

SURVEY REPORT
OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS
FOR
SOONER LAKE
2025

SURVEY REPORT

State: Oklahoma

Project Title: Sooner Lake Fish Management Survey Report

Period Covered: This report discusses survey results from 2025.

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Date Prepared: January 2026

Sooner Lake

ABSTRACT

Sooner Lake was surveyed using experimental gillnets to determine the status of the Hybrid Striped Bass, Saugeye and White Perch populations during the 2025 fall sampling season in November and again in December. Data from the November 2025 sample will be compared to previous standardized sampling efforts to monitor trends in catch per unit effort (CPUE) and population dynamics. The November sample will be compared to the December sample to evaluate the differences and see if Saugeye/White Perch relationships are temperature/time of year related.

Recommendations include gillnetting fall of 2026 for Hybrid Striped Bass, Saugeye and White Perch. Increase the Hybrid Striped Bass stocking rate to 10/acre. Change the length limit on Saugeye to 14in. Continue stocking Threadfin Shad broodstock each year. Lastly add standalone signage that explains White Perch must not be returned to the water alive.

Introduction

Background

Sooner Lake impounds Greasy Creek, 15 miles south of Ponca City in Noble and Pawnee Counties, Oklahoma. The Greasy Creek basin is a small, prairie grass watershed. The silt load is light and is trapped on the West side of Highway 177. Overall water quality is very high due to the small size and quality of the watershed which results in very stable water levels even during heavy spring rain events. Sooner Lake covers 5,400 surface acres and was constructed in 1976 by the Oklahoma Gas and Electric Company to serve as a cooling reservoir. The thermal impact of the plant is limited to the west side of the lake which only covers about 25 percent of the total area of the lake, so the main body of Sooner Lake is thermally unaffected. Sooner Lake is located close to the Arkansas River and was initially filled and by pumping water from the Arkansas. Water levels are now maintained in the same way. Sooner Lake has a mean depth of 28 feet and a maximum depth of 89 feet, a shoreline development ratio of 5.2, a very low water exchange rate of 0.05 (inflow/storage capacity) and a secchi disc visibility of around 70 inches in the main pool in August; turbidity is primarily from plankton.

Fish habitat consists primarily of aquatic vegetation, primarily pondweed, water milfoil and cattails. Due to stable water levels and clear water, aquatic vegetation covers most shorelines and extends out to a depth of six feet. Standing timber is restricted to several coves south of Highway 15 and is not accessible by boat from the main body of the lake. Rip-rap habitat originally covered 9.7 miles but the more exposed stretches were concreted in to prevent further wave erosion. The remaining rip-rap areas are located behind the north and central dykes and covers 4.1 miles of shoreline. Substrates are largely clay with some limited areas of sandstone rock. The surrounding topography is open tall grass prairie which leaves the lake open to the prevailing winds.

Current Management Practices

Evaluate and Maintain Stocked Moronid and Percid Fish Populations

Hybridized fish species like hybrid striped bass and saugeye do not have the capability to reproduce and sustain their populations as other game fish can. These put and take fisheries are subject to greater control by fisheries managers who must request annual introductions to maintain their abundances in satisfactory levels for the angling public. Populations must be monitored closely to ensure this limited resource is used most efficiently. The Sooner Lake hybrid fishery is high profile and utilized regularly by fishing guides. The saugeye fishery at Sooner Lake is currently being evaluated as a method to control invasive white perch. The maintenance of current data on these species is vital

to gauging success of these management strategies and communicating about them with constituents.

White Perch Monitoring and Research

The aquatic nuisance species White Perch was first documented in Sooner Reservoir in 2006. Following introduction, managers observed increasing numbers, negative impacts on sport fish, and angler dissatisfaction. A year-long diet study was conducted to determine if a viable candidate for biological control of White Perch was present in the current species assemblage. The 2016 completion of that study found the foraging success of Saugeye to be significantly higher than that of the other predator species examined. Stocking Saugeye to control White Perch in Oklahoma is novel and no standard protocol currently exists for stocking rates and length limit regulations. A five year evaluation of this concept began in 2019 following two seasons of collecting baseline data. The plan included Sooner Reservoir maintaining an 18 inch minimum length limit on Saugeye, doubling Saugeye stocking rates to 40 fish per acre, and halving Striped Bass x White Bass Hybrid stockings to 5 per acre.

2025

November

We sampled Sooner Lake using experimental gillnets. Gillnets were deployed around the lake at randomly selected sites perpendicular to the shore in a minimum of 6ft deep. A total of 20 net nights of sampling was completed. All fish were measured (mm) and weighed (g). Target species had their otoliths removed for aging (Hybrid Striped Bass, Saugeye, White Perch).

Hybrid Striped Bass:

A total of 93 Hybrid Striped Bass were collected. Catch Per Unit Effort (CPUE) was only significantly different (lower) compared to 2022 (Figure 1, Table 1). Proportional size distribution (PSD) significantly decreased compared to 2024 but was not significantly different for the other years of the study (Figure 3). Preferred sized fish did not significantly change compared to 2023 or 2024 (Table 2). Mean length at age was significantly lower compared to 2023 and 2024 for age 1. Age 2 hybrids were not significantly different from 2024 but were significantly higher compared to every other year (Figure 2, Table 3). Length frequencies resemble that of 2024 with about 30% of hybrids ranging from 450mm (17.7in) to 499mm (19.6in) but had a noticeable increase in Hybrids 275mm (10.8in) to 299mm (11.8in) (Figure 10). Relative weight of hybrids was 81.63 ± 1.4 and was not significantly different from 2022, 2023, and 2024.

Overall Hybrid Striped Bass had significant decreases in growth for age 1 fish and in PSDs bringing them down to the 50th percentile (previously 75th) of Hybrid fisheries state wide. The age 2 and age 3-year cohorts remained above the 75th percentile of hybrid fisheries statewide. PSD and PSD-P additionally ranked above the 50th and 75th percentile respectively compared statewide fisheries. CPUE did not significantly change compared to last year but was down from previous years and could make it more challenging for anglers to catch them. Continued monitoring using gillnets should be done to determine changes in the Sooner Lake fisheries as increased Saugeye stocking has now halted. The Sooner Lake creel survey found Hybrid Striped Bass were the most targeted species in the lake and the second most harvested species and overall trends of the species in the lake over the study period mixed results compared to before reduced Hybrid stockings. Returning to 10 hybrids/acre would hopefully increase catch rates for the heavily sought after fish.

Saugeye:

A total of 115 Saugeye were collected, and otoliths removed for aging. Catch Per Unit Effort (CPUE) was 6.07, a significant decrease from 2020 and 2024 but not significantly different from the rest of the years in the study (Figure 4, Table 4). Mean Length at Age (MLA) had no significant difference for age 1, 2, and 3 Saugeye from 2024 and only significant increases sporadically from earlier years none of which were 2017 and 2018 the pre increased stockings samples (Figure 5, Table 5). Proportional Size Distribution (PSD) was 82 and was not significantly different from any year in the study (Figure 6). PSD – Preferred was 21 and not significantly different from 2023 or 2024. Length frequencies indicate Saugeye are most abundant in the 425mm (16.7in) to 449mm (17.7in) (Figure 11). Relative weights significantly decreased from $89.72 \pm .73$ in 2024 to 82.12 ± 1.79 in 2025 but not significantly different from 2023 (80.53 ± 1.03).

Saugeye catch rates decreased significantly returning to the same levels as before increased stockings took place. This puts Sooner Lake in the 83rd percentile of Saugeye fisheries statewide for CPUE. While Mean Length at Age did not significantly change from beginning to ending of the project, some year classes did have increased growth compared to baseline data. Growth slowed drastically at age 3 but were reaching harvestable size at that age (Table 6). Harvestable Saugeye make up 21% of the catchable sized fish in Sooner Lake and over 25% of the Saugeye surveyed were within one inch of becoming harvestable. This should alleviate some of the challenges anglers have faced trying to catch harvest sized Saugeye (18in). 2025 was the first-year stocking rates return to historical levels (20 fish/acre). Continued monitoring over the next few years would allow managers to observe changes in the population as abundances decrease. In addition, the Sooner Lake creel survey found Saugeye were the third most preferred, the second most actively targeted and the first most harvested species for anglers when fishing at Sooner Lake. Due to the results of the 2025 gill netting and the creel survey it is recommend that a change in the length limit of Saugeye at Sooner Lake is warranted and be reduced to the statewide size limit (14in).

