

Pennsylvania Fish & Boat Commission Biologist Report

Beltzville Lake

Carbon County

2013 Fish Population Survey

Beltzville Lake is a 973 acre US Army Corps of Engineers (ACOE) reservoir located five miles east of Lehighton, just off of US Route 209 and contained within Beltzville State Park. From the Northeast Extension of the Pennsylvania Turnpike, take Exit 74 and follow the signs to Beltzville State Park.

The reservoir's construction on Pohopoco Creek began in 1962 and the impoundment was filled in 1972. Since then the Pennsylvania Fish and Boat Commission (PFBC) has managed the reservoir's fishery under statewide inland water regulations while stocking a variety of sportfish (e.g., Brown Trout, Walleye, Striped Bass, Channel Catfish, and Muskellunge (pure and tiger) to enhance angling opportunities. The cold water release reservoir outlet also supports an exceptional year-round mixed wild and stocked Trout fishery in Pohopoco Creek below the dam downstream to the private club boundary marked by a cable crossing the stream approximately 1 mile downstream from the SR 0209 bridge.

Biologists used a variety of techniques to sample fish populations in the Reservoir in spring and fall 2013. Fish collection included use of trap nets, gill nets, hoop nets, and night electrofishing totaling 2,770 hours of combined sampling effort. The purpose of the surveys were to reassess natural and hatchery supported sportfish for fisheries management purposes aimed at improving populations for anglers. General Reservoir survey results are presented to provide an update on sportfish abundance and sizes present. Table one lists the twenty-nine different species collected, number caught, and lengths recorded during the survey. Additional insights on selected sportfish abundance and population structure are illustrated through length frequency distributions showing the number of fish captured in one inch length intervals (Figures 1 through 8).

Table 1. Species captured, number caught, and size ranges for fish collected during the 2013 Beltzville Lake survey.

Species	Number caught	Length Range (Inches)	Comments
Game Species			
American eel	1	37	Migratory
Largemouth Bass	380	1-21	62% > 12"
Smallmouth Bass	113	2-18	56% > 12"
Striped Bass	36	17-27	53% > 20"
Brown Trout - hatchery	6	6-21	
Common Carp	6	22-34	
Panfish			
Black Crappie	8	8-13	
Bullhead - Brown	66	9-18	
Yellow	34	8-14	
Bluegill	1,421	2-9	9% > 7"
Channel Catfish	24	13-32	
Green Sunfish	133	1-6	
Yellow Perch	467	4-15	5% > 9"
White Perch	205	4-14	47% > 9"
Pumpkinseed	382	1-9	29% > 7"
Redbreast Sunfish	151	2-9	3% > 7"
Rock Bass	209	2-11	28% > 8"
Sunfish hybrid	2	6-7	
White Sucker	34	9-23	
Pikes			
Chain pickerel	233	1-25	46% > 18"
Muskellunge - Pure	1	14	
Tiger	3	35-42	
Walleye	124	4-26	99% > 15"
Forage Species			
Alewife	1,759	3-5	
Banded Killifish	5	2-4	
Bluespotted Sunfish	6	1-3*	*adult size
Satinfin Shiner	3	2-3	
Spotfin Shiner	3	2-3	
Spottail Shiner	1	4	

Largemouth Bass and Smallmouth Bass populations continue to provide sustainable angling opportunities supported through natural reproduction. Sixty and 23 percent of the total Bass catch was ≥ 12 and ≥ 15 inches in total length, respectively. The largest fish collected were three Largemouth Bass exceeding 20 inches and five pounds. The abundance of Largemouth Bass in the 12 through 14 inch range is encouraging for the 2014 Bass season as fish from this strong year class persist in the population (Figure 1). The gradual reduction in the number of Largemouth Bass > 13 inches and Smallmouth Bass > 14 inches shown in the frequency distribution suggests low angler exploitation under the statewide 12-inch minimum size limit. Shoreline tree cutting projects, especially in the Pohopoco Creek Arm, have provided some much needed fish cover while stabilizing banks (i.e. mitigating wave action). Night electrofishing during late spring and fall found more quality size Largemouth Bass, Sunfish species, and other species occupying sunken tree habitats than along shorelines without such added cover. Largemouth Bass (N=380) outnumbered Smallmouth Bass (N=113) in 2013 by more than 3:1 indicating a major shift in the Black Bass community. In 2001 Smallmouth Bass were the dominate Black Bass species as noted by the 5:1 catch ratio (N=119:N=23), and were the most abundant Black Bass species in prior surveys as well.

