

December 3, 2015

North Brandon Shores HOA  
P.O. Box 2165  
Brandon, MS 39043

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

North Brandon Shores 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 and crappie) and improving the conditions for the production of forage through enhancing the pond's fertility level and supplemental feeding:

- Maintain the current fertilization regime.
- Intensify the current supplemental feeding regime.
- Largemouth bass (16" and less) harvest should be limited to 15/person/day.
- Bluegill harvest should be limited to 10/person/day.
- All crappie caught should be harvested.
- Apply herbicide to control aquatic vegetation in Summer 2016.
- Conduct an electrofishing balance assessment (Annual Evaluation) roughly one year from this date.

North Brandon Shores Lake fishery has become a very stable balanced fishery. Overall I am please with the length frequency distribution of all fish species present. Please continue to harvest crappie. The condition factors of the largemouth bass are slightly lower than 2014. If we see an additional decline next year, it is likely that we will need to increase the harvest rate of small bass. We will know more next year. I encourage any property owner to install an automated fish feeder. This will help grow even larger bluegill and make fishing for bluegill easy. This combined with good fertility obtained through fertilizing will ensure a healthy fishery.

We are always available to discuss these recommendations or answer any other questions you might have.

Good fishing,

Scott Kirk  
Fisheries Biologist, MS

Management Plan  
For  
**North Brandon  
Shores Lake**

November 20, 2015





## Introduction

As an integral part of the ongoing management program for North Brandon Shores Lake, Southeastern Pond Management conducted a comprehensive evaluation of the 65 acre impoundment on November 20, 2015. 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, plus consultation with Mr. Brian Davidson, provide the basis for this management plan.

The goal of this management plan is to create and maintain a balanced fish community with the potential for trophy largemouth bass in North Brandon Shores 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 North Brandon Shores 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 North Brandon Shores Lake, November 2015.



## Pond Assessment

At the time of our visit, total water alkalinity in North Brandon Shores Lake was measured at **25.2** 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. North Brandon Shores 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 infestation of smartweed and a light infestation of alligatorweed growing along the margins.

Descriptions of these plants can be found in the Aquatic Weed Identification section of this report.

North Brandon Shores Lake appeared to have an excellent plankton bloom at the time of our visit, the result of consistent fertilization.



North Brandon Shores Lake, November 2015.



## 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

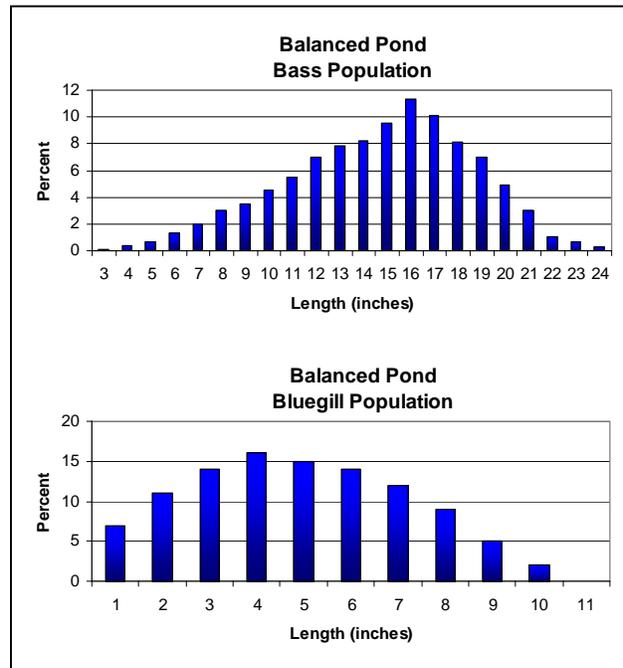


Figure 1. Length distribution of bass and bluegill in a typical balanced pond.

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 North Brandon Shores Lake was sampled with standard boat-mounted electrofishing equipment. The sample contained largemouth bass, threadfin shad, crappie, copperside bluegill, golden shiners, and redear sunfish (shellcracker). Currently, largemouth bass and crappie re functioning as the primary predators in North Brandon Shores Lake. The threadfin shad, shiners, bluegill, and shellcracker are the prey.