White Perch:

A total of 228 White Perch were collected, and otoliths removed for aging. Catch Per Unit Effort (CPUE) was 12.11, a significant increase from 2024 but not significantly different from baseline samples (Figure 7, Table 6). Mean Length at Age (MLA) for age 1 White Perch had a significant increase compared to 2024, and significant decreases were observed for age 2 and 3 (Figure 8, Table 8). White Perch were collected in higher numbers than in the previous year except 2022 (Table 7). Proportional Size Distributions (PSD) were not significantly different from any previous sample (Figure 9). PSD – Preferred was 53 and not significantly different from 2024. Length frequencies indicate a peak of White Perch at 250mm (9.8in) to 275mm (10.8in) (Figure 12).

Catch rates significantly increased but were not significantly different from baseline data in 2017 and 2018. Catch rates for White Perch and Saugeye have almost mirrored each other during this entire study (Figure 4, Figure 7). This trend will be interesting to monitor in the coming years to determine if it holds while Saugeye stockings are returned to previous levels. Mean Length at Age of age -1, -2 and -3 White Perch did not significantly change from the 2017 and 2018 data (prior to the altered stocking regime). 2025 was the first year of the return to normal Saugeye stocking rates, continued monitoring is needed to see changes in White Perch and Saugeye populations as Saugeye abundances will likely decrease.

December

We sampled Sooner Lake using experimental gillnets. Gillnets were deployed around the lake at randomly selected sites perpendicular to the shore in a minimum of 6ft deep. A total of 21 net nights of sampling was completed. All fish were measured (mm) and weighed (g). Target species had their otoliths removed for aging (Hybrid Striped Bass, Saugeye, White Perch).

Hybrid Striped Bass:

A total of 29 Hybrid Striped Bass were collected. Due to the low catch rate the C.V. of Hybrids was .60 resulting in CPUE data not being statistically tight enough and therefore not used. All other metrics were not significantly different from the November sample.

Saugeye:

A total of 255 Saugeye were collected, and otoliths removed for aging. Catch Per Unit Effort (CPUE) was 12.57 ± 3.9 , a significant increase from the November sample. Mean Length at Age (MLA) had no significant difference compared to November. Proportional Size Distribution (PSD) was 93 and PSD – Preferred was 21 neither were significantly different from November. Length frequencies indicate Saugeye were still most abundant in the 425mm (16.7in) to 449mm (17.7in) but had increases in the 400mm (15.7in) to 424mm (16.7in) and 450mm (17.7in) to 474mm (18.7in) (Figure 13). Relative weights significantly increased from 82.12 ± 1.79 in November to $93.40 \pm .94$.

White Perch:

A total of 41 White Perch were collected, and otoliths removed for aging. Catch Per Unit Effort (CPUE) was 2.23 ± 1.58 , a significant decrease from November. Mean Length at Age (MLA) for age -1, -2, and -3 were not significantly different from November. Proportional Size Distributions (PSD) was 88 and PSD – Preferred was 44 and neither were significantly different from November. Length frequencies indicate a peak of White Perch at 250mm (9.8in) to 275mm (10.8in) the same as November (Figure 14). Relative weights significantly increased from $80.75 \pm .96$ in November to 85.16 ± 2.62 .

Evaluation of November vs December gillnetting and the relationship with Saugeye and White Perch

Saugeye were more abundant in December than in November, while White Perch decreased and became more inconsistent in the nets resulting in a C.V. that was far outside the .2 benchmark used for catch analysis. Relative Weights both significantly increased in December for both species and it was noted that stomachs of Saugeye were

full of small shad while November samples had more empty stomachs and could be a factor in the significant increase in Wr. All other metrics remained statistically unchanged. Catch data for Saugeye and White Perch appear to have a strong correlation to both when sampling took place during the year and water temperatures (Figure 15 and 16). This most likely is the primary factor causing changes in the White Perch and Saugeye catch data used to evaluate the effectiveness of increased Saugeye stockings.

Evaluation of Saugeye as a control for White Perch

Over the course of the evaluation of the White Perch control project we have observed what looked to be an inverse relationship between the abundances of white perch and saugeye captured during our SSP gillnetting. Initially, we thought this to be a natural relationship between the two species. As time went on we observed this trend moving in regard to the timing of sampling and water temperatures. In an attempt to tease this out we sampled twice during the 2025 fall gillnetting season. Both samples were within the confines of our SSP protocols. We still observed the inverse relationship in abundances but we also had statistically different CPUEs for the same species in samples that were only a month apart.

We have been unable to detect any meaningful change in the White Perch population in Sooner Lake over the course of our altered stocking regime. While it is still possible that the increase in Saugeye stockings may have been impacting the White Perch population, it is not thought that our current SSP standards will ever be able to tell us if they truly are. The differences in catch rates between our two samples in 2025 raises many questions on the usefulness of CPUE data using our current SSP protocol. This is something we will address with the ODWC SSP Committee.

It seems the effect, if any, of Saugeye on the White Perch population in Sooner Lake has been similar to what we see when using Saugeye to control stunted crappie populations. White Perch in their native range on the East Coast exhibit great reproductive potential that can cause overpopulation and stunting, similar to crappie in Oklahoma. In Maine, for example, for most waters the only management recommendation needed for white perch is unlimited harvest at current levels of fishing pressure.

If White Perch were not considered an invasive species, we would speak favorably of the White Perch population in Sooner Lake. Unlike other Oklahoma waters they have invaded, White Perch in Sooner regularly reach preferred, even memorable size. They are good table fare and customers of local fishing guides are requesting to target them on trips. Our 2024-2025 creel found White Perch were the third most harvested species while the ninth most preferred species to target. It appears that what few people target White Perch do harvest them. This could be due to it being illegal to throw them back or for consumption.

We will continue to closely monitor the White Perch population on Sooner Lake with yearly gillnetting. We are confident in the age and growth data we collect. If we start seeing slower growth rates for White Perch it may warrant upping the stockings of Saugeye again. If we are unable to decrease their numbers we should at least have fish in the population that anglers will utilize for table fare.

RECOMMENDATIONS

1. Evaluate Hybrid Striped Bass, Saugeye and White Perch in 2026 using gill nets.
2. Continue stocking rates of 10 fish per acre for HSB.
3. Standalone signage explaining White Perch must not be released back into the water alive.
4. Continue stocking Threadfin Shad broodstock each year.
5. Change Saugeye length limit to 14in.

