

November 17, 2017

Mr. Chris Madden  
3480 Woodland Lake Drive  
Hernando, MS 38632

Dear Mr. Madden:

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

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

- Maintain the current fertilization regime.
- Install Texas Hunter Automatic Fish Feeders
- Intensify the current feeding regime.
- Largemouth bass (13" and less) should be harvested, up to a total of ~9,000 pounds per year.
- Stock 4 loads of threadfin shad in Spring 2018.
- Conduct an electrofishing balance assessment (Annual Evaluation) roughly one year from this date.

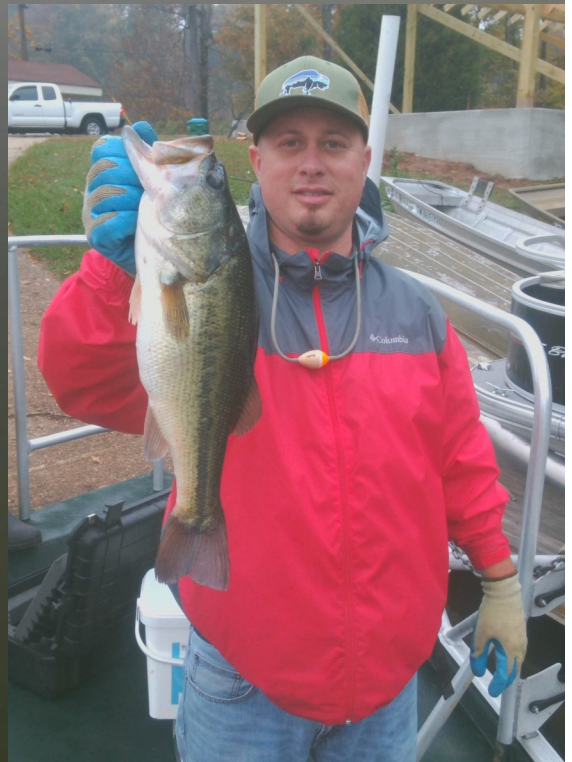
Mr. Madden, thank you for having us conduct another evaluation on the Woodland Lake. We were able to record noticeable improvements in the health of the largemouth bass population, as well as noticeable improvements in the average size of largemouth gizzard shad. We are always available to discuss these recommendations or answer any other questions you might have.

Good fishing,

Luke Moran

Management Plan  
For  
**Woodland Lake**

November 6, 2017





## Introduction

As an integral part of the ongoing management program for Woodland Lake, Southeastern Pond Management conducted a comprehensive evaluation of the 300 acre impoundment on November 6, 2017. 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 Woodland 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 Woodland 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 Woodland Lake, November 2017.



## Pond Assessment

At the time of our visit, total water alkalinity in Woodland Lake was measured in excess of **40** parts per million (ppm). This level of alkalinity is well above the minimum recommended threshold of 20 ppm, and represents conditions suitable for effective fertilization. Woodland Lake has been fertilized in the recent past, with successfully maintaining a healthy plankton bloom.

Bass harvest was reported as moderate. This level of harvest has proven beneficial, yet more needs to be done to bring the lake into balance. Harvest, and its importance in structuring fish

communities will be discussed in more detail in the Recommended Management Activities section of this report.

We did not observe any problematic aquatic vegetation. Aquatic weeds and problems associated with them will be discussed in the Aquatic Weed Control section of this report.

Woodland Lake appeared to have a very light plankton bloom at the time of our visit, the result of the fertilization program ending due to low temperatures at the end of the season.



Woodland Lake, November 2017.



