

LOUISIANA FOREST STEWARDSHIP NEWSLETTER

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WADING BIRDS



Great Egret
-USFWS

WADING BIRD USE OF RECREATIONAL FISH PONDS

Story by Rachel Villani

Recreational fish ponds can have a number of purposes. Common uses include swimming, watering livestock and, of course, recreational fishing. Fish ponds can also provide great habitat for wading birds throughout the year for foraging, spending the winter and occasionally for breeding when the right conditions are present. Whether you have an existing pond and want to make it more desirable for wading birds, or you are planning on creating a new pond, there are options for managing your pond for wading birds and fishing. First, this article will cover important information about wading birds, including the common species that can be found in Louisiana, food sources that wading birds use, methods they use when looking for food and the type of habitat that wading birds use. Then, we will cover a few ways you can attract wading birds to your recreational fish pond and maintain a productive fish population.

Hérons, egrets, storks and ibises are all part of a group commonly known as wading birds. In Louisiana, common wading birds that you have probably seen include great blue herons, white ibises and great and snowy egrets (see Table 1: Common Wading Birds in Louisiana for other common species). Wading birds have noticeably longer legs and bills than most other types of birds. These physical adaptations allow them to effectively use shallow water habitat. Wading birds typically prefer water depths between 2.75 to 4.75 inches deep. Although wading birds will primarily use areas with water that is only a few inches deep, they can also occasionally be found in other areas. Sometimes wading birds will be seen in areas that have little to no water, and other times wading birds can be found looking for food in deep water.

Wading birds forage many different ways and have different adaptations that allow them to successfully find food. While the light-colored bodies of birds such

as great and snowy egrets may stand out and make the birds very noticeable from a human perspective, their white bodies actually blend in with the sky when viewed from below, or from a prey perspective. This allows them to stand in the water without being noticed from below while waiting for prey to come near enough to be caught.

Snowy egrets will use this tactic and stand extremely still in the water. When potential food approaches, they strike quickly to catch the prey. Another tactic that is used by snowy egrets can be referred to as stalking. They will shake their yellow feet to scare prey into

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moving as they slowly walk through the water. Great blue herons and great egrets also utilize this tactic. These birds will walk, run or quickly dart through the water, which startles fish, frogs, crawfish and other potential prey into moving. Then, as their prey is trying to escape, the birds will snatch it up.

Most of the food that wading birds eat comes from bodies of water, which can include streams, rivers, lakes and fish ponds. Because their food comes from or near water, wading birds have bills that are adapted for feeding in and around water. Wading birds can use their bills for probing in the mud, spearing prey in the water, plucking food off of vegetation and filtering invertebrates out of the water. Wading birds will eat a variety of food. Their diet can include invertebrates, fish, amphibians, reptiles and crustaceans (see Table 2: Common Wading Bird Food Items). Although, wading birds will feed on fish that are present in your fish pond, they will most likely not cause a decline in your fish population because fish are not their only source of food. These birds include a variety of other organisms and plants in their diet.

Common Wading Bird Food Items (from NRCS article "Wading Birds," Fish and Wildlife Habitat Management Leaflet 16)

Fish	catfish, minnows, shiners, carp
Insects	insect larvae, water boatman, dragonflies
Crustaceans	crawfish, snails
Plant Parts (roots, seeds, etc.)	sedges, wigeon grass, rushes, smartweeds
Invertebrates	grasshoppers, beetles, worms
Reptiles and Amphibians	bullfrogs, lizards, snakes

RECREATIONAL FISH PONDS

Wading bird habitat is usually limited to the edges of ponds, which often provide shallow water that can be searched for food. In the summer when evaporation can occur at high rates or when water level manipulation is possible, ponds can provide mudflat areas that are useful to wading birds that prefer this type of habitat. By lowering water depths one to two feet for a portion of the summer and exposing the soil, you can grow aquatic plants that could possibly provide food for wintering wading birds, and even for migrating or wintering waterfowl.

