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## Earl Says...

Why is it I can sit for hours listening for and waiting on a turkey but I always have trouble keeping my mind on any regular task at hand? Well, it's turkey season again and since the weather is finally cooperating, all my waking hours are either in the woods or thinking about chasing birds.

Last week I was fortunate enough to be involved in this year's Alabama Governor's One Shot Turkey Hunt. The goal of the Governor's Hunt is to showcase Alabama as a preferred destination for business, industry and nature-based recreation. The event also funds scholarships for two state universities. This year over \$200,000 was raised for scholarships for wildlife students in Alabama.

I went along with my friend Taylor Deese as he guided Robert DeWitt, an Outdoor writer with The Tuscaloosa News and he was lucky enough to bag two birds in two days. I say lucky but it helps to have a guide who knows how to talk turkey enough to bring the birds in to you! Although we didn't win any prizes at the event, the hunts were really memorable for us all.

Andy Whitaker  
Publisher/Editor



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# Factors Influencing Antler Development and Quality

By Jeremy Meares

Jeremy Meares is a wildlife biologist and hunting lease manager for Westervelt Wildlife Services. He manages over 220,000 acres of industrial timberland in central and west Alabama and is involved in wildlife consulting. Jeremy received both his B.S. and M.S. from the University of Georgia specializing in deer management.



*Studies have shown some buck fawns develop hardened antlers at around 8 months of age. This usually happens after hunting seasons are over and fawns achieve the required weight to reach sexual maturity.*

The “great spike debate” was a topic that has caused division among biologists, researchers, and certainly hunters. The “once a spike, always a spike” mentality spawned heated discussions around the firepot and likely is responsible for some hunting buddies parting ways. One of the main studies that sparked this debate took place in Texas (where else?) on the Kerr Wildlife Management Area. The results from this study supported a high predictability between a buck’s antlers as a yearling and his subsequent antler quality at maturity. In this study, spike-antlered yearling bucks were deemed inferior and were recommended for removal. Shortly after this study, researchers at Mississippi State University ran a similar study and found there to be no predictability between yearling antler quality and quality at maturity. Once these results were published, a line was drawn in the sand and you were either on one side or the other. These studies will be referenced and examined in more depth later in this article.



The growth of the quality deer management movement attempted to bridge this gap between the two camps. When we began looking closer at antler development and specifically the occurrence of spikes, it became evident there were factors that play a role in this process. These factors are age, nutrition, fawning dates, and genetics. We will discuss these and their specific impacts in detail.

### **Factors Impacting Antlers**

Antlers of male white-tailed deer can vary greatly depending on age, nutrition, and genetics. Research has shown both age and nutrition have direct, positive impacts on antler growth. Genetics determine potential antler size and configuration. The role genetics play in how specific antler traits are passed on is a topic still highly debated.

### **Age**

Usually the first set of antlers a buck will grow happens at one year of age. However, studies show a varying percentage of buck fawns develop hardened antler buttons at around eight months of age. This occurrence usually takes place after the hunting season so hunters rarely observe it (unless you are conducting a winter camera survey). Early birth dates and adequate nutrition allow fawns to achieve the weight required to reach sexual maturity facilitating antler growth.

It has been accepted that antler size typically increases annually until it peaks at five to seven years of age. In studies conducted with captive deer in Mississippi and Texas, one-year-old bucks grew 28% of their ultimate maximum gross Boone and Crockett score, two-year-old bucks increased to 62%, three-year-old bucks were at 78%, four-year-old bucks were at 92%, and five-year-old bucks were at 99%. Bucks with nutritional deficiencies would likely take one to two years longer to reach their maximum size.

Managing buck age structure is vital to any management program with



*Antler quality typically increases with age. The photos above are of the same buck at 2 ½ years old (top), 3 ½ (middle), and 4 ½ (bottom).*

increased antler size as a desired result. Management goals will dictate the age at which bucks are harvested. Age is the easiest factor to manipulate and follow out of the three listed above (nutrition and genetics being the others). As previously stated, antler size can be doubled simply by allowing bucks to go from one to two years of age. Allowing one more year of growth yields a 30% improvement.

Predicting antler characteristics of mature bucks based on what they are as yearlings has been long debated among deer biologists and hunters. Research studies have shown the number of antler points in yearlings is both a poor and excellent predictor of age. Variation in the birth dates of fawns contributed to some of the conflicting results. So what are we supposed to do with that? Thankfully researchers went back and took another look at the data collected in some of these studies. Upon further examination of one of the data sets, researchers looked at using gross Boone and Crockett scores. When looking at

yearling Boone and Crockett scores, it was found to be a reasonable predictor of antler size for the smallest and largest groups but less accurate with those considered average. Moving up one age class and examining scores of two year olds increased accuracy. One thing to keep in mind when looking at antler size at a broad level is there will always be an average but there will also be individuals that will run the spectrum of variation that may require decisions on a case by case basis.

#### Nutrition

Antler development is significantly impacted by nutrition prior to and during the growth process. Males of all ages require adequate nutrition to achieve their genetic potential. Research documenting the relationship between nutrition and antler development dates back to the 1950's. As a result, we have discovered that a variety of nutritional "pieces" come together to generate antlers; mostly protein, energy, and minerals.

Protein levels required for maximum

antler development will vary with age. The nutritional demands of body growth usually trump antler growth so we see a higher protein requirement in younger animals to achieve optimal growth. To provide optimal antler production across age classes, managers should provide nutritional opportunities that have a minimum of 16% protein beginning in the spring and through the fall.

Dietary energy has been found to be just as important as protein to antler growth. Studies have shown that restricting dietary energy decreased beam length and diameter along with the number of points in one-year-old bucks. Dietary energy levels are not usually targeted by managers because forages providing adequate protein typically meet energy requirements as well.

Mineral requirement for antler growth is something we know little about. However, since minerals are present in antlers, we can assume some amount is required. Previous research has focused on the roles of macroelements like calcium and phosphorus.

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Most of the demand for calcium and phosphorus during the antler growth process is supplied by mobilization from the skeletal system. This still occurs even when deer have access to concentrated mineral sources. Minerals used during the growth process are presumed to be replaced through dietary consumption. Most mineral demands are met by the environment but in some cases minerals may be limited. For example, sandy soils can be deficient in phosphorus. Homemade mineral supplements are pretty easy and inexpensive to provide, simply mix two parts dicalcium phosphate with one part mineralized salt.

### Genetics

An animal's genetic make-up controls its potential for antler development including antler size, shape, and number of points. If you want to stir up a lively firepot discussion, just bring up genetics. Of the three main factors influencing antler development, genetics is the one managers have the least control over.

Given it requires a male and a female to create a fawn, there is no reason to believe that one has a greater influence on antlers than the other. On the doe's side, her contributions including supporting fetal growth, providing adequate quantities of quality milk, and her ability to find good habitat all have lingering impacts on how genetic potential is expressed. Nutritional condition during a young buck's first winter and the following spring/summer impact how growth potential is expressed. As a buck matures, variation in the environment and health will play a role in how genetics are expressed as well. Given these variations, it is extremely difficult to evaluate genetic potential of individuals. If managers desire to include genetic manipulation into management programs, a proven method of evaluating genetic potential is required.

The level at which antler traits are passed on is often used as justification by hunters for harvesting a buck they



*Providing quality nutrition prior to and during the antler growth process can significantly impact antler development.*

feel was "inferior" for whatever reason. We often hear hunters say "I shot that buck because I didn't want him passing on those bad genes". Research on the degree that these traits are inherited has produced results on opposite ends of the spectrum. Studies conducted in Texas reported high levels of heritability at one year of age for number of points, main beam length, basal circumference, and antler mass. While a study in Mississippi showed low to moderate levels of heritability at the same age for the same antler qualities. Conclusions from the Mississippi study stated genetic selection of yearling males could not alter the genetic quality of a deer population and noted a strong maternal influence. So who is right and who is wrong? There really is nothing to support that either study was wrong in their conclusions based on the populations studied, especially when you consider the reproductive patterns of the populations. When you dig into this a little further, there are differences in fawning dates between the two research pens. The Texas fawns had an earlier fawning date that had no impact on yearling antler size. Conversely, the Mississippi fawns had later fawning dates that did

impact yearling antler size. It stands to reason this difference in fawning dates obviously impacted antler size at one year of age and contributed to the maternal influence noted in the Mississippi study. Given the heavy influence external factors play in the expression of genetic potential, additional studies are needed to fully understand heritability of antler traits.

