

# Lake Canadohta Crawford County

## 2017 Muskellunge Trap Net Survey



*Area 2 Fisheries Biologist Brian Ensign with a 45-inch pre-spawn female Lake Canadohta Muskellunge.*

Pennsylvania Fish and Boat Commission (PFBC) Fisheries Management staff from Areas 2 and 9 returned to Lake Canadohta in the spring of 2017 to continue evaluation of the Muskellunge population. The evaluation is part of a multi-year study to examine the effectiveness of stocking strategies (spring yearlings vs fall fingerlings) and to assess the effects of a regulation change (no closed season; 1 fish/day; 40 inch minimum size) adopted in 2007. This year marks the fourth year of that evaluation. Sample timing of the survey was spot on, occurring during the peak of spawning activity. Further details regarding objectives and preliminary results of these studies are referenced in the [2017 Updated Muskellunge Management Plan for Pennsylvania](#), whose purpose is to better manage Pennsylvania's waters for Muskellunge. Although our primary target was Muskellunge an inventory of the other gamefish and panfish species was also carried out during this survey.

Staff set twenty Pennsylvania style trap nets during the week of April 17, 2017. A total of 52 adult Muskellunge were captured (Table 1, Figure 1) in 468.13 hours of effort. That yielded a catch rate of 0.11 fish/hr. This catch rate far exceeded (by a factor of 10) the Musky Management Plan minimum benchmark of 0.01 fish/hr, a requirement for continued stocking. Additionally, the total number of fish captured and the calculated catch rate in 2017 were each the 2<sup>nd</sup> highest on record. All captured fish were enumerated, measured for total length, weighed and scanned for the presence of a Coded Wire Tag (CWT) and/or Passive Integrated Transponder (PIT) tag. Additionally, any new fish, not previously tagged, were injected with a PIT tag to further identify individuals recaptured in future years. PIT tags contain a unique 15-digit ID number, similar to a product bar code used in retail stores. Anglers will be unaware if a Muskellunge has been tagged because all tags are located underneath the skin and thus can be only detected using special equipment (CWT Wand Detector and PIT Tag Reader).

