

Fall 2017

Introduction:

Fisheries management is a dynamic process and continued monitoring and analysis is needed to maintain a level of fishing that is desired by the community. Lost Lake recognizes this, and JadEco, LLC was contacted to collect data on the fishery for Fall 2017.

Daytime AC Electrofishing was conducted for a total of 80 minutes throughout much of the lake on October 23, 2017. A total of 587 fish were collected with 15 species being represented. Only 56% of the fish collected were desired game species, while the remainder consisted of un-desirable gizzard shad (168), common carp (42), green sunfish (28) and bullhead (5) and non-game fishes such as bluntnose minnows (3), golden shiners (10) and white suckers (3). While white suckers, bluntnose minnows and golden shiners are not a game species, their spawn do provide forage to other gamefish in the lake.

Water clarity readings were good the day of the survey, with visibility at 3 feet. Air temperature was at 12.7°C (55°F) and water temperature was at 14.2°C (58°F). Sampling equipment appeared to be working well the day of the survey. We were assisted by volunteers on the front of the electrofishing boat as well as a follow boat working to collect fish the electrofishing boat may have missed.

To assess the fishery, we utilize several indices in fisheries management as tools to interpret the population structure and condition of the fishery. Data analysis tools such as Catch Per Unit Effort (CPUE) provide information on the abundance of species. The quantity of fish collected within a certain amount of time determines the CPUE. This is used for the collection as a whole, or per species comparisons. Proportional stock density (PSD) is also analyzed on important game species. This is a fisheries assessment tool used to determine the size distribution of the fish within a population. Relative weights (Wr) are calculated to provide insight into the condition of the fish in a population or fish community. They also provide an understanding of the size structure of game species within the lake, and provide information on length to weight relationships to better understand if your game fish are relatively fat, or relatively thin. Potential changes in the predator / prey relationships and available forage can be interpreted through these metrics. Combined, these metrics provide information on the gamefish community, species density and potential trends in the fishery.

Summary of Fisheries Data Collected in Fall 2017:



The following is a summary and interpretation of the data from the Fall 2017 fish survey. A comparison to the previous 2015 report by Illinois Department of Natural Resources is provided in a subsequent section of this report.

Over all, the health and condition of the fish collected during the survey was good. We saw no visible signs of disease, stressors, or parasites. We collected a total of 69 largemouth bass that comprised less than 12% of the overall collection. Bluegill comprised just over 38% of the collection with 226 fish collected. Nearly 29% of the collection was gizzard shad and 7% was common carp.

Younger bass and bluegill (young of the year) appeared to be under represented in the samples with only 7% of the bluegill catch being 2.9" or less and 19% of bass were less than 7.9" in length.

Crappie represented approximately 3% of the total collection, and 5.5% of just the gamefish collected. Crappie are less susceptible to electrofishing than other sportfish. This, partially, may be due to the habitat preference of the crappie for deeper. Spawning brings them into the shallows making them more susceptible to collection in the spring, but netting is the best way to sample the crappie fishery.

There was a high collection of carp with .53 carp collected per minute. The goal should be to manage carp at a level under .25 fish per minute electrofishing. Along with the high numbers, the second concern is the presence of smaller carp in the sample. There was one carp collected at 14". The presence of smaller carp indicates not only successful spawning, but that recruitment is occurring and not all young carp are being controlled by predation.

Largemouth Bass:

The collection rate for largemouth bass was under our objective collection rate at 0.86 fish per minute. The average relative weight of bass collected was 101, indicating a relatively fat average bass at Lost Lake. The PSD or 'proportional stock density' metric to analyze the size structure of the bass population was used. This is a comparison of the stock (>8") to quality (>12") size bass in the sample. The objective range for largemouth bass PSD is 40-70. The PSD for Lost Lake was at the top of the range at 70, but within our objective range. The RSD14 for largemouth bass was at 59, much higher than the objective range (10 to 20). The proportion of bass over 19" compared to all bass over 8" was at 11. This would indicate a high number of bass greater than 14" in the fishery. Average largemouth length in the survey was at 12.8".

