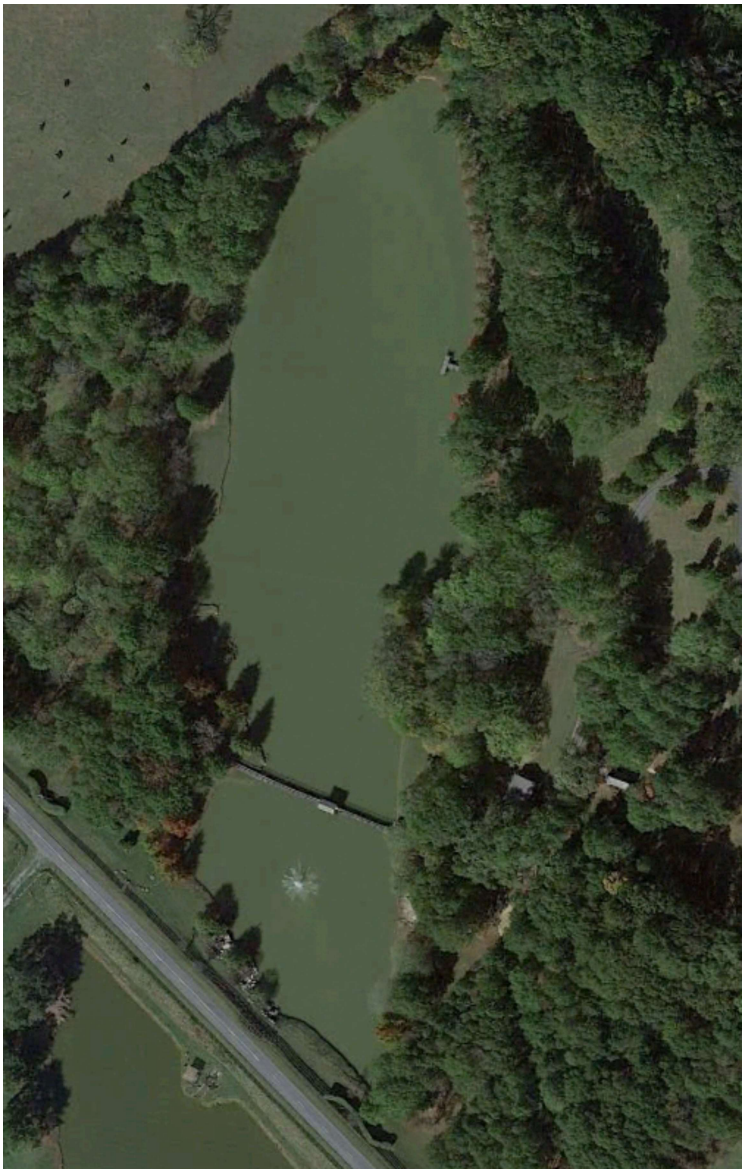
Fisheries Assessment and Management Plan
John Grattafiori's Lake



October 18, 2021

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Site Description

On the day of my survey the lake was at full pool. The primary spillway of the lake is a concrete free crest weir near the eastern abutment. The weir is approximately 6 feet in width and about 15 feet in length. There is no apparent secondary spillway and the earthen dam has about 24 inches of freeboard. The lake's water level is maintained by runoff from the upstream watershed and likely some groundwater. The watershed above the pond is mostly pasture and cropland with some woodland. There are five ponds of smaller surface area than this one upstream in the watershed.

