Fall 2020

Introduction:

Lake Summerset leadership understands the need to collect data at Lake Summerset to effectively manage the fishery and to maintain a level of fishing expected by the membership. JadEco was contacted to assist with the data collection and to provide recommendations on the path forward for the fishery at Lake Summerset. Spring 2020, we witnessed a large-scale fish kill of black crappie of all size ranges. Concerns for the fishery were raised by members, and a follow up survey was performed to evaluate the remaining fish community and population structure. This report provides information on the data collected by JadEco the past two seasons as well as comparisons to previous IDNR reports that were available.

Daytime DC Electrofishing was conducted for a total of 90 minutes in various areas around the lake on October 16, 2020. Water clarity readings were 42 inches the day of the survey, and water temperature was at 54.1°F. The air temperature was at 34°F and conditions were very windy for the first run survey on the dam. The equipment was functioning well, and we observed a good survey.

We had one netter in the main boat and a follow boat assisting with fish collection and picking up fish the main boat may have missed or floated up late. A total of 1,089 fish were collected during the survey, with an overall CPUE effort of 12.1 fish per minute. Our objective goal is 6 or more total fish per minute. We had a very high collection of young bass (under 9") and bluegill between 3" and 4".

A total of 9 species of fish were observed during this survey. Six species comprised valuable sport fish, consisting of largemouth (563) and smallmouth bass (6), bluegill (466), yellow perch (24), walleye (1), and northern pike (1). The remaining 3 species were white suckers (4), bluntnose minnows (20), and silversides (4), all of which provide additional forage for predators. The entire collection was desirable species. The white suckers, bluntnose minnows, and silversides all represented non-game fish, and aren't necessarily considered undesirable.

To effectively evaluate the fishery, we utilize several standards established in scientific literature. These consist of analysis for catch per unit effort (CPUE) per species, total catch per unit effort, proportional stock density (PSD) on important game species, and relative weight (Wr) were analyzed. These metrics provide information on the gamefish population density and potential trends in the fishery. 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.

JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*

Summary of Fisheries Data:

Overall, the fishery at Lake Summerset continues to maintain an abundant population of largemouth bass, while still allowing quality pan fishing experiences. There continues to be high collection rates of younger largemouth bass in the 6" to 8.9" range, but an abrupt drop in bass collection between 9" and 11.9". Largemouth bass comprised nearly 52% of the entire collection and bluegill comprised nearly 43% of the collection. The largemouth bass population structure continues to be very good right now in Lake Summerset with a good distribution of bass in all size categories, and better representation of larger bass. The largemouth bass population had very good relative weights again in 2020, indicating the opportunity for growth and for anglers to catch relatively fat, largemouth bass during their angling outings.

As suspected after the spring fish kill, we did not observe any crappie in the 2020 survey, and the fishery needs to be monitored. Angler reports claim crappie are still being caught, and the spring spawning will be an indicator of the crappie survival, post fish kill. It may take a few years of strong year classes to get the fishery back.

Bluegill relative weights were still fairly good at 96 and there was decent distribution of larger bluegill in the survey with bluegill collected up to 9.1" in length.

We observed 6 smallmouth bass with a CPUE of 0.07 and relative weights continue to be excellent at 125. Size ranges of smallmouth bass collected indicate decent spawning is occurring, unless small bass were recently stocked.

We also collected one northern pike (31.1") and one walleye (27.6") during the survey along with three species of forage (bluntnose minnows, silversides, and white suckers).

Largemouth Bass:

The fall 2020 survey had a very high collection rate for largemouth bass again at 6.26 fish per minute. The 2019 survey had a largemouth CPUE of 8.86 fish per minute. This was due to a strong year class of bass in 2018/2019 seasons. Even with the high CPUE and dense fishery, relative weights were good and maintained a 101 average, consistent with 2019. Wr ranged from 78 to 147. The objective range is between 90 and 110. These are excellent, and represent a population that is likely having good growth rates. This can only be verified through an age and growth study. We collected 5 bass over 20" in length and the heaviest bass was over 5 pounds. Anglers should be enjoying an excellent bass fishery at Lake Summerset.

JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*

We utilized a fisheries management tool known as the PSD or 'proportional stock density' metric to analyze the size structure of the bass population. 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 fall 2020 was at 74, and consistent with 2019 at 76. This is slightly above our objective range and is due to the high collection of larger, quality bass. RSD 14 (comparison of the stock size to bass greater than 14") was at 50 and well above the objective range of 10 to 20, and up from 32 in 2019. This means that 50% of all bass collected larger than 8" were over 14" in length. Again, I expect anglers are enjoying relatively good fishing at Lake Summerset for fat, healthy bass, but this is skewed out of balance due to the low collection of the 9" to 10.9" size bass.

Average bass lengths were at 8" with a range from 2.2" young of the year to 20.5" adults. Five bass were observed over 20".

Bluegill:

Catch per unit effort for bluegill was very high at 5.18 fish per minute, with a total of 466 bluegill collected. This is above our objective range of 2.0 to 4.5 fish per minute. The bluegill ranged from 1.4" to 9.6" and averaged 4.2". There was a high collection of bluegill between 3" and 3.9" (220 fish). The average weight of bluegill over 8" was 0.53 pounds, and there were 22 bluegills over 8" collected. This is excellent for a bluegill fishery. The average relative weights were good at 96, and within our objective range of 90 to 110. The Wr ranged between 64 and 141.

As with largemouth bass, we use the proportional stock density (PSD) metric to evaluate the size structure of the population. The PSD for bluegill evaluates all bluegill over 3" compared to the bluegill over 6". The bluegill PSD was at exactly 15 again in 2020, and was under our objective range of 20 to 40. This is likely due to a high collection of bluegill between 3" and 3.9" in length. The RSD7 for bluegill was at 8, and RSD 8 was at 6. By protecting these larger males with the creel limit changes, the bluegill fishery is expected to improve.

