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Native Hard Mast Trees for Whitetail Deer

By Ryan Shurette



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When it comes to acorns, it is common knowledge that acorns in the white oak group are more sought-after by whitetail deer than those in the red oak variety. Species like white oak, post oak, and swamp chestnut oak are typically much-preferred over red oak varieties due to the higher tannin content found in the red oak varieties. Acorns are especially critical for building fat reserves for colder temperature and scarce food resources in the late winter months. (Photo R. Shurette)

Perhaps nothing stirs the memory and spirit of an outdoorsman like sitting in a deer stand on a crisp still morning in late November as the last few washed out sienna and chocolate-colored oak leaves let go their grasp and float silently to the forest floor. As the day's first orange rays of sunlight illuminate the tops of the adjacent hill, a familiar and calming feeling falls over the hunter as the world begins to awaken. Confidence is high on this morning because it just so happens to be a mast year and this particular stand was strategically selected and hung amid a good crop of mature mixed oaks and there is plenty of sign below, with hundreds of freshly nosed out cups in the leaf litter, created by hungry whitetails who

have been nuzzling for the abundant acorns. Gray squirrels, due to their acrobatic jumping or tireless nut-harvesting, periodically cause the little gems to rain down through the hardwood limbs onto and into the blanket of crumpled leaves on the ground. Blue jays move as a small mob through the canopy vying for their turn at the bounty, and in turn they loosen even more acorns from the various species of large oaks. As the hunter is soaking in this scene at a bird's eye level, along with the scents and noises of a classic autumn morning, the unmistakable sound of a deer walking deliberately but cautiously though the dry and brittle leaves directly behind the stand is almost certain to increase one's heart rate, regardless of how many times this

scenario unfolds. This painting of a typical autumn deer hunt is etched in the minds of millions of Americans, and this scene is probably something close to the one we all can imagine. Although many deer hunters might think of chasing whitetails through pine plantations, or open clearcuts, or sitting on large open greenfields or even corn feeders, it is hard to beat hunting natural hardwood forests in the fall. Whitetails and acorns just naturally go together, and it is this ancient and semi-predictable cycle of transferring energy, from the sun itself into the leaf, and ultimately into the acorn as carbohydrate and other nutrients, that is the basis of the affinity. In this article we will examine several desirable hard mast trees, especially the eastern oaks,

and discuss their characteristics, identification, and production potential with regards to whitetail deer food.

Oaks (Genus *Quercus*), and all other hardwoods for that matter, are angiosperms and therefore produce flowers. Oaks produce both male (catkins) and female flowers on a single tree. From these wind-pollinated female flowers, cupule fruits (acorns) are produced. North America is very diverse when it comes to the number of species of native oaks found here. Most of the continent's oak species occur in Mexico (over 150 native species) and about 90 varieties occur in the United States. While almost all of these oak species are utilized by various kinds of wildlife, some are more important to deer and other large ungulates than others, depending on their mast-producing potential, tannic acid content, and other characteristics. Oak trees, depending on the species, may mature from 5 to 25 years and typi-

cally they will see an increase in the number and quality of acorns produced as the tree becomes older and larger. There is usually great variability regarding acorn production in a stand of oaks from one year to the next. Individual trees can also be highly variable in their production depending on weather and environmental factors, insect and animal herbivory, and energy storage status of the parent tree. Oaks also tend to synchronize low production years as well as mast years to increase the chances of successful regeneration. In other words, by overwhelming acorn-eating animals a stand of oaks is more likely to produce recruitment in the form of germinating acorns and ultimately young oak saplings.

There has been a surfeit of research over the past fifty to one hundred years regarding the mast production of different hardwood trees. Much of this research was focused around the feeding of free-ranging livestock like pigs and cattle

during a time when corn was too valuable to be shared with domestic animals. In 1949, Albert Downs quantified the average rate of production for some common eastern oak species and emphasized the importance of acorn production for both wild game and free-ranging domestic livestock. From a seven-year study in North Carolina and northern Georgia, he found that scarlet oak was the best producer on average. In that study a single 27-inch scarlet oak produced 46,000 acorns, but he notes that other oaks of the same species in the vicinity only produced a fraction of that yield. During small crop years insects, squirrels, and birds may eat almost all the acorns in the tree, before they are available to deer and other animals that are not able to access them. Downs noted that during many sub-par mast years, deer and other ground-dwelling mammals ate 100% of the cast acorns in the first few months after dropping.

	Chestnut Oak	White Oak	Northern Red Oak	Black Oak	Scarlet Oak
DBH	Lbs./tree	Lbs./tree	Lbs./tree	Lbs./tree	Lbs./tree
10	.9	.7	.4	1.1	2.5
12	3.0	1.4	2.2	1.7	3.9
14	5.0	2.8	5.7	2.3	5.6
18	8.1	6.7	14.5	3.4	12.1
22	9.8	11.3	17.1	4.6	17.5
26	10.5	13.1	13.8	5.8	18.3
30	10.8	12.5	10.0	7.0	18.3

Table 1. Average acorn production in select oak species. Adapted from Downs 1949.

So, what are the best hard mast trees for Whitetails? The answer depends on the specific property and location, but generally speaking, the best native hard mast trees are the ones that that most consistently produce abundant nutritious mast crops that deer can access.

With this being said, and all else being equal, deer do have their favorites. When it comes to acorns, it is common knowledge that acorns in the white oak group are more sought-after by whitetail deer than those in the red oak variety. Species like white oak, post oak,

and swamp chestnut oak are typically much-preferred over red oak varieties (like water oak, scarlet oak, blackjack oak, cherry-bark oak, black oak, and northern and southern red oaks) due to the higher tannin content found in the red oak varieties. Acorns of virtually all



Swamp chestnut oaks (also sometimes called basket oaks) are characterized by their long oval shaped leaves with small numerous lobes and lateral venation on both sides of the leaf midrib. This species produces very large acorns (1.25 - 1.5 inches) that are on the same par as white oak regarding their nutrition and palatability to deer as well as other wildlife. Crude protein content is only about 4% but fat and carbohydrate content can be very high in the acorns, at 3.3% and 56.1%, respectively. (Photo public domain)

species are relatively low in protein but are very high in carbohydrate and fats. These fats and carbs are the main reason whitetails will often leave high protein food items (like alfalfa, soybeans, clover and other legumes which are often 30%+ protein). Deer need fat reserves for the winter and acorns do a good job of helping them build those. Acorns also provide critical vitamins and minerals like calcium, phosphorus, potassium, and niacin. Ok that is all good, but which acorn is the best? If you asked a hundred bowhunters what's the favorite acorn of a whitetail deer, probably 90 or more of them

would say it is hands down the **white oak** (*Quercus alba*). White oak acorns are relatively tannin-free, sweet and not bitter, and have enough mass to be worthwhile for deer to pick up. When whitetails are targeting an abundant white oak acorn crop there is little that will pull them away from them until they consume them down to the point at which it takes more effort than is gained in the way of energy. White oaks can be locally abundant across their range, which basically includes the eastern half of the country (from east Texas up into the eastern portions of Minnesota). They are tolerant of

semi-xeric conditions and are somewhat fire tolerant in the dormant season. They do better in richer soils towards the bottoms of slopes or in flat low woodlands but can grow on dry upper slopes. They are easily identified by their light-colored scaly bark and smooth lobed leaves (5-8" long). They can live to over 400 years and grow into massive trees with large full crowns. They begin producing modest acorn crops at around age 20 but it isn't until they are about five decades old that they start dumping large quantities of mast on the forest floor. Unless they are found in open fertilized situations (like lawns, field edges, or golf courses), they typically don't produce good mast crops every year. Sometimes it can be several years between crops but when there is a crop it can be impressive, and it doesn't take whitetails long to find them.

Other species in the white oak group are also highly preferred by deer for their mast. In general, this group can be distinguished from red oaks by having leaves with rounded lobes without bristles at the lobe tips (unlike the sharp pointed lobes and bristles seen in members of the red oak groups). White oak members usually yield ample mast only once in 3 to 5 years while red oaks generally produce every two years. **Swamp chestnut oak** (*Q. michauxii*) is a species that is similar to the white oak, but it prefers bottomland habitats in silty loam soils. However, it is not excluded from rocky slopes and higher elevations in some cases. The 10 hunters who didn't choose white oak as the favorite deer food will probably say swamp chestnut oak. It is true that deer love them. Swamp chestnut oaks (also sometimes called basket oaks) are characterized by their long oval

shaped leaves with small numerous lobes and lateral venation on both sides of the leaf midrib. This species produces very large acorns (1.25 - 1.5 inches) that are on the same par as white oak regarding their nutrition and palatability to deer as well as other wildlife. Crude protein content is only about 4%, but fat and carbohydrate content can be very high in the acorns, at 3.3% and 56.1%, respectively (Ross, 2013). Like white oaks, good seed crops are typical for this species only every 3 or 4 years or so. This species is generally available at tree nurseries and many land managers plant these oaks in strategic locations to attract and provide forage for deer.

