

November 20, 2020

Mr. Peyton Norville
4141 Glenbrook Drive
Birmingham, AL 35213-3126

Dear Mr. Norville:

Enclosed, please find your copy of the Management Plan we recently completed for Hollybrook Lake.

Hollybrook Lake is presently functioning as a dynamic, balanced fishery. As such, our management recommendations center primarily on reducing the total number of adult predators (largemouth bass, crappie, spotted bass and catfish), introducing supplemental forage (threadfin shad) and improving the conditions for the production of forage through enhancing the lake's fertility level:

- Largemouth bass (12" and less) should be harvested, up to a total of ~570 pounds per year.
- Harvest all crappie caught.
- Harvest all spotted bass caught.
- Harvest all catfish caught.
- Apply 200 tons of agricultural limestone in Winter 2021.
- Maintain the current fertilization program in Spring 2021.
- Maintain the current supplemental feeding program in Spring 2021.
- Stock 2 loads of threadfin shad in Spring 2021.
- Stock 2 loads of threadfin shad in Fall 2021.
- Conduct an electrofishing balance assessment (Annual Evaluation) roughly one year from this date.

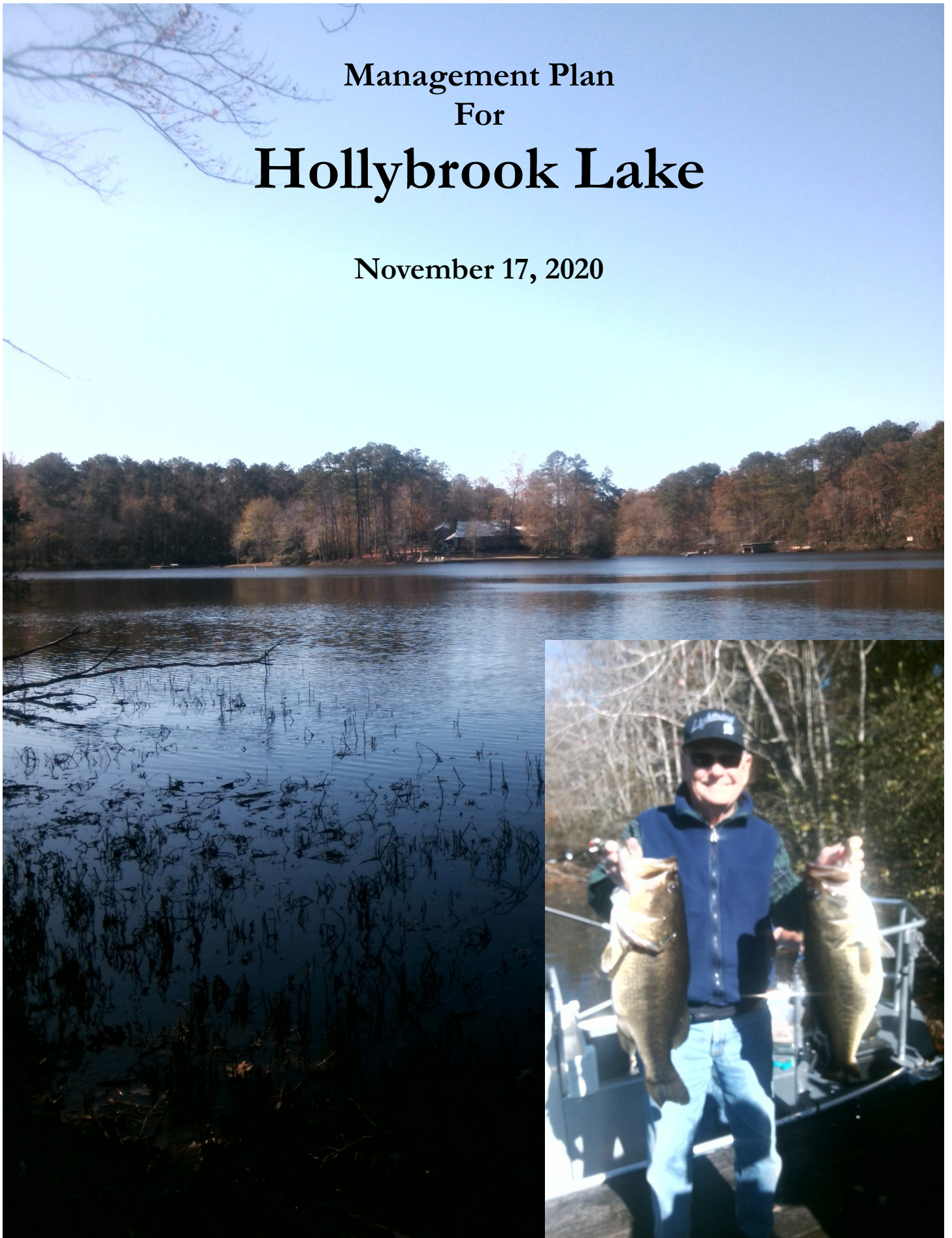
Mr. Norville, we are always available to discuss these recommendations or answer any other questions you might have.

Good fishing,

Ben Lee

Management Plan
For
Hollybrook Lake

November 17, 2020





Introduction

As an integral part of the ongoing management program for [Hollybrook Lake](#), [Southeastern Pond Management](#) conducted a comprehensive evaluation of the 57 acre impoundment on November 17, 2020. A representative sample of the fish community was collected by electrofishing to accurately assess the present state of balance. In addition, a water chemistry test was conducted to determine total alkalinity. The degree of aquatic weed infestation was also recorded. Results of these assessments provide the basis for this management plan.

The goal of this management plan is to create and maintain a balanced fish community in [Hollybrook Lake](#). The following evaluation report and management plan details and explains our recommendations with the following goals in mind:

- ◆ Create conditions favorable for the consistent production of “quality size” and “trophy size” largemouth bass (Table 1).
- ◆ Create conditions favorable for the consistent production of “quality size” bluegill (Table 1).
- ◆ Generally maintain a high level of water quality as well as an aesthetically pleasing environment for aquatic recreation.

Table 1.

| | LMB | Bluegill |
|----------------|--------|----------|
| “Quality Size” | 16-20” | 7-10” |
| “Trophy Size” | 20”+ | 10”+ |

It is important to note that quality fishing will not be accomplished “overnight”. As you read through this plan, bear in mind that the specific activities we have recommended are not one-time inputs, but rather a collection of ongoing management activities that will establish and maintain long-term quality fishing. Proper pond management, like the management of any natural resource, is an ongoing process. Each management input is recommended individually; however, it should be noted that the *management program* suffers if all activities are not implemented. Feel free to contact us and further discuss management ideas you may have.