Figures and Tables

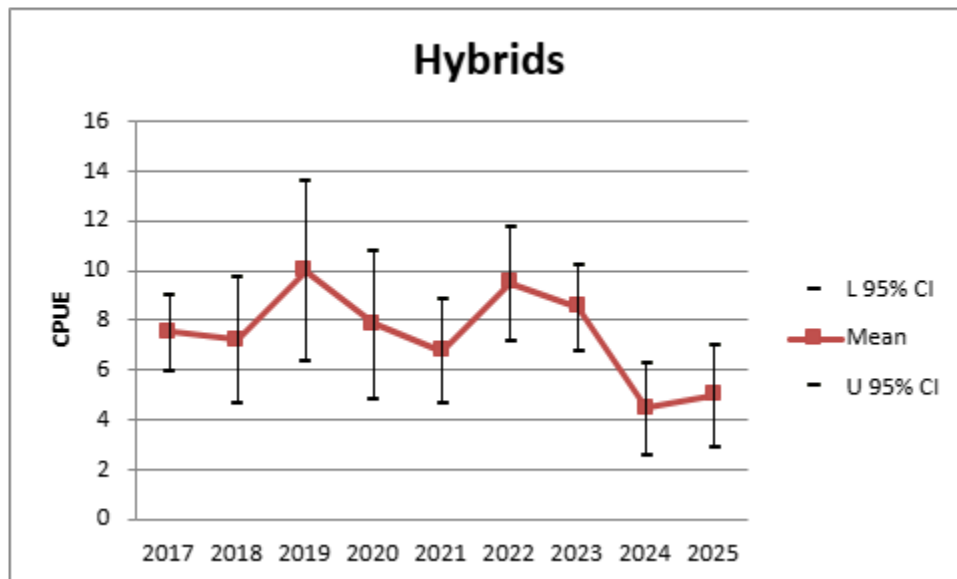
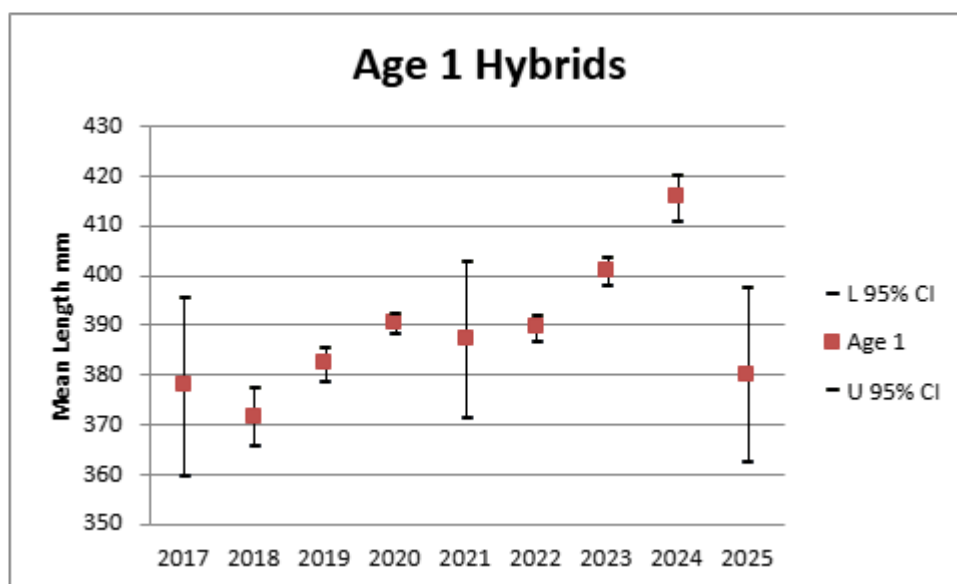


Figure 1. Catch Per Unit Effort of Hybrid Striped Bass in Sooner Lake.



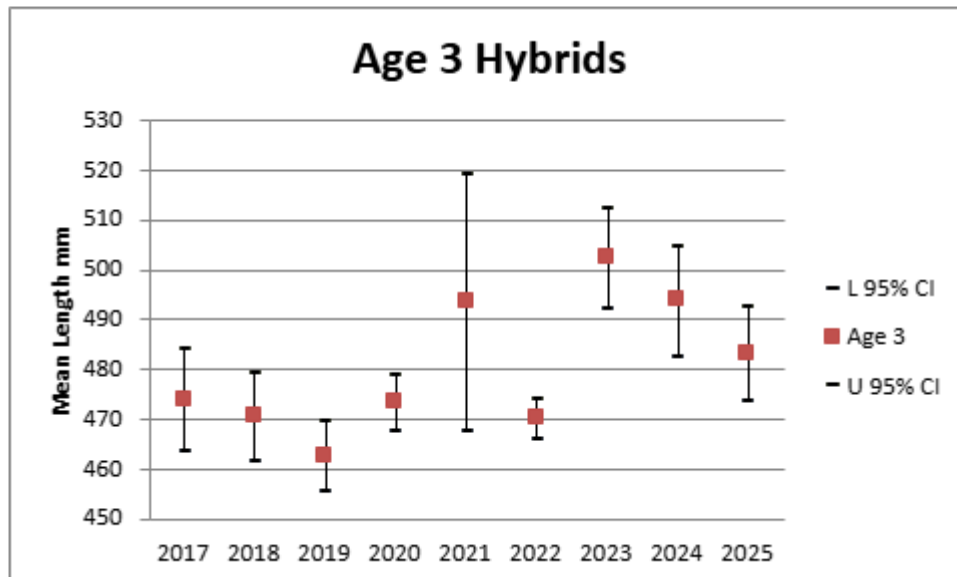
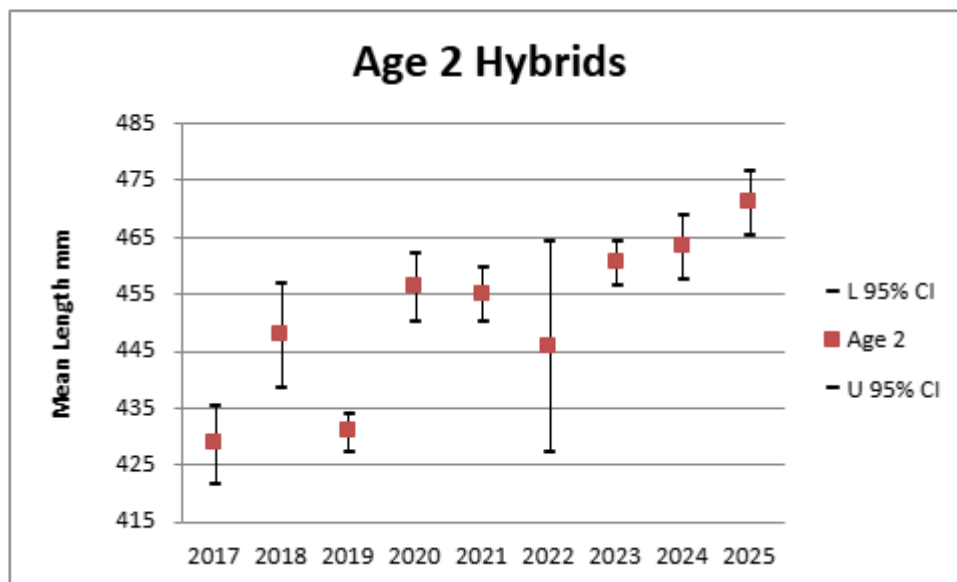


Figure 2. Mean Length at Age of Hybrid Striped Bass for age 1, 2, and 3 in Sooner Lake.

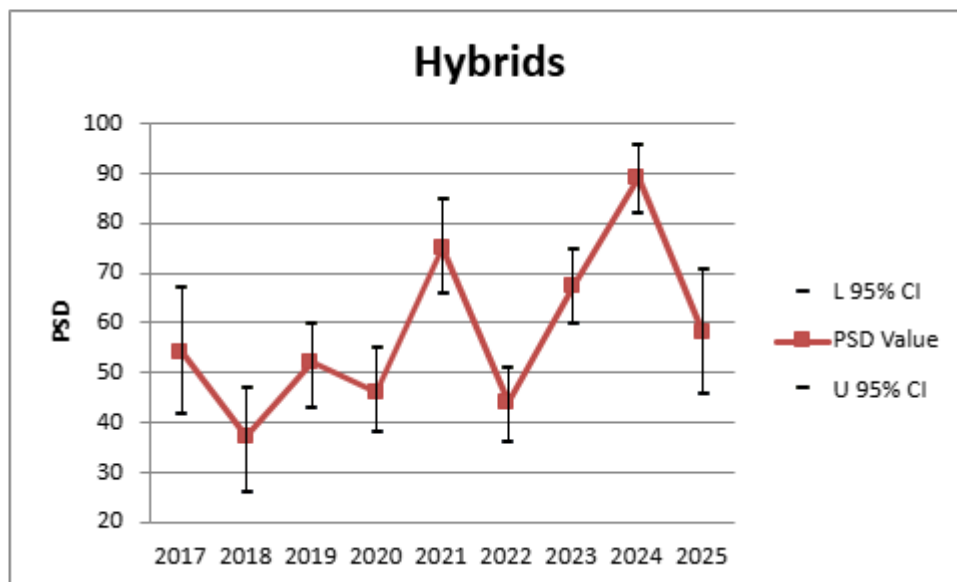


Figure 3. Proportional Size Distributions of Hybrid Striped Bass in Sooner Lake.

