



# Wildlife Trends

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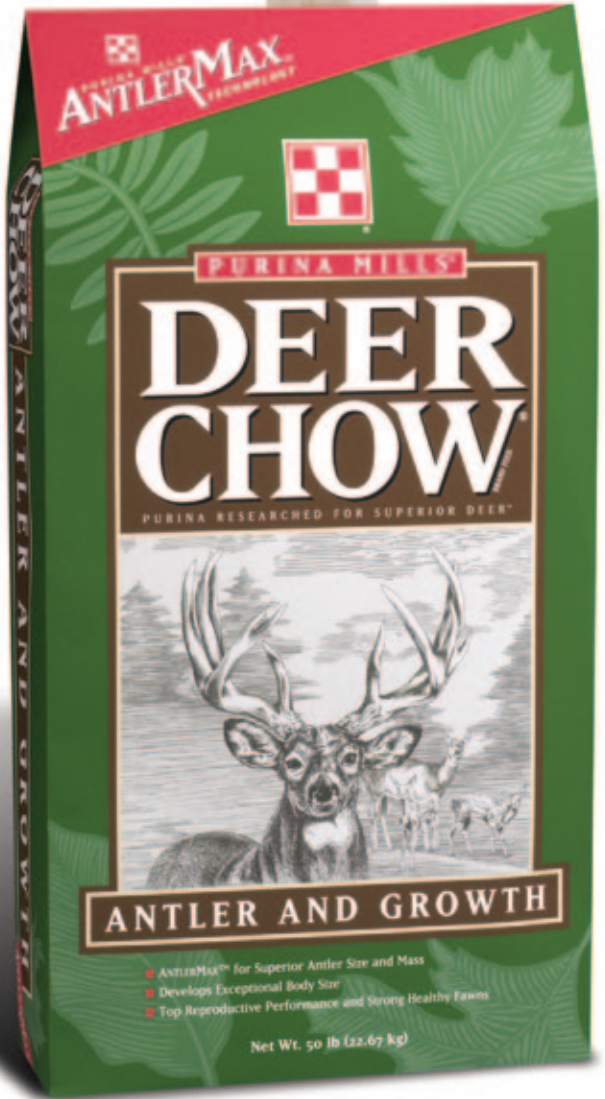
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## Earl Says...

The world of quail hunting and wildlife management lost a giant in the industry recently when Kim Price, Publisher and Owner of *Covey Rise* magazine, passed away at his home after a short illness. Kim is fondly remembered by quail and wildlife enthusiasts all over the country.

I first met Kim and his brother, Tim, about a year after we started publishing *Wildlife Trends*. These two were the most avid quail hunters I had ever met. I mean they lived and breathed it. Since Kim had a journalism background as an Associated Press reporter and owned several newspapers in Alabama, they decided to start their own magazine to help promote quail hunting and update hunters and landowners on the latest research and news in the quail industry. Kim and Tim traveled across the country as well as a couple of foreign countries hunting quail and visiting plantations and ranches.

I had the pleasure of traveling a couple of times with these two to the annual Tall Timbers Field Day and to say we always had fun would be a gross understatement. Everybody knew him and he always took time to listen to their hunting stories and exploits. Like I said, he truly loved anything to do with quail hunting. I also had the chance to see just how good he was at it when the three of us hunted together not long ago when we were invited to tour the property of Judge George Peagler in Americus, GA. I went along mostly as the photographer and he worked with me on which action shots to take as well as how to show the real beauty of a property.

Kim will be missed by his family, friends and lots of folks in the quail industry. Rest In Peace, Kim. I am a better man for having known you.

Andy Whitaker  
Publisher/Editor



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Cover photo by Andy Whitaker

# Reproductive Habitat

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.



*Want to protect your fawns from coyotes? Encourage large blocks of native grass like broomstraw, Indian grass, etc. in openings, fields, and blackbelt prairie!*

**R**eproductive habitat, what is it, why do we need it, how do we create it, and how do we maintain it? Reproductive habitat is usually not managed for but is an important component in all wildlife management. All wildlife species have some special needs for either nesting or food/cover for their young. Each species needs places to place their young or eggs (nests, dens, etc) and these offspring have special dietary needs and, therefore, the habitat required to support this diet. For instance, brood habitat for birds is one of the least managed for and least understood habitat types. Game birds from quail and turkeys to songbirds like shrikes and indigo buntings all need good brood habitat. Without it we either have poor or no populations of these species. We can have all the nesting habitat in the world for these birds and hatch many successful nests, but if we do not raise successful broods of chicks to adulthood, we will not have good populations of quail, turkeys or insect-eating songbirds.

To better understand brood feeding and requirements, we need to cover a little basic biology. Some birds, like quail and turkeys, have **precocial** chicks meaning that they hatch from the egg with open eyes, are fully feathered with down, and follow their parent(s) away from the nest immediately after hatching. They have the ability to either find food on their own or they are shown food by the parent, but are not fed. Many songbirds, however, have **altricial** young which are born nearly naked, eyes closed, stay in the nest after hatching and are fed by the parent(s). Depending on the type of nests these birds use, various habitats are needed. Quail, turkeys, sparrows, among others are classified as “ground-nesting” birds. They heavily utilize broomstraw-based habitat types to build and conceal their nests and many have precocial young. Other birds build nests in shrub or tree branches or utilize hollows in trees for nesting. Most of these “above-ground” nest builders have altricial young that must stay in the nest until they can fly. Doves are a good example of these and the availability of good nest sites can limit their reproduction, although they will nest on the ground. Den and hollow nesters have examples of both with birds like owls raising the young in the den until they can fly and species like wood ducks having chicks that leave the nest immediately to follow the parent to find food.

Most birds need a high protein diet for the first 2-4 weeks after hatching and insects are commonly the high protein of choice. Quail and turkeys need to be led immediately after hatch to habitats that are rich with small insects within a few inches of the ground. Adult birds such as flycatchers, indigo buntings, loggerhead shrikes, grassland sparrows, kestrels, blue birds, various warblers, yellow-breasted chats, as well as a variety of others, all need to have close access to insect rich environments to feed their young while in the nest and their young need these habitats

once they fledge (leave the nest and begin to fly) and start to forage on their own. Insects are also an important part of adult turkey and quail diets in the spring and summer.

In mammals, some similarities exist. Deer, for instance, need good places to hide their fawns where predators cannot find them for the first couple weeks until the fawns begin following the dam. In these first weeks, the fawn is dependent on milk from the doe and, typically, does not move unless she is there. Grassy cover is an excellent place to hide fawns where their spotted patterns mimic sun-dappled environments and their lack of scent keeps them from being detected unless they are seen. Once they begin to follow the doe, they begin to feed on browse and mast in addition to milk. Other mammals, not usually managed for (raccoons, squirrels, coyotes, etc.), also need places to have their young like ground dens, tree dens, etc. and, in some cases, lack of dens can be limiting to their ability to reproduce. Mammals all leave their young in the “nest” in the first weeks and most are born blind and helpless, tended by the mother until they become more self-sufficient.

## **NESTING COVER**

Creating nesting cover for cavity-nesters from raccoons and squirrels to blue birds, kingbirds, owls and wood ducks is easily understood. They need dead trees as well as older, live hardwoods that develop hollows in places where branches have broken off. In lieu of these, boxes can be installed in good places for these critters to nest. Wood duck, blue bird, screech owl, and squirrel boxes are all available (both commercially made and plans) and should be considered where natural hollows are limited.

For those species that need shrub and tree branches to nest, managing for a wide diversity of ground vegetation, shrub and mid-story sapling layer in addition to taller trees is simple and recommended. This habitat type is rarely limiting on most properties in the southeast.

Nesting cover for “ground-nesting” birds and mammals like white-tailed deer that heavily utilize grassy cover to hide their young, however, is often limiting in many properties. While deer and turkeys can reproduce without much of this habitat, their reproductive output can be enhanced by developing high quantities and quality of broomstraw habitat. Quail and other birds like



*Fall disked fields with abundant ragweed can be one of the most productive insect production and brood rearing habitat types available for young chicks.*



*Recently burned pineywoods is one of the most productive brood habitat types for insect production for quail and turkey chicks.*

Bachman's sparrows, meadowlark, etc., on the other hand, are highly dependent on this habitat and become virtually non-existent without it. This habitat type is sunlight dependant and does not grow well in shady environments. Heavy thinnings in pine woodlands, combined with regular burning is the most common prescription for creating this environment.

Patch size of this habitat type is also highly important. Small and/or narrow patches of broomstraw habitat might be good nesting or fawning cover but may encourage a high proportion of the nest or fawns to be hidden in areas that are easily searched by predators. If these habitat patches are long and narrow (less than 50 yds wide), raccoons searching for bird nests or coyotes and bobcats searching for fawns become very successful at finding their prey. Managing these patches of cover in larger blocks is encouraged and making sure that there

is ample nesting cover left after spring burning occurs is important.

### **BROOD HABITAT**

While most mammals do not require different cover and habitat for their young, birds typically do. Once young mammals begin following their mothers on foraging forays, they typically begin to feed on the same foods the mothers do. Many young birds that left the nest immediately after hatch are often those that need a specialized "brood" habitat. As noted, quail and turkey chicks feed almost exclusively on insects for the first 2-3 weeks until they begin to fly efficiently. Their highest mortality time frame is also in these first "flightless" weeks. Anywhere between 50-75% of the chicks hatched may be lost before they can fly even in the best managed habitat, so both quality and quantity is important.

The most highly selected insects are the grasshoppers and crickets, spiders,

flies, and beetles. So where do we find these "bugging areas"? Typically the best bugging grounds are areas where new growth of weeds is occurring. The two best habitat types for critters that forage on the ground are burned, open woodlands and weedy fields. Grassy areas can provide some bugging habitat, but the best insect production seems to be where "weeds" like forbs and legumes are abundant. This is where insects lay and hatch eggs and where their young are grown. Small insects can be eaten by a wide variety of birds and the short growth of new weed fields and burned woods keep the insects available to ground foraging chicks like quail and turkeys.

