LEE CREEK

ANNUAL RESERVOIR/WATERSHED REPORT 2021

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INTRODUCTION

The Fort Smith Utilities, Environmental Quality section conducts annual fisheries and water quality assessments on both surface water reservoirs and their watersheds. The reservoirs are used to supply raw water to the city's two (2) drinking water treatment facilities. Changes in fish, algae and macro-invertebrate population and community structure can reflect shifts in water quality. Monitoring the overall fisheries and water quality of the two (2) raw water reservoirs is one (1) tool utilized by the Fort Smith Utilities to ensure quality drinking water, in the quantity demanded by the City of Fort Smith and the surrounding communities. Combinations of active and passive sampling techniques are used to evaluate reservoir/stream fish populations, through the generation of specific indices. Aquatic macro-invertebrate populations are evaluated by the generation of specific indices. Indices are evaluated using trend analysis to follow changes in structure, abundance and condition of target fish and macro-invertebrate populations. Algae assessments are done weekly to monitor algal blooms that may affect taste and odor of water produced. The degree of monitoring effort varies annually and is typically a function of weather and water conditions.

SITE SELECTION

Passive Sampling

Due to reservoir's physical characteristics, site selection for passive collection techniques was difficult at best. Lee Creek Reservoir covers approximately 634 acres and has an average depth of eight (8) feet. The 439 square mile watershed delivers extremely high flows to the reservoir during storm events, resulting in large quantities of woody material being washed in and deposited along the reservoir littoral zone. Mats of woody material are often formed after storm events and drift with prevailing winds. The extreme fluctuations in water level, flow and the introduction of woody material hinder the deployment and operation of passive sampling techniques, including trap netting, experimental gill netting and trammel netting. For this reason, a random sampling approach could not be used for site selection. Trap netting sites were selected for their ease of deployment and reduced surface and sub-surface debris that tend to entangle nets and therefore reduce netting efficiency. Two (2) sites are located on the East side and two (2) on the West side of the reservoir. This increases the ability to monitor fish movement during various diel cycles.

One (1) gill and one (1) trammel net site were selected for Lee Creek Reservoir. These two (2) sites are on the West side of the reservoir and were also selected for their ease of deployment and reduced surface and sub-surface debris that tend to entangle nets and therefore reduce netting efficiency. Both nets are set across the primary channel of Lee Creek, thus reducing some bias from their relatively close proximity to one another and their placement only on the West side of the reservoir. Historic data suggests abundant fish movement within the channel, thus ensuring collections that reflect current fishery conditions.

Active Sampling

Boat electro-shocking is conducted over the entire length of the reservoir. Fort Smith Utilities has adopted a random electro-shocking sampling approach, currently being used by the Arkansas Game and Fish Commission (AGFC). This approach will be detailed in the Methods section of this document.

METHODS

Trap Nets

Standard trap nets require a relatively flat, hard substrate for pot placement and a clean bottom for leader/wing deployment. Nets are set perpendicular to the shoreline. The nets are set and contents emptied every 24-hour after deployment. Nets are typically deployed on the Monday of the sampling week, with collections being made on the following days and final net retrieval on Friday. Attempts are made to sample crappie populations early in the season to minimize the effects of post spawn individuals on fish condition indices. Fish are identified to species level, measured, weighed (game fish only) and returned to the water. Some incidental mortality is typically experienced and can be expected while conducting any fisheries study. Catch-per-unit-effort (CPUE), relative weight (Wr) analysis and percent composition indices are calculated from the recorded data. For evaluation purposes, target fish species are grouped into 25-millimeter increments.

Standard trap nets are constructed of two (2) 3X6 foot, 5/16 inch diameter steel frames, with center bracing, set 2.5 feet apart. The second 3x6 foot frame has a slit throat. Netting material consists of ½ inch square, No. 150 knotless netset treated nylon. Four (4) 2.5-foot diameter hoops set 24 inches apart lead to a cod end with a five (5) inch, No. 5 braided drawstring closure. The first hoop has a six (6) inch throat and is set 32 inches from the 3x6 foot frame. The leader is constructed of the same net material, hung 14 meshes per foot on a No. 60 nylon twine and will be 50x3.5 feet. A leader float line is fitted with 2x1.5 inch corks and a sinker line fitted with 1.5-ounce weights. The leader will also be netset treated and connected to the second 3x6 foot frame center base.

Experimental Gill Nets

Experimental gill nets require a relatively flat or gently sloping substrate, and a clean bottom to prevent excessive damage to the monofilament netting. Experimental gill nets are 91.4 meters in length, 2.4 meters in height and have panels of increasing mesh size (¾ to 2 inches). The nets are set perpendicular to the shoreline, stretched taut by boat and anchored to the substrate. Nets are set and the contents are emptied every 24-hours after deployment. Nets are typically deployed on Monday of the sampling week, with collections being made on the following days and final net retrieval on Friday. Fish are identified to species level, measured; weighed (game

fish only) and returned to the water. CPUE, Wr analysis and percent composition of dominant taxa are calculated. For evaluation purposes, target fish species are grouped into 25-millimeter increments.

Trammel Nets

Trammel nets require a relatively flat or gently sloping substrate, and a clean bottom to prevent excessive damage to the monofilament netting. Trammel nets are 91.4 meters in length and have a single mesh size (3 inches). Nets are set perpendicular to the shoreline, stretched taut by boat and anchored to the substrate. Nets are set and the contents are emptied every 24-hours after deployment. Nets are typically deployed on the Monday of the sampling week, with collections being made on the following days and final net retrieval on Friday. Fish are identified to species level, measured; weighed (game fish only) and returned to the water. CPUE, Wr analysis and percent composition of dominant taxa are calculated. For evaluation purposes, target fish species are grouped into 25-millimeter increments.

Boat Electro-shocking

Electro-shocking is conducted through the use of a boat mounted Smith-Root Incorporated®, 5.0 Electro-fishing System, powered by a Honda® GX340, 11.0 horsepower gasoline generator. A single standard anode boom, with a 40-inch diameter array is mounted to the front of the boat. Lighting mounted on the front of the boat, is powered by a Honda® EM650 gasoline generator and converter box combination. Sampling is typically conducted during nighttime conditions. When the unit is operational, fish are stunned and drawn to the electric field at the front of the boat where they are retrieved using long handled dip nets. Upon collection, the fish are placed in two (2) 30-gallon tubs, partially filled with reservoir water. At the end of each collection period, fish are identified to species level, measured (mm) and weighed (g) (game fish only). The fish are then released in an area that will not influence future sampling numbers. Catch-per-unit-effort (CPUE), relative weight analysis, Proportional Stock Density (PSD), and percent composition of dominant taxa are calculated. Relative Stock Density (RSD) is also calculated but has now been changed to PSD-P. For evaluation purposes, target fish species are grouped into 25-millimeter length increments. A random sampling approach has been adopted to better ensure representative fishery collections.

As previously mentioned, a random sampling approach has been adopted to better ensure representative fishery collections. Lee Creek Reservoir is divided into 40, 600-meter sampling sites. A minimum of 14 sites must be electro-shocked, for a period of 10-minutes each, to ensure a random sample. Prior to sampling, sites are selected from a random number generator. Sites not conducive to sampling efforts, due to shallow or extremely deep water, are excluded from the selection and a substitute site is chosen at random. Due to the large number of sites and in case of equipment problems, the 14-sites can be sampled over the course of two

(2) nights. However, sampling must be completed during the same week if possible to reduce the bias of fish movement related to changing water or weather conditions.