Threadfin shad have become an important component of the forage base in North Brandon Shores Lake. We observed several different size groups, indicating a healthy population. Maintaining a healthy shad population will be important for North Brandon Shores Lake to continue producing quality and trophy size bass.

Largemouth bass ranging in size from 9 to 24 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 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 reflects slight decline over last

year. This year’s average relative weight was 94, as compared to last year, 97 (Figure 4).

Largemouth bass 16 inches and smaller represent the primary targets for harvest over the coming months.

Bluegill and shellcracker were collected ranging in size from 2 to 10 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. Mature adult bluegill were also abundant in the sample.

Overall, we characterize the fish community in North Brandon Shores Lake as balanced. A more detailed explanation of balanced ponds in general, and North Brandon Shores Lake in particular is located in the Current State of Balance section of this report.

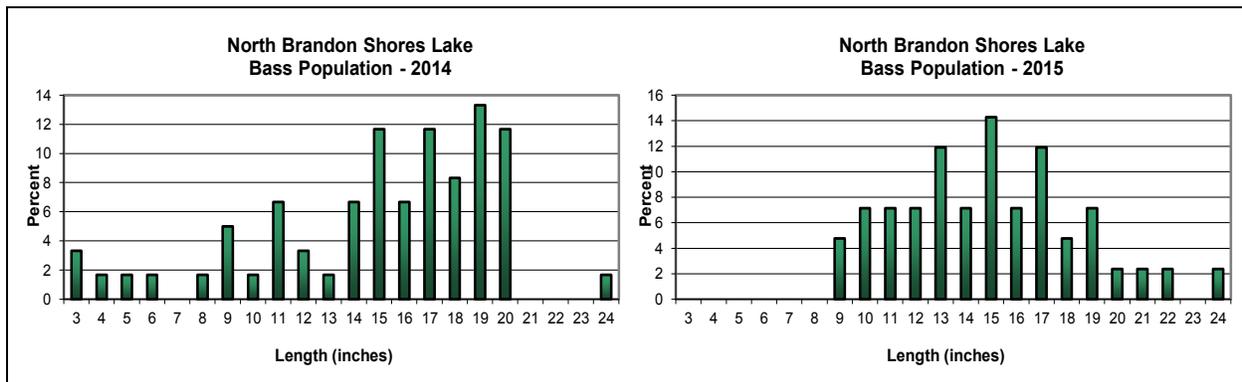


Figure 2. Comparison of the length distribution of bass collected in North Brandon Shores Lake in October 2014 and November 2015.

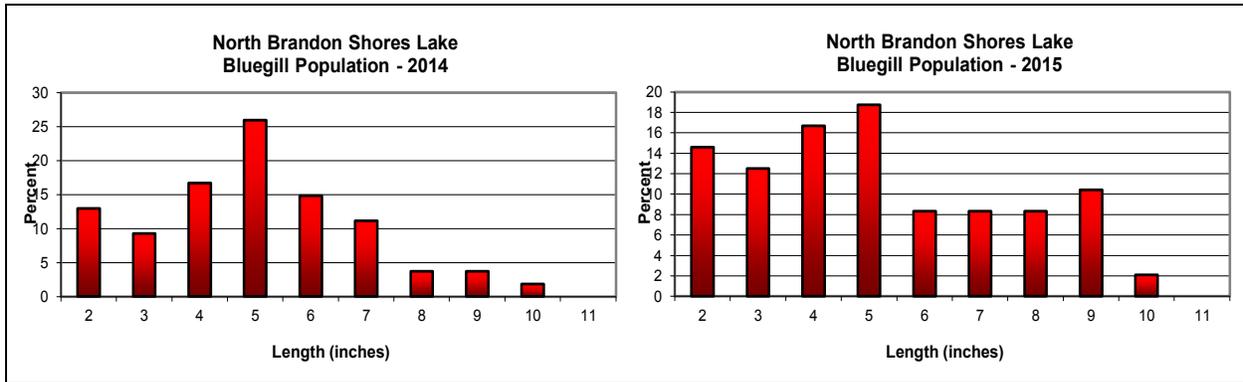


Figure 3. Comparison of the length distribution of bluegill collected from North Brandon Shores Lake in October 2014 and November 2015.