Previous evaluations of [Hollybrook Lake](#) have resulted in the thoughtful outline of management options in an effort to approach your stated management goals. Our latest findings, as well as management recommendations, result from our most recent visit and are contained within the following pages.



Electrofishing equipment was used to collect a fish sample from [Hollybrook Lake](#), November 2020.



Lake Assessment

At the time of our visit, total water alkalinity in [Hollybrook Lake](#) was measured at **18.8** parts per million (ppm). This level of alkalinity is slightly below the minimum recommended threshold of 20 ppm, and represents conditions unsuitable for effective fertilization. [Hollybrook Lake](#) has been fertilized adequately in the recent past.

Bass harvest was reported as limited. This level of harvest has proven adequate. Harvest, and its importance in structuring fish communities will be discussed in more detail in the Recommended Management Activities section of this report.

During the evaluation, we observed a moderate to heavy infestation of water willow and a moderate infestation of buttonbush growing along the margins. Descriptions of these plants may be found in the Aquatic Weed Identification section of this report.

[Hollybrook Lake](#) appeared to have a light plankton bloom at the time of our visit.



[Hollybrook Lake](#), November 2020.



Fish Community Balance

Ponds and the animals they support are governed by a predator-prey relationship. The interactions of predator and prey are characterized by a concept we refer to as *balance*. By definition, suitable balance in a fish community is characterized by a healthy distribution of both predator and prey over a wide range of age and size classes. In order to assess the relative balance of a fish community, the species functioning as predators and the species functioning as prey must be defined. **Predators** are species which rely on other fish as their primary food source. **Prey** species rely on sources other than fish for their food source.

Classic balance in small impoundments is defined by several parameters, not the least of which involves a suitable ratio (by weight) of predator to prey. Further, the key to maintaining balance in a sport fish pond is a healthy size distribution of both predator and prey. If one size-class becomes overly abundant or lacking, a condition of imbalance results. By analyzing an electrofishing sample it is possible to determine the state of balance within a given fish community.

In fisheries science, the *condition* of individual fish is used as another indicator of the overall balance of the entire fish community. Relative weight (Wr) is an index used to categorize the condition of fish within a given population. Calculated Wr values greater than 100 indicate

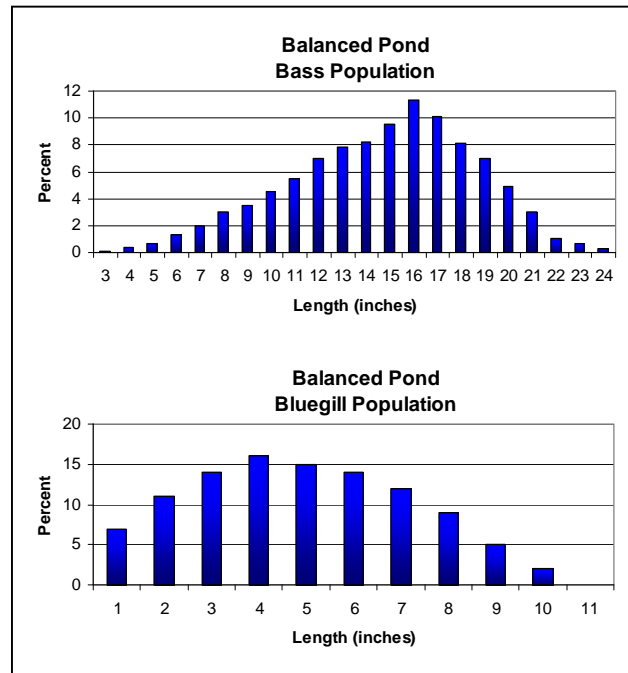


Figure 1. Length distribution of bass and bluegill in a typical balanced pond.

plump, robust fish. Wr values less than 100 suggest that individuals are in less than excellent condition, perhaps the result of some predator:prey imbalance. Wr values less than 85 would indicate malnourished fish; a sign of intense competition for forage.

Figure 1 depicts balanced populations of predator and prey in a typical sport fish pond. Note that all sizes are well represented; no noticeable gaps are present.



Predator and prey fish are measured and weighed to analyze the overall balance of the fish community.



Fishery Assessment

The fishery in [Hollybrook Lake](#) was sampled with standard boat-mounted electrofishing equipment. The sample contained largemouth bass, bluegill, crappie, gizzard shad, spotted bass and redear sunfish (shellcracker). Currently, largemouth bass, crappie and spotted bass are functioning as the primary predators in [Hollybrook Lake](#). The bluegill, gizzard shad and shellcracker are the prey.

Largemouth bass ranging in size from 3 to 25 inches in total length were collected in moderate abundance. The length distribution of largemouth bass (Figure 2) reveals the presence of bass over a wide range of size classes. This represents no change from the previous year.

The average relative weight of adult bass in our most recent sample additionally reflects little change over last year. This year's average relative weight was 92, as compared to last year, 91 (Figure 4).

Largemouth bass 12 inches and smaller represent the primary targets for harvest over the coming months.

Bluegill and shellcracker were collected ranging in size from 3 to 7 inches in total length. Figure 3 depicts the length distribution of the bluegill population. Of note, an abundance of intermediate (3-5") bluegill and other forage was collected. Further, mature adult bluegill were present in the sample.

Overall, we characterize the fish community in [Hollybrook Lake](#) as balanced. A more detailed explanation of balanced ponds in general, and [Hollybrook Lake](#) in particular is located in the Current State of Balance section of this report.