### **Antler Abnormalities**

If you have hunted for any length of time, chances are you have encountered a buck with an abnormal set of antlers. Causes for antler abnormalities are numerous but the more common ones are injury, systemic conditions, and genetics. The velvet antler tip is the most important tissue impacting size and shape, but its softness makes it extremely susceptible to injury or irregularities resulting from damage. Antlers, if damaged during growth, can continue growing in an abnormal shape/direction. The other main source of injury occurs at the pedicle. Pedicle injuries can cause a variety of abnormalities including size, asymmetry, and arrangement. With the growing popularity of QDM programs, our deer herds



*The above series of photos are the same buck from 5 ½ (top) years of age through 7 ½ (bottom). At 6 ½, the buck experienced an injury-related abnormality. However, at 7 ½, he returned to a relatively symmetrical set of antlers.*

now have a higher percentage of older-aged bucks in the population. With an older buck structure, you tend to see more fighting, thus increasing the risk of pedicle injury. A secondary result from an older age structure and increased fighting behavior is brain abscess. Brain abscesses are typically fatal but duration of the infection can vary significantly. Abnormalities can also result from injuries to a hind leg. Usually, the abnormal antler is on the opposite side of the injured leg. Asymmetry is another common variation seen in antlers. Studies in South Carolina and Mississippi have shown asymmetry in main beam length being more prevalent in the yearling age class. Differences in main beam length tend to decrease with age. In most cases, the abnormalities I have witnessed have been the result of either age (young) or injury to the developing antler, pedicle, or hind leg. With antlers usually being the desired end product of most management plans, they become a target for monitoring progress. In some cases, antlers are used as harvest criteria. A selective harvest approach involves bucks meeting a specified antler goal being selected for harvest while protecting those that do not.

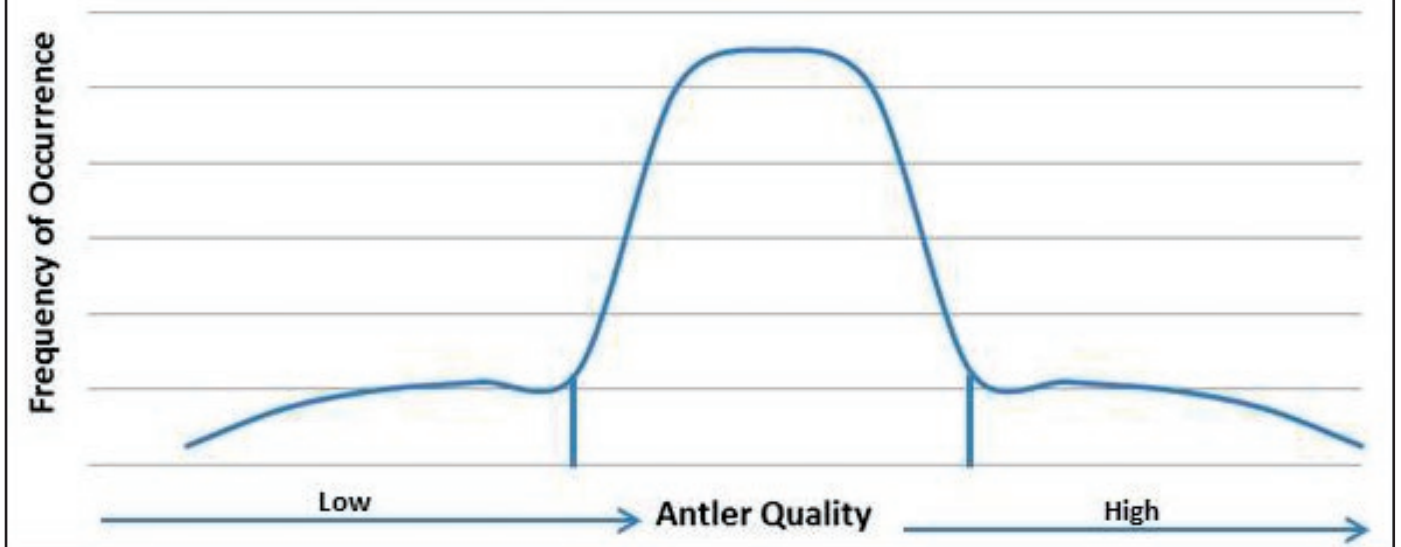
### **Selective Harvest**

As management programs progress, some level of selective harvest is utilized to achieve the management goals for a property. This strategy can be used to correct an unbalanced sex ratio or to improve buck age structure by selecting for older-aged bucks in the harvest. By employing a selective harvest approach, managers are attempting to increase the prevalence of animals that meet their management goals and decrease the prevalence of those that do not. Selective harvest techniques can be used to improve age structure, cohorts (standing crop), or genetics.

Research has shown antlers can be indicative of age class. In a Mississippi study, beam length and Boone and



## Antler Quality of a Given Cohort



The above graph depicts a normal distribution of antler quality for a given cohort. By focusing harvest pressure on the left side of the distribution (lower quality), managers may have an impact on cohort antler quality (depending on harvest intensity).

Crockett score showed greatest correlation with age while antler points was the weakest. Antler characteristics can be related to age but significant overlap in characteristics can be seen among age classes. By using antler measures to

manage age structure, managers are likely removing higher quality young bucks and protecting low-quality mature bucks. This practice is commonly referred to as “high grading”. Over time this approach can degrade antler

quality of entire cohorts.

The cohort management style can result in both positive and negative results depending on the approach. If a property has excess bucks in the population, antler quality of a cohort can be

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*Using antler points as harvest criteria tends to lead to high grading. Under an 8 point or better rule, the mature buck on the left would be protected while the high-quality young buck on the right would be eligible for harvest.*

improved by selecting lower quality bucks for removal. By removing these bucks, you “free up” more resources for the bucks with greater potential.

Aggressive management of cohorts can involve the selective removal of young bucks. However, this method is only viable if managers can predict future antler size based on current status. This difficulty has been discussed above based on previous research. Antler characteristics tend to follow a normal distribution curve (bell-shaped) where most frequent characteristics occur in the middle of the curve (average or median) and those less frequent on the tails of the distribution. Following this logic, there will be very few individuals exhibiting very large or very small values for a desired characteristic.

Extensive data collection over time provides both site and age-specific information on antler characteristics. This data can help managers develop selective harvest strategies helping mold antler characteristics of cohorts at maturity.

Altering cohort antler characteristics requires managers focusing harvest efforts on the part of the distribution that will help reach management goals. If you picture a bell-shaped curve showing ant-

ler quality for a given cohort, the area to the left of the main distribution would represent lower quality bucks. By targeting these bucks on the left side of the distribution, managers can have an impact on cohort antler quality when these bucks reach maturity. Harvest efforts anywhere else will either have a negative or negligible impact on antler quality at maturity. Harvest intensity will impact how cohort antler quality changes. Researchers from Mississippi State University set up a simulation study that showed removal of at least 50% of bucks meeting predefined antler size criteria was required to generate measurable change at four years of age.

For a selective harvest program to be successful, hunters must be able to judge age-specific antler quality and select those bucks not meeting antler quality goals. The high degree of overlap in antler characteristics makes it difficult to determine age based solely on antlers. Hunters must be able to distinguish whether they are looking at a high-quality young buck or a low-quality older buck. Without this ability, there can be no measurable cohort-level improvements.

The third selective harvest technique

aims at improving genetics. This approach involves altering the frequencies of genes in a breeding population resulting in increased potential for growing large antlers. Managers can only manipulate genetics if they can judge genetic potential of bucks and also increase the reproductive success of the “superior” animals. This approach would increase cohort antler size along with the gene frequencies responsible for larger antlers. Sounds pretty simple right? Well not so fast. As mentioned previously, there are several external factors that can impact how genetic potential is expressed thus impacting genetic selection. These factors include fawning dates and a variety of environmental impacts like rainfall and temperature. In addition, in wild free-range populations, how can we judge the genetic potential of does? The tending breeding system of whitetails further complicates matters in that breeding opportunity is spread randomly amongst males and there is no way to ensure genetically superior males sire enough offspring to have any impact on antler quality. One final limitation of this method is dispersal of yearling males. Immigration (moving in) of



yearlings will always introduce new genetics into the population, negating any change through selection. Conversely, emigration (moving out) of yearling males from the managed population furthers ineffectiveness. Given these limitations, manipulating genetics at a population level is likely not a viable option for most deer management scenarios.

More details from the studies mentioned in this article can be found in *Biology and Management of White-tailed Deer* (Hewitt 2011) under the Antlers chapter authored by Drs. Steve Demarais and Bronson K. Strickland of Mississippi State University. They have been at the forefront of the most recent research involving selective harvest and factors influencing antler development and quality. It should be evident at this point there is not a cookie cutter, one size fits all management strategy that will increase the proportion of large antlered bucks in a given population. The factors managers in free range conditions can have the most impact on are age and nutrition. Maximizing these while employing some level of selective harvest techniques should be sufficient to achieve most management goals. However, keep in mind years of site-specific data and hunter education are necessary for determining age-specific antler quality which will be the backbone of deer management goals for a property.



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# Hatcheries



By Scott Brown

Scott Brown is a biologist and regular contributor to *Wildlife Trends Journal* with over 30 years experience in research and managing natural resources throughout the southeast. Scott founded Southern Sportsman Aquatics & Land Management in 2007 and now has clients from Texas to Florida, and into the Carolinas. Scott can be reached at [scott@southernsportsmanaquatic-sandland.com](mailto:scott@southernsportsmanaquatic-sandland.com) or (336) 941-9056.