The upper limit of the size range for bluegill has increased with the largest bluegill collected in 2019 at 8.7", 2015 at 8.0" and for 2011 at 7.5" and 9.1" in 2020. Again, by following the recommended limit changes, we should observe an improvement in the bluegill PSD by protecting the larger males.

Smallmouth Bass:

Smallmouth bass were represented in the survey with 6 fish collected at a rate of 0.07 fish per minute. Smallmouth ranged in size from 3.5" young of the year to 16.9" adults. The average bass collected was 9.1". The largest bass was nearly 2.2 pounds and relative weights for smallmouth bass were excellent with a 125 average. Relative weights ranged from 117 to 132.

The smaller sizes indicate good natural spawning and recruitment for smallmouth bass. This is excellent since most impoundments in this area do not exhibit good smallmouth recruitment, especially with the presence of a dense largemouth bass fishery that is represented at Lake Summerset.

Black Crappie:

In 2019, we observed a high collection of black crappies with 92 individual fish collected with a CPUE of 1.31 fish per minute. There was good representation for multiple year classes of crappie and crappie were collected from 2.2" to 12" with an average size of 5.5". Nearly 33% of the crappie collected were larger than 9", and 13% were greater than 10". That collection indicated we should have expected an excellent season of crappie fishing in 2020 and beyond.

However, a fish kill that targeted the crappie (all size ranges) started dying off after ice out and continued into pre-spawn for the crappie. We did not observe crappie in this survey, but angler reports have been that some crappie have been caught this summer. The 2021 spawning season will be the indicator of what has survived and what spawning / recruitment we may expect.

Muskie and Northern Pike:

One 31.1" northern pike was collected. We did not see muskie on this survey. The relative weights for the northern collected was at 100, and within our objective range.

Yellow Perch:

We collected 24 yellow perch at a rate of 0.27 fish per minute. They ranged in size from 2.8" to 11.7" with an average size of 6.8". Relative weights for yellow perch were very low with an average of 81 and ranging from 72 to 96. This is consistent with the 2019 survey results. The largest perch had a weight of 0.70 pounds and a low relative weight at 79. Perch that length should weigh around 0.88 pounds.

Recommendations:

Continue to conduct electrofishing fish surveys to follow trends in the fish population. By performing annual surveys, any changes in trends or concerns with the fishery can be rectified more quickly through creel and size limits changes and stocking programs. Previous data collection was too sparse to actively manage the fishery. With the kill observed this spring, consistent surveys can also help understand the changes that may occur with increased harvest pressure on other species (bluegill in particular), and spawning and recruitment of the crappie.

The largemouth bass fishery is doing well, and monitoring the abundance of bass in the 9" to 11.9" size ranges is needed. There has been a gap in that size the past two

survey. This size continues to be a lower density. Change the current bluegill limits to allow the harvest of only 5 over 8" daily. The remaining limit can be kept, but under 8". We want to protect big males to improve this fishery.

Fish Habitat:

The Lake Summerset Association should work to place quality fish habitat throughout the lake. Placement of both shallow and deep structure would benefit the fishery, and in particular the bass fishery. Many association lakes require structure be placed only in deep water due to swimming and boating concerns so any volunteers should be working with the Association prior to placement of any structures in the lake.

Along with placement of 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. The Association leadership is working towards MANAGING, not eradicating aquatic plants. This includes chemical control of invasive non-natives (curly leaf pondweed), and harvesting native plants. They are currently developing an optional treatment to provide added benefit to private homeowners. Development of this plant management program or strategy will benefit the fishery to ensure the plants are *managed to improve the fishery* while continuing to *maintain recreational use* of the lake.

Size and creel limits:

The bluegill limit should be changed to allow the harvest of only 5 bluegills over 8" daily. This will help improve the bluegill fishery by protecting the larger males that are regulating the bluegill spawn. The Association should also encourage the release of larger bluegill by anglers during the spawning season to improve the size distribution of bluegill. At this time, we recommend an educational effort to the membership on *why* this is beneficial. We can assist by providing articles for publication, if requested. By starting an educational program, a level of acceptance can be created in the event it is needed to mandate this change.

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) If walleye is a desired species for the anglers, annual (or every other year) stockings of walleye can be done to ensure fishing opportunities for walleye continue. These should be stocked in the fall of the year at 6"-8" in size. With the forage density that is present, stocking densities could be as high as 10 per acre, but 5 per acre is a good number for maintenance supplemental

stocking. If budget is a concern, the per acre quantity can be adjusted between 5 and 10 fish per acre.

2) If channel catfish are desired by the membership, an annual, or every other year, stocking can be done at an 8"-10" size range. The larger the catfish, the better their stock survival. Please note that a MINIMUM of 8" stock size is required. Fish smaller than 8" are more likely to be consumed by other sport species as prey. Stocking densities of 10 fish per acre is a good guideline. We are not seeing catfish in our surveys at this time.

3) Periodic stocking of muskie is necessary to maintain a muskie fishery. Previous recommendations were to stock 140 muskie every third year. While this recommendation is fine, I prefer to stock annually or every other year to reduce the gaps in size structure. Stocking up to 45 every year or 90 every other year would be recommended.