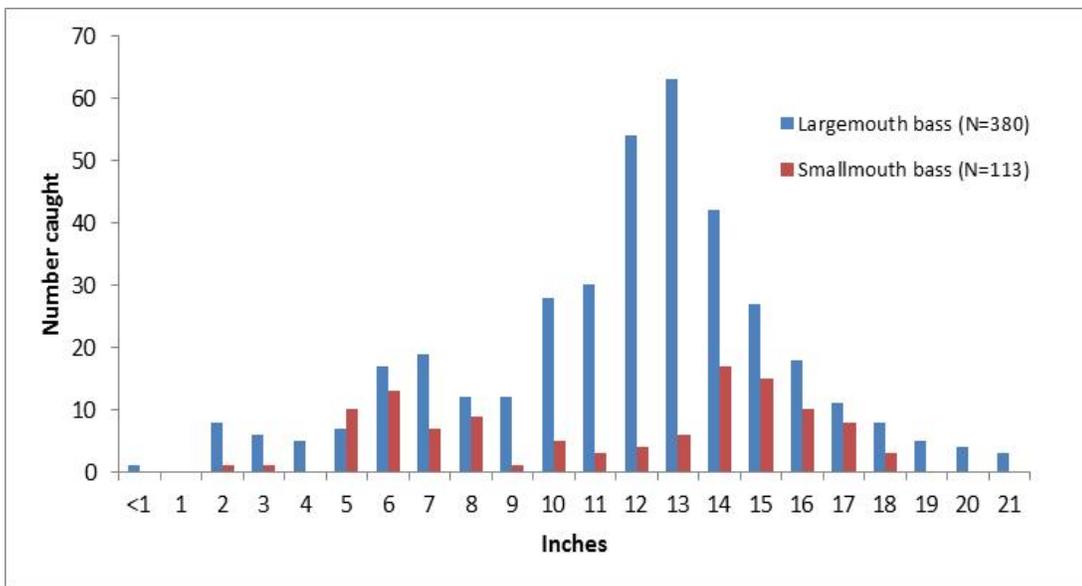


Figure 1. Length frequency distributions of Largemouth Bass and Smallmouth Bass.



ACOE Biologist Greg Wacik with two 20-inch Largemouth Bass captured during night electrofishing.



PFBC Lake Habitat Manager, Keith Beamer holding two 18-inch Smallmouth Bass captured during trap netting.

Annual fingerling Walleye stockings continue to produce a worthwhile density of legal length fish. Nearly all (99%) collected Walleye measured ≥ 15 inches in total length (Figure 2). The longest Walleye captured was 26 inches in length, and the heaviest weighed over six pounds. The low catch rate of juvenile Walleye may reflect seasonal effects on sampling increasing selectivity for larger fish, differences in habitat preferences, and yearly variations in stocked juvenile survival and recruitment, especially when considering the scarcity of favorable near shore cover to protect fingerlings from larger predators.