Most ponds are shallow at the edge and then gradually get deeper towards the middle. If your pond starts shallow but becomes deep very quickly, then there is only a limited amount of habitat that will be available for wading birds to use. If you have a pond with a steep shore and want to attract wading birds, you will have to modify the shore of your pond. Modification would involve rebuilding the slope of the bank so that the transition from shallow to deep is more gradual. Keep in mind, though, that you want to maintain enough deep water in the center of the pond to sustain the fish living in your pond. Fish need deep areas of water for better survival, especially in times of intense heat, when evaporation can lower the water level in your pond.

The amount of vegetation around the pond edge can be very important. Plants that are often found around the edges of the pond where water levels are lowest are called emergents. Emergent



Fish pond with foraging habitat along the edges and potential nesting habitat in the cypress trees..

- Cody Cedotal

vegetation is a plant that is rooted in the soil underneath the water, but emerges above the surface of the water. Wading birds are known to utilize these plants both directly and indirectly. They will eat plant parts (seeds, roots, tubers and berries) off of emergent vegetation and also look in and on vegetation for prey. Numerous small snakes, fish and other amphibians or reptiles seek refuge and protection in these vegetated areas. Wading birds will often flush these organisms to the open water, increasing the chance of catching them. Some species of wading birds, such as little blue herons, will use emergent vegetation to feed on, to hunt for food and to hide in. These shallow water areas near a vegetation edge are usually the best places to look for wading birds.

Throughout the year, wading birds will use your pond primarily for feeding. However, in some situations, ponds have the vegetation necessary to provide wading birds with nesting habitat. Wading birds nest either in colonies or by themselves. A colony of wading birds that is nesting is called a rookery. Wading bird rookeries almost always occur in the branches of trees that are growing in or near water. If your pond has trees along the shoreline or in a portion of the pond, such as a forested island, your pond could attract nesting wading birds. Most large wading birds, such as great egrets, will nest in colonies in trees. However, not all wading birds nest in trees. Some smaller wading birds, including least and American bitterns, rails and purple gallinules, will nest in dense vegetation on or near the ground where their nest will be very well hidden.

MANAGEMENT OF FISH PONDS FOR WADING BIRDS

Despite the many feeding benefits for wading birds, vegetation is not always good for fish ponds. If there is too much vegetation in or around your pond, it may create more problems than benefits for wading birds and fish populations. If your pond has a problem with an overabundance of plants, there are methods to control and remove vegetation that may be taking over your pond. The type of vegetation will determine the type of action you will need to take. Examples of common problem plants are hydrilla (*Hydrilla* spp.), alligator weed (*Alternanthera philoxeroides*) and water hyacinth (*Eichhornia crassipes*). For many aquatic plants that are rooted in the soil, a drawdown (which is drawing the water level down) performed in the winter will expose them, leaving them vulnerable to freezing and drying out. Applying herbicide to undesired plants is another option. The type of herbicide that is needed will depend on the plant species



Black-crowned night heron
- USFWS

Great blue heron
- USFWS

White ibises
- USFWS

Little blue heron (juvenile)
- USFWS

Common Wading Birds in Louisiana

- Great Egret
- Snowy Egret
- Cattle Egret
- Great Blue Heron
- Little Blue Heron
- Black-crowned Night Heron
- Yellow-crowned Night Heron
- White Ibis



Snowy egret
- USFWS



Cattle egret
- USFWS

that is being controlled. When applying herbicide, remember to always follow label instructions carefully or there could be harmful effects to you, the water quality and surrounding plants and animals. Another important thing to remember is that, when plants that have had herbicide applied to them die, they use oxygen from the water during the decomposition process. For this reason, it is best when treating nuisance plants with herbicide to treat small areas at a time to prevent the decaying plants from using all the oxygen in the water. This would increase stress on fish populations and could result in a large-scale fish kill.

Physically removing the plants from your pond is also an option. You can remove nuisance plants by cutting, mowing or pulling up from the ground by hand. Floating plants, such as hyacinth, can be scooped out with a net. If removing the plant or plant parts by hand, be careful to dispose of the plant so that it cannot spread to another body of water. For more detailed information on how to control aquatic plants that may be taking over your pond, contact your local office of the Louisiana Department of Wildlife and Fisheries or visit www.wlf.louisiana.gov.