4) ***If there is a requested to perform any stocking beyond these recommendations between this report and any future surveys, JadEco should be contacted for discussion and opinion.***

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				Obj. (fish/min)
	20f	19f	15f**	11f**	20f	19f	15f**	11f**	
Largemouth Bass:	563	620*	218	112	6.26	8.86*	3.63	1.9	1.0-2.5
Bluegill:	466	203	209	143	5.18	2.9	1.6	3.48	2.0-4.5
Smallmouth Bass:	6	15	18	3	0.07	0.21	0.3	0.05	- - - - -
Black Crappie:	- - - -	92	- - -	- - -	- -	1.31	- -	- -	0.2-0.8
Yelow Perch:	24	11	- - -	- - -	0.27	0.16	- -	- -	- - - - -
Muskie:	- - - -	1	- - -	- - -	- -	0.01	- -	- -	- - - - -
Northern Pike:	1	3	- - -	- - -	0.01	0.04	- -	- -	- - - - -
Walleye:	1	- - -	1	5	0.01	- -	0.02	0.08	- - - - -
Channel Catfish:	- - - -	- - -	1	1	- -	- -	0.02	0.02	- - - - -
White Sucker:	4	3	- - -	- - -	0.04	0.04	- -	- -	- - - - -
Bullhead:	- - - -	1	- - -	- - -	- -	0.01	- -	- -	- - - - -
Common Carp:	- - - -	- - -	9	10	- -	- -	0.15	0.17	Below 0.25
Bluntnose Minnow:	20	2	- - -	- - -	0.22	0.03	- -	- -	- - - - -
Silverside:	4	55	- - -	- - -	0.04	0.79	- -	- -	- - - - -
Total CPUE	1,089	1,006	456	274	12.1	14.36	5.72	5.67	6.00 plus

*Under 7" sampled only first run. Very high numbers of bass under 7" fall 2019. Excluding all bass unde 8" from CPUE would provide CPUE for largemouth bass at 2.17 fish per minute, and a total CPUE of all fish at 7.67 fish per minute.
** 2015 and 2011 are from IDNR fisheries reports.

Table 2: Proportional Stock Density (PSD)

Species:	'20f	(19f)	('15f**)	('11f**)	Objective
Largemouth Bass:	74	(76)	(57)	(79)	40-70
Bluegill:	15	(15)	(5)	(5)	20-60
Black Crappie:	- - -	(100)	(- - -)	(- - -)	30-60
Smallmouth Bass:	100	(83)	(63)	(33)	30-60
Yellow Perch:	31	(63)	(- - -)	(- - -)	30-60
Walleye:	100	(- - -)	(- - -)	(80)	30-60

** 2015 and 2011 are from IDNR fisheries reports.

Table 3: Relative Weight (Wr)

Species:	Wr (Ave)				Range:				Objective
	20f	19f	15f**	11f**	20f	19f	15f**	11f**	
Largemouth Bass:	101	101	105	94	78-147	80-120	- - - - -	- - - - -	90-110
Bluegill:	96	99	109	88	64-141	61-145	- - - - -	- - - - -	90-110
Black Crappie:	- -	103	- -	- -	- - - - -	91-135	- - - - -	- - - - -	90-110
Smallmouth Bass:	125	129	93	95	117-132	110-149	- - - - -	- - - - -	90-110
Yellow Perch	81	81	- -	- -	72-96	76-86	- - - - -	- - - - -	90-110
Northern Pike:	100	95	97	- -	100	91-97	- - - - -	- - - - -	90-110
Walleye:	75	- -	86	80	75	- - - - -	- - - - -	- - - - -	- - - - -

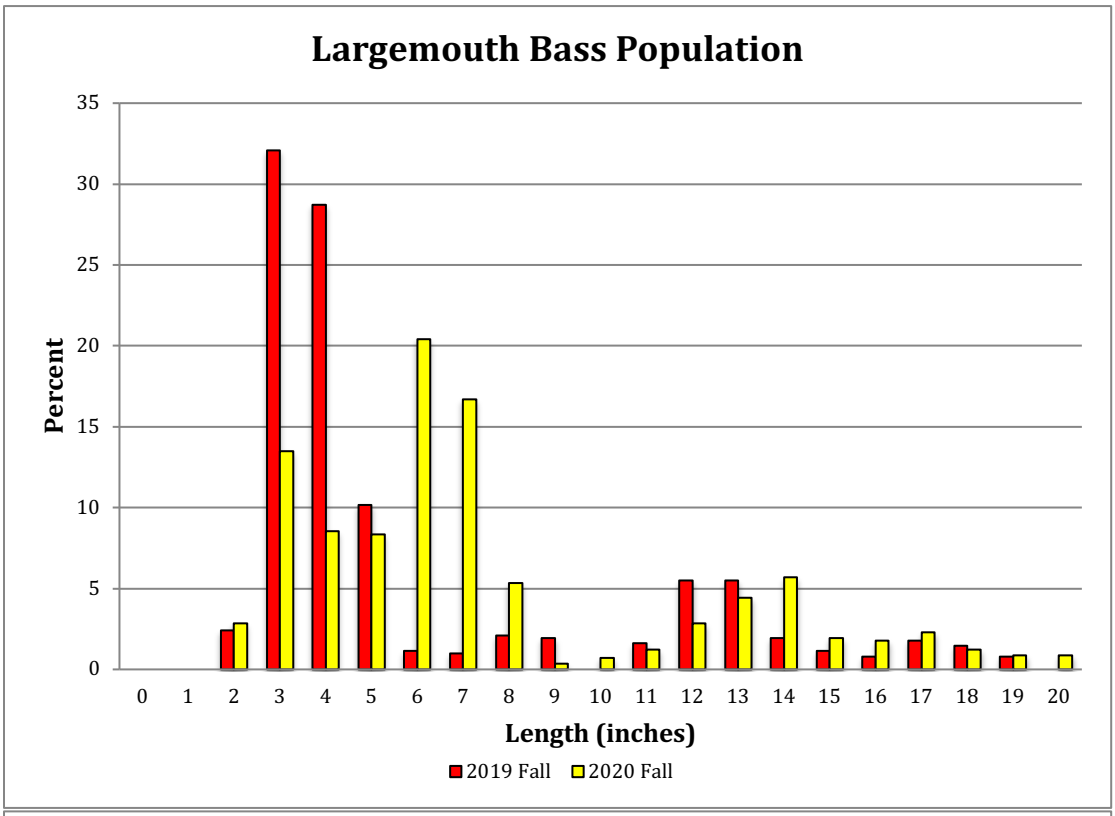
**2015 and 2011 are from IDNR fisheries reports.