## 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

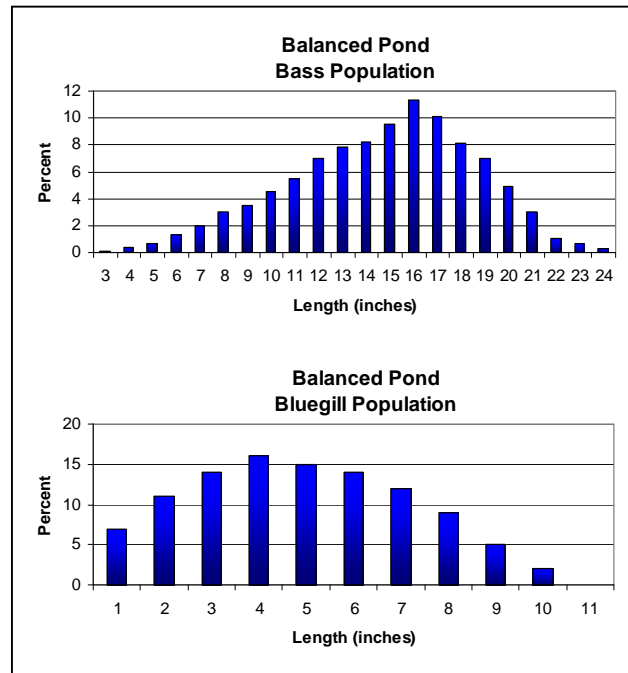


Figure 1. Length distribution of bass and bluegill in a typical balanced pond.

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

Largemouth bass ranging in size from 4 to 18 inches in total length were collected in high abundance. The length distribution of largemouth bass (Figure 2) reveals the presence of bass over a wide range of size classes. This represents improvement from the previous year, most likely the result of improved bass harvest.

The average relative weight of adult bass in our most recent sample additionally reflects notable improvement over last year. This year's average relative weight was 90, as compared to last year, 81 (Figure 4).

Largemouth bass 13 inches and smaller represent the primary targets for harvest over the coming months.

Bluegill and shellcracker were collected ranging in size from 3 to 11 inches in total length. Figure 3

depicts the length distribution of the bluegill population. Of note, the size distribution reflects high numbers of intermediate (3-5") bluegill and other forage, while mature adult bluegill were relatively less abundant in the sample. We did however, catch relatively low numbers of bluegill. This should be monitored moving forward to ensure the largemouth growth does not stall.

The gizzard shad population was in considerably much better shape this year than last year. This can be affected by the improved fertility management, bass harvest, and stocking threadfin shad. Maintaining a healthy shad population will be important in the progression of the fishery in Woodland Lake.

Overall, we characterize the fish community in Woodland Lake as bass-crowded. A more detailed explanation of bass-crowded ponds in general, and Woodland Lake in particular is located in the Current State of Balance section of this report.

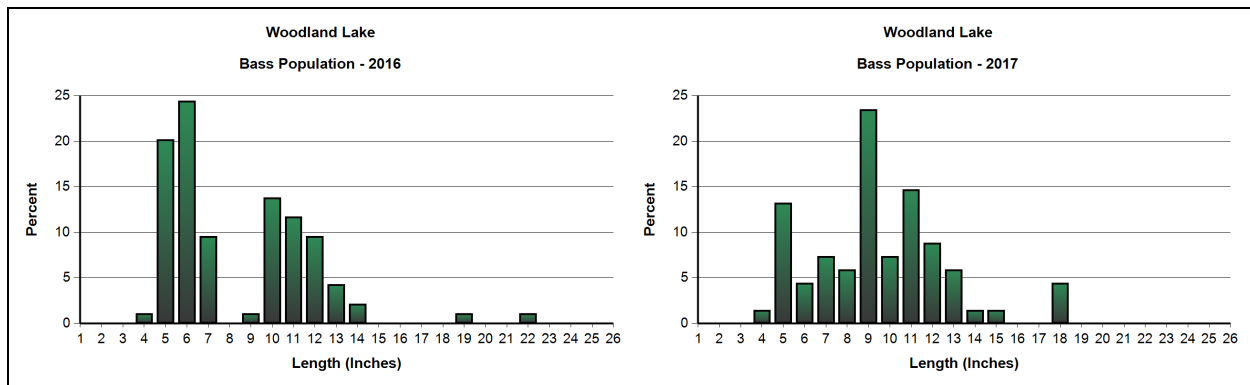


Figure 2. Comparison of the length distribution of bass collected in Woodland Lake in April 2016 and November 2017.