Backpack Electro-shocking

Backpack Electroshocking is conducted in streams in the Lee Creek Watershed. The species of stream fish present are a good indication of water quality depending on the tolerance value assigned to certain species. A Smith-Root Backpack Electro-shocker is used to stun the fish for collection. Two (2) 20-minute runs are done on each stream and the fish are identified to species level after each run. Fish collected are identified and released on site after identification. Data is then analyzed and an Index of Biotic Integrity (IBI) trend analysis is done based on a predetermined set of values for each species. The IBI analysis will give a stream condition number that will help determine stream health.

Surber Net

Aquatic macro-invertebrates are key indicators of stream health. The City of Fort Smith samples twice a year for macro-invertebrates in all the streams in each watershed. Three (3) samples are taken at each site at riffles with enough flow to carry the macro-invertebrates into the surber net. The surber net is 12 inches by 12 inches (1 sq. ft.) and is placed in a spot determined by the sampler to have sufficient cobble and flow. The sampler then rubs each rock to detach the macro-invertebrates clinging to each rock in the one (1) square foot area. After all the rocks are rubbed sufficiently a garden shovel is used to disturb the streambed for any macro-invertebrates that are buried. The net is then emptied into a container and the macroinvertebrates are fixed in 10% formalin for picking at a later date. The macroinvertebrates are then picked, preserved, and sent off to an outside contract laboratory for identification and enumeration. The data received is then compiled and four (4) different metrics are used to obtain a “Stream Condition” factor. Each of the four (4) metrics is on a scale of one (1) to five (5). Five (5) is the best score for each metric and a 20 is the best stream condition factor.

Algal Enumeration

Algae Enumeration is done weekly on both reservoirs. A secchi disk is lowered into the water and used to determine the visible photic zone. This number is then divided by two (2) to obtain the ¼ zone depth, at which the algae sample is taken. Samples are collected in a 2.2L PVC Beta Plus water bottle (Wildco Inc.) that is lowered to a depth determined by the secchi disk. One (1) sample is collected on Lee Creek at the L2 site. The samples are then taken to the lab and 100 mL of the sample is measured out and concentrated down to 20 mL, using a 63-µm nominal pore size Wisconsin Plankton Bucket. A one (1) mL sample is then taken and placed into a Sedgwick-Rafter counting chamber slide. After the algae are counted, the data is entered into a database to obtain phytoplankton units per liter and MIB & Geosmin (Taste and Odor) levels. This helps to better track trends and predict blooms that could affect water quality or taste.

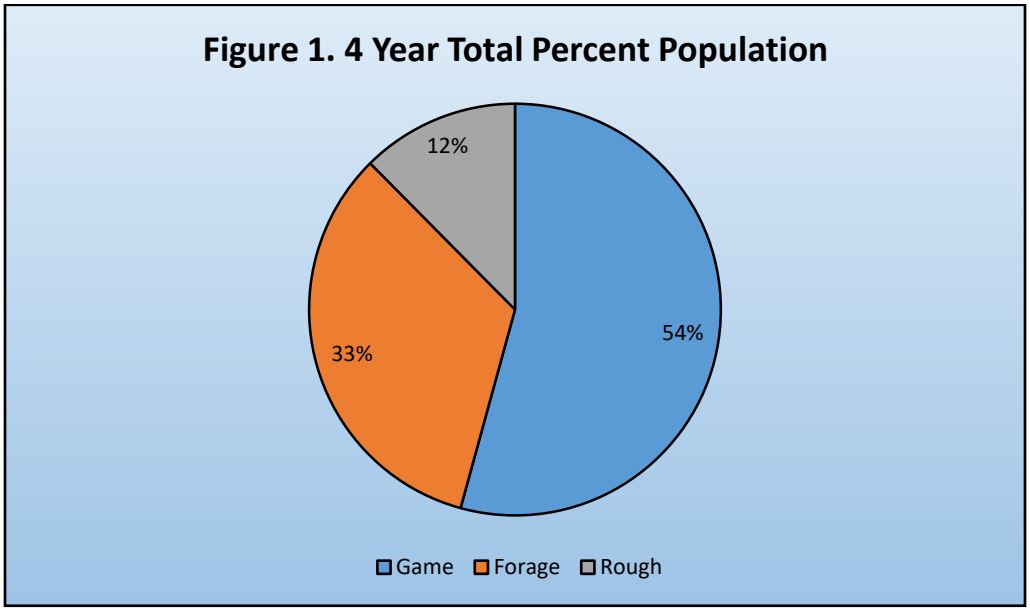
Water Quality

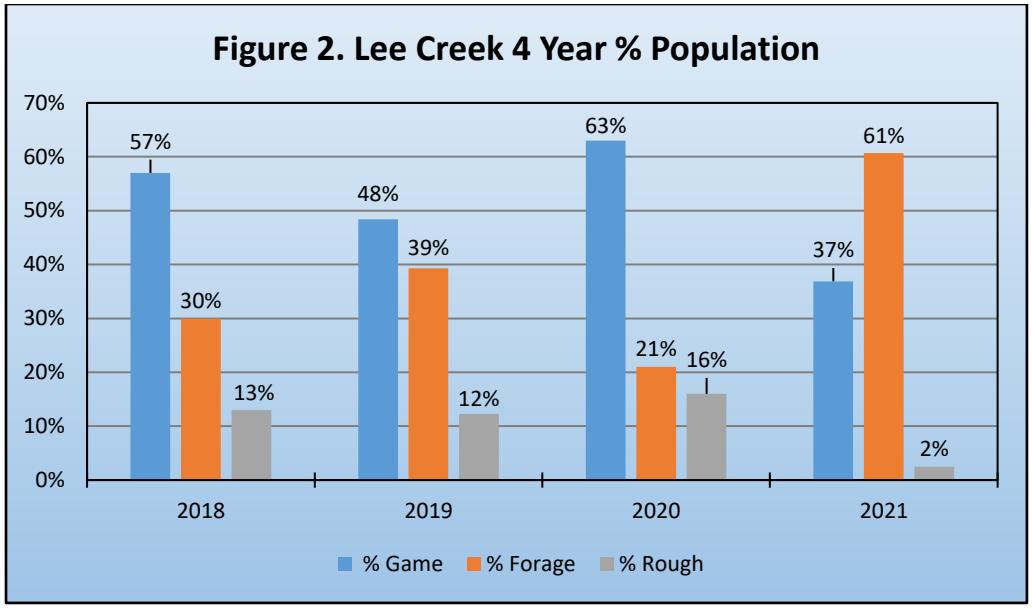
Phosphorous, nitrogen, and chlorophyll-α are three (3) water quality indicators tested by the City of Fort Smith. Phosphorous samples are obtained by a surface grab at five (5) pre-determined sites that extend the length of the reservoir. Nitrogen sampling is done on a monthly basis at two (2) sites on both reservoirs. One sample is taken at the site nearest the intake structure (L2) while the other sample is taken at the site that is at the uppermost part of the reservoir (O). Chlorophyll-α is taken at the site nearest the intake structure and two (2) samples are taken. One (1) sample is determined by the secchi disk depth obtained for the algae sample. The other sample is taken at two (2) meters. Phosphorous and nitrogen samples are an indicator of nutrient loading from the reservoir's watersheds and elevated levels can lead to uncontrollable algae blooms. Chlorophyll-α is used to determine primary productivity and can give you an insight into the reservoirs trophic status.