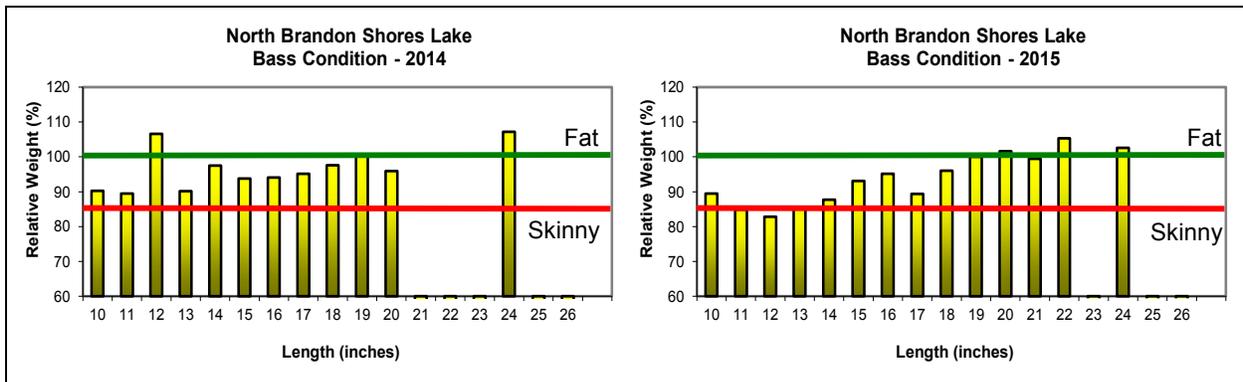


Figure 4. Relative weight distribution of adult largemouth bass collected from North Brandon Shores Lake in October 2014 and November 2015.



## 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 North Brandon Shores Lake contained a healthy distribution of bass across many different size groups. Additionally, the majority of the bass were in good condition with relative weights ranging from 82 to 105. Bass in the 18 to 24 inch length group were in excellent condition, indicating an abundant forage base for this length group of bass. However, the bass in the 10 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 North Brandon Shores 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.



## 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.

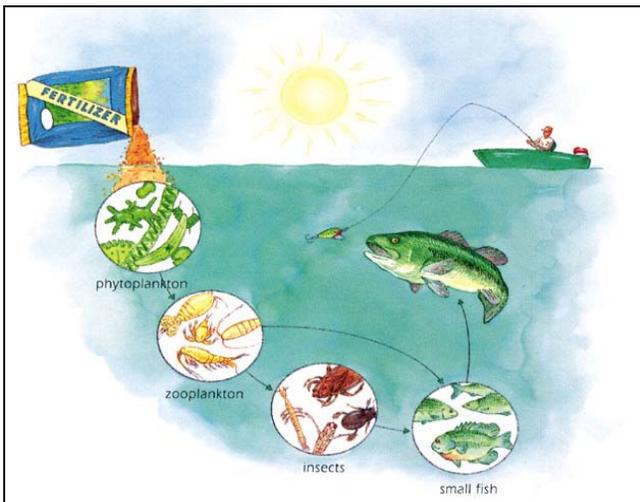


## Fertilization

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 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 intensifying the existing 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.

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 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



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).

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.

**Given the present state of vegetation in your pond, chemical control is recommended.** This approach involves the use of aquatic-approved herbicides to reduce or eradicate aquatic weeds. We are commercially licensed to apply aquatic-approved herbicides. Our treatments are warranted to control existing weed growth. We cannot, however, warrant against re-growth; the integrated approach to controlling nuisance vegetation is your best insurance against weed problems in the future. The cost and timing of our recommended herbicide treatment are listed in the Recommended Management Activities section of this report.

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:** Alligatorweed

**Scientific Name:** *Alternanthera phyloxeroides*

**Distinguishing Characteristics:**

Mature leaves approximately 1/2 inch wide and 3-4 inches long. Leaves arranged oppositely along stem. Stems often reddish brown. If present, flowers white.

