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Earl Says…

As I'm writing this with just a few days left in the Alabama deer hunting season, I've figured out that the older I get, the colder I am in the stand. And with the latest snowstorm we recently had I had to make a special effort to tough it out. But as the saying goes, "you can't kill them from the couch".

With turkey season coming up next, I wanted to remind you all about the upcoming **National Wild Turkey Convention** in Nashville, TN February 13-15. If you will be attending, please take the time to stop by our booth we will be sharing with The Wildlife Group.

Thank you all for subscribing with us and contact me with any article ideas or questions you may have.

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Cover Photo by Patrick Nash

The Importance of Openings to Wildlife in a Forested Landscape

By Ryan Shurette

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Seasonality matters when disking fallow fields. A study in 2001 by Carver et. al. showed that fall and winter disking was much more favorable regarding bobwhite quail brooding habitats, resulting in an increase in Solidago spp. (goldenrods), Rubus spp. (blackberry/dewberry), and Ambrosia artemisiifolia (common ragweed) shown here.

The incorporation and maintenance of open habitats in a wildlife management plan is standard, especially in the heavily forested systems of the Southeast. Out west, there's often a lot of open space, ranging from prairies, deserts, meadows, or open rangelands. However, almost every wildlife management strategy east of the Mississippi River will include either creating new openings or maintaining existing ones for game and non-game wildlife. This recommendation is probably as common and fundamental as the "thin and burn" mantra that has been engrained into every biologist and habitat manager in the region. If we think about it, isn't the chief desired result of thinning and burning, at least in a wildlife management context, really just the creation of open habitats under a given timber stand anyway? What do we really mean when we say we should "provide openings" for wildlife? What kind of "openings" are best? How big should they be? Where should they be located? What should be planted in them, if anything? The answers will obviously depend on many factors (such as the region, soil type, existing resources on the property, the type and structure of forest in the vicinity, and most importantly on what particular species, or suite of wildlife species, being managed for) but there are almost always logical answers to these questions.

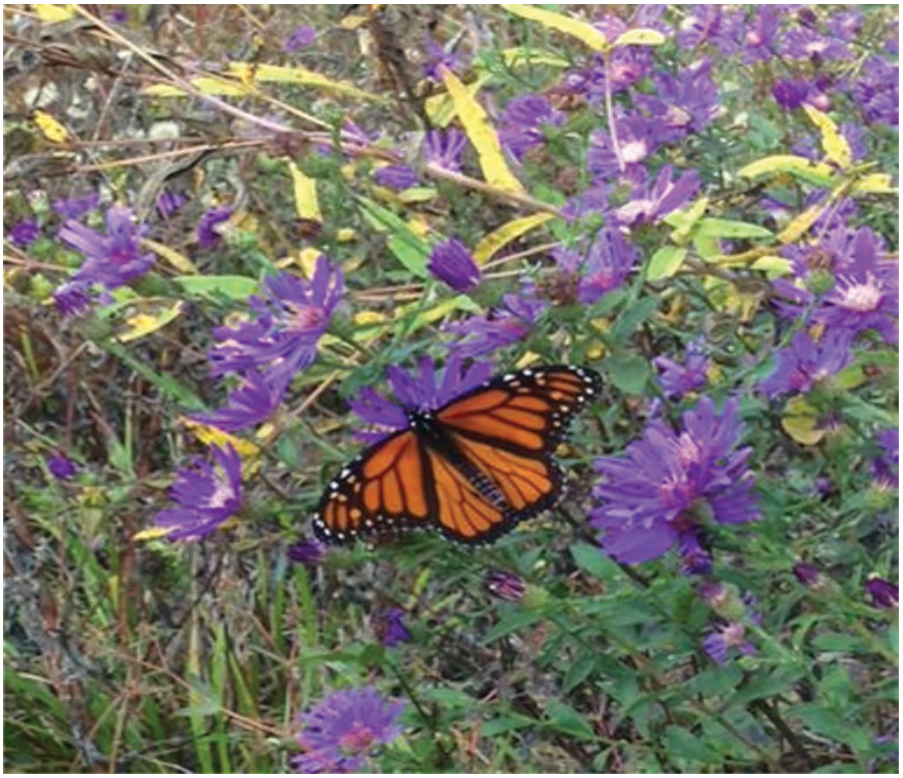
In this article we will address these factors and the other aspects of managing openings for wildlife.

Let us first establish the definition and scale of a wildlife opening. The Merriam-Webster dictionary initially defines an *opening* as "something that is open, such as a breach, aperture, or open width or span." On a relatively small scale (perhaps as a bobwhite would see its world) an opening could be the eight or ten inches of bare ground between clumps of bluestem grasses, where weed seeds can be scratched out. These kinds of micro-openings are indeed critical to its survival. However, Merriam-Webster goes on to expand the definition to include an "area without trees or with scattered, usually mature trees that occurs as a break in a forest". When most land managers think of openings, this characterization and scale is obviously what they're talking about. But even so, if you ask a hundred people to describe what forest openings on a property should look like, you'll get a lot of different answers and opinions. Some deer hunting club members, for example, might describe ideal openings as larger food plots planted in cool-season attractant forages, such as wheat, oats, rape, or clover. Or they might also endorse high-protein warm-season legumes that can help to build antler mass and increase doe fitness and reproduction potential. If quality deer management, or even just a high frequency of hunter-deer encounters is the goal, these recommendations may very well be the best thing one might consider across a property. For turkey hunters it might even be similar, and there might even be a few other game and even non-game species that would benefit from this "food plot" scenario. But most hunters and managers recognize that these examples are fairly narrow functional descriptions of forest openings. Even deer and turkeys have needs besides food that can be provided by certain kinds of openings. Think about bobwhites. They spend 95% of their life in what we might consider an opening, or at least an arrangement of openings, even though those habitats might exist under timber stands. Many wild animals are adapted, and even bound in many cases, to early-seral herbaceous plant communities, whether they exist in treeless fields or under sparsely forested systems. So from a wildlife management perspective, an opening might actually be thought of as any significant area that has sufficient sunlight reaching the ground such that early-successional vegetation can be released or expressed. Even if those areas are planted as a food plot. One of the most important things to remember about openings is that they bring the energy of the sun close to the ground (first through the process of photosynthesis in the herbaceous vegetation there and then by the storage of that energy into the insect and other invertebrates) so that it can be accessed by a diversity of species. Whether they eat seeds, flowers, buds, leaves, corms, bulbs, tubers, the insects the plants provide, or the animals that eat any of these foods, this kind of ecosystem is often very rich in food (and cover) resources.