Manipulating the water levels in your pond can be an effective management tool to provide different types of habitat for wading birds during different times of the year and control unwanted vegetation. To manipulate the amount of water in your pond, it needs to be equipped with a drain pipe or water control structure.

The goal you have for your pond will determine when and if you want to lower the water levels in your pond. If you have problems with nuisance plants along the edge of your pond and want to control them, lowering the pond levels in the late fall and winter would be beneficial. As mentioned earlier, by drawing the pond down, the nuisance weeds are exposed to the cold and this can kill the undesirable plants. In the early spring you can allow the pond to fill back up to its usual levels by simply collecting rainfall or by pumping

water in from an outside source, if you have the ability to do that. In the winter, shallow water is important for wading birds that migrate to Louisiana and they will use these areas for feeding much like they would in the summer.

A spring or summer drawdown of one or two feet will expose the substrate in the shallowest areas, providing a mudflat that will encourage vegetation growth. Mudflats are good for wading birds, including ibises, which tend to forage in muddy areas with only a small amount of vegetation growth. Vegetation will grow on the mudflats while the area is exposed. This will provide food and habitat for wading birds and then habitat for waterfowl when the area is allowed to re-flood. However, drawing your pond down in the spring could have potentially harmful effects on your fish population in smaller ponds and could result in a fish kill. If you have a large pond this may not be an issue. Also be aware that in Louisiana, the summer is very hot and evaporation rates tend to be very high, so drawing



Water hyacinth clogging a body of water
- Amy Scaroni

down the pond may increase the effects of evaporation and cause you to have lower pond levels than you intended. It's usually not possible to drawdown your pond in both the winter and spring of each year, so the option you choose, if any, will depend on your objective. Not all ponds need to be drawn down and may be suitable for fish and wading birds without doing so.

Recreational fish ponds can provide wading birds with the variety of habitat and food sources that they need to survive in Louisiana. The key to managing a productive fish pond and providing wading bird habitat is to offer a variety of habitats. Combining deep and shallow shorelines in the same pond will provide fish with the habitat they need and also provide wading birds with shallow water that they can use for feeding. Providing areas along the edge of your pond that have vegetation and areas without vegetation will provide wading birds with different areas to feed in, and in the summer, possibly nest. Balancing wading bird habitat with fish management is possible in a recreational fish pond without sacrificing the success of either goal.

For more information on managing fish ponds for wading birds, contact the Louisiana Department of Wildlife and Fisheries, nongame section at 225-765-2359 or visit the website at www.wlf.louisiana.gov.

Rachel Villani is a wildlife graduate student at Louisiana State University.

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CARBON MARKET OPPORTUNITIES FOR FOREST LANDOWNERS

Story by Matt Smith

CARBON SEQUESTRATION? WHAT'S THIS ALL ABOUT?

The greenhouse affect, global warming, biofuels, alternative or "green" energy, carbon neutrality, emissions reduction, carbon sequestration...these are just a sample of some of the terminology that has become increasingly prevalent in the mainstream media today. The global initiative to reduce the impacts of fossil fuel consumption combined with the controversial issue of dependence on foreign oil sources has developed into what could be considered a renaissance period for the international community when it comes to environmental policy and responsible environmental practices. It certainly appears that the time has arrived for real progress on the issue of global warming and its impacts on our society.

What does this all mean for forestry? There are four main methods by which a greenhouse gas emitting entity can reduce its emissions to get under an emissions cap. These include the reduction of point emissions, reduction of the entities' carbon "footprint" by using alternative fuels or energy sources, the purchase of offset credits from another entity that has reduced its emissions below the cap or the purchase of offset credits from sequestration projects (projects that fix carbon in some way). Forests are just one type of sequestration project that can participate as an offset in many registries and markets today. When considering forestry offset projects, there are four primary types: afforestation, reforestation, managed forests and forest conservation projects.

While afforestation, reforestation and forest conservation are all important aspects of forest carbon sequestration, the primary focus of this article is sustainably managed forests. Managed forests are somewhat controversial in the carbon world today. It is believed however, that this forestry offset type has perhaps the greatest potential in the United States. Forests that are managed for some mix of objectives and benefits such as recreation, biodiversity, wood products, esthetics and water quality, benefit society most by providing all of these co-benefits along with clean air and reduced greenhouse gas (GHG) buildup in the atmosphere. This suite of environmental services is matched by no other type of offset.

