

Smith Mountain Lake Striped Bass

July 2021

Lake Striped Bass History

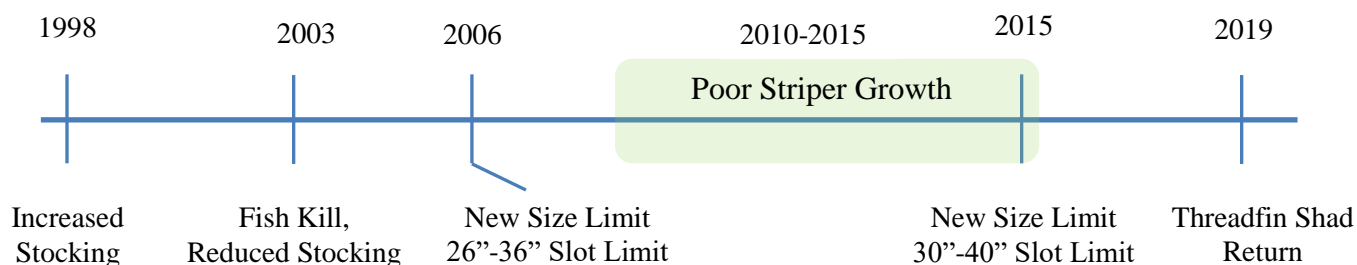
This section is for those who may be new to the area, fishery, or Department of Wildlife Resources (DWR) updates. The lake has experienced a lot of changes in the past 20 years and management of the lake has been directed primarily at maintaining a healthy striped bass population. Management has been shaped primarily by angler interests. Angler interests vary greatly; some would prefer high catch rates regardless of sizes caught while others prefer much larger fish even at the expense of low catch rates. Producing high catch rates and lots of trophy striped bass at the same time has not been very successful. The majority of anglers seem to prefer the middle, having decent catch rates with the chance to catch a trophy fish occasionally. Smith Mountain Lake is the only lake in Virginia that has adequate habitat to produce good numbers of larger striped bass, and DWR continues to manage for trophy fish to be a component of the fishery. Management goals will not always align with all anglers primary interests and some striped bass anglers will disagree with the goals and how management is conducted. DWR welcomes continued discussions from those who have other ideas and interests since we do manage for the angling public and need input from everyone as we attempt to provide the best fishery possible that satisfies the most anglers.

After the striped bass kill in 2003, a 26"-36" protective slot limit was initiated to help rebuild the population and increase the number of larger striped bass. The fishery responded well and most anglers were generally happy with the regulations. However, growth rates declined for "slot size" fish by 2010. By 2013, there was less than a two inch difference in the average sizes of 5-12 year old fish and all these ages averaged less than 30 inches. Striped bass at SML should average about 36 inches at age 10. At the same time, DWR observed that the shad population was also showing impacts from too much predation. Shad data collected by DWR showed a correlation between the number of adult gizzard shad (> age 1 or 6 inches) and striped bass growth, higher numbers of adult gizzard shad corresponds with better striped bass growth (Figure 3).

A new protective slot limit (30"-40") was initiated in 2015 to reduce the number of stunted striped bass between 26-30 inches, improve growth, and provide continued protection for some of the larger fish. Estimates from SML tagging data show that approximately 90% of the striped bass ≥ 30 " are caught each year. While many of these fish would be released voluntarily, additional protection was needed to meet management goals for these valuable fish. Additional changes may still need to be made but data collected to date, indicated the shad population recovered and striped bass growth improved to near historical growth rates for younger ages by 2018. Many of the older stripers that were stunted, never will achieve full growth potential.

Smith Mountain Lake has had a thriving population of blueback herring since about 2015. This species had not been observed by DWR in at least 25 years (old records indicate Bluebacks may have been present 30+ years ago) and may be changing fishing patterns. Blueback Herring prefer cooler temperatures and allow striped bass to forage deeper throughout the year, especially during the summer.