Recent clearcuts can provide excellent early successional plant resources but they must be burned or receive some kind of periodic disturbance so they won't develop too much woody encroachment which will eventually shade out the understory plant community.

Since different species have very different requirements and needs, it stands to reason that the abundance and availability of openings are more important to some wildlife species than others. This statement is true of course, and can be effectively illustrated by birds, since they're represented by so many species, virtually all of which are all adapted to different habitats and food resources. Bobolinks, for example, eat, roost, nest, and spend all phases of their life in early successional habitats like open meadows, prairies, and fields. In fact, they avoid forested areas and even forest edges. This bird is a

Kentucky Department of Fish and Wildlife Resources publications recommend either late February to mid-March or late August to September for most wildlife mowing. This gives the broadest number of wildlife species the best chance at successfully completing important life cycle stages without disruption.



The diverse herbaceous vegetation in wildlife openings can provide important nectar and host plant habitat for monarchs and other butterflies.

species of conservation concern since it has declined across much of its range, largely due to a decline in open native habitats. Ideal managed openings for this species in the breeding season would be fairly large (several acres or more) and would consist of native forbs and legumes mixed among bunchgrasses, although they can also be sometimes found in hayfields, vetch, and agricultural crops. Bobolinks winter in the grasslands and marshlands of South America. Mourning doves are another popular species that do well with large open spaces. On the other hand, at the opposite end of the spectrum from bobolinks, many bird species (such as pileated woodpecker, yellow-billed cuckoo, blackburnian warbler, hairy woodpecker, barred owl, and red-eyed vireo) couldn't care less about treeless openings in the forest. This is because their diet, and life cycle for that matter, doesn't depend on anything these openings provide. In fact, some of them might feel quite exposed and vulnerable in large openings. Open areas provide unobstructed space that allow for visual scanning and pursuit of prey by several avian predators, such as the red-tailed hawk.

For this reason, some bird and small mammal species prefer edge habitats where open spaces meet forested habitat, theoretically so they can escape the opportunistic, and relatively fat and slow Buteo (soaring) hawks. Species like song sparrows, gray catbirds, northern flickers, eastern bluebirds, northern cardinals, and indigo buntings are frequently observed in or near edge habitats. Often the shrubby transition area where an opening gradually blends into forest is what these edge-loving species actually utilize for protection and cover. But even here they are still not completely safe. Cooper's hawks can quickly and easily navigate tree limbs in flight and are more effective at catching birds than red-tails. Other predators have learned to hunt edges too. Coyotes, foxes, raccoons, skunks, and many snake species

have been shown to concentrate their hunting efforts on edge habitats and use them as part of their daily hunting routines.

Just as a large clear opening can allow visual detection of prey, it also allows some potential prey species to keep a defensive eye out for predators. Wild turkeys, which have excellent daytime color and movement detection, are known for using fields and open forests to maintain a visual defense for predators, and they won't typically forage long in thick shrubby woods or brush for this reason. Anyone who hunts field or pasture turkeys knows how difficult it can be to fool a turkey in this type of setting. As long as they can see over the grasses, crops, or ground cover they're standing in, turkeys seem to have the upper hand. Dense native herbaceous vegetation in openings can provide bedding cover for deer, nesting cover for quail, forage and cover for eastern cottontails, nectar and host plant habitat for monarchs and other butterflies, berry and insect foraging for red foxes and black bears, hunting ground for northern harriers, bugging and nesting habitats for eastern meadowlarks and dickcissels, pollen stores for native bees, nesting for short-eared owls, and countless other requirements for a myriad of wildlife species.

We've established that wildlife will readily visit and use openings for a variety of different reasons. Therefore, many managers maintain their openings in different conditions and varying stages of succession to provide a diversity of benefits. Again, the preferred recommendations would depend on where in the country you are and what species you want to benefit most, but it is usually a good idea to consider a diversity of openings, even if you are only interested in game species. But it also depends on the amount and condition or quality of the existing early successional habitat you already have in either existing permanent openings, or under the timber stands on your property. For example, if you have a thousand-acre property and 200 acres of it is occupied by well-thinned, open pine forest (with a basal area of less than 50 or 60 square ft per acre) with a good grassy understory, you might not need any additional native openings or meadows, particularly if only deer and turkey are the priority. In that case you could focus on managing any additional openings as non-native food plots for supplemental nutrition or as attractants for harvest. But if all the thinned habitat was located on one far end of the property, as opposed to several locations spaced across it, there might be a benefit from adding more native openings on the lacking side too to improve availability, even for fairly mobile game species like deer and turkey. If the entire property is in dense mid-rotation pine plantation, adding some significant openings would almost always be very beneficial since herbaceous plant resources would likely be a limiting resource. If bobwhites were the only priority however, you would likely want to maximize native herbaceous habitats under timber stands, and even then, probably include several additional permanent openings, managed for native bunchgrasses (nesting habitat) or annual pioneer plant species (brood rearing habitat). Wild turkeys aren't as particular in their brood-rearing habitat as quail and they will readily use forest openings or road rights of way containing common grasses like foxtail, panicum, and crabgrass in the late spring for brooding their poults. For maximum wildlife diversity and a focus on non-game species and pollina-

If you ask a hundred people to describe what forest openings on a property should look like, you'll get a lot of different answers and opinions. Effective forest openings can range from permanent native herbaceous vegetation, to periodically mowed or disked fallow fields, to food plots planted with cool-season attractants or warm-season agricultural crops (shown here).