The growth structure of these weedy areas is also important. Thick mats of grass inhibit movement of ground traveling birds and do not provide much bare ground to move and find food. Stems of plants like ragweed, partridge pea,

climbing and woody legumes, horseweed, dogfennel, goldenrod, blackberries, milkweed and many others, all provide stems with bare dirt in between for ease of movement and foraging ability as well as a canopy cover of leaves to shelter chicks and keep them from being seen by predators while they are feeding.

The areas that quail and turkey hens select to take their broods to vary by the quantity of each habitat type that is available to them, soil types and how it appears. For instance, in the some clay regions of Florida and Georgia, quail broods are most often raised in recently burned, open pine woodlands, often near field edges. In some sandy lands in central Georgia, however, broods are more often found in fall disked ragweed fields with burned woodlands selected second. It, undoubtedly, has a lot to do with the species, structure and density of the vegetation growing on the site, fertility and moisture of the soils, as well as the density and type of insects produced on these habitat types that makes hens select one type over another.

Regardless, it is generally a good idea to establish a well-distributed series of bugging areas of a variety of types across a property to provide a good selection of choices for your hens to raise their chicks. In pineywoods habitats that are well-managed and already providing the broomstraw habitat for nesting, it means having 50 - 70% of your woods burned each year in the winter or spring. Burning reduces the leaf litter on the ground, creates more bare dirt and stimulates quality plants to resprout in your woods creating excellent bugging areas.

Annual burning is necessary for maintaining bugging grounds. If fire is excluded from any area for too long these unburned areas will become too thick for movement and nesting. Rotating the burn areas annually is always a good idea so that there is good nesting habitat next to good brood rearing areas and chicks do not have to travel far to reach feeding grounds after

hatching. Burn areas in the 25 – 150 acre range are probably ideal. Blocks less than this are not used effectively and could have higher predation rates on chicks. Blocks more than this isolate birds like quail within the burn block where they are more susceptible to predation and do not have good nesting and cover within their home range.

Managing brood habitat in field systems requires making sure that the majority of your brood fields are disked in the fall of each year. Fall disking has been used on quail lands for decades to promote a variety of seed producing plants and reduce fall cover prior to hunting season. It just so happens that this technique promotes one of the best insect production areas and brood habitats available for insect eating birds. One of the most common plants promoted by fall disking is common ragweed. This plant is a host for a variety of insects and usually small grasshoppers are extremely abundant in the spring and summer in ragweed fields. Other plants that occur with ragweed in these fields are partridge pea, beggarweed, blackberry, Doveweed and milkweed, among others. These plants are all good insect producers in addition to supplying seeds for various birds

throughout the summer and fall. Ragweed is also one of the most highly selected seeds by quail in the early fall.

Field size is also important in these systems. Fall disked fields less than 1 acre can often be too small to effectively raise broods because predators can hunt this size field well and possibly increase brood mortality. Fields more than 5 acres or so are not used effectively by quail and turkey broods because so much of the field is located away from the edge where these birds typically position themselves. Fields in the 1-5 acre range are probably ideal for brood habitat, especially for quail and turkey broods that spend their early life totally on the ground walking from place to place.

In very poor fertility and droughty soils, fertilizing these fields may have some advantages. Early in the spring when these fields are beginning to grow, fertilized fields begin growth earlier and develop the canopy that protects young chicks faster. This allows the earliest broods to begin utilizing these fields sooner. The drawback on fertile soils is that the growth later in the year can become rank and thick. Disking these fields can be completed anytime from October to March, but fall is the best time for a variety of rea-



*Pineywoods that are thinned and regularly burned, but left unburned for a year, makes unrivaled habitat for quail and turkey nesting as well as fawning cover in southeastern habitats.*

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sons. Disking in October and November allows managers of quail properties to reduce cover in these fields, thereby concentrating birds in field edges and woodlands. This increases the chance that the birds can be found later in the hunting season. These disked fields are also used heavily by turkeys throughout the winter because they can find seeds, roots and tubers exposed by disking.

Winter greenfields planted for deer are also an acceptable brood habitat type. If a field is disked in the fall and planted to a light mix of winter grains (wheat, oats or rye) and clover, it can become a nice spring/summer insect producer for broods. If ryegrass is planted in the field, it grows too thick for quail or turkey chicks to negotiate through, chokes out the clovers, and is virtually useless for brood habitat. In a good mix, the winter grains begin to seed in mid-spring, providing seeds for the adult birds, the clovers provide greens for the adults and chicks and the mix produces a considerable amount of insects through the summer. If the planting rates are relatively low (50 - 70 lbs/acre) and the field is well fertilized, native weeds begin to grow through during the summer and provide multiple benefits.

There are various required habitats for wildlife species. Quality cover is necessary to allow adults to survive the winter and enter the breeding season, nesting habitat is imperative to successfully hatch chicks, and quality brood rearing habitat is required to successfully raise broods to adulthood. If one of these is missing, your population of the selected species will not reach its potential. Brood habitat provides multiple benefits for both birds due to insect and seed production as well as deer for weedy forage production. It is easy to create and maintain and is a required addition to any property that attempts to manage game or non-game wildlife.

Reproductive cover is often not considered but is certainly one of the most important habitat types for any wildlife species. To successfully maintain or increase populations, young must be produced and survive to adulthood at the same or greater rate than adults are lost in the population. In a species like quail, for instance, roughly 80% of the fall population is made up of young of the year, regardless of hunting pressure. It is obvious in this scenario that reproduction each and every year is imperative to maintain huntable populations. In a longer lived, lower annual mortality species like white-tailed deer, for instance, they can replace themselves if they successfully produce a fawn every other year or so but a lot depends on hunting pressure and mortality. In all species, the higher the reproductive output, the more individuals are available for hunter harvest.



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# Historical Trends in Wildlife Management

By Kevin Patterson

Kevin Patterson is C.E.O. and president of Predator Control Systems, LLC. He has a B.S. in Wildlife Biology and has 30 years of experience in predator control work. He conducts predator control work throughout the south, southeast and Midwestern United States.



*Wildlife management efforts not only benefit game animals but also non-game animals, like this Scissor-tailed flycatcher.*

As with any endeavor, properly and successfully managing natural resources, such as forest, fisheries and wildlife populations, mandates knowledge, effort and sometimes, the sheer will and determination to achieve your goals. Depending on your individual resources, such as property size, available natural habitat, and tools with which are available for your use, anyone with the right amount of passion, determination and perspective can increase and maintain their property to attract, hold and even protect selected wildlife species.

I have been very fortunate to have traveled and worked in numerous states from the Rocky Mountains to the Atlantic Ocean, meeting some outstanding individuals with the passion and endeavor of protecting and managing healthy and viable wildlife populations. It occurred to me many years ago that, depending on the locale, wildlife management strategies and techniques had to be utilized which were best suited for

the climate, latitude and general natural habitat of the particular area.

The science of wildlife management attempts to balance the needs of wildlife with the needs of people using the best available science and proven techniques. Wildlife management can include wildlife conservation, predator control, and game keeping. Throughout the years, wildlife management has grown to include a diversity of tools, such as mathematics, chemistry, biology, ecology, climatology, and geography to gain the best results.

**Wildlife conservation** aims to halt the loss in the earth's biodiversity by taking into consideration ecological principles such as carrying capacity, disturbance, succession and environmental conditions such as physical geography, pedology and hydrology with the aim of balancing the needs of wildlife with the needs of people. Most wildlife biologists are concerned with the preservation and improvement of existing habitats, although reinstatement techniques are increasingly being used in an attempt to manipulate existing habitat to best suit, attract and hold wildlife species in a given area. Techniques can include reforestation, predator control, nitrification and denitrification, irrigation, coppicing and hedge laying.

**Predator Control** is the control of real or perceived predators (pests) and can be for the benefit of wildlife species, farmers, landowners, game keepers and/or safety reasons. In the United States, wildlife management practices are often implemented by a governmental agency. However, in the last several years, private landowners and land managers have grown to become just as integral in wildlife management as these federal and state governmental agencies.

Wildlife Management studies, research and lobbying by interest groups help designate times of the year when certain wildlife species can be legally hunted, allowing for surplus animals to be harvested and removed. In the United States, hunting season and bag limits are



*Predator Control efforts aid wildlife managers in protecting young wildlife and give them an opportunity to survive to adulthood.*



*Kevin Patterson displaying red and gray fox pelts harvested in central and northern Missouri in 1985. Due to the explosion of coyote populations in this and many other areas of the United States, fox populations have drastically declined.*



*Dr. Ducote Haynes showing one of his many outstanding food plots containing chicory in central Arkansas.*

determined by guidelines set by the United States Department of Interior, Fish and Wildlife Service (USFWS) for migratory game such as waterfowl and other migratory game birds. The hunting season and bag limits for state regulated game species, such as deer, are usually determined by State Game Commissions, which are made up of representatives from various interest groups, wildlife biologists, and wildlife researchers.

In most of the Midwestern and Eastern United States, the majority of land is privately owned. Therefore, even though the federal and state governments govern fish and wildlife rules and regulations (i.e. open/closed seasons, bag and creel limits, etc.), private landowners and private land managers are responsible for most of our nations wildlife populations health and viability through their indi-

vidual wildlife management efforts. Whether private property is being managed for trophy white-tailed deer, quail, wild turkey, or a diversity of wildlife species, the non-governmental populous can and should be proud of their efforts and successes in their natural resource management efforts.