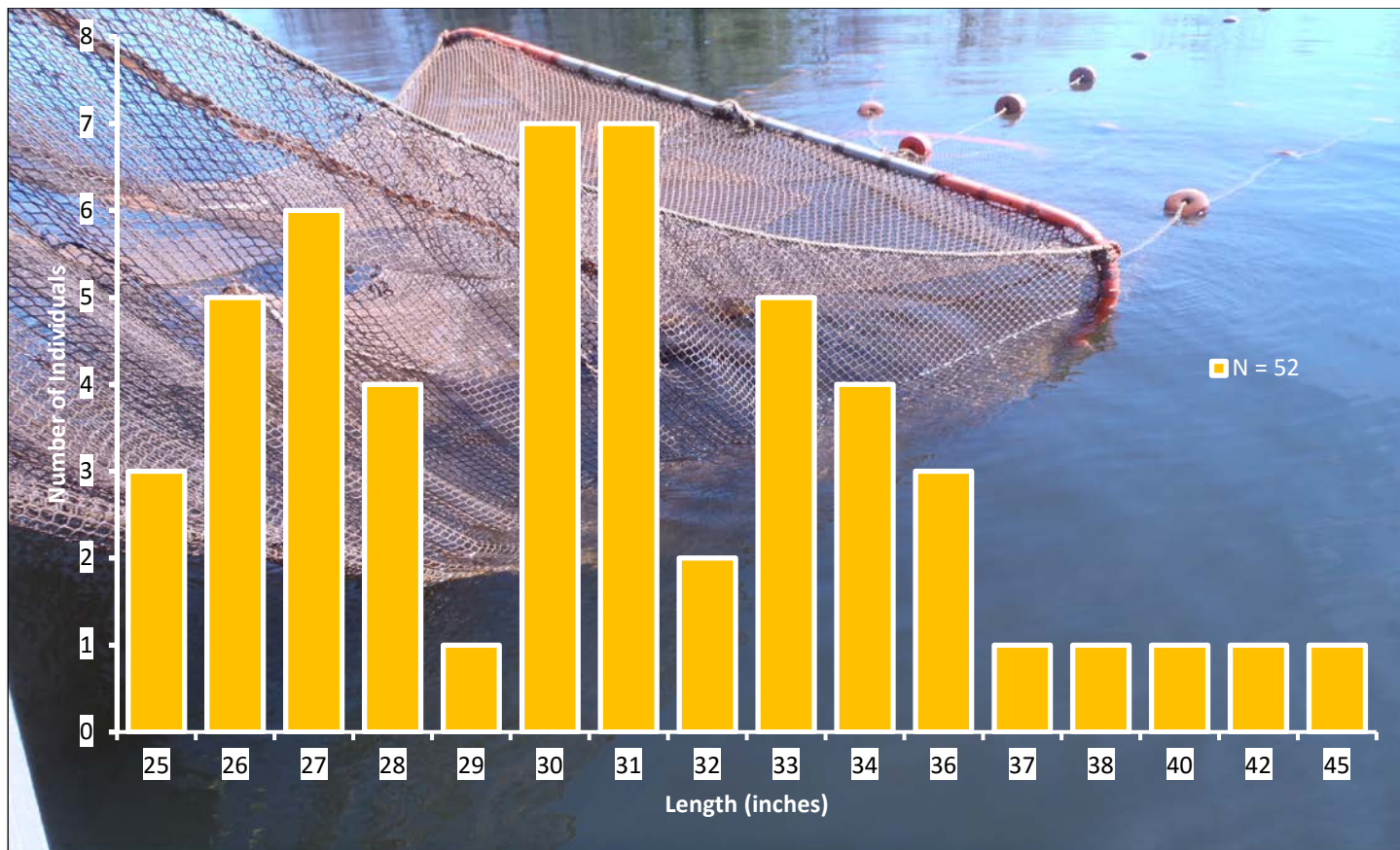


Figure 1. Length frequency distribution for Muskellunge captured in trap nets during the week of April 17<sup>th</sup>, 2017.

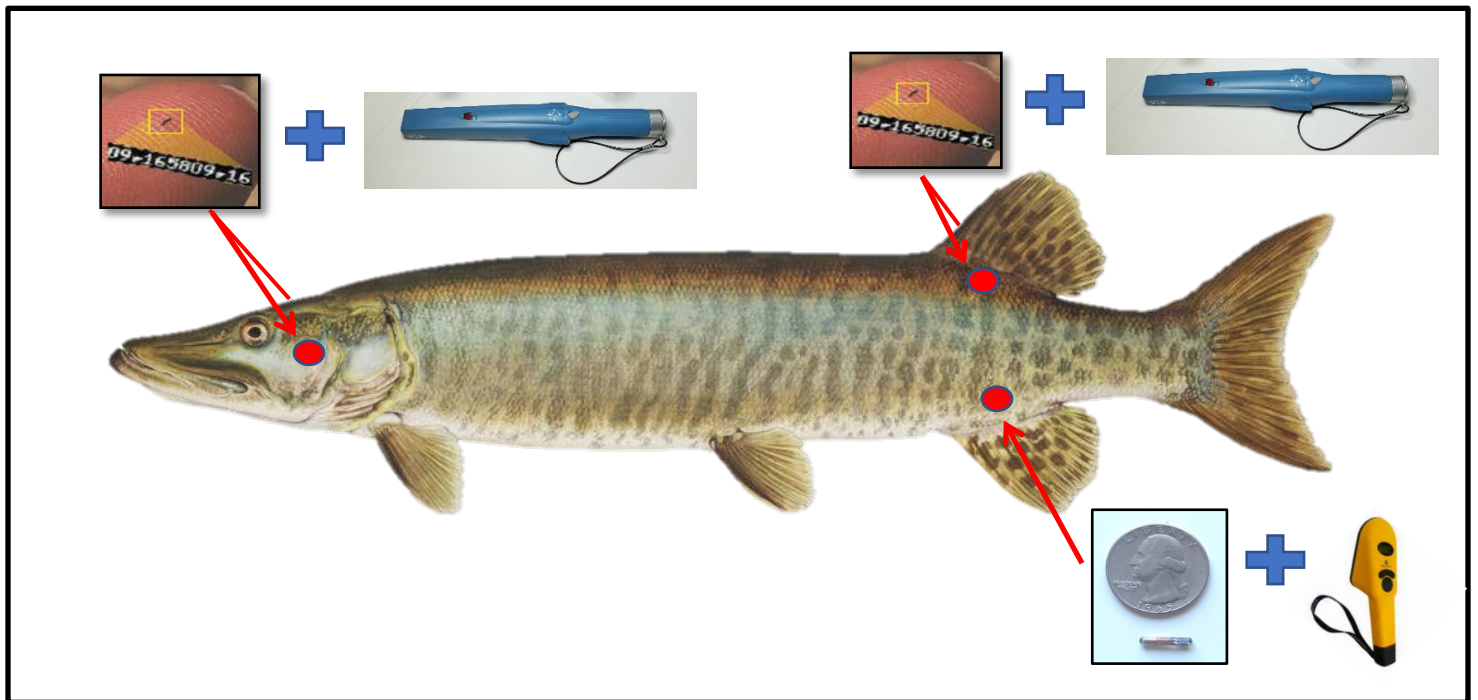
**Table 1. Lengths, weights, sex and tag presence of Muskellunge captured in trap nets at Lake Canadohta during the week of April 17<sup>th</sup>, 2017.**

