



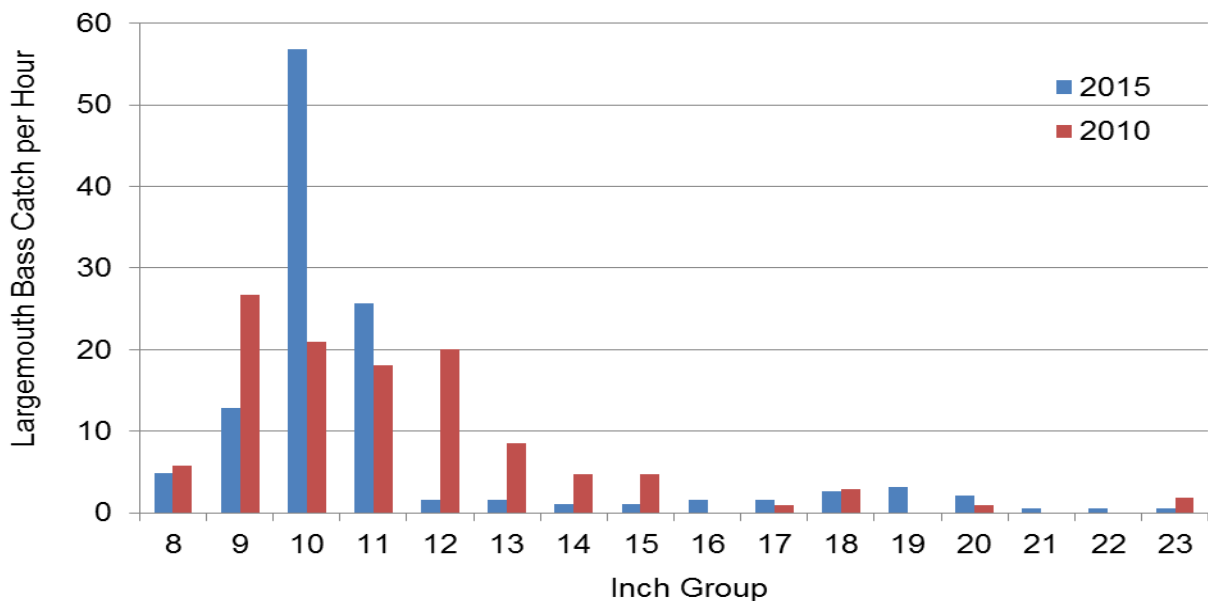
## Mill Creek Reservoir (Amherst County) 2016 Management Report



Mill Creek Reservoir is a 189-acre impoundment located in the Blue Ridge Mountains of Amherst County. This is the largest of the three public reservoirs owned by the County and provides opportunities for fishing and family outings. Various facilities include picnic tables and grills, portable toilets, play area, boat ramp, and associated parking. The lake is open year round but nighttime activities are prohibited except for fishing. Anglers are required to obtain a permit from the county to fish at night. Boats propelled by oar or electric motors are welcome but outboard motor use is prohibited.