RESULTS

Total Percent Population

Twenty-one (21) species of fish were collected on Lee Creek Reservoir during the four (4) year sample period. Game fish included three (3) species of bass, two (2) species of crappie and three (3) species of catfish. Game fish made up 54% of the population sampled over the four (4) year period, varying annually from 48% to 63%. Forage fish comprised 33% of the population over four years as seen in Figures 1 and 2. This value is low but relative weights (Wr) of game fish do not indicate a lack of forage making sampling bias a more likely reason for low percentages seen. The rough fish population (12%, Figure 1) is lower for 2021 (2%, Figure 2) than previous years.





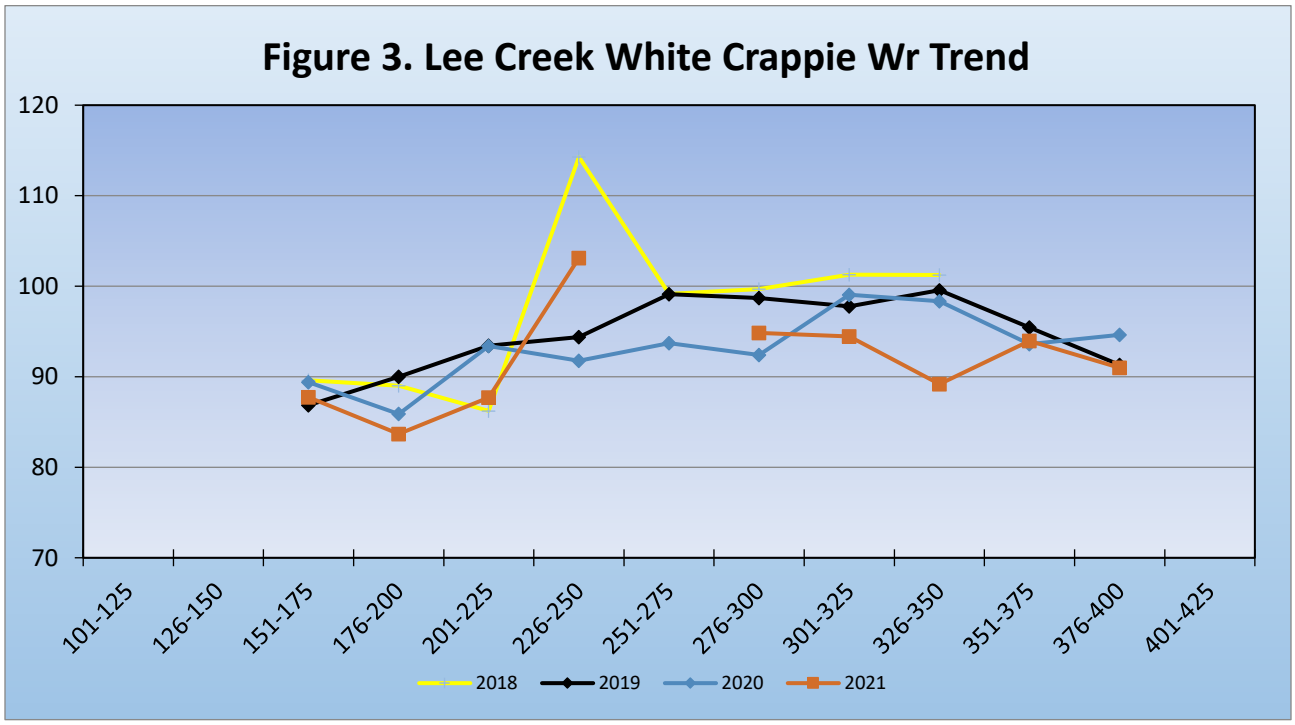
Trap Nets

Trap net sampling was conducted from March 16, 2021 to April 15, 2021 to determine white crappie (Pomoxis annularis) population dynamics. Black crappie (Pomoxis nigromaculatus) were collected, but only four (4) individuals were caught. That data was omitted due to number (N) of individuals being too low to perform any meaningful statistical analysis. Table 1 includes four (4) years of sample data for white crappie.

Wr values range from 83.68 to 103.11 averaged between length classes. The average Wr of white crappie for 2021 was 91.67 denoting the population growth is in the 91st percentile. The data would suggest the forage base is sufficient for growth and there is minimal competition for food. Figure 3 summarizes Wr's for four (4) years of spring sampling.

PSD-Q and PSD-P values were calculated for the white crappie population. PSD-Q, formerly PSD, was at 92.68 while PSD-P, formerly RSD_{10}, was at 81.71. Recommended PSD-Q for white crappie is 30-60. 2021 values are above what is recommended due to a lack of smaller fish (<203mm) and an overabundance of fish >203 mm. Recommended PSD-P values are >10. The 2021 PSD-P calculation is quite large meaning most of the fish caught were on the larger end of the spectrum. 73% of the crappie sampled were above 301 mm. The high PSD numbers could be due to a dominant age class commonly seen in crappie populations. Another explanation could be sampling site or time of year.

Table 1. Lee Creek Trap Net Data				
	2018	2019	2020	2021
Net Nights	20	22	15	21
N	81	138	120	82
Mean L (mm)	275.95	294.18	277.29	315.17
Mean W (g)	339.26	408.3	349.23	501
Mean Wr	97.71	97.11	93.96	91.67
CPUE	0.344	0.261	0.33	0.163
PSD	88.9	94	82.5	92.68
PSD-P	72.8	80.4	73.3	81.71



Gill Nets

No Gill Nets were run in 2021.

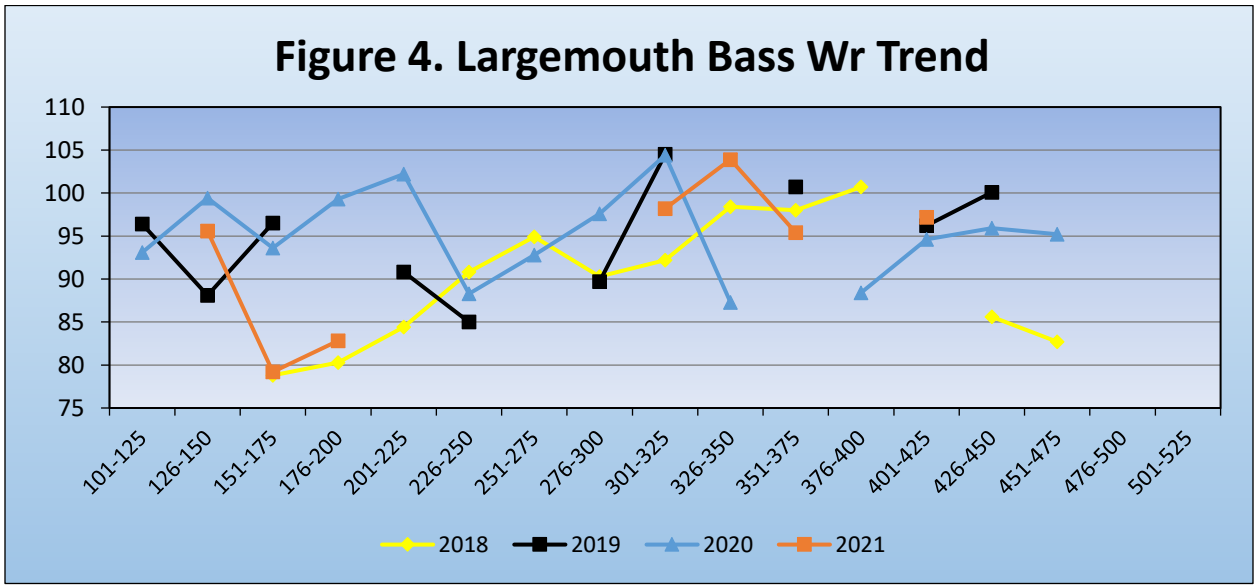
Trammel Nets

No Trammel Nets were run in 2021.