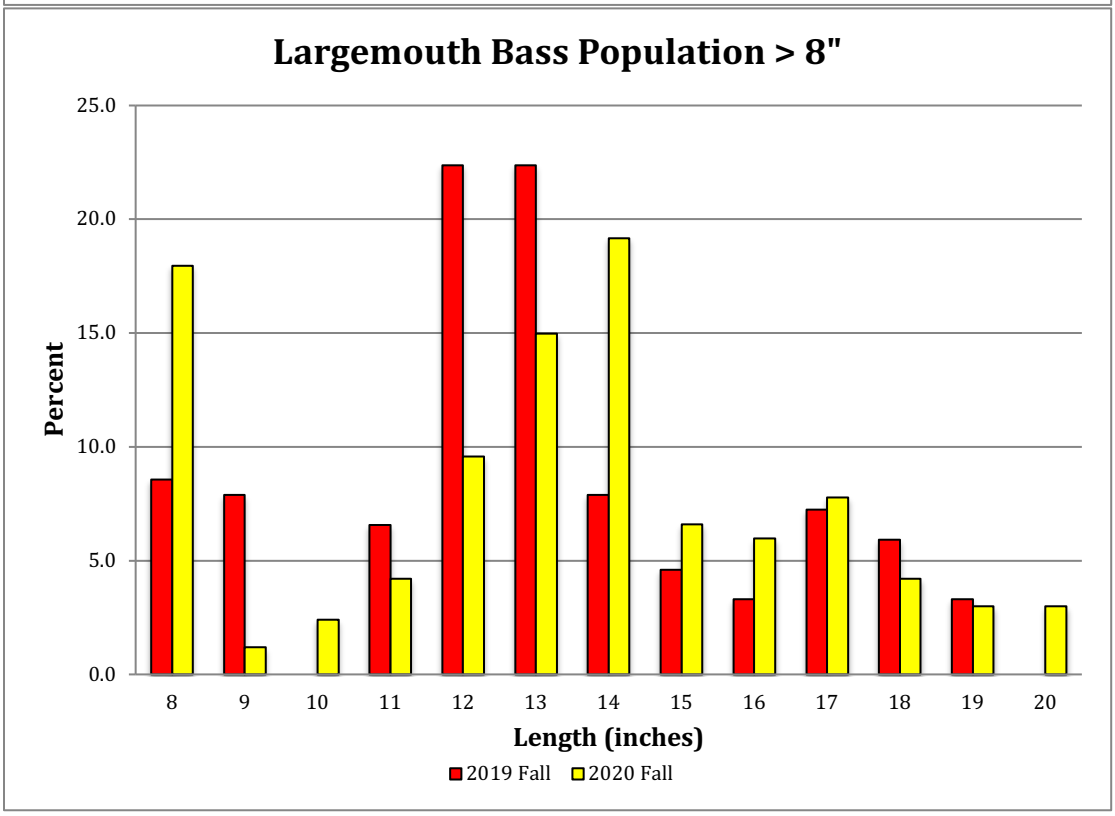
JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*

Table 4: Length Ranges by Species

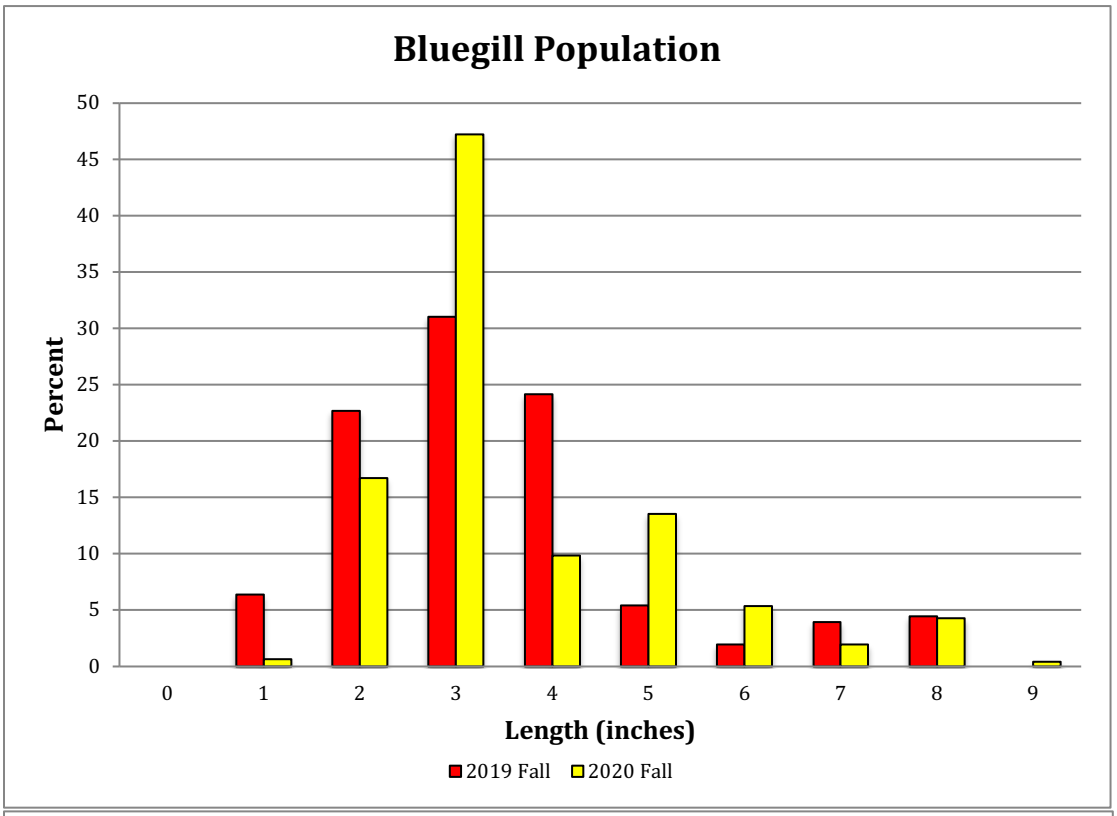
Species:	***Length:***				***Average:***			
	20f	*19f*	*15f***	*11f***	***20f***	*19f*	*15f***	*11f***
Largemouth Bass:	***2.2"-20.5"***	2.6"-19.4"	2.5"-19.5"	2.4"-19.3"	***8.0"***	6.5"	- -	- -
Bluegill:	***1.4"-9.6"***	1.4"-8.7"	0.75"-8"	1.2"-7.5"	***4.2"***	3.9"	- -	- -
Smallmouth Bass:	***3.5"-16.9"***	4.1"-16.7"	3"-18.1"	- - - -	***9.1"***	8.8"	- -	- -
Black Crappie:	- - - -	2.2"-12"	- - - -	- - - -	- -	5.5"	- -	- -
Yelow Perch:	***2.8"-11.7"***	4.4"-11.5"	- - - -	- - - -	***6.8"***	7.7"	- -	- -
Muskie:	- - - -	33.9"	- - - -	- - - -	- -	33.9"	- -	- -
White Sucker:	***11"-22.1"***	16"-19.1"	- - - -	- - - -	***17.2"***	17.9"	- -	- -
Walleye:	***27.6"***	- - - -	12"	9.4"-24.8"	***27.6"***	- -	- -	- -
Northern Pike:	***31.1"***	13.1"-29.1"	- - - -	- - - -	***31.1"***	18.7"	- -	- -
Bluntnose Minnow:	***2.2"-3.7"***	2.4"-3.3"	- - - -	- - - -	***3.5"***	2.9"	- -	- -
Silverside:	***1.9"-3.0"***	2"-3.6"	- - - -	- - - -	***2.5"***	2.9"	- -	- -
Bullhead:	- - - -	10"	- - - -	- - - -	- -	10"	- -	- -