Looking at the size structure of the bass fishery, 19% of the fish collected were less than 8" stock size, over 33% were between 8" and 14", and nearly 48% were over 14" in length. The bass fishery is excellent for larger bass, and one of the better

fisheries I've sampled in Northern Illinois. While there is a good size distribution of larger bass, there are few in the young of the year class. These young bass are critical for ongoing recruitment as older fish die, these younger fish are needed to grow and replace the next size class.

Bluegill:

We collected 226 bluegill with a CPUE of 2.83 fish per minute. This is within our objective range between 2 to 4.5 fish per minute, but on the lower end of the spectrum. The PSD was at 16, which is below our objective range (20-60). This would indicate that of the fish greater than 3" in length (stock size), only 16% were larger than 6" in length (quality size). We collected a total of 33 bluegill over 6" and they comprised nearly 15% of the overall bluegill catch. Less than 7% of the entire catch was less than 3" in length, and is a concern for bluegill spawning and recruitment at Lost Lake. This will need to be monitored to better understand what is happening. The Relative stock density (RSD) for 7" bluegill was 2. Bluegill Wr averaged 94. While this is within our objective range, it is below optimal and could indicate slower than average growth rates. Age and growth analysis would need to be done to verify this.

Crappie:

Six black crappie and 12 white crappie were collected for a combined CPUE of 0.23 fish per minute. This is a good collection of crappie during fall electrofishing. Crappie were collected between 7.6" and 11.9" in length. No young of the year crappie were collected, but there appears to be multiple year classes represented. The relative weights for the crappie collected were low with an average of 82. The PSD was above our objective range for both black and white crappie at 67 and 100 respectively. I suspect the high PSD is due the high collection of crappie greater than 8" in length. Thirty-Five percent of the collection was over the minimum creel size of 10". This species can be cyclical in its population with good year classes and several years with gaps. Based on the data from 2017, I anticipate multiple year classes were observed. The low relative weights are a concern and the crappie population should continue to be monitored.

Smallmouth bass:

Only two smallmouth bass were collected at a rate of 0.03 fish per minute. The average smallmouth collected was 9.6" with the range from 8" to 11.2". For those collected, the relative weights were low with an average of 81. The PSD for smallmouth bass was 50. This indicates that of the fish sampled, 50% of the bass over 7" were 11" or larger. The collection of smallmouth bass would indicate the recent smallmouth stocking (450 fish in 2016) was successful.

Walleye:

Two walleye were collected during the electrofishing survey. A low collection during daylight electrofishing does not indicate a poor walleye fishery. Night electrofishing, or spring netting, is a better assessment tool to assist in understanding the walleye fishery at Lost Lake. The 2015 IDNR electrofishing data indicated a very high daytime electrofishing collection for walleye with 82 collected at 1.37 fish per minute, which is very high for daytime electrofishing. Further sampling would provide better insight into the walleye fishery at Lost Lake.

Comparison to 2017 and the 2015 IDNR Report

Not all indices reported in the 2015 IDNR report were comparable to the 2017 data due to data gaps. However, based on the data provided, we can compare the catch per unit effort, proportional stock density, and relative weights for most of the important game species. Further electrofishing data would help to better understand the trend in the fishery. Gamefish represented a total of 75% of the overall collection in 2015 and only 56% in 2017. Nongame species represented a much higher portion of the population in 2017. This trend should be monitored.

Largemouth bass:

Catch per unit effort in 2017 was below our objective of 1 fish per minute minimum, but the CPUE in 2015 was 1.72 fish per minute and within our objective range. There was a reduction in relative weights collected in 2017, but were still excellent. The PSD was higher at 70 in 2017, up from 62 in 2015. Largemouth bass collection comprised a total of 12% of the entire catch in 2017, down from the 16% representation in 2015. Both surveys indicated a strong bass population greater than 14" in length.

Bluegill:

Like the bass, catch per unit effort was higher in 2017 (3.63 fish per minute) than 2015 (2.83 fish per minute) for bluegill. The percentage of total catch was more consistent between years with 34% in 2015 and 38% in 2017. The bluegill PSD dropped quite dramatically between 2015 (59) and 2017 (16). This would indicate fewer large bluegill represented in this survey compared to the 2015 survey. Continued monitoring would help better understand that trend. IDNR did not provide relative weights for bluegill so there isn't a comparison.

