



*Electrofishing Survey and Report for
Sunset Lake and Sunrise Lake and
Magness Creek Property Owners Association*

August 7, 2017

Introduction

Arkansas Fish and Wildlife Management, Inc. is a private consulting company dedicated to helping you manage and develop your lake, reservoir or farm pond and to ensure that you are getting the most from your investment. We appreciate the opportunity to help you manage your fisheries resources this year. Fisheries Management is an inexact science, and results of your efforts oftentimes require months or even years to capitulate. In order to manage your fisheries resources most effectively, we measure and attempt to manipulate four factors: Water quality, fertility, aquatic vegetation, and fish populations. Successful management of these factors will provide the maximum reward to the lake owner.

At the request of Mr. Josh Wheeler, Arkansas Fish and Wildlife Management personnel visited two reservoirs belonging to the Magness Creek Property Owners Association in order to conduct a comprehensive electrofishing evaluation on the reservoir, and to make recommendations to meet the objectives of the lake owners. Relevant data concerning the fish populations, water quality, and general physiology of the lake was collected. Sound data collection is essential to establish the condition of the fisheries populations and water quality parameters. The following evaluation report and management plan details the findings, and lists our recommendations for proper management of the lake. From conversations with members of the Property Owners Association, we have determined that the primary objective for this lake is to manage for a well-balanced fishery for all gamefish species with an emphasis on consistent production of quality-sized bass. We've established a set of goals as outlined below:

- Steady and consistent production of largemouth bass, abundant numbers in all size classes, and quality-sized bass on the top end.
- Consistent production of quality size and quantities of bluegill and redear bream, as well as providing ample forage for the desired predator species.
- Sustain and enhance the water quality parameters for optimum fish production, long-term health and viability, as well as produce an aesthetically pleasing environment.

Please note here that the specific recommendations contained in this report are not one-time management activities, but rather a compilation of on-going management practices, which aim to establish and maintain quality angling. We emphasize to our clients that fisheries management is a continuing process, with trial and error involved, and that many of our recommendations are requisite and dependant on others, and that implementation of only certain proposals and recommendations may cause the management plan, as a whole, to be ineffective. Lakes require systematic and purposeful management with long-term strategies that over time will improve the lake balance. Lakes can suffer from small and large cumulative impacts and cannot manage themselves effectively. Lake Management is a collaborative process with many components. Activities are recommended and discussed separately in this commentary, but the management plan, as a whole, suffers if some parts are ignored or not implemented. The lakes were sampled in June, on separate occasions, a couple of weeks apart. The lakes looked quite different from each other right now, with the lower lake being in much better shape regarding fish populations. We'll discuss the lakes separately.

Sunrise and Sunset Reservoirs Physiology and History

Sunset Lake (upper lake) is approximately twenty-two surface acres in total. This lake has little diversity in depth ranges and bottom contour. The lake is approximately 30 years old. Most of the lake consists of shallow flats with very little bottom contour. There is a little man-made cover in the form of laydowns, brush tops, and boat docks. There is a significant watershed, with a fairly sizeable, seasonal creek which runs through the lake and exits by way of a significant concrete spillway structure, and this creek provides plentiful water even during the driest periods. The reservoir has a maximum depth of about eight feet with an average depth of about four feet. The bottom of the lake has a heavy silt load at present, which I now think is starting to limit the spawning substrate in this lake. All in all, the lake appears to be well designed and constructed. However, as the lake has aged, the upper lake appears to have become a fairly effective sediment trap, which may be benefitting the lower lake at the expense of the upper lake.

The lake contains a little significant structure in the form of fallen trees and brush piles, shoreline vegetation, a little rock on the lower end, and man-made structures such as boat docks. There is some aquatic vegetation around the banks, providing limited cover for fry and fingerling fish and forage production. Some smartweed, alligatorweed, cattails, softstem bulrush, and pondweed lined the banks, and some small patches of pennywort and water lily had emerged in the center of the upper end of the lake

The lake had a very slight plankton bloom when observed, but also had some turbidity issues producing a bit of a milky, muddy appearance to the water. Visibility in the water was less than 16" at the time of our visit. Water samples were taken during the observation, and the pH, hardness, and alkalinity levels were tested and found to be in the acceptable to preferred range. The alkalinity was about 30 ppm, which is on the low end but common in area reservoirs. An application of lime, while not a necessity at this time, would push the alkalinity and hardness to more preferred levels. The pH level was 6.8, which is near neutral and should be fine for promoting fertility and fish growth. These water quality parameters should be noted at least annually, and lime can be added should they fall below acceptable levels.