**Game keeping** is the management or control of wildlife populations for the overall well being of game and may include harvesting other animals which share the same niche or controlling predator populations to maintain a high population of the more profitable game species, such as pheasants, quail, white-tailed deer, wild turkey, waterfowl, etc. In his 1933 book, *Game Management*, Aldo Leopold, one of the pioneers of wildlife management as a science, defined it as “the art of making land

produce sustained annual crops of wild game for recreational use.”

## **HISTORICAL FACTS**

Although wildlife management in the United States did not emerge as a profession until the 1930s, there were some early attempts at management. The earliest game law dates back to 1639, when Rhode Island closed the hunting season for white-tailed deer from May to November. Other regulations during this time focused primarily on restricting hunting. At this time, lawmakers did not consider population sizes or the need for preservation or restoration of wildlife habitats.

The profession of wildlife management was established in the United States in the interwar period (1920s – 1930s) by Aldo Leopold and others who

sought to transcend the purely restrictive policies of the previous generation of conservationists, such as anti-hunting activist William T. Hornaday, Leopold and his close associate Herbert Stoddard, who had both been trained in scientific forestry, argued that modern science and technology could be used to restore and improve wildlife habitat and thus produce abundant “crops” of ducks, deer, and other valued wild animals.

The institutional foundations of the profession of wildlife management were established in the 1930s, when Leopold was granted the first university professorship in wildlife management (1933, University of Wisconsin, Madison), when Leopold’s textbook, ‘Game Management’ was published (1933), when The Wildlife Society was founded, when the Journal of Wildlife Management began publishing, and when the first Cooperative Wildlife Research Units were established. Conservationists planned many projects throughout the 1940s, some of which included the harvesting of female mammals such as deer to decrease rising populations. Others included waterfowl and wetland research. The Fish and Wildlife Management Act was also put

into place to urge farmers and landowners to plant food for wildlife and to provide cover for them.

In 1937, the Federal Aid in Wildlife Restoration Act (also known as the Pittman-Robertson Act) was passed in the United States. This law was an important advancement in the field of wildlife management. It placed a 10-percent tax on the sales of guns and ammunition. The funds generated were then distributed to the individual states for use in wildlife management activities and research. This law is still in effect today.

### **Types of Wildlife Management**

There are two general types of wildlife management:

**Manipulative management** acts on a population, either changing its numbers by direct means or influencing numbers by the indirect means of altering food supply, habitat, density of predators, or prevalence of disease. This is appropriate when a population is to be harvested, or when it decreases to an unacceptably low density or increases to an unacceptably high level. Such densities are inevitably the subjective view of the wildlife manager, and may be disputed by animal welfare interests.

**Custodial management** is preventive or protective. The aim is to minimize external influences on the population and its habitat. It is appropriate in a national park where one of the stated goals is to protect ecological processes. It is also appropriate for conservation of a threatened species where the threat is of external origin rather than being intrinsic to the system.

### **OPPOSITION**

As with most any idea, there will always be opposing viewpoints, especially when it comes to managing wildlife populations. The control of wildlife populations through culling and hunting has been criticized by animal rights and animal welfare activists for many years. These critics object to the real or perceived cruelty involved in some forms of wildlife management. As a life-long wildlife conservationist and wildlife biologist, I have seen, first-hand, how some wildlife species can suffer from diseases such as canine distemper, sarcoptic mange, follicular mange, and demodicosis (Red Mange), etc., when allowed to over populate.

Some environmentalists have also opposed hunting techniques in wildlife



*Trophy white-tailed bucks, like these, are sometimes pen raised and utilized for their genetics and artificial insemination of does.*



*Trophy bull elk are just one of many species of ungulates which are properly managed today.*



*Quail hunting plantations and ranches contribute to many hours of outdoor pleasure for the upland game bird sportsmen. Here, a quail hunting vehicle getting ready for a hunt on a south Texas ranch.*

management where they believe it is unnecessary or will negatively affect biodiversity. Some critics of game keeping note that habitat manipulation and predator control are often utilized to maintain artificially inflated wildlife populations of valuable game animals, including introduced exotic species, without regard to the ecological integrity of the existing habitat.

### **SEASON ESTABLISHMENT**

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Historically, open season is when individual wildlife species are allowed to be pursued, hunted and harvested by law and usually occurs during or close to the breeding season of the wildlife species. Hunters are usually restricted on what is legal to harvest by sex, age or class of animal. For example, there may be an open season for any antlered white-tailed deer with 4-points or more on at least one side. Restrictions which are in place for hunters are established through wildlife research findings.

Closed season is when a wildlife species is protected from hunting and/or trapping by law. Any attempt to pursue a wildlife species during their established closed season is punishable by law and is termed as illegal hunting or poaching. Most states have programs such as Operation Game Thief (OGT), Turn In Poachers (TIPS), etc., which have a toll free telephone number where individuals may provide information to wildlife officers anonymously and may even receive a monetary reward if the information leads to an arrest and/or conviction for the illegal activity.

Where the number of animals to be harvested is to be tightly controlled, wildlife managers may implement a type of lottery system called a "limited draw" system. Many hunters may apply but only a select few are chosen to receive permits. These types of hunts may still have restrictions on what may be legally harvested, such as age, sex or class restrictions.

### **WEAPONS**

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In the wildlife management arena,

one of the conservation strategies is to restrict the type of weapon(s) which may be used by hunters for a particular open season. Bottom line is that weapons chosen for hunters to legally use will be capable of producing a clean, quick kill. For example, some states have a minimum draw weight for recurve, long and compound bows for all ungulates (deer and elk), and wild turkey. Additionally, most states will have an ammunition capacity law. Some hunters confuse this with a "plug" law. An example would be where the law will restrict a shotgun to be capable of holding no more than three shells in the magazine and chamber combined to hunt wild turkeys and/or waterfowl species. This type of law encourages and actually mandates fair chase. Missouri even has an ammunition capacity law for firearms when hunting white-tailed deer. This regulation is established where any firearm used to pursue white-tailed deer (shotgun or rifle) during the open season cannot have the capacity to hold more than eleven (11) shells in the

magazine and chamber combined.

### **HUNTER EDUCATION**

Hunter education certification is mandatory in most states. For example, in Missouri, any individual born on or after January 1, 1967 must have attended and successfully been certified in a hunter education course (from Missouri or any other state) in order to purchase a Missouri firearms deer or wild turkey hunting permit. Kansas is July 1, 1957. Some state conservation agencies have even made this task very simple by allowing individuals to study and take their hunter education test "on-line". All states with mandatory hunter education certifications grandfather other states. Colorado's law is if the hunter is born on or after January 1, 1949, they must possess a hunter education certificate, thus being much more restrictive than Kansas, Missouri and other states. It always amazed me when I was a Wildlife Officer in Kansas and Missouri when hunters who were applying for their Colorado and Wyoming elk

tags would call and need their hunter education certifications in less than 24-hours in order to meet those states hunter education requirements. It always pays to investigate and educate yourself on other states wildlife conservation regulations if you are planning an out-of-state hunting trip.

The science of wildlife management throughout the United States over the last several years has evolved tremendously with the technological advances. When a wildlife manager and/or hunter can currently sit at home and view real time photographs and video of their hunting area, I cannot begin to guess at what the future holds for wildlife management. Only time will tell...

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# Managing Aquatic Plants in Ponds

By Matt Euten

Matt Euten works as a fisheries biologist for Southeastern Pond Management in Birmingham, AL. He earned his Masters degree in fisheries science from Auburn University where he studied the recruitment and growth of largemouth, smallmouth and spotted bass. Contact him at [meuten@sepond.com](mailto:meuten@sepond.com).



**T**here are a few key ingredients required to truly grow quality and trophy-sized largemouth bass in ponds and lakes. First, you have to create a nutrient rich aquatic environment that provides enough food to support the fishery. Once the food is abundant, one must maintain balanced conditions among the predators and prey species in the pond to ensure acceptable long term growth rates among your fish population. Implementing an intensive bass harvest program, increasing the pond's total alkalinity and maintaining an intensive fertilization program are the most basic management activities required to create these trophy fisheries. Quite often when these nutrient rich environments are created in ponds, so are conditions favorable for aquatic plant growth. Occasionally, the presence of aquatic plants in ponds can be beneficial to a fish population; however, in most cases, aquatic plant management and control is very expensive, so it is best to keep the plants out! In this article, we

*Is this a common site for your pond throughout the spring?*



will examine the pros and cons of the presence of aquatic vegetation in ponds and examine the various methods for control of some of the more common aquatic plants occurring in ponds.

Whether you're dealing with algae or cattails, the potential impact to the fish population must be identified to effectively manage any aquatic vegetation. There are aquatic plant species that are beneficial to a fishery and can serve as refuge for forage species from predation, harbor invertebrates for bluegill and small bass or serve as a food source for some fish species. However, dense stands of vegetation can be detrimental by draining the nutrients intended for fish growth, hindering successful predation by the bass and prevent access and angling success. Preventing aquatic weed growth by manipulating factors such as available sunlight and nutrients is the best option for lakes intended to grow quality and trophy fisheries.

Trophy-sized largemouth bass aren't consistently caught from clear, pristine aquatic environments. Big bass grow in nutrient rich environments where the food is plentiful. Unless your pond is located in the black belt region of the Southeast, to create a nutrient rich environment in a pond, agricultural limestone and pond fertilizer must be applied annually. However, implementing these management activities not only creates an aquatic environment favorable to growing big bass, but it indirectly increases the potential for aquatic plant growth. Bass need food to grow and the best way to provide this food is by creating a productive aquatic environment, therefore, at some point aquatic infestations will occur. As fisheries managers, it is critical that these infestations be controlled or prevented to ensure a successful management program.