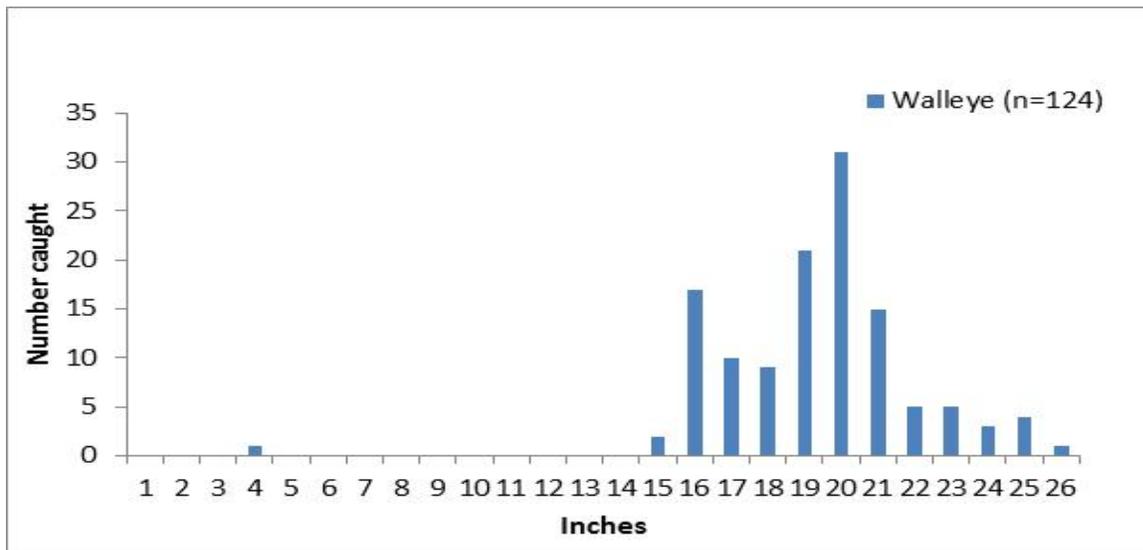


Figure 2. Length frequency distribution of Walleye.



George Vernoski (Fisheries Biologist Aide) and David Arnold (Area Fisheries Manager) holding four Walleye in the 20 inch length range.

Annual fingerling Striped Bass stockings continue to maintain a popular and targeted "Striper" fishery. Fifty-three percent (n=19) of the catch was greater than the legal length of 20 inches (Figure 3). Like Walleye, the absence of smaller Striped Bass may: (1) reflect seasonal sampling effects favoring capture of larger fish, which have different thermal habitat preferences compared to smaller Stripers, and (2) yearly variations in stocked juvenile density, survival, and or recruitment. Angler exploitation of legal length Striped Bass, variable forage abundance (e.g. alewife), and habitat are factors that also influence the quality of the fingerling supported fishery.

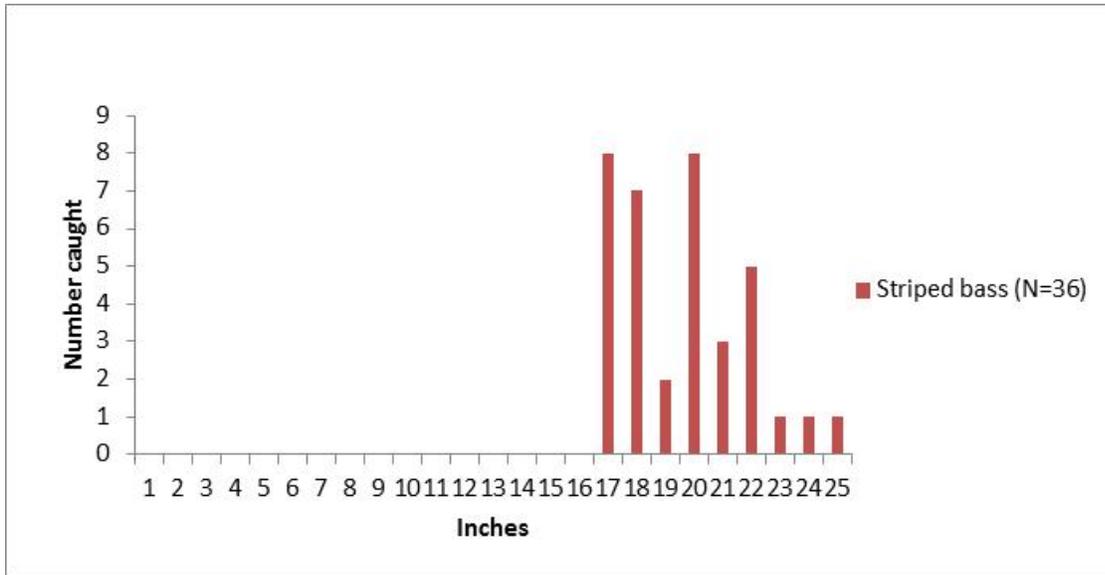


Figure 3. Length frequency distributions for Striped Bass.



