

Marsh Creek Lake, Blue Marsh Lake, and Nockamixon Lake

Chester, Berks, and Bucks Counties

2016 Musky Surveys

The [Pennsylvania Fish and Boat Commission \(PFBC\)](#) evaluated the [tiger muskellunge](#) and [Muskellunge](#) populations in Marsh Creek Lake, Blue Marsh Lake, and Nockamixon Lake in late winter and early spring, 2016. The PFBC manages tiger muskellunge and Muskellunge populations in many lakes and rivers across the Commonwealth. In southeastern Pennsylvania lakes, these populations depend on hatchery stockings of fingerlings to provide quality recreational fisheries, as no lake reproduction of Muskellunge occurs in this portion of the state. The 2016 trap net survey at Marsh Creek Lake was conducted to evaluate the relative abundance and physical condition of the tiger muskellunge and pure Muskellunge populations. The 2016 trap net surveys at Blue Marsh Lake and Nockamixon Lake continue the multi-year studies begun in 2013 and 2012, respectively, that were part of a statewide study designed to evaluate the effectiveness of enhanced stocking rates and regulation changes (no closed season, 1 fish/day, 40 inch minimum size) on musky populations statewide. Please see the [PFBC's Musky Fisheries Management Plan](#) for more details.

Marsh Creek Lake

Marsh Creek Lake is a 535 acre reservoir located in [Marsh Creek State Park](#), Chester County. The park is managed by the [Pennsylvania Department of Conservation and Natural Resources \(DCNR\)](#) and is located four miles north of Downingtown.

Marsh Creek Lake supports tiger muskellunge and pure Muskellunge populations. The tiger muskellunge population has been maintained by fingerling stockings from the PFBC's hatchery system, which have occurred regularly since 1975. Yearlings were

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also stocked in 2007. In addition to the PFBC's stocking program, [Muskie's Inc., Penn Jersey Chapter 50 \(MI50\)](#), a cooperative nursery, raised and stocked advanced tiger muskellunge fingerlings in 2012 and 2013. The pure Muskellunge population in Marsh Creek Lake has been supported almost exclusively by the MI50 club, which has purchased and stocked advanced Muskellunge fingerlings periodically since 2006. The only pure Muskellunge stockings conducted by PFBC included fingerlings in 1999 and yearlings in 2009.

Seven Pennsylvania style trap nets were set in Marsh Creek Lake between March 8 and 10, 2016. The trap nets were set in water depths ranging from 6 to 12 feet and allowed to fish overnight for approximately 22 hours before being tended the following day. Captured fish were counted, measured, and released, and each net was then re-located to another sampling location to ensure that a random sample of suitable habitats was evaluated.

Marsh Creek Lake supports quality populations of tiger muskellunge and pure Muskellunge. A total of two tiger muskellunge, ranging from 36 to 38 inches in length and 11 to 14 pounds, and two pure Muskellunge, ranging from 41 to 42 inches in length and 17 to 18 pounds, were captured during the 2016 trap net survey. The combined catch rate for tiger muskellunge and pure Muskellunge was 0.024 fish/hr. This catch rate exceeded the PFBC's minimum statewide catch rate objective of 0.01 fish/hr established for Pennsylvania's reservoirs. All of the tiger muskellunge and pure Muskellunge captured were in good physical condition, indicating that the lake was not overpopulated with the species.

Marsh Creek Lake is managed as a multiple use fishery offering a variety of species for anglers to target. Many other fish species were captured during the 2016 trap net survey, such as Black Crappie, Bluegill, Largemouth Bass, White Crappie, and Yellow Perch (see Table 1).

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Table 1. Summary of fish species trap netted in Marsh Creek Lake between March 8 and 10, 2016.

| Fish Species | Number Captured | Size Range (inches) |
|---------------------|------------------------|----------------------------|
| Black Crappie | 362 | 5 - 11 |
| Bluegill | 520 | 2 - 9 |
| Green Sunfish | 1 | 5 - 6 |
| Largemouth Bass | 4 | 4 - 11 |
| Muskellunge | 2 | 41 - 42 |
| Sunfish Hybrid | 1 | 7 - 8 |
| Pumpkinseed | 8 | 5 - 7 |
| Tiger Muskellunge | 2 | 36 - 38 |
| White Crappie | 17 | 4 - 13 |
| White Perch | 4 | 7 - 15 |
| Yellow Perch | 338 | 3 - 12 |

Notes:

Trap nets are not an effective gear type for capturing or evaluating Largemouth Bass populations. Bass populations are evaluated by boat electrofishing. Please see the [2011 Biologist Report](#) for results of the Largemouth Bass electrofishing survey.