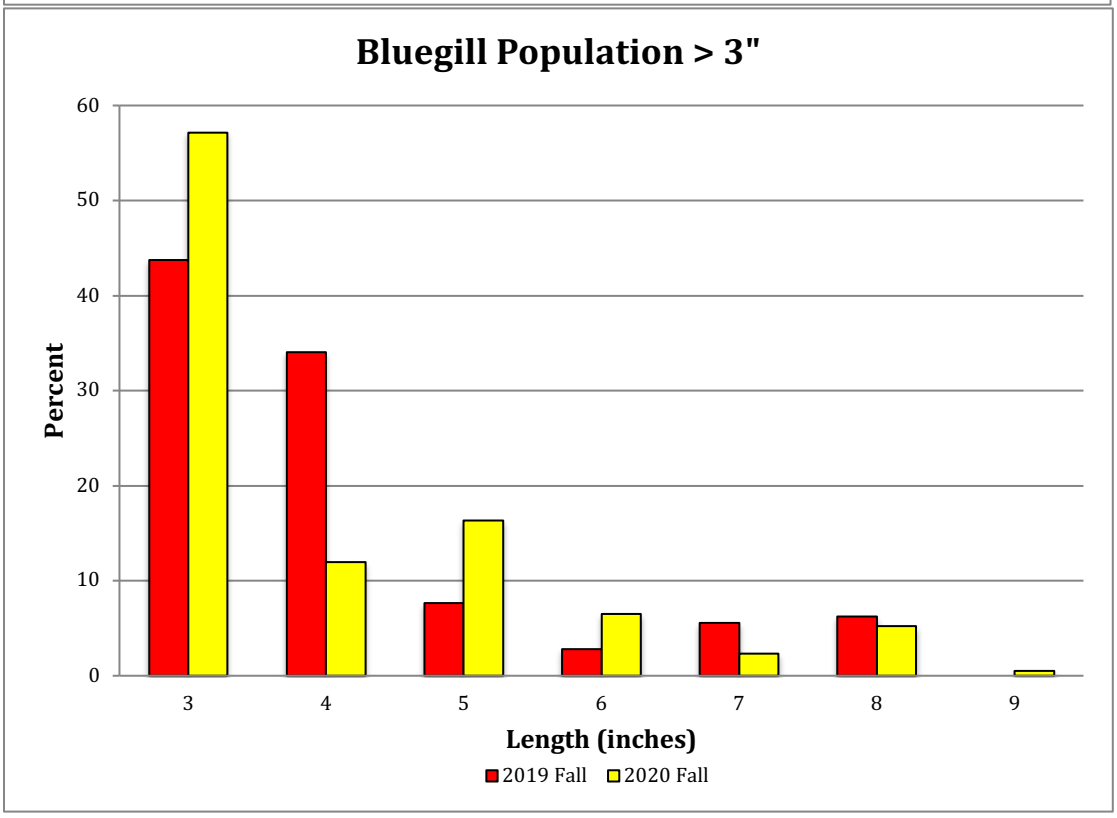
JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*