*This is a typical hatchery pond with green water, aeration and an easy to operate drain. Some hatcheries use fish feeders in their grow-out ponds to save time of not having to hand feed every day, multiple times per day.*

There are many Federal, State and private hatcheries around the country. Each has its own capability of which species and how many it can produce. Some hatcheries are no more than a holding location with ponds or concrete raceways for fish that are delivered from other hatcheries that spawn and grow the fish, then deliver to a distributor who holds them until someone purchases them where they are picked up by the land owner or delivered by truck or trailer to the lake site. Some hatcheries (mostly private) over the years have developed genetically enhanced versions of already existing fish species and some have developed crosses between two species that may or may not be better than natural, native species. I know of one state hatchery, using sophisticated equipment like heaters and chillers, which has developed a way to get certain species to spawn multiple times per year by simulating winter, then spring, thus “tricking” the fish to spawn.



Long before your fish are stocked an enormous amount of work and money is spent spawning, hatching, rearing and delivering fish. No matter the species or spawning methods, brood fish (parents) are required. Depending on the breeding objective the parents may be of the same species, may be of two different species or sub species, or from the same species, but genetically superior individuals of that species. The Morone Hybrid (Sunshine Bass and Palmetto Bass which are sometimes referred to as Wipers) comes from one white bass and one striped bass parent. The Tiger/Gorilla Bass comes from one Northern strain and one Florida strain largemouth bass parent. There is a large bream achieved from crossing the green and redear sunfish. Most recently we've seen the largemouth bass spawning of a male and female both from females known to have been a trophy. That

means both the male and female came from different females, but both mothers were over 10-12 pounds. This is being done by some states through Lunker or Trophy Programs where people, after catching an exceptional largemouth bass, can donate the trophy bass to the State Fishery Department where it is spawned and the offspring are released (stocked) back into public waters throughout the state. Recently, private hatcheries have begun offering fish from this type breeding to private lake owners. This increases the probability that you have the genetics in your fish population to grow high quality or trophy fish. But remember, you still need quality habitat and forage, as the best genetics on the planet cannot produce big fish without good water quality, habitat and abundance of food.

Fish will produce eggs and sperm naturally when environmental conditions

are conducive. Hatcheries can manipulate the process by injecting brood fish with various hormones to produce eggs and sperm. The eggs and sperm are then collected and mixed for fertilization. Another way is to have the brood fish in a controlled outside environment where they spawn naturally and the offspring may or may not need to be collected soon after hatching to prevent predation. The third way is performed inside a controlled environment by artificially simulating winter then spring by adjusting water temperatures and amount of daylight exposure over a period of time and letting the fish lay eggs on artificial spawning mats where the eggs can easily be collected, moved and hatched and reared with little mortality.

Once eggs are fertilized they are moved to incubation jars where water is constantly kept moving to suspended eggs until they hatch. A two gallon



*This long raceway is being used to artificially spawn largemouth bass. The tarp is drug over the tank every day later in the afternoon and earlier each morning while the frigid water's temperature is gradually raised over weeks to simulate spring until the bass have the right water temperature and the proper daylight to trigger the spawning instinct.*

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incubation jar can hold up to 20,000 channel catfish eggs and 100,000 Hybrid Striper eggs. Fish eggs begin cell division two hours post fertilization and a spinal cord is visible on largemouth bass after just 21 hours post fertilization. The fish larvae are removed from jars as soon as they hatch and may be kept inside concrete or fiberglass/plastic raceways, or moved to outdoor nursery ponds where they feed on microscopic zooplankton and some species eventually feed on fine fish food (fish meal), in powder form. The ponds are usually fertilized to create an algae bloom (green water) and supports the zooplankton some young fish species eat. They are aerated and have clean bottoms with no submerged vegetation and probably grass up to the water's edge. Microscopic largemouth bass fry grow to one inch fingerlings in 30-40 days. Channel catfish fry can grow to three inches in two months.

Depending on the species and the size desired for stocking, the fish may be held a month, several months or up to a year after hatching before being stocked. The larger the fish, the more costs to hold it, which results in higher prices for the eventual buyer. Obviously a fish that feeds on other fish is more expensive to rear to larger sizes. However, depending on the existing fish population and species makeup of their final destination, you may need larger fish to reduce predation by fish already present. A lake with no large predators can be stocked with 2-3 inch channel catfish, but if big bass are present, stocking nothing short of eight inches or larger is advised to reduce predation by bass. When largemouth bass reach approximately 1.5 inches, they begin to feed on small fish and insects or they can be trained to consume pellet feed. This is a fish that is expensive to keep at a hatchery to grow into larger sizes due to feeding costs and they eat each other, so the profit is literally eating up your profits.

Hatchery ponds may or may not have collection areas near the drain. If they do, draining and catching every fish present is a fairly easy task. If not, dealing with mud and not retrieving every fish may be an issue when the pond is drained. Some hatcheries move the fish from ponds to raceways where the fish can be sorted by size and then either fed more to get them to desired size or hauled and stocked. The fastest way to size fish is to use sizing grates created so only certain sizes and species will fall through. If catfish are being sorted and eight inches is desired, the appropriate grate is used to sift out the correct size individuals while the smaller ones fall back into the tank. It is much easier to size fish and load onto trucks and trailers from a drive through raceway than from the pond bank.

Fish are loaded onto trucks or trailers equipped with



eration and usually bottled oxygen. The water is also salted. As freshwater fish become stressed, they flush the needed salts out of their body through osmosis. When hauling freshwater fish, adding salt to the tanks is recommended and when hauling saltwater fish, diluting the saltwater is recommended as they do the opposite and receive a salt overload when stressed by bringing in more salt than their body can handle. Fish become stressed when placed into crowded hauling tanks. The number of fish that can be safely hauled at one time is based on species, quality of hauling equipment, air and water temperatures as well as the size of individuals being hauled. This is why better hatcheries only haul certain species during certain times of the year. Hauling a load of threadfin shad several hundred miles in mid-August is generally not done because the water heats from the

air and the destination water temperature may also be too warm. The fish may not be alive when they reach their destination or they may perish shortly after stocking due to the excessive heat of lake water. Some species are more resilient to stress or environmental changes than others. Hauling distances can also dictate when certain species can be stocked. Hauling fish 10 miles compared to 300 miles is a big difference on how long the fish will be in the tanks. Fish can also be bagged up and hauled or shipped. Usually the oxygen in fish bags can last up to 48 hours depending on air temperature, how many fish per bag and how big the individuals are. This is usually done with fry, but can also be done with fingerlings and even young adults of some species if the trip is short.

Once the hatchery truck arrives to your site (or the fish bags are deliv-

ered), the fish should be tempered prior to stocking. This is when you compare the tank water chemistry to the lake water chemistry parameters such as water temperature, Dissolved Oxygen (DO) and pH. They can check for more, but these are the bare minimum. Tempering should be performed by slowly running water into the tank allowing it to sheet flow out of the top or slowly through a valve on the bottom of the tank. With bags, first submerge them closed and let the temperatures equalize and then gradually allow water to seep in to equalize the other mentioned parameters if they are not close. Once the three mentioned parameters are close in the tank and lake, the fish can be stocked. Tempering is routinely skipped, but it reduces shock and mortality of fish during and post stocking. If the water in the tank is 68° F and the water in the lake is 82° F, there will be



*Here is a typical sized channel catfish that gets stocked into a waterbody with an established largemouth bass population. Even this size can be a meal for larger bass if the opportunity arises. Sometimes paying a little extra for larger fish pays off in the long run by reducing mortality.*



*Slowly tempering fish before being stocked to increase survival rate is highly advised.*

stress and unnecessary mortality. When stocking fish from cooler temperatures to warmer there is more stress than warmer temperatures in tank to cooler temperatures in lake. A large difference such as basic pH (8) to acidic (less than 6) can also cause stress or mortality. The DO is not as important and rarely an issue, but if the DO is extremely low in the lake (below 3.0 milligrams/liter) then postponing the stocking may be an option as opposed to possibly losing most or all the fish post stocking.

Not all species are as easy to spawn and rear as others. Most hatcheries can spawn bass, bream, trout, yellow perch and other coldwater species. Other species in the wild are only produced by a few hatcheries throughout the country and some species are not produced by any hatcheries and are caught in the wild then sold by hatcheries. When possible, we recommend purchasing your fish from locally spawned or caught stock. This is not always feasible, but should be your first choice when possible. Sometimes a species is not produced locally because of weather or climate, so the species you desire to stock may be native to your area, but no hatchery nearby produces it because of the expense to do so or the climate is not



*This redear sunfish is reaching the hopes of the landowner when it was stocked as a fingerling.*



conducive to be successful. The rarer the species and the fewer hatcheries that carry them means you will pay a higher price. Check state regulations prior to ordering fish to assure the species you desire is legal to stock in your state.