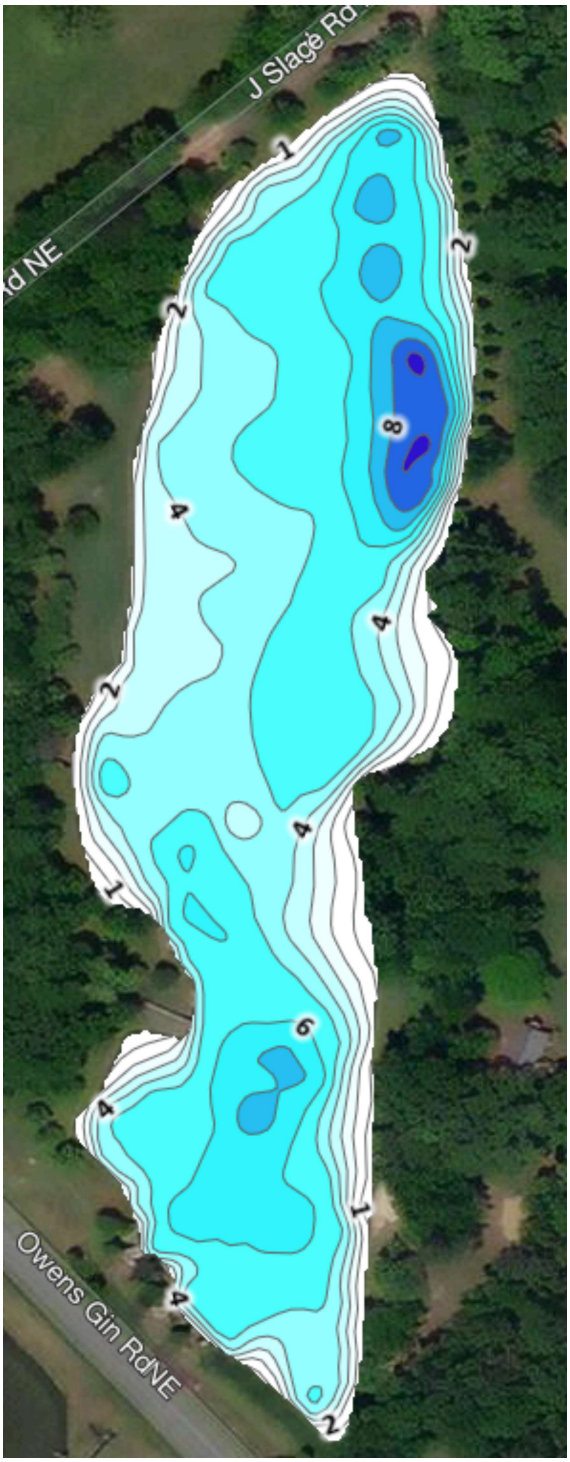
The lake is aligned generally north to south and the dam crosses the drain on the north end. The dam is located almost immediately adjacent Salacoa Creek very near its confluence with the Coosawattee River. The dam crosses in a north-south direction at the eastern end of the lake. The dam is about 180 feet in width and about 15 feet long on the top.

I examined 19 aerial images of the lake site taken between 1985 and 2019. Neither the dam nor lake is discernible on aerial imagery dated in 1993 but an image taken in 1999 shows the lake but only partially filled. The next available image is from 2004 and shows the lake essentially in its current state. I suspect that the lake was constructed around 1999. Based on measurements I made from aerial imagery, the lake is approximately 5.67 acres in surface area. The area of the watershed that drains into the lake was measured at 433 acres for a watershed:pool ratio of approximately 80:1. Ratios greater than 40:1 generally reflect so much flushing inflow that fertilization is not an economical option and spillway structures are extensive and hard to maintain. Ratios less than 20:1 generally are lakes with insufficient inflow to stay full during periods of low rainfall. The watershed/pool ratio of this lake is significantly above the desirable range.

Based on my examination of topographic features of the lake on USGS topographic quadrangles, I believe that the elevation of the top of the dam to be approximately 640 feet. The elevation of the Coosawattee River at its confluence with Salacoa Creek appears to be about 630 feet. I examined the USGS gage data collected from the nearby Coosawattee River and the river stage elevation appears to rise several times annually more than 10 feet and often approaches 20 feet. This means that multiple times each year the dam of this lake will be inundated by rising river flows downstream.

The pond has moderately sloping shorelines throughout. There are abundant stumps and shallow areas generally away from the shoreline. There is a dock on the lake that is constructed on fixed piers and a wooden bridge that crosses the lake on the upper end.

I gathered bathymetric data on the lake and compiled the topographic map shown in the following figure. The average depth of the lake was 4.7 feet and the maximum depth found during the survey was 10.16 feet. The total lake volume was calculated to be 26.62 acre feet.



About 17% of the lake's area was 3 feet deep or less and this represents an almost ideal proportion of shallow water to deep water.

On the day of sampling the lake's water had a visibility of approximately 26 inches. I measured total hardness and it was 81 ppm. Optimal fish production is most readily achieved in water with hardness of 20 ppm or more.