**Growth Habit:**

Emersed. Sprawling plant rooted at shoreline. Forms dense, floating mat out into pond.

**Management Program Impact:**

Low to moderate.





**Common Name:** Smartweed

**Scientific Name:** *Polygonum* sp.

**Distinguishing Characteristics:**

Leaves arranged alternately along stem.  
Swollen rings occur around stem at the base of every leaf.

**Growth Habit:**

Emersed.

**Management Program Impact:**

Low to moderate.





## Siltation and Turbidity Control

Siltation, as it relates to small impoundments, is the influx of soil particles from the surrounding watershed. Clay turbidity, or suspended clay particles, is the most common result of siltation in the southeast. Extended periods of heavy siltation can greatly affect the fish community in several ways as well as the overall aesthetic and recreational value of the pond.

Clay turbidity lasting several months during the growing season can greatly reduce the reproductive success of the adult bluegill as well as the survival of bluegill fry. Growth rates of juvenile bass subsequently decline in response to their reduced food supply. Furthermore, periods of poor water clarity undoubtedly reduce the foraging efficiency of all size groups of bass. Initiating or intensifying a supplemental feeding program will compensate for some of the loss in bluegill reproduction and growth caused by the soil turbidity.

Siltation can also impact the fish community by reducing the production of plankton (the base of the food chain). The frequent intrusion of acidic

soil particles from exposed soil in the watershed will likely reduce the alkalinity and the ability of phytoplankton to uptake nutrients. Phytoplankton communities require



Alluvial fan

sunlight to grow, thus extended periods of muddy water may reduce sunlight availability such that phytoplankton production is greatly reduced. Fertilization is typically ineffective under these conditions.

Muddy water typically has a lower average concentration of dissolved oxygen compared to water with a phytoplankton bloom. If soil turbidity develops suddenly, as in the case of a heavy rain storm, dissolved oxygen could drop to critically low levels requiring aeration.

Large amounts of silt deposited in the pond bottom, called alluvial fans, greatly increases the potential for aquatic weed problems. Extremely shallow areas resulting from siltation that allow light



Soil turbidity as a result of heavy siltation can affect the fish community and aesthetic quality of ponds.



to penetrate to the bottom regardless of the water clarity, enable weed growth to begin. Aquatic plants once restricted to the margins often form thick mats across silted-in areas.

The first step toward improving the effects of siltation and water turbidity is to determine the source. The most common cause of siltation and muddy water is disturbed or bare areas within the watershed. As rainfall flows over these exposed areas, the material gets transported to and deposited in the pond. The alkalinity of the pond can determine the rate at which the water clarity improves. It takes longer for soil particles to settle in low alkalinity ponds. In some cases, extremely fine soil particles (called Colloidal particles) remain in suspension indefinitely.

Another cause of soil turbidity is catfish or common carp. If present in high enough numbers, these two species can stir up the pond bottom to the extent that the water remains muddy.

The next step toward improving an impacted lake is to stop the siltation or remove the fish causing the muddy water. If possible, grass should be established on any bare soil in the watershed. If this is not immediately possible, such as in an unfinished construction site, silt fences should be constructed and maintained. In cases where the source of the siltation originates on adjoining property, it is generally the adjoining property owner's responsibility to compensate any loss in the recreational value of the affected pond. A representative from the Environmental Protection Agency (EPA) may be contacted to help persuade the property owner or developer to take responsibility.

Depending on the amount of silt that entered the pond, removal of the deposited material may be recommended. Often, a track hoe can be used from the bank to remove material from the margins or areas in the upper end. However, if large areas are affected, it may be necessary to draw the lake down to facilitate access with larger equipment.

If the water clarity does not improve once the source of siltation and/or soil turbidity is controlled, flocculation may be necessary. In the case of acidic clay particles (red clay), they tend to repel each other and will not clump together to form a larger particle that can settle. Flocculants are substances that will bind to clay particles and form bridges between other clay particles. Flocculants have no residual



Heavy silt deposits should be removed with equipment to deepen lake edges.



Flocculants, such as alum or lime, are often used to clear muddy water.

effect, in terms of improving water clarity, and thus should not be used until the source of muddy water is stopped.