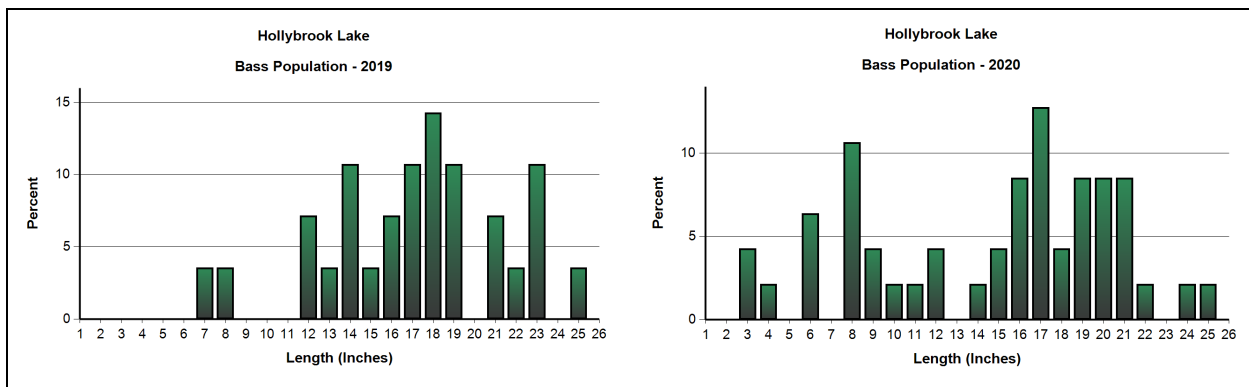


Figure 2. Comparison of the length distribution of bass collected in [Hollybrook Lake](#) in November 2019 and November 2020.

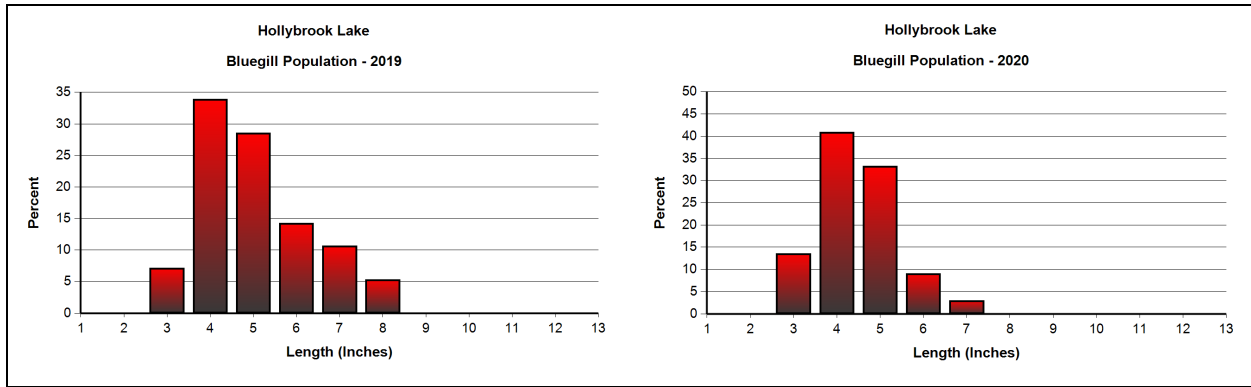


Figure 3. Comparison of the length distribution of bluegill collected from Hollybrook Lake in November 2019 and November 2020.

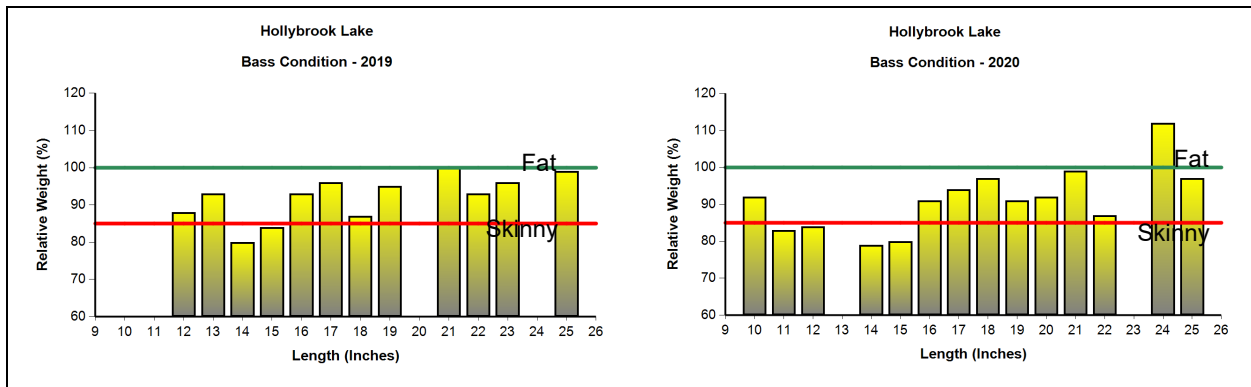


Figure 4. Relative weight distribution of adult largemouth bass collected from Hollybrook Lake in November 2019 and November 2020.



Length, Weight, and Condition of Tagged Bass in Hollybrook Lake November 17, 2020

| Tag # | Length (in) | Weight (lbs) | W _r |
|---------|-------------|--------------|----------------|
| 20431 | 23.8 | 8.9 | 112 % |
| 20430 | 21.3 | 6.0 | 106 % |
| 16579 | 21.1 | 5.3 | 98 % |
| 10488 * | 25.2(22.5) | 9.4(6.7) | 97 %(100%) |

Tag #'s marked with an asterisk represent “re-captures”. The numbers in parentheses represent the respective data collected the last time these individuals were captured.





Balance

Most pond management activities are centered on creating or maintaining a balanced fish community. A balanced sport fish pond is preferred by most anglers because it provides quality bass and bluegill, both in terms of number and size. A balanced fish community is characterized by a wide size distribution of bass, bluegill and other forage species; adequate reproduction of all species is present.

As mentioned previously, our recent electrofishing sample from [Hollybrook Lake](#) contained a healthy distribution of bass across many different size groups. Additionally, the majority of the bass were in good condition. Bass in the 16 to 25 inch length group were in excellent condition, indicating an abundant forage base for this length group of bass. However, bass in the 11 to 16 inch group were in slightly poorer condition, indicating the need for selective bass harvest and/or supplemental forage stocking to maintain a well balanced fishery.

The presence of intermediate size (3-5") prey is critically important in sport fish ponds. These individuals are the size preferred by the more abundant, younger bass in a typical population. A

high relative abundance of intermediate size prey is often an indication of a balanced pond.

When a state of balance exists, intermediate size prey are among the most abundant segment of the overall fish community. Under these conditions, bass typically grow quickly, and are capable of reaching their full growth potential.

During our electrofishing sample, we observed a healthy forage base, particularly the distribution of intermediate sized prey. In order to maintain the predatory:prey balance and the continued growth of bass in [Hollybrook Lake](#), it will be necessary to ensure that conditions for the production of forage such as fertilization, supplemental feeding and selective bass harvest are sustained or even enhanced.