All in all, the reservoir was well designed and constructed, and this should have long-term effects in preventing problems with the reservoir.

Fish Population Assessment

The fish populations in Sunset Reservoir were sampled with typical, boat-mounted electrofishing equipment. The sample was taken late in the evening, and at night, after a fairly windy, summer day, and turbidity was just a bit of an issue. Visibility was probably less than 16". The water temperature was 87 degrees F, and I believe that some of the fish, especially crappie, may have been too deep for electrofishing to be effective. But, I believe that we still were able to get a good representative sample of what is in the lake at this time. We collected a representative sample of several sportfish species including largemouth bass, bluegill, redear bream, black crappie, and channel catfish. Undesirable rough fish were quite prevalent, as well. We noted common carp, buffalo, spotted and longnose gar, and gizzard shad. Also quite prevalent were redhorse suckers, which are very common in the watershed.

Our observations indicated that Sunset Lake has a low density largemouth bass population, that is fairly slow-growing due to a lack of forage recruitment. We observed bass ranging in size from 10 inches up to about 5 pounds, but much less frequent numbers than we had seen in this lake before. We saw no young-of-the-year bass, indicating a failure in the spawn this spring. There are a number of possible explanations for the lack of spawn. It could be an untimely flood event, or excess turbidity, but I think the long-term issue is probably siltation and a lack of suitable spawning substrate in the lake, now. Most of the smaller bass observed were not skinny, but not as corpulent as I would have liked to have seen. I collected a few bass in the 10-15 inch range for aging, and found that these bass are growing much slower than the average bass in our area. Bass only live to be 7 or 8 years old, and to produce large bass, they need to be growing at a rate of a pound a year or better. Every sample from Sunset Lake was growing much slower than that, at an average growth of less than half a pound per year.

Bluegill were also much less numerous than I would have liked to have seen. There was fairly good size distribution, with bluegill being noted from one inch up to a few

specimens that were quite large, and all size ranges in between. The multiple size ranges are what you want to see, but the numbers were rather sparse, which I am sure is the primary reason that the bass were, for the most part under-nourished and slow growing.

A small number of small to medium-sized, adult, black crappie were noted, which fall both into the predator and prey category. Black crappie normally thrives in clear, high-quality water. While we understand that crappies are a desired species in this lake, they can add to the difficulty in managing a lake. The more species of predators in your lake, the less obvious your pond management procedures become. Both black and white crappie compete with your bass for food, and since they spawn earlier, they often get a foot-hold ahead of the bass and may out-compete them for the available forage. Crappies are very prolific and we recommend at this time that any crappie caught be kept and removed from the lake.

A few very large specimen of redear were noted, and they could provide a superb fishing opportunity. Redear bream were fairly prevalent in the sample, and some had attained quality size. While they can provide additional forage for the predators in your lake, they are not nearly as prolific as the bluegill and can't be relied on to produce abundant forage for your bass. They often attain larger size than bluegill, and are excellent table fare. They can be kept when they attain eating size and released if too small. They will not have a significant impact on the predator-prey relationship of your lake. Redear, unlike bluegill, feed primarily on phytoplankton, crustaceans, bottom-dwelling insects and snails. They do provide an exciting opportunity to catch and to eat, though.

A very few specimens of channel catfish were noted, and in sparse numbers they should not have any pronounced effect on the predator/forage relationship of the lake. Some of these catfish have grown quite large. Channel catfish are cavity spawners, and there will be little natural reproduction in this lake. If the property owners wish to continue having a sizable population of channel catfish, they will have to be periodically re-stocked. I know that there used to be occasional fishing derbies held for kids in these lakes, and if those are continuing, they will probably keep an ample number for those who like to fish for them.