When working with hatcheries, ask questions. Are the fish spawned on site or brought in from somewhere else? Be specific on what you want, the number and size. If you order four inch bluegill and they arrive averaging two inches, point it out and renegotiate the price, or refuse delivery. Get a scoop of fish in a bucket with water and randomly measure 10-20 of them before they are stocked. If they are all or mostly considerably short, then you need to decide what to do next. Many clients want to know if they get the number they ordered. This one is tougher to check, but it can be done. Usually you take the hatchery's word. Inquiring how many individuals per pound and how many total pounds are being delivered helps. The only way to check 100% is to weigh all the fish stocked between truck and lake, and then calculate if that

number is what you ordered. If you ordered 10,000 fish and they were 500 per pound, then you should receive 20 lbs of fish. When looking for a hatchery, ask your Lake Manager or neighbors to recommend someone who they recently used and like. Unless it's a hatchery you have a long standing relationship with, meet the truck at the lake and look at the fish. When they hit the water, were they lively and immediately swam away, or did they come out lethargic and stay around the stock site in shallow water for a long time? Did you see a lot of bellies (dead ones) when they were stocked? A day or two afterwards, walk the shoreline and look for floaters (dead ones). This brief survey gives a sense of post stocking survival rates. If it is an existing population and there are predators present, do not stock small fish at the bare beach site. Try to stock near habitat (vegetation or woody structure) to reduce instant predation.

All hatcheries are different but this is some basic information on how hatcheries operate and how a landowner can

work with them. Not all private hatcheries are created equal. There are many good hatcheries we have dealt with throughout the Southeast, but there are some that are not so great. I always advise landowners that building a good relationship with both a hatchery and a Lake Manager or fish biologist helps to create the best source of information for you and assures you will be doing what is best for your waterbody as well as spending your money wisely. Hatcheries we work with require some relationship building and there needs to be someone you trust, unless you plan on measuring and weighing every fish you stock!

I want to thank my friends at the Florida Bass Conservation Center & Richloam State Fish Hatchery for giving me a tour of their facility, allowing me to take photographs and helping me get facts straight for this article. They are a state owned hatchery where tourists are welcome to see behind the scene operations at one of the most advanced and modern hatcheries in the country, while also learning about the Florida Largemouth Bass.

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S I N C E 1 9 4 0

# The American Crow

By Mark Thomas

Mark Thomas is a Certified Wildlife Biologist/Forester and President of Forestry/Wildlife Integration, LLC. He is also a Past Chairman and current Board Member of the Quality Deer Management Association. Contact him at 205-733-0477 or [caribouhunter55@yahoo.com](mailto:caribouhunter55@yahoo.com) or visit his website, [www.forestrywildlifeintegration.com](http://www.forestrywildlifeintegration.com).



I've always enjoyed watching crows. They are extremely clever birds and many a young hunter has honed their hunting skills by hunting them. The American crow is in the Corvidae (jay) family and they are found all over North America. There are two other species which are similar in appearance; the common raven, which is larger in size and the fish crow, which has a smaller bill and a different call.

Ornithologists recognize four subspecies in North America which include the Eastern crow, Western crow, Florida crow, and Southern crow. I just lump them into one, the American crow. They measure 16 to 21" in length, with a wingspan of 33 to 39". They weigh between 11 to 22 ounces and males tend to be slightly larger than the females. Most people can readily identify the crow just by their call – *caaw-caaw-caaw*. They also make a wide variety of sounds and can mimic animals and other birds. Crows are capable of making at least 250 distinct calls. Their lifespan in



the wild is usually 7 to 8 years, but some crows should live to be 17-21 years. They have lived up to 30 years in captivity. They are, of course, entirely iridescent black in color. Albinism in crows is extremely rare, but does occur occasionally.

American crows are monogamous cooperative breeding birds that form large family units of up to 15 individual birds. There is a large family unit of around 12 to 15 birds that live around my home in Shelby County, Alabama, and have for years. They are residents and do not migrate. Usually the only crows that migrate are those found in northern Canada, and they migrate south in the winter. These large flocks (or murders as the poets call them) stay together for many years and offspring from the previous nesting seasons will usually remain with the family and assist in rearing the new fledglings. Although crows do not reach breeding age for at least two years, most do not leave the group to breed for four or five years. The reason that crows appear to be of different size in a family unit is that some of them will always be the young of the year, and they are smaller in body size.

Let me explain migration in a little more detail. American crows are, at least partially, migratory. Some populations do migrate, some populations are entirely resident, and in some populations, only some of the crows migrate. In the southern states, crows are almost entirely residents, and do not migrate. They do, however, move around in large numbers within their home range, mostly on forage missions where many family units come together. In the northern range, many crows migrate southward, but many stay all year. In Saskatchewan and Alberta, for example, crows migrate to the lower plains states of Nebraska, Kansas, and Oklahoma. I saw a migration of over 50 crows flying very high recently pass over my home, heading south. They passed right over my resident population with no inter-

mixing or interaction.

The nesting season starts in the early spring, and most eggs will be incubated in early April sometimes into May. They build large, bulky nests from sticks, almost always in trees. They tend to prefer pines but will also build nests in oaks. The outer part is made from sticks while the filling is mud and grass. In the middle is a thick bowl of grapevine bark, cedar mulch or anything similar that is soft. From three to six eggs are usually laid and incubated for only 18 days. The young crows fledge in around 35 days after they hatch. Nesting success averages around 50%, with about four young raised in a successful nest. It is quite rare to actually find an active crow nest, as they are very secretive around this time. How many of you reading this article have ever seen an active crow nest? I was up in Branson, Missouri at the Proving Ground with Dr. Grant Woods last summer and we found a young crow on the ground obviously learning how to fly. We picked him up and set him on a limestone ledge in the sun and he took off after a few minutes. Crows will nest only one time per year.

Crows are omnivorous and will feed on carrion, seeds, eggs, about anything found stranded on a shoreline (fish,

crawdads), grains (corn, wheat) and insects by the billions. They also eat other bird's nestlings and can often be seen hunting through mid-story canopies robbing nests of their young. They make a short "ca" sound when they do this to keep track of each other while hunting. It has been estimated that they eat over 1,000 different food items. One individual crow was observed catching over 100 grasshoppers in a three-hour period while feeding the nestlings. They are quite accomplished hunters and will hunt, catch and eat mice, frogs and other small animals. In the fall they consume large quantities of nuts and acorns. They are one of the only birds that can modify and use tools to obtain food, another example of their intelligence. They can also recognize the face of an individual human. Someone feeding them, for example, can create a unique call to name them. They also have been observed picking up stones and dropping them on unsuspecting hawks, owls and sometimes humans.

Crows have been observed to fashion twigs and leaves into several types of hooks and serrated working tools for use as probes in prying insects out of hidden recesses. This research was conducted in New Caledonia, an island in the South Pacific. They also carry their



tools from one site to another for reuse. In studies of captive crows it was found that they would use a small stick in order to pull in a longer stick placed out of their reach which was needed to dig food out of a deep recess – they used one tool to get another tool. This research was conducted at the University of Auckland in New Zealand. Many scientists believe that crows are capable of matching the tool-using skills of the great apes.

Crows are highly susceptible to the West Nile virus which was originally a mosquito-borne African virus that causes encephalitis in humans and livestock. Other members of the Corvidae family are susceptible as well. Crows are often monitored as a bioindicator of this disease. Direct transmission of the West Nile virus from crows to humans is unlikely. They are very sensitive to the virus and can succumb easily to an infection. It has been estimated that the American crow population has dropped by as much as 45% since 1999 because of the virus, and they still number approximately 31,000,000, or roughly the same number as whitetail deer.

American crows are quite common in every state in the Union and extend from the Pacific Ocean to the Atlantic Ocean, all across Canada, and even into northern Mexico. They basically live all over the world, except Antarctica. They inhabit woodlands, prairies, farmlands, towns and even major cities, as they are quite common, widespread, and adaptable. They can gather in large communal roosts sometimes numbering in the millions. Other birds that roost like this are robins, starlings, blackbirds, swallows and herons. One of the largest crow roosts in the country is located in Fort Cobb, Oklahoma, where an estimated 2 million crows roost every night, except during the mating season. They were first described and named by Christian Ludwig Brehm and their name (*Corvus brachyrhynchos*) means “short-billed crow”. Scientists currently recognize 40 species of crows within

the *Corvus* genus.

I have always heard the old saying “to eat crow” and wondered where it came from. According to legend, “eat crow” means to admit to a humiliating mistake and supposedly comes from a story that involved the War of 1812 when a British officer made an American soldier eat part of a crow that he had shot. I’m not really sure if that is true or not but it makes for a great story! In Leviticus (11:15) we are instructed not to eat crows and ravens, as they are unclean. *“These are the birds you are to detest and not eat because they are detestable: the eagle, the vulture, the black vulture, the red kite, any kind of black kite, any kind of raven, the horned owl, the screech owl, and the gull, any kind of hawk, the little owl, the cormorant, the great owl, the white owl, the desert owl, the osprey, the stork, any kind of heron, the hoopoe and the bat.”* This admonishment is also repeated verbatim in Deuteronomy 14:14.

Back in your school days I’m sure many of you studied the slightly ghoulish ballad about two crows (*The Twa Corbies*) picking over the remains of a newly fallen knight. The author is anonymous but this poem dates from 1611 and is thought to be a variant of *The Three Ravens*. It is an ancient mid-evil Scottish ballad penned in archaic Scots. There is a musical version by The Corries and a dramatic reading can both be found on YouTube.