Bluegill, Black Crappie, and Yellow Perch were the most abundant panfish species captured. Most Bluegills (72%) were between six and eight inches in length with very few (1%) exceeding this size range. Crappies ranged from 5 to 13 inches in length, but only eight percent exceeded nine inches. Yellow Perch ranged from 3 to 12 inches in length, but only eleven percent exceeded nine inches. Unfortunately, angler-introduced White Perch were also present. As has occurred in other southeastern Pennsylvania lakes, angler introductions of this species have been temporarily or permanently damaging to segments of their fisheries. In an attempt to improve the quality of panfish populations, PFBC biologists will further evaluate 2016 panfish data along with past fisheries data and upcoming angler survey data to determine if [Panfish Enhancement Special Regulations](#) are warranted for selected fish species at Marsh Creek Lake. Few Largemouth Bass were captured, which was expected since it is well established that trap nets are not an effective gear type for capturing or monitoring bass populations. For

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information on the lake's bass population, please see the [2011 Marsh Creek Lake Biologist Report](#) for results of the Largemouth Bass nighttime electrofishing survey.

Marsh Creek Lake has plenty of access for shoreline anglers, two boat launch areas (only electric motor use is permitted), and boat rentals. Night angling is permitted; however, night launching is only allowed from the west shore boat ramp. Largemouth Bass and Smallmouth Bass are managed under the [Big Bass Program Special Regulations](#).

Blue Marsh Lake

Blue Marsh Lake is a 1,150 acre impoundment constructed by the [U.S. Army Corps of Engineers \(ACOE\)](#) on Tulpehocken Creek in western Berks County in 1979. The reservoir is located six miles northwest of Reading. As an ACOE impoundment, the primary function of the reservoir is flood control followed by water supply, water quality control, and recreation. The reservoir experiences a five foot draw down each fall and winter to provide flood protection to downstream areas.

The tiger muskellunge population in Blue Marsh Lake has been supported by fingerling stockings from the PFBC's hatchery system, which have occurred almost annually since 1979. Yearlings were also stocked in 2007 and 2010. Pure Muskellunge fingerlings were stocked by the PFBC throughout the 1990's, but had poor survival and, therefore, were discontinued.

Twenty Pennsylvania style trap nets were set in Blue Marsh Lake between March 16 and April 1, 2016. Trap nets were set in water depths ranging from 3 to 13 feet and allowed to fish overnight for approximately 22 hours before being tended the following day. In general, captured fish were counted, measured, and released, and each net was then re-located to another sampling location to ensure that a random sample of suitable habitats was evaluated, including areas in the main lake, Spring Creek Cove,

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Tulpehocken Creek Cove, and Licking Creek Cove (Mt. Pleasant). Captured tiger muskellunge were examined for past fin clips (removed fins), scanned for Passive Integrated Transponder (PIT) tags, measured for total length, and weighed. A fin clip and PIT tag were applied to all previously untagged fish. Scales were also collected and will be used in combination with sectioned fin rays for age and growth analysis.

Blue Marsh Lake supports a good tiger muskellunge population. Seven tiger muskellunge, ranging from 35 to 44 inches in length and 11 to 20 pounds, were captured during the 2016 trap net survey. Four of seven (57%) tiger muskellunge captured exceeded legal size (40 inches). The 2016 tiger muskellunge catch rate was 0.015 fish/hr and was comparable to the trap net catch rates observed between 2013 and 2015 which ranged from 0.01 to 0.02 fish/hr. The 2016 catch rate exceeded the PFBC's minimum statewide catch rate objective of 0.01 fish/hr established for Pennsylvania's reservoirs. Over the course of the four year study, March and April trap net catch rates of tiger muskellunge in the no wake zone have exceeded catches in the main lake.

