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FISH SURVEY REPORT

Aspen Lake

Prepared For:

Woodland Lakes HOA

12 Woodland Lks

Sullivan, MO 63080

Locations:
Indiana
Illinois | Kentucky
Tennessee | Missouri

Est. 1966

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Introduction

A survey of the fish community and other physical, biological, and chemical factors directly affecting the fish community was completed at Aspen Lake on May 5, 2026. The major objectives of this survey and report are:

1. To provide a current status report on the fish community of the lake.
2. To compare the current characteristics of the fish community with established indices.
3. To provide recommendations for management strategies to enhance or sustain the sport fish community.

Table 1. Selected lake and water quality parameters.

	Surface	Ideal Range
Acres	2.89	-
Temperature (F)	67.0	-
Dissolved Oxygen (ppm)	7.93	5.0+
pH	7.72	6-9
Alkalinity (ppm)	32	20+
Total Hardness (ppm)	28	20+
Total Phosphorus (ppm)	0.01	0.01-0.09
Total Nitrogen (ppm)	0.67	1.0-10.0

Water Chemistry

When managing an aquatic ecosystem the quality of water should always be considered first. If a lake or pond is perfectly constructed with abundant food and habitat, but has poor water quality, the fishery will ultimately suffer and never reach it’s full potential. Although oxygen is typically not a year-round issue there are certain situations that can cause oxygen to drop to detrimental levels. If parameters such as pH or alkalinity are too low or too high it can put tremendous stress on the organisms living in it or even create a toxic environment all together. Other important parameters to consider are nitrogen and phosphorus levels. Nitrogen and phosphorus are two major nutrients that drive the plant growth in an aquatic ecosystem. If the ratio of nitrogen to phosphorus is below 17:1 there is potential for blue-green algae to become abundant. These species of algae can create a stressful environment for fish due to disruption of the food web.

The results of selected physio-chemical parameters from this waterbody are presented in Table 1. Dissolved oxygen, pH, alkalinity, and hardness levels were all in acceptable ranges. The lake had sufficient oxygen (>5.0 ppm) down to 6 feet. The temperature profile has steadily decreasing temperature with increasing depth (Figure 1).

The nitrogen to phosphorus ratio is approximately 67:1 at the surface. Overall, water quality parameters indicate this waterbody appears to be capable of supporting a healthy fish population.

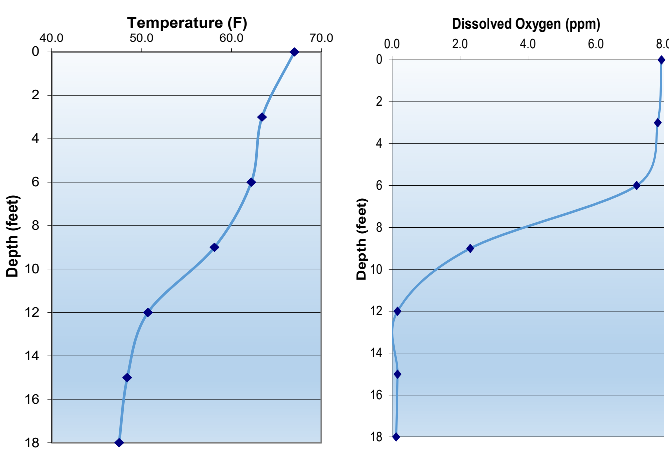


Figure 1. Temperature and Dissolved Oxygen profiles.

Aspen Lake

Fish Collection

Fish sampling was done with the use of an electrofishing boat. Electrofishing is simply the use of electricity to capture fish for the evaluation of population status. Electrofishing equipment used in this survey consisted of a 16-foot aluminum boat equipped with a Midwest Lake Electrofishing Systems Infinity Box powered by a 6500-watt portable generator and two booms mounted with Wisconsin style rings. Electrofishing was done around the entirety of the shoreline and totaled 15 minutes of shocking.

