

Fishing Access

Ethan Dam has a primitive rock boat launch and dock located on the west shore near the dam. The Ethan Lake Association has also installed a fishing pier and picnic shelter for lake users.

Field Observations of Water Quality and Aquatic Vegetation

The water in Ethan Dam was very turbid during the survey with a Secchi depth measurement of 20 cm (8 in). Scattered beds of common cattail (*Typha spp.*) surround the entire shoreline and no submerged vegetation was observed.

BIOLOGICAL DATA

Methods:

Ethan Dam was sampled on July 11-12, 2012 with five overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh ($\frac{3}{4}$ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. Trap-net sites are displayed in Figure 4.

Results and Discussion:

Trap Net Catch

Of the eleven species sampled in the trap nets, black bullheads were the most abundant by far (Table 1).

Table 1. Total catch from five overnight trap net sets at Ethan Dam, Hanson County, July 12-13, 2012.

| Species | Number | Percent | CPUE | 80% C.I. | Mean CPUE* | PSD | RSD-P | Mean Wr |
|-------------------------|--------|---------|-------|---------------|---------------|-----|-------|------------|
| Black Bullhead | 1,031 | 92.9 | 206.2 | <u>+137.9</u> | 195.0 | 0 | 0 | 79 |
| Bigmouth Buffalo | 29 | 2.6 | 5.8 | <u>+3.4</u> | 0.3 | -- | -- | -- |
| Common Carp | 10 | 0.9 | 2.0 | <u>+1.2</u> | 1.0 | -- | -- | -- |
| Green Sunfish | 9 | 0.8 | 1.8 | <u>+0.9</u> | 0.0 | -- | -- | -- |
| Northern Pike | 9 | 0.8 | 1.8 | <u>+0.6</u> | 4.0 | -- | -- | -- |
| Channel Catfish | 8 | 0.7 | 1.6 | <u>+0.9</u> | 0.0 | -- | -- | -- |
| Black Crappie | 6 | 0.5 | 1.2 | <u>+1.0</u> | 3.1 | -- | -- | -- |
| Largemouth Bass | 4 | 0.4 | 0.8 | <u>+0.6</u> | 0.1 | -- | -- | -- |
| Yellow Perch | 2 | 0.2 | 0.4 | <u>+0.3</u> | 0.0 | -- | -- | -- |
| Walleye | 1 | 0.1 | 0.2 | <u>+0.3</u> | 0.0 | -- | -- | -- |
| White Crappie | 1 | 0.1 | 0.2 | <u>+0.3</u> | 4.2 | -- | -- | -- |

* 5 years (1998, 2000, 2002, 2004, 2006)

Table 2. Catch per unit effort by length category for various fish species captured with trap nets in Ethan Dam, Hanson County, July 11-12, 2012.

| Species | Substock | Stock | S-Q | Q-P | P+ | All sizes | 80% C.I. |
|-------------------------|----------|-------|-------|-----|-----|-----------|---------------|
| Black Bullhead | 92.6 | 113.6 | 113.6 | -- | -- | 206.2 | <u>+137.9</u> |
| Bigmouth Buffalo | 4.4 | 1.4 | 1.2 | 0.2 | -- | 5.8 | <u>+3.4</u> |
| Common Carp | 1.8 | 0.2 | -- | 0.2 | -- | 2.0 | <u>+1.2</u> |
| Green Sunfish | -- | 1.8 | 1.0 | 0.8 | -- | 1.8 | <u>+0.9</u> |
| Northern Pike | -- | 1.8 | 0.2 | 1.6 | -- | 1.8 | <u>+0.6</u> |
| Channel Catfish | 0.2 | 1.4 | -- | 1.4 | -- | 1.6 | <u>+0.9</u> |
| Black Crappie | -- | 1.2 | -- | -- | 1.2 | 1.2 | <u>+1.0</u> |
| Largemouth Bass | -- | 0.8 | 0.8 | -- | -- | 0.8 | <u>+0.6</u> |
| Yellow Perch | -- | 0.4 | -- | 0.4 | -- | 0.4 | <u>+0.3</u> |
| Walleye | -- | 0.2 | 0.2 | -- | -- | 0.2 | <u>+0.3</u> |
| White Crappie | -- | 0.2 | -- | -- | 0.2 | 0.2 | <u>+0.3</u> |

Length categories can be found in Appendix A.