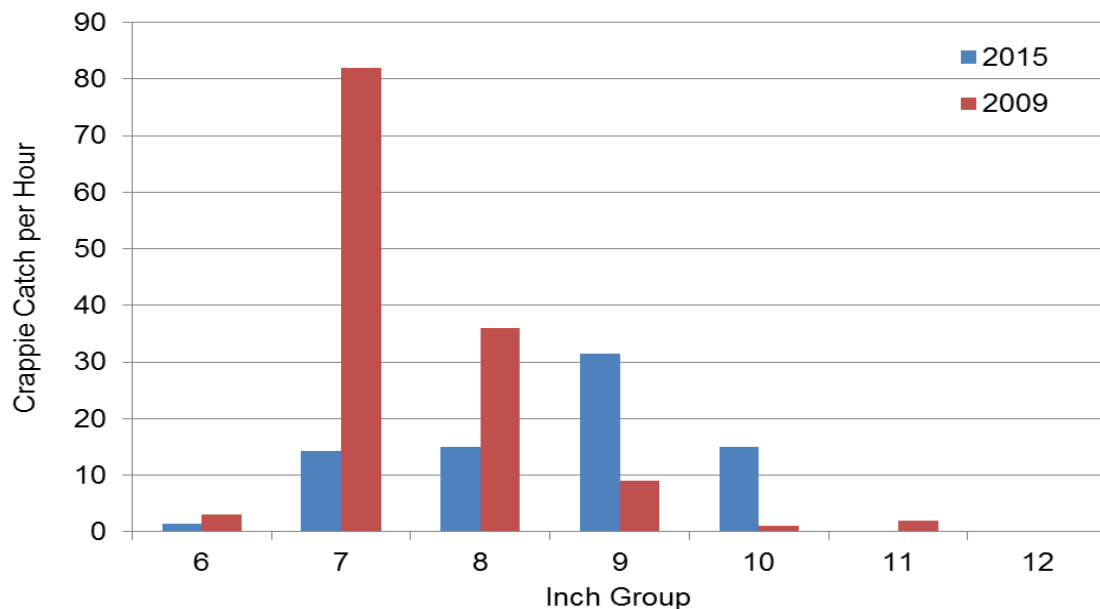
The reservoir was impounded in 1985 and was stocked with largemouth bass, bluegill, redear sunfish, and channel catfish. This reservoir had a very stable largemouth bass population with good numbers of small and large fish. However in 2010, hydrilla (exotic aquatic plant) became established which eventually resulted in an unbalanced bass population by 2014. The density of young bass increased, due to hydrilla infestations, to a level that growth of these fish slowed dramatically. Growth, for five year old bass, dropped from an average of 14.2 inches in 2009 to 11.4 inches in 2015.

Largemouth bass up to 23 inches were still collected during DGIF sampling in 2015 but the number of larger bass will continue to decline if growth rates are not improved. Efforts are underway to reduce the number of smaller bass and improve growth.



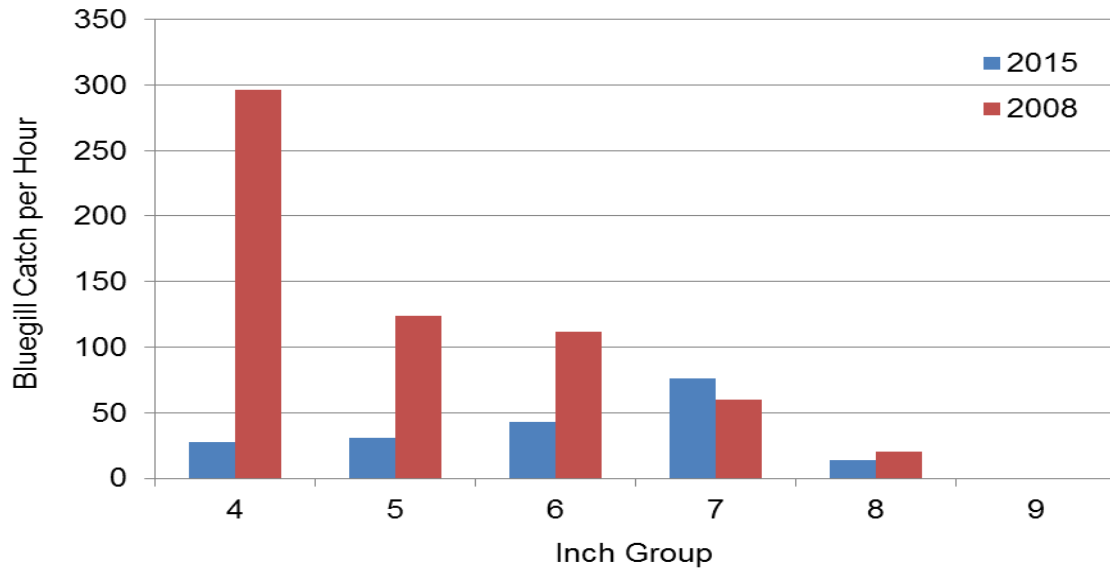
**Figure 1. Largemouth bass collected during the 2010 and 2015 Mill Creek Reservoir electrofishing surveys.**

Although crappie were not officially stocked into Mill Creek Reservoir, they have become established and do provide fishing opportunities. Crappie are one of the most prone species for experiencing erratic spawning success, which often causes major population fluctuations. Crappie routinely have good and bad spawning years. The crappie population at Mill Creek Lake is no exception. Older fish dominate the current fishery. This pattern is typical in small lakes and is expected to continue. The unfortunate side to good and bad reproductive years is that anglers can expect to have good crappie fishing some years and bad in other years. Size limits and creel restrictions used by managers to control fish populations can not make up for years with poor reproduction. However, a new 9 inch minimum size limit on crappie was initiated in 2013 to increase the average size since most crappie have been harvested before they reach age 4 or 9 inches. In addition, the size limit will extend good year classes for anglers an extra 1-2 years and make modest improvements in the sizes of crappie harvested. Most crappie at this reservoir usually do not exceed 10 inches.