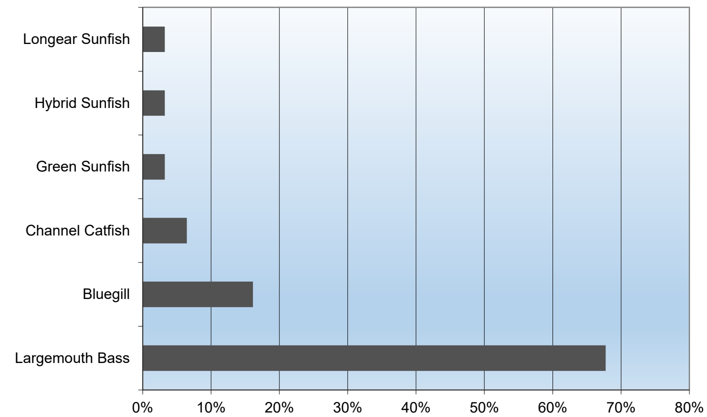


Figure 2. Relative abundance of species collected.

All fish collected were placed in water filled containers aboard the sampling boat for processing. Each fish collected was measured to the nearest half-inch. Five fish in each half-inch group were weighed to determine average and relative weights. Relative weight is a condition factor used to determine the overall plumpness of an individual fish. Relative weight values from 90-100 indicate good condition while anything under 90 is considered in poor condition. It can be assumed that fish with higher relative weights are finding enough food and are growing at a higher rate than fish with a lower relative weight.

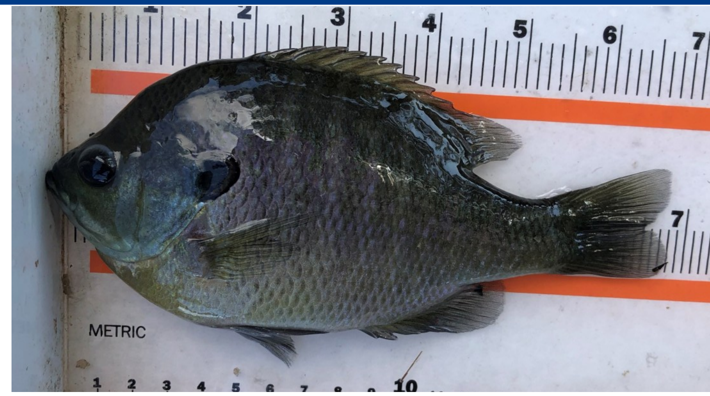
A total of 31 fish weighing 11.09 pounds and representing six species was collected from Aspen Lake . The relative abundance of these species can be found in figure 2 and a full data table can be found at the end of this report. The data collected are adequate for management implications; however, there will be unanswered questions regarding aspects of the fish population and other related factors of the biological community in the lake. All fish numbers used in the report are based on the samples collected and should not be interpreted to be absolute or estimated numbers of fish in the lake.

Largemouth Bass caught during survey.

Green Sunfish caught during survey.

Predator-Prey Relationship

Even the most diverse systems can be broken down into predator-prey relationships. Often times the Largemouth Bass-Bluegill relationship is the most important. Bluegill are a great prey item for Largemouth Bass because they spawn multiple times a year and are continually creating food for Largemouth Bass. Managing for one species typically involves influencing both and as one of these populations change the other typically changes with it. In a balanced state both Largemouth Bass and Bluegill can experience proper growth rates.



Bluegill

Aspen Lake—Bluegill

Bluegill were collected at a rate of 20 fish per hour during the survey, indicating extremely limited forage abundance relative to predator demand. Approximately 20% of sampled Bluegill measured between 3–6 inches, suggesting poor representation within an important forage size class supporting intermediate-sized Largemouth Bass growth. Approximately 80% exceeded 6 inches in length. Average Bluegill relative weight was 91, suggesting fair body condition.

Overall the Bluegill population is extremely lacking. There does not appear to be a population large enough for angler to consistently catch them. Additionally, the lack of Bluegill in the pond has lead to poor growth in Largemouth Bass.