Walleye:

The 2015 survey had a very high collection of walleye for day time electrofishing. While the number was lower in 2017, it is expected that there is still a dense walleye fishery in the lake. During personal communications with one of the IDNR biologists onsite during the 2015 survey, they had concerns that the high density of predators may be the cause for the low collections of important prey species such as the

bluegill young of the year. Night electrofishing or netting would be a better indicator of the current walleye fishery at Lost Lake.

Smallmouth Bass:

Smallmouth were collected at a higher rate in 2015 than 2017. A total of 20 fish were collected for a CPUE of 0.33 fish per minute in 2015 while the rate was only 0.03 fish per minute with 2 fish represented in the sample in 2017. This lower collection is not cause for concern at this time, but for the smallmouth bass fishery to take hold, stocking will need to continue until young of the year recruitment is observed. Successful natural spawning and recruitment would indicate a sustainable population.

Gizzard Shad and Carp:

The data for 2015 showed that 1.4% of the total catch was carp in 2015 and 7% in 2017. Gizzard shad comprised 15% of the total catch in 2015, and 29% in the 2017 survey. Catch per unit effort for carp increased from 0.15 fish per minute to 0.53 fish per minute between 2015 and 2017. Gizzard shad also increased from 1.58 fish per minute to 2.10 fish per minute. As previously noted, the game fish represented 75% of the catch in 2015 and only 56% of the total catch in 2017. There appears to be a large biomass of carp and shad that can compete against gamefish for food and space.

Recommendations:

Carp are a non-native species that can have negative consequences for not only the fishery, but lake water quality as well. With the high collection of carp, and the representation of smaller carp in the sample, a carp removal effort should continue.

Lost Lake has a limited carrying capacity of fish for the lake. It can only support a specific 'biomass' of fish. This can be represented by desirable species such as bass and bluegill or non-game species, like carp. Carp represent a large biomass of the fishery at Lost Lake. Along with the competition for space, carp, and gizzard shad, compete with other desirable sport fish for food. By reducing their biomass, or converting them to a desirable species you can improve the angling experience on the lake.

Along with taking up space or biomass, carp continually turn up the lake sediments releasing nutrients, prey on game fish nests (eggs), and prevent beneficial aquatic plants from establishing. As you are aware, by removing them, you can have a positive impact on the lake ecology as well as the fishery. The current carp removal efforts, once successful, should have a big impact on the sport fish population.

Continue to monitor the fishery for young of the year recruitment of bass and bluegill through electrofishing efforts. I know the community is looking at long-



range plans to develop a dredging program. Development and subsequent execution of a dredging program would also benefit the fishery. Currently, much of the upper reach of the lake is inundated with sediments which, in turn, reduce the amount of spawning habitat available to the sportfish population. Dredging would also improve water quality and clarity.

Fish Habitat:

Even though Lost Lake does have natural shorelines with fallen trees and structure, effort should still be made to place quality fish habitat throughout the lake. Placement of shallow structure would benefit the fishery, and in particular the bass and bluegill. These shallow structures would allow young of the year fish a place to hide, grow, and recruit. It is possible the high predator biomass may be suppressing the bass and bluegill recruitment, and providing cover may allow more of those young fish to recruit up to the larger size classes.

Multiple material types can be used to create successful habitat. Many fishing clubs use Christmas trees and cinder blocks to place structure. While these materials are readily available and easy to handle, there are better structures that can be built by the volunteers, or purchased through suppliers. Use of hard wood treetops, wooden pallets, or even PVC can provide long-term structures. We could assist you with developing these structures, as well as placement recommendations, if needed.

Lost Lake should work to establish a native aquatic plant community within the lake. Along with structure, the aquatic plant management program is important to the fishery. Aquatic plants provide oxygen to living organisms, nurseries to young fish, and a food supply of aquatic invertebrates to bolster the food chain for these growing fish. They also utilize nutrients that could otherwise be used by planktonic algae. An aquatic plant management program is needed to ensure the establishment of quality native aquatic plants. This plant management program or strategy should consider the types of plants to introduce, how to protect them from predation and by uprooting by the dense carp population while they get established.

Size and Creel Limits:

If you are trying to establish a sustainable smallmouth bass fishery, catch and release should be implemented until the smallmouth population begins to show signs of natural recruitment.