Two angler limits of legal length Striped Bass.

A White Perch population has become established in Beltzville Lake and currently offers Panfish anglers with a worthwhile alternative to the lake's modest Sunfish (i.e., Bluegill, Pumpkinseed, Redbreast Sunfish, and Green Sunfish) and Yellow Perch fisheries. Forty-seven percent and 12% of White Perch were ≥ 9 and ≥ 12 inches in total length, respectively (Figure 4). In comparison, only five and two percent of Yellow Perch were ≥ 9 and ≥ 12 inches. For Sunfish, 12% of the combined catch was ≥ 7 inches (Figure 5). In addition, Rock Bass offer fair angling opportunities with 28% of the catch ≥ 8 inches (Figure 6).

Anglers are encouraged to harvest White Perch, although native to the drainage they tend to overpopulate man-made reservoirs and predominate, often at the expense of other equally desirable gamefish species. An added benefit of harvest is that White Perch are also a popular sportfish, sought after for their sweet delicious taste. Anglers interested in fishing for White Perch are directed to Pohopoco Creek Arm beyond the first major bend or other shallower coves during the spring spawning period when water temperatures are between 50°F and 60°F.

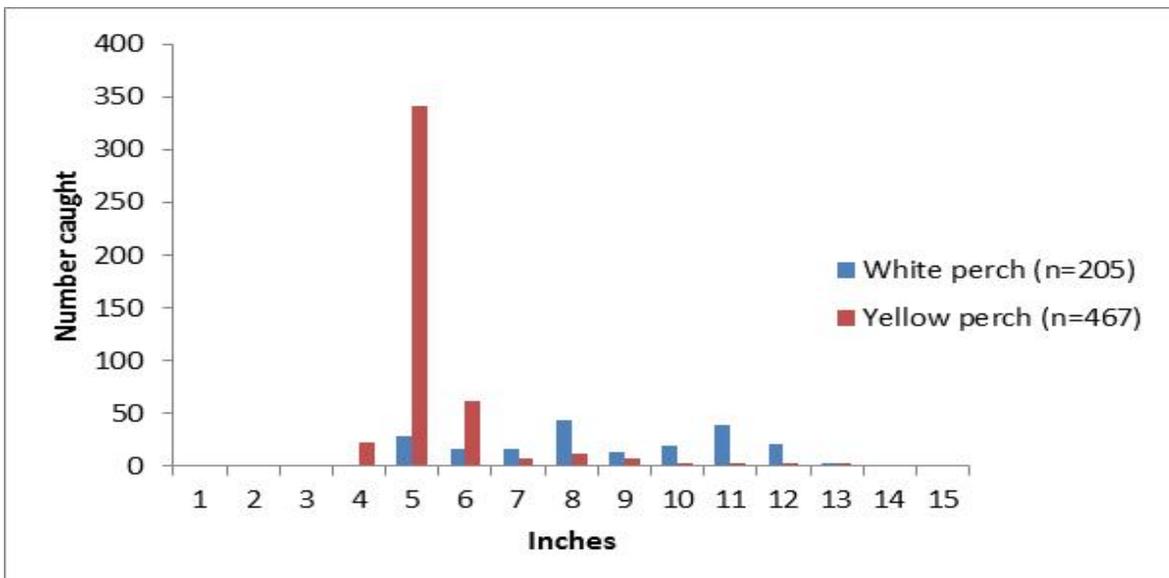


Figure 4. Length frequency distributions for White Perch and Yellow Perch.



Three White Perch exceeding 10 inches in length.