One way to be involved in the management is to fill out an angler diary since much of our striped bass data comes from this program and captures data we cannot collect otherwise. Additionally, DWR needs annual growth data on striped bass. DWR collects growth data from gill nets, which targets younger and smaller fish, primarily up to 3 years of age. Anglers have provided larger striped bass for growth data to DWR for many years and this data has been a vital component of management. Anglers who harvest larger striped bass (≥ 25 inches) can remove the head after cleaning and drop the head off at Captain's Quarters for later pickup by DWR. Captains Quarters has a chest freezer located on the outside of the building to place heads in. The age of each fish can be determined from the otoliths (ear bones) that are extracted from these heads. Anglers need to provide a length and date caught for each fish head dropped off and can include name and contact information if you would like to know the ages of fish that you dropped off.



Information for 2020

Angler diary catch of striped bass (≥ 20 ") improved in 2019 and 2020 after three years of reduced catch rates in 2016-2018. It took an average of 3.3 hours to catch a striped bass in 2011-2015 and 4.5 hours in 2016-2018. However, catch rates for larger fish (≥ 26 inches) remained stable (Table 1). Catch rates for stripers at least 30 inches improved in 2017 through 2020 and is currently higher than any year recorded since the diary program began over 20 years ago.

Overall, anglers have had improved catches the past couple years and current catch rates are near the average compared to the last 15 years (Table 1 & 2). The number of mid-size fish (20"-25"), that has historically been the major portion of angler catches, improved in 2019 and again in 2020. The improvements were from better survival of fish stocked since 2017 (Table 4 & 5). Gill net catch rates for 1-year old stripers in 2018 was the highest ever recorded.

Current management objectives are to maintain the striped bass population similar 2019-2020 levels. However, a slight decline in growth the past two years and a very large number of stripers collected in fall gill nets that were from the 2020 stocking is concerning. Continued increasing populations will likely result in reduced health and inadequate forage as seen in the past. We may have to reassess the increasing number of larger striped bass if trends continue, as the lake's forage will only support a limited biomass of striped bass. Each large fish consumes the same amount of forage, as several smaller fish so there are tradeoffs, lots of big fish reduces the number of smaller fish the lake can sustain.

There are concerns with the current shad population and striper growth as both of these declined 2020, but do remain within acceptable levels (figure 3). Further declines would indicate potential forage shortages. Sampling in 2021 will provide additional insight for shad trends and striper growth.

The threadfin shad population has been increasing the past two years. No threadfin shad were collected in DWR shad sampling from 2010-2018, threadfin shad were likely extirpated during past cold winters but may have been restocked by anglers. While threadfin shad can be a good compliment to other shad species, they do compete with other forage species and reduce gizzard shad reproduction. If Threadfin shad populations stayed consistent, they would not be as concerning. Because they reduce gizzard shad reproduction, the forage base can be severely reduced if most threadfin die in the winter. If threadfin shad numbers are high enough, reducing gizzard shad production, a threadfin winter kill can cause lack of adequate striper forage for 6-7 months until shad numbers rebuild. This situation did occur in 2003 and was one of the causes for the striped bass fish kill. The winter of 2020/2021 was cold enough to cause a limited threadfin shad kill. Temperatures from this winter were close to lethal temperatures for threadfin but were not cold enough for a complete kill. DWR is expecting forage to be reduced in 2021 (March-August) due to losing significant numbers of threadfin shad last winter and combined with the poorest year class of gizzard shad ever seen during DWR shad sampling. Average catch of young gizzard shad (< 6") 2001-2019 was 200 fish per hour but was only 7 per hour in 2020.

Striped bass stocking was reduced in 2021 because striped bass growth has declined, gill net catch rates of 6-month-old stripers in 2020 were highest on record (2 times higher than any other year), and the forage could be temporally reduced from potential threadfin shad kill this past winter. DWR continually adjusts stocking rates depending on various conditions of striped bass and forage populations.

For additional information or questions, feel free to contact me.