Aquatic plants, like all plants, need three ingredients to grow; sunlight, food and water. Ponds and lakes are great environments for aquatic plants because most have an abundant supply of all three factors during the growing

season. Manipulation of any or all of these factors is the only way to prevent and/or control aquatic plant growth. To help prevent sunlight penetration through the water column, ponds and lakes should be constructed to where the entire lake drops to at least 3 feet deep roughly 1 foot from the shoreline. A dense phytoplankton bloom created through fertilizing will shade the water column enough in ponds with the above dimensions which will help prevent sunlight from penetrating the pond bottom were aquatic plants begin. A good fertilization program must begin early in the spring, usually the first week of March, before any aquatic vegetation begins. If the pond owner starts fertilizing too late and an aquatic weed becomes established, then that fertilizer intended to create a good phytoplankton bloom is usually consumed by the aquatic plant infestation. By controlling your nutrient input and shading the water column, pond owners can effectively manipulate two of the variables for plant growth and in most cases prevent most major weed infestations.

Just like everything in life, things don't always turn out as planned and sometimes, no matter how diligent you are with a fertilizer program, aquatic weeds can still pop up. If this does occur, it is best to consult a fisheries biologist to have the plant identified and implement a management plan for

control before the infestation gets worse. Aquatic infestations can be controlled in ponds or lakes in many ways such as mechanical, biological and chemical control. First, you can manually remove the plants from your lake. Mechanically removing aquatic plants works, but it can be very labor intensive and time consuming. White amur (grass carp) and tilapia are two fish species that can be stocked in ponds to consume certain plant species. Grass carp are relatively inexpensive and do not reproduce in ponds. Stocking rates for grass carp can vary. However, successful control of a number of submerged, as well as some floating plants, has resulted from higher stocking rates. Grass carp are not going to provide immediate success on substantial aquatic infestations and therefore it is best to stock these fish for more long term control. Tilapia, in high abundance, are very effective on filamentous algae, however they cannot survive our winters and will need to be stocked annually. One very attractive advantage to stocking tilapia is they have high reproduction rates in ponds and their offspring make an excellent meal for bass. The most effective method for immediate control of an aquatic infestation is by applying an aquatically approved herbicide. Herbicides are most effective when the plants are actively growing and therefore it is best to catch these



*Filamentous algae is probably one of the most invasive aquatic plant species found in ponds and lakes.*



*Various species of aquatic vegetation can become well-established along the shoreline of a pond or lake.*

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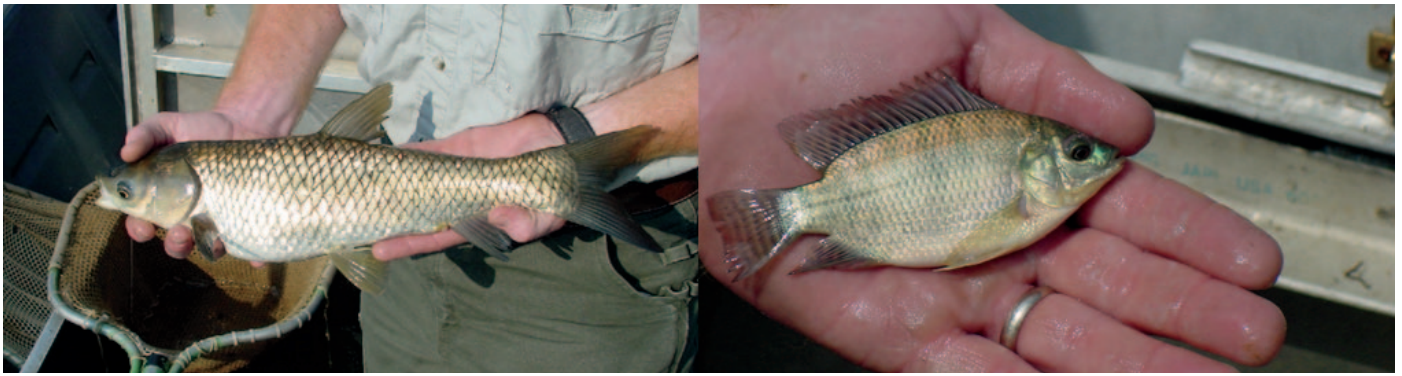
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plants early in their growth stage.

Aquatic vegetation can be grouped into four major categories or growth forms; algae, submerged, floating and emergent. Algae are primitive rootless plants that can be found free-floating throughout the water column (planktonic algae) or growing along the pond bottom, attached to various structure or even floating on the pond's surface (filamentous algae). Floating plants are just as the name implies and are found floating along the surface not attached to the pond's bottom. This group can range in size from less than a millimeter (watermeal) to as large as 3 feet above the water line (water hyacinth). Submerged plants are rooted plants that grow below the water line. Occasionally these plants can reach or grow just above the surface. But because of their flaccid or soft stems, most of the vegetative mass rarely reaches the surface. Emergent plants are rooted plants that grow above the surface of the water line and are mostly found along the pond's shoreline.

Probably the most common and most problematic of the four aquatic plant groups is the algae species. If you have ever owned a pond or have ever fished someone else's, then you have crossed paths with some form of algae. There are lots of different algae species that



*Grass carp (left) and tilapia (right) can be stocked to help control some aquatic plants.*

can grow in ponds and these species can be some of the hardest to manage. Most algae species have negative effects when established in ponds. However, phytoplankton, a planktonic algae, can serve as a major food source for many invertebrates and larval fish. This form of algae is beneficial because it serves as the base of the food chain which helps increase the carrying capacity of the pond and ultimately grow bigger fish. Phytoplankton blooms give ponds a greenish tint that can shade sunlight penetration through the water column and prevent other aquatic plants from growing.

Filamentous algae, on the other hand, could possibly be the most annoying aquatic plant to grow in ponds throughout the country. Like I stated earlier, more than likely if you have ever fished a pond more than once, then you have experienced the true nuisance that is filamentous algae. Infestations of filamentous algae hinder accessibility, ruin the fishing and take up the nutrients intended for establishing phytoplankton blooms in ponds. For these reasons it is highly recommended that any filamentous algae growth be addressed immediately. Control of the various species of filamentous algae can be quite arduous and the key factors for control are to correctly identify the species and act fast before the infestation gets out of control. Most filamentous algae species start growing along the pond's bottom and as it matures it captures oxygen bubbles and rises to the surface. It often forms large green to yellow mats along

the pond's surface and has a "slimy" feel. Other species of filamentous algae have been described as having hair like characteristics or look similar to the texture of cotton candy. The most immediate control for any filamentous algae growth is by treating with an aquatically approved algaecide. Algaecides are contact herbicides and when applied correctly they begin to kill the plant immediately. Grass carp stocked at relatively high rates have proven to provide prolonged control of filamentous algae. Therefore, stocking activities should be geared more as preventative measures. Over the last few years we have seen that tilapia, which were stocked as food for bass, have helped control filamentous algae growth, particularly when stocked in abundance.

Of the submerged aquatic plant category the species found in the *Najas* and *Potamogeton* genera are probably the most common plants found in southern ponds. More commonly known as naiad and pondweed, respectively, these plants can look similar and are usually found growing in dense stands along the pond's bottom. In clear ponds, these species can grow in the deeper areas and can eventually top out at the pond's surface. Grass carp will consume most all submerged aquatic vegetation and they have proven very effective in controlling the various species of naiad and pondweed. For long term control of submerged aquatic vegetation, grass carp are highly recommended. Ponds with dense stands will most likely require multiple herbicide applications as well

as stocking grass carp. Watermilfoil, coontail and hydrilla are also some other common submerged aquatic plants found in ponds, all of which are readily consumed by grass carp and/or can be treated with herbicides.

Floating aquatic plants are not nearly as numerous in southeastern ponds as the other plant groups. However, their presence can have devastating effects on ponds if left untreated. The most common floating plants I've seen in ponds would be duckweed, watermeal and water shield. Floating plants like duckweed and watermeal are two of the most impactful and resilient aquatic plants found in ponds or lakes. Both species are usually found in smaller, more quiet waters and if not treated can overwhelm a water body quickly. Duckweed and watermeal are very small green plants and are often times found growing in colonies together. If either of these plants covers a pond surface for an extended period of time, they can cause oxygen depletion in the water body which could result in a fish kill. Because both of these species are small and can become so densely compacted, complete control is almost impossible and can be very expensive. It is best to consult a biologist to create a management plan to control any floating aquatic plant.

The various species of emergent aquatic plants are probably the least impactful of all the aquatic groups mentioned above. Most every pond has some form of emergent aquatic plant, i.e. cattails or bulrush, and these plants



*An extremely dense stand of watermeal found growing in a water retention pond.  
Each small green "granule" is an individual plant!*

have probably been either unnoticed or mistaken as a terrestrial plant. Most emergent plants only grow a few feet from the shoreline and can provide a form of refuge for smaller fish. Regularly spot treating these plants can help prevent an overabundance and still allow a pond owner the opportunity to create a successful fertilization program without losing the nutrients to the plants. Aside from the cattails and bulrushes, the most common emergent

plants are water primrose and alligator weed. These plants look similar. However, in spring, alligator weed produces small white flowers and water primrose's flower is yellow. In most ponds, these plants rarely become invasive. But it is recommended that they be treated with herbicides about every two years depending on abundance. Water shield or Dollar Bonnet is another emergent aquatic plant that has become somewhat prevalent in our

waters. It is a relatively small floating plant with oval shaped leaves. At the surface the leaves are green, but have a reddish purple hue and gelatinous gel on the underside and stem. Under ideal conditions this plant can take over the shallower areas of a pond and rob the nutrients provided by an intensive fertilization program. Grass carp are not generally effective on most emergent plants and therefore the best management activity for control is through regular herbicide applications.