Aquatic Vegetation

During our visit, a fairly heavy amount of rooted aquatic vegetation were noted around the shoreline, but none appeared to be a problem for fish production, nor much a detriment to angling, and should be considered an asset at this juncture. There were some patches of rooted vegetation starting to form in the shallow, center of the upper end of the lake. There was also some filamentous algae coming on at the time. Filamentous Algae is generally a cool weather plant, and hot weather often causes it to dissipate. It can also be easily treated with copper sulfate compounds, which are readily available in our area. Things can change rapidly in this realm, however, so should any type of vegetation become a problem, we can recommend a solution.

Recommendations

As stated before, the reservoir seems to be in satisfactory balance in its predator-prey relationship, but both predator and prey densities are low, and they are exhibiting slower than normal growth rates for both the predator and prey species. I think that this is due in large part to the sedimentation occurring in the upper lake. The sediment coming down the creek is settling out in the upper lake, creating poor conditions for both the production and the growth of gamefish in this lake. In my opinion, a reduction in harvest and perhaps some supplemental stocking would be in order for this lake. I think that this is just a band-aid remedy, though, and it would be an ongoing process. The only tangible way to rectify this problem long-term would be a complete renovation and removal of the silt-layer in this lake.

I believe that you have a somewhat viable bream fishery for both the bluegill and the redear bream. Harvest of these species can be allowed at this time in moderate numbers. Just to be on the safe side, though, I would restrict your anglers to harvesting ten to fifteen head of bluegill per angler per day. If the abundance of the crappie remains, or the condition of the small bass gets worse in the future, we may want to recommend suspending the harvest of bluegill until the trend is reversed. But in the meantime, some harvest of bluegill should be fine.

Harvest of the redear bream will have minor impact on the predator/prey relationship of the lake, and they should provide a better angling opportunity. I think they can be harvested at will at the present time.

I would continue to harvest channel catfish at every available opportunity. We did not see the numbers of catfish that we know are in the lake. Electrofishing gear is not generally very effective on channel catfish, and when you see a just a few in a sample such as we made, they are probably fairly common. They are a top-end predator, and forage quite efficiently on the bluegill, and compete directly with the bass for available forage.

Any rough fish that are caught should be removed from the lake including gar, carp, drum, buffalo, bowfin (grinnel), gizzard shad, suckers, or any other undesirable species.

Sunrise Lake (Lower Lake)

This lake was in much better shape from a fisheries standpoint than the upper lake. Largemouth bass were much more frequently observed, as were the forage species, and these bass appear to be growing in at least an average rate.

Lake Sunrise is the lower (East) lake in the Magness Creek Subdivision. It is approximately 27 surface acres with a maximum depth of nine feet and an average depth of about five feet. It has a bit more diversity than its sister lake upstream. There are some steeper, vertical banks on the upper end and the north side, and bit more average water depth. Like Lake Sunset,

docks and a few introduced brushpiles provide most of the cover, although there is a little bit of emergent vegetation on the upper end of this lake. As you would expect, the pH and alkalinity levels in Lake Sunrise were identical to the upstream lake. The pH was 7.1 and alkalinity was about 25 ppm. Again, these are in the acceptable range for good fish production. However, the water quality in the lower lake was much superior to the upper lake. Although the visibility was about the same, at probably 16-18", the lower lake had a fairly good plankton bloom, and the low visibility was from desirable plankton bloom, and not from turbidity. It has been a very rainy summer, and lots of water has gone through the spillways of these lakes. It appears that the upper lake is being a very effective sediment trap, and much of the sediment load leaches out in the upper lake, benefitting the lower lake. It was quite obvious, as we were electrofishing, that the upper lake has a much siltier bottom than the lower lake. As we covered the lakes, I was constantly checking the bottom substrate with the fiberglass handle of a long-handled dip net, and there was hardly a spot in the upper lake where you could find a hard patch of bottom, while the lower lake was practically silt-free. I think that this is having a profound effect on the fisheries of the lakes.