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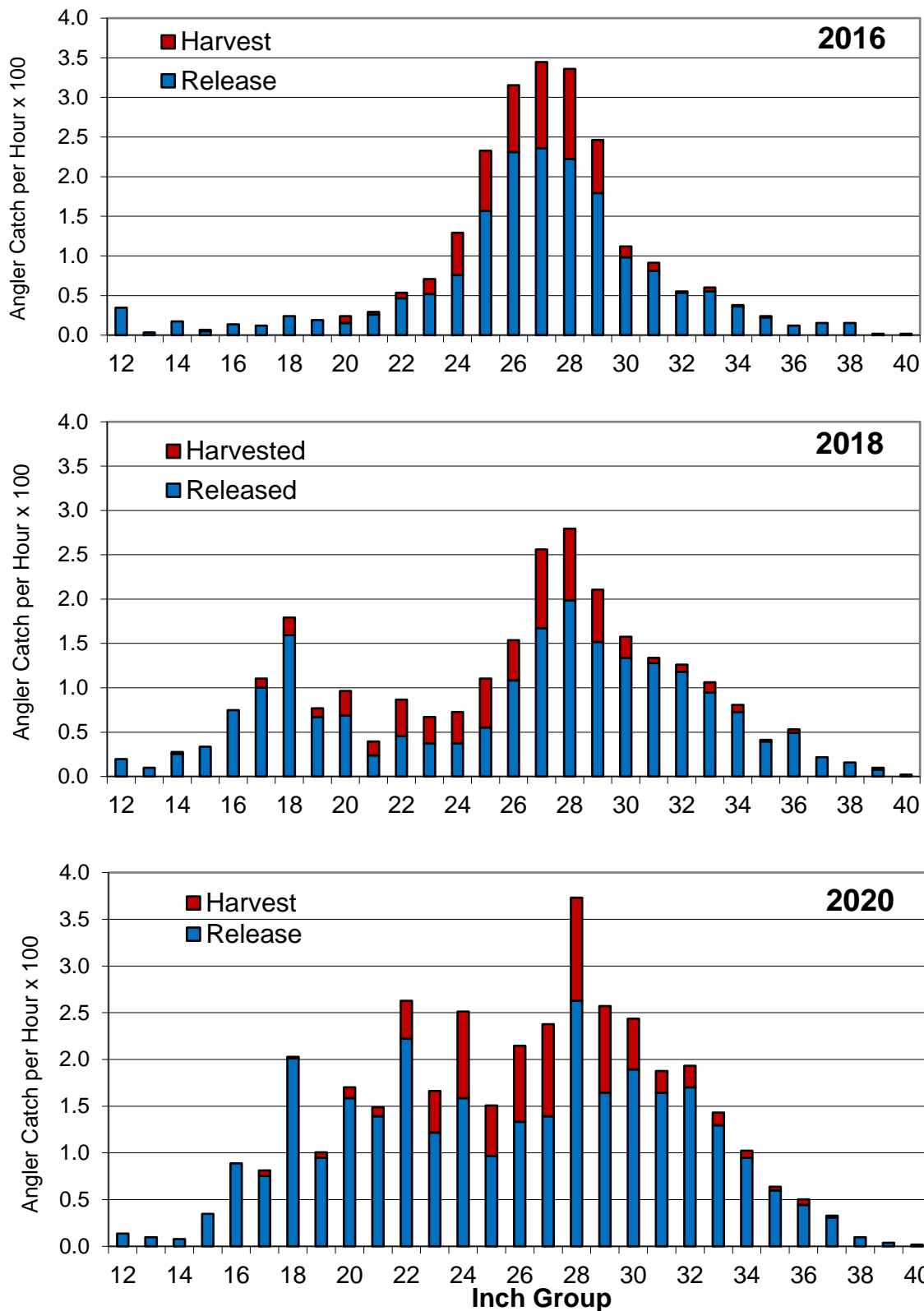


Figure 1. Striped bass data collected from Smith Mountain Lake angler diaries in 2016, 2018, and 2020. Each bar represents angler catch rate of striped bass for each inch group and what portion of those were harvested and released. Higher bars equal more fish caught.

Table 1. Catch data trends for striped bass caught by anglers at Smith Mountain Lake for various size groups. It took 2.8 hours to catch a striper of any size in 2014 and 2.6 hours in 2020, but 3.3 hours to catch a striper at least 20 Inches in 2014 and 3.1 hours in 2020. Hours of fishing to catch larger (≥ 26 Inches) stripers has been stable. It took 3 times longer in 2017-2018 to catch a striper 20"-25", but improved in 2018-2020. Hrs / Fish = hours of fishing to catch one striped bass. Data collected from angler diaries.