Stocking:

Stocking is always subjective to budgetary constraints, and all recommendations may not be able to be met. Stocking recommendations should *always be re-evaluated based on subsequent fish population sampling.*



- 1) Due to the high collection of gizzard shad, stocking of muskie or hybrid stripers can continue. While hybrid stripers are less expensive, they are more prone to spillway escapement. Past studies on muskie diet have indicated that they prefer gizzard shad, when available as a primary forage. If muskie are a desired species by anglers, periodic stocking is necessary.

I recommend stocking muskie at a rate no more than 1 fish per acre. To maintain consistent size classes, stockings should be done every other year. Generally, you can purchase muskie at 12" and larger. Larger fish have better survival rates. These are being stocked to help convert the biomass of gizzard shad into a desired sport species.

- 2) Based on the previous IDNR survey, walleye numbers are high. I would recommend reducing your annual walleye stocking rate to no more than 5 per acre. Continued periodic stockings will most likely be necessary to maintain a viable fishery for anglers. Walleye should be stocked at 6"-8".

If budgetary constraints are a problem, stocking every other year may be an option, keeping in mind limited year-class strength and size gaps in the fish that may be observed by fisherman and their creel.

Table 1: Catch Per Unit Effort (CPUE) by species

Species:	Number		Fish/Minute		Objective
	'17	('15*)	'17	('15*)	
Largemouth Bass:	69	(103)	0.86	(1.72)	1.0 – 2.5
Bluegill:	226	(218)	2.83	(3.63)	2.0 – 4.5
Black Crappie:	6	(37)	0.08	(0.62)	0.2 -0.8
White Crappie:	12	(6)	0.15	(0.10)	0.2 -0.8
Walleye:	2	(82)	0.03	(1.37)	-----
White Bass (hybrid):	1	(1)	0.01	(0.02)	-----
Channel Catfish:	10	(5)	0.13	(0.08)	-----
Smallmouth Bass:	2	(20)	0.03	(0.33)	-----
White Sucker:	3	(10)	0.04	(0.17)	-----
Green Sunfish:	28	(30)	0.35	(0.50)	-----
Hybrid Sunfish:	--	(2)	---	(0.03)	-----
Pumpkinseed Sunfish:	--	(1)	---	(0.02)	-----
Yellow Perch:	--	(1)	---	(0.02)	-----
Yellow Bullhead:	5	(3)	0.06	(0.05)	-----
Bluntnose Minnow:	3	(--)	0.04	(--)	-----
Golden Shiner:	10	(12)	0.13	(0.20)	-----
Gizzard Shad:	168	(95)	2.10	(1.58)	-----
Common Carp:	42	(9)	0.53	(0.15)	< 0.25
Total	587	(635)	7.34	(10.58)	6.00 +

*IDNR Report: 60 min electrofishing

Table 2: Proportional Stock Density (PSD)

Species:	2017	('15*)	Objective
Largemouth Bass:	70	(62)	40-70
Bluegill:	16	(59)	20-60
White Crappie:	100	(--)	30-60
Black Crappie:	67	(92)	30-60
Walleye:	100	(76)	30-60

*IDNR Report:

Table 3: Relative Weight (Wr)

Species:	Wr (Ave)		Range		Objective
	'17	'15*	'17	'15*	
Largemouth Bass:	101	(105)	(86-124)	(--)	90-110
Bluegill:	94	(--)	(74-114)	(--)	90-110
White Crappie:	82	(--)	(64-89)	(--)	90-110
Black Crappie:	82	(--)	(77-89)	(--)	90-110
Walleye:	91	(97)	(89-93)	(--)	90-100
Smallmouth bass:	81	(96)	(80-82)	(--)	90-110
Channel Catfish:	108	(--)	(90-120)	(--)	90-110