Fish populations in Lake Sunrise looked much healthier than in the upper lake. Bass, bluegill, and redear were found in good numbers and most size ranges, indicating a fertile, vibrant, well balanced fish population. We noted several largemouth in the trophy class, as well as some very large redear and bluegill bream. The largest bass noted was probably between 7.5 and 8 pounds. While we didn't weigh it, I'm pretty close at estimating the sizes of LMB. A couple of large channel catfish were also observed. This lake looked as though it could provide a very enjoyable fishing experience.

The largemouth bass were in much better condition than the bass in the upper lake, and there appeared to be a moderate to good population, numbers-wise. Bass were fairly prevalent in the one to two-pound range, and several were observed in the four to five-pound range, averaging quite a bit larger than those in Lake Sunset. All in all, the bass looked in good condition with average growth rates and decent numbers in here.

Forage species also looked better in Sunrise Lake. Bluegills were found in fair numbers in all size ranges, and a few better-than-average-size adults were observed. Medium sized bluegill (4-5") were much more abundant than in the upper lake.

Just as in the upper lake, we saw some trophy size redear sunfish, and I think that there is probably a great fishing opportunity that is not being exploited here.

We only observed a few specimens of crappie in the lower lake, but that is desirable. Once you let crappie get established, they'll oftentimes become over-crowded and stunted in a lake this size. But should some residents want to emphasize and enhance the crappie fishing in the community, the lower lake would definitely be the candidate for stocking some.

We didn't see near as many rough fish in the lower lake. A few of the suckers were observed, as well as a fair number of gizzard shad, but we didn't see the larger buffalo, gar, and carp that seem to be thriving in the upper lake.

Once a lake is in a well-balanced condition such as this one, harvest is necessary to maintain that state. You usually need to harvest about ten to fifteen pounds per acre of predator species per year from this lake. Harvest of a few more of these size fish will allow more fish to advance into the larger size classes and eventually into trophy class fish. That includes both your bass and crappie. It will be difficult to monitor the harvest in these lakes with quite a few anglers having access to the lakes. But it appears that the current rate of harvest is doing a sufficient job at keeping this population looking good. I don't think that I would change a thing with the current regimen on this lake. Supplemental forage would improve the growth rates of the predator species, if you so desired.

Fertilization Program

In order to maintain the fertility of the reservoirs, and to promote more rapid growth of your fish populations, a regular fertilization program would be beneficial. Fertilization stimulates the growth of microscopic plants that feed the fish as well as shade out undesirable aquatic vegetation. These plants are called phytoplankton, and will cause the reservoir to get a brownish-green color. Fertilized ponds can support three or four times as many pounds per acre of fish biomass than can the same unfertilized pond, resulting in more and larger average fish. In a situation such as yours, where fishing pressure is never expected to be very high, fertilization will be an absolute necessity to keep fish growing at an optimum level. Fertilizing a reservoir your size is not a real expensive proposition, and it is well worth the effort.

Your shoreline aquatic vegetation is a little heavy right now. There is ample cover for fry and fingerling fish, but not so much as to hinder angling in most places. Proper fertilization should help you maintain that desired level of aquatic vegetation. If implemented fairly early in the year, it can help to shade out much of that undesirable rooted vegetation like you sprayed this summer. Your reservoir already has acceptable pH levels and alkalinity, so liming should not be necessary at present. Your fertilizer should prove to be quite effective.

When the water temperature in the spring starts staying in the sixties during most of the day and night, it is time to begin fertilization. In your area, this will most likely be sometime during the month of April or May most years. I would recommend using 11-37-0 super-phosphate liquid fertilizer, as it will produce a much more uniform, as well as a quicker bloom than granular fertilizer. Phosphates are the most important nutrients for establishing a phytoplankton bloom on your pond. On the initial application, we recommend one to two gallons per acre, and subsequent applications, can probably be halved. I've been using a water-soluble, 10-52-4 powdered fertilizer for several years that has proven to be quite effective as well. It's not quite as messy as the liquid, and seems to do just as good a job.