Post oaks (*Q. stellata*) are more adapted to drier, poorer soils than swamp chestnut oaks and white oaks, and they are also more tolerant of periodic dormant-season fire. They have semi-scaly bark and can grow to be fairly large old trees. Their range consists of the southeast US, north throughout the state of Missouri, across through the southern portions of Illinois and over to the southern Pennsylvania border. Post oaks are easily identified by their distinctive habit and cross-shaped leathery leaves. They are very resistant to rot and decay and therefore are used for railroad ties, building timbers, and fence posts (thus the name). The acorns are not as large as white oak or swamp chestnut oak but they are of good quality and are utilized heavily by whitetail deer and other wildlife, especially in some regions of Texas where they are the most numerous hard mast species. Post oaks are typically later in their acorn production than the white oak. **Bur oak** (*Q. macrocarpa*) is another member of the white oak group that is found in the Midwest

and central regions of the United States. This species has very large, cupped acorns that are used by deer but they are of slightly lesser value in most locations. Bur oaks inhabit alkaline and calcareous clay soil types in dry habitats. These acorns are much more bitter than the swamp chestnut and white oak but their large size offsets some of the taste problems.

Chestnut oaks (*Q. montana*) also have large acorns in relation to other members of the white oak group. Deer will eat them, especially early in the season before other varieties are available, but they are not as sought-after as other preferred oaks since they are higher

in tannins and bitter. Chestnut oaks (also called mountain oaks) are fire tolerant and typically grow in poor rocky acid soils of the southern Appalachians and piedmont regions. They are more consistent acorn producers and often drop mast even when white oaks do not. Besides the large acorns, they are identified by their large wavy edged, shallow lobed leaves and tough, gray furrowed bark. **Live oaks** (*Q. virginiana*) are very common in the low sandy flat country of the coastal plain. This species is an evergreen in most cases and frequently produces large quantities of small smooth acorns, sometimes to the point of them actually piling up beneath the tree. Deer will eat



them when they need to but live oak acorns are not a preferred mast choice. Other lesser-known members of the white oak group include the **bastard white oak**, also known as the bluff oak (*Q. austrina*), **swamp white oak** (*Q. bicolor*), **Chapman oak** (*Q. chapmanii*), **Texas live oak** (*Q. fusiformis*), **sand live oak** (*Q. geminata*), **Harvard oak** (*Q. harvardii*), **Lacey oak** (*Q. laceyi*), **overcup oak** (*Q. lyrata*), **sand post oak** (*Q. margareta*), **dwarf live oak** (*Q. minima*), **Mohr oak** (*Q. mohriana*), **chinkapin oak** (*Q. muehlenbergii*), **Oglethorpe oak** (*Q. oglethorpensis*), **swamp post oak** (*Q. similis*), and **scrub oak** (*Q. vaseyana*).

As mentioned before, the red oak group is a distant second to the white oak groups when it comes to

whitetail preference. However, that does not mean they are not important, and it also doesn't mean they are not a great place to hang a tree stand in the late fall and even winter. Most red oaks are later producers and this timing difference helps to spread mast availability over the later months. Many red oak acorns are actually higher in nutrition than white oak varieties but their high tannin content not only makes them very bitter and less palatable, but tannin can also negatively affect digestion. Deer can cope with red oak acorns just fine if they have other food items to supplement with. Some of the most common red oaks are obviously the **southern** and **northern red oaks** (*Q. falcata*, and *Q. rubra*). These large trees are identified by their dark furrowed bark and leaf

shape. Southern reds have the classic bell-shaped lower leaves and sharper "turkey foot shaped" canopy leaves. Northern red oaks have sharper multi-lobed leaves that resemble a Chinese pagoda, much like the similar **cherrybark oak** (*Q. pagoda*). Northern red oaks prefer moist soils while southern reds grow on dry upland sites. **Scarlet oak** is another upland species that can be found on poor acid soils throughout the eastern half of the US. Scarlet oaks have deeply dissected leaves, especially in the canopy, and can produce copious amounts of acorns every other year. **Water, willow, and laurel oaks** are typically found in riparian areas or bottoms, often in sandy soils. They are important to deer since they are usually available to some extent even when white oak varieties might not be, although the acorns of these red oak members are indeed bitter. In addition to these common eastern species there are dozens of other species in the red oak group including **pin oak** (*Q. palustris*), **Shumard oak** (*Q. shumardii*), **black oak** (*Q. velutina*), **blackjack oak** (*Q. marilandica*), **turkey oak** (*Q. laevis*), and several others. Each oak species has its own niche and preferred habitat and therefore will be more abundant in some regions than others. That is why it is difficult to rank these species in respect to their nutritional value to whitetail deer. Again, it depends on mast availability in a particular year and other food resources that might be accessible to a population in that same year.

Feral swine, squirrels, other mammals, and many species of birds compete with deer for acorns. Acorns also have many insect pests and this factor can impact mast availability for deer and other game



Southern red oaks have bell-shaped lower leaves and sharper "turkey foot shaped" canopy leaves. They are high in tannins but whitetail deer do consume them to supplement other food items when they are available. (Photo R. Shurette)

species. Some of the most common insects that affect acorns are long-snouted and short-snouted acorn weevils, (*Curculio* spp. and *Conotrachelus* spp.). These small beetles (about 0.5 inches long) feed on acorns as adults, and they also lay eggs inside the acorn, which hatch into larvae inside the shell. The larvae feed on the meat of the acorn until they reach their last instar stage, at which time the acorn is usually already spent and useless to deer. You can identify weevil damage in an acorn by the small round hole in the side of the shell. Acorn moths and filbert-worms, (another species of moth) can also affect acorn crops, with the former laying eggs in the acorn after it germinates and sprouts on the ground, and the latter attacking acorns while they are still on the tree. Environmental factors like high winds, hail, and late frosts during flowering can also wreak havoc



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Water, willow, and laurel oaks are typically found in riparian areas or bottoms, often in sandy soils. They are often important to deer since they are usually available to some extent even when white oak varieties might not be, although the acorns of these red oak members are indeed bitter.

on acorn crops on a local or even a regional scale.

We have clearly established that acorns, especially those in the white oak group, are the most preferred hard mast for whitetails. Besides oaks, however, there are certainly other species that produce important hard mast and deer forage.

One is the **American beech** (*Fagus grandiflora*). Beech nuts are high in protein, but they are not a very reliable food source. In the Southeast a good beech mast crop is often spaced out to every 4 or 5 years, with Northeastern populations being a little more consistent. Beech nuts are also relatively small, but they are readily picked up and consumed when available. Beech trees are usually associated with bottoms or riparian habitats and are easy to identify by their muscular trunks, smooth bark, and serrate leaves with parallel venation. The light brownish yellow dormant

leaves of beech trees usually hold in the fascicles of the twig termini until new growth pushes them out in spring, which is a key feature for identification during the winter. Under the limbs of small beech trees also seem to be favorite places for bucks to make scrapes.

Honey locusts (*Gleditsia triacanthos*), in areas where they are abundant, may serve as a locally important food source for deer. These trees are identified by their compound leaves and large sharp thorns. The large seed pods (which are actually legumes) are sought-after hard mast when they fall to the ground and become available. Deer will also browse the green foliage in summer. Deer are also known to eat the nuts of **pignut** and **bitternut hickory** (*Carya spp.*), but the extent to which they prefer them is debatable. I consistently see these two species in the literature as being part of the

whitetail deer's menu, but in most cases, they are only a small part of the diet. In a 12-year Texas study conducted by the Southern Forest Experimental Station of the Forest Service and others, for example, **Carya fruit** (hickory nut) frequency was only 1 out of 3195 in fecal remnant counts. Their utilization of thicker shelled varieties like **mockernut** and **shagbark** is probably negligible. I have seen and heard feral pigs loudly crunching pignut hickory nuts, one after another, but have not personally seen deer targeting them. I am sure they do eat them from time to time depending how scarce other mast foods may be but according to most of the literature, hickories do not appear to be extremely important to whitetails in a normal year. **Black walnut** (*Juglans nigra*) would probably be about the same deal. I can't imagine a whitetail would choose risking a broken molar for such a small reward unless they were desperate for food.

In summary, native hard mast is important for carrying whitetail deer herds through the dormant season. Acorns are especially critical for building fat reserves for colder temperatures and scarce food resources in the late winter months. The acorns of white oak varieties are generally preferred over red oaks due to lower tannin content and milder taste. By knowing the species of oaks on your property you can have a better understanding of the hard mast resources and mast crop potential that will be available to your whitetail deer herd.

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Got 'Em! Now What?

The moral and ethical dilemma of feral hogs caught in traps.