A TEST CASE FOR SUSTAINABLY MANAGED FORESTS

You may be wondering about the income potential of participation by managed forests in carbon markets. Over the past few years we have been asking that question ourselves. In order to fully understand the potential for managed forests as offset projects we decided to test the actual performance of a tract of managed forest, which we'll call the K tract. The K tract is a 9,000+ acre privately owned tract of high quality hardwood forest in the northeastern United States. At the date of the analysis, the tract is comprised of a mix of age classes distributed in even aged stands across the property.

Although there are a variety of market opportunities available for carbon offset credits at this time, our analysis is based on the only open market available in the United States, the Chicago Climate Exchange (CCX). CCX is the world's first and North America's only voluntary, legally binding rules-based greenhouse gas emission reduction and trading system. It started its first pilot period in 2003 with 13 members. The CCX now has approximately 250 members including companies such as Rolls Royce, Dow, DuPont, Ford, IBM, IP, Mead Westvaco, Stora Enso NA, and municipalities such as the state of New Mexico, cities of Boulder, Chicago, Portland, Berkeley, Oakland and many others.

Our test was built to answer one primary question: "How would the K tract have performed as a forestry offset project from 2001 to 2006 had the landowner entered the CCX without changing their management plan?" Our test involved the establishment of baseline carbon stocks from existing forest inventory, modeling growth using the CCX approved NE TWIGS growth model, and removing harvest volumes annually, all under the CCX rule set. Other edits included adjustments for other activities such as forest road construction. It should be noted that during the analysis period, total harvest levels equated to roughly 40 percent of overall growth. This is a key factor in the calculation of net volumes of carbon for the project.

In order to get our analysis started it was necessary to establish our project's baseline carbon stocks for the beginning of 2001. To accomplish this task we converted per species volume estimates from a 2001 forest inventory to its carbon dioxide equivalent. The result was overall estimates of carbon stocks that averaged 28 metric tons carbon dioxide equivalent (MtCO₂e) per forested acre. Using this

baseline data and the actual harvest levels along with estimates of growth from the NE TWIGS growth model, net sequestration for the K tract was calculated for each year. The results revealed that our managed forest sequestered an average of about 14,850 MtCO_{2e} annually, or about 1.69 MtCO_{2e} per forested acre per year.

After calculating the sequestration levels for our forest, we then calculated the estimates of income through the sale of the resulting carbon “credits” on the CCX platform. At the time of the project, carbon credits sold for values between \$0.95 and \$3.70 per MtCO_{2e}. Using these historical prices for carbon, our project yielded gross income of \$135,738 for the period.

The cost side of our analysis breaks the various costs for the project into two categories, start up costs and participation costs. Start up costs can include forest inventory costs, costs of third party certification of sustainability, such as Sustainable Forestry Initiative (SFI) or Forest Stewardship Council (FSC), and lastly, project preparation costs. Participation costs include fees associated with aggregation, trading, reporting and verification. These costs are incurred after the project is approved and are dependent on the scope of the project and the amount of carbon generated for trading or banking. For the K tract the total costs for participation for the six year period equated to \$91,779.53.

The end result of our economic analysis for the K tract revealed net revenue from the sale of carbon credits of \$43,959, or about \$0.83 per forested acre per year. These results are summarized in the table below:

<i>Summary of K Tract Test Case Results</i>	CCX
Total MtCO_{2e} Sequestered (six years)	89,105
<i>Average annual sequestration</i>	14,851
<i>Average annual sequestration per forested acre</i>	1.7
Total Revenue	\$ 135,738.69
Total Costs	\$ 91,779.53
Total Net Revenue	\$ 43,959.16
<i>Annual per forested acre net revenue</i>	\$ 0.83

While \$0.83 per forested acre per year is a positive economic outcome, it is hardly worth getting excited about. Landowners faced with the decision as to whether or not to enter this ecosystem market will not be likely to do so at this level of financial incentive.