	2014 Hrs / Fish	2015 Hrs / Fish	2016 Hrs / Fish	2017 Hrs / Fish	2018 Hrs / Fish	2019 Hrs / Fish	2020 Hrs / Fish
Any Size	2.8	2.9	4.2	4.1	3.8	3.1	2.6
≥ 20 Inches	3.3	3.1	4.5	4.4	4.7	3.7	3.1
≥ 26 Inches	7	6	6	6	6	5	5
≥ 30 Inches	20	21	24	16	14	12	10
20-25 Inches	6	7	18	21	21	13	9

Table 2. Catch data trends for Smith Mountain Lake, angler diary data only includes striped bass caught at least 20 inches in length. The table includes the average number of hours to catch one striped bass, and percent of stripers caught that were citations. The last column is the number of striped bass citations issued by DWR for striped bass caught by any angler (not just diary anglers) at SML.

	Hours/Striped Bass	% Citations in Diaries	DGIF Citations
2004	3.3	0.1%	7
2005	3.4	0.2%	25
2006	3.8	0.7%	23
2007	5.0	0.4%	38
2008	3.6	0.8%	45
2009	3.5	0.6%	42
2010	5.2	0.9%	90
2011	3.4	0.4%	63
2012	2.9	0.4%	44
2013	3.6	0.1%	32
2014	3.3	0.3%	31
2015	3.1	0.7%	20
2016	4.5	1.3%	34
2017	4.4	1.2%	46
2018	4.7	2.1%	35
2019	3.7	2.2%	38
2020	3.1	1.2%	NA

Table 3. Smith Mountain Lake striped bass percent of angler catch of all sizes for different size groups. Data was collected from Smith Mountain Lake angler diaries.

Year	< 20"	20"-25"	26"-29"	≥ 30"
2004	34%	57%	8%	1%
2005	21%	50%	23%	6%
2006	16%	45%	31%	8%
2011	19%	34%	32%	15%
2012	19%	38%	32%	11%
2013	21%	42%	27%	10%
2014	14%	44%	28%	14%
2015	8%	41%	37%	14%
2016	6%	23%	53%	18%
2017	10%	19%	46%	25%
2018	21%	18%	34%	27%
2019	17%	24%	32%	27%
2020	15%	30%	29%	26%

Table 4. Smith Mountain Lake striped bass stocking numbers, estimated survival of stocked striped bass for the first year (collected at age 1½), and average sizes stocked. Marine striped bass were stocked in 2015 instead of traditional stockings from Kerr Reservoir broodstock. Additional fry were stocked in 2020, surplus fry typically have very poor survival and should not contribute many fish.

Year Stocked	# Stocked	Estimated Survival	Av. Size Stocked
2006	349,963	Excellent	1.1"
2007	410,423	Good	1.4"
2008	400,334	Good	1.2"
2009	268,826	Fair	1.3"
2010	368,826	Excellent	1.1"
2011	327,511	Excellent	1.5"
2012	350,658	Good	1.4"
2013	351,219	Fair	1.3"
2014	300,338	Fair	1.0"
2015	348,121	Poor	1.2"
2016	317,268	Poor	1.3"
2017	448,136	Excellent	1.2"
2018	390,823	Fair	1.5"
2019	313,591	Good	1.5"
2020	411,312	NA	1.1"

Table 5. Smith Mountain Lake striped bass catch data (fish/net) collected from DWR fall gill nets for ages ½ - 2½ and for all striped bass collected.

Sample Year	Catch/Net Age ½	Catch/Net Age 1½	Catch/Net Age 2½	All Ages Catch/Net
2006	4.7	2.8	1.0	10.1
2007	1.0	19.3	1.0	22.9
2008	3.5	12.9	4.0	20.5
2009	0.8	16.9	1.6	21.4
2010	3.6	6.6	4.4	16.0
2011	4.1	22.9	1.6	30.6
2012	2.3	19.2	3.8	26.2
2014	0.1	10.1	3.3	15.5
2015	0.1	8.6	3.0	16.1
2016	0.9	5.9	1.8	10.8
2017	2.2	5.3	0.3	9.3
2018	1.0	23.4	2.3	27.8
2019	1.1	9.2	2.3	13.3
2020	10.9	14.6	2.5	29.0

Table 6. Striped bass average length data collected from DWR gill nets at Smith Mountain Lake.