## The Twa Corbies

As I was walking all alane,  
I heard twa corbies makin a mane;  
The tane unto the ither say,  
“Whar sall we gang and dine the-day?”  
“In ahint yon auld fail dyke,  
I wot there lies a new slain knight;  
And nane do ken that he lies there,  
But his hawk, his hound and his lady fair.”  
“His hound is tae the hunting gane,  
His hawk tae fetch the wild-fowl hame,  
His lady’s tain anither mate,  
So we may mak oor dinner swate.”  
“Ye’ll sit on his white hause-bane,  
And I’ll pike oot his bonn blue een;  
Wi ad lock o his gowden hair  
We’ll theek oor nest when it grows bare.”  
“Mony a one for him makes mane,  
But nane sall ken whar he is gane;  
or his white banes, whan they are bare,  
The wind sall blaw for evermair.”

*twa = two, corbies = crows, fail dyke = wall of turf, wot = know, kens = knows, swate = sweet, hause-bane = neck bone, een = eyes, theek = thatch, banes = bones.*

Native Americans believed that the crow symbolized wisdom and it was the sacred bird used in their famous Ghost Dance. Braves (Sioux) would wear crow feathers in their hair and believed that when the great final flood came to Earth the crow feathers would lift the ghost dancers from the ground to the safety of the heavens. Many Indians thought that the crow was a pathfinder for hunting parties.







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# Prescribed Burning For Timber And Wildlife

By Ted DeVos

Ted DeVos is co-owner of Bach and DeVos Forestry and Wildlife Services and a Certified Wildlife Biologist and Registered Forester. Contact him at 334-269.2224.



*Growing season burns are exceptional at controlling hardwood saplings and shrubs*

**T**he use of prescribed fire has been around for centuries in North America, being first used by native people for creating access to game and good feeding range for deer, etc. Nature helped this process along in the Southeast by causing lightning set fires which burned large expanses of upland Longleaf Pine woodlands (tens or hundreds of thousands of acres per burn) each year depending upon seasonal weather. Amazingly enough, and contrary to popular belief, the deep Southeast was dominated by a near monoculture of pine except for the wetter draws and creek/river bottoms where fire seldom burned. Through thousands of years of consistent fire, plants and animals adapted to this dominant habitat type and often required it for survival. Also contrary to popular belief, this predominantly pine stand with a scattering of upland and bottomland hardwoods was the habitat type which resulted in the huge populations of game and non-game wildlife the first settlers to the



Southeast described. This woodland described by early botanists and travelers was a “cathedral-like” forest, “scatteredly planted to broom-pine (Longleaf)”, with a grassy (herbaceous) understory which was very easy but monotonous to ride through.

In today’s environment, it is becoming increasingly uncommon to see large scale burning in the woodlands, both because of excessive development nearby or lack of understanding of the benefits of prescribed fire in the Pineywoods. Burning for preparation of clearcut sites for replanting is most common but does not have the same wildlife benefits. Smoke management is the most common problem with many complaints arising due to “smoking in” roadways and developments. “Smoke on the Road” signs, pre-burn notification of affected residents and simple explanation of why you are burning may reduce complaints.

So the sensible question arises of “why go to all the trouble to burn”? The simple answer is that more acres of wildlife habitat can be positively influenced for far less money with controlled burning than with probably any other management technique. Generally, burning helps control sapling hardwoods keeping the woodlands more open, allowing sunlight to reach the dirt, thereby stimulating native plants which many species rely on for food. In addition, burning reduces the duff layer on the ground, scarifies seeds, and acts as a fertilizer catalyst promoting the sprouting of many seeds which would be dormant without fire. With that introduction, let’s look at the more common species which benefit from a controlled burning program.

### **Quail**

Of all the game species occurring in the Southeast, quail have had the hardest

time in the environment of the last three decades. For a variety of reasons primarily related to habitat destruction and degradation, quail populations have severely declined throughout the Southeast. One of the most obvious habitat degradation factors is the lack of fire in the woodlands. Ask anyone who lived in the rural Southeast before the late 60’s what the woodlands were like and you will learn a few things about quail management and burning. Fire was routinely used to control hardwoods and quail were abundant around the many small farms. Quail are also one of the only game animals which can seldom be managed without annual burning in portions of their range.

Several benefits are associated with fire that directly influence quail populations. In woodlands which are kept open (lots of sunlight on the ground), fire keeps the shrubs under control but still allows resprouting. This allows some



*Open burned pineywoods is ideal habitat for a variety of both game and non-game wildlife species*





*Turkeys are attracted to a fresh burn*



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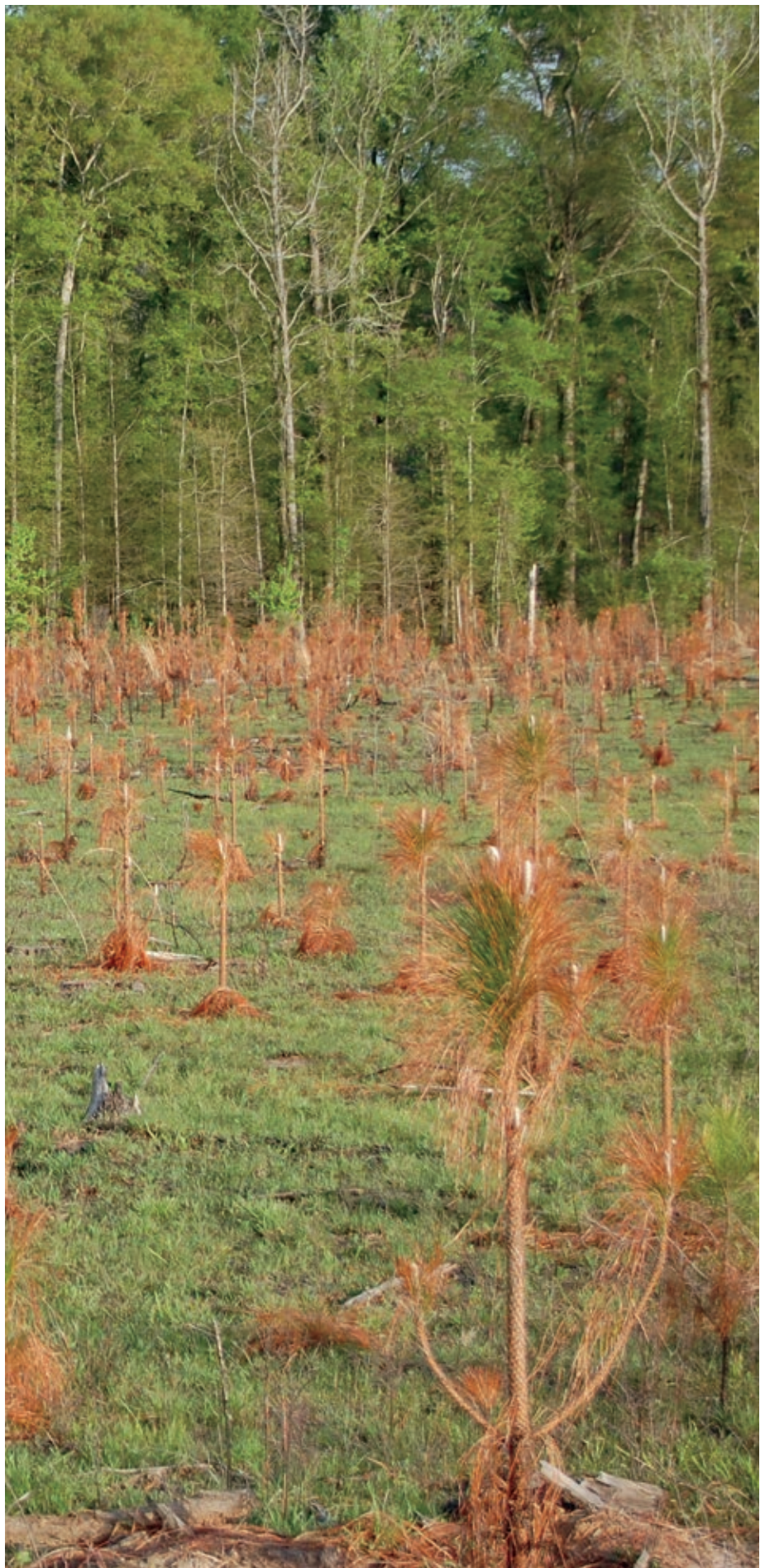
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“hard” cover to be retained close to the ground giving birds some protection from predators. Fire also removes build-up of dead vegetation (duff) on the ground exposing seeds there and allowing quail access to food and allowing easy movement through the growing vegetation. By stimulating hard seeded plants such as legumes to sprout, fire actually increases the production of seeds and food plants on which quail rely through the year. Fire promotes grasses to grow (by controlling taller hardwood saplings) in the understory and, by leaving portions of the woodlands unburnt for a year, allows you to increase coverage of quality nesting cover. Research is indicating that burned woodlands rival fallow fields for insect production and quail cannot be raised without good quality brood rearing range containing high insect densities.