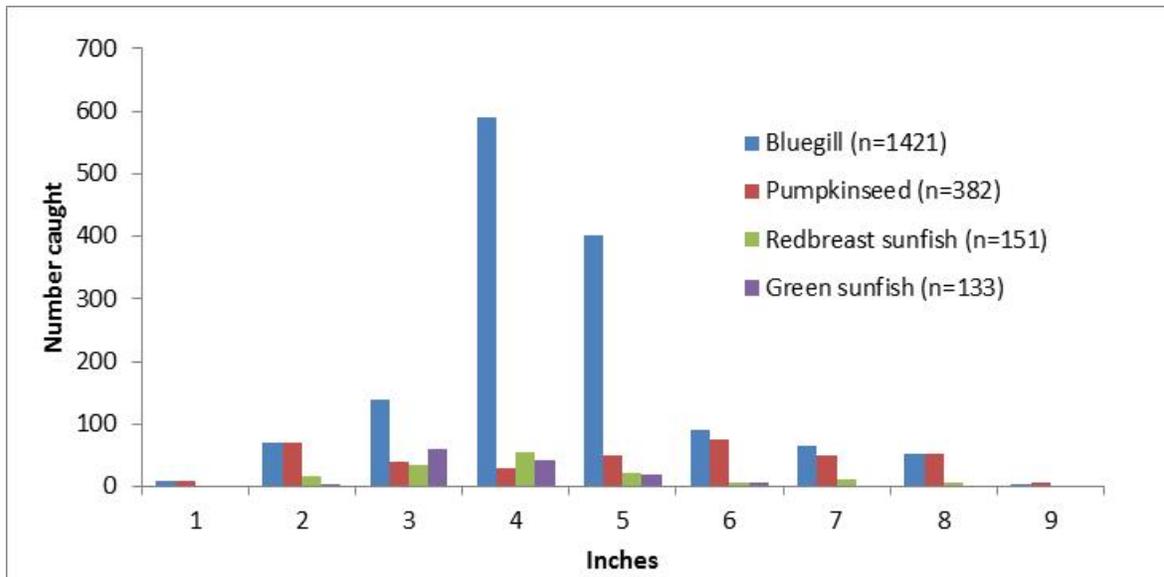


Figure 5. Length frequency distributions for Bluegill, Pumpkinseed, Redbreast Sunfish and Green Sunfish.

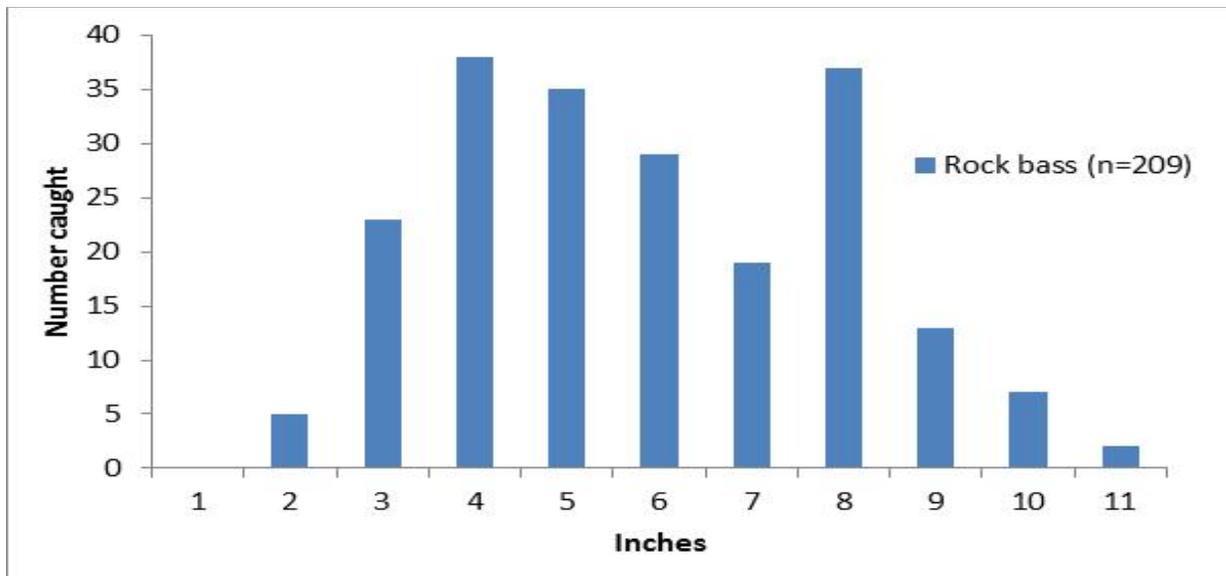


Figure 6. Length frequency distribution for Rock Bass.