In a typical fertilized sport fish pond, bass harvest is required in order to prevent overcrowding. The old idea of "throw him back and catch him when he gets bigger" is not a sound approach in small impoundments. If sufficient harvest does not occur, a bass-crowded condition is the likely result. This usually leads to a low quality bass fishery.

Strategies to improve the quality of the bass and bluegill fishing are discussed in the Recommended Management Activities section of the report.



A balanced pond supports an abundance of bass, bluegill and other forage species of all sizes.



Competing Predator Species

The presence of predator fish species other than largemouth bass may have an impact on the balance of the fish community. The severity of the impact depends largely on the species present and its density relative to the entire fish community. Some predator species may prove to be beneficial to certain management goals at moderate densities; however, most species negatively affect management goals to some degree. Generally, the more fish species present in a pond, the more complicated and less predictable pond management practices become. Once established, it is often difficult to completely remove an undesirable predator from a pond; however, harvesting every individual caught will increase the availability of prey for largemouth bass. In order to maintain a balanced pond with competing species, the bass must become a larger component of the predator community. An additional forage species, such as threadfin shad, typically reduces the negative effects of additional predators.

Competing predator species can be introduced in a number of ways. A pond can be contaminated with different fish species by a feeder stream, especially if the pond basin is not poisoned before stocking. Occasionally, adjacent waters flood and connect a pond introducing different species. For example, oxbow lakes are often flooded on a regular basis by an adjacent stream or river. This greatly reduces the effectiveness of many management practices. Many times, competing predator fish are brought in from other waters by fishermen themselves. Several competing predator fish found in small impoundments are listed below:

Black and/or white crappie are commonly introduced by fishermen in ponds, however they are not a desired predator species in small impoundments less than 50 acres. Not only do crappie compete with adult bass for food, but also with juveniles because they typically spawn before bass. Furthermore, their reproduction is often highly erratic. Maintaining balance with an abundant crappie population can be difficult in small impoundments.

Catfish are often stocked with bass and bluegill to add angling opportunity. Unfortunately, catfish are also direct competitors of largemouth bass and



Crappie



Channel Catfish

can have an impact on the forage community if they are allowed to reach large sizes. Catfish recruitment is usually low in ponds with an established bass population. Therefore, a small population of catfish can be sustained in small impoundments if an abundant forage base is maintained.

Spotted bass caught from public waters are often mistaken for largemouth bass and introduced in sport fish ponds. Spotted bass compete fiercely with largemouth bass in small impoundments. Not only do the adults compete for food, but spotted bass typically spawn earlier, thus giving the fry a survival advantage. Often this early advantage allows spotted bass to dominate the bass population in smaller systems. Once spotted bass become established, targeting spotted bass when harvesting becomes an ongoing management practice.



Spotted Bass



Gar



Bowfin



Green Sunfish

Other predator species, such as **gar**, **pickerel**, **bowfin**, etc., are often considered “rough” or “trash” fish. The presence of these fish in a pond usually indicates flooding of an adjacent river or major tributary. They are often difficult to remove with angling. They do not seem to become as abundant as crappie or spotted bass in a bass/bluegill pond, but have a negative impact nonetheless.

Other species such as **green sunfish** and **warmouth** commonly inhabit sport fish ponds. These species typically are introduced by small feeder creeks. Green sunfish, in particular, have the ability to enter ponds without a feeder stream, possibly by way of aquatic birds. Each of these fish can function as predators by eating small bluegill

and other forage in ponds. They can also compete with bluegill for food and spawning sites. Fortunately, their impact is usually minimal as they rarely exceed 6 or 7 inches and typically do not become abundant in a pond with an established bass population. However, these species can become problematic if allowed to multiply before a healthy bass population is present.



Competing Prey Species

The presence of prey fish species other than bluegill and redear sunfish (shellcracker) may have an impact on the balance of a fish community. The severity of the impact depends largely on the species present and its density relative to the entire fish community. Some prey species may prove to be beneficial to certain management goals if managed correctly; whereas other species may negatively affect management goals. Generally, the more species present in a pond, the more complicated pond management practices become. The results of these management practices also become less predictable. Once established, it is often impossible to completely remove undesirable prey species from a pond. Bluegill are usually displaced by the competing species to some degree. A supplemental feeding program for the bluegill is often recommended to compensate for the lack of natural food in these situations.

Competing prey species can be introduced in a number of ways. A pond can be contaminated with different fish species by a feeder stream, especially if the pond basin is not poisoned before stocking. Occasionally, adjacent waters flood and connect a pond introducing different species. For example, oxbow lakes are often flooded on a regular basis by an adjacent stream or river. This greatly reduces the effectiveness of many management practices. Occasionally, competing prey fish are brought in from other waters by anglers. Several competing prey fish found in small impoundments are listed below:

Probably the most common competing prey species found in small impoundments is **gizzard shad**. If not controlled, gizzard shad can eventually have a significant negative affect on the entire fish community. Juvenile gizzard shad are difficult to distinguish from threadfin shad, a prey species more suited for sport fish ponds. For this reason, gizzard shad are often mistakenly captured in rivers and stocked in ponds as bass forage.

In certain situations, and if managed correctly, gizzard shad can be an ideal supplemental forage for producing exceptionally large bass. Trophy bass require large food items, measuring 6 to 10 inches in length, to maximize growth. Gizzard shad quickly grow to 6 and 7 inches long and will achieve a larger adult size than threadfin shad, thus providing the



Juvenile Gizzard Shad



Adult Gizzard Shad

larger bass with a more efficient prey item. However, when stocked in a bass/bluegill lake, their large potential size and rapid growth rate often allow gizzard shad to “stockpile” at a size too large to be consumed by the average bass in the population. Over time, they can occupy a large portion of the total fish biomass within the lake. Gizzard shad reproduction will eventually decrease in response to over-crowding. This lack of shad reproduction coupled with low levels of bluegill reproduction, due to heavy competition from the overly abundant adult gizzard shad, will result in almost no available forage for the average size bass in the population. To avoid this situation, it is usually necessary to remove a portion of the gizzard shad population every 3 to 5 years with the fish toxicant rotenone. Maintaining a healthy, reproducing population is the key to managing gizzard shad in a sport fish lake.