Discussion

Ethan Lake is an important recreational resource for the town of Ethan and the surrounding area. Unfortunately, the lake has become so shallow and turbid due to decades of siltation that it can no longer sustain naturally-reproducing game fish populations. Despite several stockings since 2010 (Table 6), very few game fish were sampled in 2012.

Table 6. Trap-net CPUE for all fish species sampled in Ethan Dam, Hanson County, 2004-2012.

| Species | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------|------|------|------|------|------|------|------|------|-------|
| COC | 1.2 | | 0.4 | | -- | | -- | | 2.0 |
| BIB | 0.4 | | 0.2 | | -- | | -- | | 5.8 |
| BLB | 27.2 | | 6.8 | | -- | | -- | | 206.2 |
| CCF | -- | | 0.2 | | -- | | -- | | 1.6 |
| NOP | 1.6 | | 1.6 | | -- | | -- | | 1.8 |
| GSF | -- | | -- | | -- | | -- | | 1.8 |
| LMB | -- | | -- | | -- | | -- | | 0.8 |
| WHC | -- | | 0.6 | | -- | | -- | | 0.2 |
| BLC | 7.4 | | 3.4 | | -- | | -- | | 1.2 |
| YEP | -- | | -- | | -- | | -- | | 0.4 |
| WAE | -- | | -- | | -- | | -- | | 0.2 |

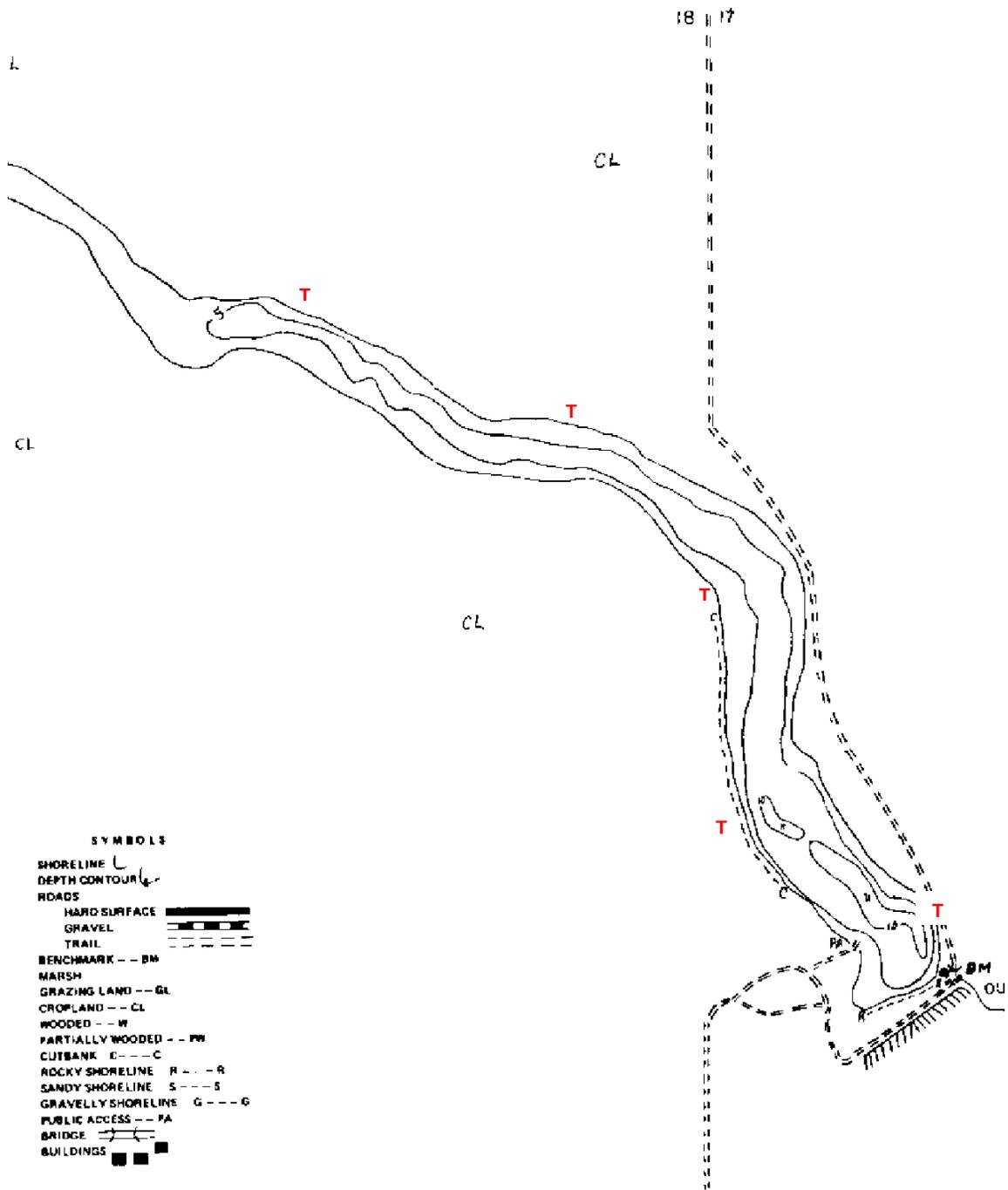
COC (Common Carp), BIB (Bigmouth Buffalo), BLB (Black Bullhead), CCF (Channel Catfish), NOP (Northern Pike), GSF (Green Sunfish), LMB (Largemouth Bass), WHC (White Crappie), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye).