The tiger muskellunge population in Blue Marsh Lake may improve in several years depending on survival and growth of the 2016 fingerling stocking and sizes of future fingerling stockings. In 2016, fingerlings stocked at Blue Marsh Lake averaged 9.8 inches in length, which was considerably larger than prior years due to exploratory efforts to raise larger fingerlings by the PFBC's hatchery system. For comparison, fingerlings stocked at Blue Marsh Lake in 2014 and 2015 averaged six to seven inches in length.

Stocking larger fingerlings has been shown to increase survival in other southeastern Pennsylvania lakes and lakes in other states, such as Wisconsin. Stocking larger fingerlings allows fisheries managers to reduce stocking rates and possibly provide fisheries where past stockings failed due to poor survival. For instance, instead of stocking Blue Marsh Lake with 5,750 fingerlings per year (5 fish/acre), the larger fingerlings may make it appropriate to stock only 575 fingerlings per year (0.5 fish/acre)

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or less depending on size of the fingerlings and subsequent survival rates, which may vary by waterbody. Ultimately the reduction in stocking rates has potential to improve efficiency, decrease costs, and enhance fishing. These concepts are currently being explored and will be considered in the revision of the PFBC's Musky Fisheries Management Plan as more fish population survey and hatchery production information becomes available.

Blue Marsh Lake is managed as a multiple use fishery offering a variety of species for anglers to target. In addition to tiger muskellunge, many other fish species were captured during the 2016 trap net survey, such as Black Crappie, Bluegill, Channel Catfish, Common Carp, Flathead Catfish, striped bass hybrids, Walleye, White Catfish, and White Crappie (see Table 2).

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Table 2. Summary of fish species trap netted in Blue Marsh Lake between March 16 and April 1, 2016.

| Fish Species | Number Captured | Size Range (inches) |
|---------------------|------------------------|----------------------------|
| Alewife | 5,430 | - |
| Black Crappie | 494 | 3 - 16 |
| Bluegill | 3,516 | 2 - 9 |
| Brown Bullhead | 2 | 10 - 12 |
| Brown Trout | 1 | 7 - 8 |
| Channel Catfish | 309 | 9 - 30 |
| Common Carp | 13 | - |
| Flathead Catfish | 6 | 28 - 48 |
| Golden Shiner | 2 | - |
| Green Sunfish | 4 | 3 - 6 |
| Sunfish Hybrid | 71 | 2 - 8 |
| Pumpkinseed | 62 | 3 - 7 |
| Striped Bass Hybrid | 8 | 4 - 20 |
| Tiger Muskellunge | 7 | 35 - 44 |
| Walleye | 141 | 16 - 30 |
| White Catfish | 10 | 13 - 18 |
| White Crappie | 12 | 10 - 15 |
| White Sucker | 30 | - |
| Yellow Bullhead | 6 | 8 - 12 |
| Yellow Perch | 7 | 4 - 14 |

Notes:

Trap nets are not an effective gear type for capturing or evaluating Largemouth Bass or Smallmouth Bass populations. Bass populations are evaluated by boat electrofishing.

Bluegill, Black Crappie, Channel Catfish, and Walleye were the most abundant sportfish species captured. Bluegills were the most numerous species captured, but most (71%) were between four and six inches in length with very few exceeding this size. Crappies ranged from 3 to 16 inches in length with fish over nine inches comprising 16% of the catch. Channel Catfish were the third most abundant species captured and ranged from 9 to 30 inches in length with fish over 20 inches comprising 42% of the catch. Walleye ranged from 16 to 30 inches in length with fish over 20 inches comprising 65% of the

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catch. For more information on Walleye in Blue Marsh Lake, please see the [2013 Blue Marsh Lake Biologist Report](#). No Largemouth Bass or Smallmouth Bass were captured, which was expected since it is well established that trap nets are not an effective gear type for capturing or monitoring bass populations.