By Ron Jolly



Unless you have had your head buried in the mud for the last decade you are aware of the feral hog invasion occurring across the United States. You have heard of the destruction caused by these invasive creatures and the diseases they carry. You have read and heard of the many theories and plans designed to control feral hogs. You have seen some of the innovative traps, futuristic night vision scopes and thermal optics, yet feral hog populations continue to explode and expand across the land.

As owners of a small farm in east-central Alabama, my wife Tes and I have experienced the invasion of feral hogs first-hand. We have witnessed the destruction of habitat and food sources. We have stressed our physical abilities and financial resources in an effort to protect our land from the feral hog invasion. We have learned valuable lessons

along the way and made strides towards making our farm hog free, but after a decade we are still not there.

I know it is difficult for those who have not dealt with feral hogs to understand the depth and scope required to get a handle on the feral hog problem. Many think hogs are fun to hunt and do not understand what it takes to win this war, but have no doubt, it's a war. When it's your land being destroyed, your time consumed, your finances being wrecked, you will have a different perspective on feral hogs.

Feral Hog Facts

Feral hogs are prolific breeders. A female, or sow, can become sexually mature and have her first litter on average around one year of age. Litters average six pigs and the average sow has 1.5 litters per year or three litters in two years in aver-

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age conditions. Her life span averages six years. Under better than average circumstances, such as abundant food sources, both litters per year and number of pigs per litter can be much higher. In good circumstances two litters per year are possible, the first litter before the age of one year. More pigs per litter are common and average lifespan is longer.

Over the vast majority of their range, feral pigs face very light pressure from predators. This combined with the very prolific nature of hogs has created the perfect storm and the feral hog explosion we face today.

When hog numbers approach carrying capacity of their range they simply move to better conditions. This movement is part of the expansion problem but natural expansion is a slow process. Feral hog expansion has and continues to

be greatly aided by humans transporting and releasing them in areas that are pig free.

Feral hogs are extremely intelligent creatures and once they are established in an area it is almost impossible to eradicate them. They associate humans with danger and learn to avoid them. Attempts to control them commonly educate them and make control even more difficult.

Our situation has drastically improved since the pinnacle of the invasion four years ago. It has been proven that smart traps designed and manufactured by companies such as Boar Buster™ and Jager Pro™ are the most efficient way to remove hogs from your property. Our experience is with Jager Pro™ and their *Integrated Wild Pig Control*®, (*IWPC*®) philosophy. They have proven that a trained *Hog Control Operator*™, using the right equipment, can eliminate hogs on 10,000 acres in 15-18 months. The amount of time that 10,000 acres remains pig free depends on the answer to six questions.

1. Are neighboring landowners implementing a successful *IWPC*® program?
2. Are there enough trained and certified Hog Control Operators™ in the county to effectively implement the *IWPC*® program?
3. Has the state passed legislation to stop intrastate and interstate transportation of feral pigs?
4. How well are law enforcement personnel enforcing these rules in the state?
5. Are judges and the court system prosecuting those breaking the rules with heavy fines?

6. How many criminals are illegally transporting and releasing new feral hog populations in the county?

Success Creates New Problems

When we implemented our *IWPC*® program in 2016 we partnered with two neighbors and each bought a Jager Pro™ trap, camera and gate. We worked together with one goal in mind—rid our land of feral hogs.

We learned that randomly shooting hogs reduced our chance of trapping the entire sounder so we only shot single hogs and never a group.

We learned the value of conditioning hogs to trust a feeder as a reliable food source. We learned the value of information about the number of pigs in a sounder and to identify problem hogs that did not readily enter the trap. We learned patience paid big dividends and didn't drop the gate until the entire sounder was inside the trap.

Once the traps were assembled and in place the gates began to fall within days. With each drop of the gate the numbers of pigs captured increased. At first, we butchered pigs for our own freezers. We gave pigs to friends and family. When a sounder became comfortable with



Cleaning and processing large groups of hogs is time consuming work but we feel an obligation to utilize as much of the meat as possible.



We use a Slow Glow Hog Light, soured corn and text capable trail camera to take out trap shy hogs.

the trap, we notified anyone and everyone interested in wild pig meat. Despite our best efforts there were more pigs trapped than we could utilize or give away. Since 2016 we have removed almost 600 hogs from three small farms that combined total less than 800 acres.

As managers, we are stewards of our land. We feel responsible for the welfare of the wildlife that call it home. The delicate balance between wise management, ethics and morals proved to be a huge challenge for each of us. Bluntly stated, our goal was to rid our land of non-native feral hogs and the only way to do that was to kill them. The fact that we could not utilize them all or find someone who could weigh heavily upon us.

Put yourself in our shoes. We are

all committed to making our land the best it can be for wild-life. Suddenly we are invaded by a non-native species whose very nature is destructive to our land and the native wildlife. What would you do? You have two choices. You can kill pigs or watch your land and the wildlife suffer the consequences of feral hogs.

You would think as time passed the task would become easier, that your conscience would not ache with every drop of the gate. At this time that has not happened for Tes and me. We weigh the cause and justify the effect. We have to keep our eye on the goal of ridding our land of feral hogs.

Lessons Learned—Humane Euthanasia

As I write this story our farm is pig free. Last night we received a trail

camera photo via text message of a large, solitary boar at a bait station set up just for him. Sour corn in a 12 inch deep hole in the ground was more than he could resist. He was the only hog we had seen on the farm for over a month. We scrambled, grabbed our gear and headed to the site.

The Slow Glow Hog Light illuminated the big boar just enough for us to see him through conventional deer rifle scopes steadied by bipod shooting sticks. Countdown three, two, Ba Bang. The shots were almost simultaneous and he never knew what hit him. It was a clean, humane kill and the meat was appreciated by a friend who loves wild pork sausage, but it's not always that way.

Note: Always check and comply with rules and regulations for baiting and shooting feral hogs at night in your state.

When we first started euthanizing hogs in the traps it was not pretty. Five, ten or as many as 30 hogs in a trap is pandemonium, especially in daylight and after the first shot is fired. Again, we found ourselves wrestling with the moral and emotional issue of killing hogs. For this reason, Jager Pro developed a comprehensive set of protocols for humane euthanasia of feral hogs.

“The American Veterinary Medical Association, (AVMA), has determined that a bullet to the brain is a humane way to euthanize feral swine,” says Rod Pinkston, founder of Jager Pro. “A properly placed gunshot causes immediate insensibility and a humane death. Under trapping conditions, a gunshot is the only practical way of euthanasia. Our capture protocol is all hogs must be euthanized in the trap no more than one hour after capture.

Most captures occur at night and a one-hour protocol reduces stress on animals by decreasing the amount of time they spend in the trap. A nocturnal routine reduces damage to animals and equipment because feral hogs tend to stand still when blinded by a 1200 lumen light. Feral hogs attempt much more violent escapes during daylight.”

“A properly placed 40 grain .22 caliber bullet is economical and entirely capable of euthanizing even the largest hog. It is important to recognize the exact location of a feral pig’s brain, especially when using a small caliber bullet. Proper bullet placement is absolutely necessary to achieve a humane result,” said Pinkston. “Scientifically, a gunshot destroys the brain which produces instant loss of consciousness and immediate animal collapse. However, brain electrical activity may continue for another 30 sec-

onds producing exaggerated muscle activity and limb movement. It is important to recognize these involuntary movements are normal and not an indicator of distress, pain or suffering because death is almost instantaneous.”

The Reality of it All

Once we accepted there were no alternatives to killing feral pigs, whether the meat could be utilized or not, learned the most humane way kill them and saw the population begin to shrink, the task became somewhat less troubling. Still, it has never been fun.

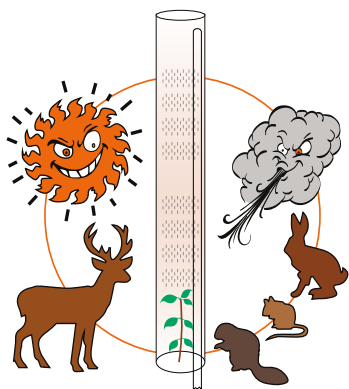
Like many things in life it boils down to what is right, what is better for your land and the native wildlife that calls it home. Sadly, more and more managers are faced with these difficult decisions as the expansion of feral hogs continues across our country

We found peace and solace in the fact that we could make a difference. We continue to search for ways to make it all easier but knowing we were ridding our land of a disease carrying, habitat wrecking, non-native plague was the tipping point. Like many things in life and wildlife management, the end justifies the means.

Is our problem solved? No. We understand there will be more pigs on our farm but we also know they will not be here long and the destruction will not be as severe. Until we can expand our efforts to more farms in our area, we will always have pigs. They are opportunistic and relentless in their pursuit of food. Well managed land is a magnet for them and they always find it. All we can do is keep doing what we do and know it’s for the greater good. Sadly, for now, there is no other way.