CARBON IN HARVESTED WOOD PRODUCTS

As we consider the outcome of this historical analysis and look to the future for managed forests in carbon markets, it is important to keep our eye on policy and rule set developments that are on the horizon. From a broad perspective, as we think about accounting for sequestered carbon from our forests it's easy to understand that growth and harvest are the key factors influencing our net carbon stocks. Growth represents our sequestration and harvest equates to our “emission.” The problem with this train of thought is that the harvesting of trees does not fully release the associated carbon stocks into the atmosphere. Wood is made into products, which then have a lifespan of their own. Consequently, the wood tied up in harvested wood products in use contains sequestered carbon that can be accounted for and is not emitted at the time of harvest.

If we implement the DOE 100-year depreciation model method for harvested wood products in use on the K tract, the resulting net

revenue increases from \$0.83 per forested acre per year to \$1.14 per forested acre per year, a 37 percent increase in net revenue. While this income level is still not very significant, you can see the impact of this policy development on the projects economic performance.

THE CURRENT MARKET RESULT

When we completed the K tract analysis in August 2006, the sale price of one MtCO_{2e} on the CCX platform was \$4.35. This is significantly more than the \$0.95 to \$3.70 per MtCO_{2e} used in the historic K tract economic analysis.

If we take the sequestration estimates from our K tract analysis and apply the current price of carbon for each year in the period, our net income estimates rise to nearly \$4.70 per forested acre per year. If we then add in the ability to take credit for harvested wood products in use, our net revenue rises to \$5.92 per forested acre per year, or total net revenue just over \$310,000 for the six year period. As you can see, market conditions and policy developments are creating an income opportunity for forest landowners that could be significant over time. It is at these levels of net revenue that we believe forest landowners will be interested in making the commitments and investments required to participate in carbon markets.

SUMMARY

The successful completion of the K tract analysis project revealed a number of important and interesting aspects about sustainably managed forests and the rapidly developing carbon markets. While the historical economic results weren't very impressive, the K tract test model did produce a positive financial result. This result is more encouraging when you consider the current price of carbon, which could result in revenue streams similar to those currently generated through recreational leases on forestland.

While interviewing representatives from carbon markets and registries and by reading through volumes of carbon market rules and policies, it became readily evident that this business is in its infancy and is rapidly changing. Rule sets are rapidly developing in response to policy development and other influences. The various viewpoints on additionality, assuredness and permanence combined with outside political pressures will make the acceptance of offset credits from managed forests inconsistent at best. The general belief that a federal greenhouse gas program will happen in the coming years makes it imperative that the forestry community look to influence policy favorably in this regard.

No other form of carbon offset project can produce a volume of carbon credits to mitigate climate change with all of the other positive ancillary benefits that managed forests provide society. Clean water, biodiversity, esthetics, wood products and recreation are just a few of the valuable co-benefits from forests that you will not find in agricultural sequestration projects, geologic sequestration or methane gas capture. The potential for managed forests in this new ecosystem market is significant. New rule set developments and the rising prices for carbon credits are creating a significant opportunity for some forest landowners.

For more information contact Matt Smith at 716-664-5602 ext. 313 or email msmith@foreconinc.com.

Matt Smith, is the Director of Land Management at Forecon Inc., CF, ACF, EMS-A.

AREA IV FFA FORESTRY CAREER DEVELOPMENT EVENT

Story by Cody Cedotal

The Future Farmers of America (FFA) is an organization that has been involved in introducing high school students to careers associated with agriculture for many years. Through the FFA, agriculture teachers can utilize curriculums related to cattle production, poultry production, swine production, horticulture, electrical engineering, small engine repair, welding and many others to expose students to these activities. In many instances students will compete against one another in both local and state fairs and career development events to hone skills necessary for a career in one of these fields.