Golden shiners are probably most often introduced in ponds as bait from anglers. They are occasionally stocked by pond managers as a supplemental forage for growing largemouth bass. Golden shiners are prolific and can provide an abundance of food for bass. However, they are nest predators and as such bring their own set of possible problems to the table. When they are allowed to multiply to great numbers they can significantly reduce the reproductive success of bass and bluegill. Golden shiners tend to cause problems in ponds most often when allowed to multiply before predators are stocked. An intensive supplemental feeding program for bluegill may compensate for the reduced reproductive success.

Common carp are occasionally found in sport fish ponds and are almost always the result of flooding from an adjacent tributary or river. However, we have seen mirror carp, an ornamental

variety of common carp, introduced by mistake in ponds. These fish get very large and can cause problems when they become abundant, especially in smaller ponds. Carp will stir up the pond bottom when feeding and when spawning. Small ponds can become very turbid with an abundance of common or mirror carp. These carp will also train to pellet feed and significantly reduce the effectiveness of a supplemental feeding program for bluegill.

Different types of **suckers** can be introduced in ponds by a feeder stream or flooding of a nearby tributary. Suckers undoubtedly compete for food and space with the prey fish community of a sport fish pond. However, their impact is usually minimal if introduced in a pond with an established bass population. Suckers can provide forage for growing large bass.



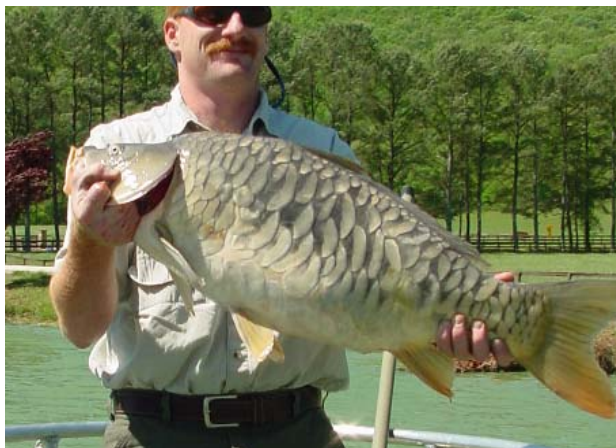
Golden Shiners



Spotted Sucker



Common Carp



Mirror Carp



Fish Harvest

One of the keys to a balanced fish community as well as the growth of trophy largemouth bass in your pond is the selective removal of largemouth bass. Largemouth bass, when present with bluegill as their primary source of forage, produce an annual surplus which must be harvested in order to maintain balance. Bass harvest rates are designed to reduce the level of predation on the bluegill population as well as increase the growth rate and condition of the remaining bass. Recommended harvest quotas often change in response to population changes and should be re-evaluated annually. In your pond, selective harvest of the smaller, more abundant size range, at a rate of **10 to 20 pounds per acre per year**, is recommended at this time. Harvesting largemouth bass can be accomplished by the following methods:

(1) **Hook and Line Harvest:** Largemouth bass of the appropriate size should be removed whenever they are caught up to the harvest goals. A record should be kept of the total number and weight of bass removed during each fishing trip. Larger bass, those presently exceeding the size limit, may be "protected" since these represent the potential trophy bass in the pond.

(2) **Electrofishing Harvest:** Selective bass harvest through electrofishing is a particularly effective management tool. This method of harvest may be quite productive if hook-and-line efforts are not



A measuring device should be kept handy to determine the correct size bass to harvest.

adequate. The cost for this service is based on time spent (hourly). We will keep close records of the total number and weight of individuals removed.

One important point is that bluegill and shellcracker harvest is strictly optional in balanced ponds. It is not necessary to harvest a certain weight of bluegill per acre to maintain the predator/prey balance or to prevent bluegill overpopulation. The bass will more than adequately control bluegill numbers. Typically, a generous amount of adult bluegill can be harvested in a well-fertilized, balanced lake. However, over-harvest of bluegill may be a concern, depending on the number of anglers and fishing pressure. We often recommend limiting bluegill harvest to **10 per person per day** in bass-crowded ponds to prevent over-harvest. In severely bass-crowded ponds, we recommend **suspending bluegill harvest** until the population increases through management efforts.



Bass must be harvested at the proper rate each year in order to maintain a balanced fish community in small impoundments.



Lime Application

Water alkalinity plays a large role in the health and productivity of fish communities. The water alkalinity of a pond is determined by the soil pH and the alkalinity of the water source feeding the pond. Highly alkaline soils in the watershed of a pond (such as in the black belt) help promote the growth of phytoplankton, the base of the food chain, by allowing full availability of the nutrients in the system. Alkaline soils also have a high buffering capacity, which reduces broad daily fluctuations in pH.

Most small impoundments across the Southeast however, have relatively acidic soils in their watershed and require periodic applications of lime to maintain a total alkalinity of at least 20 ppm of CaCO_3 . This minimum alkalinity level is required to have high nutrient availability to phytoplankton communities, thus maximizing the effectiveness of a fertilization program. In lakes with an alkalinity reading of less than 20 ppm, we recommend applying a liberal dose of agricultural limestone.

There exists no “magic formula” to determine the amount of lime required to increase and maintain total alkalinity above the 20 ppm threshold. Many lakes in the Southeast seem to require only 2-3 tons per acre in order to meet the initial “lime requirement”. However, since you cannot apply too much lime to a pond and the more applied, the longer the benefit, it is usually more cost effective to apply larger amounts of lime, such as 4 to 8 tons/acre, at longer intervals.

The length of time between necessary lime applications is very difficult to predict. There are many environmental variables at play such as: 1) beginning alkalinity of the water, 2) amount of water flowing through the pond, 3) other sources of alkalinity (springs, etc.), 4) amount of tannic acid released in the water from trees and leaf matter and 5) amount of acidic soil particles entering the water.

The method of lime application is critically important to the effectiveness and longevity of a liming effort. Agricultural lime does not readily

dissolve in water, rather it sinks and reacts with the soil on the pond bottom. Therefore, proper application of lime involves uniform distribution of the



Alkalinity tests quickly indicate the need for lime in ponds.



Bulk lime is applied by washing it directly into the water in such a way that it covers most of the lake bottom.

material over at least 80-90% of the surface of a lake. This is best accomplished using a specialized boat called a liming barge. Bulk lime is loaded directly onto the front platform of the barge; it is then washed from the platform with water from a high pressure pump as the boat is slowly driven throughout the pond.