Wild turkeys aren't quite as particular in their brood-rearing habitat as quail and will readily use small forest openings or road rights of way containing grasses like foxtail, panicum, and crabgrass.

tors, managing several types of openings, and alternating succession across a few years (one-, two- and three-year+ stages), might be ideal. Varying the size of openings is a good way to appeal to a broader array of species too. Larger openings (greater than 3 acres) are preferable by some species (like doves) but even small openings can have value if they occur in a dense shady forest which could be otherwise devoid of herbaceous vegetation.

Now that we've established the diversity of their use, let's talk about how to create and maintain some different types of openings. Throughout the southeastern region's natural history, openings (I.E. treeless conditions) were maintained on the landscape by several physical conditions and natural events. Geological factors and soil characteristics of a region can sometimes influence the openness of a forest or produce treeless openings at a particular site. If the soil is too thin over the underlying bedrock to support trees (such as in a glade) open herbaceous conditions will be expressed. And a similar expression can occur within wetlands, marshes, or bogs where it is simply too wet for trees to thrive. Many rare plants and animals occur in these habitat types, but we won't focus on these types of openings since their characteristics are driven mainly by the physical environment of the local site.

We know that fire influences forest structure and composition and that it can effectively promote early successional habitats. And we also know that fire frequency, intensity, and seasonality can play a significant role in what the landscape and resulting vegetation looks like. Fire is a cheap and extremely effective tool for keeping sapling trees and woody brush at bay. And for that reason, many land managers use it, not only in thinned timber stands, but also for maintaining their permanent old fields and openings. Yes, fire alone can be effective, but usually only if the vegetation that is being managed for is conducive to it, or in other words only if the vegetation in the opening produces enough consumable fuel to carry a fire which is intense enough to kill the woody competition. Fields dominated by native bluestems or Indiangrass are usually an adequate fuel type and therefore can be maintained easily, and theoretically indefinitely, in an open state by fire alone. Although there is a lot of local variability, winter and spring burns generally favor native bunchgrasses while growing-season burns can help release forbs.

But if you are a quail manager and want to promote and maintain an abundance of permanent openings with a flush of semi-succulent pioneer plants like ragweed, Diodia, partridge pea, and goldenrod, specifically for brood-rearing in late spring and early summer, there are likely even better methods than burning. Fall or winter disking on a two- or three-year rotation (at a depth of 2-4 inches) can promote and refresh legume and forb composition and abundance where grasses have become too dense. Seasonality matters when disking fallow fields. A study in 2001 by Carver et. al. showed that fall and winter disking was much more favorable for bobwhite quail brooding habitat and they found that "spring disking promoted agronomic weed species such as *Senna obtusifolia* (coffeeweed) and *Crotalaria spectibilis* (showy rattlebox) which have little food value to quail". This study found that fall disking on the other hand resulted in an increase in *Solidago spp*. (goldenrods), *Rubus spp*. (blackberry/dewberry), and *Ambrosia artemisiifolia* (common ragweed). If quail, or other ground-dwelling precocious birds such as turkey, are not your management focus, this seasonality might not make that much difference. And if you will be preparing the soil more

intensively to plant crops, their germination and planting time will dictate the seasonality of soil preparation. Fallow disking takes advantage of the wild and existing seeds in the seedbed, and they can efficiently serve their purpose in establishing good habitat in many cases, depending on the focal wildlife species and manager's intent. If you are planting food plot crops it is usually well worth it to get a soil test at the location of the opening (unless you already know your soil characteristics) to ensure the planned crop plants will thrive. With fallow disking this doesn't really matter since the local "weed" seeds will be doing the work anyway.

For properties that are occupied by closed canopy timber, clearcutting (in patches or across the entire stand) is one of the most obvious methods of converting forest to openings. Typically, additional treatments (like stumping with a dozer, etc) are made if the opening will be maintained with equipment. This work can be intensive and therefore it is sometimes handled via the timber sale contract and performed by the purchaser or contractor, since they will often have the necessary equipment onsite. Recent clearcuts themselves can provide excellent early successional plant resources but they must be burned or receive some kind of periodic disturbance at some point so they won't develop too much woody encroachment, which will eventually shade out the understory plant community. The history of an area being used for the opening can dictate what management options or treatment recommendations would be best. For example, if the opening has just been created from an intact pine forest that has no signs of exotic plant species, it will likely be much easier to establish a native plant community of bunchgrasses and composites there, than say an existing field of fescue or Bermudagrass, or even an agricultural crop field where countless other undesirable and aggressive weed seeds might lie in wait in the seedbed. Open spaces occupied with exotic pasture grasses and agricultural weeds can have some limited benefits (such as turkey brooding) in some cases, but usually they are not very valuable (with respect to food or cover) to many animals besides livestock. That is where the landowner must decide how much cost and effort and they want to invest, and whether to restore their openings to a native plant community, plant them as food plots, or just simply let them be and not worry too much about their vegetative composition. If the latter is the choice, periodic mowing can be a simple and cost-effective method. Besides burning, periodic mowing is probably the cheapest way to maintain early succession, especially if the openings are accessible and the size and total area is not too large to manage with equipment. Bushhogging, even if done only every few years, can be enough to keep most hardwood saplings at bay and allow beneficial herbaceous plants to establish. Seasonality of mowing is a popular topic of debate. No one timeframe will work best for all species, but managers usually recommend periods that are the least disruptive to the priority wildlife species. If nesting and brood rearing are important to the landowner, it is probably best to mow outside the times these activities are occurring. But it is also important to allow time for vegetative growth and establishment in these habitats, so that they can successfully occur in the first place. Kentucky Department of Fish and Wildlife Resources, for example, recommends either late February to mid-March or late August to September for most wildlife mowing. This general recommendation gives the broadest number of wildlife species the best chance at successfully completing important life cycle stages each year. Sometimes with repeated mowing alone, grasses (even desirable native grasses) can become dense and crowd out more favorable plants like legumes and forbs. In this case, incorporating growing season burning or periodic disking into the mowing regime can often increase the vegetative diversity. Again, it depends on the objectives and focal species in the management plan.