MANAGEMENT RECOMMENDATIONS

1. Stock low oxygen tolerant species such as northern pike and yellow perch when available to maintain fishing opportunity for area residents.

Table 7. Stocking record for Ethan Dam, Hanson County, 1990-2012.

| Year | Number | Species | Size |
|-------------|---------------|-----------------|------------------|
| 1990 | 4,250 | Largemouth Bass | Fingerling |
| 1993 | 4,250 | Largemouth Bass | Sml. Fingerling |
| 2010 | 405 | Largemouth Bass | Juvenile |
| | 200 | White Bass | Adult |
| 2011 | 270 | Channel Catfish | Adult |
| | 160 | Walleye | Large Fingerling |
| | 632 | Yellow Perch | Adult |
| 2012 | 1,800 | Yellow Perch | Adult |



Legend Trap Net: T

Figure 1. Sampling locations on Ethan Dam, Hanson County, 2012.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

| Species | Stock | Quality | Preferred | Memorable | Trophy |
|--------------------|-------|---------|-----------|-----------|--------|
| Walleye | 25 | 38 | 51 | 63 | 76 |
| Sauger | 20 | 30 | 38 | 51 | 63 |
| Yellow perch | 13 | 20 | 25 | 30 | 38 |
| Black crappie | 13 | 20 | 25 | 30 | 38 |
| White crappie | 13 | 20 | 25 | 30 | 38 |
| Bluegill | 8 | 15 | 20 | 25 | 30 |
| Largemouth bass | 20 | 30 | 38 | 51 | 63 |
| Smallmouth bass | 18 | 28 | 35 | 43 | 51 |
| Northern pike | 35 | 53 | 71 | 86 | 112 |
| Channel catfish | 28 | 41 | 61 | 71 | 91 |
| Black bullhead | 15 | 23 | 30 | 38 | 46 |
| Common carp | 28 | 41 | 53 | 66 | 84 |
| Bigmouth buffalo | 28 | 41 | 53 | 66 | 84 |
| Smallmouth buffalo | 28 | 41 | 53 | 66 | 84 |

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.