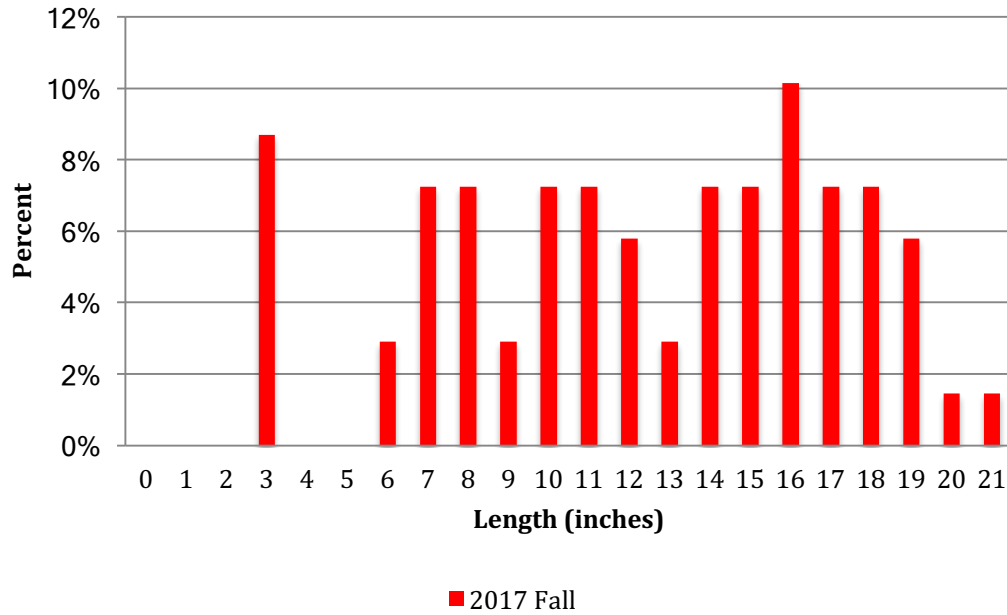
*IDNR Report:

Table 4: Length Ranges by Species

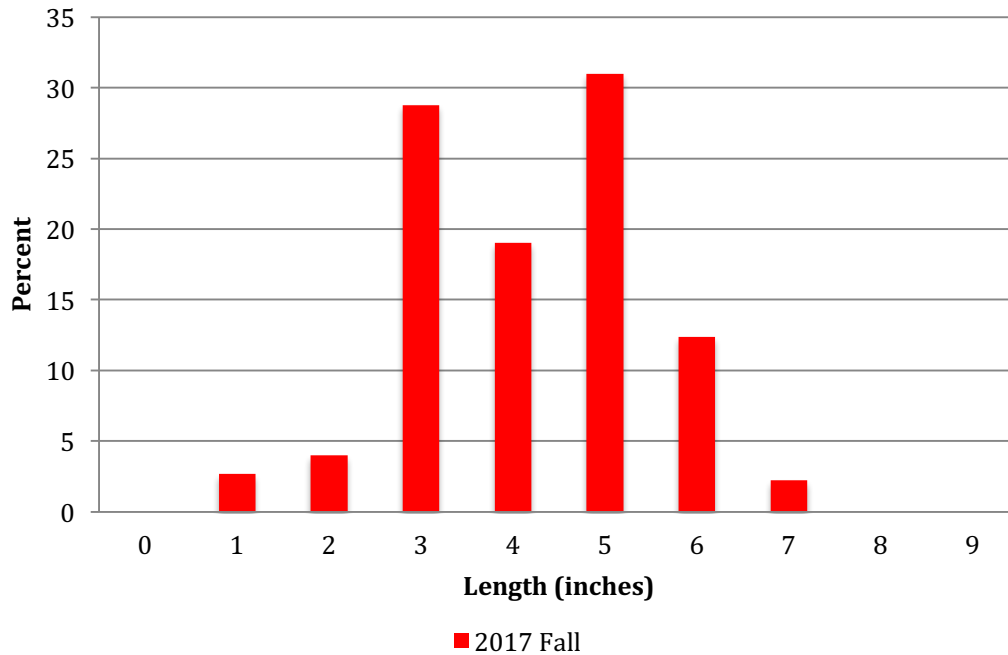
<i>Species:</i>	<i>Length:</i>		<i>Average</i>	
	<i>'17</i>	<i>'15*</i>	<i>'17</i>	<i>'15*</i>
Largemouth Bass:	3.0-21.1"	(n/a)	12.8"	(n/a)
Bluegill:	1.5-7.4"	(n/a)	4.7"	(n/a)
White Crappie:	8.5-11.9"	(n/a)	9.9"	(n/a)
Black Crappie:	7.6-10.7"	(n/a)	9.1"	(n/a)
Walleye:	19.3-21.3"	(n/a)	20.3"	(n/a)
White Bass (hybrid):	7.9"	(n/a)	7.9"	(n/a)
Channel Catfish:	15.7-24.0"	(n/a)	18.9"	(n/a)
Smallmouth Bass:	8-11.2"	(n/a)	9.6"	(n/a)
White Sucker:	15.9-17.4"	(n/a)	16.5"	(n/a)
Green Sunfish:	1.8-6.5"	(n/a)	4.3"	(n/a)
Yellow Bullhead:	11.3-11.5"	(n/a)	11.4"	(n/a)
Bluntnose Minnow:	2.2-2.7"	(n/a)	2.5"	(n/a)
Golden Shiner:	3.1-8.3"	(n/a)	5.1"	(n/a)
Gizzard Shad:	3.3-13.2"	(n/a)	8.1"	(n/a)
Common Carp:	14.3-25.6"	(n/a)	22.5"	(n/a)