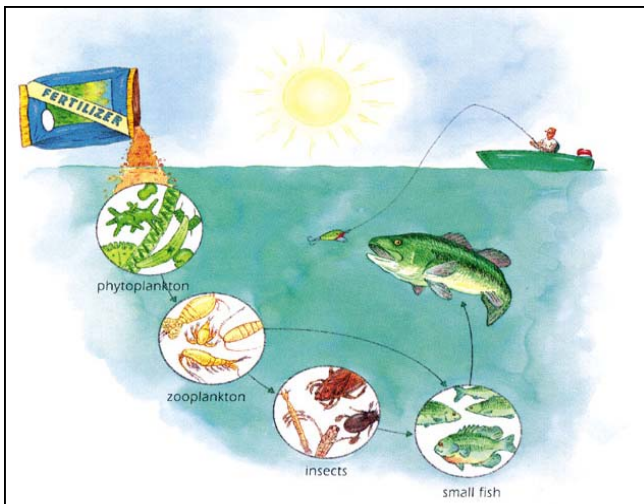


Fertilization

The concept of *carrying capacity* describes the total biomass (i.e., weight) of fish a pond is capable of producing. A given body of water, subject to varying levels of fertility, has a finite limit, or carrying capacity, in terms of the overall biomass which it can support. Lake fertility limits the number as well as the average and maximum size of fish present.

The limiting nutrient in most freshwater systems, as it relates to plankton production and a generally high level of fertility, is phosphorous. Phosphorous must be added on a regular basis during the growing season in order to stimulate significant plankton growth. Plankton, both plant and animal, are the base of the food chain in ponds. Infertile ponds, those with low alkalinity and relatively little nutrient input, are characterized by low levels of plankton production. In effect, this limits the amount of food available to the small insects and insect larvae which are the next link in the food chain. The *ripple effect* of low fertility is observed far up the food chain, all the way to the primary predators, largemouth bass. In order to create and maintain a high level of plankton production, thus providing conditions most favorable for fish production, fertilizing on a regular basis is required.

Fertilization takes place during the growing season, from March through October. We recommend SportMAX® Water Soluble Pond Fertilizer (10-52-4), applied at a rate of 4-8 pounds per surface acre per application. Fertilizer should be applied according to the Standard Pond Fertilization Schedule:



Food chain of a typical fertilized pond.



When you subscribe to our Fertilization Service, our technicians will routinely visit your pond and properly apply fertilizer. A well fertilized pond should have 18 to 24 inches of visibility.

Standard Pond Fertilization Schedule

- ◆ Beginning in early March, make three applications at two week intervals.
- ◆ Make the next three applications at three week intervals.
- ◆ Thereafter, apply once per month or whenever visibility exceeds 18-24 inches.
- ◆ Cease fertilization by the end of October.

Our **Fertilization Service** completely removes the burden and nuisance of fertilizing your lake. Our trained technicians will visit your pond, at prescribed intervals, carefully measuring and recording water visibility and applying the proper dosage of fertilizer. Our visits are conveniently recorded on a small sign, situated on the pond bank. In addition, we regularly check and log total water alkalinity as well as keep an eye out for potentially problematic vegetation.

Fertilization is the most basic and important element necessary to create an environment conducive to the production and growth of sport fish.

The cost of our Fertilization Service is listed in the Recommended Management Activities section of this report.



Supplemental Forage Stocking

The harvest of largemouth bass at the proper size and rate can be quite challenging in sport fish lakes, especially if they are not fished extensively. When the annual largemouth bass harvest falls short of the recommended quota, stocking supplemental forage becomes extremely important in efforts to maintain an adequate forage base. An abundance of forage must be available at all times in order to maximize the growth of top-end predators such as largemouth bass. The feeding behavior and movement patterns of adult predators change frequently. Therefore, the presence of a variety of forage types, occupying different habitats within the pond, tends to maximize predator:prey encounters and improves overall foraging efficiency.

In your lake, the introduction of **threadfin shad** (*Dorosoma petenense*) will be highly constructive. The benefits to stocking threadfin shad are numerous. The combination of a relatively small adult size, coupled with their ability to reproduce in large numbers, make threadfin shad a near perfect food for the most abundant size group of largemouth bass. Most often, results of successfully establishing threadfin shad into a lake will be observed in improved growth rates for all size groups of bass. In addition, by partially shifting

bass predation from bluegill to shad, more bluegill will reach the important *intermediate* size range. Finally, through subtle interactions lower in the food chain, threadfin shad effectively reduce bass *recruitment*. In other words, fewer bass fingerlings survive to adulthood, thereby reducing the annual bass surplus. The bass that are *recruited* into the adult population will enjoy an increased abundance of prey, which leads to enhanced growth rates and a larger maximum size.

Threadfin shad frequently exhibit a distinctive schooling behavior, most often in open-water areas. In fact, the shad's primary defense against predators is its ability to seek out open water, away from where predators are more likely to be waiting to ambush prey. Once the bass figure out this behavior, the jig is up. Ponds with abundant shad populations frequently enjoy excellent top-water fishing action, oftentimes in or around schools of shad in open water.

Threadfin shad typically have two distinct heavy spawning periods: in the Spring and again in early Fall. Stocking is most often recommended immediately prior to or during a heavy spawning period. Stocking rates are designed to establish a sustainable population of threadfin shad and vary depending on the size of the lake and its state of balance.



Threadfin shad are ideal forage for increasing the growth and condition of largemouth bass. Adults range from 3 to 7 inches.



Supplemental Feeding

Feeding bluegill pellet food is a proven management practice used to increase the number of “quality” and “trophy” size bluegill in ponds. Feeding produces unusually large and healthy bluegill and increases their reproductive potential. In addition, feeding concentrates fish for improved catch rates and provides entertainment from watching the fish eat. Given these benefits we recommend maintaining the feeding program in your pond.

In an effort to benefit the entire bluegill population, fish food should be applied from at least 1 feeding station for every 5 acres of water. Each feeding station should dispense feed at a rate of 5-10 lbs/day during the growing season (March - October). The daily ration should be divided into 3 short feeding periods, such as: early morning, late morning, and late afternoon. Several short periods are necessary to reduce feed waste because bluegill have small stomachs and will not consume much at once. Most commercial floating catfish fingerling pellets are suitable for feeding bluegill. These types of feeds are readily available on the market; Purina® makes an excellent pellet, under the name, “Game Fish Chow”. Game Fish Chow is made up of several different pellet sizes that can be consumed by a wide size range of bluegill.



A good bluegill feed has several different pellet sizes.