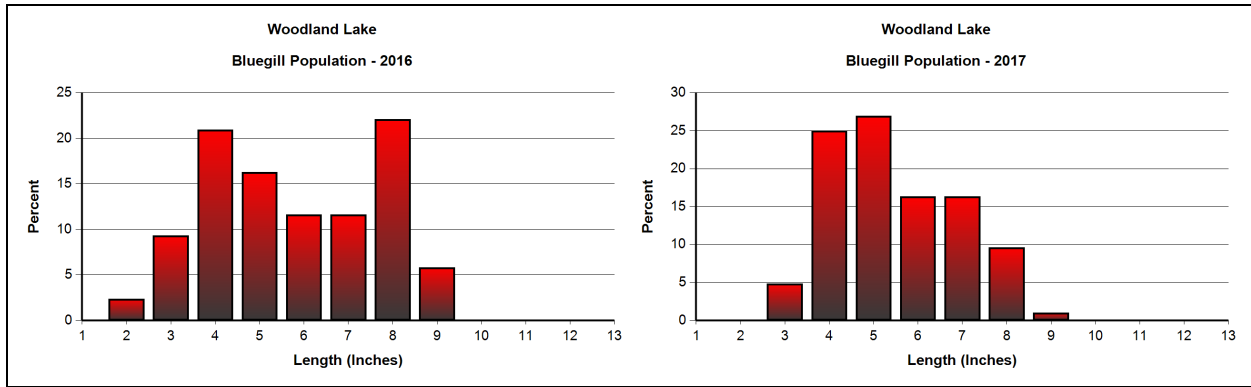


Figure 3. Comparison of the length distribution of bluegill collected from Woodland Lake in April 2016 and November 2017.

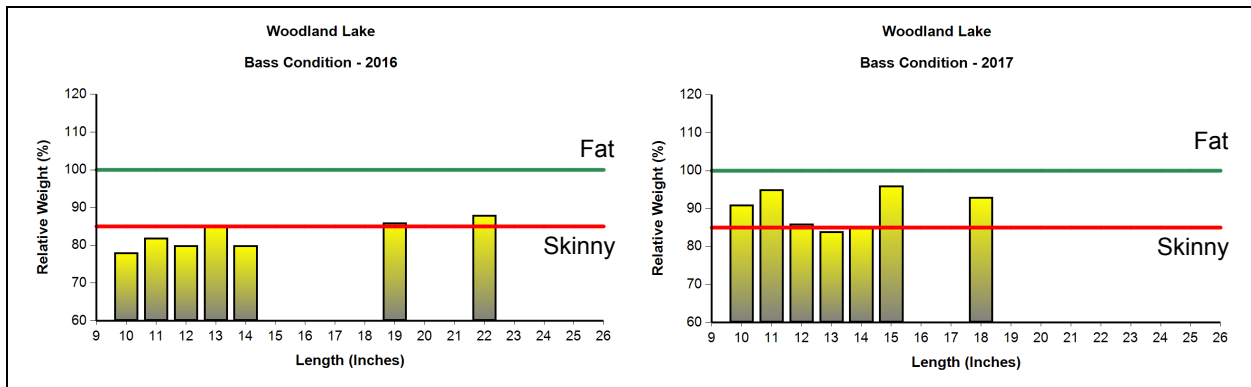


Figure 4. Relative weight distribution of adult largemouth bass collected from Woodland Lake in April 2016 and November 2017.



## Bass-Crowded

Bass-crowded is an imbalanced condition that is relatively common in private ponds and is characterized by large numbers of small, skinny bass, and relatively few but unusually large adult bluegill. In this situation, bass growth is stunted due primarily to a lack of adequate nutrition. The largemouth bass is such an efficient predator that, if not controlled through responsible harvest, it will severely reduce its own food supply. Under these conditions, bass will perform poorly and will never reach their full growth potential.