Boat Electro-shocking

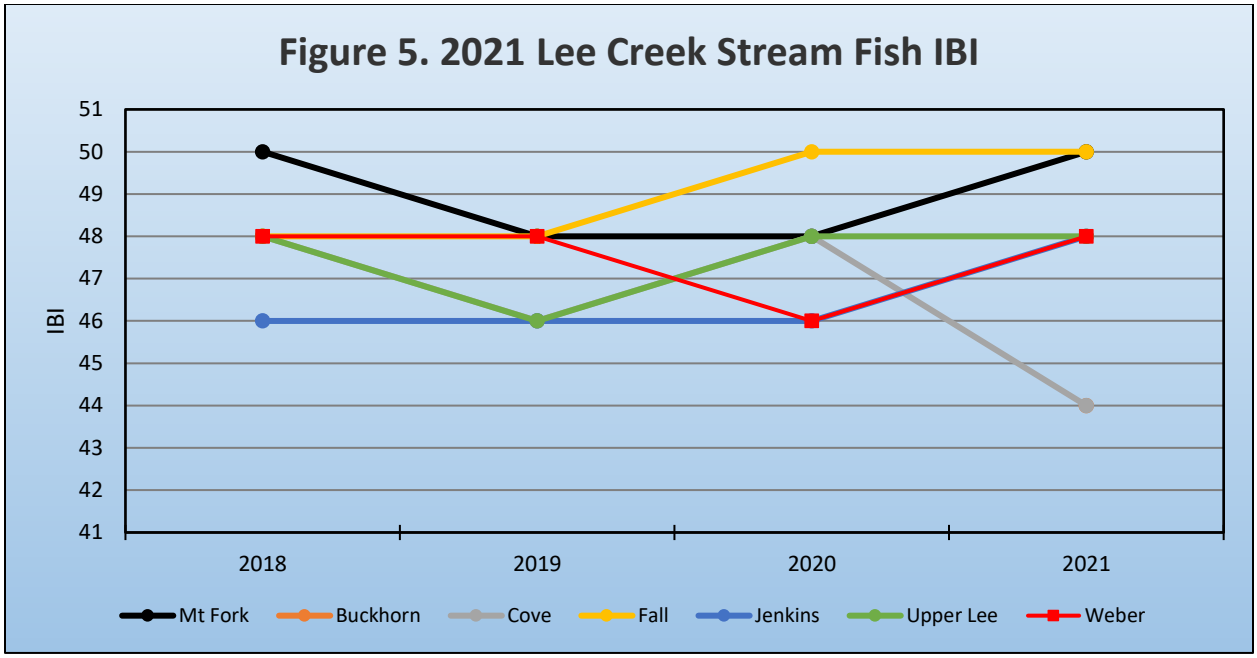
Boat electro-shocking was conducted on September 9, 2021. Due to boat problems, only ten (10) runs were conducted. Thirteen (13) largemouth bass (*Micropterus salmoides*) were sampled with an average Wr of 91.4. Mean length was 272 mm and mean weight was 404 grams. The PSD and PSD-P values are the same at 53.9. PSD value is within the acceptable range while PSD-P is on the high side.

Table 2. Lee Creek Electroshocking Data				
	2018	2019	2020	2021
N	50	19	230	13
Mean L (mm)	277.1	244.1	185.4	272.31
Mean W (g)	364.9	348.2	117.26	404.62
Mean Wr	89.7	93.5	96.8	91.4
CPUE	21.46	10.38	98.71	7.78
PSD	33.3	41.7	23.81	53.85
PSD-P	13.3	25	19.05	53.85



Backpack Electro-shocking

Backpack electro-shocking was conducted from July 9, 2021 to July 29, 2021. Seven (7) sites were sampled this year to obtain IBI scores to gauge the "health" of each stream. The number of taxa ranged from 13 at Buckhorn to 20 at Weber, and Upper Lee (Figure 5). Cove was the only creek that saw a drop in IBI score this year going from 48 to 44. Three (3) creeks, Mt. Fork (48 to 50), Jenkins (46 to 48), and Weber (46 to 48) all had IBI scores that went up by 2 points. Upper Lee (48) and Fall (50) stayed the same from 2020. All creeks were in the good range of IBI scores except for Buckhorn and Cove, which are at the top of the fair range.



Surber Nets

Macroinvertebrate samples were taken during the first quarter of 2021 from March 8 to March 11. All streams sampled scored a 20, which is the highest score on the index (Table 3). Taxa richness went up in all creeks sampled along with EPT (*Ephemeroptera*, *Plecoptera*, and *Trichoptera*) taxa richness. Mt. Fork was the only stream that experienced significant negative changes. The percent clingers dropped from 55.9% to 38.8%. Tolerance values for all the streams remained similar and percent clingers excluding Mt. Fork showed similar numbers from previous years.

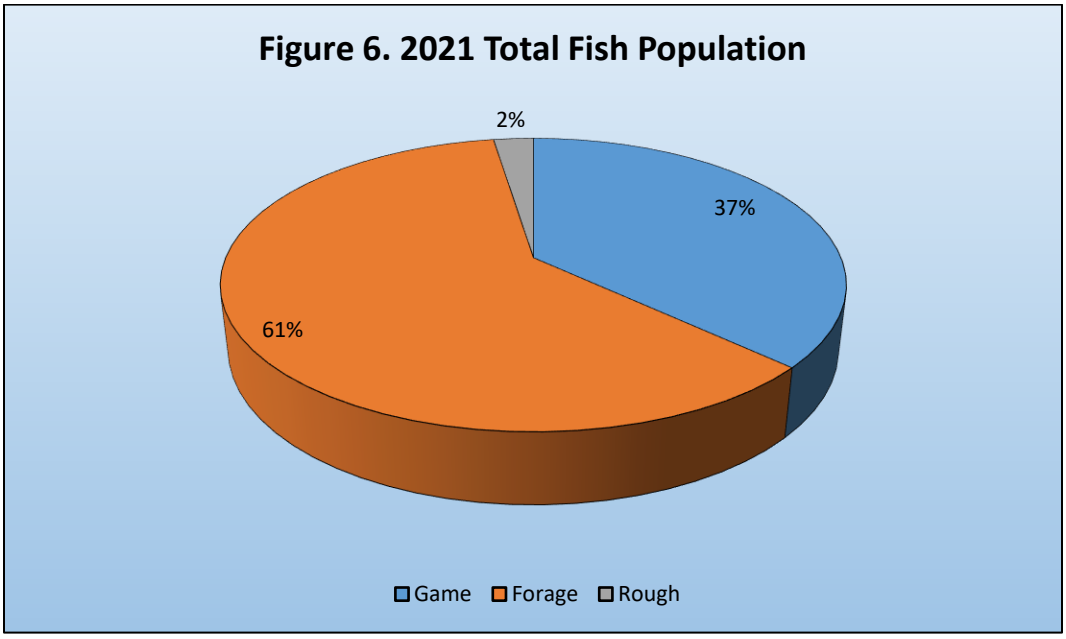
Table 3. Lee Creek 1st QTR Stream Condition