Management Goals

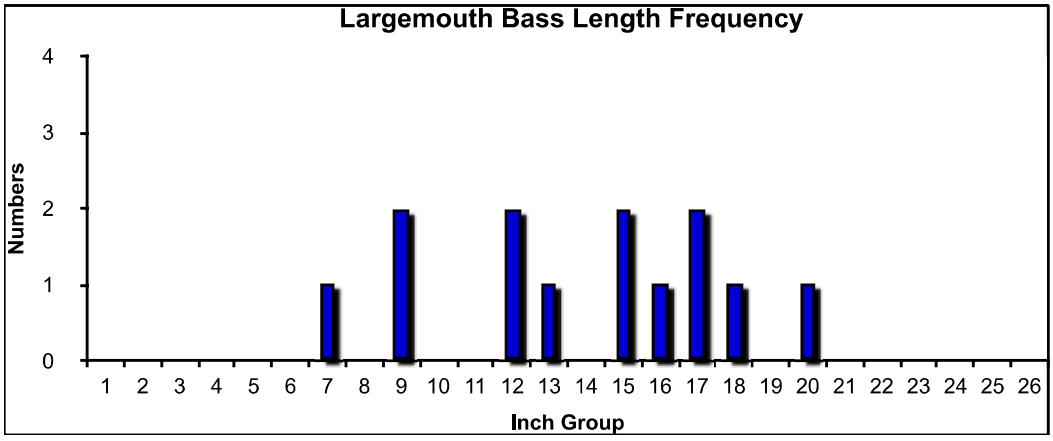
Management of this lake will be severely constrained by the lack of control of the water exchange both upstream and downstream. That is to say that the constituents of the fish population of the lake cannot be controlled. Several times each year during even minor flood events, the entire lake will be inundated by high flows both upstream and downstream. The fish population will always be constituted by fish from outside the lake that enter during these floods. Management measures should therefore focus on short term goals that will tend to temporarily improve fishing and that are not severely impacted by flooding events.

Fish Population

I sampled the lake with a boat mounted electrofisher for approximately 2.5 hours on 18 October 2021. Sampling was conducted throughout the entire lake to insure that the sample collected was fully representative of the fish population. A representative sample of all fish collected were enumerated, measured, and weighed.

During my sampling the overall abundance of fish was moderate. I collected 13 species, gizzard shad, threadfin shad, black crappie, bluegill, largemouth bass, redear sunfish (shellcrackers), redbreast sunfish, spotted sucker, common carp, golden shiner, brown bullhead, grass carp and warmouth sunfish, listed in declining relative abundance. In addition we saw but failed to collect long nose gar. It is very likely that other species inhabit the lake but were not collected by me because of their relatively low numbers and resistance to this sampling gear.

Largemouth bass were widespread in the lake although not abundant. Their length distribution is shown in the following figure. Young of the year bass, spawned in 2021 are perhaps represented by the 7-9 inch groups. These were the smallest bass found during sampling and this size would represent excellent growth of young of the year bass. The low abundance of this cohort reflects the overall abundance of bass and suggests that low bass recruitment may be limiting overall bass abundance. Other age groups are not readily discernible in the length distribution. The



wide range of sizes collected would suggest that bass abundance is not currently influenced by fishing.

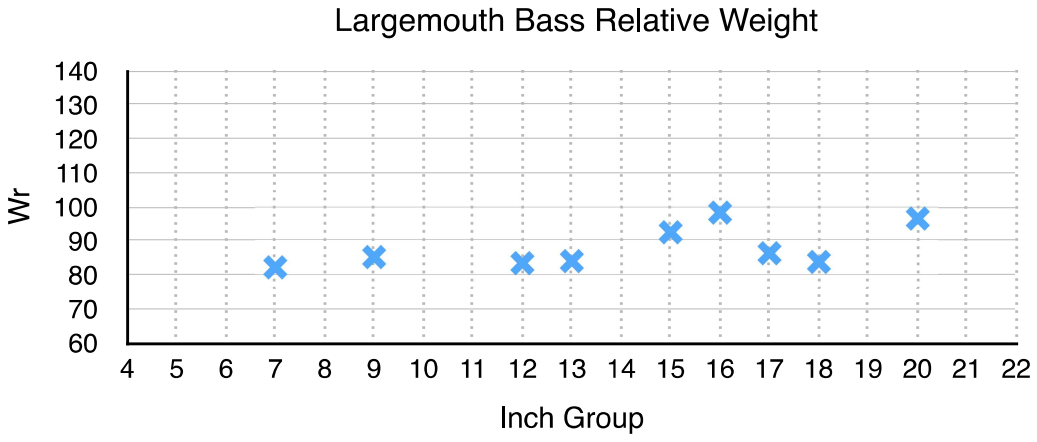
The relative stock density (RSD) is another way of examining the relative abundance of various sizes of bass of interest to anglers and is shown in Table 1. For a lake to consistently produce good bass fishing, the proportional stock density (PSD), that portion of the bass population of quality size and greater, and thus of most interest to anglers, should be between 40-60%. The PSD on your lake was 83%, above the desirable range. This could indicate that the abundance of bass overall is currently limited by recruitment or poor reproduction. If that is indeed the case it

Table 1. Relative stock density of largemouth bass collected.