Chain Pickerel continue to maintain their abundance in Beltzville Lake with nearly half (46%) of the catch being ≥ 18 inches in total length or legal size (Figure 7). The length frequency distribution of the catch shows an uninterrupted range of sizes present, which indicates consistent annual production. We surmise that the "skinny" appearance of many individuals may be due to sparse near shore habitats yielding sparse forage organisms which may both reduce fish condition and limit abundance. The reservoir is characteristically steep sided with limited shallow water habitat preferred by Chain Pickerel. Although Chain Pickerel are often considered an unintended catch by anglers targeting other species, they are exciting to catch because of their aggressive nature when hooked. They are also a species that is very active through winter under the ice and provide enjoyment and excitement when caught by ice anglers targeting them.

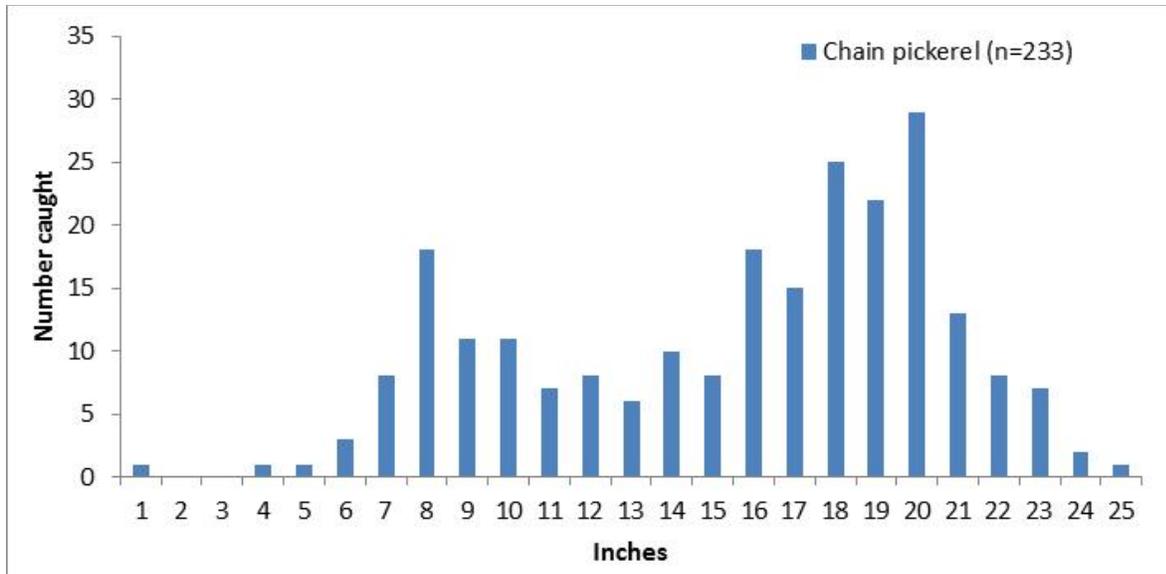


Figure 7. Length frequency distribution for Chain Pickerel.

Three Tiger Muskellunge measuring 36, 38, and 42 inches in total length and one 14-inch "pure" Muskellunge were collected during the 2013 survey. The low number of Muskellunge collected is consistent with past survey results and their typical low detectability during sampling. Survival and recruitment of stocked fingerlings to legal length (≥ 40 inches) is considered extremely low, those that survive offer anglers with the prospects of a true trophy catch.



Area Fisheries Manager Dave Arnold cradling a 42 inch Tiger Muskellunge.