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Buckhorn	14	14	18	18	**	18	18	**	20
Cove	16	16	20	20	**	16	20	**	20
Jenkins	20	20	20	20	**	20	20	**	20
Upper Lee	20	12	20	20	**	20	20	**	**
Mt. Fork	20	18	18	20	**	20	20	**	20
Weber	***	**	18	20	**	18	20	**	20
Little Lee	**	**	**	20	**	20	20	**	20

**no samples available for analysis

Reservoir Population Distribution

The reservoir population distribution is divided into three (3) groups: Game, Forage, and Rough fish (Figure 6). The game fish are most of the predators sought after by anglers e.g. crappie, bass, and catfish. This group made up 37% of the population sampled this year. Forage fish are at the bottom of the food chain and are typically predated upom by the game fish and other predators. Forage fish made up 61% of the fish sampled this year. Forage fish population is important because low forage numbers lead to smaller Wr's for predator fish due to competition and lack of food. Rough fish are the last group not actively sought after by anglers. This group is typically the suckers, gar, carp, etc and only accounted for 2% of the population.



Algal Enumeration

Algae counts are conducted on samples collected weekly (Figure 7). Enumerations were conducted to determine the percent composition of MIB & Geosmin producing algae, which affect drinking waters taste and odor. The counts are also used to monitor phytoplankton growth especially blue-green algae, which are becoming more of a concern in drinking water reservoirs worldwide. During a short period in September, the blue-green *Cylindrospermopsis spp.* was prevalent in samples on Lee Creek. June through October was the peak growing season for algae this year, starting predominately with Chlorophyte's (green) and Dinophytes (dinoflagellates) as the dominant algae. Chrysophytes (golden-brown) took over for a short time with Bacillariophyta (diatoms) taking over as the dominant algae for the rest of the year. The most common MIB & Geosmin producing algae seen in 2021 was *Fragilaria spp.* A four (4) year trend analysis is summarized in Figure 8.

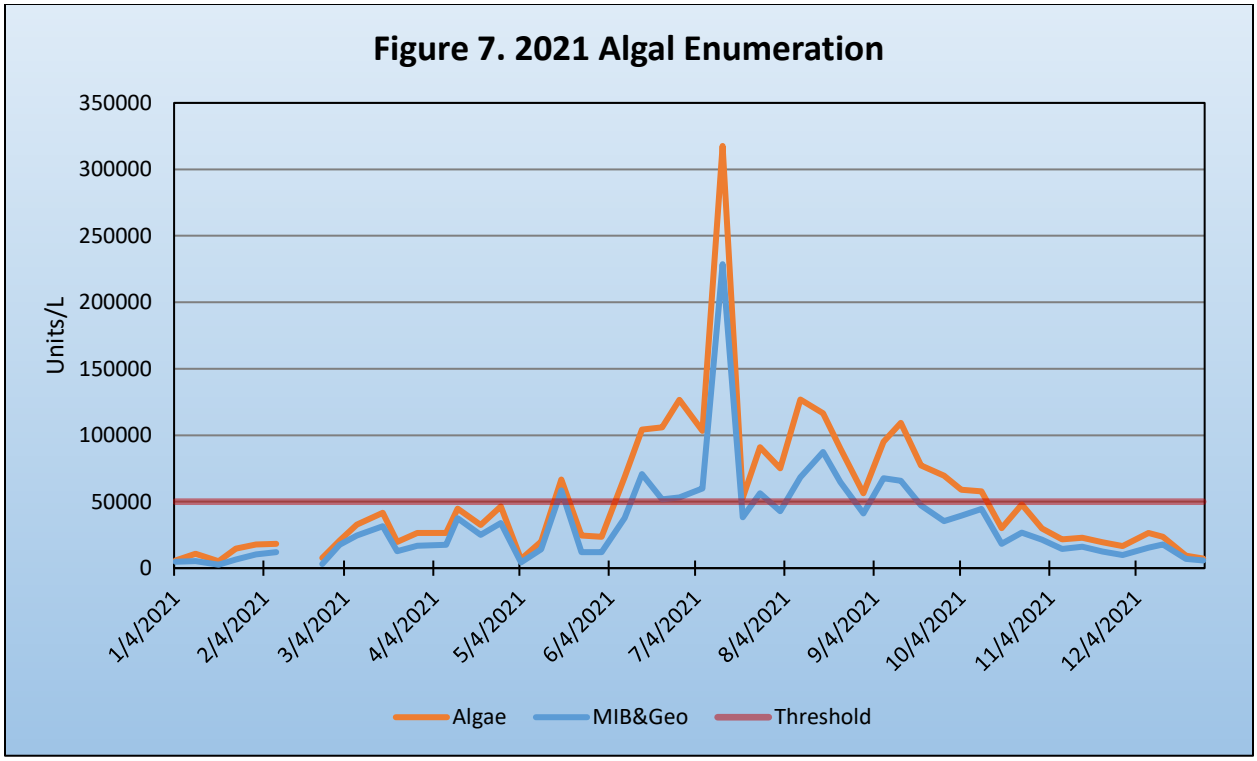


Figure 7. 2021 Algal Enumeration
350000
300000
250000
200000
150000
100000
50000
0
Units/L
1/4/2021
2/4/2021
3/4/2021
4/4/2021
5/4/2021
6/4/2021
7/4/2021
8/4/2021
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11/4/2021
12/4/2021
Algae
MIB&Geo
Threshold