No matter how you manage your pond, whether as an intensive trophy bass management program or for more balanced conditions, at some point you're going to have to deal with some form of aquatic plant growth. It is always best to consult a biologist first to correctly identify the plants and help you manage the infestation. If you are more the hands-on type of pond owner, just remember it is always best to be proactive rather than reactive when managing or even preventing an aquatic plant infestation.



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# Threatened and Endangered Species: Turning a Liability Into an Asset

## PART I: Why Conserve Endangered Species?



*This is the first article in a two-part series on listed species and their impacts on the private landowner. Part I provides background information on the Endangered Species Act itself and the reason it is important to conserve listed species. Part II will build off of that background and present the monetary incentives available to private landowners to accomplish that goal.*

Our ancestors once viewed North America's bounty as limitless, but today's generation now comprehends the seriousness and finality of extinction events and how quickly they can strike. Species once thought to be limitless such as passenger pigeons and bison are poster children for how easy it can be to decimate a species. Having a diversity of species is extremely important because we never know how everything is interconnected, as John Muir, naturalist, noted: "When one tugs at a single thing in nature, he finds it attached to the rest of the world." The downfall of

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*Dwarf Lake Iris (Great Lakes Region)  
Credit: USFWS*

*Disclaimer: The findings and conclusions in this article are those of the author and do not necessarily represent the views of the USFWS. Contact your local FWS Field Office to learn about the latest policies, species, and programs appropriate to your area.*

one may trigger the collapse of many, especially if that one critical species was essential to the functioning of a particular ecosystem. Examples of such keystone species, as they are called, include beavers, elephants, and wolves. Many species are indicators of the quality of the environments they inhabit; their presence/absence and health reflects water quality, air quality, and the amount of ozone in our atmosphere. Also, these same species provide valuable ecosystem services like water and air purification and the decomposition/detoxification of wastes.

Aldo Leopold once said, “The last word in ignorance is the man who says of an animal or plant, ‘What good is it?’ If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.” Aldo Leopold has been called the father of wildlife management, and had he not died in 1948, most likely would have celebrated the creation of the Endangered Species Act, a landmark piece of legislation for conservation.

### **The Ongoing Evolution of the Endangered Species Act**

Before the Endangered Species Act of 1973, there were several predecessors. Most notably was the Endangered Species Preservation Act of 1966. It was the first time a list of endangered fish and wildlife was created and authorized the USFWS to buy critical habitat for such species. However, it did not require the protection of habitat on non-federal lands, only encouraged it. The Act also did nothing to curb the sale of endangered species or their parts. In 1969, the Act was amended, and the Endangered Species Conservation Act (often referred to the Amendment of 1969) provided additional protection to species outside of the United States that

were in danger of extinction by not allowing the importation and sale of such species. Most notably, invertebrates were considered for the first time in the listing process.

In 1973, Congress rewrote the law to create the Endangered Species Act (ESA) which protected a myriad of species and their critical habitats. This original law was very strict. A 1978 amendment added wording that required all listed species to have critical habitat designations but also that economic impacts had to be considered in that designation process. Since this was obviously an attempt to trump the biological necessity of a listing, an amendment in 1982 reversed this decision and kept all considerations based on scientific data, not economics. However, the original ESA was weakened some as the 1982 amendment also created a permit process through Habitat Conservation Plans that allowed for some incidental take. This was an incentive to those still wanting to carry out developmental actions that may otherwise have been in violation of the ESA. The Experimental Populations provision was also added at this time to encourage the reintroduction of species to their former habitats/ranges without as many legal restrictions on these species.

The 1990’s saw the creation of incentive programs to encourage conservation and defend the ESA from the critics who viewed it as a hindrance to eco-

nomics development. Two such incentives that arose at that time were the Safe Harbor Program and Candidate Conservation Agreements. More programs have been created over the years to allow more flexibility to landowners needing compensation for restrictions placed on their lands while at the same time preserving the species for which the ESA was intended. These programs have also helped change the “shoot, shovel, and shut up” philosophy of many landowners, who, fearing regulations, would purposefully destroy habitats that may attract or harbor a listed species.

There are various status categories to which a plant or animal species may be assigned as part of the current listing process. The terminology can be confusing when some terms are synonymous with others. Truly “listed” species are those that are federally recognized as endangered or threatened. States also maintain their own listed species for populations within their borders. Protection for these state listings is not part of the federal mandate. An *endangered species* is one that “is in danger of going extinct in all or a significant portion of its range,” while a *threatened species* “is likely to become endangered within the foreseeable future.” *Candidate species* are those that have not been listed yet but “for which the USFWS has sufficient information on their biological status and threats to propose them for listing” and are on the Federal Register.



*Buena Vista Lake Ornate Shrew (California) Credit: USFWS*



*Clubshell mussel (West Virginia)*

However, other higher priority species have taken precedence over them at this time. *At-risk species* can be those on the federal candidate list or not but are facing serious threats. *At-risk species* are usually state listed as well. A *species of concern* is any species that is being monitored due to threats but is not protected at this time. Many species of frogs that are facing serious declines due to the rampant spread of the deadly fungal disease, Chytridiomycosis, fall into this category. Also, many bat species that are affected by White Nose Syndrome (another fungal infection caused by *Geomyces destructans*) are considered species of concern.

Private landowners are not required by the ESA to actively manage for listed species on their property, but they may not legally “take” the organisms themselves. Section 9 defines “take” as: harassing, harming, pursuing, hunting, shooting, killing, trapping, capturing, collecting, or purposefully destroying feeding or breeding habitat so that survival is impaired (e.g. cutting down a nest cavity tree). Federal land managers are, however, required to manage their lands for listed species. Although animals are afforded the most protection from “take”, plants are not as lucky. The ESA states that no one can own or remove any listed species from federal lands or purposely destroy them on state protected lands. In other words,

plants persist on private property based on the actions or non-actions of the landowner to maintain their habitats.

### **Extinction Rates and Landowner Responsibilities**

It is estimated that of the over 500 million species that have ever lived on Earth, only about 2% are still with us today. Out of those 10-50 million species currently with us, only about 1.7 million have been classified. In the past, extinctions occurred at a constant rate except during dramatic events such as meteor strikes, Ice Ages, and other climate-altering phenomena. Usually, when an organism is too specialized, has a low reproductive rate, and/or cannot readily adapt to change, it often does not survive as a species. If extinctions are simply a “survival of the fittest” test, why then do scientists worry about them? Background extinctions, as they are called, continue to this day as part of the normal evolutionary process, but other species declines are adding to that number. Human influences now rival other great episodes in history so that the current rate of extinction has been estimated to be 10,000 times greater than natural levels. Factors that have hastened the decline of many species (and not just those vulnerable to changes) include: habitat alteration/ destruction, environmental disasters,

unregulated hunting or collecting, competition from exotic/invasive species, and the alteration of the planet’s climate. Since 1620, greater than 500 species of plants and animals are estimated to have gone extinct in the United States alone. With a majority of US lands under private ownership, each landowner really does have the power to help or hinder the situation.

It is estimated that two thirds of threatened and endangered species have habitat on private land (includes corporate forestlands). It is therefore vital to the continuation of these species that private landowners become involved in their protection and restoration. Most landowners want to do the right thing and be good stewards of their land. The last thing they want is their actions to produce more legal restrictions. Besides, it is more expensive for taxpayers to try to recover a species than it is to conserve it in the first place. As a landowner, perhaps one should feel honored to know that his/her property is so unique that it harbors equally unique species worth preserving for future generations. Opening up that land to researchers and participating in a reintroduction program may be exciting as well. Part II of this article will examine the many incentives available through Section 6 of the ESA and other sources to assist private landowners with managing their lands for the perpetuation of imperiled species.

Keeping every “cog and wheel” may directly benefit humans since many agricultural products depend on insects and bats for pollination as well as pest control. Then there are the contributions species make to medicine. Chemicals from a myriad of plants and animals can be found in more than a fourth of all prescription drugs in the United States. Just think how differently things would be today had the fungus that produced penicillin had gone extinct before its discovery. Besides medicinal benefits, wildlife has an economic value when it comes to recreation. Birding brings in almost \$400 million annually



in the United States, while wildlife watching (ecotourism) provides approximately \$85 billion (2001 figures) each year. Being exposed to wildlife often produces a “conservation ethic” in the people involved and they begin to see more social value in protecting habitat than in its development potential.

It is helpful to know where priority areas for conservation are located in order to make the biggest impact towards the preservation of biodiversity. It is also beneficial to acknowledge areas most threatened by habitat destruction. The US Forest Service’s Forests on the Edge (FOTE) project has used GIS mapping to locate forestlands that are important for preserving ecological functions in the region. These same acreages are thus also those in most need of protection from development and other threats. Areas identified as regions of greatest concern include the West Coast, parts of the Atlantic and Gulf Coasts, and the interior Southeast (for providing habitat to at-risk species). Similarly, the highest ranking watersheds of concern comprised 44 million acres and were those located in the East, especially in the Central and Southern Appalachians, the Southeastern portion of the Gulf Coast, and parts of the Midwest and West Coast.

### **Legacy of the Endangered Species Act**

The preamble of the ESA states that the importance of this legislation is to preserve species that “are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” Because of the existence of the Act, 99% of all listed species have been saved from extinction. (Only 9 listed species have been declared extinct.) Success stories include the peregrine falcon, bald eagle, brown pelican, small whorled pogna, and the American alligator. As of September 2011, 23 species have been removed from the list because their populations have recovered. Many species are still afforded continued protec-

tion, though, through other legislation such as the Migratory Bird Treaty Act of 1918 and state game laws (e.g. alligators). Currently, there are 1,373 plants and animals listed as threatened or endangered in the United States. The grand total of all endangered, threatened, candidate and at-risk species number over 6,000. With a projected increase in the US population of 80 million people by 2030, this number of rare species is likely to increase without proactive measures to curb habitat destruction and its associated problems such as pollution, invasive species, loss of ecosystem functions, and the spread of diseases. Now climate change and sea level rise are being factored into the listing process, but not without much opposition as in the case of the polar bear. In May 2008, the polar bear was the first species to be listed as threatened due to climate change. Balancing human needs with those of our fellow creatures is always a challenge. However, Aldo Leopold had it right when he said, “That the situation appears hopeless should not prevent us from doing our best.”