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 low relative abundance of intermediate size prey is often an indication of a bass-crowded pond. Under these conditions, bass typically become stunted between 8 and 14 inches. Bass in this size range require an ample supply of 3-5" prey in order to grow past the stunted size and become "quality" and "trophy" adults. When a condition of balance exists, intermediate size prey are among the most abundant segment of the overall fish community. As mentioned previously, our recent electrofishing sample from Woodland Lake showed a good distribution of sizes, yet relatively low numbers of bluegill.

Under-harvest of bass is most often the cause of the bass-crowded condition. In bass-crowded populations, despite their overabundance and relatively poor condition, the adult bass spawn each year. Due to the presence of an actively reproducing prey population, these juvenile bass are able to grow quite well in their first year. In order to maintain this rate of growth past 8-10 inches however, they require a slightly larger prey item. In bass-crowded ponds, the availability of slightly larger (3-5") prey is limited. As a result, the growth rates of the bass decline dramatically and they begin to demonstrate characteristics of stunting. Recent bass harvest was reported as "limited" in Woodland Lake.

In a typical fertilized sport fish pond, bass harvest is required in order to prevent



Typical bass from a bass-crowded pond.

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, the crowded condition perpetuates itself. This results in a less than quality bass fishery.

Finally, competing predator species in the form of crappie were observed in relatively low numbers in Woodland Lake. There is not an immediate concern that crappie will significantly impact the management program. Nevertheless, the potential impact of competing predator species, including crappie, are discussed in the following pages.

Strategies specifically geared toward improving the bass-crowded condition are discussed in the Recommended Management Activities section of this report.





## 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. We generally recommend harvesting the smaller, more abundant size range of bass at a rate of **25 to 35 pounds per acre per year**. 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. 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.

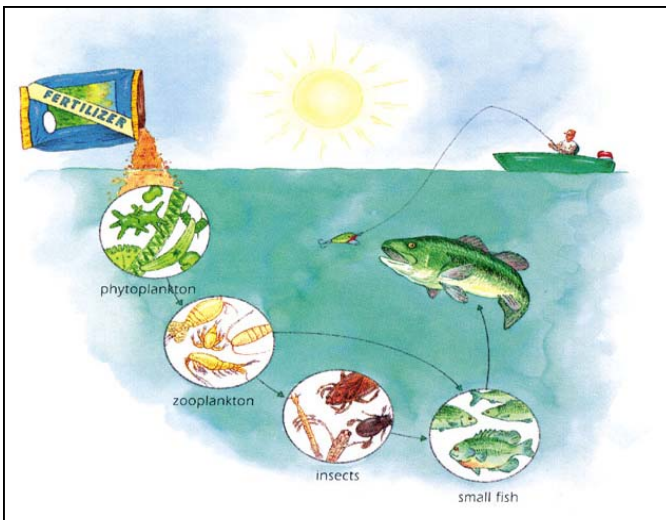


## Fertilization

The concept of *carrying capacity* describes the total 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 is the most basic and important element necessary to create an environment conducive to the production and growth of sport fish. 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.



SportMAX® Water Soluble Pond Fertilizer can be poured directly into the prop wash of a small motor. 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.

We offer a convenient **Fertilization Service**, which 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.

If you elect to fertilize on your own, **we can supply you with a season's worth of material, prior to the scheduled start of the season.** SportMAX® comes conveniently packaged in heavy duty, water-resistant plastic bags; ideally, it may be stored in a barn or equipment shed sufficient to keep the direct elements away.

SportMAX® is easy to use; proper application involves simply pouring the material directly from the bag into the open water — no mixing... no mess!

Recommended application rates for SportMAX® range from 4 to 8 pounds per acre. Particularly in the early season, the higher rate is often necessary to stimulate a plankton bloom. Generally by the middle part of the season, the lower rate is adequate.