Category	Length	Numbers	RSD
Stock	8-12”	2	17%
Quality	12-15”	3	25%
Preferred	15-20”	6	50%
Memorable	20-25”	1	8%
Trophy	>25”	0	0%
	PSD =	83%	

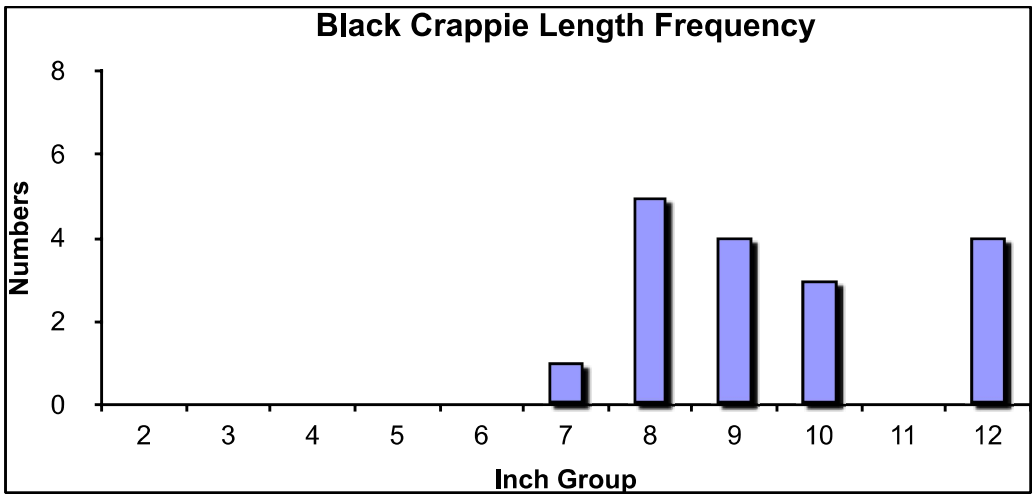
is perhaps caused by severe competition with other species for available forage resources, predation on young bass, poor spawning success or a combination of these three.

The average relative weight (Wr) of bass in each length group is shown in the following figure. Wr is a comparison of how the bass’s condition (plumpness) compares to a statewide average bass of the same length. Wr values of 100 are ideal and those of 80 or below indicate thin or poor condition. In a pond with abundant forage fish, Wr values of 110-120 are common. This index is used to assess forage conditions, with higher Wr indicating better forage availability for those size groups of bass. Average Wr of most size groups were less than 90. There appears to be a tendency for smaller bass to have lower average Wr than larger bass. This indicates a scarcity of forage small enough for small bass to consume. A bass can generally consume forage fish that



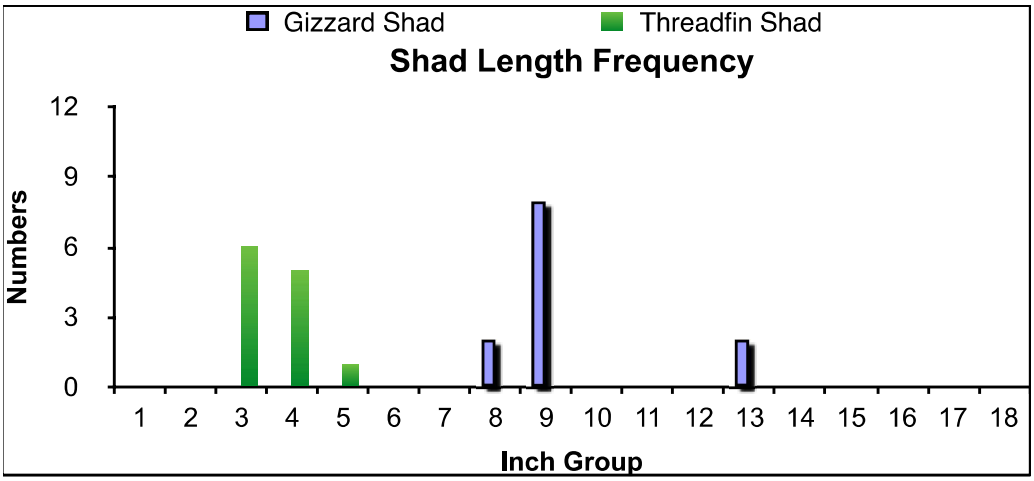
are 1/4 to 1/3 their own length. Forage suitable for 12 inch and smaller bass was not common in the pond.