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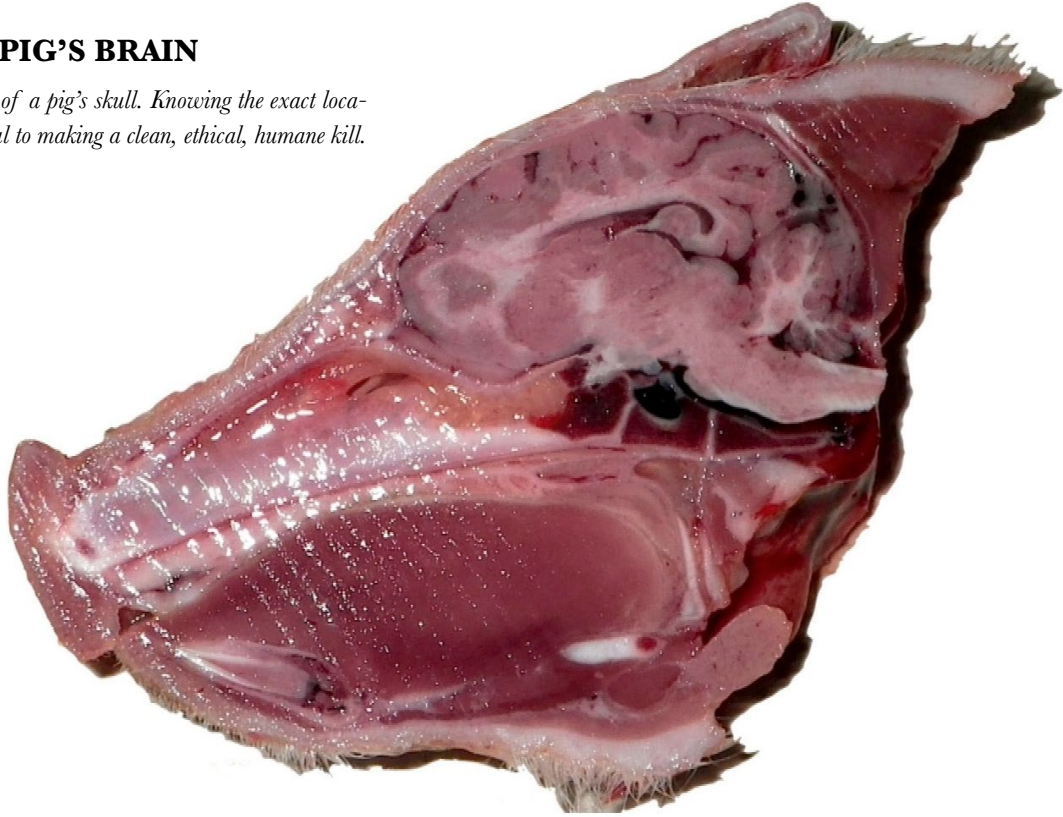
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ANATOMY OF A PIG'S BRAIN

This photo is a cross section of a pig's skull. Knowing the exact location of a pig's brain is critical to making a clean, ethical, humane kill.



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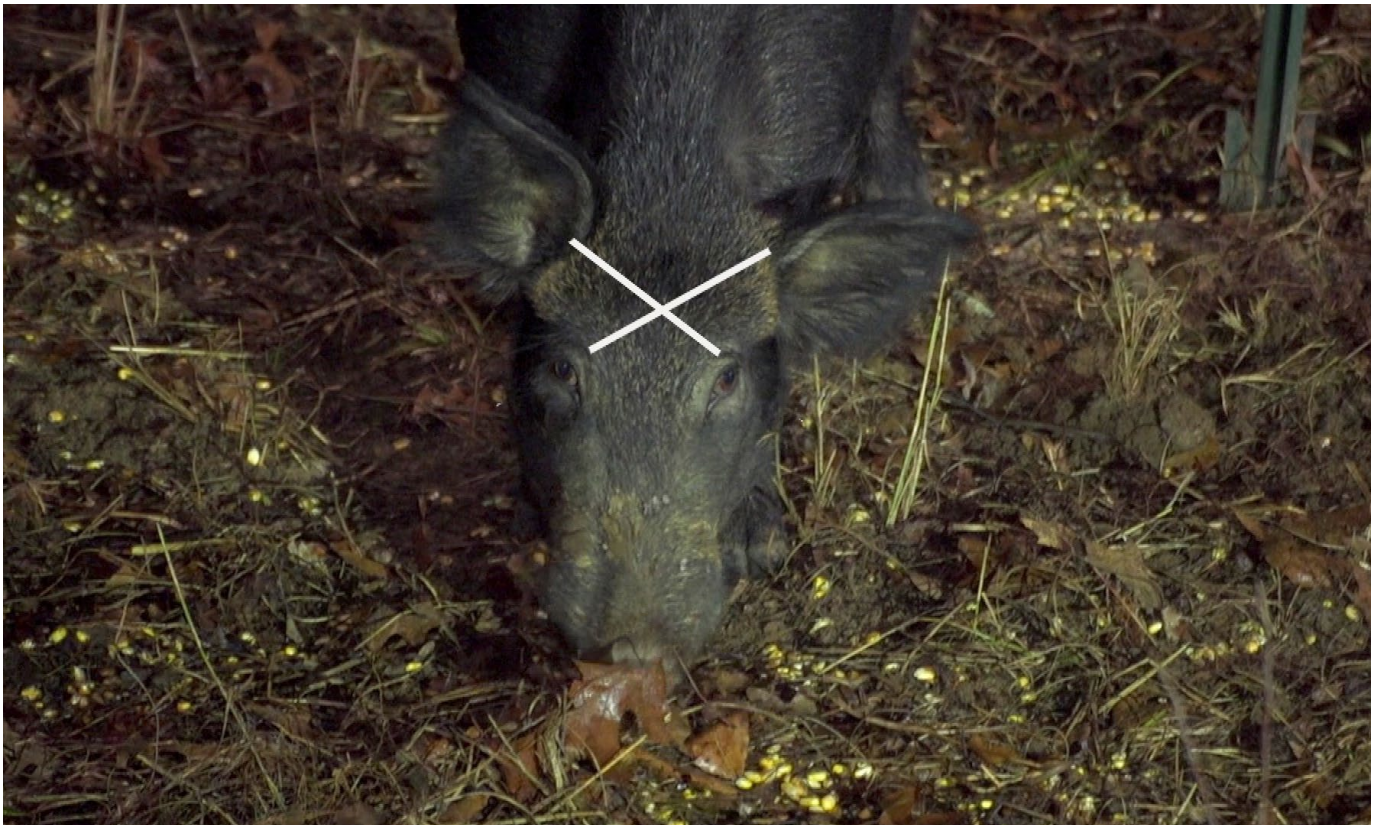
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FRONTAL SHOT

The mistake most often made during a frontal shot is aiming between the eyes, especially when the jaw or snout is angled down. The proper shot placement is two to three inches above the eye sockets in the center of the forehead. When the jaw is horizontal to the ground the perfect frontal impact site is the center of the forehead above the eye sockets. The bullet should always be directed toward the spinal column during a frontal shot.