Herbicide certainly has its place in wildlife opening management also. Modern formulations offer a lot of versatility, and they can be used to selectively and effectively manipulate vegetation in an opening. In pastures or old fields dominated by sod-forming grasses like Bermudagrass, products like glyphosate and imazapyr are commonly used to clear the slate so that natives or desirable forage plants can be successfully planted (although this will usually take multiple treatments across two or three seasons to complete). If bahiagrass is the dominant target, methsulfuron methyl is generally more effective. And if tall fescue needs to be removed, a fall application of imazapic is typically the better choice. For releasing specific plants in an existing opening there are also many options across the selective products available. Besides plant species selectivity, another advantage of using herbicides for opening maintenance is that they can be used to treat brush and tree saplings in an area where ground disturbance or equipment restrictions occur. If some hardwood saplings have encroached into an opening that you can't readily get a tractor into, a spray bottle with a

50:50 mix of triclopyr amine and a small hatchet might be all you need to make an effective hack-and-squirt application to kill them and prevent most re-sprouting. Or if the saplings are cut and removed, the rootstock can be treated with essentially the same effectiveness by immediately squirting all the outer ring (cambium area) of the severed stumps. Cut-stump and hack-and-squirt applications generally need to occur in the fall or winter when the sap is down. In some cases, simply girdling trees can be used for creating a temporary opening, but this technique is usually only for creating small openings, or again in areas equipment can't go. Although it has a lot of utility, herbicide can also degrade open habitat conditions for wildlife simply by decreasing vegetative diversity. In large agricultural operations, especially where non-palatable crops (like cotton) being grown, herbicide usually does a great job in reducing crop competition, but in doing so it removes all of the beneficial forage-, flower-, and seed-producing plants that many species might otherwise use for habitat. When I think of herbicides in regard to wildlife opening management, I tend to think of their most important uses as treating woody competition in herbaceous situations, and cleaning up exotic pasture grasses, as their two primary utilities.

In summary, openings can be critical to a successful management plan, especially in forest-dominated landscapes, depending on which species or list of species being prioritized. Openings are not important to all animals, but for those species of wildlife that do use them, each will have its own unique component requirements, and this drives the condition and composition need for any given opening on a property. Openings can be managed (through methods such as controlled fire, mowing, disking, and herbicide applications) in a variety of different successional stages, using a diversity of plant species ranging from non-native food crops to native grasses, forbs, and legumes. The herbaceous plants which occur in open habitats can serve as the basis for meeting the food and seasonal cover demands for the focal wildlife on a property. While plant species composition under large timber stands can be coarsely adjusted by management, these plant communities can often be fine-tuned in dedicated wildlife openings.

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SEASONAL FIRE
Prescribed Burning in Winter and Summer

By Ted DeVos

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Backfires move slowly against the wind and are good for securing downwind firelanes and consuming heavy fuel areas.

Prescribed fire is one of the most useful yet misunderstood and under-utilized tools for land managers, foresters and wildlife biologists. While there seems to be some increase in the use of fire in woodlands in the last decade (roughly 1 million acres in Alabama), there are many more millions of acres that need burning and are not getting it. In this pair of articles, we will discuss the benefits, risks, and opportunities of burning during the different seasons of the year. The first article will cover use, benefits and techniques of cool or dormant-season burning and the second will cover growing-season burning.

In the deep Southeast, fire has been an integral part of the evolution of our woodlands. From East Texas to Virginia, from the Gulf of Mexico to the Appalachian Mountains, the natural ecosystem has been driven by regular fire. Most of the coastal plain area south of the piedmont was forested in Longleaf pine and, historically, a burn interval of 2-5 years was the norm. Lightning or native American set fires burned vast acreages and the habitat it created was described by early explorers like William Bartram in the 1770's. He described "a vast forest of the most stately pine trees

Spot head and strip head fires allow you to burn more acres with less intensity and damage.

that can be imagined", which continued for many miles". Another description – "passing through a level, open, airy pine forest, the stately trees scatteringly planted by nature, arising straight and erect from the green carpet, embellished with various grasses and flowering plants". For those who think old-growth hardwood forests of oak, beech and chestnut were the natural pre-settlement condition of the Southeast, there is this account: While passing through South Carolina's longleaf forests in 1858, Englishman Charles Mackay wrote

> "Where, northward as you go,
> The pines forever grow;
> Where, southward if you bend
> Are pine-trees without end;
> Where, if you travel west,
> Earth loves the pine-tree best;
> Where, eastward if you gaze,
> Through long, unvaried ways,
> Are pine-trees evermore.

These early explorers also described abundant wildlife populations of deer, turkeys, bear, panthers, bison, elk, pigeons, etc., all dependant on the fire-maintained woodlands of the Southeast. Needless to say, fire was and is an important driving force in our woodlands.