For an additional boost to the bluegill population, feeding in the winter is an option. Winter feeding keeps the bluegill plump and healthy during a period when natural food is not readily available. To improve consumption in the cold months, a sinking feed may be used. Sinking feed can be purchased during the winter at most dealers that normally stock fish food. Several feeding periods should be maintained for the winter also. However, the timer on the feeder should be changed in late October to adjust for the shorter day length.



Supplemental feeding attracts bluegill to certain areas so they are easier to catch.

We market Sweeney and Texas Hunter automated game and fish feeders. Simply put, these feeders are the finest of their kind. Sweeney directional feeders are offered in two sizes (AF1100 - 75 pound capacity and AF1300 - 225 pound capacity) and three colors (galvanized, hunter green and camo). Texas Hunter directional feeders are also offered in two sizes (DF125 - 75 pound capacity and DF425 - 225 pound capacity) and they are only available in green. They are powered by rechargeable 12-volt batteries and most models come equipped with a solar charger. Sweeney and Texas Hunter directional feeders may be conveniently mounted on the bank or on piers.



Aquatic Weed Control

Aquatic weed growth can be a serious problem in recreational ponds. Weeds use up important nutrients in fertilizers that are intended for fish production, as well as interfere with normal activities such as fishing and swimming. In addition, excessive weed growth detracts from the aesthetic value of a pond, particularly if it is the focal point of a recreational area.

There are three approaches we use to prevent or reduce unwanted aquatic weeds. They can be placed in 3 different categories: chemical control, biological control, and sunlight-limiting control. Often, an integrated approach involving a combination of these tools offers the most effective solution.

Chemical control involves the use of aquatically approved herbicides to reduce or eradicate aquatic weeds. Although chemical control can be costly on large areas, it is usually the best method for a quick response.

The most common form of biological control is stocking grass carp. Grass carp are often introduced into ponds at low stocking densities as a preventive measure before weeds become established. However, once weeds have become established, a higher density of grass carp is needed to control them. Grass carp readily eat a variety of common weeds, do not reproduce, and are fairly inexpensive. Typically, grass carp become less effective when they reach 6 to 7 years old and must



Herbicide application is typically the quickest form of weed control.



Grass carp are often introduced for long-term control (top). Pond dyes temporarily limit sunlight to retard aquatic weed growth (bottom).

be restocked. One drawback to grass carp is their propensity to train on pellet food intended for bluegill; thereby reducing the effectiveness of a supplemental feeding program.

There are also a variety of water colorants or dyes that can be added to ponds before weeds become established that limit sunlight penetration and “shade out” certain types of weeds. A regimented fertilization program is often the most effective form of sunlight-limiting control. Typically, phytoplankton blooms stimulated early in the spring through fertilization can shade out potential weed growth before it becomes a problem.

Color photos, including distinguishing characteristics and growth habits of the aquatic vegetation in your pond, are listed in the following Aquatic Weed Identification section.



Common Name: Buttonbush

Scientific Name: *Cephalanthus occidentalis*

Distinguishing Characteristics:

Large woody shrub with fragrant ball-shaped flower heads.

Growth Habit:

Moist soils near ponds and in shallow standing water.

Management Program Impact:

Low.





Common Name: Water Willow

Scientific Name: *Justicia americana*

Distinguishing Characteristics:

Stems erect. Leaves arranged oppositely along stem. Leaves 3 to 6 inches long and 1/4 to 1/2 inch wide with a noticeable, white midvein running entire length. When present, flowers light blue to purple.

Growth Habit:

Emerald. Spreads by rhizomes and can form large colonies along shoreline.

Management Program Impact:

Low to moderate.





Dam and Shoreline Maintenance

Dam and shoreline maintenance should be addressed periodically to ensure the integrity of the dam and overall recreational value of the pond. The dam should be kept free of trees; roots may eventually tunnel into the dam, creating weak spots. If mature trees are already present, they should not be cut down, as dead and decaying roots are potentially more harmful. Generally, trees less than 4 inches in diameter at breast height do not have roots penetrating the core of the dam and should be removed before they become a threat to the structure of the dam.

In an effort to prevent erosion the entire dam should be covered with a manageable grass. Large rock is recommended at the waterline along the dam face if there is the potential for erosion from wave action. The spillway should also have some type of erosion prevention. The amount and frequency of water flow should determine the type. The bottom and sides of the spillway should be lined with large rock or concrete if water flows across it often. For

spillways that are used less frequently, well maintained grass provides sufficient erosion protection. Spillways should be checked periodically and any debris should be cleared.

Additionally, the shoreline and surrounding watershed should be vegetated to prevent erosion and muddy water. If necessary, livestock should be provided limited access to the pond. Heavier vegetation should be trimmed or treated with herbicide.

Beavers and muskrats can cause aesthetic and structural damage to sport fish lakes. Large rock placed along the waterline of the dam will usually prevent beavers and muskrats from boring in. Trees can be protected by wrapping steel mesh around the base of the tree to a height of about 4 feet. Otters often visit ponds from nearby creeks and can have a significant impact on the fish population. Droppings with scales and fish bones are evidence of otter visits. These nuisance animals should be removed as soon as detected. Techniques include body-gripping traps, snares, foothold traps, and shooting. Permits and licenses may be required.



Beavers and muskrats can bore in to the side of the dam and weaken its structure. Emergency spillways should be lined with concrete if they receive heavy flow (inset).



Annual Evaluation

In addition to ongoing management, your pond should be checked on a regular basis. Our annual maintenance plan includes an aquatic weed assessment, a water test to determine lime requirement, and an electrofishing balance check to assess the fish community.

Regular electrofishing evaluations are necessary to assess the effectiveness of a management program. Electrofishing allows us to stay on top of the pond's condition in order to make necessary changes in management recommendations.



Annual electrofishing evaluations determine the effectiveness of management practices.



Summary of Management Recommendations

[Hollybrook Lake](#) is functioning as a balanced system that has a moderate level of fertility. Several management inputs are necessary to maintain a state of balance as well as increase the total density of sport fish. The management activities we are recommending for [Hollybrook Lake](#) will center on reducing the total number of adult predators, introducing supplemental forage, and enhancing the conditions for the production of forage.

To create conditions suitable for effective fertilization, we recommend **applying at least 200 tons of agricultural limestone** this winter. To maintain a high density of sport fish as well as help control aquatic vegetation, we recommend **continuing an intensive fertilization program** in [Hollybrook Lake](#). **SportMax® Water Soluble Pond Fertilizer** (10-52-4) should be applied according to the *Standard Pond Fertilization Schedule*.