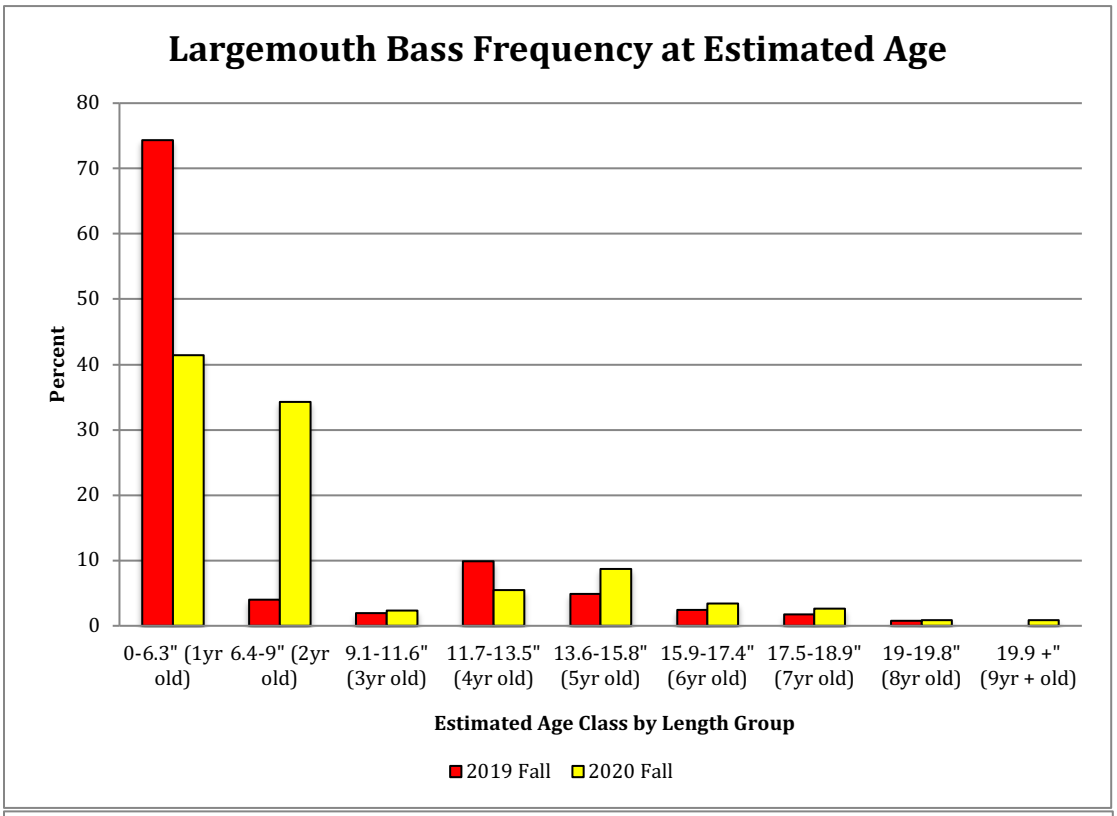


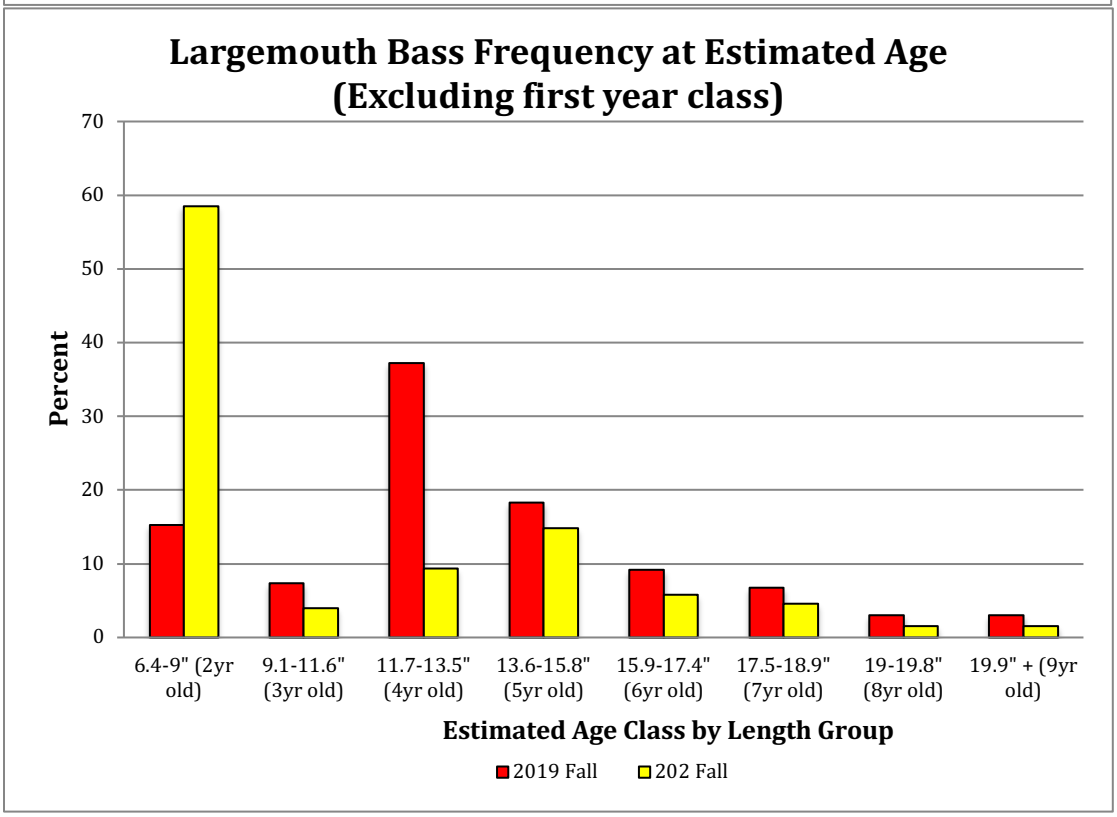
JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*