To find out if you have a listed species on your property, (1) contact your state’s Natural Heritage Program to determine if you are near an existing known population, and (2) contact your local USFWS office to have a biologist make a site visit to your property. Don’t forget to celebrate Endangered Species Day

each year on the third Friday in May.

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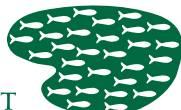
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# The Versatile Gourd

By Keith Summerour

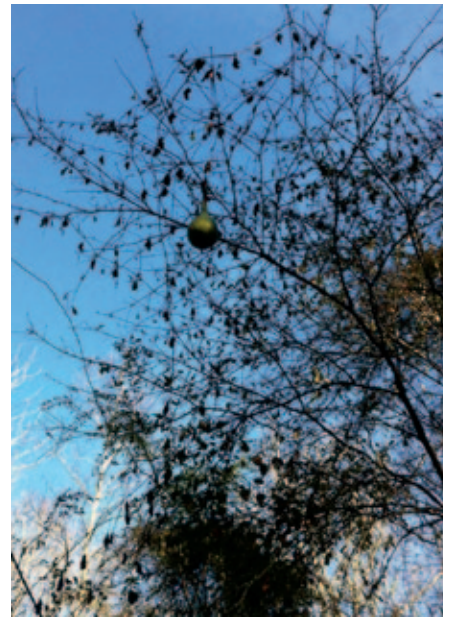
Keith Summerour, a graduate of Auburn University, founded Summerour Architects. Since 1991, the firm has been designing high end residential and commercial projects throughout the country but with a strong presence in the Southeast.



*The author's son, Harrison, assisting with removing gourd seeds*

**T**he Calabash “bottle” Gourd was first domesticated around 10,000 years ago in Asia and about 4,000 years ago in Africa. It is thought that the gourd arrived in the Americas via Paleo Indians at the end of the last ice age. The gourd’s primary use was for the transport of water and food as the rind of the gourd is very tough and has been known to be weatherproof for up to seven months. Dippers and cooking utensils can also be created by removing the seeds and cutting the hard rind for specific purposes.

The most recognizable use of the gourd in the rural landscape is for constructing Purple Martin housing. This tradition was started by native Indian tribes who hung the hollow gourds on exposed tree limbs within close proximity of their village. This was done in an effort to reduce pesky insects and provide early warning against predators such as snakes and raccoons. The Martins will harass unwanted interlopers



as they protect their colony.

The Martins eventually found it safer to nest around humans and shifted their natural nest selection instinct behavior to nest only within close proximity of man-made structures. The aesthetic of a Martin Colony also adds to the overall farmstead, breathing life and interest into the architecture of the farm.

I discovered another interesting addition to the farm on a recent visit to Beijing, China. A gourd arch was constructed using bent rebar and old hoop house skeleton structures. The arch adds a wonderful contrast to what are usually rectilinear buildings and creates shade in summer for barnyard animals. Another benefit is that you can view the hanging fruit rather than them hiding beneath the large gourd leaves.

Last spring, I experimented with planting gourd seeds on the edges of food plots and checked on the progress of the plants periodically over the season. Deer seem to avoid the leaves, and to my joy, I discovered this fall a cache of gourds hanging from a nearby tree. The gourd vine had climbed like Kudzu from the food plot and into the surrounding trees and produced, (with assistance from gravity), very long handled gourds. The green gourds I collected are now drying for the use of a new Martin Colony this spring.

The gourd, when planted properly,

can be an exciting new addition to our planting scheme this year. A fruit which takes a long time to develop will delight

when hiding under those giant leafy vines come September.



*Pen and ink drawing by Dr. Bill Summerour, 1975.*

# Q&A with The Wildlife Group



Editor's note: Since it is the height of tree planting time across much of the country, we recently sat down with Allen Deese, Nursery and Sales Manager of The Wildlife Group, to ask a few common questions we all have on tree planting and care.

## **Can you tell us the best time to plant trees and explain where the different planting zones are?**

The absolute best times to plant are fall and winter. When planting containerized plants I like to start as soon as the temperature drops below 80 degrees and I anticipate the beginning of winter. This is typically sometime around the 1<sup>st</sup> of November. Bareroot plants are a little different in that most nurseries tend to wait until around the 1<sup>st</sup> of December, after several frosts, to begin digging the plants to get them ready for shipping. So planting of bareroot plants should be done as early in December as possible and no later than the end of February. Keep in mind that planting early will give the newly planted trees some much needed winter rains and some early root growth before spring.

The USDA Hardiness Zone map simply gives you the plant hardiness zones for

*“The finished product!”*

your area. For instance most of the southeast is in Zone 8. Many plants will do well in several zones so the listing may say “USDA Zones 3-8” this would mean the plant will thrive in zones 3,4,5,6,7,8.

**How do you prepare your trees for shipment to your customers?**

Container trees are potted during the dormant season in a mixture of pine bark, peat moss, lime, fertilizer and a minor element package. These plants are grown out for one season and can be shipped via freight lines or picked up at the nursery.

Bareroot fruit and oak trees are pulled and dipped in a mixture of Moisture Mizer and a Root Growth Stimulator. They are then packaged in a 2 mil plastic wrap and placed in a wax lined box .The bareroot trees are shipped to your door via UPS.

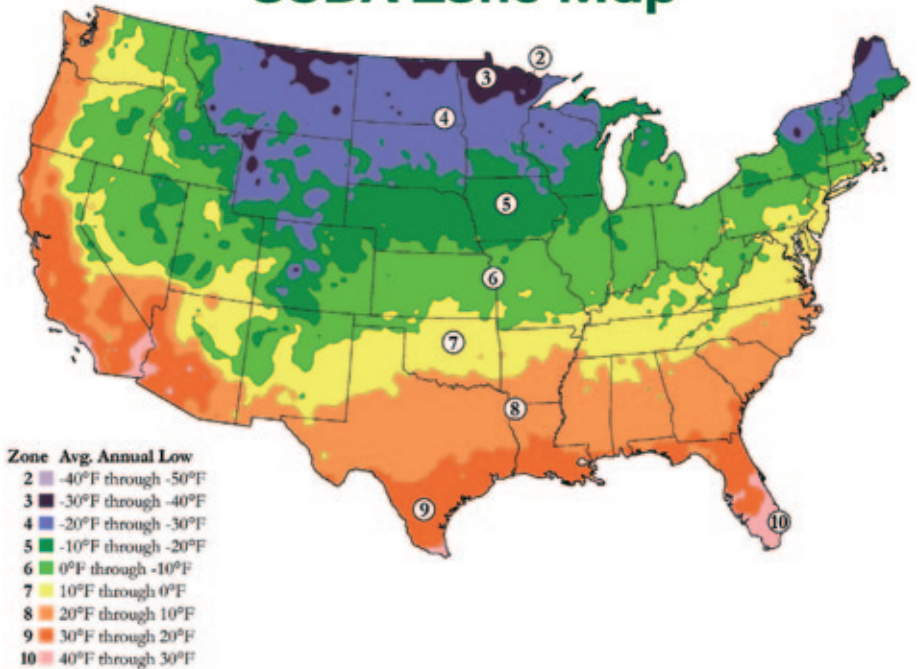
**What do we need to do to the trees when we receive them and how long do we have before we need to plant?**

Once a customer receives the packaged trees from UPS he should immediately open the box to check and inventory his shipment. The roots should be moist and the trees in good condition. If you see any problems immediately call the nursery and notify them of your concerns.

After you have looked over your package the best thing is to plant them as soon as possible. If it will be a couple of days or even one before you can plant, store the box closed in a cool place out of direct sunlight. A walk-in cooler is ideal but your garage or an old barn or shed will suffice. The most important thing is to keep the roots moist, cool and out of direct sunlight. If moisture is an issue, take old newspapers, wet them, and place them in the box around the roots. Stored properly, the trees will be fine for a couple of weeks.

On a last note I believe it is very beneficial to rehydrate your plants prior to planting. This means to soak the roots in water for up to one hour before you plant them. Once planted it’s a good idea to water them in to remove all air

## USDA Zone Map



*All bare root plants are dipped in root stimulator and packaged for UPS shipping.*



*Here are the 48" and 60" tree protector tubes with a fiberglass stake.*

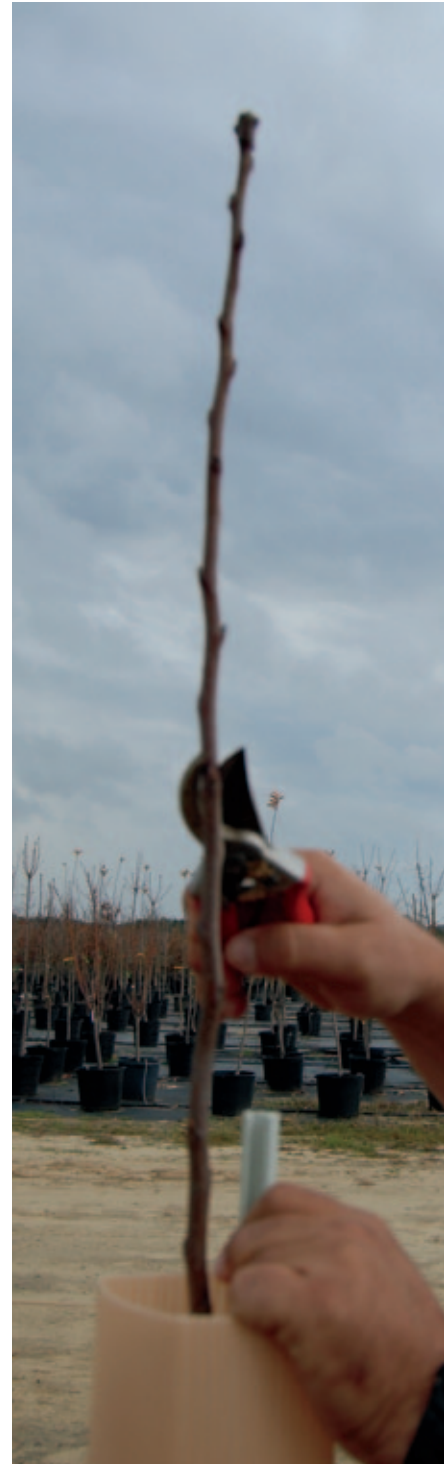


*Proper planting depth for a bare root plant is very important.*

pockets from the soil and allow it to settle around the roots.