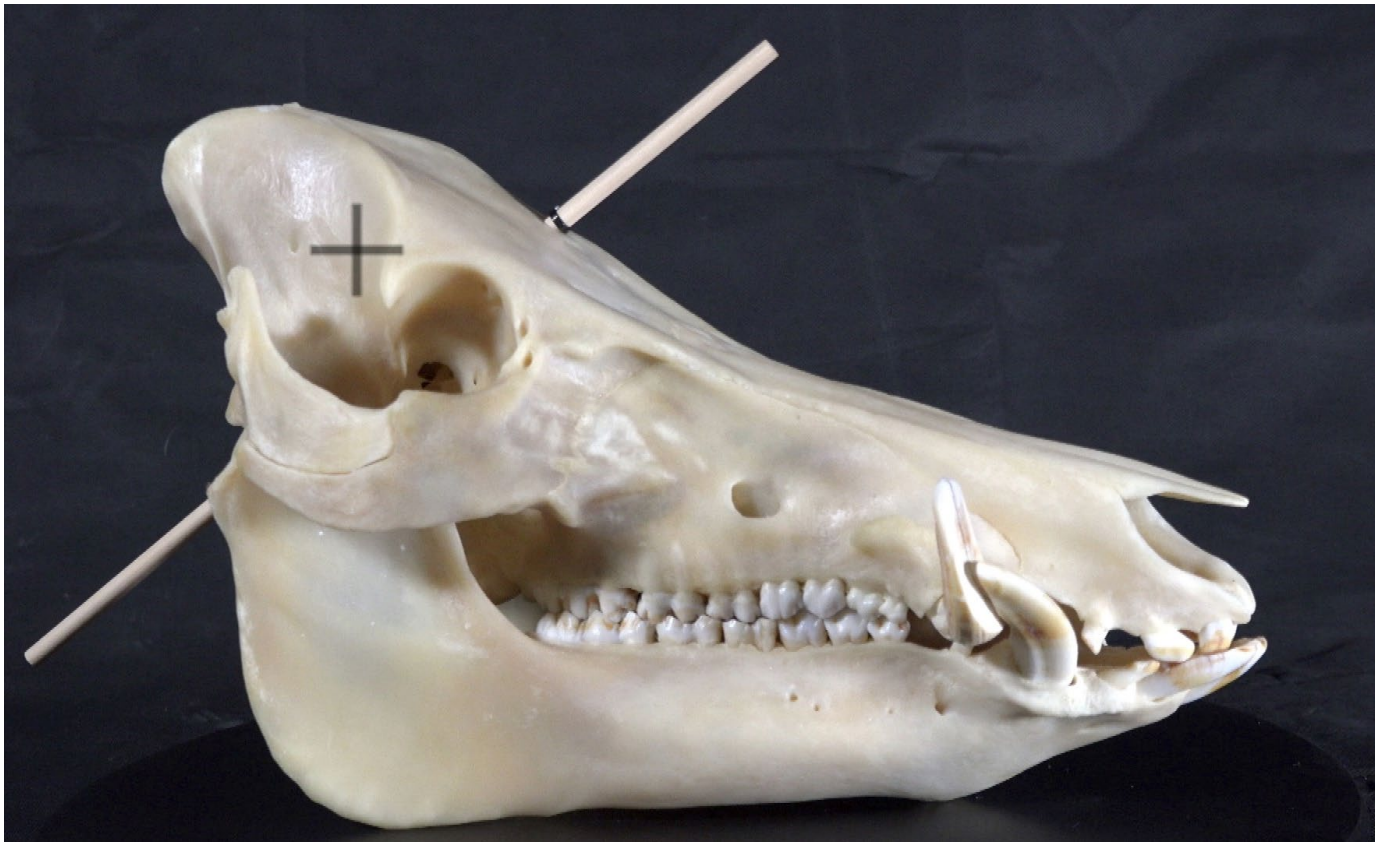
QUARTERING-TO SHOT

The perfect quartering-to impact site is slightly above the eye socket to the center of the cranial cavity. The bullet should always be directed toward the brain's center during a quartering to shot.



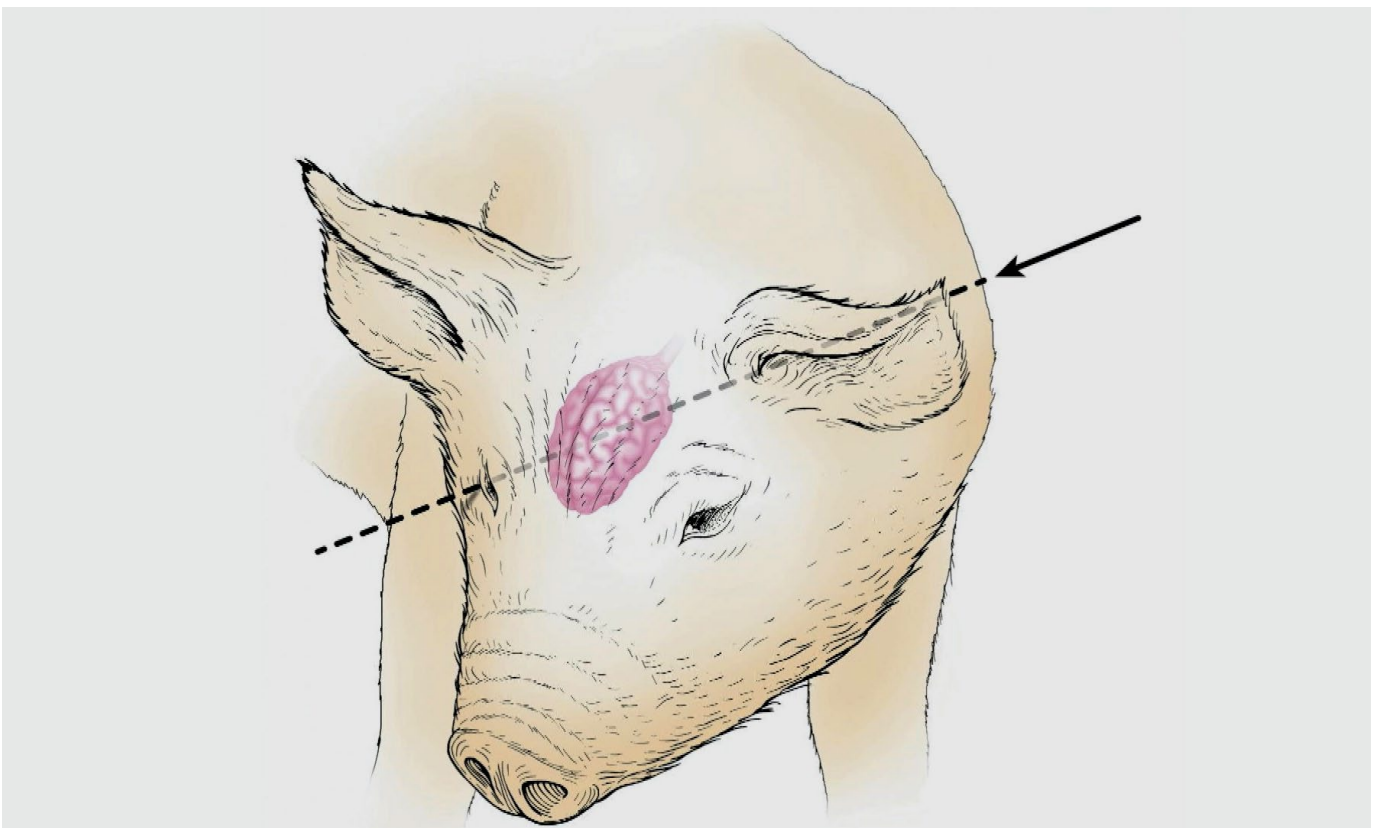
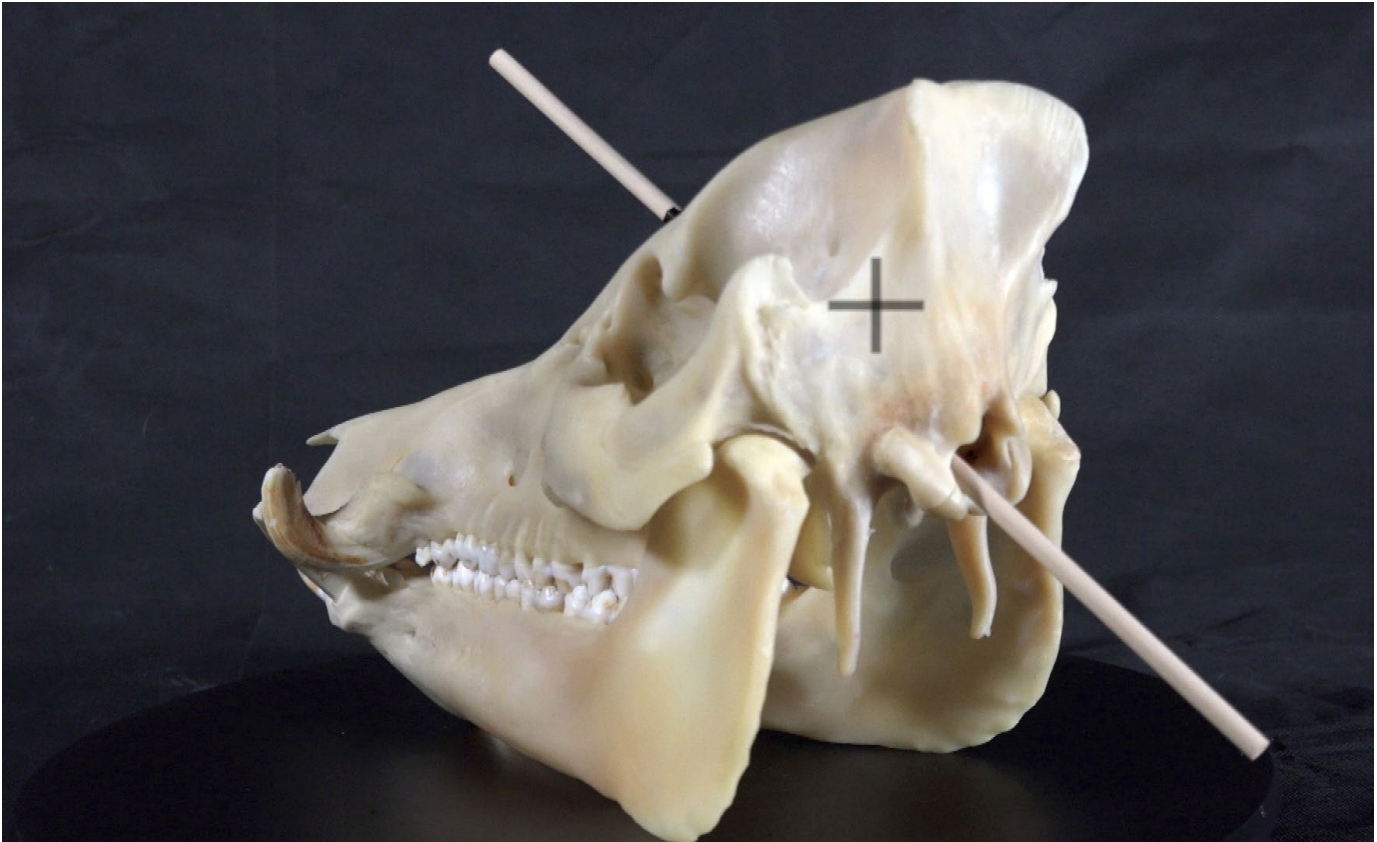
TEMPORAL SHOT

The perfect profile, or temporal impact site is slightly above the eye socket and below the ear to center the cranial cavity. The bullet should always be directed toward the brain's center during a temporal shot.