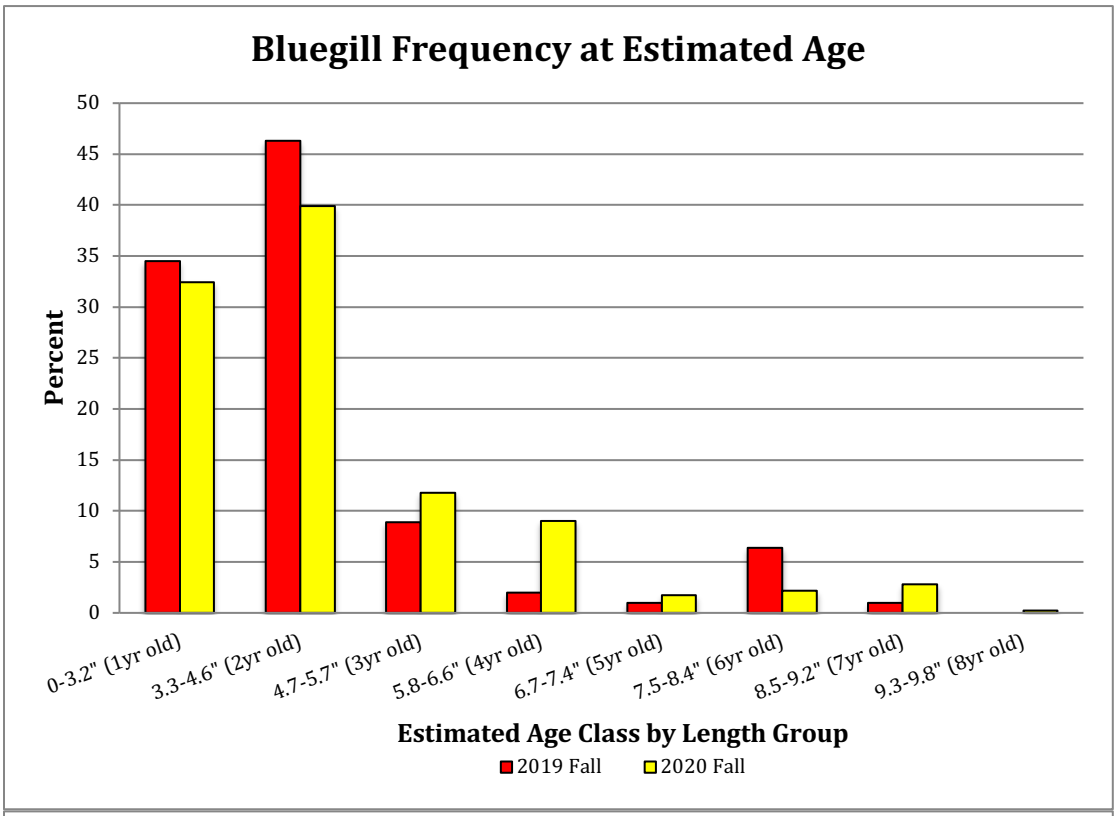


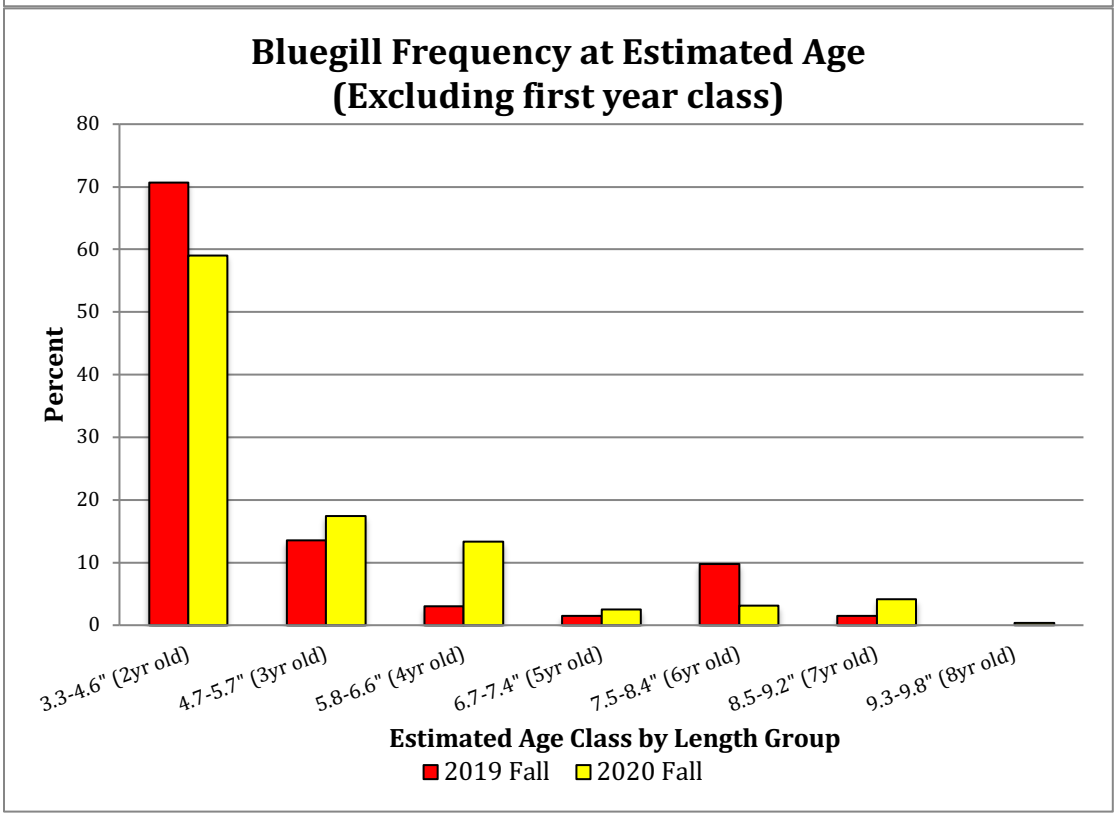
JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*