Other notable sportfish species captured during the trap net survey included Flathead Catfish and striped bass hybrids. Flathead Catfish ranged from 28 to 48 inches in length. Large Flathead Catfish are not uncommon at Blue Marsh Lake. For instance, the current Pennsylvania state record was caught in the spillway of Blue Marsh Lake in 2006 and weighed just over 48 pounds. Striped bass hybrids ranged from 4 to 20 inches in length and continue to be stocked as fingerlings on an annual basis when available. While present, no pure Striped Bass were captured.

If you plan on fishing [Blue Marsh Lake](#), please be advised that Largemouth Bass and Smallmouth Bass are managed under the [Big Bass Program Special Regulations](#) and crappies are managed under the [Panfish Enhancement Special Regulations](#). In addition, the upper portion of the lake is a no wake zone, while the lower portion of the lake has no outboard motor horsepower restrictions. The lake has three boat launches, including the Dry Brooks and State Hill Boat Launches operated by the ACOE, and Sheidy Boat Launch (open 24 hours) operated by the PFBC. The Stilling Basin, which is the outlet of the lake, is also a popular fishing location (open 24 hours) with a universally accessible fishing platform. Blue Marsh Lake is managed by the ACOE, so please see their [website](#) for the full range of recreational activities offered at the lake.

Nockamixon Lake

Nockamixon Lake is a 1,450 acre reservoir located in [Nockamixon State Park](#), northern Bucks County. The park is managed by DCNR and is located five miles east of Quakertown and ten miles north of Doylestown.

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Please see the [2015 Nockamixon Lake Biologist Report](#) for the stocking history of tiger muskellunge and pure Muskellunge fingerlings in Nockamixon Lake by the PFBC and the MI50 club.

Twenty Pennsylvania style trap nets were set in Nockamixon Lake between April 6 and 21, 2016. Trap nets were set in water depths ranging from 4 to 12 feet and allowed to fish overnight for approximately 22 hours before being tended the following day. In general, captured fish were counted, measured, and released, and each net was then re-located to another sampling location to ensure that a random sample of suitable habitats were evaluated, including areas in the main lake, Threemile Run Cove, Tohickon Creek Cove, and Haycock Creek Cove. Captured tiger muskellunge and pure Muskellunge, were examined for past fin clips, scanned for PIT tags, measured for total length, and weighed. A fin clip and PIT tag were applied to all untagged fish. Scales were also collected and will be used in combination with sectioned fin rays for age and growth analysis.

A total of six tiger muskellunge, ranging from 35 to 39 inches in length and 11 to 15 pounds, were captured during the 2016 trap net survey (see Figure 1). The tiger muskellunge catch rate was 0.01 fish/hr or one fish for every four trap nets set. This catch rate was the lowest of the time series since the study began in 2012, but still met the PFBC's minimum statewide catch rate objective of 0.01 fish/hr established for Pennsylvania's reservoirs (see Figure 2).