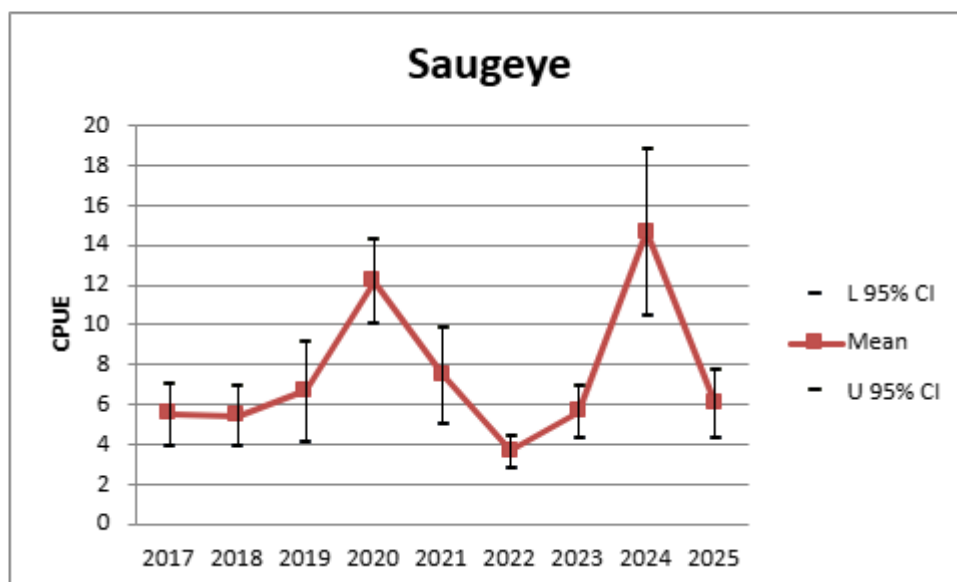
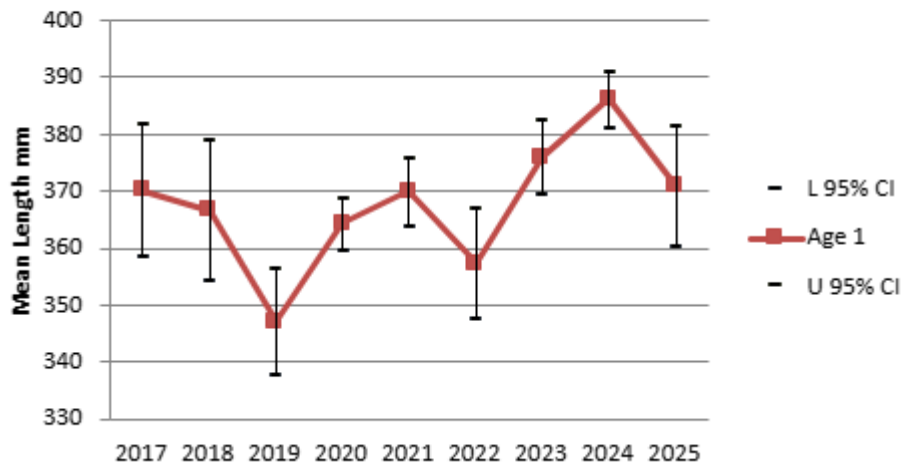
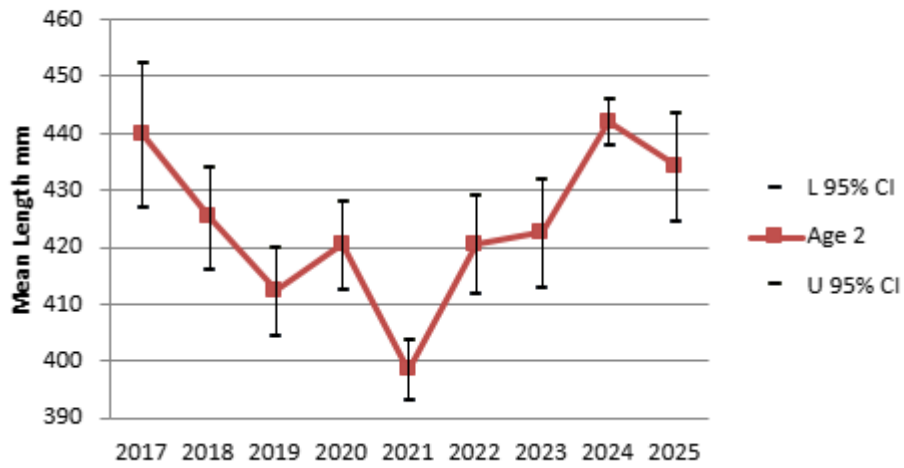


Figure 4. Catch Per Unit Effort of Saugeye in Sooner Lake.

Age 1 Saugeye



Age 2 Saugeye



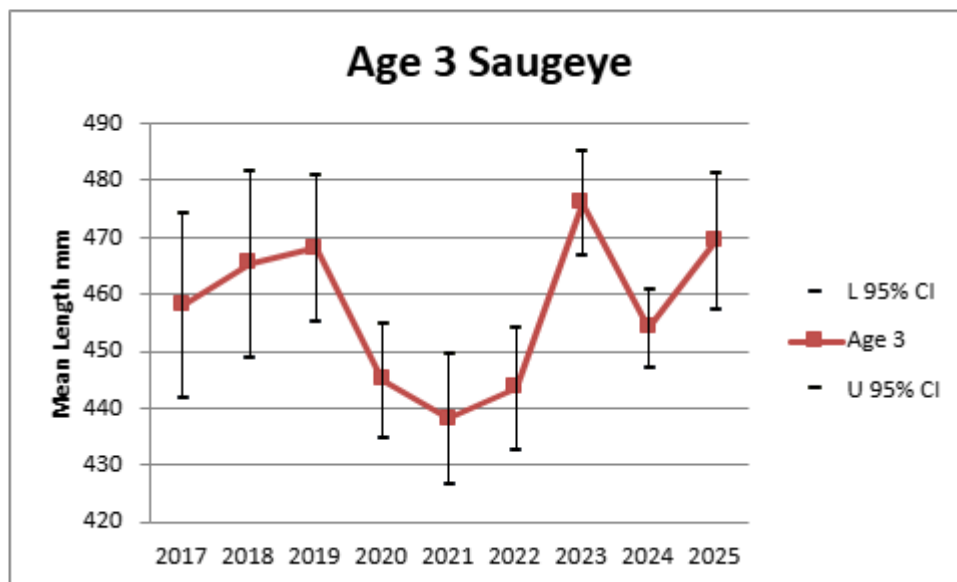


Figure 5. Mean Length at Age of Saugeye for age 1, 2, and 3 in Sooner Lake.

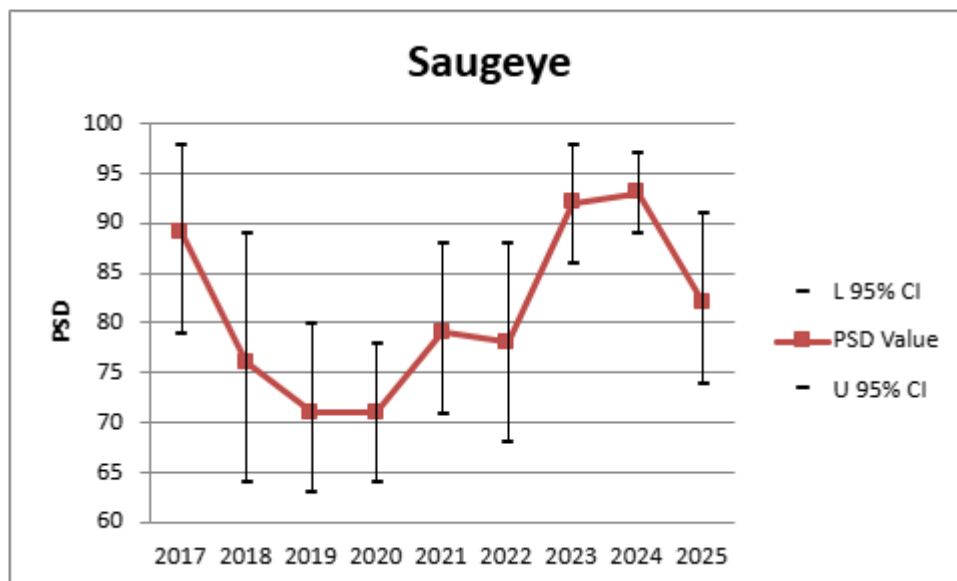


Figure 6. Proportional Size Distributions of Saugeye in Sooner Lake.