Several flocculants are available for improving water clarity. Aluminum sulfate, or alum, is the most effective for improving water clarity in muddy ponds. However, alum applications increase the acidity of the water and could lead to fish mortality. Alum should be used carefully in low alkalinity ponds. Gypsum is also an effective flocculant and will not reduce water pH; however it is often ineffective in high alkalinity ponds. In many cases, agricultural limestone will bind to acidic soil particles causing them to settle. Applying lime will also increase alkalinity in lakes thereby increasing the lake's productivity.



## 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

North Brandon Shores Lake is functioning as a balanced system that has a moderate level of fertility. Several management inputs are necessary to maintain balance as well as increase the total density of sport fish. The management activities we are recommending for North Brandon Shores Lake will center on reducing the total number of adult predators 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 North Brandon Shores Lake. **SportMax® Water Soluble Pond Fertilizer (10-52-4)** should be applied according to the *Standard Pond Fertilization Schedule*.

For North Brandon Shores Lake, **bass harvest should be limited to 15/person/day** (16 inches and less). 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 North Brandon Shores Lake to **10/person/day**. **Annual electrofishing evaluations** will help determine if fish harvest recommendations should be adjusted.

We recommend **intensifying the current supplemental feeding program** in North Brandon Shores Lake. Fish food should be applied from 9 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 North Brandon Shores Lake.

Alligatorweed, and smartweed 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 North Brandon Shores 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:

LEVEL 1

Highest priority. Generally, require immediate attention.

LEVEL 2

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

LEVEL 3

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



FERTILIZATION ROUTE

ANNUALLY

Current Status: **Approved**

Approved  Declined  Done

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

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



**COST: \$ 538.00 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.

**MANAGEMENT ACTIVITY:**  
Continue fertilization program

**LEVEL 1**

SUPPLEMENTAL FEEDING

ANNUALLY

Current Status: **Owner Responsibility**

Approved  Declined  Done

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

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



**COST: Cost of Food**

**MANAGEMENT ACTIVITY:**  
Continue feeding program

**LEVEL 1**

SUSPEND LMB HARVEST

ANNUALLY

Current Status: **Owner Responsibility**

Approved  Declined  Done

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

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



**COST: N/A**

**MANAGEMENT ACTIVITY:**  
LIMIT bass harvest to 15/person/day (16 inches & less)

**LEVEL 1**

SUSPEND BG HARVEST

ANNUALLY

Current Status: **Owner Responsibility**

Approved  Declined  Done

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

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



**COST: N/A**

**MANAGEMENT ACTIVITY:**  
LIMIT bluegill harvest to 10/person/day

**LEVEL 1**



ANNUAL HARVEST

ANNUALLY

Current Status: Owner Responsibility

Approved  Declined  Done

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

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



**MANAGEMENT ACTIVITY:**  
Harvest all crappie caught

**COST:**  
Hook and line: N/A

**LEVEL 1**

SUPPLEMENTAL FEEDING

SPRING 2016

Current Status: Awaiting Owner Approval

Approved  Declined  Done

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

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



**MANAGEMENT ACTIVITY:**  
Install 6 Texas Hunter LM-175 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-175 directional fish feeder, solar charger, rechargeable battery, assembly, and installation. An additional delivery charge will be added.

**LEVEL 2**

HERBICIDE TREATMENT

SUMMER 2016

Current Status: Awaiting Owner Approval

Approved  Declined  Done

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

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



**MANAGEMENT ACTIVITY:**  
Herbicide treatment to control aquatic vegetation

**COST: Variable\***

\* This price includes all labor and materials. Complete control is warranted. An additional mileage charge will be added.

**LEVEL 2**

ANNUAL EVALUATION

FALL 2016

Current Status: Awaiting Owner Approval

Approved  Declined  Done

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

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



**MANAGEMENT ACTIVITY:**  
Annual electrofishing evaluation

**COST: \$ 700.00\***

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

**LEVEL 1**



## Recreational Stocking Options

There are several species of freshwater fish that can be stocked to increase angling diversity as well as the overall recreational value of a sport fish lake. Some of these stocking options may have an impact on the balance of the fish community. This impact can often be minimized with conservative stocking rates and intensifying certain management activities.