QUARTERING AWAY SHOT

The perfect quartering away impact site is behind the ear aiming towards the opposite eye to center the cranial cavity. The bullet should always be directed toward the brain's center during a quartering away shot.



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Organics in Your Waterbody

By Scott Brown



One common form of organic materials washing in your lake may be from routine agricultural activities on your property or upstream whether it be crops or livestock, you can still manage and achieve a quality fishery in your lakes.

Over the years you may have heard me or your professional lake manager discuss organics or organic material in a lake or washing in from runoff. There are numerous forms of organics that affect our environment and your lake in particular and can have both positive and negative effects on it. Organic influences are like many other things in life, they're good up to a point. The older your waterbody is,

generally the more organics you already have present, below the waterline, not counting what continues entering your pond annually. How organics affect your lake is based on what is going on around your lake, how much runoff your lake receives, how deep your lake is and how old it is. Therefore, each lake is different when it comes to dealing with organics when managing a lake. And it can all change over the years as

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activities around and upstream change.

Organic material is defined per Wikipedia “the large source of carbon-based compounds found within natural and engineered, terrestrial and aquatic environments. It is matter composed of organic compounds that have come from the remains of organisms such as plants and animals and their waste products in the environment”. Your pond receives runoff that may contain organic material from lawn or agricultural fertilizers, livestock or animal waste, dead plant material from swamps, pastures and/or forests. Knowing the organic influences and evaluating them as good or bad helps to manage and possibly help you in changing the current situation. Anything natural that is decomposing is a form of organics. This may be dead algae (planktonic or filamentous), grasses, broadleaf plants, leaves, sticks/stumps, or even muck (high organic sediment) that was created from all of the above over decades.

All green water (planktonic algae bloom) is not bad, whether manmade or naturally occurring. There are many naturally occurring algae blooms, but there are even more now than decades ago, with some very large lakes around the country now having algae blooms that are influenced and maintained from indirect land activities upstream or around the waterbody. These are usually development (housing,

commercial, golf courses, etc.) and agricultural practices.

There are still natural sources of organics from forests, swamps, wetlands, etc. As a lake manager we always look at surrounding influences and talk with new clients to identify any positive or negative runoff. Some runoff is low in organics, while some are high. Some natural runoff can be high in organics such as a swamps and marshes, or frequently dried then flooded wetlands upstream of a waterbody. An occasionally flooded upland grassy area may be a source for organics in your waterbody. The area grows typical upland grasses and broadleaf plants until flooded, the plants die, and as the water recedes dead grass, leaves and plant material wash in contributing to adding organics while simultaneously lowering the Dissolved Oxygen (DO) level.

Results of organics affect water chemistry both positively and negatively, and it may do both in the same year contributing to a perfect algae bloom in the spring and early summer, but then a weather event and hot water temperatures make the algae too dense, creates large DO swings during a 24 hour period, or too much of the algae dies off at once and the DO levels crash and start to stress or kill fish. Anything decomposing requires oxygen to do so and if an overload of decomposing material is present, the DO becomes depleted where fish cannot breathe and even decomposition slows down.

Some ponds have years of leaf litter on the bottom resulting in less oxygen in the water and decomposition slowing down, which means the fish are probably present, but in low numbers and stressed most of the time.

Organics also affect fish growth which may be positive or negative, and can dictate which species do best under your specific conditions. A green lake may be full of quality bass and bream, which indicates the amount of organics present is good for fish production and growth. Some green lakes are hypereutrophic (excessive nutrients with a dense algae bloom) that do not have a lot of fish, which indicates the water quality is poor the majority of the time, fish are probably under stress, leaving them undernourished due to not eating with poor growth and reproduction success. High organics present without green water can still negatively affect fish, including adding a few degrees of heat during summers, particularly in the South, in shallower lakes due to the heat being expelled during the decomposition process. If your lake is experiencing a high organic inflow for many years, it may have large numbers of undesirable fish species more tolerant of poor water quality such as gar, bowfin, suckers, American eels, bullheads, etc.

The first source of organics in your lake may be manmade and intentional. Many pond owners conduct a fertilization program



An abundance of undesirable species such as gar, bowfin, brown or yellow bullhead or eels can indicate a poor water chemistry makeup, possibly caused by an organic overload.

in waterbodies that are lacking organics and want the benefit of an algae bloom to increase the carrying capacity of small and trophy fish. Sometimes this is coincided with liming. A low pH will not allow planktonic algae to prosper so agricultural lime is added to release phosphorous to grow algae. You can have an extremely high nutrient level without an algae bloom if the pH is too low, but usually have a lot of other heavy plant growth with excessive organics. Clear water does not mean there is not already high organic matter on the bottom in the form of muck or undecomposed plant debris.

One common source of organic material with our clients is agricultural runoff. Feed lots, milking barns, pastures, livestock having direct access to the waterbody and crops and/or fruit/nut tree runoff. Animals defecating in a pasture, feed lots or in barns (cow milking or large horse barns), where the water makes its way into your waterbody can be detrimental to the lake due to the amount of organics entering it. Also, some fertilizer spread on fields and around trees eventually gets washed into the water from rain. It accelerates weed growth and may produce an algae bloom too dense for the aquatic system

to tolerate. These large influxes of organic material results in poor water chemistry from too high of ammonia, nitrogen and too low dissolved oxygen for fish growth to excel.

Some waterbodies tolerate runoff from crop fields, as it is usually not as high in organics as animal waste. Sometimes the field runoff amount is just enough to cause a desirable algae bloom that hopefully does not get too dense, while in other waterbodies the algae bloom from organics gets too dense most of the year. We have seen some excessively green ponds in agricultural settings loaded with

fish. If it goes years between major issues it will be filled with quality bass and bream. If it frequently experiences partial or major algae die-offs which results in fish kills, it may be full of small healthy-looking fish that never get the chance to reach quality size due to frequent low DO periods preventing them to reach ages where they are quality or trophy size.

There are several remedies to excessive organics either from past or current activities, or a combination of both. For lakes with a lot of organic build up from decades of

Not all green water is "dirty". Just the right amount of organic materials can create a beautiful algae bloom and grow some quality large-mouth bass.

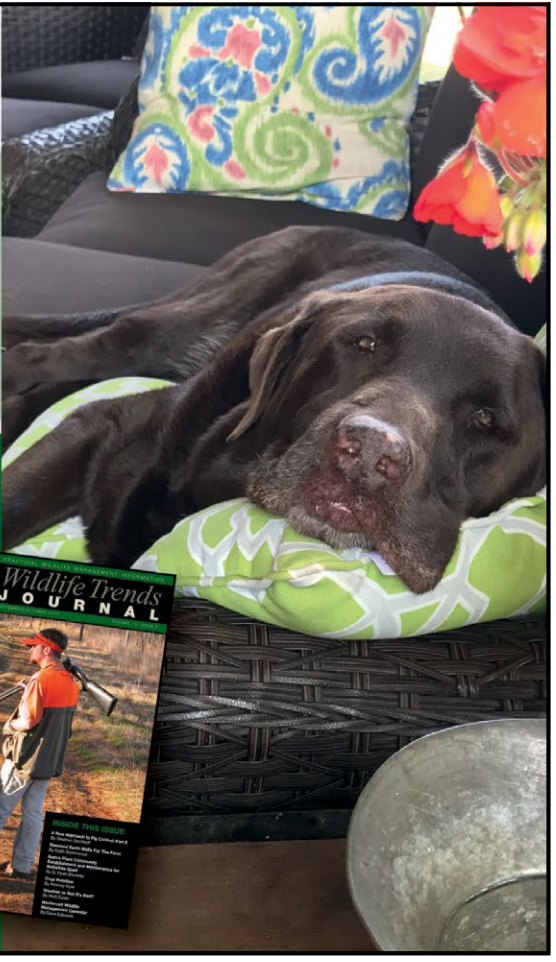


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Activities including treating vegetation in and around your waterbody can increase organics and cause water chemistry issues in some instances. If your waterbody already has a high organic composition, mechanically or by hand removal may be a solution to limit additional organics entering the system.