| <b>Size (inches)</b> | <b>Weight (pounds)</b> | <b>Sex</b> | <b>CWT Recap</b> | <b>PIT Tag Recap</b> | <b>CWT Stocking Origin, PIT Tag Comments</b> |
|----------------------|------------------------|------------|------------------|----------------------|--|
| 24.5                 | 3.7                    | M          | X                |                      | Spring Yearling Stocking                     |
| 25.1                 | 3.8                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 25.2                 | 4.0                    | M          | X                |                      | Spring Yearling Stocking                     |
| 25.9                 | 4.5                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.0                 | 3.7                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.1                 | 3.3                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.1                 | 3.6                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.3                 | 4.3                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.5                 | 4.8                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.6                 | 4.5                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.7                 | 5.0                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 26.8                 | 4.2                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.8                 | 4.1                    | M          | X                |                      | Spring Yearling Stocking                     |
| 26.8                 | 4.4                    | M          | X                |                      | Spring Yearling Stocking                     |
| 27.4                 | 4.4                    | M          | X                |                      | Spring Yearling Stocking                     |
| 27.5                 | 5.5                    | M          | X                |                      | Spring Yearling Stocking                     |
| 27.7                 | 5.8                    | M          | X                |                      | Spring Yearling Stocking                     |
| 27.8                 | 4.7                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 28.3                 | 7.0                    | M          | X                |                      | Spring Yearling Stocking                     |
| 29.3                 | 5.5                    | M          | X                |                      | Spring Yearling Stocking                     |
| 29.5                 | 5.8                    | M          | X                |                      | Spring Yearling Stocking                     |
| 29.6                 | 6.8                    | M          | X                |                      | Spring Yearling Stocking                     |
| 29.6                 | 6.3                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 30.0                 | 6.3                    | M          | X                |                      | Spring Yearling Stocking                     |
| 30.0                 | 8.0                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 30.3                 | 8.0                    | F          | X                |                      | Spring Yearling Stocking                     |
| 30.5                 | 6.1                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 30.6                 | 7.3                    | F          | X                |                      | Spring Yearling Stocking                     |
| 30.8                 | 7.8                    | M          |                  |                      | No CWT                                       |
| 30.8                 | 7.8                    | F          | X                |                      | Spring Yearling Stocking                     |
| 31.0                 | 6.7                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 31.3                 | 8.8                    | F          | X                |                      | Fall Fingerling Stocking                     |
| 32.0                 | 8.8                    | M          | X                |                      | Fall Fingerling Stocking                     |
| 32.4                 | 7.9                    | F          | X                |                      | Fall Fingerling Stocking                     |
| 32.4                 | 9.5                    | F          | X                |                      | Spring Yearling Stocking                     |
| 32.6                 | 9.3                    | F          | X                |                      | Spring Yearling Stocking                     |
| 32.7                 | 8.5                    | F          | X                |                      | Spring Yearling Stocking                     |
| 32.8                 | 9.5                    | F          | X                |                      | Spring Yearling Stocking                     |
| 33.2                 | 9.3                    | F          | X                |                      | Fall Fingerling Stocking                     |