This effort was continued recently at the LSU AgCenter, Idlewild Research Plantation near Clinton, LA. On September 28, 2007, the Area IV FFA Forestry Career Development Event (CDE) was held at this facility for schools in southeast Louisiana. This event is one of four local forestry competitions held each year throughout the state. The forestry CDE consists of six different events, all of which are skills important to forest management. Students test their skills at compass and pacing, map reading, tree identification, timber stand improvement, sawtimber volume estimation and pulpwood volume estimation. The compass and pacing portion of the CDE requires students to navigate a staked course and provide bearings and distances between each point. Map reading requires that students identify outlined parcels of land by section, township and range on a 1:24000 quad map. Students are trained to identify as many as 40 common tree species along with scientific names in preparation for the tree identification event. The timber stand improvement event presents students with example landowner objectives and then requires that they make decisions on which trees to harvest and which trees to leave within a stand based upon those example objectives. Lastly students measure diameters and merchantable heights of sawtimber and pulpwood trees to determine a per acre volume estimate for both products.

Approximately 115 FFA members, ag-teachers and parents participated in the Area IV FFA Forestry CDE this year. Agriculture teachers from Maurepas High, Springfield High, Albany High, Franklinton High, St. Amant High, Covington High, Ponchatula High, Fountainbleau High, Live Oak High, Fifth Ward Junior High and Creekside Junior High brought teams to the CDE. Each school had at least one four-student team in the contest, with many schools having two teams in the competition. The top five teams from each area move on to compete in the state forestry CDE which is usually held in November each year. This year's top five consisted of multiple teams from Springfield High (first and third place) and Maurepas High (second and fourth place) as well as a team from Franklinton High (fifth place).

There is a large amount of work necessary to organize and prepare for all CDEs. For the past several years, Brian Chandler, Area Extension Forester for the LSU AgCenter, has taken on this task with assistance from Dr. Bradley Leger, former Executive Secretary, and Dr. Ronald Mayeux, current Executive Secretary of the Louisiana Association of FFA. Other assistance in the contest set-up and event supervision has been provided by Dr. Don Reed of the LSU AgCenter; Wade Dubea, Mike Thomas, Jay Meadows and Henry Childres of the Louisiana Department of Agriculture and Forestry; Brian Cutrer of Georgia Pacific; and myself. Special thanks to all who supported the event and to those local ag-teachers who took the time to train students and participate in the Area IV and other area FFA Forestry CDEs.

I participated in the Area IV FFA Forestry CDE and state CDE as a student of Denham Springs High from 1991 through 1994. Although



Student measures tree diameter with a Biltmore stick during sawtimber event.

- Cody Cedotal



Students measure merchantable heights during pulpwood events.

- Cody Cedotal



First place team from Springfield High School pictured with Brian Chandler (left).

- Bradley Heger

I always had an interest in the outdoors, these contests were my first exposure to forestry and really sparked my interest to pursue a career in forestry/wildlife. From high school I went on to graduate from LSU in 1998 with a degree in forestry and ultimately to work in my current position as the Forest Stewardship Biologist for the Louisiana Department of Wildlife and Fisheries. The FFA and its programs are vital in terms of getting students exposed to forestry and other agriculture-related fields and worthy of all of our support. You may be helping to inspire a consulting forester, wildlife biologist, county agent or other resource professional that will one day provide management assistance for you on your property.

Cody Cedotal is a Forest Stewardship Biologist at LDWF.



Well managed fish ponds can provide recreational opportunity all year.

- Cody Cedotal

WINTER MANAGEMENT STRATEGIES FOR POND OWNERS

Story by Mark McElroy

Pond owners interested in fish production and/or the overall aesthetics of a pond should use the winter months to their advantage by implementing winter management strategies. Incredibly, most pond owners tend to neglect their pond from around October through February and only emerge with renewed interest after the first warm weekend of March. These winter months should be regarded as an opportunity to get a head-start on management with methods to enhance fish populations and control next year's nuisance aquatic weeds.

One management strategy that every pond owner should consider is a drawdown between the months of November and February. As its name suggests, a drawdown means dewatering the pond and allowing shallow areas that typically support aquatic vegetation to dry. This will address many objectives as detailed below. The pond should be allowed to return to pool stage in March as day time temperatures begin to increase. This will create favorable habitat conditions for fish populations and limit potential stress caused by low water levels during the growing season. General recommendations for every pond should include a winter drawdown once every four to five years.