For [Hollybrook Lake](#), **harvest bass 12 inches and smaller** at a rate of **10 pounds per acre per year (570 lbs./yr.)**. The recommended bass harvest rate and size will likely change over the next few years as the fish community responds to management inputs.

We recommend **limiting bluegill harvest** in [Hollybrook Lake](#) to a “consumptive” level, meaning ONLY bluegill and shellcracker which are intended for table fare should be removed; the over-harvest of adult bluegill, particularly during the spawning season, may lead to a decrease in the total number of mature, adult bluegill and a corresponding decline in angling catch per unit of effort. **Annual electrofishing evaluations** will help determine if fish harvest recommendations should be adjusted.

Supplemental forage in the form of threadfin shad should be stocked in order to enhance the growth and condition of the largemouth bass.

We recommend **maintaining an intensive supplemental feeding program** in [Hollybrook Lake](#). Fish food should be applied from feeding stations at a rate of at least 5 lbs/feeder/day from March through October.

Aquatic weed control will also be an integral part of the management program for [Hollybrook Lake](#). Water willow and buttonbush have the potential to multiply quickly and should be monitored closely, particularly during the growing season. We feel that the quickest and most efficient way to control aquatic weeds in [Hollybrook Lake](#), if they should become a problem in the future, is by herbicide application.

The management activities we recommend over the course of the next twelve months are listed in the following pages. In an effort to assist in the prioritization of these management inputs, we have developed a simple color-coding system. You will note this system in the bottom right-hand corner of the respective Management Recommendations to follow:



Highest priority. Generally, require immediate attention.




Secondary in importance to Level 1. Directed toward achieving your stated management objectives.



Increase enjoyment and/or functionality of your pond but have less impact on the overall management program.



| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------|---------|
| ANNUAL HARVEST | | | |
| ANNUALLY 2021 | | | |
| <p>Current Status: Owner Responsibility</p> <p><input type="checkbox"/> Approved <input type="checkbox"/> Declined <input type="checkbox"/> Done</p> <p>Date Approved: _____</p> <p>Date Done: _____</p> |  | <p>COST: Hook and line: N/A</p> | LEVEL 1 |
| | <p>MANAGEMENT ACTIVITY: Harvest ~570 pounds of LMB (12" inches and less)</p> | | |

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------|---------|
| ANNUAL HARVEST | | | |
| ANNUALLY 2021 | | | |
| <p>Current Status: Owner Responsibility</p> <p><input type="checkbox"/> Approved <input type="checkbox"/> Declined <input type="checkbox"/> Done</p> <p>Date Approved: _____</p> <p>Date Done: _____</p> |  | <p>COST: Hook and line: N/A</p> | LEVEL 1 |
| | <p>MANAGEMENT ACTIVITY: Harvest all crappie caught</p> | | |

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------|---------|
| ANNUAL HARVEST | | | |
| ANNUALLY 2021 | | | |
| <p>Current Status: Owner Responsibility</p> <p><input type="checkbox"/> Approved <input type="checkbox"/> Declined <input type="checkbox"/> Done</p> <p>Date Approved: _____</p> <p>Date Done: _____</p> |  | <p>COST: Hook and line: N/A</p> | LEVEL 1 |
| | <p>MANAGEMENT ACTIVITY: Harvest ALL spotted bass caught</p> | | |

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------|---------|
| ANNUAL HARVEST | | | |
| ANNUALLY 2021 | | | |
| <p>Current Status: Owner Responsibility</p> <p><input type="checkbox"/> Approved <input type="checkbox"/> Declined <input type="checkbox"/> Done</p> <p>Date Approved: _____</p> <p>Date Done: _____</p> |  | <p>COST: Hook and line: N/A</p> | LEVEL 1 |
| | <p>MANAGEMENT ACTIVITY: Harvest all catfish caught</p> | | |



LIME APPLICATION

WINTER 2021



COST: \$ 65.00/ton*

* This price includes purchase and delivery of lime, application of lime and the cost of a loader/operator. An additional mileage charge will be added.

Current Status: Awaiting Owner Approval

Approved Declined Done

Date Approved: _____

Date Done: _____

MANAGEMENT ACTIVITY:
Apply 200 tons of agricultural limestone

LEVEL 1

FERTILIZATION ROUTE

SPRING 2021



COST: \$ 458.00 per application*

* Price subject to change. Cost includes 4 pounds of fertilizer per acre applied by our technicians according to the Standard Pond Fertilization Schedule. Additional fertilizer may be applied to achieve desired results. Cost of additional fertilizer is \$1.95 per pound, also subject to change.

Current Status: Awaiting Owner Approval

Approved Declined Done

Date Approved: _____

Date Done: _____

MANAGEMENT ACTIVITY:
Resume fertilization program

LEVEL 1

THREADFIN SHAD

SPRING 2021



COST: \$ 1,800.00/load*

* This price does not include delivery.

Current Status: Awaiting Owner Approval

Approved Declined Done

Date Approved: _____

Date Done: _____

MANAGEMENT ACTIVITY:
Stock 2 loads (~20,000) adult threadfin shad

LEVEL 1

THREADFIN SHAD

FALL 2021



COST: \$ 1,800.00/load*

* This price does not include delivery.

Current Status: Awaiting Owner Approval

Approved Declined Done

Date Approved: _____

Date Done: _____

MANAGEMENT ACTIVITY:
Stock 2 loads (~20,000) adult threadfin shad

LEVEL 1



ANNUAL EVALUATION

FALL 2021

Current Status: Awaiting Owner Approval

Approved Declined Done

Date Approved: _____

Date Done: _____



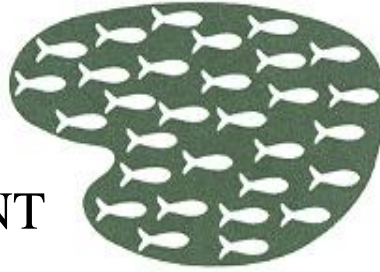
MANAGEMENT ACTIVITY:
Annual electrofishing evaluation

COST: \$ 850.00*

* This price includes comprehensive written Management Report. An additional mileage charge will be added.

LEVEL 1

SOUTHEASTERN
POND
MANAGEMENT



“Managing Your Liquid Assets”

Southeastern Pond Management

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