Draining, scraping and deepening your lake may be the best solution for decades or centuries of high organic build up. Although expensive, it turns succession back and will leave you with decades of worry-free lake management regarding poor water quality.

mismanagement or natural succession draining, drying the bottom and refilling, or draining, scraping the bottom and refilling may be the best option. A waterbody's life cycle starts with it filling with water, then gradually filling in with sediment, followed by plant

growth with decomposing material building up on the bottom via naturally or from herbicide use, until it is eventually filled in and changes over from a lake to wetlands or marsh, and eventually uplands. This process takes centuries under normal conditions, but

does become accelerated with human influences.

The most extreme fix is the drawing down, scraping, removing material, deepening the lake, refilling and starting over. This technique turns the clock back to the waterbody's beginning. Drawing down, allowing the muck to dry and refilling is another remedy that requires less labor and money since no material is being removed and can be very successful at turning back lake succession. This technique sets succession back a good ways, but not back to its beginning. Both these are major undertakings with the process, but both can be very beneficial to older waterbodies that you want to restore.

For current organic influences, excluding livestock from some waterbodies, redirecting runoff away from your waterbody or creating filter areas for water to cleanse before entering your waterbody is advised. Therefore, we always recommend a buffer of vegetation along the shoreline and up away from the water's edge to help filter sediment and organics prior to entering the lake. This is the same in a rural or housing development/golf course setting. If the lake is used for livestock watering, creating another source, using troughs and/or fencing them out of your primary fishing lake is advised.

There are products on the market now that are labeled as Phoslock (developed in the

1990's), which is made from bentonite clay that binds with the phosphorus molecules and takes them out of the water column, reducing the organic levels in the lake. This is commonly used on high nutrient lakes where algae (planktonic and filamentous) have become dense and a chronic problem.

A remedy for helping prevent fish kills due to high organics is the installation of a subsurface aeration system, which doesn't remove organic materials, but it can reduce the threat of fish kills caused by it. It does not guarantee you will not have a fish kill as sometimes the overwhelming amount of organics and lowering of the DO is greater than what the aeration system can handle.



Quality fish come from good water chemistry, good habitat, unlimited forage (food) and good genetics.

Also, the moving of the water helps lower the amount of phosphorus that can be used by algae for growth.

Excessive high organics does not mean you cannot have a

successful fishery, but you must understand that the fishery can crash any time and be able to accept that. As stated earlier it may not crash for 7-15 years and the fishery is top notch, or it may crash after two of three

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years, setting you back to year one soon after you just restarted. Some landowners know this and accept it and take the gamble, others moderately address organics in their lake, and some go to great measures to have a balanced organic influence with better than average water chemistry and a high-quality fishery. Each scenario is different and should be addressed as such. You must look at all the physical attributes of your waterbody and your budget to determine which approach is best for you. The best situation is when you can have water for all your agricultural needs and still dedicate a waterbody to growing high quality fish or even better, the agricultural practices are just enough to enhance all the lakes, grow big fish and continue that scenario for years with few hiccups.

I always laugh inside when a client or someone makes a statement about how dirty a green lake is, because it may or may not be. A crystal-clear lake may have more contaminants than a green lake, we just don't know until we investigate. Next time someone says to you that a green lake is dirty, you may want to spend a little time educating them that they could be wrong and that green lake may be full of big, beautiful bass and bream and sometimes the beautiful clear lake may have very few fish in it. A little organics is good, but like anything, too much of a good thing is bad.



This is a very young pond, only a few years old, with an algae bloom fed by surrounding agriculture and an aeration system that maximizes the carrying capacity.

Wildlife Trends Journal Management Calendar

Dave Edwards



Strip disking is an easy and effective method to create quality wildlife habitat

Strip disk areas to promote natural, desirable habitat for wildlife.

Strip disking is simply one of the easiest, cheapest, and most effective management practices to implement to create high quality food and cover for wildlife. Strip disking is as simple as it sounds. To strip disk, you merely drop the disk far enough into the soil to lightly break the surface of the ground. Lightly disking the ground will provide enough disturbance to stimulate the natural seed bank of wildlife friendly “weeds” the following spring and summer. Heavy disking like you were preparing a clean seedbed for planting a food plot is not needed. One pass is generally enough to stir

the ground up and expose bare soils that will promote germination of desirable weeds. While not necessary, I often mow areas I plan to strip disk ahead of time. This makes disking more effective if vegetation is relatively thick or tall. It also knocks back/reduces competition of the undesirable or overgrown plants I am trying to replace. Strip disking can be done in thinned pine plantations, relatively open mature pine stands, along the edges of food plots, or in open fields. Basically, anywhere sunlight can reach the ground will work. To optimize the benefit of strip disking, avoid disking straight lines. A serpentine pattern that winds through the habitat will provide the

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 President of Tall Tines Wildlife & Hunting Consultants, Inc. Contact him at TallTinesConsulting@gmail.com or 912-464-9328.

most edge and diversity. However, consider following the contour of the land to avoid creating potential erosion issues. Make the strips 8 - 25 feet wide, and separate them by undisked strips 60 to 100 feet wide. Make the strips as long as possible. These strips can be thought of as a rest-rotation system. After a year, disk another swath next to the previously disked strip. This develops a mosaic of vegetation that is one to three years old. Strip disking at different times of the year will result in different plant communities. While disking can be conducted any time of year, it is normally done in spring or fall. Fall/winter disking normally results in a broad-leaf plant response, while spring/

summer disking promotes native grasses. Altering the season in which you strip disk will add diversity to your property that will benefit various wildlife species.

Prepare dormant season prescribed burn plans and initiate burns as weather permits.

Fire is a management strategy that is relatively cheap to implement and results in better habitat for wildlife. If you have pines on your property, fire is an essential tool to improve wildlife habitat and should be on your annual task list.

However, burn plans need to be well thought out and completed well ahead of time. With the exception of longleaf pine/coastal plain areas, most understory burning in the Southeast is conducted during the winter dormant season.

Acceptable relative humidity, temperature, fuel moisture, and steady, persistent winds often occur during this period. Cool season burns are generally conducted between December and spring green up. In the Deep South, try to conduct burns before March 15 to avoid destroying turkey nests. Cool season or winter burning is not only a good way to reduce fuel loads and control undesirable hardwoods in a pine stand (which reduces the chances of a wildfire that can be detrimental), but is also a great way to stimulate new understory plant growth which will result in quality food sources for wildlife. Fire rotations (interval of time between burning the same area again) vary depending on your goals and habitat types but are generally every 2-5 years to promote quality wildlife habitat. It is also a good idea to

strategically plan your burns so that you always leave some areas unburned. How much area to burn will depend on your specific property and habitats. However, do not feel that you must burn large areas (50-100 acres or more) to make a difference and create quality wildlife habitat. Relatively small burn areas in the 5-10-acre range are easily done in a couple hours and will make a difference. Always check local burning laws and consult with an experienced burn manager before lighting a woodland fire. The U.S. Forest Service or your state forestry commission are great sources for obtaining more information regarding burning in your area. Check with the US Forest Service for information regarding prescribed burning as well as examples of a burn plan. It is also a good idea to coordinate



Prescribed dormant season burning not only reduces risks of wildfires but is an exceptional habitat management strategy that produces quality food and cover for wildlife.



If you have multiple waterfowl impoundments, early December is the time to flood the pond(s) for the last phase of the season.

your burns with a professional land manager that has experience burning.

Provide supplemental feed for deer.

Even in the South, late winter can be a nutritionally stressful period for deer. They have endured the rigors of breeding season and natural food sources can be limited. Providing supplemental feed during this time can boost energy and nutrition. This recommendation/activity is directed towards landowners or managers that have done a good job managing the natural habitat, food plots, and deer herd conditions. That is, before thinking about starting a supplemental feeding program for deer on your property, you need to take care of the “important” things first. In other words, you cannot hang shutters if you do not have a house – and you will not grow big bucks and a healthy herd with supplemental feed alone. It is a supplement to

other management strategies and activities. However, when done in combination with other core management practices, supplemental feeding can be valuable for deer. Be sure to check your local game laws before providing feed on your property. Many states do not allow the use of feed during hunting season. Ideally, providing supplemental feed throughout the year is best, but supplemental feed will be most used and most valuable for deer in late winter and summer. These are periods when natural food availability is at its lowest. So, if you have a limited budget and cannot or do not want to feed throughout the year, provide it during the periods deer need it most.

Identify roads on your property that need attention.

Winter is often very wet in the mid-south which makes this a great time to identify and assess problem areas along roads where work will

be needed next summer. Make notes or identify areas on maps that you can refer back to when you start to repair roads next spring or summer. You will be glad you did. Once your property dries out, it can be difficult to remember and/or find the areas that were bad during the hunting season. Although many landowners/hunters access properties during hunting season on 4-wheelers, electric carts, or other gas-powered ATV’s that will certainly get through wet and slippery roads, roads are an important part of managing a property. If you are actively managing your property, you will need to be able to drive or transport large equipment such as spreader trucks, tractors, and agriculture buggies throughout the property. Thus, having good roads is essential.