**Figure 2. Crappie collected during the 2015 and 2009 electrofishing surveys.**

The sunfish population is comprised of primarily bluegill but redear sunfish are also present. The high reproductive capability of sunfish has offset angler harvest effects on population size but the heavy fishing pressure can reduce the number of large sunfish. Bluegill size structure has recently increased due to the overabundant bass population. Additional bass predation on small sunfish improves growth and sizes of sunfish due to reduced competition. Mill Creek Reservoir provides good sunfish fishing with high numbers of 7 inch fish and a limited number of 8 inchers for those panfish enthusiasts.



**Figure 2. Bluegill collected during the 2015 and 2008 electrofishing surveys.**

Channel catfish are stocked every two years and provide a limited catfish fishery. Yellow perch were first observed by DGIF in 2008 but are in low abundance and are not making much of a contribution to the lake’s overall fishery.

The reservoir can be accessed by taking route 60 to Lowesville Road (Rt. 718), turn right onto route 610, and bear left at the first intersection. Permits for night fishing are available through Amherst County at 434-946-9371.

## Methods

- Three runs totaling 0.77 hours of daytime, boat electrofishing were completed on 4/18/14 for largemouth bass, crappie, catfish, and yellow perch assessment. Water temperature was 15° C.
- Five runs totaling 1.82 hours of daytime, boat electrofishing were completed on 4/20/15 for largemouth bass population dynamics information and 4 runs (1.33 hrs) for community assessment. Four hundred forty five bass < 320 mm were removed from the lake. Water temperature was 19° C.
- Four runs totaling 1.86 hours of daytime, boat electrofishing were completed on 4/28/15 for additional largemouth bass population dynamics and bass removal, 485 bass < 300 mm were removed from the lake. Water temperature was 16° C.

## Mill Creek Reservoir Key Findings

- The largemouth population had been stable from 2003-2010 based on electrofishing catch rates (CPUE) and PSD indices. No sampling was conducted between 2010 and 2014 due to personnel limitations. Sampling in 2014 showed bass CPUE increased and PSD indices decreased from 2010 samples, indicating the bass population had possibly become unbalanced and bass crowded.
- More thorough sampling was conducted in 2015 to further evaluate major changes observed in 2014 from previous years sampling (2003-2010), when fish populations and the fishery had been stable. Data from previous sampling years (2003-2010), compared to 2015 showed; total bass CPUE increased (151 to 266 fish/hr), stock size bass increased (48 to 146 fish/hr), PSD decreased (44 to 18), and bass growth decreased for ages 2-5. In addition, bluegill CPUE declined from 617 fish/hr to 206 fish/hr during the same time period.
- The only known major change in the lake between 2010 and 2014 was the addition of hydrilla in 2010, which had inundated nearly the entire littoral zone by 2011. Grass carp were stocked in 2011 to control hydrilla and has resulted in a major reduction of hydrilla in the lake. Reports indicate hydrilla had not been entirely eradicated by 2015.
- Largemouth bass reached the 14-inch (356 mm) minimum size limit at age 5 in 2009. However, bass only averaged 290 mm at age 5 in 2015. The poor growth also reflects the overabundant bass population and reinforces the need to change management since current growth does not allow most bass to reach the minimum size limit and prevents anglers from harvesting stunted fish and improving the bass crowded conditions. Approximately 90% of the bass population in 2015 was less than the 14-inch minimum size. In response; DGIF began removing small bass from the lake, 930 bass were removed (< 350 mm) in the spring of 2015.
- Bluegill catch rates (CPUE/hr) dropped substantially in 2015 from previous years. CPUE for 2003 and 2008 averaged 617 fish/hr but was only 206 fish/hr in 2015. PSD and

RSD indices increased in 2015, a result of declining stock and increasing quality size bluegill. Changes in the bluegill population reflect additional predation from the increasing bass population.