Year	Age 1½	Age 2½	Age 3½
Goal	17.0	21.0	24.5
2006	17.2	21.0	24.3
2007	16.9	21.0	24.9
2008	16.7	20.8	24.5
2009	16.0	20.4	23.9
2010	17.0	20.5	23.4
2011	17.0	20.7	23.6
2012	17.2	20.9	23.4
2014	16.7	20.5	23.6
2015	16.5	21.3	24.2
2016	17.1	21.5	24.7
2017	17.1	22.4	24.6
2018	17.0	21.3	25.6
2019	17.0	20.7	24.0
2020	16.4	21.3	23.6

Table 7. Striped bass average lengths collected from DWR gill nets (ages 1-3) and anglers (ages ≥ 4) at Smith Mountain Lake. The “Goal” is what striped bass growth rates should be based on historical data. There was good growth after the 2003 striped bass kill until about 2010. By 2012; growth started declining, especially for fish over 4 years old due to high numbers of fish in the protected slot limit and declining shad populations.

Year	Age 1½	Age 2½	Age 3½	Age 4	Age 5	Age 6	Age 7	Age 8
Goal	17.0	21.5	24.5	27.0	29.0	30.5	32.0	33.5
12-14	17.0	20.7	23.5	25.2	26.4	27.6	28.5	29.1
16-17	17.1	22.0	24.6	26.9	27.7	28.4	28.8	29.1
2018	17.0	21.3	25.6	26.5	28.3	28.6	30.1	
2019	17.0	20.7	24.0	27.4	28.9	29.5	29.9	30.3
2020	16.4	21.3	23.6	26.6	28.7	29.4	30.5	31.1