## 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 initiating an intensive 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.



Optimally, choose a floating ration with multiple 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 Texas Hunter automated fish feeders. Simply put, these feeders are the finest of their kind. Texas Hunter directional feeders are offered in three sizes (LM135 - 70 pound capacity , LM175 - 100 pound capacity, and LM435 - 250 pound capacity) and they are only available in green. They are powered by rechargeable 12-volt batteries and come equipped with a solar charger. Texas Hunter directional feeders may be conveniently mounted with adjustable legs on the bank, or on with fixed dock legs 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.



## 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).



## Nuisance Animal Control

Several different aquatic animals can affect the management of small impoundments. Some critters bore holes and make dens in the dams of ponds. This can reduce the integrity of the dam as well as ruin the aesthetic value of the pond. Other animals can impact the fish community. However, there are many aquatic animals that have little negative impact on ponds or the fish community and coexist quite well. Determining if an animal has a negative effect on a sport fish pond, and then creating a method of control is an important component of a comprehensive management program.

Beavers and muskrats are common residents of sport fish ponds across the Southeast. Although they seem to have little affect on the fish community, they are both capable of significant aesthetic and structural damage. They often bore in to the shoreline of ponds to create dens. Dens built along the dam can eventually weaken the structure of the dam. Beavers are especially capable of severe timber destruction around the shoreline.

Attempts to remove beavers and muskrats should begin as soon as detected. Techniques include body-gripping traps, snares, foothold traps, and shooting. Complete removal of beavers and muskrats can be quite difficult in small impoundments, thus protecting the dam and shoreline trees may be necessary. 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.



Shoreline beaver damage.

Otters can be frequent visitors of sport fish ponds, especially if they are built on or near a large creek. Otters consume large amounts of fish each day and can have a significant impact on a sport fish



Puncture wounds left by otters on largemouth bass and gizzard shad (inset).



community. Their impact varies with the number of individuals present, frequency of visits, and size of the pond. Otters are secretive and often go unseen; however, droppings with scales and fish bones are evidence of their presence. Techniques for removal include body-gripping traps, snares, foothold traps, and shooting.

Many fish-eating birds visit sport fish ponds seasonally or even daily. Cormorants are probably capable of the most destruction to fish communities as they often congregate in large numbers to over winter in the southeast. Lakes located near large river systems and/or near large catfish operations are the most susceptible to cormorant problems. Also, ponds with an abundance of standing timber seem to be particularly attractive. Depending on the food availability, cormorants may remain on a pond for months, potentially making a large impact on the fish community. The best approach to controlling cormorant predation on small impoundments is to



Cormorant

use harassment techniques. These techniques often involve shooting guns, noise makers, cannons, etc. However, this technique requires a dedicated effort and often must be repeated several times a day for several weeks. Lethal control of cormorants requires a depredation permit issued by the U.S. Fish and Wildlife Service.

Heron and kingfishers usually have a solitary lifestyle and will not congregate in large groups. Although, their impact may be more noticeable in small ponds less than 1 or 2 acres, their control is hardly worth the effort. Mergansers also visit southeastern ponds during the winter; however, their impact appears minimal.

A long-time misconception is that turtles can become too abundant and can affect the balance of a fish community. Turtles typically forage on aquatic invertebrates, plant material, and dead organic matter. Although they may stumble upon an occasional nest of fish eggs, turtles have no noticeable effect on the ability for sport fish to reproduce sufficiently.

If an aquatic animal is thought to be negatively impacting the recreational value of a sport fish pond, it is recommended that you consult one of our fisheries biologists before control measures are taken. Remember to follow the state game laws and acquire permits and licenses if required.



Great Blue Heron





## 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

Woodland Lake is functioning as a bass-crowded system that has a high level of fertility. Several management inputs are necessary to restore balance as well as increase the total density of sport fish. The management activities we are recommending for Woodland Lake will center on reducing the total number of adult predators, introducing supplemental forage, and enhancing the conditions for the production of forage.