- Black crappie catch rates in 2014 and 2015 were similar to averages from previous collections. Crappie reproductive success at Mill Creek Reservoir has historically been erratic and is similar to most regional small lakes. The varying recruitment creates a fluctuating fishery since crappie are heavily harvested at young ages and populations drop quickly after low recruitment episodes. In an attempt to provide a more stable fishery and improve average size of harvest, a 9-inch minimum size limit was initiated in 2013. This new regulation is promising based on increasing RSD indices in 2015, but more time is needed to determine if added protection has benefitted the fishery long term.
- Channel catfish were collected in 2014 and 2015 but in low numbers. Current sampling methods are not adequate to fully inventory the catfish population but do indicate current stocking practices are providing a put-grow-take fishery.
- Yellow perch were first collected in 2008 but are currently at low densities. Total catch rates were 3 fish/hr in 2014 and 2015. This species contributes little to the overall lake fishery.
- Mill Creek Reservoir is one of three Amherst County lakes, all are small reservoirs and in close proximity to each other. Each reservoir is managed differently based on fish assemblages, fertility, and angler pressure to provide diversified fishing opportunities and capitalize on each reservoir's unique characteristics. Mill Creek Reservoir sustains the highest fishing pressure, has relatively low fertility, and is managed for balanced fish populations. Consequently, bass need substantial protection to prevent excessive harvest as documented prior to 2002, when a 12 inch minimum size limit was enforced. Stonehouse Lake is a shallow but fertile reservoir and produces much higher fish biomass than the other three. This reservoir is managed as a trophy bass fishery due to faster bass growth and historical production of larger bass. Thrasher Lake is managed for quality sunfish while allowing for ample bass harvest. Fish populations at these three lakes has aligned well with current management objectives with the possible exception of Mill Creek Reservoir, which has recently become bass crowded after the introduction of hydrilla.

### Management Recommendations

- Continue monitoring the 14-inch minimum size limit and remove additional small bass in 2016 and possibly more in the future until the bass population becomes balanced. If a balanced bass population cannot be achieved with DGIF removal efforts, appropriate size limit changes should be investigated.
- Continue stocking catfish at similar densities if available.
- Monitor hydrilla coverage and stock more grass carp if hydrilla has not been substantially reduced or eliminated.