**Channel catfish** (*ictalurus punctatus*) are especially popular additions to sport fish ponds. Catfish are generally easy and fun to catch, grow quickly, and good table fare. They are also direct competitors of largemouth bass. Catfish recruitment (reproduction) is usually low in ponds with a healthy bass population. However, they can impact the forage community and should be harvested before they reach large sizes. Maintaining an abundant forage base and intensifying the supplemental feeding program will reduce their impact on the fish community.

Another popular addition is the **hybrid striped bass** (*Morone chrysops* x *saxatilis*). Known for hard-fighting, hybrid striped bass can provide an exciting change of pace to bass angling. They are genetically sterile and adapt well to small impoundments, usually occupying more offshore, open-water areas than the largemouth bass. They will readily consume pellet fish food; their growth rates may be significantly increased by offering a high protein feed. Intensifying the feeding program and

maintaining a healthy threadfin shad population is recommended with the addition of hybrid striped bass.

A relatively new option in sport fish lakes, specifically designed to increase catch rates of bass is the introduction of **feed-trained largemouth bass**. These highly aggressive northern bass (*Micropterus salmoides salmoides*) have been trained to consume pellet fish food. Like hybrid striped bass, feed-trained bass benefit greatly from a high-protein ration.



Feed-trained Largemouth Bass

Supplemental feeding is also productive in efforts to maintain their aggressiveness and high catchability. Feed-trained bass will consume natural forage and reproduce in sport fish ponds, thus they can affect the overall balance of the fish community. The predator:prey dynamics in the pond should be considered before stocking feed-trained bass. Broadcasting a high-protein ration and stocking supplemental forage is highly recommended with the addition of feed-trained bass. Also, bass harvest rates may need to be increased to accommodate the additional fish. Feed-trained bass are typically marked in such a way as to make them easily distinguishable from other bass.



Channel Catfish



Hybrid Striped Bass



Rainbow Trout

**Rainbow trout** (*Oncorhynchus mykiss*) are frequently stocked in Southeastern ponds to increase angling opportunity during the winter. Rainbow trout become aggressive when the water cools and will actively consume high-protein pellet fish food throughout the winter. They too can have an impact on the forage community, but only for a brief time, as they perish when the water warms in mid to late spring.

**Redear sunfish** (*Lepomis microlophus*), also known as shellcracker, are traditionally stocked along with bluegill in sport fish ponds. Redear sunfish are a perfect addition to bass/bluegill ponds because they compete very little with bluegill for food and spawning grounds. Redear



Redear Sunfish

sunfish typically only spawn once a year, compared to bluegill which are multiple spawners. For this

reason, redear sunfish tend to decrease in numbers over time in ponds with an abundant bass population. Intermediate size redear sunfish are often stocked in older ponds to boost the population.

Occasionally, we have available **jumbo-size Florida largemouth bass** (*Micropterus salmoides floridanus*) for stocking.

These additions are popular among pond owners desiring instant results in terms of big bass. Stocking rates are generally low, resulting in virtually no adverse impacts on the structure of the existing forage base.