|              |             |          |          |          |   |
|--------------|-------------|----------|----------|----------|---|
| 33.9         | 10.0        | M        | X        |          | Fall Fingerling Stocking  |
| 33.9         | 9.8         | F        | X        |          | Fall Fingerling Stocking  |
| 33.9         | 9.8         | F        | X        |          | Spring Yearling Stocking  |
| 35.2         | 10.5        | F        |          |          | No CWT  |
| 35.9         | 12.5        | M        | X        |          | Spring Yearling Stocking  |
| 35.9         | 13.0        | F        |          |          | No CWT  |
| 36.3         | 11.5        | F        | X        |          | Fall Fingerling Stocking  |
| <b>*37.4</b> | <b>15.0</b> | <b>M</b> | <b>X</b> | <b>X</b> | <b>Spring yearling stocking, PIT Tag recap in 2016, initially tagged on 5/2/2015</b>  |
| 39.6         | 16.5        | F        | X        |          | Spring Yearling Stocking  |
| <b>*41.7</b> | <b>21.3</b> | <b>F</b> | <b>X</b> | <b>X</b> | <b>Spring yearling stocking, PIT Tag recap in 2016, initially tagged on 4/23/2013</b> |
| 44.5         | 24.5        | F        |          |          | No Tag CWT  |

Note: All CWT and untagged fish were injected with PIT tags  
 \*CWT & PIT recaptured adult

Of the 52 adults captured, 45 contained a CWT indicating they were study fish reared in a PFBC hatchery. Three of the 45 CWT fish also possessed a PIT tag, indicating they had been captured in assessment gear in a prior year. Two of the PIT tagged adults were previously captured in 2016. Of the 45 CWT tagged adults, 31 (63%) originated from spring yearling plantings and 14 (27%) originated from fall fingerling plantings. This equated to a catch ratio of three (3) spring yearling to one (1) fall fingerling, demonstrating that older and larger size fish stocked in the spring exhibit higher survival than smaller size fish stocked in the fall.



*Muskellunge Tag location and specialized CWT and PIT tagging equipment used to verify positive tag identification.*

In recent years annual stocking of both fall fingerling and spring yearling Muskellunge have maintained this Muskellunge population and stocking goals have been met or exceeded every year since 1985.

Historical abundance, size ranges and catch rates sampled by both Fisheries Management and Union City Hatchery are provided in Table 2. Beginning in 2018, as referenced in the 2017 Update to Pennsylvania's Muskellunge Management Plan, Lake Canadohta will now receive alternate year stocking of spring yearling based upon survival assessments derived from this study and similar results derived from other study waters. Anglers should be aware that Lake Canadohta is contained within the Muskellunge Brood Stock Lakes Program and is often utilized by hatchery staff to collect mature Muskellunge that are used to produce both purebred musky and tiger musky. Offspring derived from these broodfish are utilized, in part, to meet management stocking requirements statewide. Waters within the Brood Stock program require immediate release of all Muskellunge caught by anglers from April 1 through May 31.

**Table 2. Comparison of Muskellunge trap net catch rates by Fisheries Management staff & Union City Fish Hatchery personnel in Lake Canadohta since 1985.**

| Species | Year | Number Collected | Size Range (inches) | Catch per Trap Net Hour |
|---------|------|------------------|---------------------|-------------------------|
| *MKY    | 2017 | 52               | 24 – 45             | 0.111                   |
| **MKY   | 2016 | 27               | 23 - 46             | 0.055                   |
| ***MKY  | 2015 | 16               | 28 – 36             | 0.020                   |
| **MKY   | 2014 | 44               | 25 - 36             | 0.027                   |
| ***MKY  | 2013 | 59               | 24 - 40             | 0.035                   |
| **MKY   | 2012 | 43               | Not Measured        | 0.044                   |
| *MKY    | 2006 | 16               | 24 - 48             | 0.080                   |
| *MKY    | 1998 | 8                | 28 - 41             | 0.031                   |
| *MKY    | 1985 | 30               | 24 - 33             | 0.130                   |

\* Fisheries Management Trap Nets

\*\* Union City Fish Hatchery Trap Nets

\*\*\*Fisheries Management & Union City Fish Hatchery, Trap Nets Combined.