Black crappie were more abundant than any other predators in the lake. Their size distribution is shown in the following figure. Small crappie tend to be pelagic, inhabiting open water, and less vulnerable to electrofishing than intermediate and larger crappie. This sample of their population was dominated by intermediate size fish that are generally too small to be of interest to anglers. Black crappie are predatory and consume aquatic insects and small forage fish. Without an abundance of small forage fish, crappie rarely grow well enough to produce significant numbers of harvestable size fish. In this respect they compete with both largemouth bass and bluegill for



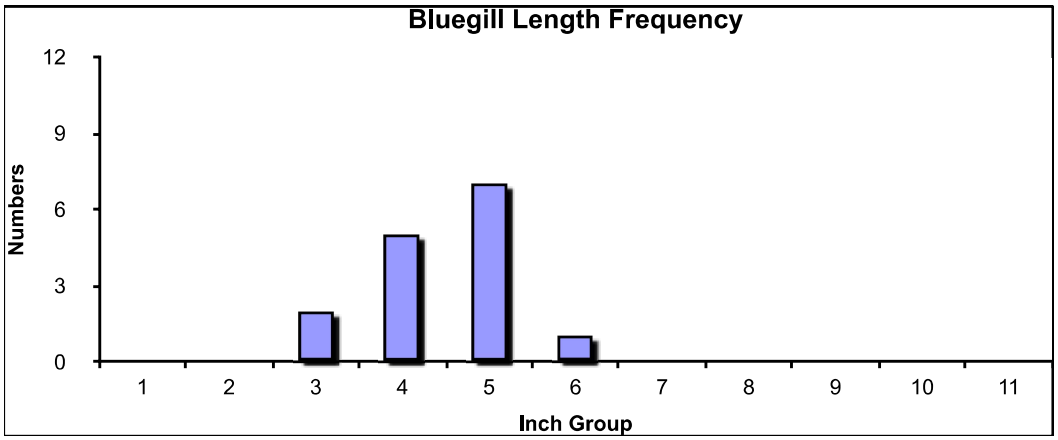
food resources.

Both gizzard shad and threadfin shad were present in the lake although gizzard shad were much more abundant. The length frequency of both species are shown in the following figure. Shad generally can be good forage for bass and other predators but in order to benefit most sizes of bass, the shad should reproduce frequently and their populations should be dominated by small-sized individuals. Gizzard shad were not represented by any small size fish and their populations was exclusively large fish that are mostly unavailable to any predators as forage. Threadfin shad



were small enough to represent a significant forage source for 12 inch and larger bass, but even they were too large for stock size bass to consume. None of the shad sampled were small enough to be considered as a forage source for black crappie.

Bluegill are a very important forage fish because of their production potential. If present in adequate numbers and in good physical condition, bluegill will often spawn multiple times each year producing an abundance of forage suitable for small predators throughout the growing season. However in this lake, bluegill were neither adequately abundant nor in good physical condition and this alone perhaps explains why largemouth bass and black crappie do not have adequate forage. Bluegill are likely limited in abundance in this lake by low production and heavy competition for resources from young of other competitive species. The length distribution of bluegill sampled is shown in the following figure. Some bluegill of less than 2 inches in total length were observed during sampling but were low in number. No recent hatch



of bluegill were observed during sampling. Bluegill are an important prey item for bass and bass can consume a bluegill about 1/4 their own length. Fertility is highly correlated with bluegill spawning and production. If well fed and in good condition, bluegill will spawn repeatedly throughout the growing season but in a less fertile environment they may spawn only once or twice per year. In the relatively infertile environment of this pond and in the presence of several competitive species, low bluegill production severely limits the food availability for the majority of the size groups of bass.