In our business, we see plenty of properties that utilize regular burning and enjoy the benefits of it. We also see plenty more properties that either don't burn or don't burn enough to make much of an impact. The benefits of prescribed fire are many. Regular burning:

- "opens up" the understory of pine woodlands allowing easier wildlife access
- increases visibility and hunter access, thereby increasing hunter success and enjoyment of the land
- increases aesthetic values and promotes wildflower production
- helps control the density of shrubs and hardwood saplings, allowing more sunlight to reach the ground
- encourages a more open understory grows more grasses and weeds providing food for all wildlife species
- promotes legumes and perennial grasses for food and cover for wildlife
- acts as fertilizer for some understory plants
- reduces hazardous fuel buildup that leads to wildfires
- Helps control some insects and diseases
- Helps increase timber growth by controlling competing vegetation
- Helps increase timber value by allowing loggers visual access to all timber so they know what they are buying
- Helps decrease negative impact of logging by cleaning up sapling hardwoods before loggers are on site

Remember though, if you have a pine site that has never been burned and is choked up with midstory hardwood saplings, one burn will NOT make a significant impact. However, regular burning, especially in conjunction with mechanical or chemical control of the hardwood saplings, will clean up and maintain a beautiful and productive pine woodland.

Most burning in the Southeast is conducted in the winter or "cool season". It has become the traditional time to conduct burns because 1) no nests or young-of-the-year wildlife are at risk and 2) regular fronts pass through leaving consistent winds and 3) dead vegetation is abundant and available as fuel. Cool temperatures and lower humidity are very conducive to burning. While only focusing on this season limits the time and acre-

age you can burn in a season, this is the season we will focus on in this article. Growing season burning will be discussed in the following article.

Because of the lower humidity and consistent winds of late winter/early spring as well as dry fuels on the forest floor, winter/spring is a relatively simple season to burn. A large amount of acreage can be burned in a relatively short window of time. Dry broomsedge and pine needles and even hardwood leaves act as a good fuel base for fires. This is an excellent season for "maintenance" burns to help keep fuel loads low and control the density of shrubs and small saplings. It is also a good time for first burns to reduce fuel accumulation while acclimating the area to burning where fire has rarely been used. Some conditions dictate winter burns only:

- Longleaf less than 15'tall
- Sites that have not been burned in the last decade
- Hardwood sites

The caveat is that while conditions are often good for burning, weather conditions are often "too good" for burning. Humidity levels lower than 25% and winds above 10 mph are common and make burning volatile. Under these conditions, prescribed fires become unstable and can be hard to control. Since liability is a major consideration in prescribed burning, making sure that conditions are suitable and your fire stays inside the burn area is essential. It is amazing how much more valuable the neighbor's timber is when it has been damaged by an escaped fire. It is usually MUCH more valuable than any logger or procurement forester would pay for it!

Keeping control of YOUR fire and reducing the impact of YOUR smoke is of utmost importance. Escapes do happen and plans for how to stop escapes are an essential part of the planning process. Smoke management is also a major liability concern on all burns and knowing what your smoke is expected to do and where it will go is also important in planning the burn. Knowing where any housing developments, urban areas, airports, schools, hospitals, roads or other smoke-sensitive areas are allows for planning required wind directions and smoke dispersion levels for your burn area. For instance, if you have a road bordering your burn unit on the west and north side, you will need a north and/or west wind to move smoke away from this hazard.

The type of fire to be applied is usually dictated by the terrain, weather conditions, timber type and age, fuel loading, fuel type and desired results. Discussing backfires is a sensible place to start. **Backfires** are fires burning AGAINST the wind. With winds out of the north, for instance, a backfire is one set on a southern

Having dead standing snags along your firelanes is an excellent way to have jumps across the fire lane.

Headfires are ideal for burning open grassy woods with little damage and a lot of acres in a short time.

firebreak and burns slowly to the north. Backing fires have the least intensity, flame length and rate of spread. Backing fires, however, have more "linger time" and do a better job of consuming fuels and burn deeper into the duff. These fires tend to be the safest and easiest to control. It has the least chance of scorch and is best used for "securing" downwind sides of burn units, as well as burning heavy fuel areas and young pine plantations. Bear in mind, however, that with a 180-degree shift in the wind, a backing fire becomes a head fire instantaneously! Due to the slow movement and better fuel consumption, backing fires can damage feeder root systems if soils and surface duff are too dry or in areas with heavy fuel buildup. Also, burning large areas takes a long time with backing fires.

Head fires are those fires that burn WITH the wind. These fires are usually fast, hot, don't linger long and have high flame height. They can often carry, or throw, burning brands, leaves or other debris a considerable distance increasing the chance of an escaped fire. Burning large areas with head fires should only be done when the risk of escapes is minimal and all downwind areas are considered safe. For instance, large sections of open, grassy, pine woods in quail plantations can be burned with controlled head fires very quickly. This makes burning very cost-efficient.

However, head fires can also scorch timber easily, even large sawtimber, due to the release of a lot of energy in a short time frame. Canopy heat is usually much greater with head fires than with other types of fires. Head fires are best used where large acreage of light fuels need to be burned, especially under mature timber. Breezy conditions make the fire move faster but also keeps heat from building up in the canopy of the trees. Head fires produce a lot of smoke but quickly go out once the fire is past. This shorter "linger time" makes head fires ideal for burning young longleaf without damage to the bases of the trees.

Flank fires are those fires that burn at right angles to the wind. Because winds shift considerably

Breezy days with high dispersion allows the smoke to dissipate in the atmosphere more quickly and reduces impact of your smoke.