**How large should the hole be for our trees and do we need any special equipment?**

Basically the hole should be twice the diameter of the root ball in width not depth. This is very important! Never plant your trees too deeply because this will stunt or kill them. Always plant



*Example of the first pruning cut on a newly planted tree.*



them at the same depth they were planted at the nursery or a little higher. A common mistake is digging a really deep hole, planting and not watering in. After the first good rain the ground settles and the plant sinks below ground level either killing or stunting its growth.

As far as equipment, you'll need a good back and a shovel or posthole diggers. For larger trees, a Skidsteer with an auger attachment works great. When using anything, try and stay away from a perfectly round hole with hard edges. This tends to create a bowl affect and will not allow the roots to spread properly. Try to taper and break up the edges slightly to encourage lateral root development.

**What about fertilizer and tree protectors?**

All newly planted trees need some sort of protection from wildlife. Even though we are planting for them they are the worst enemy of a tree. For larger trees I simply recommend a five foot staked circular fence and a 36" trunk protector. The trunk protection will deter rabbits and field mice from gir-

dling the bark around the base and killing the tree.

All bareroot trees benefit greatly from the use of tree protectors. After being in this business for 15 years, I will not plant a seedling without one. They enhance the growth at a stunning rate and protect the tree. But watch out for wasps during the summer and ants in the fall! Clean out the tubes at least once per season, typically in late fall after the leaf drop.

Fertilizer can be a benefit or an enemy. High amounts of fertilizer can kill a tree and also hinder the fruit and nut production by encouraging vegetative growth so only use the recommended amount. Also, keep in mind that if your trees are adjacent to your food plots, you may not need additional fertilizer.

**What are the best trees to plant around a pond or in low, wet ground?**

Pond or wetland plantings are somewhat different. For instance Bald Cypress, Dawn Redwood and Pond Cypress are all trees that can be planted directly in the water and live in stand-

ing water year round. But oaks that are labeled wetland or lowland species will not survive in year round standing water. Nuttall Oak, Overcup Oak, Swamp Chestnut Oak, Swamp White, Water Oak and Cherry Bark Oak are all examples of wetland trees that can withstand some flooding. Flooding typically occurs during the winter months, December thru February. Then the water drains off in late February and early March. These species can withstand flooding during this period but not year long standing water.

**What are the best trees and/or shrubs to use as a screen for roadsides and to shield access to shooting houses?**

Leyland Cypress, Eastern Red Cedar, Waxmyrtle and Thornless Eleagnus all do a great job of creating screens from roads or for access into hunting areas. When creating screens or borders I've found it best to not use any type of mast producing plants that attract wildlife to your property lines, walkways to and from stands or around your hunting blinds.



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# Wildlife Trends Journal Management Calendar



## **Deer stand preventative maintenance**

While it is not a fun job, deer stand maintenance will prolong the life of stands and their accessories and in some cases will prevent tree damage during the growing season. Things such as removing seat cushions, camo wraps, shooting rest padding, and/or actually pulling deer stands out of the woods and storing them out of the weather will significantly increase their life and save

money in the long run. Squirrels and Mother Nature can and will ruin a deer stand in as little as one summer. Taking the time to label parts (cushions, wraps, ladder sections, etc) will help keep loose items “marked” and make reinstallation next fall much quicker and easier. Before storing stands for the summer, I check them for needed repairs, touch them up with paint, and lubricate any moving parts. This helps protect the stands but also allows time

By Dave Edwards

February/March 2012

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 Hunting & Fishing 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.

*Late winter is the best time to scout for new deer hunting locations*

for the odors associated with paints and oils to fade before next fall. If you have enclosed shooting houses, take time now to close windows, doors and make attempts to “seal it up” where needed to keep out unwanted pests. While exterminating a few wasps is easily done next fall, removing 6 months worth of owl droppings is another story! If you plan to leave ladders and lock on stands in the woods over the summer be sure to loosen the fasteners, straps, or chains

that attach them to the tree to allow room for the tree to grow during summer. You may be amazed at how fast a tree can “absorb” (grow around) a chain! As a side note, while in the area, I often use this time to do a little scouting for next hunting season as well.

### **Squirrel hunt.**

Squirrel hunting seems to be a lost passion for many hunters. Squirrel season runs through February in many states and can offer some great excitement. I often use squirrel hunting as an excuse to be in the woods scouting for deer sign. As you will see in the calendar item below, late winter is one of the best times to scout for new deer hunting spots. Whether you are interested in scouting for deer or not, squirrel hunting is a great activity that will help you learn a property and will often spark ideas of ways to improve it. However, as my kids have gotten old enough to shoot .22 caliber rifles, I value squirrel season as it provides a great way to teach them how to hunt without having to be too serious or quiet and often results in lots of action and shooting. As we move along hunting we take time to investigate everything we come across such as deer tracks, turkey feathers, armadillo shells, and turtles which leads to discussions about how nature works. Be sure to pack plenty of snacks!

### **Late winter is the best time to scout for new deer hunting locations for next season.**

Because deer have been exposed to a great deal of hunting pressure over the past few months, they are using areas they feel most comfortable and safe. If you find where they are “hiding” now, you will know where to find them next season once the hunting pressure builds and deer seem to disappear. During February the weather is still cool (or cold), leaves are off the trees and rubs and scrapes are still fresh. Scouting in late winter will help reduce hunting pressure next fall by reducing the need



*Install or check/prepare wood duck nesting boxes in February*

for full scale “pre-season scouting” which can put deer on the alert that “the hunters are back”. Hunting smart is the best way to reduce hunting pressure on your property. Scouting in late winter is one of the hunting smart strategies.

### **Erect new wood duck boxes and/or clean out existing boxes in preparation for the nesting season.**

Place 4”-6” of sawdust or wood shavings in the bottom of the box for nesting material (I prefer shavings versus sawdust because they do not absorb moisture as easily which causes rotting and mold – check with a wood shop that uses a planer for shavings. Cedar chips that are used for dog bedding can be good nesting material as well). Erect new boxes before February in highly visible areas near good brood rearing habitat. Adequate protective cover is essential for brood survival. Brood habitat should include a dependable source of water with plenty of shrubs and emergent vegetation for food and cover. Wood duck boxes should be cleaned and inspected at least once per year. Word of caution – always be careful when opening wood duck nest boxes. Many other animals use the boxes. Animals commonly found in wood duck boxes include gray squirrel, flying squirrel, rat snakes, screech owls and flycatchers.

### **Mow early or wait until early summer.**

If you have areas that need to be mowed, mow them before turkey nesting season (which is generally March-May) to prevent destroying nests. Unless necessary, I recommend leaving as much of your roadsides, fields, and other openings un-mowed to provide additional nesting habitat for turkeys and other birds. Much turkey nesting research shows that these areas are valuable and heavily used for nesting by hen turkeys. Even if turkeys do not use all of the un-mowed areas, these areas will host an alternate food source (small mammals – rats, mice, and rabbits) for potential turkey nest predators. Having this “extra habitat” also increases the “search area” and reduces predator success in finding turkeys and their nests giving turkeys a better chance of producing a clutch and surviving. This strategy is more valuable for landowners whose property has limited nesting habitat.

### **Plant shrubs to screen unnatural structures or objects**

While this has nothing to do with wildlife management, it may enhance experiences around the property you hunt. Late winter is a great time to install or transplant shrubs or other plants to hide unnatural objects around your camp or property. Examples of



*Delaying mowing until early summer will significantly improve turkey nesting and brood rearing habitat. If you must mow, do it early to avoid destroying nests later.*

such items may include electric boxes, AC units, pump houses, clay target throwers, etc. While purchasing shrubs or plants is always an option, consider transplanting natural plants that exist on your property. These plants are well adapted for the soils and climate of your property and best of all they are free. Choose shrubs/plants that are evergreen or will provide the “cover” needed to do the job. A few plants I have had great success with include wax myrtle, broomsedge grass, and various holly and ferns. When digging up plants keep as much of the root ball intact as possible. That is, leave plenty of room around the base of the plant and cut a circle around the plant with a shovel working deeper and under the plant until the root mass (full of dirt) breaks free. Handle the root mass with care while transporting to its new home. The goal is to keep as much of the existing soil around the roots in place as possible – which protects small feeder roots

of the plant. A large plant container (black pot that shrubs or trees are grown in) is useful to have when transporting to protect the root ball. Dig the new hole larger than the original and loosen soil in and around the hole. After placing the plant in its new home, use soil from the hole to pack around the root ball. Ensure no air pockets exist and firmly pack the soil (firm not compact) around the plant. If possible, water the plant. During its first year of life (particularly the first summer), the shrub may need a little TLC. Make sure it has plenty of water and keep competing vegetation under control. Depending on the situation, native shrubs can provide great screen along property lines where needed.