Scout now for next duck season

Doing a little homework this season, even if it means missing a hunt



Help deer recover from the rigors of the rut and enter spring in better condition by providing them with nutrient rich feed in late winter.

or two, will help you have better duck hunts next year. By this I mean take time to watch and glass wetlands, moist soil impoundments, beaver ponds, lakes, and flooded fields to find new areas to hunt. While food sources and water can change from year to year, in most cases ducks will be attracted to the same areas each year. Simply stage yourself somewhere that you can see the area you are scouting without spooking ducks. In most cases, a high vantage point that offers a landscape view is best as it often allows you to see where ducks are coming from as they approach and which direction they go when they leave. Good vantage points are often hills, highways, bridges, barns, and sometimes deer stands. The point is to get as high as you can so that you can see the sky

where ducks are flying. I can't tell you how many times I have set up and scouted like this and found an even better spot by being able to see flocks from a landscape level verses getting into the actual area (tight) where I thought ducks would be. In some cases, you may not see ducks go down but notice that lots of flocks headed in a certain direction. Relocating closer to the area you saw ducks headed on the next scouting mission will often reveal a new honey hole. As you begin to pinpoint areas ducks are using, close in tighter and start learning exactly where ducks want to be and how they approach when coming in. If it is still duck season, this is when I like to hunt the spot a couple times. Doing so will help you identify exactly where to build a blind this summer. So, by next sea-

son, you will be sipping coffee after putting out your spread of decoys while waiting on daylight and ducks to start flying.

Prepare for last phase of duck season

If you have multiple duck ponds and hunt waterfowl throughout the season, strategic/staggered flooding schedules help maximize hunting opportunities by extending the food supply in ponds. That is, by not flooding some ponds or areas early in the season you essentially "save" these ponds and their associated food for later in the season. Thus, if you have "saved" ponds on your property for the late phase of duck season, mid-late December is the time to initiate flooding of these areas. Maintaining water depths of 12"-18" is ideal for puddle ducks

such as wood ducks, mallards, gadwall, teal, etc.

If you enjoy duck hunting but only have one or two small “duck holes” on your property, enhancing these areas (water management, plantings, etc.) and managing the hunting pressure will ensure you have exciting hunts each time you go. Like most wildlife, ducks react to hunting pressure. As hunting pressure increases, the number of ducks using the area decreases.

Managing the pressure simply means that you do not hunt the pond too often and allow the area time to rest between hunts. A good rule of thumb is to not hunt a small pond (or any small area where ducks use) more than once per week. It is also a good idea to not hunt the area in the morning and afternoon of the same day. If food sources remain and you allow the pond to rest longer than a week, you will be pleasantly surprised at the number of ducks that will be using the pond, especially if there is hunting pressure on surrounding areas.

Implement “hinge cutting” to create quality habitat while improving timber stands

Timber Stand Improvement (TSI) is the general practice of removing lesser quality or undesirable trees within a forest to reduce their competition with desirable trees. An example may be a situation where a quality oak tree is surrounded by lots of young or mid-aged red maple trees. As you can imagine, the ground below is layered with fallen leaves and because sunlight is not reaching the ground little vegetation exists – which is poor wildlife habitat. Removing the red maples would increase sunlight, water, and



Late winter is a good time to overhaul sprayers to ensure they are ready for spring work.

nutrients for the oak allowing it to grow more vigorously (this is known as “releasing” the oak) and due to increased sunlight plants would begin to grow on the forest floor. Hinge cutting is simply a variation of the normal TSI technique. Rather than completely cutting down undesirable trees, trees are cut only halfway through. They fall, or “hinge” over, and create instant cover but do not die, so they continue to produce leaves and vertical shoots. If they are desirable browse species, a new food source is created. Hinge cutting is a good way to provide food for browsing animals such as deer, provide thicket cover for quail and rabbits, nesting cover for turkeys, and release the best quality saplings/trees for optimal growth, all at the same time. Hinge cutting is an excellent way to create both food and cover within large areas of park-like oaks without cover, near wildlife food plots, or along transitions between different habitats such as along

edges of fields. If planned well, hinge cut areas can be strategically located to create thickets (bedding and loafing cover for deer) in a way that will influence deer movement and enhance hunting success.

Methods used to hinge cut vary depending on how large the undesirable trees are. Hinge cut trees at waist height. For small-diameter stems, the simplest way is to hold the sapling in one hand, bend, and whack the bend with a machete. Two or three shallow cuts side by side will allow a better bend than one deep cut. A hand saw or a chainsaw is easier for larger stems. After the cuts, force the sapling down until it is parallel to the ground.

Perform preventative maintenance and calibrate sprayers in preparation for burning and early summer uses

Although you probably won't use them for a couple months, late win-

ter is a good time to overhaul sprayers. By overhaul I mean check all hoses, tubes, connections, filters, nozzles, etc. This is also a good time to calibrate sprayers so that everything is ready when early summer weeds become a problem in food plots. We commonly use the pistol nozzle of our sprayers to assist in prescribed burns. Be sure to check all parts and test the pistol nozzle, hoses, etc. if you plan to use it this winter during burning activities. Working on sprayers is a great mid-day activity while hanging out

at the camp during a weekend of hunting.

Tree planting activities - start planning, ordering supplies, and planting.

Strategically adding beneficial trees to your property adds habitat diversity, wildlife value, aesthetics, and can be a very gratifying project – especially once the trees mature and you see the value they provide. However, planting trees is more than just randomly plopping trees in the ground. For the best results

plantings should be well thought out with the future in mind. Besides the obvious “where” to plant trees, you need to consider which species are suitable and do well in your soils/climate, how large they get, and future maintenance needs. Once trees are planted, they will require a bit of care to ensure good survival and growth during their first couple growing seasons. Site preparation is important to reduce competing weeds to enhance tree seedling survival during the first growing season. Depending on the situation, an initial mowing may be needed to provide a clean working area and reduce weed competition. There are many species and varieties of soft (e.g., fruit trees) and hard mast (e.g., oaks) trees available that will benefit wildlife on your property. I generally like to plant a diversity of trees that will provide various food sources throughout the year. Supplemental tree plantings not only provide additional food resources for wildlife on your property but can provide exceptional enhancements to the aesthetics. Common areas to add supplemental tree plantings include road intersections, roadside management areas, old field habitats, and in or along the edge of fields or food plots. The key is to plant them in areas that will receive sunlight. Some trees require cross-pollination to produce fruit so, if needed, be sure to plant them in small groups. I recommend contacting your tree supplier/nursery, such as the folks at The Wildlife Group, well ahead of planting time. They can help you determine which trees will grow and produce best on your property, help you develop a planting plan based on your goals, and ensure the trees and other supplies are ready when you are.



Strategically adding beneficial trees to your property adds habitat diversity, wildlife value, and aesthetics.



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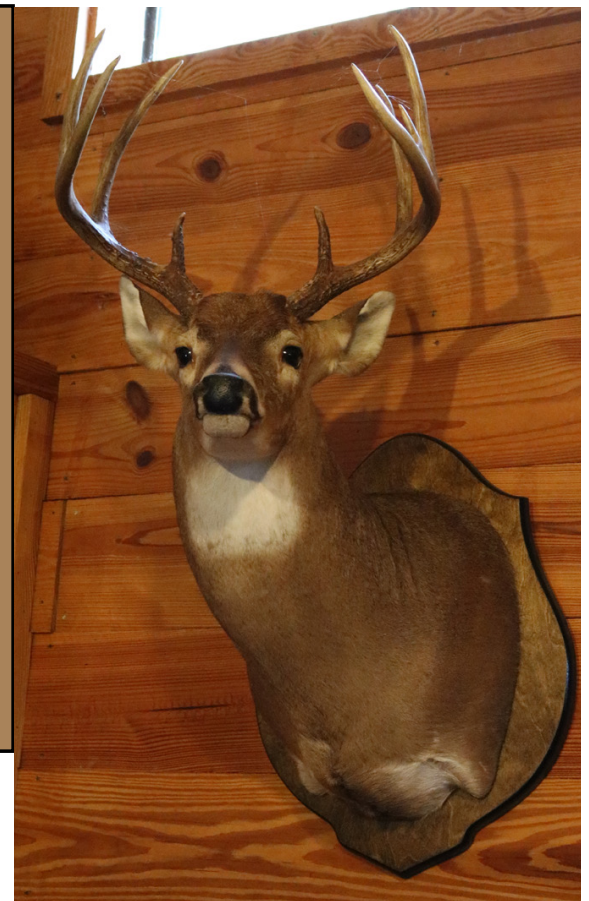


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