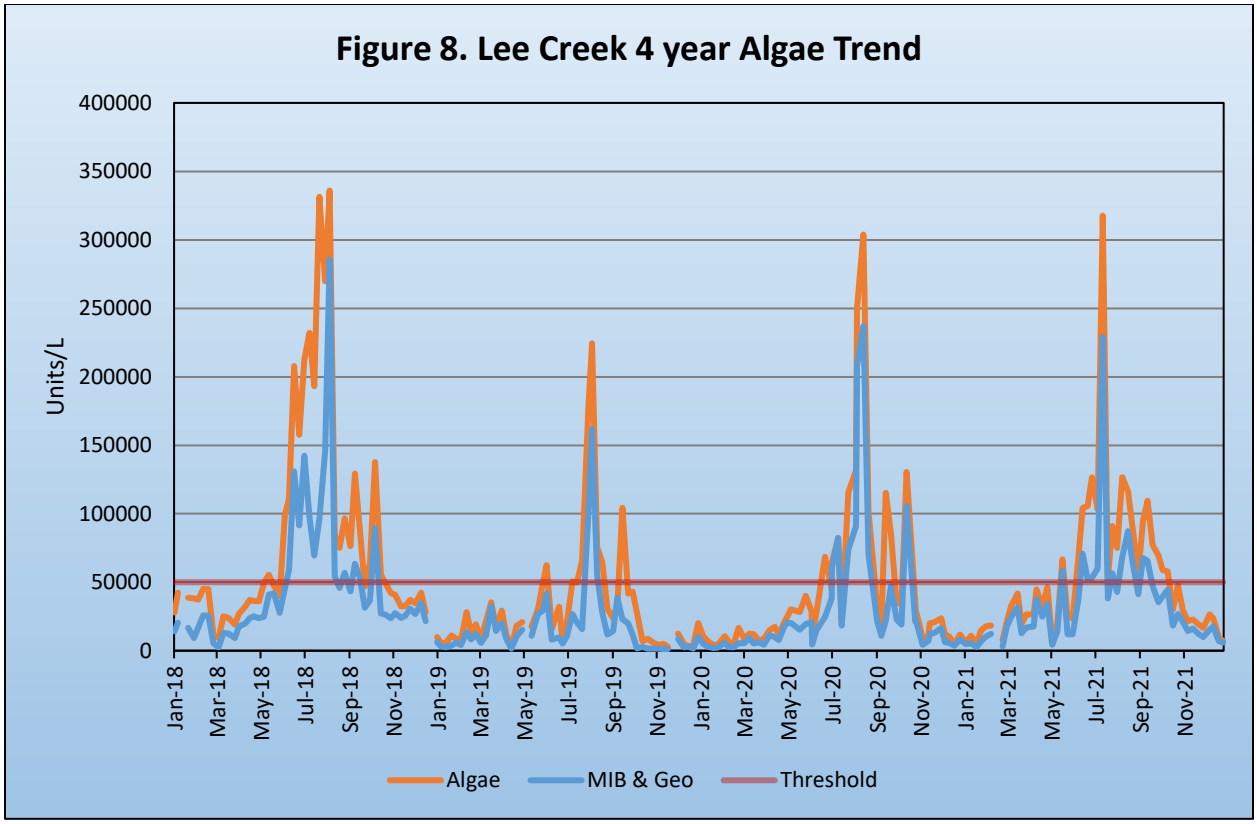
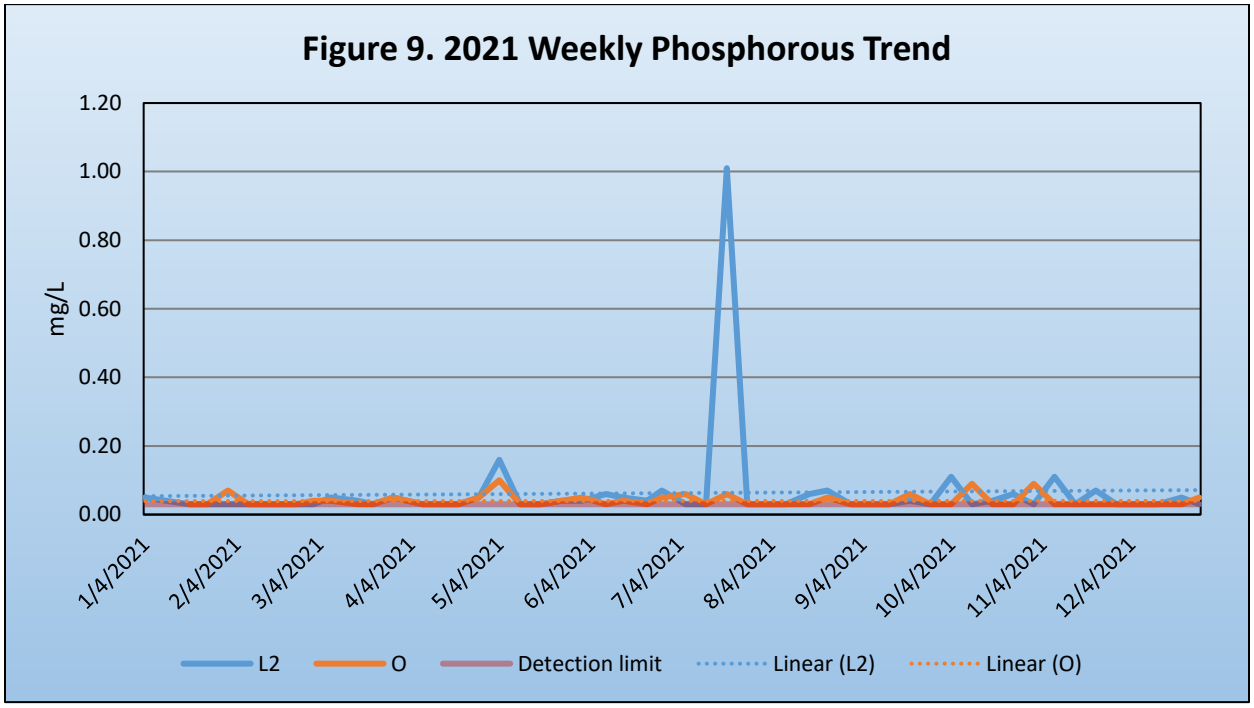
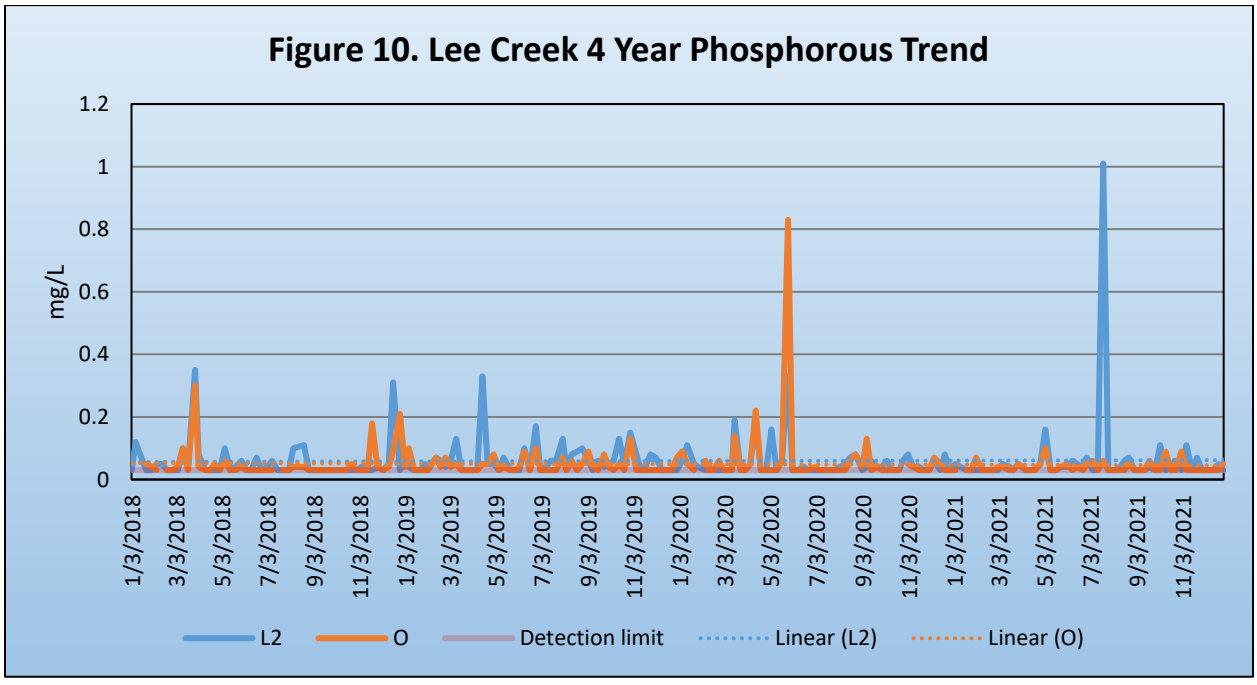