*IDNR Report:

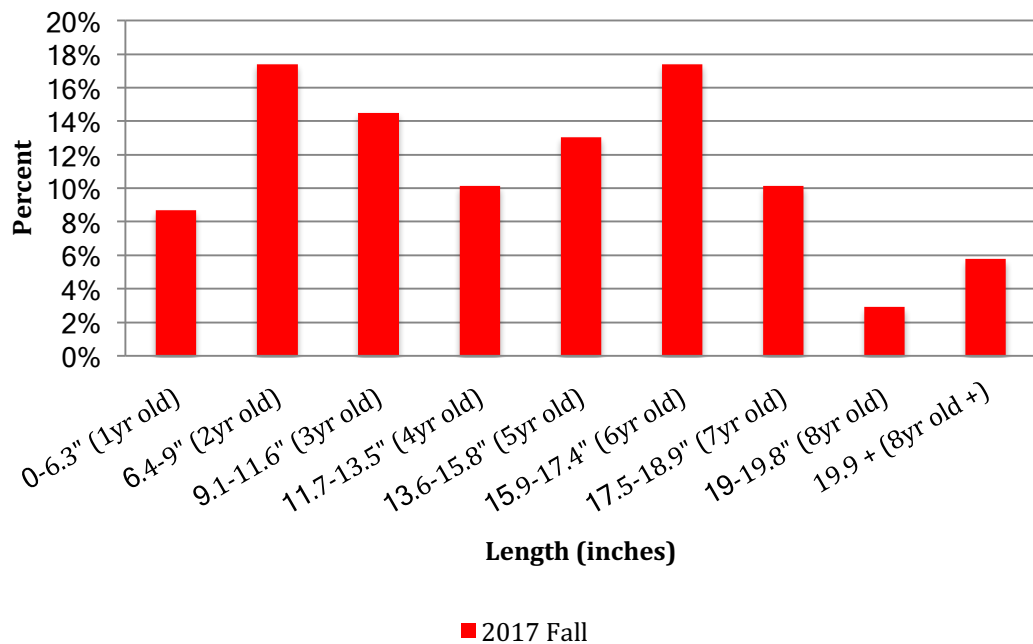
Largemouth Bass Population



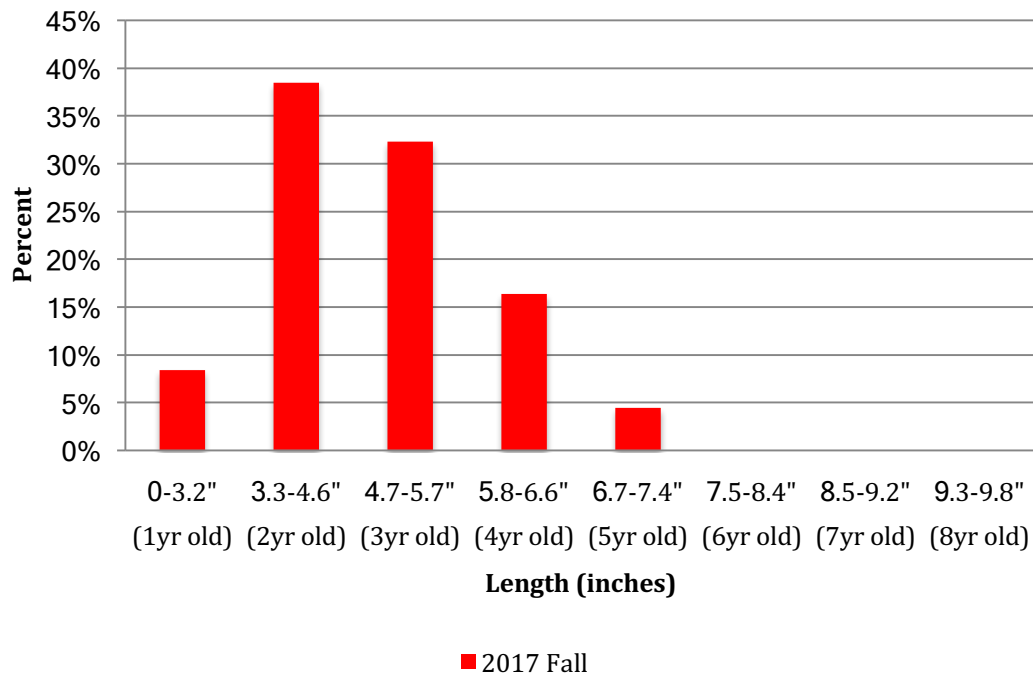