Burning young longleaf on windy days helps reduce damage and results in a fast fire with little linger time.

during a burn, flank fires usually alternate from flank, head, and back fires. These fires are useful for securing the "sides" of a burn block, where the downwind side has already been burned and secured with a backfire and the sides of the block are lit into the wind. Since these fires are usually a combination of back, flank, and head fires, they can be used to ignite larger amounts of acreage. Linger time, flame height, intensity, heat, and smoke all are intermediate between head and back fires.

These three types of fires are the most common used to secure burn block boundaries. Commonly, spot and strip head fires are used in the interior of the burn block to "finish out" the burn. **Spot fires** are simply individual spots of fire set inside the burn unit and allowed to burn to the downwind side. Spot fires combine all directions with head fires burning downwind, flank fires burning sideways and backfires burning into the wind. **Strip head fires** are lines of fire let to burn with the wind to the backfire burning off the downwind break. These fires consume more acreage with the head fire portion than the backfire but do burn with both back and head fires. The distance these fire types are set from the downwind fire dictates how hot your fire will be and how quickly your fire will burn the unit. The farther spot and strip head fires are set behind the downwind line, the hotter your fire will be and the more acreage will be consumed. Bear in mind that the areas where these fires meet will often be intense and can result in scorch.

By the time most folks are burning "winter" burns, fuels have had plenty of low humidity and windy days to "cure". These fine "dead" fuels like broomstraw and other grasses, pine straw and small sticks and brush dry out quickly after rain events and often, after one to two days, will burn quick and hot in low humidity conditions. Volatile conditions of low humidity and/or higher winds often result in "poorly behaved" fires that seem to always attempt to get out of the burn unit.

This is especially true in areas where the fine fuels are "held up" off the ground. The amount of fuel and how high off the ground it is has a lot to do with how it will burn. Fuels like pine straw can be flat on the ground in a mat or held up off the ground on bushes, branches, etc, like a "ladder". Situations where bushes like blueberry, wax myrtle, yaupon, etc. have draped pine straw, allows these fuels to dry very quickly and burn with access to a lot of oxygen. This can result in a very hot fire that "climbs" up into the tops of smaller trees. This is often the case where a site has not been burned in several years. Care must be taken to burn these sites carefully and slowly to avoid scorch and an escaped fire. One or two cool fires on sites like this help reduce this heavy fuel loading and removes the shrubs that hold the fuel off the ground. Later fires become more easily controlled.

On sites that have been more regularly burned, shrubs and small saplings are often less prevalent and fuels are composed of more "matted" pine straw and lower fuels like broomstraw and other grasses. While these fuels can burn quickly, they are, typically, not as hot nor tend to climb into the canopy. Winter fires are ideal to maintain these conditions and keep fuel loading low.

Interestingly, winter burns have a much better chance of burning down into hardwood drains and

The summer following a burn, the understory is composed of an abundance of high quality food and cover for wildlife.

bottoms than growing season burns. Allowing fires to burn into hardwood areas is not a particular problem unless the fire is hot. In all fires, there is a risk of damage to hardwoods that you want to keep and high value stands of bottomland hardwoods, especially sawlog size trees, can be damaged by a hot fire. While a low-intensity backfire creeping into a hardwood stand usually does no damage, a fast, hot fire in low humidity and dry conditions can create a significant amount of "butt scars", rot, mortality and reduce the value of sawlog hardwood. Many landowners establish permanent firelanes along all hardwood areas to prevent fires from entering hardwood stands. Those who prefer a more "natural" look let fires go into bottoms as the conditions allow.

Fire CAN be used in hardwood and mixed pine/hardwood stands, however care should be taken to use slow, cool fires to avoid damage to crop trees. Some species of hardwoods have developed thicker bark and are quite fire-tolerant. Upland oaks like white, post, southern red and other hardwoods like dogwood, and hickory have thick or "corky" bark and are very fire tolerant. Thinner barked "slick" trees like water oak, maple, etc. have the least fire tolerance and are easily fire damaged.

The bottom line with winter burns is that while conditions can be more volatile, fires can be used to impact a large amount of acres in a brief time. Smoke dispersion is usually better and winter burns tend to produce less smoke because fuels tend to be drier with less "greenry". Cooler temperatures help keep scorch to a minimum. Heavy fuel loads and ladder fuels can be diminished easily this time of year. However, winter burns do not do a very good job of controlling hardwood sprouts and brush coverage. They can top kill sapling hardwoods up to 3-4 feet tall but do little damage to saplings larger than that. While they tend to do a good job of promoting "good" wildlife weeds and grasses, as we will see, there are better ways to promote good wildlife cover and food.

A quick note about firebreaks is in order as well. Firebreaks can be anything that a fire will not cross and often is different depending on the conditions. Wet creek bottoms, roads, and disked or bulldozed dirt lanes are the most common. However, a grassy road that has been driven on all winter and is

packed down may hold a fire on one day with high humidity but fire might cross it vigorously on another day. A paved road is a good firebreak but if there is a lot of traffic it may not be the best firebreak to use. It is also very possible for fires on windy days to throw an ember across a paved road easily.

Burn conditions to be highly aware of and knowledgeable about are as follows:

Humidity – is often the driver of how well your fuel will burn. Humidities in the 30-55% range are preferred. Humidities in the 20's can be dangerous and volatile. Above the 60's it can be difficult to burn.

Temperature – Warm days dry out fuel better than cool days. It can be hard to burn when days are close to freezing and fire on days over 80 degrees can be damaging.

Surface wind speed and direction – Wind does some obvious things like move a fire and clear smoke. It increases ventilation and oxygen to the fuel helping it to burn in addition to helping it dry out. Some wind is almost always desirable. Wind speeds above 20 mph can start to get volatile unless in heavily forested stands.

Transport wind and direction – Transport winds help move smoke away from the burn unit and higher mixing heights help dissipate smoke plumes effectively.