**Assess management strategies, review or develop a plan, & prepare for upcoming projects.**

Good planning and preparation ensures you will have everything need-

ed and be ready to initiate projects this summer. I heard a saying that has stuck with me over the years that always reminds me to plan – “People don’t plan to fail, but often fail to plan”. Planning also allows you to prioritize projects, create a budget for the upcoming year, and develop timelines for completion to help you stay on track. Many landowners simply tackle projects as they come up or as they think of them. This strategy can work, but without planning they may overlook or run out of money before addressing a more needed project. We conduct what we call “property management assessments/reviews”. During this consultation, we review/ assess projects that had been completed the previous year, review harvest data or other information that provides insight to how the wildlife we are trying to manage is responding to management, re-assess progress towards goals, assess the habitat and property in general to

determine its limiting factors, and develop a prioritized list of activities that need to happen to help the landowner achieve their goals. While this is a professional service we provide, it is a process that I feel all landowners should go through each year, whether they hire a professional biologist or not, to keep them on track.

**Spring is a good time to check soil pH and apply lime to food plots if needed.**

To check the soil pH, simply collect soil samples and send them to a soil laboratory. Your local farmers cooperative will often have soil collection bags (which normally have directions on how to collect soil samples) and will also know where you can send the soil to be tested. Although there are exceptions, most crops grow best in a relatively neutral soil pH of 6.5 – 7.0. Thus, lime is often needed to enhance the soil (this is particularly true in sandy soils). Because

it can take several months for lime to effectively change the soil pH, checking the soil in late winter will give you ample time to enhance the soil before the spring planting period. Remember, ensuring proper soil pH is often more important than what you plant or how much you fertilize. In fact, proper soil pH is essential for fertilizer to be available to the plants. Although lime can be spread anytime of year, applying it at least 4-6 months before planting will allow time for it to enhance the soil. Lime can be broadcast directly on top of the soil where rain can work it into the growing zone of the soil, but disking it into the soil will speed up the process and is recommended.

**Make preparations for spring turkey season.**

One of the best ways to ensure you have gobblers in the spring is to manage your property throughout the year to promote quality nesting cover (see

turkey habitat management article in the January-February 2009 issue for more detail on creating nesting habitat). I have worked with many landowners who had gobblers on their property all year, but they disappeared during the spring. After closer inspection, their property didn't have good nesting habitat and the hens had moved to adjacent properties carrying the gobblers with them. Quality nesting habitat is created by maintaining a patch work of early successional habitat throughout your property. Burning, herbicide applications, strip disking, timber harvest and roadside management strategies are all tools that can help you create quality nesting habitat for turkeys. Besides the key element of creating nesting habitat, creating strutting zones in strategic areas around your property will help put turkeys where you want them to be. A mower, disk, fire or a combination of these are the tools of choice for this task. Fire is my preferred tool if it can



*Draining water from flooded hardwoods before spring green up is important to ensure quality oak trees remain healthy.*

be used. Strutting areas are simply areas that have relatively little or open ground cover that will be attractive to turkeys for breeding courtships. I often create these areas between roosting and nesting areas and preferably near a food source such as an old field, chufa patch, or food plot. Areas that often lend themselves well to creating strutting areas are powerlines, old fields, food plots and roadsides. Lastly, mowing hunter access trails will help you slip into areas to hunt without making a bunch of noise. If these trails go through thick habitat, don't be surprised if turkeys use the same trails.

### **Fertilize perennial clover plots**

Although I am a fan of planting annual summer crops to provide maximum nutrition through the summer months, I also like to include perennial clover plots in my food plot strategies for diversity and as a year-round crop that will be available when other crops fade out or are being planted. Perennial clover plots will start growing rapidly once spring green up begins and daily temperatures exceed 65 degrees. Fertilizing clover can add a significant growth/nutritional boost to clover and other perennials. Because clover produces its own nitrogen, apply a fertilizer that does not contain nitrogen, such as 0-20-20, during early-mid spring to provide adequate nutrients for clover growth. If you add nitrogen, you are simply feeding competing grasses. Although I strongly recommend pulling soil samples and applying fertilizer accordingly, a "normal" fertilizer application rate for clover in the spring is 200 lbs. /acre. Once the growing season begins, monitor the plot for undesirable weeds and grass. Pre-emergent herbicides are a fantastic tool that will kill weeds before they have a chance to become a problem. If you are unable to apply pre-emergent herbicide, mowing will help reduce undesirable weeds (do not mow too low...your mower should be set to cut just over the clover).

However, if weeds and grasses persist, apply selective post-emergent herbicides for control. Although herbicides are more expensive than mowing, they are often the most effective. Mowing is used to give the clover a better chance to out-compete the weeds while herbicide kills the weeds.

### **Manage water levels in duck ponds.**

Although duck season may be over, leaving your duck ponds flooded will benefit migrating waterfowl by providing energy rich foods for their flight back north. Pond drawdown rate and timing is important and will vary depending on your management strategy (natural moist soil management or agricultural plantings). If you are planting agricultural crops for waterfowl, leaving the pond flooded through early summer will help control weeds. Just be sure to

drain the pond early enough to allow adequate drying time before planting time. However, if you are managing for natural moist soil plants, such as in a beaver pond, you will need to start pond drawdown in the spring to allow desirable native moist soil plants to germinate and grow. Slow drawdowns (over a 2-3 week period) are often desired because they will result in diverse emergent wetland species composition. Quick drawdowns result in decreased plant species diversity and are often composed of undesirable species. If you are managing a GTR (Green Tree Reservoir or flooded hardwood area), use a slow draw down process but ensure water is off the area before spring green up to protect/enhance growth of oaks in the GTR. Some oaks, particularly the more desirable ones for generating duck food, do not do well if left flooded after they begin growing leaves in the spring.



*Did you have this much success with your hunting this year?*

# Nature's Nano Technology - Biochar

## How biochar can help your food plots and tree plantings

### Biochar Properties – A One-Time Soil Amendment

Biochar is a lightweight, highly porous organic material – produced from biomass for use in soil: farms, food plots, tree plantings & gardens.



Biochar's unique physical and chemical properties have the potential to permanently improve soil structure, enhance water circulation, improve nutrient availability and enhance beneficial microbial interactions with plants. Biochar can change the soil's structure to allow compacted soil to breathe, and create homes for microbes. Its durable, stable nature continues to maintain soil quality for centuries. Simply put, biochar can build better soils.

Adding biochar to a field or to each tree planted can cut input costs and improve the nutritional quality of crops grown on poor soil. While biochar has many different effects on soil chemistry and biology, only some of its physical effects are easy to see.



*Biochar Field Trials with James Madison University, Shenandoah Gardens, Shenandoah Valley, VA*  
**Left side** is control strip - No Biochar.  
**Right side** w/Biochar - Crops performed better, had better color with higher yields.

Biochar can improve soil structure by attracting and binding particles into larger structures—known as “aggregates”. Soils with better aggregation are properly

aerated, are better able to let rainwater infiltrate and are less prone to erosion. In short, soils with better aggregation have better tilth. Such an effect is, however, unlikely to be visible in the short term—biochar needs time to interact with other soil constituents and its effect improves over several years after application.

Biochar does not decompose like compost or manure, which disappear from soil within a few years, creating a steady need for annual re-application. Years after being incorporated into your soil, biochar keeps on working and some of its effects improve with time. As biochar matures to improve aeration, drainage, nutrient retention capacity and tilth, it fosters beneficial soil microbes that perform key roles in nutrient cycling. Biochar builds a permanent healthy soil.

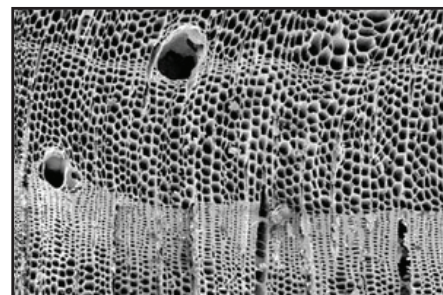
Scientists studying Terra Preta in South American rainforest describe its teeming microbial communities as a “microbial reef.” Like a coral reef does for sea-life, biochar does for the soil, supplying food and shelter. Instead of sheltering marine life, biochar supports an underground ecosystem of fungi, bacteria and other organisms—the base of the soil food chain. When times are lean, biochar is a reservoir storing bio-available nutrients. When times are full, biochar is a platform for microbes to launch a biological bloom of soil-enriching activities.

**Can prescribed burns produce biochar?**  
In an oxygen-rich burn, only ashes remain after total combustion of biomass. Low temperature smoldering fires are a natural charring process in prairie and forest ecology. Pyrolysis (the process used to make biochar), develops wherever low - or no-oxygen conditions occur in fire's uncontrolled chaos.

Forest & prairie fires produce natural biochar though only at a rate of 1% due to the open-air environment that fuels it.

National Geographic called biochar a “soil within the soil.” At plant scale, roots search the soil for water and nutrients. At a microbial scale, bacteria and their

buddies eat molecules retained in biochar pores to convert them into nutrients for plant roots. Biochar promotes resilience and diversity in this network of nutrient cycles.



*Biochar's internal structure - magnified 1000x. Biochar consists of cavities that retain water & nutrients that are released when plants need them. What can be seen here are the larger pores of biochar, it also has pores that are too small to be visible at this magnification.*

A land owner can let this “microbial reef” do the work of growing strong plants, while biochar also helps to buffer changing rainfall and water, unusual weather and fluctuations uncommon to soil. Land owners should see themselves as microscopic zookeepers—raising and sustaining vibrant communities of soil microbes. Growers should see soil as a complex living system—to be stewards of living microbial ecology.

Email us for a free copy of the eBook: **Biochar, A Field Guide for Land Owners & Farmers**, written by Soil Scientists, Agronomists & Horticulturists.

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