### **Deer**

Utilizing fire specifically for deer management is not as often used as for quail management. But outside of the Blackbelt, some of the biggest body-sized and racked deer can be found on areas managed for quail. Deer may not need the open ground to feed and move about, but the promotion of legumes and other forbs helps increase quality food supplies for deer. Amazingly, the far majority of foods deer eat year-round are these “weeds” which are strongly promoted by fire. Deer select foods in these burned woodlands which tend to be the same legumes, etc. which are so important for quail foods and deer may also be having an impact on quail production. Regularly burned open pineywoods may not look like the best deer woods due to its low herbaceous understory, but you would be amazed at the deer densities that this habitat type can support due to increased food supplies. Broomstraw and other native grasses are also exceptional bedding habitat, as well as great fawning cover. Fawns hidden in native grasses are much harder to find than those hidden other places, and if you want to hide fawns from coyotes, broom-



*Young longleaf is tolerant of winter burning.*



straw is the place to do it. As with quail management, burning in pine stands for deer should be tied closely with timber thinning and open pine woods.

## Turkeys

Although wild turkeys can be sustained at a high density without prescribed burning and probably benefit the least from the open, burned pineywoods that quail prefer, they will benefit from regular controlled burning on a portion of their range each year. Burning sections of your property is as close to legal baiting as you can get for turkeys and a fresh burn will draw them from quite a distance. Radio-telemetry studies suggest that turkeys seek out the type of grassy habitat promoted by burning for their nesting. Most turkey nests are found in broomstraw/blackberry habitat like that in quail woods. Turkey like the open nature of a more heavily stocked (shady) mixed pine/hardwood stand that is occasionally burned to keep the shrub layer at a minimum and increase production of herbaceous weeds. Burning @ 20% of your upland pine and mixed

pine stands per year is probably optimal for wild turkeys.

## Non-game and others

Several non-game wildlife species are either dependent upon or are benefitted by prescribed burning. Red-cockated woodpecker, Gopher Tortoise, and Indigo snake are species which rely on this type of habitat management to survive and are federally protected within their range. Grasshopper and bachmans sparrows, pine and prairie warbler, parula, towhee, meadowlark, bobolink, indigo bunting, blue grosbeak, vireos, and flycatchers are examples of birds which benefit from "early successional habitats" like burned, open pinelands, but which are of special concern by both state and federal agencies due to declines which are nearly as severe as that of bobwhite quail in the last 30 years. Maintaining as much grassy/weedy woodlands and idle fields on your property will greatly assist in the maintenance of these species which are having such trouble lately.

## Timber

Managing timber in a regularly burned environment can be a little more problematical, however, utilizing Longleaf pine wherever possible greatly assists a manager to maintain his uplands with burning. Longleaf can be burned much earlier in its life (as early as the 2nd year after planting or regeneration). Loblolly and shortleaf pine can be managed and burned regularly, but burning must be done carefully to avoid damaging young regeneration where it exists or is wanted. Once pine stands have grown to 3-4 inches in diameter and have been burned once or twice, they are relatively resistant to fire damage. There is conflicting information on whether regular burning slows the growth of pine timber, but generally it can assist in creating clean, limb-free boles on poles and logs and helps tree growth by reducing competition from hardwoods in these pine stands. Burning regularly with slow cool fires probably has much less effect on timber growth than burning once every 5+ years when the fires are much hotter and flame



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height is much higher. Undoubtedly, late, hot fires which result in high rates of needle scorch will slow growth or eventually kill even mature pines.

Burning in hardwood stands should be done carefully and there is currently interesting research being done on the positives and negatives of cool fires in mature hardwood stands. Fire in mixed pine/hardwood stands may eventually result in damage of some of the thinner-barked hardwoods but will also allow more sunlight (taken up by the large canopy of the hardwoods in summer) to reach the ground during the growing season resulting in better and more wildlife foods. Burning in young upland stands should be reserved for site preparation prior to replanting and for the control and removal of those hardwood stands. In general open, fire-maintained pine woodlands are better wildlife habitat anyway.

Site preparation burning is usually done in the fall and on clean sites which are to be planted in the winter. Benefits to wildlife are there, but are minimal compared to woodland burning. Timing of the burn is also a critical component of a burning program and a subject of recent debates.

### **Winter/spring**

This is the most common and traditional time of burning. The winter season is dominated with cool temperatures, frequent moist cold fronts, consistent north-west winds, and low humidity. In other words ideal burning conditions. Burning 2-3 days following a soaking rain usually results in excellent woodland burning weather. Seeds of weeds have not sprouted, leaves have not emerged on woody stems and generally little plant mortality is expected at this time of year. The main effect is cleaning up dead plant material, incorporating ash as a fertilizer, and top killing some of the smaller hardwood sprouts and shrubs. Plant response following winter burns begins once the weather warms up and generally favors



*Even after decades of regular and careful burning, larger hardwoods develop tolerance of fire and suffer little damage from it.*



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legumes and forbs which are excellent wildlife foods. Grasses such as broomsedge are often common or dominant following cool season fires.

## Growing season

Late spring/summer fires are beginning to be more common on prescribed burning programs due to the theory that it is the natural time frame for lightning set fires. With most of the woodland weeds sprouted and shrubs and hardwood trees in full leaf, higher mortality of sapling hardwoods like sweetgum can be expected. Growing season fires are often used in pine stand and wildlife management for the high control of hardwood and shrubs it provides. Some "fire adapted" plants such as wiregrass produce heavier crops of seed following summer fires, and growing season burns can be used to prepare Longleaf sites for natural seedling establishment. Drawbacks to this season of fire are the mortality of turkey, quail, and songbird nests, and killing back some of the better quality food plants such as legumes and forbs, and favoring grasses.

As you can see, developing a quality burning program in the woodlands can be complex and the advice of a professional would be recommended. Alternatives such as utilizing chemicals for hardwood control may not achieve the desired results. Beware of advertisements claiming techniques which have all the positives











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of burning without any drawbacks. One of the most important and basic benefits of prescribed burning is the removal of rank, dead vegetative material from the forest floor allowing ground dwellers such as quail to move about and find food. Day in and day out, a burning program is a cheaper and more effective wildlife management technique than utilizing chemicals for maintaining open pine stands. There is no “magic bullet”, and all techniques (burning, chemicals, bushhogging, disking, etc.) have their positives, negatives, and a place in a management program.

			
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# Wildlife Trends Journal Management Calendar

By Dave Edwards

April/May 2015

Dave Edwards is a certified wildlife biologist and regular contributor to *Wildlife Trends Journal* and other hunting/wildlife publications. Dave was honored as QDMA's 2007 Deer Manager of the Year and nominated in 2011 as Alabama Wildlife Federation's Wildlife Conservationist of the Year. Dave is General Manager for Cabin Bluff Lodge and President of Tall Tines Wildlife & Hunting Consultants, Inc. Contact him at [Dave.Edwards@CabinBluff.com](mailto:Dave.Edwards@CabinBluff.com) or 912-464-9328.

*Food plot crops of legumes such as lab lab, peas, vetch, or soybeans can provide a tremendous amount of much needed nutrition for wildlife during summer.*



## **Plant summer food plots for wildlife**

Throughout most of the Southeast, April and May are the desired planting periods for many summer crops such as millets, sorghum, peas, corn, soybeans, etc. Because many of the seed producing grass type crops that benefit birds are summer crops, wingshooters devote a lot of energy and effort into planting during this time of year. Deer hunters are well aware of fall food plots because they are so attractive to deer during

hunting season, which helps hunters observe and harvest deer but often overlook the benefits of summer crops for deer. If you are not fortunate enough to have commercial agriculture on your property or nearby, planting summer crops will benefit your deer herd if adequate acreage is planted. Many nutrient draining biological processes such as fawning, milk production, and antler development are taking place in deer at this time. Most summer plantings for

deer are very nutritious and high in much needed protein. Commonly planted summer crops for deer include many varieties of peas, soybeans, corn, lab lab, vetch, and clovers. One of my “go-to” summer blends for deer in the Southeast is a combination of clay-iron peas, lab lab, and peredovic sunflowers. One mistake I often see made is trying to plant these crops on small food plots. Because they are so attractive, plots need to be at least an acre, preferably



more. Even at low densities, deer can apply too much grazing pressure on small plots and in many cases eat all plants shortly after germination before the crop has a chance to establish. Regardless of whether you are planting for birds or deer, a successful planting starts with testing the soil and applying required fertilizers and lime to ensure good soil quality. Create a clean, smooth seed bed and plant under favorable conditions. Favorable conditions mean adequate soil moisture and a good chance of rain after planting takes place. As you can imagine, weed control poses more problems in summer plantings because of the warmer soils and good growing conditions. Therefore, it is essential to monitor summer food plots for weed encroachment and treat as needed for optimal forage production. I also recommend placing a deer “excluder cage” on each food plot to monitor crop production and deer use. Most of you have used or seen these in the past, but an excluder is simply a piece of 4’ tall close wire fence rolled to make a 3’ diameter tube then staked to the ground. It prevents deer from browsing plants inside the cage.