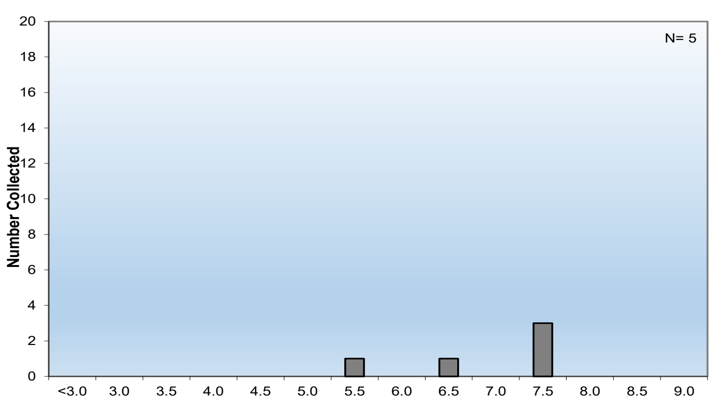


Figure 3. Length frequency distribution of Bluegill

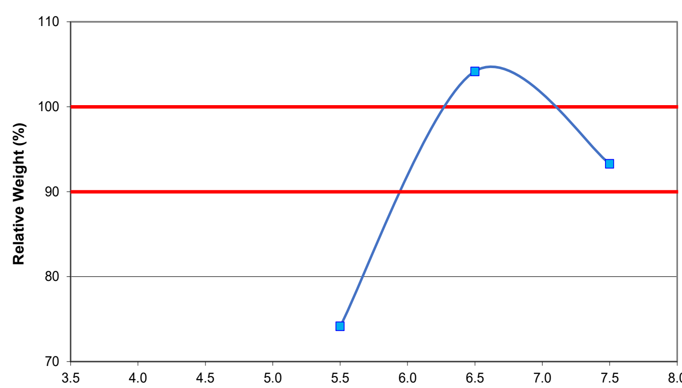


Figure 4. Bluegill relative weights

Predator-Prey Relationship

Largemouth Bass are an opportunistic predator that will eat just about any species of fish they can catch. To keep a Largemouth Bass growing properly there needs to be several different sizes of forage available. This allows the bass to continually find the optimal size of prey as it continues to grow. When the optimal size of prey is available the fish can conserve energy, resulting in a higher growth rate. If the prey is too small a Largemouth Bass could potentially spend more energy chasing a meal than it gains by eating it. This results in skinny and slow growing fish. Managing a forage base to create a variety of sizes is key to creating a healthy and balanced Largemouth Bass population.

Aspen Lake—Largemouth Bass

Largemouth Bass were collected at a rate of 84 fish per hour during the electrofishing survey, indicating an abundant predator population and elevated competition among individuals. Relative weights averaged 81 for Largemouth Bass between 8–12 inches and 68 for greater than 16 inches, demonstrating that available forage resources were insufficient to maintain desirable body condition throughout the population. No Largemouth Bass were collected within the 12–16 inch size class. None of the sampled individuals exceeded a relative weight of 90 or 100, indicating poor body condition and intense competition for available forage resources.

Largemouth Bass

One Largemouth Bass exceeding 18 inches in length was collected during the survey, indicating limited recruitment into larger size classes and reduced opportunities for quality-size angling. This individual was extremely underweight due to lack of forage available.

Largemouth Bass were stunted and overabundant at the time of the survey. Largemouth Bass were heavily accumulated within the 8–12 inch size classes. This high level of competition limits growth and contributes to poor relative weights. Without a reduction in these size classes, relatively few individuals are expected to recruit into larger size classes. There is simply not enough food to support the Largemouth Bass population at this time.