To maintain a high density of sport fish as well as help control aquatic vegetation, we recommend **maintaining an intensive fertilization program** in Woodland Lake. **SportMax® Water Soluble Pond Fertilizer (10-52-4)** should be applied according to the *Standard Pond Fertilization Schedule*.

For Woodland Lake, **harvest bass 13 inches and smaller** at a rate of **30 pounds per acre per year** (9,000 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.

In addition to largemouth bass harvest, we recommend **harvesting all crappie and catfish** which are caught during angling, regardless of size.

We recommend **limiting bluegill harvest** in Woodland 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 Woodland

Lake. Fish food should be applied from multiple 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 Woodland Lake. We did not observe any problematic aquatic vegetation during the evaluation. However, many aquatic plants have the potential to multiply quickly and should be monitored closely, particularly during the growing season.

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

Current Status: Owner Responsibility

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_



**MANAGEMENT ACTIVITY:**  
Harvest ~9,000 pounds of LMB (13" inches and less)

**COST:**  
Hook and line: N/A  
Electrofishing: \$350.00/ hour.\*

\*An additional mileage charge will be added.

LEVEL 1

FERTILIZATION

ANNUALLY

Current Status: Owner Responsibility

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_



**MANAGEMENT ACTIVITY:**  
Continue fertilization program

**COST:** Cost of Fertilizer

LEVEL 1

SUPPLEMENTAL FEEDING

ANNUALLY

Current Status: Owner Responsibility

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_



**MANAGEMENT ACTIVITY:**  
Continue feeding program.  
Feed at a rate of 5-10 pounds/day from each feeder

**COST:** Cost of Food

LEVEL 2

SUPPLEMENTAL FEEDING

SPRING 2018

Current Status: Awaiting Owner Approval

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_



**MANAGEMENT ACTIVITY:**  
Install multiple Texas Hunter directional fish feeders  
Feed at a rate of 5-10 pounds/day from each feeder

**COST:** \$ 850.00 each\*

\* This price includes a Texas Hunter LM-135 directional fish feeder, solar charger, and rechargeable battery. An additional delivery charge will be added.

LEVEL 2



**SPORTMAX**

**SPRING 2018**



**COST: \$ 1.80/lb\***

\* Pricing subject to market variability. Final price will be confirmed prior to delivery. This price does not include delivery.

**Current Status: Awaiting Owner Approval**

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_

**MANAGEMENT ACTIVITY:**

Deliver 2,400 pounds of SportMAX Water Soluble Pond Fertilizer (10-52-4)

**LEVEL 1**

**THREADFIN SHAD**

**SPRING 2018**



**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 4 loads (~40,000) adult threadfin shad

**LEVEL 1**

**ANNUAL EVALUATION**

**FALL 2018**



**COST: \$ 850.00\***

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

**Current Status: Awaiting Owner Approval**

Approved  Declined  Done

Date Approved: \_\_\_\_\_

Date Done: \_\_\_\_\_

**MANAGEMENT ACTIVITY:**

Annual electrofishing evaluation

**LEVEL 2**



### Bass Harvest Records

<b>Date</b>	<b>Number Harvested</b>	<b>Total Pounds Harvested</b>	<b>Comments</b>



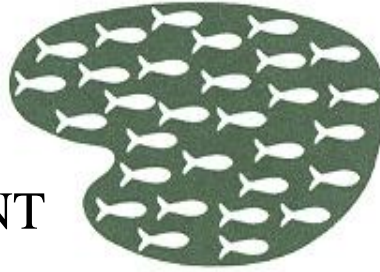
## Fertilizer Application Records

<b>Date</b>	<b>Water Color</b>	<b>Water Visibility (in.)</b>	<b>Fertilizer Applied (lbs.)</b>	<b>Comments</b>





SOUTHEASTERN  
POND  
MANAGEMENT



*“Managing Your Liquid Assets”*

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