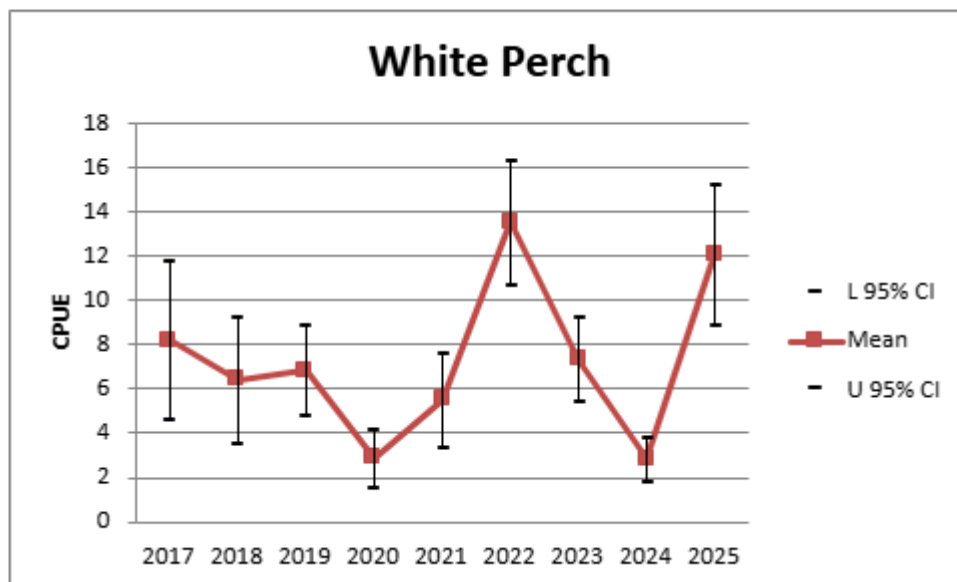
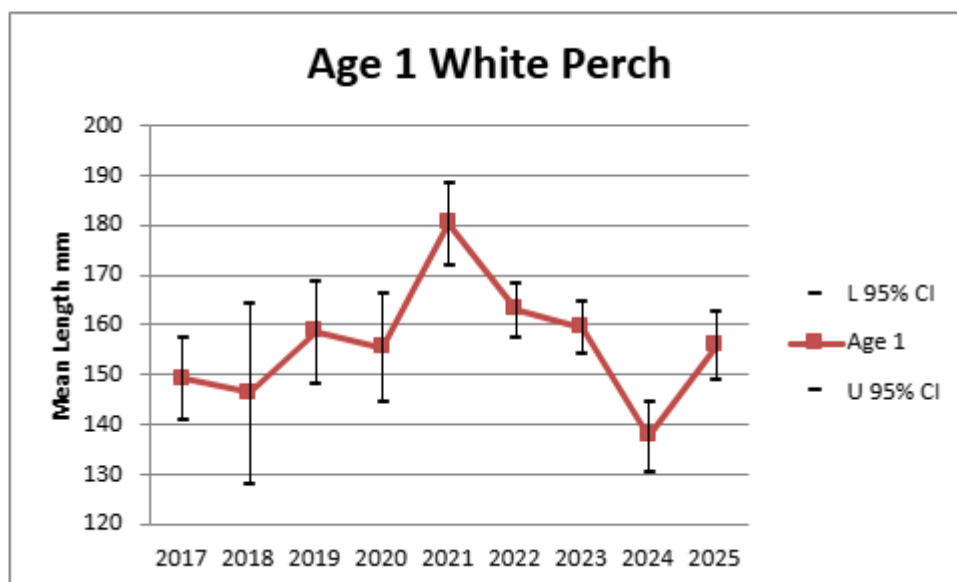


Figure 7. Catch Per Unit Effort of White Perch in Sooner Lake.



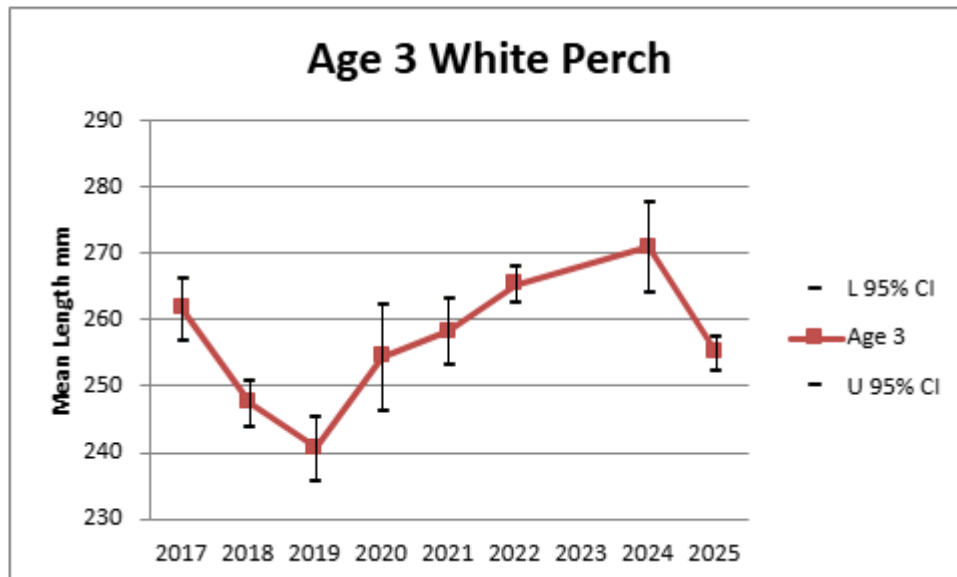
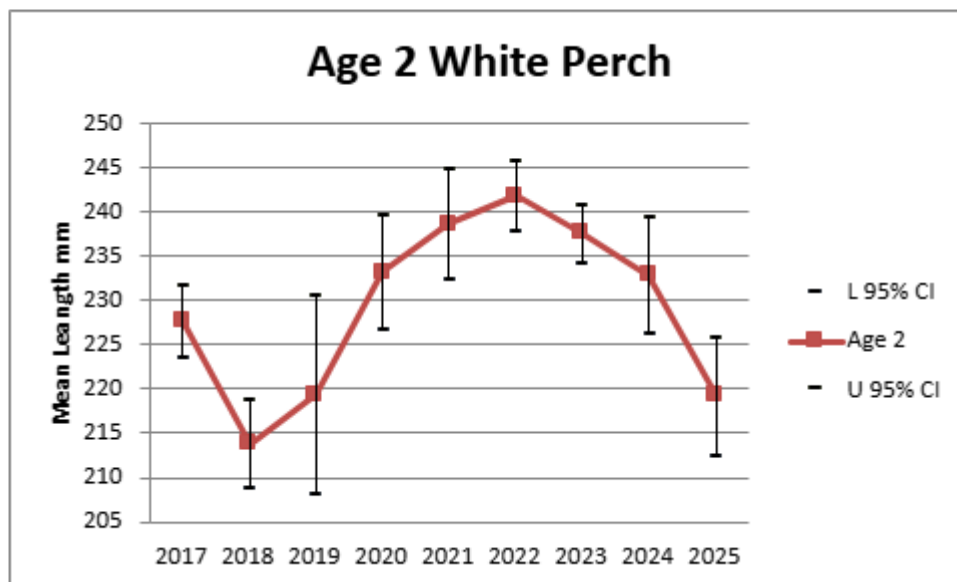


Figure 8. Mean Length at Age of White Perch for age 1, 2, and 3 in Sooner Lake.