### **Establish photo points**

Early summer is a great time to begin assessing habitat response from management strategies you have employed over the past year. Pictures are a great way to monitor and document the progress of these habitat enhancements. Examples of areas to monitor include areas that you have burned, harvested timber, applied herbicide, strip disked, fruit tree orchards, and food plots. Several photo points should be located throughout your property. Make sure to take notes or mark on a map where each photo point is located so that you can take the same picture over time. Many landowners take a picture from each location every 6 months. Pictures taken over time from these locations will reveal habitat changes and progress made. To ensure you take the same pic-

ture each time it is helpful to mark these locations on a map for future reference.

### **Inspect and make repairs to water control structures, spillways, and overflow pipes.**

Most recreational properties have some need for controlling water levels or water flow. Examples may include controlling water levels in fishing lakes, duck ponds, beaver pond, canals, or swamps/marshes. To do this, a wide variety of water control structures are used. Early summer is generally a good time to inspect these systems. Generally speaking, early summer is a dryer period than late summer or winter in most

of the Southeast. Some of the common things to look for include clogged pipes, deteriorated culverts, beaver dams, broken or missing flash boards, eroded banks, vegetation that is causing problems (like willows), broken valves or levers, missing or damaged stakes, broken beaver excluder fencing/cages, and damaged access docks/decks. Obviously, with so many different situations and different water control systems/structures out there each structure has its own unique things to check, repair and/or replace. The point is to do a thorough inspection and make any repairs needed during the “dry season”. It is certainly better to find and fix



*Early summer, which is often the driest period in the Southeast, is a good time to inspect and make repairs to water control structures.*

problems now rather than having to do so after your property is saturated during the wet season or when a flood event takes place and blows out weak components in your system.

### **Screen property lines where needed to prevent or reduce poaching.**

Most landowners or hunting clubs that are aggressively managing their property for high quality or high-end wildlife have many resources invested into developing, managing, and/or maintaining their property. Regardless of where your property is, efforts should be made to reduce or eliminate poaching. This includes properly posting your property, having secure gates, and fencing if needed. These activities relay the message that you are serious about trespassing. Something that many landowners or hunting clubs often overlook is using crops, shrubs, or other plants to provide natural barriers or screens to keep people from seeing into your property. Obstructing the view of your property from adjacent landown-

ers, hunting clubs, or along highways or roads may not eliminate poaching, but will reduce the temptation. Most properties only have a few key areas along their border that need to be screened. Some of my favorite “natural screens” include evergreen trees such as Leland cypress, cedars, or pines. These species grow well in many soils and climates and because they are evergreen they provide good screen during the winter months. Unless you are planting containerized trees, such as 25 gallon potted trees, most trees should be planted in the winter. An alternative, and something I often do, is to plant spring/summer crops or permanent grass strips that will grow tall enough to do the job. Many of these crops or grasses can be planted in April and May depending on your location. Corn, Egyptian wheat, sorghum Sudan, switchgrass, or some of the taller native warm season grasses not only make good screens, but add wildlife value to your property.

### **Control feral hog populations**

Feral hogs are very destructive and a nuisance on many properties throughout the Southeast. While hogs add additional hunting opportunities for landowners, they are difficult to control. I often hear “I’d like to have a few hogs on my property to hunt”. I agree and enjoy hunting hogs from time to time. However, if you’ve ever had hogs, you know this is not possible...you cannot have a “few” hogs. A property normally has no hogs or an overabundance of them. The reproductive potential of hogs is extremely high in good habitats. With pregnancies lasting only 115 days, hogs generally produce 2 litters of 1-13 piglets per year, with the potential to have 3 litters! So needless to say, extreme/aggressive control is needed to simply keep up with or stabilize a hog population. There are many ways to remove hogs. Some of the most common methods include trapping, recreational hunting, and professional hunting/trapping or a combination of all. There have been many articles in *Wildlife Trends* dedicated to successful trapping methods. Hog

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control should be applied throughout the year or when needed. However, many landowners increase efforts during the summer to reduce disturbance and “hunting pressure” during hunting season. Besides their destructive nature on wildlife habitat, hogs can destroy roads, food plots, pond dams and many other structures on your property. They can do several thousand dollars’ worth of damage in a short period of time. Controlling hogs will save you time, money, and frustration.

### **Subsoil food plots**

Soil compaction, also called hardpan, may limit or constrain forage production and plant survival in food plots. A hardpan is a densely compacted layer of soil that lies between the topsoil and the subsoil. Generally speaking, depth of hardpans vary but are often 4”-12” below the surface of the soil and are caused by the weight and pressure of tractors (and other equipment) on the



*As we all know, wild hogs can be very destructive and cause lots of issues. Summer is great period to implement control strategies such as intense trapping.*

soil and repeated disking/tillage over several years that loosen top soil allowing the finest particles of the soil (clay) to migrate downward, accumulate, and

bind creating a very dense layer. This dense layer is “the hardpan”. Imagine it as a layer of concrete below the surface of the soil. As you would expect, water



*Subsoiling to reduce compaction can significantly benefit soil characteristics and plant growth.*



and oxygen do not travel well through hardpans, thus during periods of adequate rainfall, water may lie in puddles on the surface of the compacted soil and evaporate before it can seep down into the soil. Similarly, during periods of low rainfall the topsoil of food plots that have a hardpan dries out quickly due to the shallow layer of topsoil and inability to draw moisture from subsoil resulting in stressed or dead food plot crops. Hardpans can be easily detected in food plots using a soil probe, which is a 2' to 4' metal rod - sharpened on one end to penetrate the soil, and a handle on the other end to assist in pushing the probe through the soil. You can make a probe out of rebar or purchase one from a forestry supply company ([www.forestry-suppliers.com](http://www.forestry-suppliers.com)) for about \$75. The best time to check for hardpans is when the soil is not extremely wet or dry. Insert the probe at various locations across the food plot. As the probe is inserted, the force required to move it through the soil should remain about the same until a hardpan is reached. Upon hitting a hardpan, it will take much more effort to push the probe. From my experience, hardpans in food plots are often 4"-6" below the surface, which is the depth at which most disks plow, and may be 2"-10" thick depending on soil type and age of the field. Breaking the hardpan is often referred to as "subsoiling" which breaks up the soil to depths of 6"-12" and fragments compacted soil allowing water and roots to penetrate into the subsoil. To subsoil, you will need to use a subsoiling chisel plow – simply referred to as a subsoiler. Subsoilers do not invert or turn the soil like a plow used to prepare the field to plant; they are simply heavy duty steel shanks tipped with blades that drive deep into the soil and are pulled along to break the hardpan below the surface. As you can imagine, subsoiler plows cause significant soil drag and require a tractor or dozer with at least a 50 horsepower engine. A good rule of thumb is 10-15 additional horse-

power is required per shank on the chisel plow. Most plows have 1-5 shanks that are set 9" to 12" apart. Generally speaking, subsoiling every 2-3 years will benefit soils, keep hardpans from developing, and enhance plant growth in food plots. In most cases where subsoiling has not been used in the past, results are significant and often amazing. I use it as a routine food plot management tool to ensure quality soil management and more productive plots. While you can subsoil any time of the year, I often do it in the spring/summer during slower equipment periods and/or when fall plots are fallow. If you do not own a subsoiler, many companies rent them. However, it is a valuable food plot implement I recommend owning if you manage many acres.

### **Move, clean & keep supplemental feeders full for deer.**

For those that implement a supplemental feeding program for deer, you have probably noticed a significant decrease in feed consumption during the spring green-up period. This is a great time to move (in the same general area) and deep clean all feeders in preparation for the upcoming summer. Deep cleaning for us means hauling a feeder back to the shop to clean all old feed and debris out, then pressure washing using a bleach solution. As new vegetation begins to mature or "harden up" it will be less nutritious and attractive to deer and feed consumption will increase. Although supplemental feed should be provided throughout the year (or at least when it is legal), May through September is the most critical period to ensure deer have a quality diet. Supplemental feeding is particularly beneficial to deer herds in poor quality habitats such as coastal plain areas or areas with deep sandy soils. There is simply a larger nutritional gap to fill on these less fertile habitats. Many biological processes such as antler growth, fawning, and milk production occur in deer during this period. Later in sum-

mer is also the period in which quality natural food sources are often at their lowest. I recommend providing a quality nutrient rich feed that contains protein, calcium, phosphorus, fiber, etc. Whole corn should be avoided when possible unless you are "training" deer to use new feeding stations or your goal is purely to attract deer. Lastly, remember that supplemental feeding is just what the name implies – a supplement to properly managing the natural habitat and deer herd. It is the highest hole to "patch" in your management bucket, meaning everything else should be in place before a supplemental feeding program is undertaken or implemented.