The benefits of a winter drawdown are numerous. Most small forage fish species such as bluegill tend to inhabit the shallow areas of a pond where there is cover in the aquatic vegetation. Removing the water in these areas forces them to leave their cover and become more available to the predator species such as bass. This situation is desirable for both predator and prey populations. Forage species, like bluegill, have a tendency to overpopulate which often results in an undesirable, stunted population. A reduced number of bluegill in the larger size classes may also reduce bass growth and condition. This can reduce spawning potential and increase susceptibility to disease. Keeping bluegill numbers in check is a necessity for achieving good growth rates in their population. The main goal is to put the forage species in close proximity to the predators so the food chain has a chance to work.

Dewatering during the winter months can also help manage areas infested with nuisance aquatic vegetation by allowing freezing temperatures to kill many nuisance plant species. While roots, tubers and seeds may persist, the plants will usually not return as vigorously

in the following growing season. This passive aquatic weed control technique is effective and will save money by reducing herbicide treatments.

A drawdown allows for a more thorough break down of organic matter that typically accumulates on the pond bottom and in the mud. Because there is less oxygen in water and oxygen is required for efficient decomposition, the rate of decomposition is fairly slow on the pond bottom. Exposing the pond bottom to air increases the rate of decomposition and ultimately speeds the recycling of nutrients making them available again for everything living in the pond.

In addition, while the pond is down it is usually a good time to consider pond maintenance such as levee or water control structure repairs, adding fish structure, pier construction and liming. Placement of spawning habitat in the shallow areas is another idea worthy of consideration when there is less water present.

Winter is also the best time to lime a pond. A rule of thumb is to lime during the winter and fertilize during the growing season. The question you have to ask is, "Do I need to?" A pH test of your soil (not your water) can provide the answer. Take a hand-full of soil from under the water in several locations and place it in the plastic bag. Remove as much water as possible. This sample can then be brought to most feed and seed businesses, some hardware stores or the LSU Cooperative Extension Service office in your area for analyzing. Results will be mailed back with a lime application recommendation if the test reveals that your soils are acidic. A desirable pH is somewhere around 7, or neutral. While there are several different liming materials available, it is recommended that you use agricultural limestone.

Adjusting acid soils in a pond using lime will enhance nutrient availability to phytoplankton, the green single cell microscopic plant material floating in the water column. The phytoplankton are the bottom tier of the pond's food chain, arguably the most important tier for raising fish. An ideal phytoplankton bloom serves as the "lawn" for micro-invertebrates (the next tier up on the food chain) to feed upon, as well as producing oxygen and inhibiting submerged nuisance aquatic weed growth. Submerged vegetation will only inhabit those areas of the pond where sun light reaches the pond bottom. The phytoplankton density should be adjusted using lime and fertilizer so as to prevent light penetration to depths greater than 18 to 20 inches.

Failing to adjust a pond's acidic soils can be catastrophic to fish populations. As discussed above, your phytoplankton serves as the bottom tier of the food chain and without it your fish will exhibit poor reproduction, recruitment, condition and growth. It's not inconceivable to lose an entire year class of bass in a pond that lacks sufficient phytoplankton. Bass fry with fully developed mouth parts can perish within hours if the pond is deficient in quality invertebrates to feed upon, a symptom of insufficient phytoplankton.

Pond owners need to consider pond management issues on a year-round basis. Take advantage of the winter months as a time to reflect on the previous growing season and implement management strategies in preparation of the next.

Mark McElroy is an inland fisheries biologist for LDWF.



Largemouth bass

- LDWF File Photo

**NEWLY CERTIFIED
FOREST STEWARDSHIP LANDOWNERS**

**# 268 Jack & Elsie Carter -
DeSoto Parish
02/21/07**

**Patrick Butler -
#269 Cherokee Plantation
W. Feliciana Parish
08/13/07**

**#271 Cat Island
W. Feliciana Parish
08/13/07**

**#270 John O. Letard -
Bush Hill Plantation
W. Feliciana Parish:
08/13/07**

**# 272 Michael Word/Jody Boyd
Polly Creek
W. Feliciana Parish
08/13/07**

**#273 Hazel Allen
St. Helena Parish
08/13/07**



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