Fingerling Channel Catfish stockings on a near annual basis have been largely unsuccessful in building a dense population and targeted fishery. The catch of 24 individuals ranging from 13 to 32 inches in length was disappointing, despite 79% (n=19) of the catch being \geq 18 inches in total length (Figure 8). Catch rates for Channel Catfish failed to achieve minimum program guideline catch rates for management through fingerling stocking. Not meeting guidelines required that we terminate fingerling stocking in 2013. This insures cost effective use of limited PFBC produced hatchery Channel Catfish. At the same time, however, the fingerling stocking program was somewhat successful in that it created a low density population of mature Channel Catfish. Such an outcome was a necessary precursor in our next attempt to boost natural production of young Channel Catfish at Beltzville Lake. We collaborated with our Habitat Division to deploy spawning box habitat devices to investigate their value in improving spawning and recruitment without additional stocking. The PFBC's Lake Habitat Section placed numerous Catfish spawning boxes in the lake to provide cavity habitats to encourage Channel Catfish spawning and provide nursery areas for catfish fry. Natural cavity spawning habitats are typically lacking in reservoirs like Beltzville (e.g., flood control) due to clearing of nearly all vegetation and landscape structures during construction. Our follow-up evaluation of spawning box effectiveness is to coincide with no Channel Catfish stockings from 2013 through 2017, at which time the population will be re-sampled to detect the presence and abundance of Channel Catfish hatched during the five years of discontinue Channel Catfish stockings.

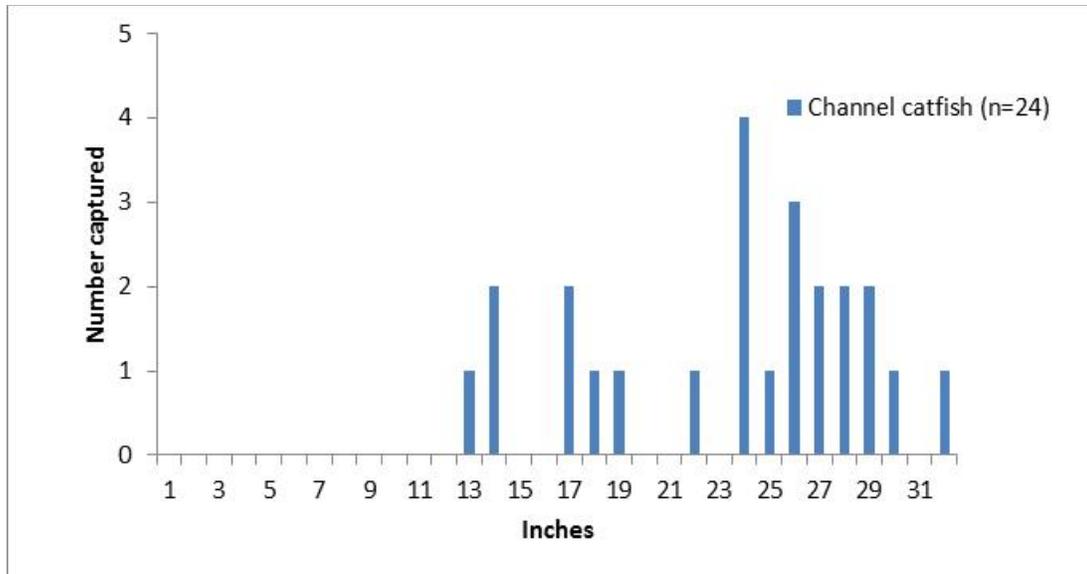


Figure 8. Length frequency distribution for Channel Catfish.

Six hatchery Brown Trout were collected during the 2013 survey, despite annual plants of 40,000 fingerlings. The low catch in 2013 consisted of two adults (19 and 21 inches) and four juveniles (6 inches). In addition, staff received little assurance from anglers solicited during the 2013 survey on the existence of a targeted Trout fishery. Also, heavy predation of recently stocked fingerling brown Trout by other species, namely Striped Bass, is a commonly reported occurrence soon after their being stocked. The consistent low assessment catch of brown Trout in 2013 and prior surveys, along with low angler interest, and noted high predation rates at time of stocking suggest that the annual stockings of fingerling Brown Trout should be terminated.