Dispersion – Dispersion and atmospheric stability also help indicate how well smoke leaves burn units. Low dispersion days and stable conditions make smoke linger and risks smoking in roads or communities. High dispersion and unstable conditions allow smoke to disperse into the atmosphere. Keep in mind that dispersion almost always gets worse after dark and winds usually decline so smoke can linger and stay close to the ground overnight.

Probability of ignition – POI is an interaction of fine fuel moisture and temperature. It is measured in percent. If POI is high (70%+) and a hot brand falls across the line the chances of it resulting in a jump are high. Low POI can result in having a hard time lighting a fire.

Many of these conditions interact closely so days with higher temperatures and higher humidity can burn similarly to cooler days with lower humidity. Also, as a rule, humidities drop during the day as temperatures increase. A fire lit at 10 o'clock will be much more volatile at 2 o'clock in the afternoon so plan accordingly. Terrain is another condition that makes a significant difference in fire behavior. Fires burning up a hill act completely different than one burning down a hill.

General Rules and Conditions of Concern

AKA, How to NOT kill your timber and burn off the neighbors!

- Always secure the downwind side of burn blocks with firelanes, a body of water, creeks, roads, and/or backfire creating a "blackline" that is burned out and with no remaining fuels before attempting to burn the rest of the block.
- Burning is volatile when humidity is below 25%, soil moisture is low (KDBI index more than 400), winds are above 15 mph, or any combination of these.
- Fires nearly always burn fast, hot and head fire uphill. Unless you know what to expect, never light at the bottom of a hill or in a ditch going uphill.
- On windy days with low humidity, expect spotting across the firelanes with any head fires.
- In most cases, burn ridge tops first, where most scorch occurs, and allow the fires to "drape" off the sides of the ridges to the bottoms. On steeper slopes, most fires will "back" downhill regardless of wind direction.
- Ring fires (stringing fire completely around the burn block perimeter), will almost always result in severe damage in the middle. There is probably more timber damage done because of burning with ring fires than any other technique. The more walking out and stripping/spotting the middle of the burn blocks, the better the burn results.
- If smoke dispersion levels, fuel moisture levels, or humidity levels are too low, or winds too high, POSTPONE the burn. Better to burn another day than risk having to "fight" your fire all day or burn on another property.
- Take your time!! Rushing will get you into trouble, damage timber and result in jumps.

Starting Your Lake Over

By Scott Brown

This 40-acre lake drained in under an hour, after a 14-inch rain event in under 30 hours breached the 70-year-old dam. It was full of trophy largemouth bass, 14-inch black crappie, and 11-inch bluegill and redear sunfish.

This year made for some devastating weather in various parts of the country, including hurricanes inland where they have never been, and rain events flooding property that had never seen water that high. Several lake owners in the Southeast had lake and pond dams break, and will have to start completely over once the dam is repaired. Starting over with a waterbody that was previously there is slightly different than starting a new waterbody. Careful planning makes for a quicker turnaround, easier to manage, and longer lasting waterbody in the future. There are many things to consider when rebuilding a lake. This article will cover from a dam failure to an established quality fishery.

Whether you are building a new lake or must start over on an existing lake, we recommend inviting a professional lake manager to meet with you on site to look firsthand at your situation and provide expert advice. On rebuilds, changes can be made before it is refilled that will improve the previous waterbody's water chemistry, habitat and/or fish population. The best advice I can give, is have patience. Yes, you lost some quality fish downstream, but with some work, funding, and knowledge, it can be better over the next 10-15 years than it was. This early success in a lake's life is known as the New Reservoir Syndrome.

Before stocking you must ask, was the entire population lost, or was there a large area of water remaining that could have harbored a good number of predators (largemouth bass). There may be an area to harbor a good number of your fish, but if total draining is necessary to properly repair the dam, they will still be lost. Do not cut corners on dam reconstruction, it needs to be the best it can be.

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Once you accept the fact that it really happened, and that can be tough to believe even when you are standing looking at it, the first step is identifying good and bad things about the old waterbody. Did the old waterbody have good water chemistry or is there something that can be changed to improve it? Is the current habitat conducive to growing lots of quality fish, or are there areas for improvement? Was the fish species present what you desired, or did you have a quality bream or catfish fishery, but really

wanted a high-quality largemouth bass fishery?

If the dam blew out, finding a quality company to rebuild it is required. We recommend someone local that knows the soils and if there is any permitting needed from County, State or Federal government. Assess why the dam may have failed. Was it due to too much water? Did the overflow drain pipe(s) or emergency over flow structures not work properly? Was the dam not cored with clay? Was the dam not wide enough? Were trees allowed to grow on the dam and roots caused a leak, and with extra water eroded it away and it failed? A good pond builder will be able to assess why it happened, and rebuild to prevent in the future. Finding clay on your property or having it trucked in will be necessary to do the repairs right. We suggest **Ponds – Planning, Design, Construction** Agriculture Handbook 590 by the USDA as a reference for landowners to use when constructing a new lake or pond or performing a rebuild. It goes into great detail on pond building, and particularly construction of the dam, outflow structures, and emergency overflow spillways. Obviously, the internet is also another endless source of information, but identifying good information from hobby lake managers and builders can be difficult, so be careful.

Locating a qualified company to rebuild can be hard. We recommend using a local company that is familiar with the area soils and permitting requirements while not requiring long distance travel, which increases costs. Start by talking with neighbors who have had lakes constructed. County or State agencies may have a list of permit requests in your area to help you identify who has recently built lakes. Were those landowners happy with their company? Have there been any problems with leaks, excessive weed growth and how is the fish population? Was the price reasonable? Another place to find quality construction companies is by interviewing local heavy equipment dealers and repair shops. They know a lot about their customers and who is reliable and not. Another source to locate pond builders is the local Agriculture Extension Office, the State Game and Fish fisheries staff or the nearest Natural Resource Conservation Service (NRCS) office.