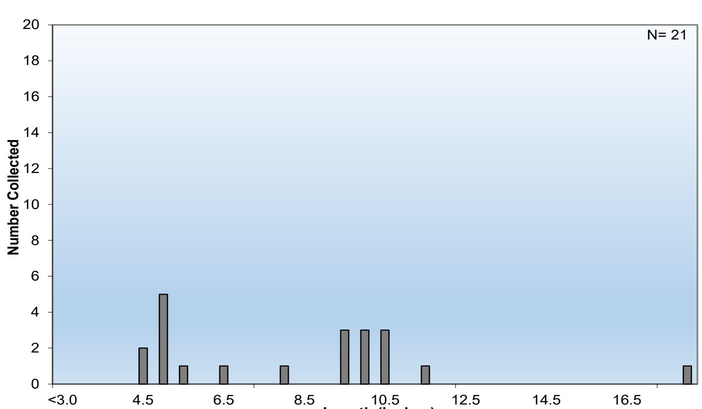


Figure 5. Length frequency distribution of Largemouth Bass

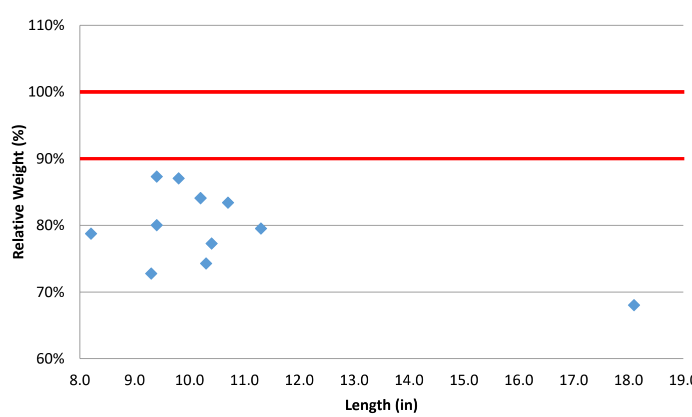


Figure 6. Largemouth Bass relative weights

Harvest

Harvesting fish is often one of the most important and under utilized management practices in a pond or lake. Harvesting, or culling, fish is simply the act of intentionally removing fish from a specific population to decrease competition among the remaining individuals. The culture of catch and release bass fishing started in the 1970's and still has a strong hold on fisherman today. There is a misconception that taking a fish out of a system will be detrimental to the population and if released someone could catch that fish again after it has "grown up." The reality is in some situations there is too much competition and the next time that fish is caught it could be the exact same size a year later. By removing that fish, and others, it leaves more food available for the remaining individuals to continue to grow each and every year.

Example of Stunted Largemouth Bass

Ponds and lakes can both become overrun with predators or prey. Each scenario presents a different set of problems. In a predator (Largemouth Bass) dominant system prey populations are decimated and the lack of food results in slow or stunted growth. In a prey (Bluegill) dominated system spawning and recruitment success of other species can be negatively impacted due to egg predation or direct competition with young-of-year fish, along with slow growth within the population.

Fixing these issues requires targeted annual harvest. In an unbalanced system generally only one species requires a heavy amount of the harvest, while in a balanced system fish should be removed from most populations to maintain a continuous level of growth.

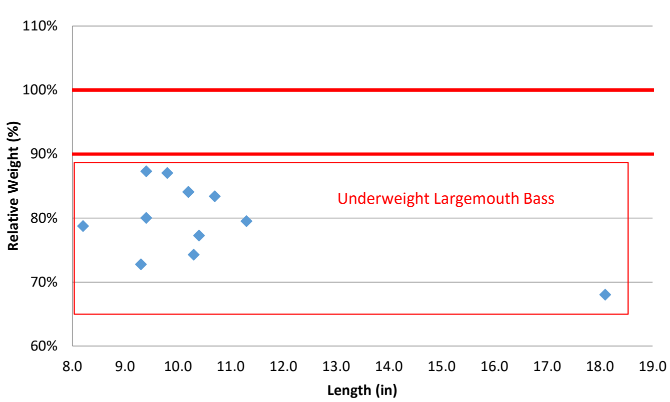


Figure 7. Largemouth Bass relative weights

Aggressive harvest of smaller Largemouth Bass is strongly recommended. Significant reductions in Largemouth Bass abundance will be necessary to alleviate competition for food resources and improve the overall balance of the fishery.

Bluegill harvest should be suspended until the fishery can be transitioned back to a balanced state.

Species such as Hybrid Sunfish and Green Sunfish can be harvested whenever caught.

Structure and Habitat

Structure and habitat are an extremely important factor to consider no matter what body of water is being managed. Just like anything else, the amount of structure in a lake should be kept in moderation. Too much or too little can lead to predictable scenarios. When very little or no structure is available Largemouth Bass spend too much time roaming around looking for food instead of saving energy and waiting near a piece of structure for food to swim by. The other end of the spectrum allows so many places for Bluegill or other prey species to hide that Largemouth Bass can't efficiently catch their prey. In both scenarios Largemouth Bass tend to have low relative weights even with proper harvest rates in place. In most cases roughly 20% of the shoreline containing structure is sufficient. This number can vary depending on the complexity of the cover.

Adding structure to a pond can be beneficial in a variety of ways. It can be a great way to increase the survival of small juvenile fish. This provides a forage base with a wide range of sizes available for your predators. Another benefit of adding structure to a pond is that they attract fish. Strategically placing structure can give you places that you can reliably catch fish.