### **Make repairs to deer stands**

Don't wait until you get the "fall bug" in September to start repairing deer stands. How many times have you made significant repairs including painting of stands right before hunting season started? Me too! Although fixing or performing general maintenance to deer stands is not what most hunters are thinking about during or just after turkey season, now is a great time to tackle this task. In many cases these repairs require oiling moving parts, replacing parts, and/or painting. Whether you need to use WD40 to quiet squeaks, add new tie wraps or pipe insulation, screening material, seat cushions, weld new pieces in place, or simply repaint shooting houses or ladder stands to prevent rust, most repairs result in "stinky" results. That is, maintaining and repairing stands results in lots of foreign scents. By completing these repairs in early summer stands have several months to air out before being placed in the woods for another hunting season. Because I primarily bow hunt, I even purchase and air out tie down straps used to fasten stick ladders and lock-on bow stands this time of year so that they are "scent free" by fall. Doing this work now also reduces unnecessary scrambling to get things ready as the season approaches.



# Wildlife Trends Journal

## Pond Management Calendar

By Scott Brown

April/May 2015

Scott Brown is a biologist and regular contributor to *Wildlife Trends Journal* with over 30 years experience in research and managing natural resources throughout the southeast. Scott founded Southern Sportsman Aquatics & Land Management in 2007 and now has clients from Texas to Florida, and into the Carolinas. Scott can be reached at [scott@southernsportsmanaquatic-sandland.com](mailto:scott@southernsportsmanaquatic-sandland.com) or (336) 941-9056.

*During late winter and early spring, largemouth bass begin spawning. This male has not yet built a nest, but looks to be assessing if this is a good site.*

Spring is the busiest time of year for pond managers both professional and Do-It-Your-Selfers. Almost all aspects of the aquatic ecosystem are addressed. Whether you are adjusting water chemistry, improving habitat (feeders, planting or chemically treating vegetation), or adjusting or surveying the fish population, almost all needed attention on your pond during late winter, spring and early summer.

### **Order and Stock Fish**

Hatcheries begin spawning and rearing fish in late winter/early spring. Hatcheries that do not spawn their own fish begin receiving their fish in spring or early summer, depending on the species and sizes desired for stocking. Not all species are offered by every hatchery, that is why shopping and ordering early is important. If you have not already ordered your fish, do so ASAP to assure you get your fish this spring

or early summer as opposed to missing out and having to wait 6 – 12 months for the next batch to be spawned or delivered to your area. Approximately 99.9 % of our stockings into lakes, where there is an existing fish population that includes largemouth bass, does not include adding more largemouth bass. If a waterbody already has bass present, improving water chemistry, habitat and forage numbers need to be addressed. Adding additional predators



*Spring electrofishing surveys not only indicate numbers and health of largemouth bass, but also identify forage species and sizes available for the upcoming growing season. Once the survey data is analyzed, stocking can be performed to fill in weak areas of the food chain to assure bass of all sizes will have forage for the year to optimize growth and carrying capacity.*

in an already forage short environment is adding to the problem.

### **Begin Fertilization Program**

Resume or start a fertilization program once the water temperatures appear that they will stay above 60 degrees. A waterbody with an algae bloom is more productive, meaning it can grow larger fish and more of them than clear water. Done properly, it also helps shade out light, which helps control submerged vegetation growth. Prior

to starting, order enough pond fertilizer to make it into late summer so you do not run out and allow the water to clear while waiting for more fertilizer to arrive and allow submerged vegetation to grow. A well thought out fertilization plan and commitment must be done prior, otherwise results can be disastrous and expensive if it is stopped or neglected mid-growing season. Desired visibility depth ranges vary by publication, but we advise our clients to keep it between 18 and 30 inches. More visibil-

ity allows too much light and submerged vegetation can grow, while less could increase the potential for a fish kill. Check visibility every two weeks and follow the fertilizer manufacturer's directions regarding application rates.

### **Start-up Fish Feeders**

Resume or start a feeding program when water temperatures are continuously above 55 degrees. It is recommended to have approximately one feeder per five acres of water. Feed



*Sometimes hand planting aquatic vegetation is necessary to create quality fish habitat. At this site, multiple species were planted to give a natural layered effect to improve the shoreline habitat and the overall look of the lake.*



once per day (mid-afternoon) until water temperatures get above 60, and then switch to twice per day (mid-morning and mid afternoon). Use floating feed and match the feed size pellet to the target fish species and size. If it is a new pond with small bream or catfish, use small pellets (called Fingerling or Grow-Out size feed) if mid-size to large catfish and bream are the target, use regular sized pellets. If you have an established pond with various sized bream and catfish, mixing the two is an option to make sure all size groups are consuming supplemental feed. If feeding all sizes, all species present is the goal, mixing various sized pellets along with floating and sinking feed can be done to get the maximum benefit from your supplemental feeding program. Whenever feeding, set duration time so all feed is consumed in approximately 15 minutes to reduce waste and not create water quality issues by over feeding.

### **Treat All Undesirable Vegetation**

Any troublesome vegetation from the year before should be treated early (as soon as green-up begins) to reduce issues regarding that plant species later in the year. When using herbicides near or in water you should have a professional certified, licensed and insured applicator perform the work. Aquatic herbicide use is much more complicated than performing these tasks on uplands. Done improperly, it can result in partial or entire population fish kills, and depending on the circumstances anything downstream can also be in danger. Fish can perish from direct contact of improperly used herbicides, but more often can be affected from decomposing vegetation (treated and dying or dead plants) which can cause low Dissolved Oxygen (DO) leading to stress or a fish kill. If using a dye, it can be added any time in mid-to-late winter to assure no unwanted growth occurs.

### **Plant any Desired Soft Tissue Plants**

If additional shoreline vegetation is desired, planting them just as the growing season begins is advised to allow them to benefit from a full growing season to take root and become established before next winter. Shoreline vegetation helps reduce erosion, provides habitat for fish and wildlife, and can be aesthetically pleasing. Do not plant anything non-native and develop a well thought out plan beforehand on which species to plant where. Consider current water depth at the time of planting and how it relates to the average depths around the pond. Also consider the amount of sunlight the location will receive and soil type requirements for each species desired to increase survival success.

### **Conduct an Electrofishing Survey**

Spring is the best time to conduct a fish survey (electrofishing), especially

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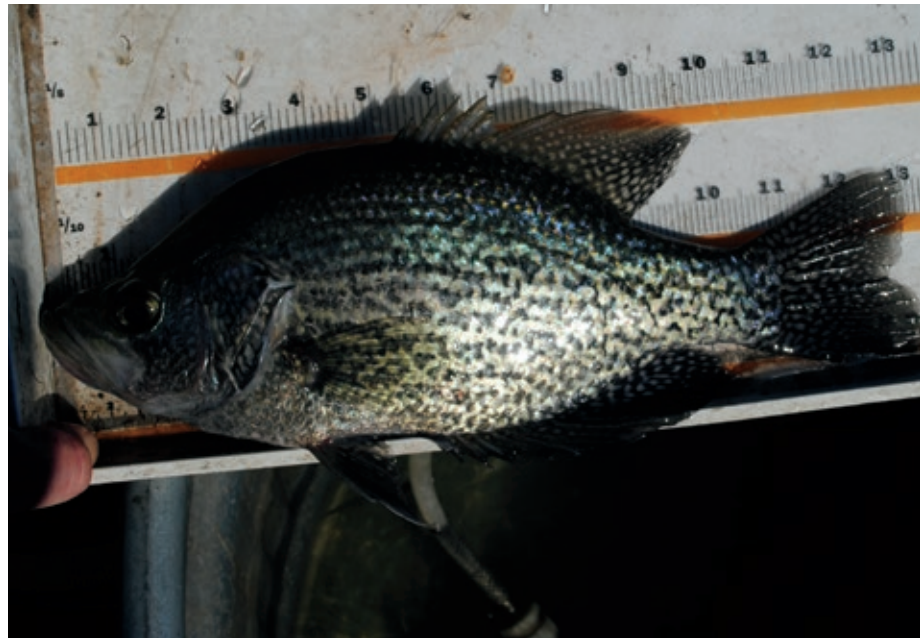




just prior, during or just after the largemouth bass spawn. These surveys provide a starting point and/or assess previous management practices which results can be used to make sound management decisions and help you reach your goals. Electrofishing allows us to obtain a snapshot of the entire fish population, not just the species and sized individuals that are caught on hook-and-line. These surveys should be done every two or three years. They are a critical management tool in the decision making process for your waterbody.

### **Remove Largemouth Bass**

Many pond management strategies include largemouth bass harvest of fish in a prescribed size range. Spring is one of the easiest times to catch large numbers of largemouth bass. If this strategy was prescribed from an earlier evaluation, get started now. If you take out all the bass prescribed early in the year there is that much more forage available



*Spring is the perfect time to get out and enjoy your lake. Fishing should be at its peak for most species in the spring whether you are a bream, catfish, bass or crappie fisherman.*

for the ones remaining. Invite family, friends and neighbors over to catch bass and let them take some home or have a fish fry. Check your state's regulations

on the number per day that each angler can harvest. Some states have no regulations on fish caught from private waterbodies, while some states are very strict.



*Not necessary to perform annually, but every two-to-three years an electrofishing survey should be conducted to document changes in the fish population and make any needed adjustments to the Management Strategy to help you achieve and maintain your goals.*



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