lake would without a doubt grow char over the summer months, thus giving fish destined for Glad Lake a full summer season of growth without fish predation. Caverly has a high prevalence of forage, and no large predators therefore growth would likely be high with low mortality. With Caverly's short transferring distance from Glad Lake it would be the best option for rearing char if the method becomes priority. Access to the lake does however reside along the Glad Lake hiking trail, therefore arrangements with parks branch would have to be obtained prior to bringing quads and trailers on the trail for the transfer. Upon recent conversations with SVSFE directors a new idea became a topic of conversation. Essentially, Duane Whyte suggested that historically, the lowland directly east of Caverly was used as a wastewater/sewage dumping station. His argument was that potentially this waste may have seeped into Caverly and potentially effected dissolved oxygen levels historically. Suggestion is to conduct winter DO's over the next few years, as it is possible the lake may now be able to over-winter stocked trout.

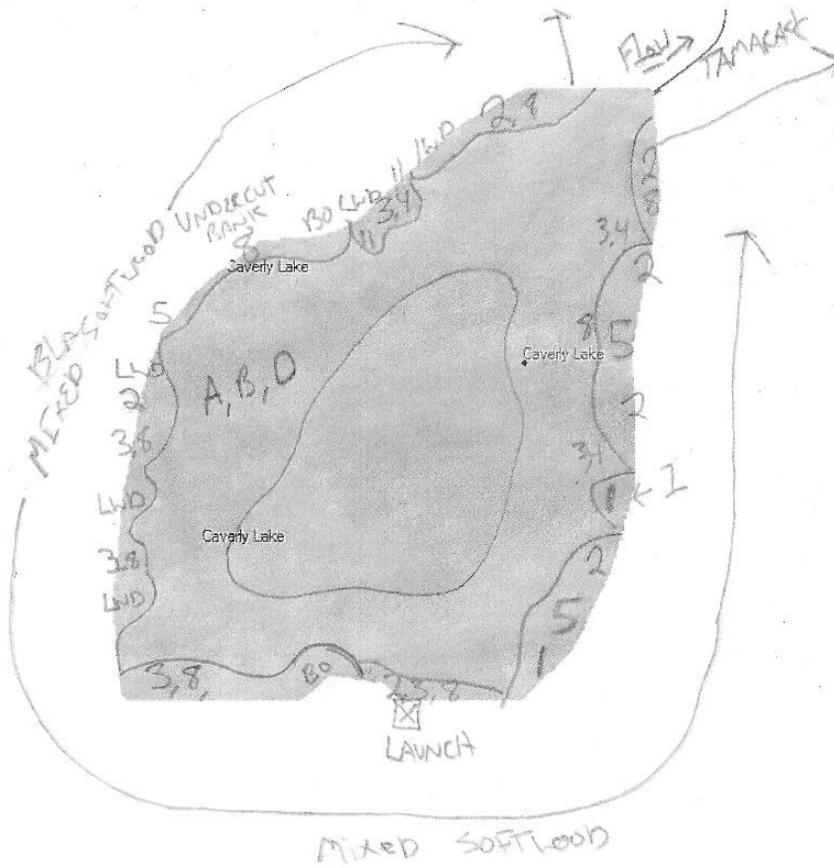


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Habitat Map (sketch)

Aug 5th 16<sup>th</sup>, 2015

CAVERLY LAKE - Habitat Map



## Emergent Vegetation

1. Bullrushes
2. Cattail
3. Scouring Rush
4. Horsetail
5. Sedge Grasses (Various)
8. Various Leaved Pondweed
11. Blade Grasses (Various)

## Submersant Vegetation

- Very high littoral percentage dominated by *Augustafolius* (A) with interspersed thread-leaved pondweed (8) & coontail (D)

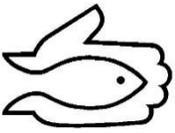
N



Lake Shoreline: 1,149 m

### Pre-Survey Calculations:

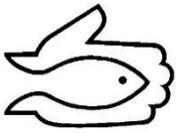
Lake Area: 7.2ha



# Summary of Activities

Sample Sites Map





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## Water Chemistry Results:

| Water Station #1           |                   |                    |        |        |        |
|----------------------------|-------------------|--------------------|--------|--------|--------|
| Project Site Code:         |                   | CA-WS-15-001       |        |        |        |
| Date:                      |                   | August-04-15       |        |        |        |
| UTM:                       | 369715<br>5740732 | Depth              | 2m     | 3.5m   | 5m     |
| Time of Day:               | 11:30             | TDS (ppm):         | 87     | 87     | 88     |
| Cloud Cover:               | 8/8               | CON (µs):          | 174    | 174    | 175    |
| Air Temp (°C):             | 18°C              | pH:                | 9.19   | 8.86   | 8.88   |
| Sample Depth (m):          | 7m                | Water Temp (°C)    | 19.5°C | 18.8°C | 18.1°C |
| Water Surface:             | Calm              | Alkalinity (mg/L): | 100    | 80     | 80     |
| Water Color:               | Yellow/<br>Brown  | Nitrates (ppm):    | 0      | 0      | 0      |
| Secchi (m):                | 1.12m             | Nitrites (ppm):    | 0      | 0      | 0      |
| Morpheodaphic Index (MEI): | TBD               | Phosphate (ppm):   | 15     | 10     | 5      |

| Water Station #1 |      |        |
|------------------|------|--------|
| DO/Temp Profile  |      |        |
| Depth (m)        | DO   | TEMP°C |
| Surface          | 9.05 | 20.1   |
| 1                | 8.96 | 20.2   |
| 2                | 8.37 | 20     |
| 3                | 7.92 | 19.3   |
| 4                | 1.69 | 15.8   |
| 5                | 1.92 | 12.2   |
| 6                | 1.98 | 10.4   |
| 6.5              | 1.94 | 10     |
| 8                |      |        |
| 9                |      |        |
| 10               |      |        |
| 11               |      |        |
| 12               |      |        |
| 13               |      |        |
| 14               |      |        |

| Benthic Sample - Water Station # 1 |    |                    |                    |
|------------------------------------|----|--------------------|--------------------|
| Benthic Substrate:                 | MU | Benthic Organisms: | Freshwater Shrimp  |
| Vegetation:                        | NA | Comments:          | Very Few FW shrimp |

| Benthic Sample - Littoral Site # 1 (369788 5740328) |    |                    |  |
|---|----|--------------------|--|
| Benthic Substrate:                                  | MU | Benthic Organisms: | Chronomids (Very Little)                               |
| Vegetation:   | NA | Comments:          | Dredge @ 2m (Very little life) - Substrate light brown |

| Benthic Sample - Littoral Site # 2 (369759 5740257) |            |                    |   |
|---|------------|--------------------|---|
| Benthic Substrate:                                  | SA, SI, DE | Benthic Organisms: | Freshwater Shrimp,<br>Chronomids, Horsetail,<br>Caddisfly, Snail,<br>Watermite, Leeches |
| Vegetation:   | Algae      | Comments:          |   |