Figure 8. Lee Creek 4 year Algae Trend
400000
350000
300000
250000
200000
150000
100000
50000
0
Units/L
Jan-18
Mar-18
May-18
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-19
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
Algae
MIB & Geo
Threshold

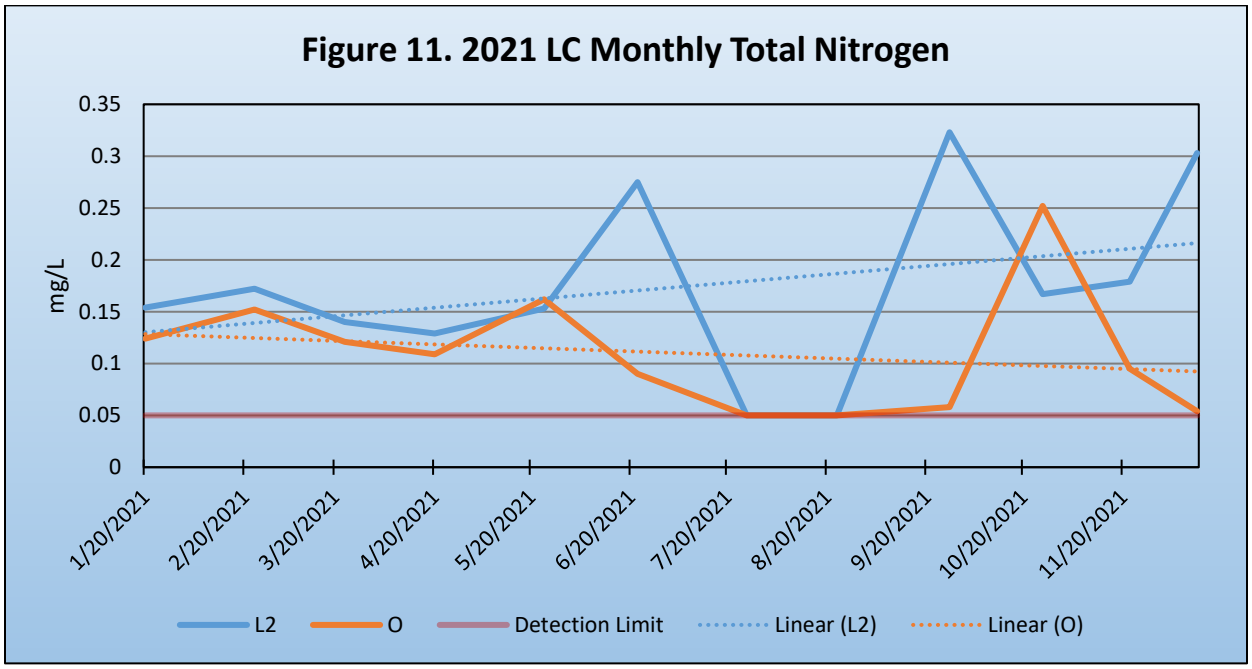
Water Quality

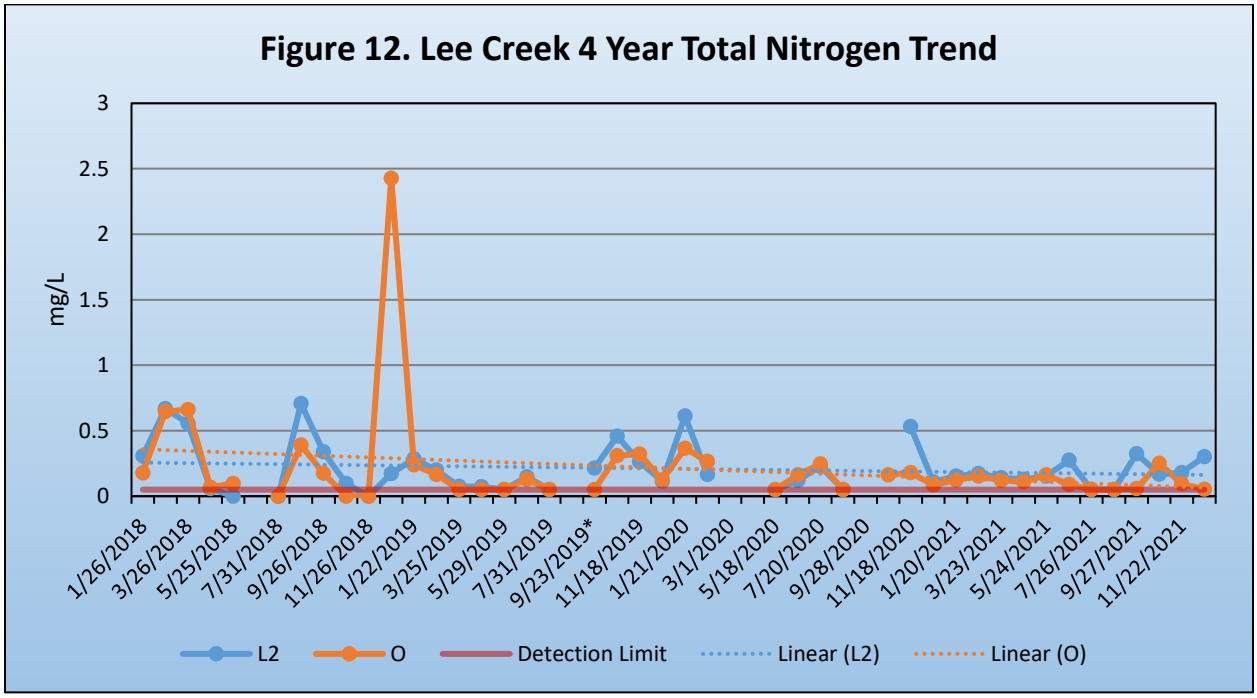
Phosphorous (P) levels at sites “L2” and “O” indicate a slight decrease to no change in the trend line over the 4-year sample period (Figure 10). The large spike seen at the end of July coincides to a large rain event introducing nutrients into the reservoir (Figure 9). Soil erosion from creek banks due to large rain events with heavy water flow tends to be the main source of P introduction into Lee Creek.





Nitrogen data for 2021 exhibits an increase at the “L2” site when 2021 is isolated from the four (4) year trend (Figure 12). When included with the four (4) year trend, the trend line shows a marginal change in N concentrations. The “O” site exhibits a downward trend for the 2021, as well as the four (4) year trend. The increasing of “L2” can be divided into two parts for 2021. The first spike from May to July, significant rain events brought large amounts of runoff and nutrients into the reservoir (Figure 11). A drop in lake level was possibly the cause of the second spike of 2021. If the reservoir does not have a chance to “flush” over the dam nutrients will concentrate in the reservoir.





CONCLUSION

The 2021 fisheries data was not as good of quality as previous years, partly due to lack of gill and trammel net data. Rough fish saw a low number in the population distribution due to this lack of data. This also explains the large percentage of game fish since the methods used target game fish more than other groups.