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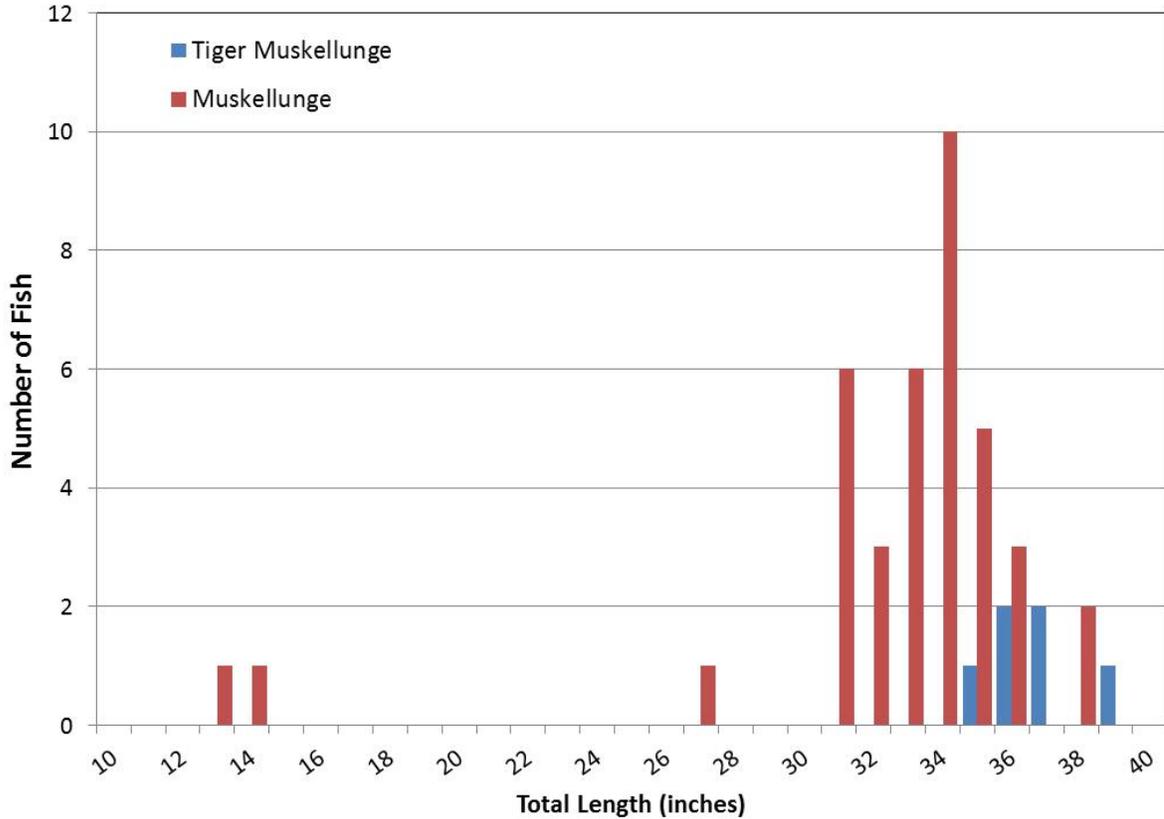


Figure 1. Length frequency distribution of tiger muskellunge and pure Muskellunge trap netted in Nockamixon Lake in April, 2016.

Tiger muskellunge have exhibited little potential to reach legal size (40 inches) in Nockamixon Lake. Two PIT tagged tiger muskellunge were recaptured in 2016, but neither fish exhibited much growth between capture events. Fish No. 982000359669279 was originally captured on April 18, 2013 at seven years old and 35.4 inches in length and was recaptured three years later on April 20, 2016 at ten years old and 36.7 inches in length. The average growth rate of this fish was only 0.4 inches per year. Fish No. 982000359669672 was originally captured on April 22, 2015 at seven years old and 35.8 inches in length and was recaptured at the same location on April 19, 2016 at eight years old and 36.1 inches in length. The growth rate of this fish was only 0.3 inches per year. A similar trend was noted during the 2015 trap net survey. Fish No. 982000359669271 was originally captured on April 19, 2013 at seven years old and 36.5 inches in length and was recaptured two years later on April 24, 2015 at nine years old

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and 37.6 inches in length. The growth rate of this fish was 0.6 inches per year. The older ages and slow growth rates of these fish indicate that few tiger muskellunge have potential to reach legal size in Nockamixon Lake. This finding has been supported by results of the Nockamixon Lake trap net surveys conducted annually from 2012 to 2016 in which only two percent of the tiger muskellunge captured exceeded legal size or 40 inches in length.

Nockamixon Lake supports a high-quality pure Muskellunge population. A total of 38 pure Muskellunge, ranging from 14 to 38 inches in length and 0.3 to 17 pounds, were captured during the 2016 trap net survey. The majority of fish were between 31 and 36 inches in length (see Figure 1). The smallest Muskellunge captured, which ranged from 13 to 14 inches, were likely from the 2015 MI50 club stocking. Males, females, and fish of unknown sex accounted for 74%, 13%, and 13% of the catch, respectively. Many of the Muskellunge captured were sexually mature males and females in spawning condition. Although some spawning may occur, it is unlikely that it would be successful or that natural reproduction could sustain a high-quality fishery in Nockamixon Lake. The pure Muskellunge catch rate was 0.08 fish/hr or eight fish for every four trap nets set (see Figure 2). This catch rate was lower than the 2015 catch rate of 0.18 fish/hr but exceeded the 2014 catch rate of 0.05 fish/hr and PFBC's minimum statewide catch rate objective of 0.01 fish/hr established for Pennsylvania's reservoirs. Based on the abundance and quality of the pure Muskellunge in Nockamixon Lake, PFBC's 2016 tiger muskellunge fingerling stocking and future tiger muskellunge stockings have been temporarily, if not permanently, discontinued at the lake while advanced pure Muskellunge fingerlings are available for stocking.