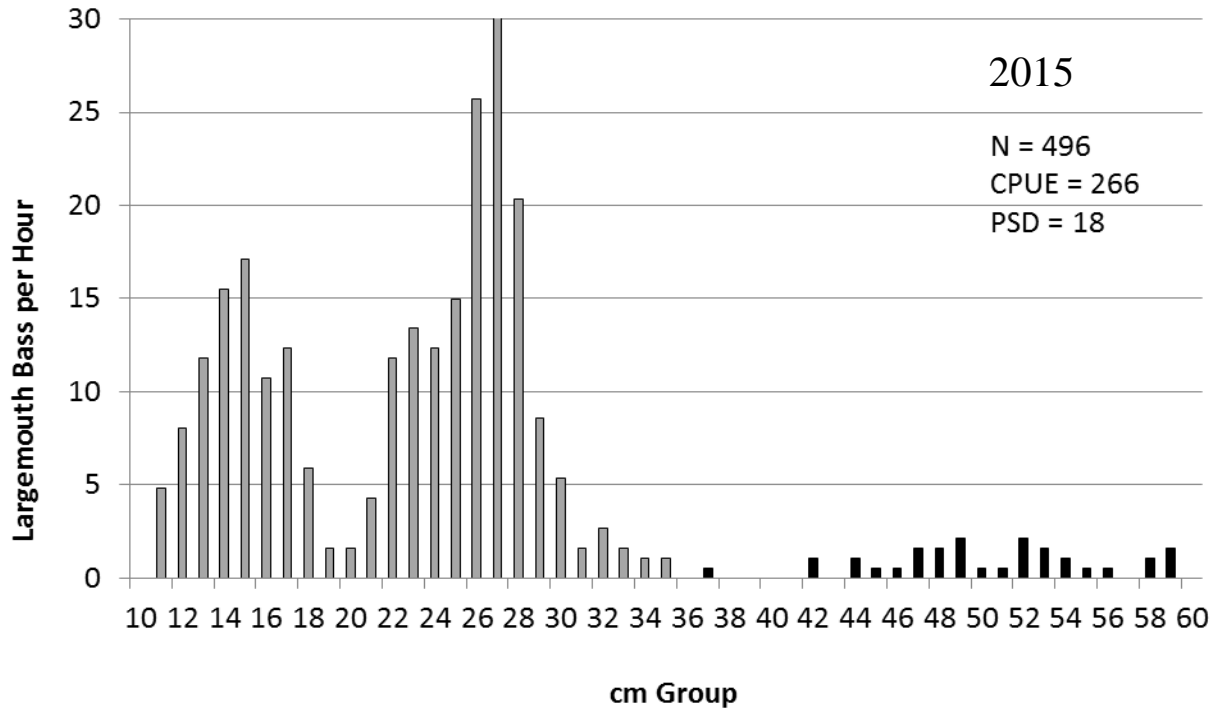


Figure 1. Length frequency distribution for largemouth bass collected with electrofishing gear at Mill Creek Reservoir on 4-20-2015.

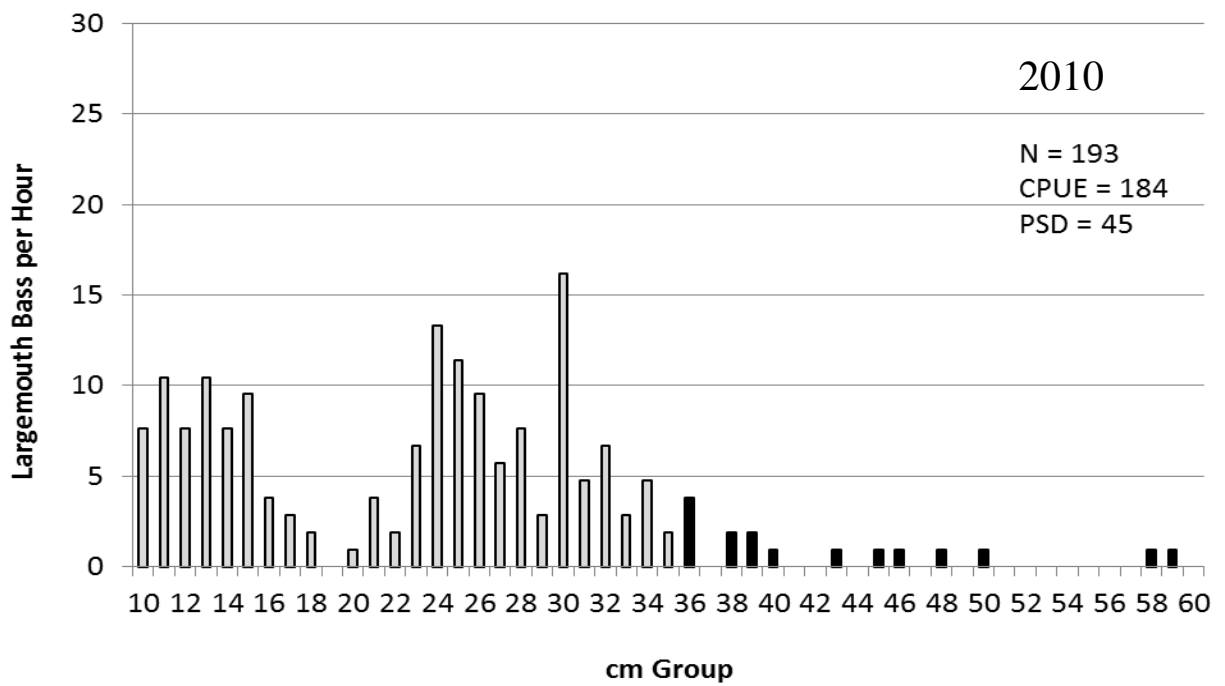


Figure 2. Length frequency distribution for largemouth bass collected with electrofishing gear at Mill Creek Reservoir on 4-07-2010.

Table 1. Largemouth bass catch per hour (CPUE) data collected from electrofishing samples at Mill Creek Lake, 2003-2015.

Year	N	CPUE Total	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	CPUE Memorable	Sample Time
2015	496	266	88	146	14	9	9.1	1.8675
2014	169	220	59	147	9	5	0.0	0.7681
2010	193	184	68	64	41	10	1.9	1.0503
2009	123	123	56	40	22	5	0.0	1.0000
2008	105	108	61	25	20	3	0.0	0.9720
2005	280	219	105	67	31	9	7.8	1.2760
2003	149	119	35	45	26	11	1.6	1.2500

Table 2. Largemouth bass proportional and relative stock indices collected from Mill Creek Reservoir during 2003-2015 spring electrofish sampling.