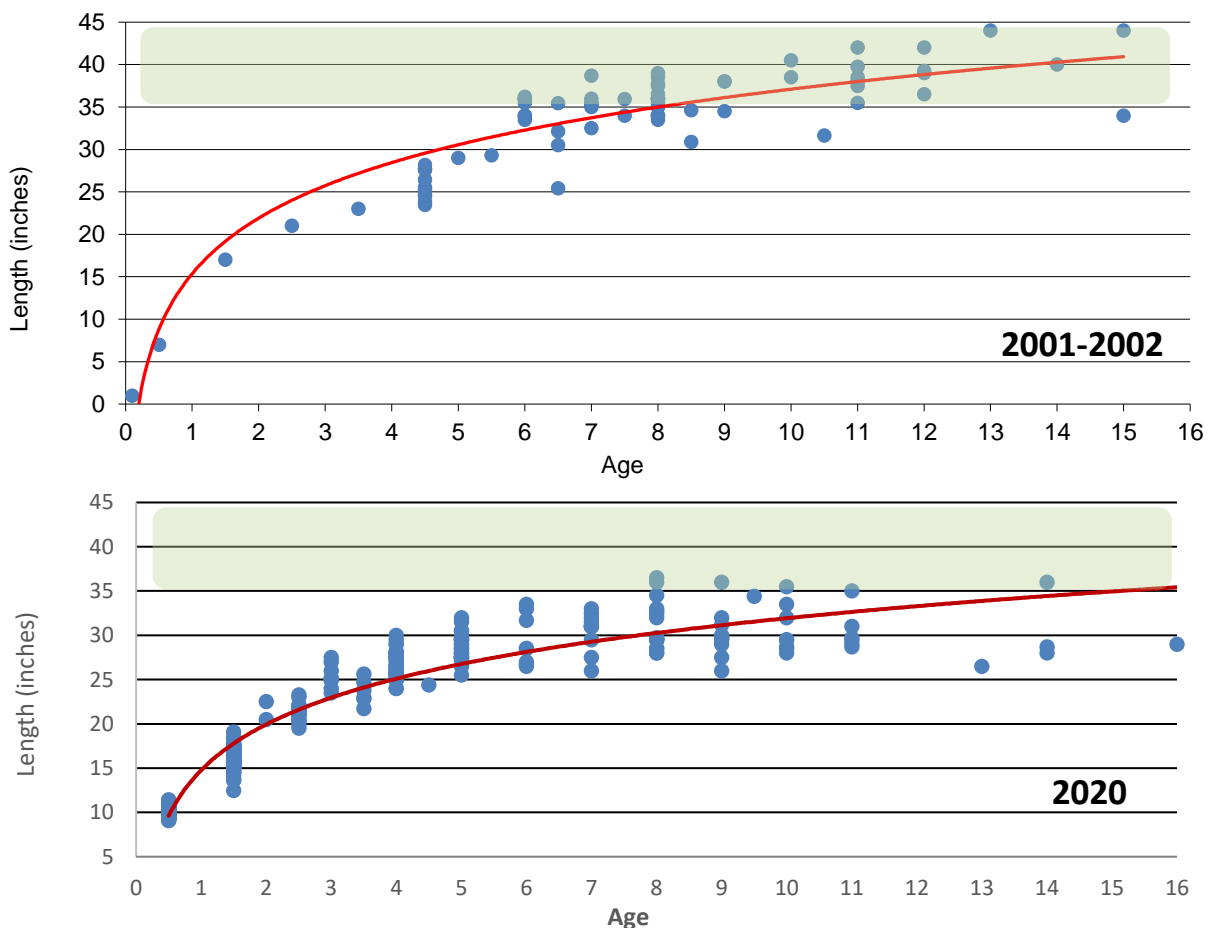


Figure 2. Smith Mountain Lake striped bass age and length data collected from anglers and DWR fall gill nets for 2001-2002 and 2020. Data collected in 2001-2002 represents good growth and how stripers at SML should grow. You may notice a fair amount of difference at each age; some grow faster or slower than average (red line), which is normal. Growth remains slow enough at current levels that not many stripers are getting into the 35+ inch range.

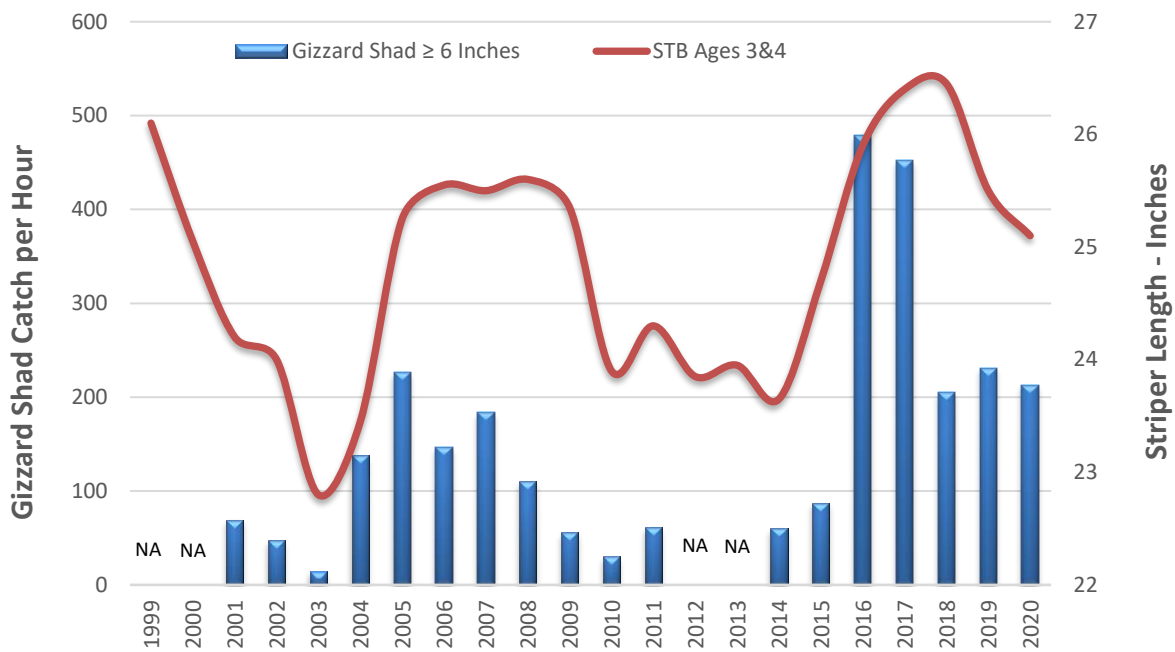


Figure 3. Smith Mountain Lake adult gizzard shad data and average growth of 3 and 4 year old striped bass collected in DWR gill nets. Gizzard shad catch is the number of shad ≥ 6 " caught per hour of sampling. Shad sampling began in 2001, no sampling was conducted in 2012 and 2013.