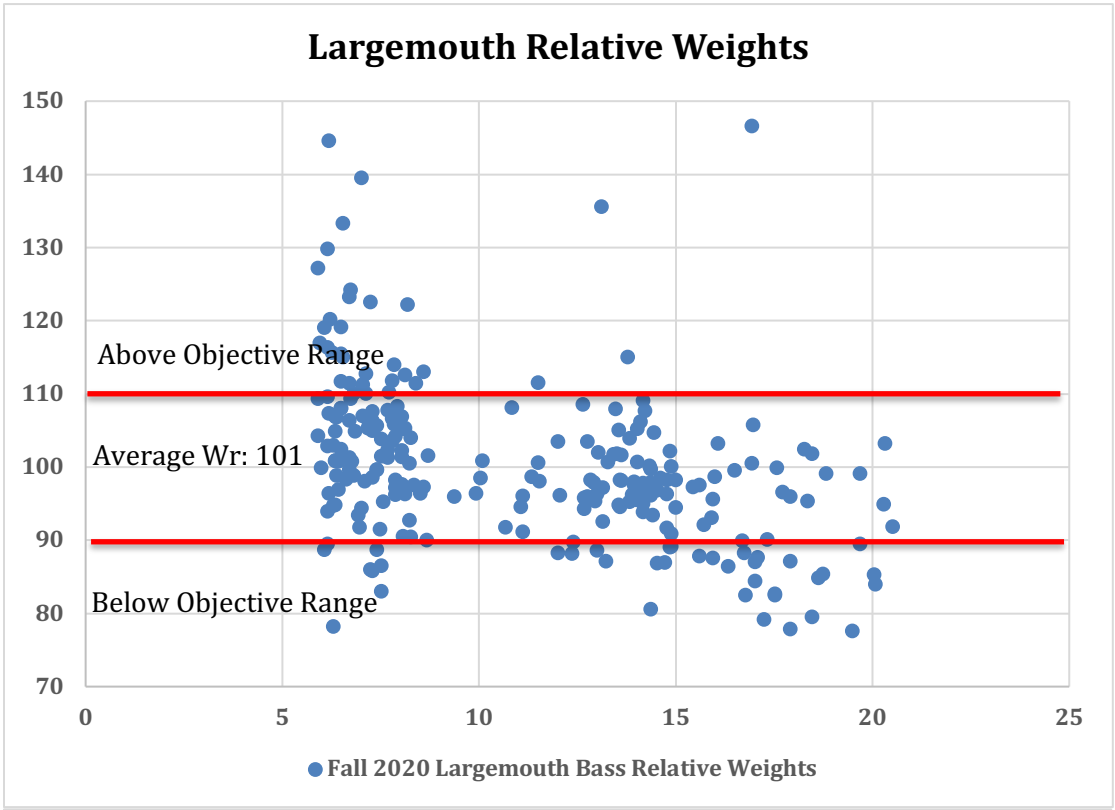


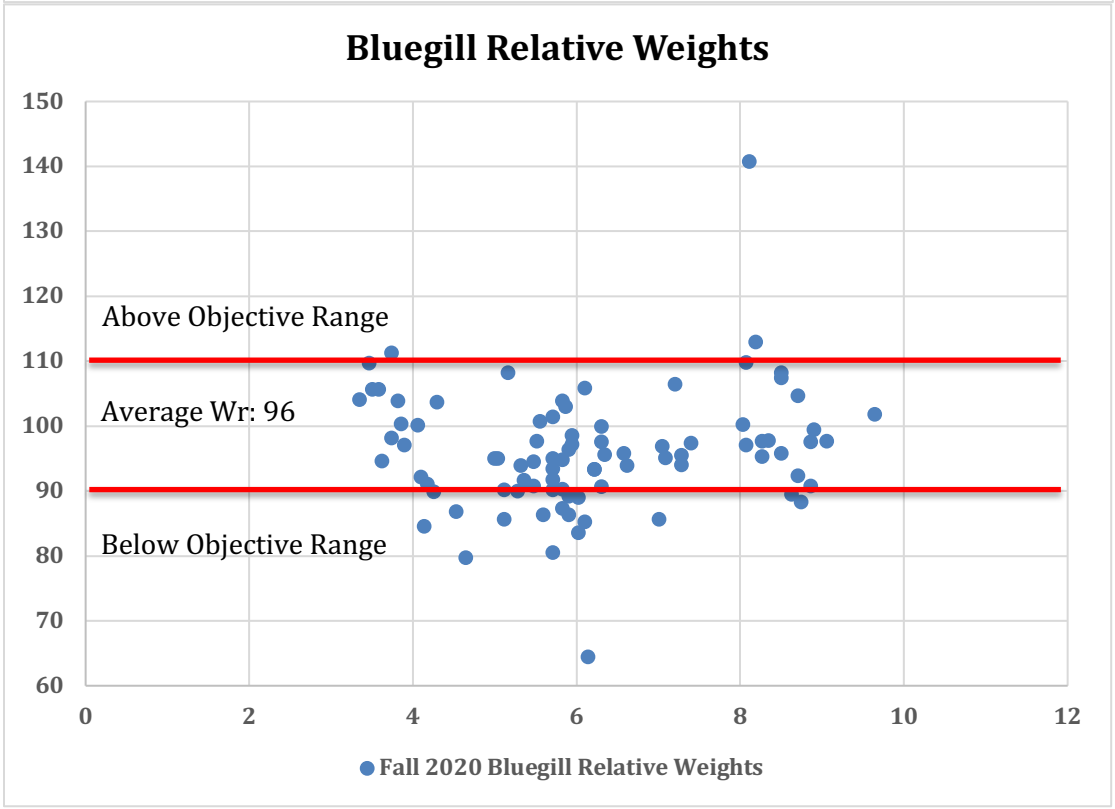
JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*





JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*





JadEco, LLC
PO BOX 445 Shannon, IL 61078
Phone: 815-543-5695 *Email: jrush@jadecoconsulting.com*