Trap net data is still trending toward larger crappie with a mean length of 315 mm and mean weight of 501 grams. Average relative weight (Wr) was 91.67 with PSD bring 92.68 and PSD-P being 81.71. Both the PSD numbers indicate a population skewed towards larger fish.

Boat electro-shocking yielded a sample size (N) of only 13 fish. That small sample size does not give a reliable statistical representation of the population as a whole. The mean length of the fish sampled was 272 mm and mean weight was 404 grams. The mean Wr of the fish sampled was 91.4 as well.

The IBI scores at all the creeks sampled using the backpack electro-shocking technique stayed the same or increased with the exception of Cove creek lowering from a 48 to 44. Mt. Fork, Jenkins and Weber all increased in IBI scores for 2021. All creeks in the Lee Creek basin were in the good range of IBI scores except Buckhorn and Cove, which fell into the fair range.

Macroinvertebrate data for all the streams in the Lee Creek Basin scored 20 out of 20 on the stream condition index. The data is only from first quarter samples, a second quarter sample was unobtainable due to weather.

Algae numbers were normal for Lee Creek in a given year. The year started with a majority mix of green algae and dinoflagellates slowly switching to golden brown then finally ending with diatom dominant samples. A short time in September saw the blue-green *Cylindrospermopsis spp.* takeover but the dominant genus of algae seen this year was mainly *Fragilaria spp.* and other diatoms.

The nutrients phosphorous and nitrogen are both showing a slight downward trend on the four (4) year graphs. The L2 site saw a large spike in phosphorous at the end of July but the rest of year stayed relatively low.

Appendix A.

Lee Creek Watershed Stream Fish Species List							
Family	**Genus**	**Species**	**Common Name**	**2018**	**2019**	**2020**	**2021**
Atherinidae	Labidesthes	sicculus	Brook Silverside				
Catostomidae	Moxostoma	duquesnei	Black Redhorse				
Catostomidae	Moxostoma	erythrurum	Golden Redhorse	✓	✓	✓	✓
Catostomidae	Hypentelium	nigricans	Northern Hog Sucker	✓	✓	✓	✓
Catostomidae	Erimyzon	oblongus	Creek Chubsucker				✓
Centrarchidae	Lepomis	cyanellus	Green Sunfish	✓	✓	✓	✓
Centrarchidae	Lepomis	macrochirus	Bluegill	✓	✓	✓	✓
Centrarchidae	Lepomis	megalotis	Longear Sunfish	✓	✓	✓	✓
Centrarchidae	Micropterus	dolomieu	Smallmouth Bass	✓	✓	✓	✓
Centrarchidae	Micropterus	punctulatus	Spotted bass	✓	✓		✓
Centrarchidae	Lepomis	gulosus	Warmouth				
Cyprinidae	Notropis	greenei	Wedgespot	✓	✓	✓	✓
Cyprinidae	Campostoma	anomalum	Central Stoneroller				
Cyprinidae	Campostoma	spadiceum	Highland Stoneroller	✓	✓	✓	✓
Cyprinidae	Luxilus	cardinalis	Cardinal Shiner	✓	✓	✓	✓
Cyprinidae	Pimephales	notatus	Bluntnose Minnow	✓	✓	✓	✓
Cyprinidae	Notropis	atherinoides	Emerald Shiner				
Cyprinidae	Notropis	boops	Bigeye Shiner	✓	✓	✓	✓
Cyprinidae	Semotilus	atromaculatus	Creek Chub	✓	✓	✓	✓
Cyprinidae	Nocomis	asper	Redspot Chub		✓	✓	✓
Cyprinidae	Notropis	whipplei	Steelcolor Shiner	✓	✓	✓	✓
Cyprinidae	Notropis	nubilus	Ozark Minnow	✓	✓	✓	✓
Fundulidae	Fundulus	catenatus	Northern Studfish	✓	✓	✓	✓
Fundulidae	Fundulus	notatus	Blackstriped Topminnow	✓	✓	✓	✓
Ictaluridae	Noturus	exilis	Slender Madtom	✓	✓	✓	✓
Ictaluridae	Ameiurus	natalis	Yellow Bullhead	✓	✓	✓	✓
Ictaluridae	Ameiurus	melas	Black Bullhead		✓		
Percidae	Etheostoma	blennioides	Greenside Darter	✓	✓	✓	✓
Percidae	Etheostoma	flabellare	Fantail Darter	✓	✓	✓	✓
Percidae	Etheostoma	spectabile	Orangethroat Darter	✓	✓	✓	✓
Percidae	Etheostoma	punctulatum	Stippled/Sunburst Darter	✓	✓	✓	✓
Percidae	Etheostoma	whipplei	Redfin Darter	✓	✓	✓	✓
Percidae	Etheostoma	zonale	Banded Darter	✓	✓	✓	✓
Percidae	Percina	caprodes	Logperch	✓	✓	✓	✓
Ictaluridae	Pylodictis	olivaris	Flathead Catfish	✓			
Ictaluridae	Ictalurus	punctatus	Channel Catfish		✓	✓	

Appendix B.

Lee Creek Reservoir Fish Species List							
Family	**Genus**	**Species**	**Common Name**	**2018**	**2019**	**2020**	**2021**
Catostomidae	Minytrema	melanops	Spotted Sucker	✓	✓	✓	✓
Catostomidae	Moxostoma	erythrurum	Golden Redhorse	✓	✓	✓	
Catostomidae	Moxostoma	carinatum	River Redhorse		✓	✓	
Centrarchidae	Micropterus	salmoides	Largemouth Bass	✓	✓	✓	✓
Centrarchidae	Micropterus	punctulatus	Spotted Bass	✓	✓	✓	
Centrarchidae	Micropterus	dolomieu	Smallmouth Bass				✓
Centrarchidae	Lepomis	macrochirus	Bluegill	✓	✓	✓	✓
Centrarchidae	Lepomis	microlophus	Redear Sunfish	✓	✓	✓	✓
Centrarchidae	Lepomis	cyanellus	Green Sunfish	✓	✓	✓	✓
Centrarchidae	Lepomis	gulosus	Warmouth	✓	✓	✓	✓
Centrarchidae	Lepomis	megalotis	Longear Sunfish	✓	✓	✓	✓
Centrarchidae	Pomoxis	annularis	White Crappie	✓	✓	✓	✓
Centrarchidae	Pomoxis	nigromaculatus	Black Crappie		✓	✓	✓
Clupeidae	Dorosoma	cepedianum	Gizzard Shad	✓	✓	✓	✓
Cyprinidae	Cyprinus	carpio	Common Carp			✓	
Cyprinidae	Notemigonus	crysoleucas	Golden Shiner				
Ictaluridae	Ameiurus	natalis	Yellow Bullhead		✓		
Ictaluridae	Ictalurus	punctatus	Channel Catfish	✓	✓	✓	✓
Ictaluridae	Ictalurus	furcatus	Blue Catfish			✓	
Ictaluridae	Pylodictis	olivaris	Flathead Catfish			✓	
Lepisosteidae	Lepisosteus	oculatus	Spotted Gar	✓	✓	✓	✓
Lepisosteidae	Lepisosteus	osseus	Longnose Gar				
Petromyzontidae	Ichthyomyzon	castaneus	Chestnut Lamprey		✓	✓	