Twelve other species were captured during the targeted Muskellunge survey (Table 3); however, the timing and gear type were not ideal for abundance assessment of some species. Overall species diversity and relative abundances of fish represented in this sampling effort were comparable to the previous 2015 survey except for Walleye. Our catch of 52 Walleye in 2017 was above that of the 2015 survey with all fish being of legal size and ranging from 18 to 25 inches. It appears the Walleye populations is underutilized by angler given the number of larger adults that currently comprise the population. Good numbers of Bluegill were also captured but most were smaller than 7 inches. Yellow Perch continue to be present in abundance although most were fingerling size at 2 to 4 inches in length. Given their small size, Yellow Perch are more or less providing an additional forage base for other predators in the lake. Moderate numbers of Black Crappie, Pumpkinseed, and Rock Bass were also captured with few individuals of quality size. A summary of all fish other than Muskellunge collected during the survey is presented in the table below.

**Table 3. Abundance, size range, and CPUE of fish collected by trap nets in Lake Canadohta during the week of April 17<sup>th</sup>, 2017.**

| <b>Species</b>   | <b>Number Collected</b> | <b>Size Range (inches)</b> | <b>Comments</b>          |
|------------------|-------------------------|----------------------------|--------------------------|
| Walleye          | 52                      | 18 – 25                    | 100% ≥ 15 inches (MSL)   |
| Northern Pike    | 9                       | 21 – 33                    | 56% ≥ 24 inches (MSL)    |
| Bluegill         | 399                     | 1 - 7                      | Only two fish ≥ 7 inches |
| Black Crappie    | 81                      | 2 – 13                     | 78% ≥ 9 inches           |
| Pumpkinseed      | 27                      | 2 – 7                      | 15% ≥ 7 inches           |
| Rock Bass        | 20                      | 1 – 8                      | 40% ≥ 7 inches           |
| Yellow Perch     | 1,444                   | 2 – 14                     | 27% ≥ 7 inches           |
| Brown Bullhead   | 95                      | 3 – 16                     | 78% ≥ 12 inches          |
| Yellow Bullhead  | 14                      | 2 – 11                     | N/A                      |
| Flathead Catfish | 1                       | 40                         | N/A                      |
| Golden Shiner    | 333                     | 4 – 6                      | N/A                      |
| White Sucker     | 7                       | 7 - 18                     | N/A                      |
| <b>Total</b>     | <b>2,482</b>            |                            |                          |

\* MSL = Minimum size limit

The Northern Pike population continues to be sampled in moderate numbers during each successive survey. The lake is not stocked with pike. Unlike Muskellunge, Northern Pike in Lake Canadohta are sustained through natural reproduction. In total, nine Northern Pike were captured and ranged in size from 21 to 33 inches with 56% being of legal size.



*An average size Walleye from Lake Canadohta captured in our trapnets.*

One species that took us by complete surprise captured in our trap nets was an adult Flathead Catfish. Typically, flatheads are not found in Northwestern Pennsylvania lakes but rather in flowing water systems such as the Ohio River, Allegheny River and as far east as the Delaware River. The PFBC does not propagate nor stock Flathead Catfish in any waterway in the Northwest. The origin of this catfish, is not certain. It was likely introduced intentionally or unintentionally from another water source. Anglers should be aware that it is discouraged and potentially harmful to transport live fish and introduce those fish into water bodies that do not contain the fish species. [Transport and stocking of some fish species into Pennsylvania waterways is illegal](#). We are not sure what effect, if any, Flathead Catfish will have on the lake's ecosystem. Future assessments targeting Muskellunge should provide a better understanding of Flathead Catfish abundance and potential impact on the current fish population.

*- Prepared by Brian Ensign, Area 2 Fisheries Biologist*