Bluegill Population



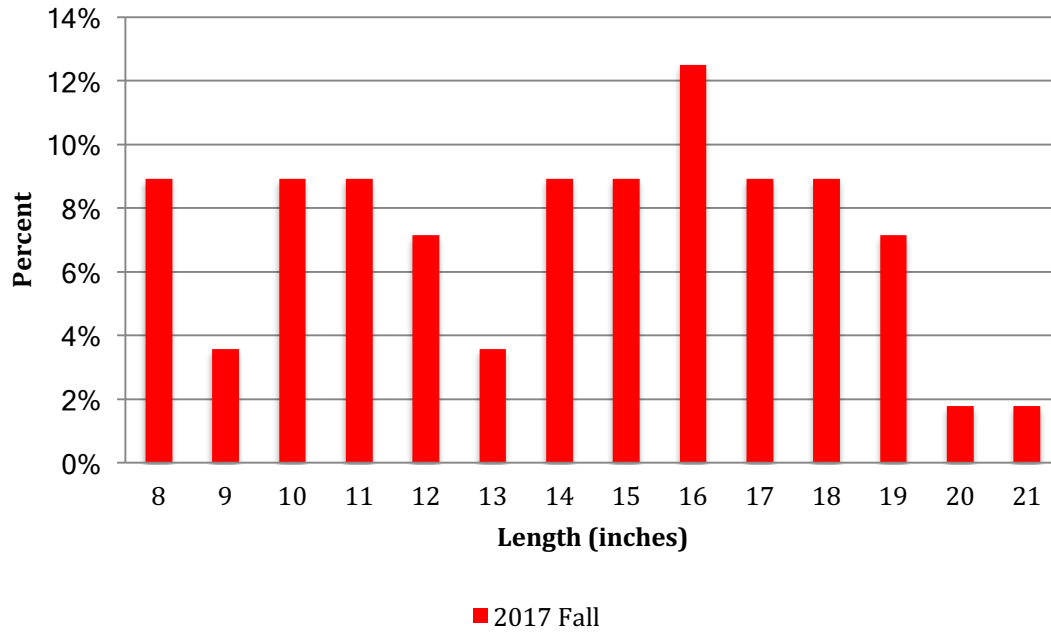
Largemouth Bass Population - Estimated Age Class