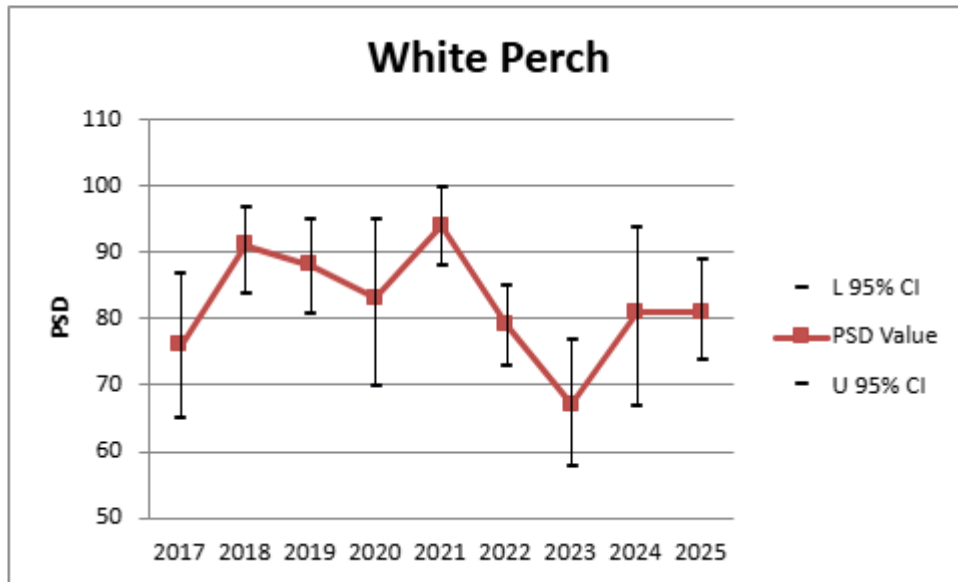


Figure 9. Proportional Size Distributions of White Perch in Sooner Lake.

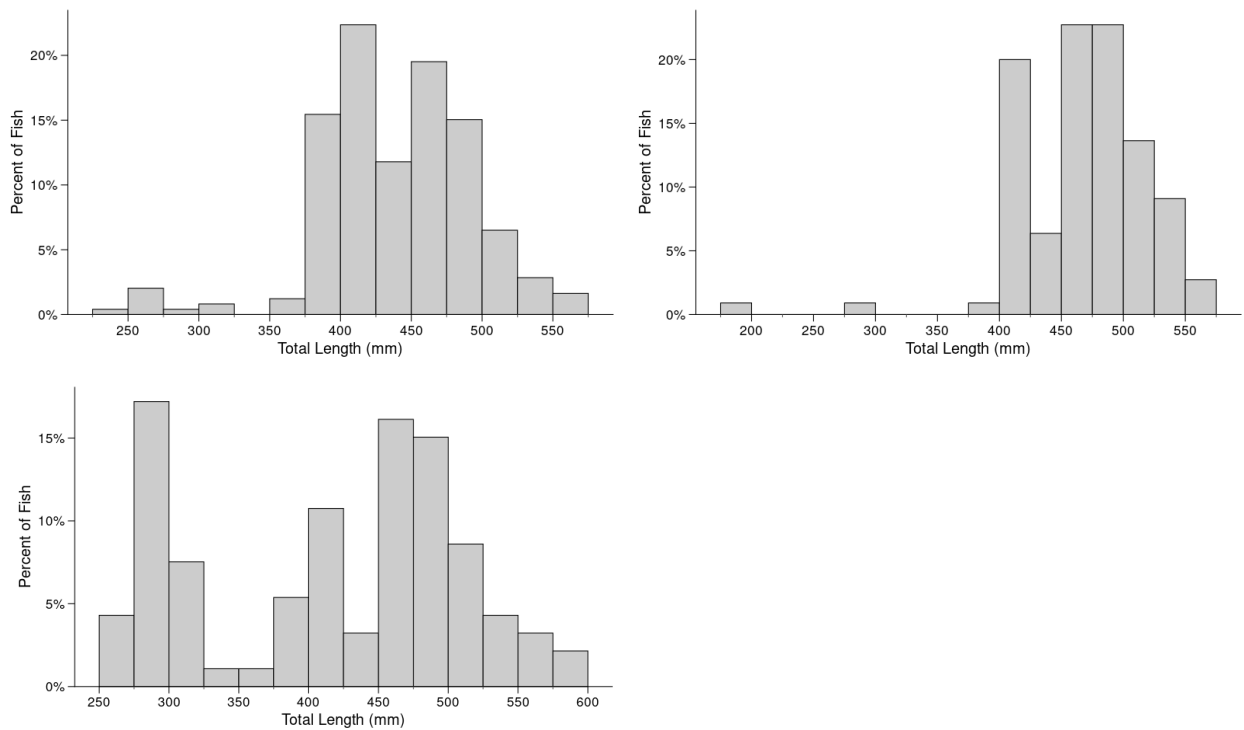


Figure 10. Length frequencies of Hybrid Striped Bass in Sooner Lake 2023 (top left), 2024 (top right) and 2025 (bottom left).

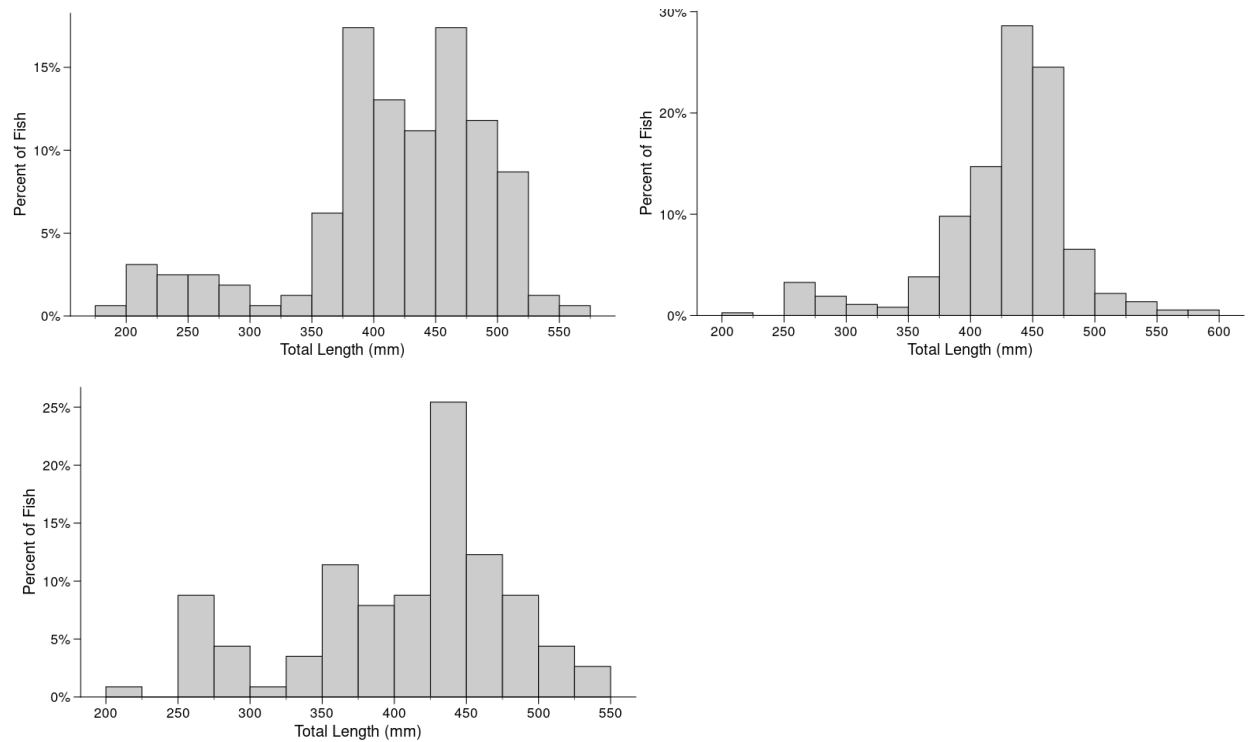


Figure 11. Length frequencies of Saugeye in Sooner Lake 2023 (top left), 2024 (top right) and 2025 (bottom left).