Furthermore, Brown Trout are likely subject to variable "habitat squeezes" during summer and early fall when lake stratification reduces the amount and quality of their preferred coldwater habitat (Figure 9). Generally when lake surface temperature rises above 68°F Trout seek refuge in colder water at deeper depths having dissolved oxygen concentrations > 5mg/l. U.S. Army Corps of Engineer (USACE) water quality monitoring (Figure 9) has shown oxygen depletion during summer in profiles off the dam's tower or deepest area of the reservoir. The onset and duration of stressful conditions for Trout during late summer and early fall suggests that the reservoir's capacity to consistently support stable coldwater habitat may be marginal from year to year.



Keith Beamer holding a 21-inch Brown Trout

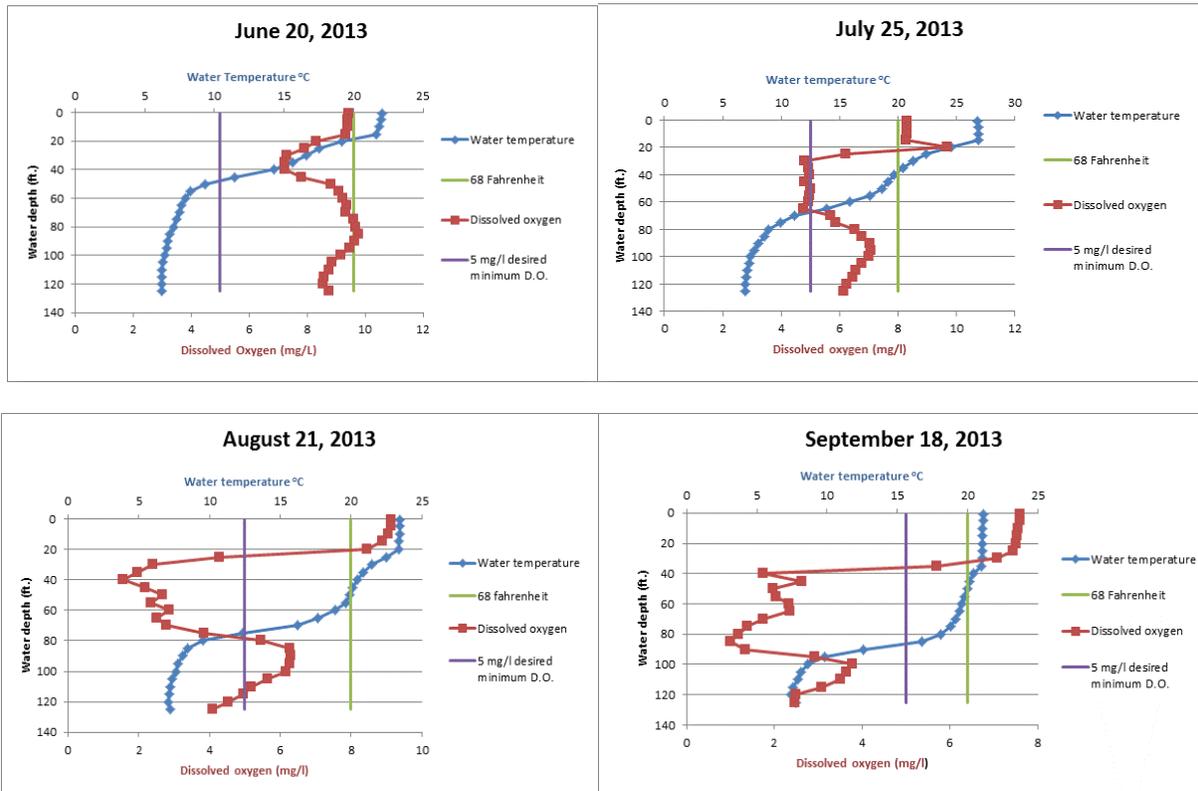


Figure 9. Vertical profiles of water temperature and dissolved oxygen near Beltzville Dam's tower during summer 2013.

Fisheries Management Area 5 (Bushkill)