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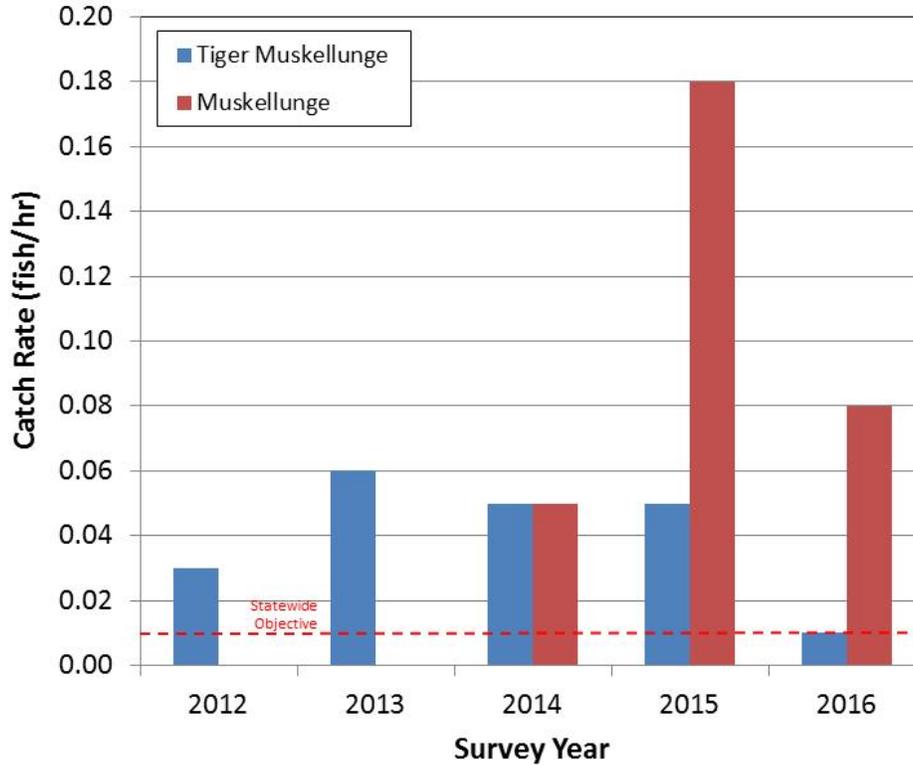


Figure 2. Tiger muskellunge and pure Muskellunge trap net catch rates in Nockamixon Lake from 2012 to 2016. Please note that pure Muskellunge advanced fingerlings were not stocked by the MI50 club until October, 2012 and did not begin recruiting to the trap net gear until 2014.

A total of ten PIT tagged pure Muskellunge were recaptured in 2016. Two of 22 fish tagged in 2014 and 8 of 80 fish tagged in 2015 were recaptured in 2016, yielding recapture rates of 9 and 10%, respectively. One additional fish from 2015 was recaptured but the PIT tag was missing. Some tag loss during tagging studies is not unusual occurrence. All recaptured Muskellunge were males and most were from the 2012 MI50 club stocking.

Growth rates in Muskellunge differ between sexes with males typically growing more slowly and generally being shorter-lived than females. Based on recaptured fish, males from the 2012 year class increased an average of 5.9 inches and 3.6 pounds from 2014 (age-2) to 2015 (age-3) and an average of 3.1 inches and 2.2 pounds from 2015 (age-3) to 2016 (age-4). Although no PIT tagged females have been recaptured thus far,

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differences in growth rates between males and females in Nockamixon Lake have become apparent with some females already approaching legal size at age-4. For comparison, Muskellunge in Pennsylvania typically do not reach legal size or 40 inches until age-8 on average.