Year	PSD	RSDp	RSDm
2015	18	10	5.1
2014	9	3	0.0
2010	45	10	1.6
2009	40	7	0.0
2008	48	6	0.0
2005	42	15	6.8
2003	47	31	1.9

Table 3. Largemouth bass age and growth data for Mill Creek Reservoir collected in 2009 and 2015.

Year		Age 1	Age 2	Age 3	Age 4	Age 5
2015	mm	151	226	270	276	290
	N	163	12	34	30	34
2009	mm	148	258	319	331	362
	N	11	17	6	3	4

Table 4. Black crappie catch per hour (CPUE) data collected from electrofishing samples at Mill Creek Reservoir, spring 2003-2015.

Year	N	CPUE Total	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	Sample Time
2015	110	82	2	15	40	26	1.3383
2014	68	89	0	0	68	21	0.7681
2009	142	142	8	76	55	3	1.0000
2008	52	53	6	14	29	4	0.9720
2005	88	69	3	10	24	31	1.2760
2003	95	95	0	5	82	8	1.0000

Table 5. Black crappie proportional and relative stock indices collected from Mill Creek Reservoir during 2003-2015 spring electrofish sampling.

Year	PSD	RSDp
2015	82	32
2014	100	24
2009	43	2
2008	70	9
2005	85	48
2003	95	8

Table 6. Bluegill catch per hour (CPUE) data collected from electrofishing samples at Mill Creek Reservoir, 2003-2015.

Year	N	CPUE Total	CPUE Young	CPUE Stock	CPUE Quality	CPUE Preferred	Sample Time
2015	275	206	11	58	111	25	1.3383
2008	201	804	64	532	184	24	0.2500
2003	215	430	14	186	214	16	0.5000



Table 7. Bluegill proportional and relative stock indices collected from Mill Creek Reservoir during 2003-2015 spring electrofish sampling.

Year	PSD	RSDp
2015	70	13
2008	28	3
2003	55	4

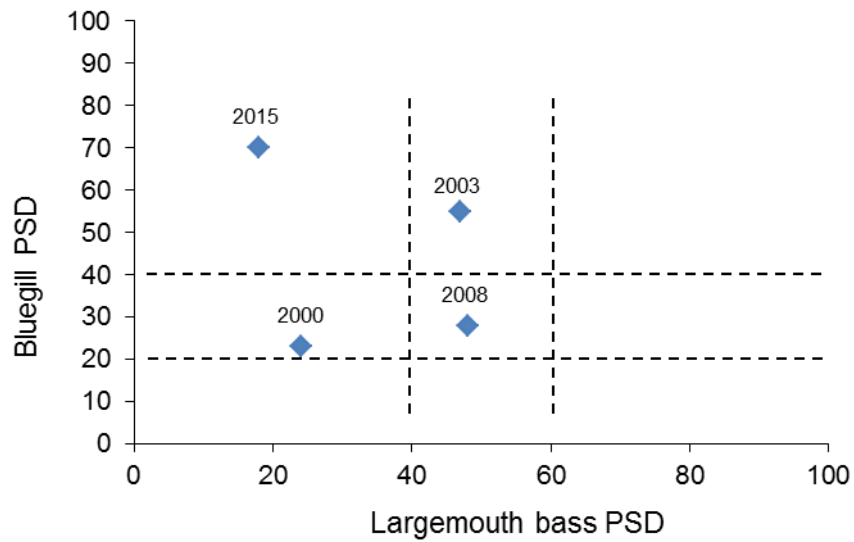


Figure 3. Largemouth bass/bluegill PSD relationship based on electrofishing surveys at Mill Creek Reservoir, 2000-2015.

Table 8. Comparative data for largemouth bass and bluegill collected in 2015 at Mill Creek Reservoir, Stonehouse Lake, and Thrasher Lake.

	Mill Creek Res.	Stonehouse Lk.	Thrasher Lk.
Largemouth Bass			
CPUE Total	266	158	171
CPUE Quality	14	67	21
CPUE Preferred	9	14	5
CPUE Memorable	1.6	4.8	3.6
PSD	18	66	32
RSDp	10	15	10
Bluegill			
CPUE Total	206	290	688
CPUE Preferred	25	35	71