Jumbo Largemouth Bass



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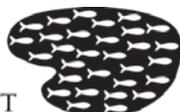
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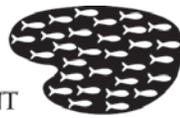
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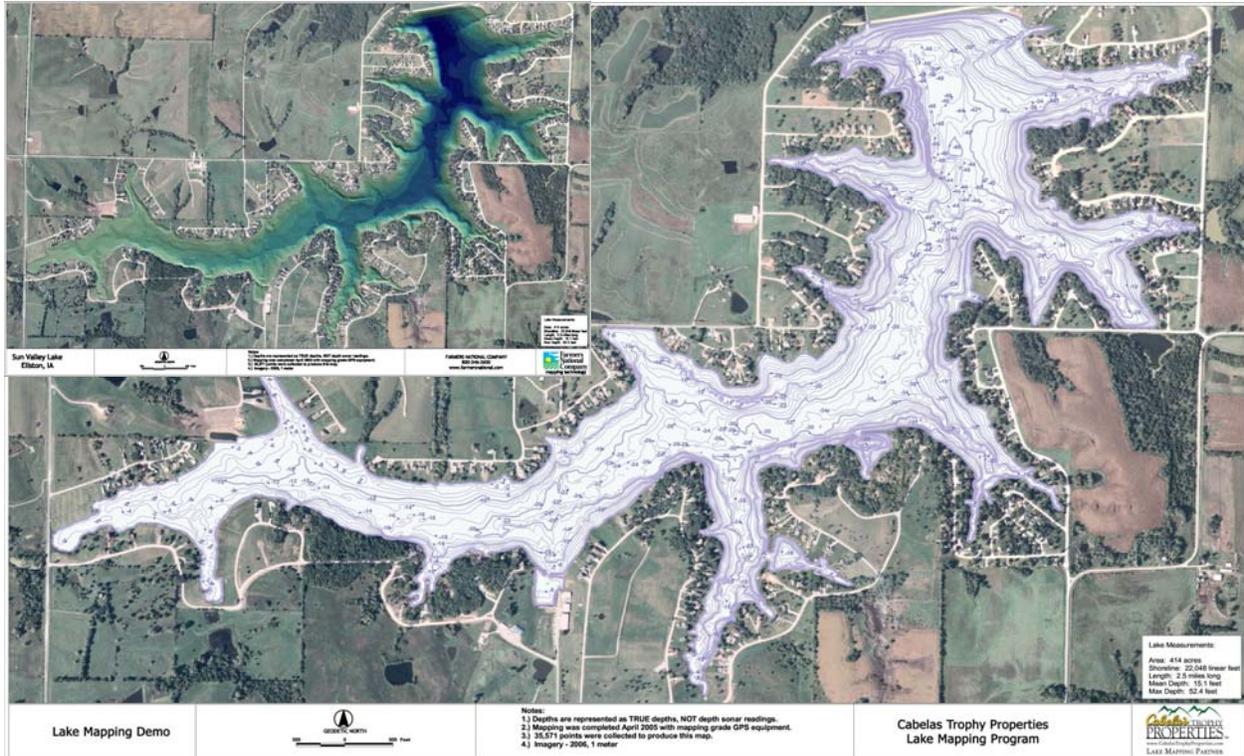
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## Lake and Land Mapping

Southeastern Pond Management (SPM) has partnered with Cabela's Trophy Properties to bring you the most innovative designs of lake and land mapping. Using state of the art Global Positioning Systems (GPS) together with an advanced depth sounder, not only can we map your property, we now have the technology to create more advanced lake maps. This technology allows us to pinpoint humps, stumps, channels, and many other fish attracting features of your lake.

Lake mapping is a widely used tool for marking fishing hotspots in lakes and reservoirs, but when

applied to private waters, these maps can be a useful management tool as well. Our lake maps will estimate the exact acreage and volume of your lake, which can assist with many management activities such as fish stocking, aquatic weed control, and sediment accumulation and removal. We offer a variety of different lake map options including contour mapping, 3D mapping, and electronic swim through technology. The 3D swim through technology allows you to experience your lake from the eyes of the fish!

Land mapping technology is an extremely useful tool for property managers, hunting clubs, timber management or just recreational enjoyment. We can design several different land maps including contour maps, aerial imagery, and electronic fly through technology. These maps can display features such as property boundaries, green fields, and many more.

We offer maps in all different sizes from 8"x11" up to large scale wall maps. Our biologists will work closely with you in deciding which type and various features are best suited for the design of your new SPM lake or land map. If you are interested in learning more about the Lake and Land Mapping program we offer, please contact us and we will gladly answer any questions you may have.



Pond Mapping



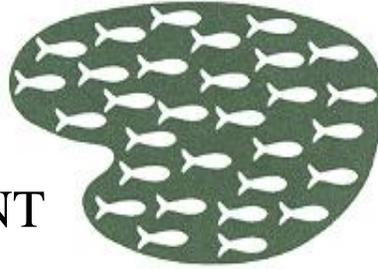








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