Fish structure can take many different forms . Aquatic vegetation, brush piles, Christmas trees, and a variety of man-made structures can all be utilized by fish. All of these different structure types have different benefits that make them good management options. Aquatic vegetation

Pickerelweed

Largemouth Bass utilizing a Mossback Root Wad Kit

grows on its own but can be hard to manage at times. Brush piles and Christmas trees are often free, but will break down over time and need to be replaced. Manufactured structure can be costly initially, but will last a lifetime. Variety is important when assessing structure in a body of water. Adding structures of varied complexity and in varied depth can help to provide habitat to a variety of fish at different stages of life.

No shoreline habitat was present at the time of the survey. Docks represented the only structural habitat feature observed. Spawning habitat also appeared inadequate. Overall habitat availability remained well below desirable levels and is likely limiting forage production and recruitment.

Complex habitat is critical for the survival of young and developing forage fish. Improvements in habitat will help create a broader and more stable forage base. Increasing structure is ideally done using a mix of woody and artificial habitat. Habitat improvements should focus on increasing the amount and distribution of available structure throughout the lake. These improvements should improve forage survival, strengthen year-class production, enhance predator efficiency, and increase the overall stability of the fish community.

Supplemental Forage Stocking

Stocking supplemental forage is a great pond management tool capable of significantly altering a fishery in a short period of time when done correctly. If a prey base, such as the Bluegill population, is being heavily predated on temporary forage stockings can be used to bolster the current population. Supplementing the Bluegill population is the most beneficial stocking. Rebounding this population will solve the major food source problem for predators. Other common species used are Fathead Minnows and Golden Shiners. Fathead Minnows are great for initial stockings in a pond due to their small size, while the larger Golden Shiners are better for an already established pond. Both of these species rarely produce a self sustaining population and will need to be stocked annually to have the greatest impact on the fishery.

Recommendation:

Stock 2,500 3-4” Bluegill, 1,000 3-4” Redear, and 30 pounds of Golden Shiners annually for 3 years

Bluegill Stocking

Golden Shiner

Supplemental Fish Food

Using a fish feeder with a high protein feed is an excellent way to push the limits of a pond in regards to fish production. By adding a huge additional food source to the pond the carrying capacity is being raised. Often the immediate effect of this management tool is growing really large Bluegill. While having large Bluegill is great there are additional benefits that work their way up the food chain. Larger Bluegill produce more and larger eggs while spawning. This is important because larger eggs have a much higher survival rate. The more offspring the Bluegill are producing each time they spawn results in a much larger forage base for Largemouth Bass to take advantage of. Even when managing for a balanced fishery using a fish feeder is always a great idea, but when looking for trophy Largemouth Bass or trophy Bluegill it is a must.

Recommendation:

Install a Texas Hunter Fish Feeder with AC Trophy Pond Feed

Texas Hunter fish feeder

Aeration

Aeration can be a beneficial addition to most any body of water that is holding fish. Aeration can help to increase the amount of habitat available to fish by increasing the amount of oxygenated water that is available. It can also be a means to reduce the risk of fish kills and reduce oxygen stress on fish. The two main categories of aeration are surface aeration and diffused aeration.

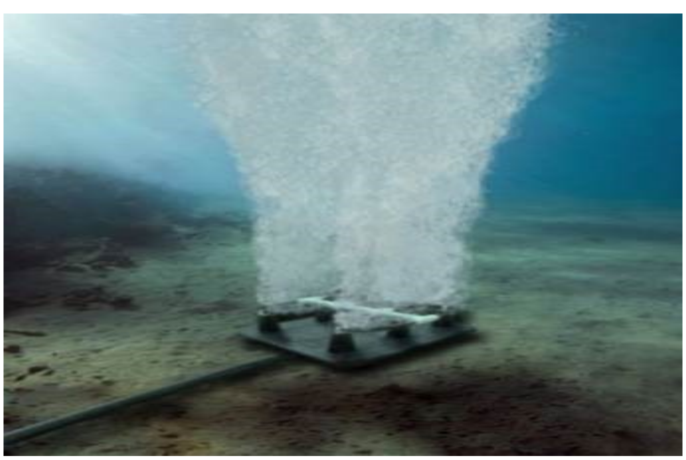
Surface aerator

Surface Aeration

Surface aeration refers to aerators that agitate the surface of the water. This agitation helps to increase the amount of oxygen that is dissolved into the water in the surface layers . Surface aeration is often confused with fountain aeration, but differs in multiple ways. In most cases, the primary goal of fountains is aesthetics, where as the primary goal of surface aeration is agitating the maximum amount of water to increase oxygen in the surface layers of a body of water. Surface aerators are good options to improve oxygen levels in bodies of water that have a low average depth or a maximum depth shallower than 8 feet.