Site fidelity, or the homing to specific areas of the lake in spring, has been exhibited by multiple fish. Since the PIT tagging component of the study began in 2013, one tiger muskellunge and two pure Muskellunge have been recaptured at the same sampling location that they were originally captured at the year before. In addition, several other fish have been recaptured at neighboring locations to where they were originally captured the year before.

Nockamixon Lake is managed as a multiple use fishery offering a variety of species for anglers to target. Many other fish species were captured during the 2016 trap net survey, such as Black Crappie, Bluegill, Brown Bullhead, Chain Pickerel, Channel Catfish, Common Carp, Largemouth Bass, Smallmouth Bass, striped bass hybrids, Walleye, White Catfish, White Crappie, White Perch, Yellow Bullhead, and Yellow Perch (see Table 3).

Bluegills were the most abundant species captured but were nearly all less than eight inches in length with most (71%) being between four and six inches in length. Crappies ranged from 3 to 18 inches in length with fish over nine inches comprising nearly 28% of the catch. The largest Black Crappie captured was 18 inches in length, while the largest White Crappie was 14 inches in length. Few Largemouth Bass and Smallmouth Bass were captured, which was expected since it is well established that trap nets are not an effective gear type for capturing or monitoring bass populations.

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Nockamixon Lake supports good catfish populations. A total of 69 Channel Catfish, 119 White Catfish, and 95 bullheads were captured during the trap net survey. Channel Catfish ranged from 12 to 32 inches in length with fish over 20 inches comprising 64% of the catch. White Catfish ranged from 9 to 18 inches in length with most being between 11 and 16 inches. Bullheads ranged from 6 to 14 inches in length with most being between 10 and 13 inches.

In addition to musky and catfish, Nockamixon Lake supports quality populations of other large sportfish as well, such as Striped Bass and their hybrids, Walleye, and Chain Pickerel. Several striped bass hybrids, ranging from 25 to 27 inches in length, were captured during the 2016 survey. PFBC discontinued the stocking of striped bass hybrid fingerlings at Nockamixon Lake in 2009 in favor of pure Striped Bass fingerlings, which continue to be stocked annually when available. However, some unallocated or “extra” hybrid fingerlings were stocked in 2016 which should continue the fishery. A total of 34 Walleyes, ranging from 21 to 29 inches in length, and 3 Chain Pickerel, ranging from 23 to 26 inches in length, were also captured during the survey.

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Table 3. Summary of fish species trap netted in Nockamixon Lake between April 6 and 21, 2016.

| Fish Species | Number Captured | Size Range (inches) |
|---------------------|------------------------|----------------------------|
| Alewife | 419 | - |
| American Eel | 3 | - |
| Black Crappie | 77 | 3 - 18 |
| Bluegill | 1,637 | 1 - 9 |
| Brown Bullhead | 68 | 6 - 14 |
| Chain Pickerel | 3 | 23 - 26 |
| Channel Catfish | 69 | 12 - 32 |
| Common Carp | 25 | - |
| Gizzard Shad | 370 | - |
| Golden Shiner | 7 | - |
| Largemouth Bass | 2 | 10 - 16 |
| Muskellunge | 38 | 14 - 39 |
| Pumpkinseed | 2 | 3 - 6 |
| Smallmouth Bass | 1 | 20 - 21 |
| Striped Bass Hybrid | 3 | 25 - 27 |
| Tiger Muskellunge | 6 | 35 - 39 |
| Walleye | 34 | 21 - 29 |
| White Catfish | 119 | 9 - 18 |
| White Crappie | 42 | 3 - 14 |
| White Perch | 21 | 7 - 14 |
| White Sucker | 6 | - |
| Yellow Bullhead | 27 | 7 - 13 |
| Yellow Perch | 30 | 4 - 10 |

Note: Trap nets are not an effective gear type for capturing or evaluating Largemouth Bass or Smallmouth Bass populations. Bass populations are evaluated by boat electrofishing.

If you plan on fishing Nockamixon Lake, be advised that the lake has a 20 horsepower outboard motor restriction and Largemouth Bass and Smallmouth Bass are managed under the [Big Bass Program Special Regulations](#). The lake has four boat launch areas, a public fishing pier, and boat rentals.

Greg Murphy
Fisheries Biologist
Area 6 - Southeastern Pennsylvania