Other species sampled in the lake were in such low numbers that analysis of their size or numbers was not conducted. Common carp and spotted suckers were not overly abundant but because of their large size represent a significant source of competition for food, primarily with bluegill. Likewise, golden shiners and brown bullheads are significant competitors and have very high reproductive potential. Many other sunfish, such as warmouth and redbreast sunfish, compete directly with bluegill for resources. Longnose gar are present in the pond but probably in quite low numbers. They grow slowly and are unlikely significant predators or competitors with other more desirable species. Their tendency to lie near the surface where they can be quite visible can mislead one to assume a greater abundance that actually exists.

In summary, the overall fish population of the lake is moderate in abundance. Bluegill, the primary forage species, was not as abundant as necessary to provide adequate forage for most sizes of largemouth bass. As a result, largemouth bass grow very slowly, are in relatively poor condition and rarely reach quality size. Other species present rarely reach a size of interest to anglers because of the interspecific competition for food and resources.

Recommendations

The presence of so many species that are in direct competition will almost eliminate the likelihood that the lake can produce good fishing. There are some management measures that may provide some important species with a competitive advantage and improve their populations as a result. Otherwise the ability to improve fishing in the lake will depend on supplementing the existing population with catchable size sportfish for anglers.

Fertilization is usually the primary management tool that increases forage fish production. Fertilization of the lake would be possible but relatively costly because of the turnover rate. Frequent flooding would negate fertilization efforts because of the flushing of both the water, and to a significant extent, the fish. I would not recommend the use of fertilizer in this lake.

Bluegill are perhaps the most important forage fish in the lake and their population should be targeted for improvement above all others. Their ability to provide valuable small forage for both bass and crappie would perhaps do more than any other management to improve the fishing in the lake. I recommend that the bluegill population recovery be enhanced by the stocking of adult bluegill. Stocking adults that are approximately 3-4 inches in length would prevent most predation by largemouth bass. Bluegill of that size are mature and if adequate food is available will reproduce and produce forage for predators. My recommendation would be to stock up to 300 per surface acre at the beginning of each growing season (February-March).

Another invaluable management measure would be a supplemental feeding program aimed at bluegill. Supplementally feeding bluegill will benefit in three ways. Harvestable bluegill will congregate around the feeder and will be easier to catch. They will also grow faster and reach larger size with this supplemental food source. And the improved condition of bluegill will allow them to spawn more frequently and provide a much more abundant food supply for young bass. I recommend the use of Purina Game Fish Chow fish food because of its formulation for effective utilization by predators like bluegill. In addition to benefiting bluegill, automatic feeders will also benefit several kinds of gamefish that you may choose to stock, such as rainbow trout, channel catfish or striped bass hybrids. I suggest the installation of one or two automatic fish feeders. Automatic feeders will allow you to reliably feed on a schedule that insures that bluegill benefit the most. I recommend Texas Hunter brand feeders based primarily on their workmanship and reliability. The challenge will be to install the feeders in such a way as to prevent their inundation during floods. Given the severe water stage variation, feeders must be

either mounted high above the water surface, on a floating platform that will rise with the water stage, or portably mounted so that they can be manually raised or moved prior to flooding.

The largemouth bass population of the lake is limited in abundance and shows signs of low recruitment. Such a delicate population balance could be easily overharvested so I recommend no harvest of largemouth bass be permitted. Black crappie tend to become overly abundant in a lake such as yours and keeping the largemouth bass abundance as high as possible will help keep their population in check. Stocking adult largemouth bass would also be advisable but it would be prudent to wait until you have had some success in increasing the bluegill abundance and reproduction, perhaps a year after beginning supplementally feeding bluegill.

Stocking addition sportfish that can utilize artificial fish food will help provide high quality and unique fishing opportunities without regard to the relatively unproductive populations of fish already present in the pond. Stocking rainbow trout of about 11 inches in length in the early winter can provide excellent fishing for about 5-6 months. These trout should grow rapidly and reach trophy size in only a couple of months. By late April, water temperatures will rise intolerably high and any that remain at that time (usually late April) will die off. If flooding occurs during the winter, these trout should tend to remain in the pond if well-trained to utilize the artificial food.

Channel catfish or striped bass hybrids are two other species that can be stocked in the pond and will grow well on artificial food. Both should be stocked at no less than 6 inches in length to avoid predation. The striped bass hybrids will tend to stay in the lake near the feeders during floods but channel catfish have a migratory tendency during times of high water.

These recommendations lack some details and timing suggestions that I can provide if you decide to implement them.