After the initial application, you should monitor the bloom to see how it responds to the added nutrients. The water should establish that brownish-green color within a few days. If not, another application may be called for. Ideally, you should not be able to

see a white object deeper than about 18 inches into the water. If the bloom is thick enough that you can't see a white object 18 inches deep, you're in good shape. If you can see a white object 22 to 24 inches deep, it's probably time to fertilize again. The plankton levels in the lower lake were ideal when we were shocking fish. Fertilization can continue all through the growing season for optimal benefit, but is most important during the spring and early summer months, when fry and fingerlings are produced and growing. As stated before, subsequent applications should not require as much fertilizer as did the initial application.

We can also provide this service. We use a work boat with a tank and boom system that is quite effective for applying liquid fertilizer evenly. Rates vary from year to year, as fertilizer prices can fluctuate greatly.

Supplemental Species Stocking

Your lower reservoir is in really good balance and most of the fish seem to be in good to excellent condition. I do not believe that supplemental stocking of any forage or predator species would be necessary or desirable at this juncture. If you wanted to produce faster growth rates on your bass and crappie, supplemental feeding of bait species will make a tremendous difference. I have had impressive results with fathead minnows, goldfish, crawfish, and even bullfrog tadpoles for putting quick weight on bass.

In the upper lake, it could use a supplemental stocking of both bass and bluegill if you want to push it to a little more viable fishery. Both bass and bluegill densities are low. Supplemental stockings would be beneficial, but they would be a temporary measure. I think there is very little recruitment going on in this lake, and you'd probably have to keep the supplemental stockings up every year to maintain even nominal numbers.

Another option for the upper lake might be to make it a catfish lake, and let the lower lake be more of a bass/bream/crappie lake. You could stock it heavily, with channel catfish, which bite readily and grow fairly fast. You'd want to implement a feeding program for sure, if you were to do that. But, I firmly believe that the only way to really get the upper lake back into the same shape as the lower lake, would be a complete renovation, and removal of the heavy silt layer in the upper lake, and then it's just a matter of years before it's back in the same condition that it is in now.

Supplemental Feeding

The use of automatic fish feeders is of great benefit to your lakes. I have seen some remarkable growth rates for bluegill in similar lakes, and the entire food chain benefits from supplemental feeding. The channel catfish and bluegill would benefit directly from the supplemental feeding, while the predator species such as bass and crappie will benefit indirectly. A feeding program increases the productivity of the lake, allowing for

higher densities and faster growth of all species. Pelleted feeds will also add to the fertility of the lake, reducing the amount of fertilizer necessary to produce the desired plankton bloom. I recommend that you feed 32% protein floating pellets in no larger than ¼" pellet size. We are a Sweeney feeder dealer, and though they are the most expensive feeder on the market, they are also by far the most reliable. Even one or two can be beneficial to your fish populations, plus you have the added bonus of concentrating some of your fish for easier and more productive angling.

Annual Checkup

All fisheries are dynamic, living, changing environments, and can change either suddenly or over a prolonged period of time. To stay on top of these changes, we recommend at least an annual electrofishing evaluation of the lakes that we manage. While your lake seems to be in excellent shape right now, there may be some management steps that need to be changed in subsequent years. Subsequent checkups won't require a complete, new management plan, unless there has been a dramatic or catastrophic change in the population dynamics of a lake. These are best performed about this time of year, early in the spring, and prior to the spawn. The fish are generally shallow this time of year, and we can usually get a true picture of what is occurring in the lake. With a regular checkup, if changes are warranted, they can be implemented over the course of a summer growing season.

Summary

Sunrise Reservoir (lower lake) is currently thriving in a well-balanced, fertile condition, with a little bit better than average growth rates and productivity for most species. There are not really many recommendations that we can make to improve on the population dynamics of the lake at this stage. In order to maintain this condition, harvest of all species and a regular fertilization program is a necessity.

Sunset Reservoir (upper lake) is in a condition of slow-growth and low productivity, attributed to a heavy build-up of sediment leaching out as the creek current slows and dumps its sediment load in the lake. Spawning substrate has been drastically reduced, and rough fish numbers have increased as habitat becomes more suitable for these species.

Arkansas Fish and Wildlife Management will be happy to provide further services to you as you endeavor to improve and maintain your fishery. We can procure and deliver supplemental species, implement your fertilization program, and continue to monitor trends and make further recommendations. It has been a pleasure working with you on this evaluation, and if we can be of further service to you please call.