Diffused Aeration

Diffused aeration is used as a tool to alter the temperature/oxygen profile of a body of water. Without diffused aeration, bodies of water will begin to layer in a process called "stratification." The top layer of a body of water is called the epilimnion and is characterized by warmer oxygen rich water. Below the epilimnion is the metalimnion/thermocline. This layer separates and prevents mixing of the warm, oxygen rich waters near the surface and the cold, oxygen poor waters on the bottom. The thermocline is characterized by a rapid change in temperature and oxygen. The hypolimnion is the bottom layer that makes contact with the sediment/benthos and is characterized by cold water and little to no oxygen.



Diffused aerator

Diffused aeration is used to remove or prevent these layers from forming (destratification) by pumping water and oxygen from the bottom of the water column. By removing these layers, diffused aeration creates even oxygen and temperature throughout the water column. This allows fish to use the entire water column as opposed to being limited to the epilimnion. This makes diffused aeration a good tool for increasing the carrying capacity of a pond and reducing the chances for oxygen stress and fish kills.

Diffused aeration can also be used as a tool to break down organic material (muck) that forms on the bottom of ponds and lakes. Introducing oxygen to the bottom sediments allows aerobic bacteria to consume and break down these organics.

Aspen Lake would be a good candidate for diffused aeration based on the maximum depth being 18 feet.

Summary/Recommendations

The fishery currently exhibits characteristics of a predator-heavy system dominated by an overcrowded Largemouth Bass population. Largemouth Bass abundance was high and body condition was poor across all sampled size classes, indicating severe competition for limited forage resources. Reducing the abundance of smaller Largemouth Bass should be the highest management priority. Decreasing competition within the Largemouth Bass population will improve growth rates, body condition, and increase the likelihood of recruiting fish into larger size classes.

Bluegill abundance was extremely limited. The overall forage population is insufficient to support the existing Large-mouth Bass population. This predator-prey imbalance is the primary factor limiting Largemouth Bass growth.

Habitat conditions further contribute to the fishery imbalance. Structural habitat was nearly absent, spawning habitat appeared inadequate, and no meaningful shoreline cover was present. Increasing habitat complexity should improve forage survival, strengthen year-class production, and increase overall fishery stability.

Supplemental forage stockings should focus on strengthening the prey base available to predators. Bluegill remain the backbone of most pond fisheries due to their ability to reproduce multiple times annually. Golden Shiners can supple-ment predator diets and reduce predation pressure on Bluegill, while Redear Sunfish provide additional forage benefits and may help suppress parasite abundance.

Installing a Texas Hunter fish feeder and utilizing AC Trophy Pond Feed remains one of the most direct ways to improve fish growth. Supplemental feeding improves Bluegill growth and reproductive output while increasing overall forage availability within the system.

The following recommendations, **listed in order of importance**, will help protect and enhance the fishery in Aspen Lake:

1. Harvest any Largemouth Bass caught
    - Any Green Sunfish or Hybrid Sunfish caught can also be removed
2. Install 40 Ugly Tree fish habitats
3. Stock 2,500 3-4” Bluegill, 1,000 3-4” Redear, and 30 pounds of Golden Shiners annually for 3 years
4. Install a pea gravel spawning area
5. Install a Texas Hunter fish feeder with AC Trophy Pond Feed
6. Install diffused aeration
7. Conduct a Fisheries analysis survey in 2029.

ALL PROPERTY OWNERS ARE RESPONSIBLE FOR FOLLOWING STATE AND LOCAL REGULATIONS WHEN MANAGING THEIR FISHERY.