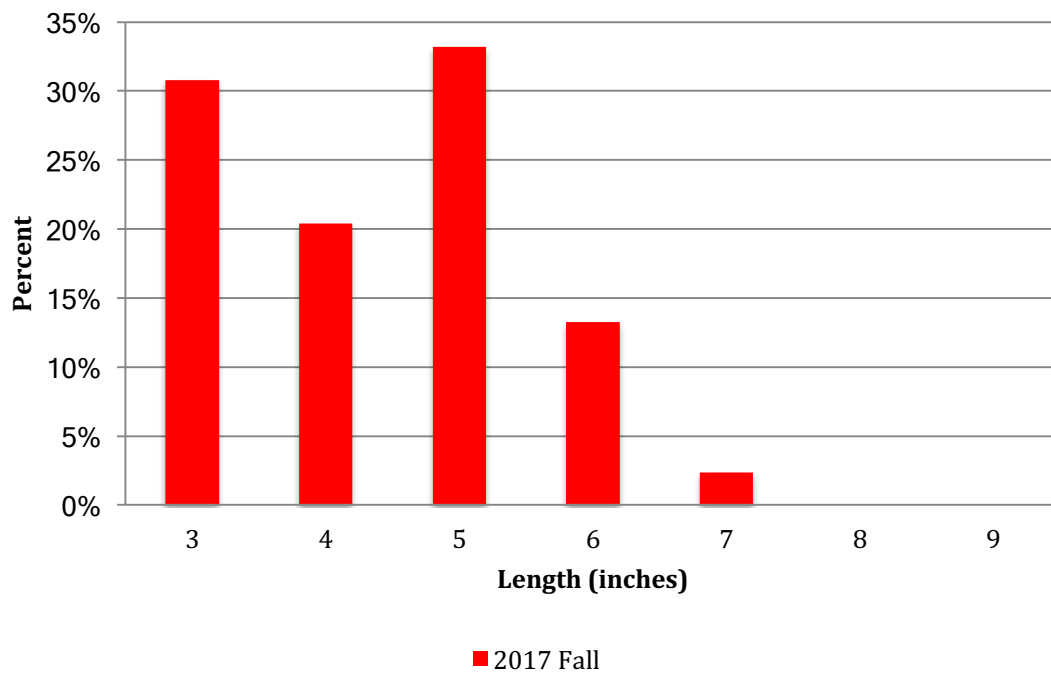
Bluegill Population: Estimate Age Class



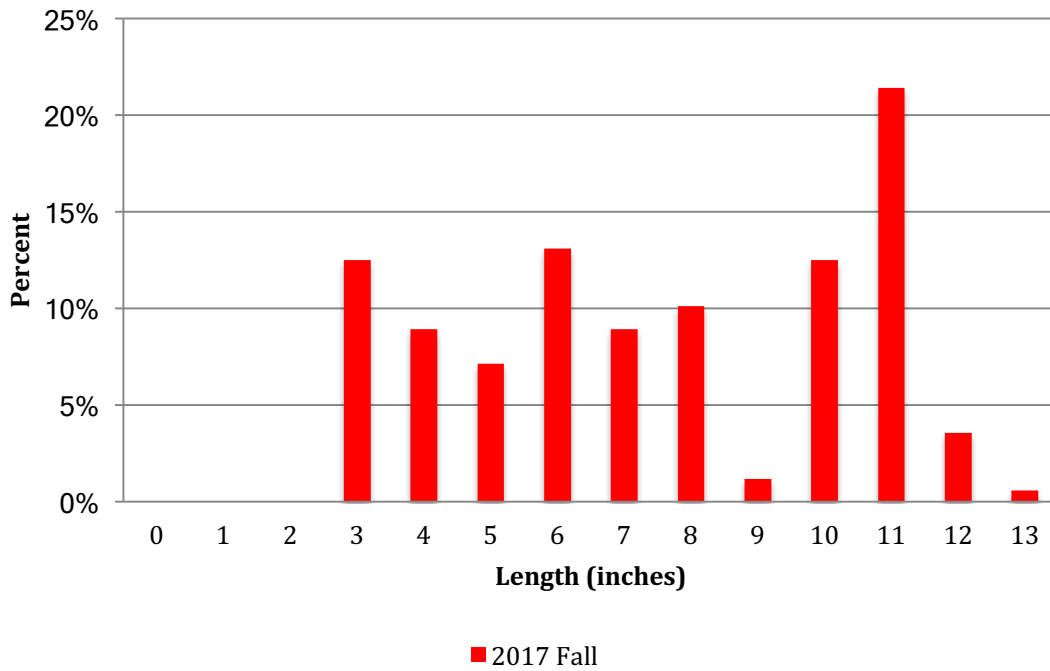
Largemouth Bass Population Distribution Greater Than Stock Size 8"



Bluegill Population Distribution Greater Than Stock Size 3"



Gizzard Shad Population



Carp Population