Table 8. Catch data trends for striped bass caught by anglers at Smith Mountain Lake for each month in 2020. Data includes all fish caught. Data collected from angler diaries.

Month	Hrs / Fish	# Caught	% Released	Average Size Caught	Total Hours Fished
Jan.	2.3	96	94%	25.6	219
Feb.	2.0	161	91%	23.7	314
March	2.3	384	81%	26.7	884
April	1.9	217	88%	25.1	419
May	3.9	139	78%	23.6	547
June	4.9	76	62%	22.2	372
July	3.1	125	54%	25.8	392
Aug.	3.0	101	40%	25.2	306
Sept.	2.3	177	69%	25.7	405
Oct.	3.0	149	87%	26.6	442
Nov.	2.7	152	89%	28.2	413
Dec.	2.2	212	95%	26.2	462
Total	2.6	1,989	80%	25.7	5,174

Table 9. Catch data for striped bass caught by anglers at Smith Mountain Lake for each month in 2020. Data includes only all fish caught that were at least 20 inches. Data collected from angler diaries.

Month	Hrs / Fish	# Caught	Average Size Caught
Jan.	2.6	83	30.2
Feb.	2.6	120	28.6
March	2.5	349	28.6
April	2.4	178	28.4
May	5.7	96	25.9
June	7.2	52	26.5
July	3.4	116	25.6
Aug.	3.4	91	26.1
Sept.	2.5	160	26.3
Oct.	3.5	127	29.0
Nov.	3.0	138	29.4
Dec.	2.6	175	27.9
Total	3.1	1,685	27.8

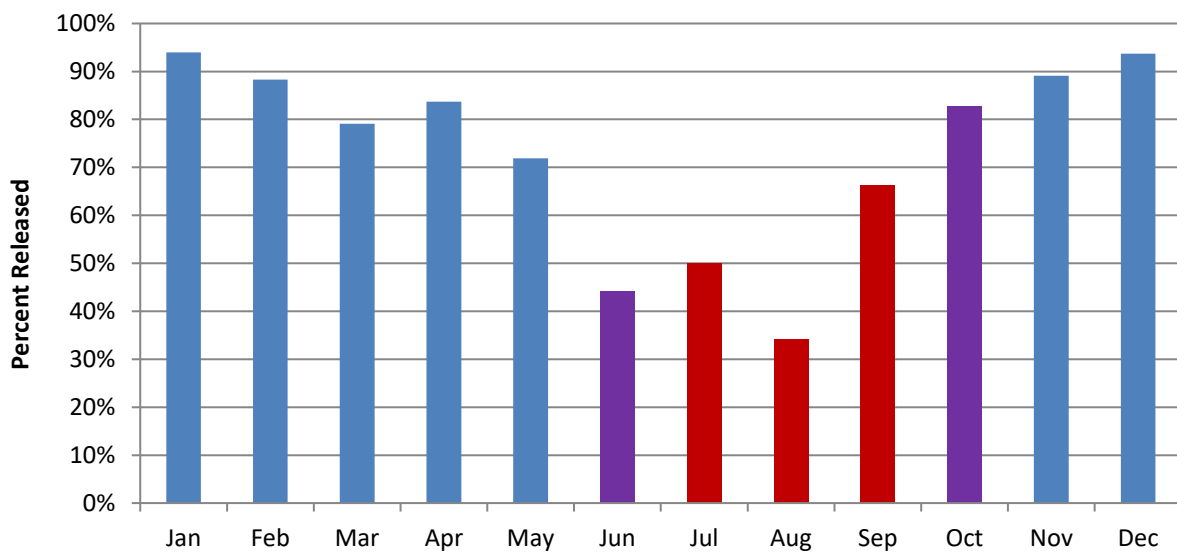


Figure 4. Percent of striped bass released by anglers at Smith Mountain Lake for each month in 2020. Data includes only fish caught ≥ 20 inches. Summer months are best for harvest as catch and release mortality is much higher during the warm water periods. June and September are transitional months and water temperatures can vary greatly depending on weather and days of the month. Some years, early June and late September have acceptable temperatures for catch and release survival. Data collected from angler diaries.