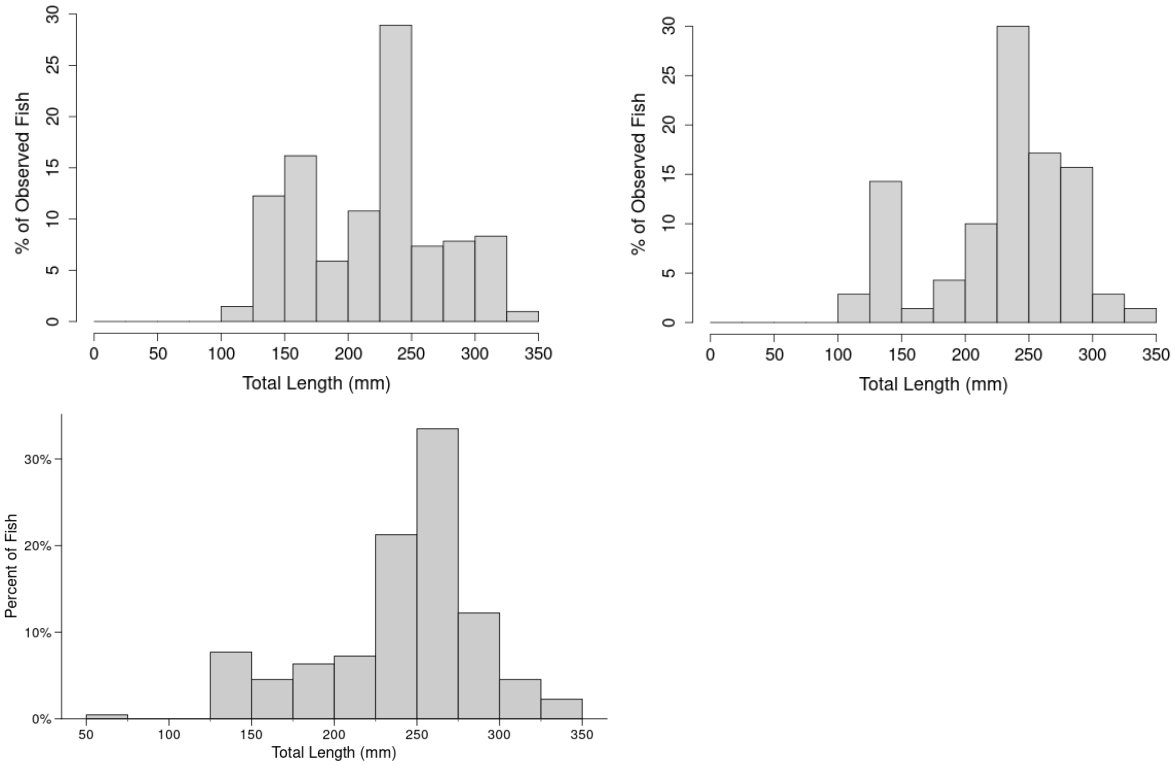


Figure 12. Length frequencies of White Perch in Sooner Lake 2023 (top left), 2024 (top right) and 2025 (bottom left).

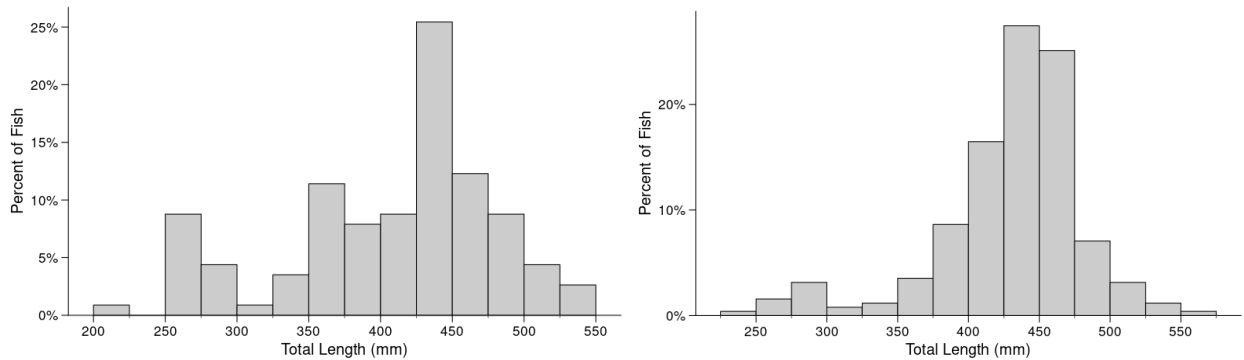


Figure 13. Length frequencies of Saugeye in Sooner Lake November 2025 (left) and December 2025 (right).

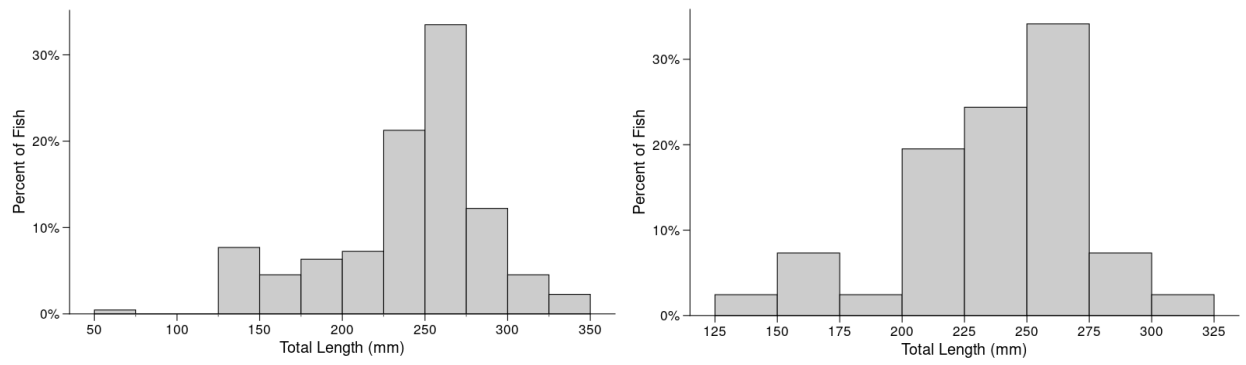


Figure 14. Length frequencies of White Perch in Sooner Lake November 2025 (left) and December 2025 (right).

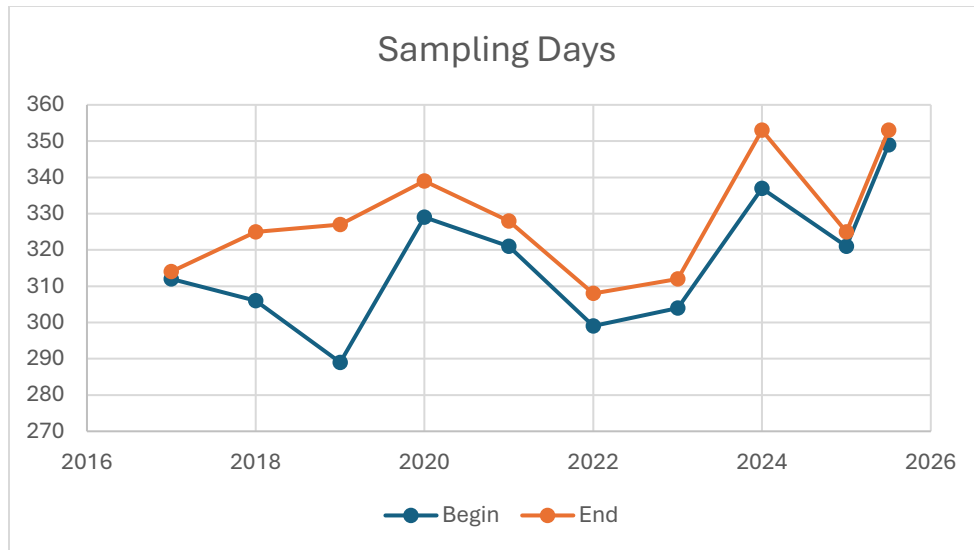


Figure 15. Sampling start and end days of each year on Sooner Lake.