Other Species Present

Channel Catfish (*Ictalurus punctatus)*

Channel Catfish are members of the Ictaluridae family. Channel Catfish can be problematic to a fishery if overabundant, but in small or moderate abundances, rarely cause problems. They are often desirable sportfish and can be good table fare. Channel Catfish are typically not represented very well in electrofishing surveys, and can often be more abundant than the data shows. Channel Catfish often do not have a high level of natural reproduction in small ponds and some lakes, and

Channel Catfish

Hybrid Sunfish

Hybrid Sunfish (Lepomis spp. X Lepomis ssp.)

Hybrid sunfish are members of the Centrarchidae (Sunfish) family. Hybrid sunfish are often a cross between Green Sunfish and Bluegill when stocked from a hatchery. Though this is the most common cross, many different species of sunfish can hybridize if both are present. Hybrid sunfish can be desirable because they can grow to very large sizes quickly, but over time they can cause problems because through generations of reproducing some of the offspring revert back to fish resembling Green Sunfish. Any hybrid sunfish caught should be removed.

Longear Sunfish (*Lepomis megalotis*)

Longear Sunfish is in the Centrarchidae (Sunfish) Family. Longear Sunfish will eat invertebrates, zooplankton, and a variety of small food items. Longear Sunfish can be considered undesirable because they can compete with Bluegill for food resources.

Longear Sunfish

Other Species Present

Green Sunfish

Green Sunfish *Lepomis Cyanellus*

Green Sunfish are a member of the Centrarchidae (Sunfish) family. Green Sunfish can be aggressive and competitive with Bluegill and other species for food and resources therefore they are generally considered an undesirable species. Green Sunfish look superficially like Bluegill. They can easily be distinguished by their larger mouths and more rounded pectoral fins

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Fish Collection Tables

SIZE GROUP (IN)	NUMBER	PERCENTAGE	AVERAGE WEIGHT (lbs.)	TOTAL WEIGHT (lbs.)	WS	RELATIVE WEIGHT
BLUEGILL						
5.5	1	20.00%	0.09	0.09	0.12	74
6.5	1	20.00%	0.22	0.22	0.21	104
7.5	3	60.00%	0.32	0.95	0.34	93
TOTAL	5			1.26		
LARGEMOUTH BASS						
4.5	2	9.52%	0.04	0.07	0.04	-
5.0	5	23.81%	0.05	0.26	0.06	-
5.5	1	4.76%	0.07	0.07	0.07	-
6.5	1	4.76%	0.11	0.11	0.13	-
8.0	1	4.76%	0.21	0.21	0.25	85
9.5	3	14.29%	0.33	0.98	0.43	77
10.0	3	14.29%	0.44	1.31	0.50	87
10.5	3	14.29%	0.46	1.37	0.59	78
11.5	1	4.76%	0.59	0.59	0.78	75
18.0	1	4.76%	2.27	2.27	3.28	69
TOTAL	21			7.24		
Channel Catfish						
13.5	1	50.00%	0.70	0.70		
16.5	1	50.00%	1.10	1.10		
TOTAL	2			1.80		
Green Sunfish						
8.0	1	100.00%	0.45	0.45		
TOTAL	1			0.45		
Hybrid Sunfish						
7.5	1	100.00%	0.34	0.34		
TOTAL	1			0.34		
Longear Sunfish						
5.5	1	100.00%	0.16	0.16		
TOTAL	1			0.00		

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Species	Scientific Name	N	%N	Size Range (in.)	Total weight (lbs.)	%Wt.	N/hr.
Largemouth Bass	*Micropterus salmoides*	21	67.74%	4.5 - 18.0	7.24	65.28%	84
Bluegill	*Lepomis macrochirus*	5	16.13%	5.5 - 7.5	1.26	11.36%	20
Channel Catfish	*Ictalurus punctatus*	2	6.45%	13.5 - 16.5	1.80	16.23%	8
Green Sunfish	*Lepomis cyanellus*	1	3.23%	8.0	0.45	4.06%	4
Hybrid Sunfish	*Lepomis ssp. X Lepomis ssp.*	1	3.23%	7.5	0.34	3.07%	4
Longear Sunfish	*Lepomis megalotis*	1	3.23%	5.5	0.00	0.00%	4
Total		31			11.09		

N = number of individuals
%N = percent number of a species as compared to the total number of fish collected
%Wt = percent weight of a species as compared to the total weight of all fish collected
N/hr. = catch rate of species (number of fish of a species collected per hour of electrofishing effort)