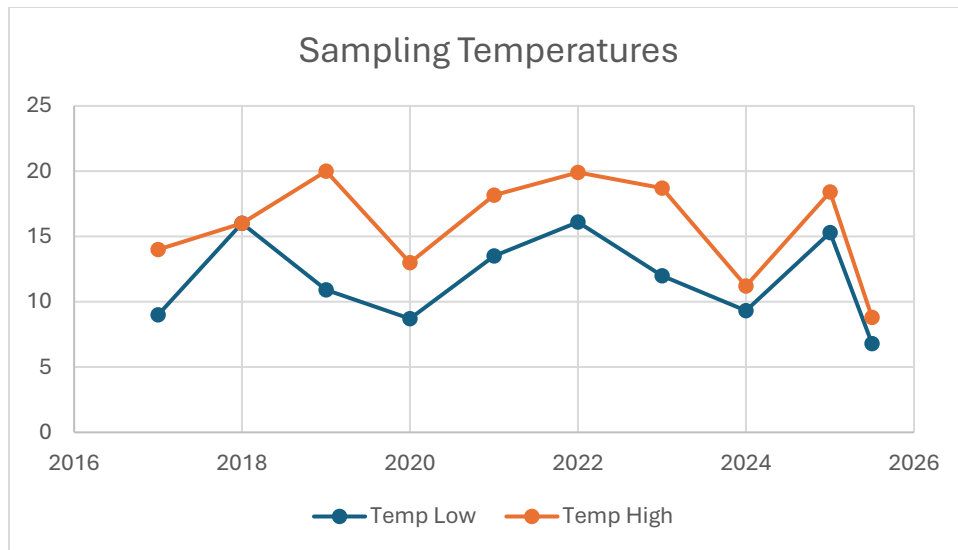


Figure 16. Sampling temperatures for each year on Sooner Lake.

Table 1. Catch per Unit Effort of Hybrid Striped Bass on Sooner Lake sampled with gillnets.

Lake	Year	Sample Size	Species	L 95% CI	CPUE	U 95% CI
Sooner	2017	15	Hybrid Striped Bass	5.99	7.52	9.05
Sooner	2018	19	Hybrid Striped Bass	4.68	7.21	9.75
Sooner	2019	25	Hybrid Striped Bass	6.38	10	13.61
Sooner	2020	29	Hybrid Striped Bass	4.85	7.83	10.81
Sooner	2021	20	Hybrid Striped Bass	4.66	6.77	8.87
Sooner	2022	30	Hybrid Striped Bass	7.19	9.49	11.79
Sooner	2023	30	Hybrid Striped Bass	6.81	8.53	10.26
Sooner	2024	26	Hybrid Striped Bass	2.56	4.45	6.33
Sooner	2025	20	Hybrid Striped Bass	2.92	4.98	7.04

Table 2. Proportional Size Distributions of Hybrid Striped Bass in Sooner Lake.

Year	PSD	PSD – P
2017	54 ± 12	1 ± 3
2018	37 ± 10	2 ± 2
2019	52 ± 8	1 ± 2
2020	46 ± 8	3 ± 3
2021	75 ± 10	3 ± 4
2022	44 ± 7	3 ± 3
2023	67 ± 8	9 ± 4
2024	89 ± 7	18 ± 9
2025	58 ± 13	15 ± 9

Table 3. Mean length at age of Hybrid Striped Bass in Sooner Lake collected using gillnets over multiple years.

Lake	Species	Sample Size (N)	Age (0)	Age-1	Age-2	Age-3	Age-4
2017	Hybrid Striped Bass	119	246.8	377.7	428.6	474	499
2018	Hybrid Striped Bass	132	252.08	372.29	453.00	472.88	450.67
2019	Hybrid Striped Bass	243	254.5	382.97	430.81	461.88	488.67
2020	Hybrid Striped Bass	194	-	390.68	456.17	472.87	508.30
2021	Hybrid Striped Bass	134	245.2	386.9	455	493.5	487.1
2022	Hybrid Striped Bass	259	254.8	389.5	445.8	470.4	492.5
2023	Hybrid Striped Bass	246	269.33	400.85	460.46	502.43	496.61
2024	Hybrid Striped Bass	111	-	415.62	463.44	493.82	-
2025	Hybrid Striped Bass	93	281.95	380.0	471.07	483.22	526.60

Table 4. Catch per Unit Effort of Saugeye on Sooner Lake sampled with gillnets.

Lake	Year	Sample Size	Species	L 95% CI	CPUE	U 95% CI
Sooner	2017	15	Saugeye	3.93	5.52	7.11
Sooner	2018	19	Saugeye	3.94	5.45	6.97
Sooner	2019	25	Saugeye	4.14	6.68	9.22
Sooner	2020	29	Saugeye	10.06	12.19	14.31
Sooner	2021	20	Saugeye	5.04	7.48	9.92
Sooner	2022	30	Saugeye	2.86	3.67	4.48
Sooner	2023	30	Saugeye	4.32	5.64	6.97
Sooner	2024	26	Saugeye	10.48	14.67	18.87
Sooner	2025	20	Saugeye	4.36	6.07	7.77

Table 5. Mean length at age of Saugeye in Sooner Lake over multiple years.

Lake	Species	Sample Size (N)	Age (0)	Age-1	Age-2	Age-3	Age-4	Age-5
2018	Saugeye	97	258.75	369.89	424.28	466.30	507.4	-
2019	Saugeye	160	265.53	344.63	410.56	465.26	465.25	-
2020	Saugeye	315	272.54	363.44	416.09	443.97	467.94	519.55
2021	Saugeye	141	265.6	369.9	398.5	438.2	-	-
2022	Saugeye	102	262.6	357.3	420.5	443.5	-	-
2023	Saugeye	161	240.47	375.97	422.62	476.09	472.29	-
2024	Saugeye	367	281.08	386.13	441.91	454.13	467.64	476.57
2025	Saugeye	115	266.69	370.93	434.17	469.43	468.75	451.33

Table 6. Catch Per Unit Effort of White Perch in Sooner Lake over multiple years collected using gillnets.

Lake	Year	Sample Size	Species	L 95% CI	CPUE	U 95% CI
Sooner	2017	15	White Perch	4.6	8.19	11.78
Sooner	2018	19	White Perch	3.59	6.42	9.26
Sooner	2019	25	White Perch	4.83	6.84	8.86
Sooner	2020	29	White Perch	1.57	2.88	4.2
Sooner	2021	20	White Perch	3.38	5.5	7.63
Sooner	2022	30	White Perch	10.74	13.54	16.33
Sooner	2023	30	White Perch	5.46	7.34	9.22
Sooner	2024	26	White Perch	1.80	2.83	3.85
Sooner	2025	20	White Perch	8.87	12.11	15.35

Table 7. Sooner Lake White Perch sampled by age.

Age	0	1	2	3	4	5	6	7	8	9	10	11	12	13
2013		1	3	18	10	4								
2014		2	3	4	7	2								
2017	3	56	38	14	2		2	5	2	2				
2018		3	48	47	8		2	3	7					
2019		19	16	42	58	17		2	1	2	5			
2020		12	35	6	6	11		1						
2021		6	32	39	6	7	9	3		1				
2022		91	47	57	83	12	35	21	14		1			
2023		78	92	2	9	6	5	7	3				2	1
2024		14	34	16		2	2	2						
2025	1	33	45	93	31	2	2	8	1	2	2	1		

Table 8. Mean Length at Age of White Perch in Sooner Lake over multiple years.

Gear	Year	(n)	0	1	2	3	4	5	6	7	8	9	10
Gill Net	2013	36	---	132	210	207	246	268	---	---	---	---	---
Gill Net	2014	18	---	163	213	219	238	250	---	---	---	---	---
Multiple	2017	124	107.8	148.4	218.2	263.8	279.5	---	274.5	284.5	299.5	304.5	---
Gill Net	2018	118	---	146.3	214.3	246.2	263.0	---	284	278.3	279.9	---	---
Gill Net	2019	163	---	161.7	220.9	241.9	263.2	279	---	290	280	299	294
Gill Net	2020	71	---	155.1	233.5	244.8	261.7	290.8	---	304	---	---	---
Gill Net	2021	104	---	180.3	238.6	258.3	273.8	284.7	287.6	307.7	---	---	---
Gill Net	2022	361	---	163	241.8	265.3	277.3	277.3	285.2	296.1	307.7	---	---
Gill Net	2023	212	---	159	236.9	---	294	295.2	308.2	313	318	---	---
Gill Net	2024	70	---	137.6	232.9	270.9	---	298	314	298	---	---	---
Gill Net	2025	228	---	155.9	219.2	255.1	274.0	---	---	306.6	---	---	---