Another thing to consider is funding. How will you pay for the repairs? After a natural disaster, there are government programs County, State and Federal cost share programs available for dam repairs and stream reclamation. Contact your County Ag Extension, NRCS, and even FEMA offices for any available types of programs in your area that may assist with funding. It will take you a few hours of time, but may be worth it in the long run.

Prior to reconstruction, someone (you, fisheries professional or your construction company), needs to check if any County, State or Federal permits are required for construction. Asking an Ag Extension or County Permitting Officer would be a good place to start. They will know if any other agencies need to be contacted prior to construction. Each state and some counties within states are different with regards to new lake construction vs. existing lake repair. Most rebuild permits are quicker and easier than new construction. Permit prices can range from free to several hundred dollars depending on location and size of water-

This dam was cut from the water, all the way down to the lake bottom. No water was left in the lake, so a complete restart was initiated.

body. Again, a good lake building company can handle all that for you.

The final step prior to repairs and refilling, is what can be done to improve it? Such things to consider changing before it refills are size, shape, depth, bottom contour, and shoreline slope. Most desired species such as bream and largemouth bass are an edge species, so the more irregular the shoreline

There are several desirable plant species in this photo. Hopefully most will come back after the dam is repaired and it refills to its historical level. Keeping an eye out for both desirable and undesirable species will be required as it fills and once complete. Certain species like willow is encouraged to grow after a drawdown.

and bottom, the more edge and habitat available for those species. Those species spend most of their time hiding, feeding and reproducing in the Literal Zone (area between land and deep water where aquatic vegetation is located). There is a lot more shoreline where it zigzags in and out than a rectangular or circle shaped lake. If there are excessive organic materials present that made for poor water chemistry prior to draining, consider scraping that material and hauling out. Outflows are important, and if that is what caused the dam to fail, it is advised to change and/or enlarge it. Consider adding any amenities such as a dock, fish attractors, gravel spawning beds, and aeration system or fountain that are easier to install when empty, than at full pool.

Depth is usually under or over done for various reasons in new lakes, such as cost, poor estimation of depth after completion or lack of knowledge how important depth is during summer and winter (depending on where you are located). During a drought, some of the water needs to be eight feet deep, while no area (unless an aeration system is installed), needs to be greater than 15 feet. Water less than eight feet deep during the hottest part of the year can foster poor water quality with elevated temperatures and low Dissolved Oxygen (DO) either stressing or killing fish. This same scenario can happen with excessively cold water and low DO during winter in northern areas. Water over 15 feet deep in warmer climates becomes stratified, where low DO water is at bottom and can be more than half

This lake already had a lot of stumps and woody snag in it, so no additional underwater structure is needed. That premium habitat will expedite the fish population rebuilding process.

the water column, rendering no fish using these areas when DO is low to a point where it stresses fish or would kill them.

Bottom contour should not be smooth nor should there be isolated deep holes not connected by deep-water trenches. Adding "catfish holes" is acceptable as long as they do not exceed recommended depths and are not just deep holes randomly dug. The water in these areas without connecting trenches to mix with higher oxygenated water become unusable areas by fish due to lack of oxygen. If these areas have connecting trenches and/or bottom aeration, they become additional usable areas by all fish during different times of the year, increasing your lake's carrying capacity.

Shoreline slope needs to be 4:1 or steeper. The reason being anything less encourages vegetation growth farther out into the lake and can cause problems in the future that require constant herbicide use or scraping. Some shoreline vegetation is good, but too much too far out from shore can hinder angling and navigation, or create an aesthetic problem of undesirable weeds at or above the water surface. This slope discourages weed growth out from shore, but still promotes fish spawning by bass and bream/panfish. Many new lake owners feel the need to create large shallow shelves or whole lake ends for spawning, but these areas inevitably become problems in ponds with aquatic vegetation, and are not necessary unless your waterbody is large and can afford such areas of space.

If organics are present and scraping is not an option, allowing it to stay drained for over three months and allowing the bottom to dry will help immensely. When it refills, where the organics have been allowed to dry and crack, it will remain hard after refilling and help the water chemistry and plant growth in the future. Maybe only remove organic materials in the literal zone to help with future spawning and plant growth. Yes, a drained lake can be an eye sore, but by allowing the bottom to dry hard will greatly help with past organic problems.

There may have been a submerged or shoreline plant that was out of control prior to dewatering. This can be addressed while exposed either with herbicides or scraping them out along with a little soil to remove roots and tubers that may allow the plant to resprout during the refilling process. Before it dies due to drying out, treat with approved systemic EPA approved herbicides. This will help reduce its presence after reflooding. A contact herbicide will only kill it above the soil, where a systemic will also kill below the soil surface.

The type of out flow you have is usually decided on

The day the forage goes in, fish feeders need to be turned on and running, broadcasting the smallest, highest protein fish feed you can afford. The faster the bream and minnows start reproducing, the more forage for small bass have when they are stocked.

Bluegill, redear sunfish, fathead minnows, and mosquitofish go in first. Six-to-twelve month later, predators such as largemouth bass go in. Followed a year after the bass go in by the threadfin shad and golden shiners.

Bream this size can be achieved the first 18 months, if you stick to a supplemental feeding program using quality feed and have both mosquitofish and fathead minnows.

by the type of lake you have and costs. For an excavated pond, a low depression spillway with gravel is sufficient. The use of gravel is advised to reduce erosion and any erosion at the outflow results in a lower lake level. For an embankment lake with dam, the ideal situation is a standpipe with gate valve and emergency overflow. The standpipe allows water to flow out when it becomes full and normal rains are present. The emergency overflow is a slightly lowered area at one end of the dam, covered in concrete or gravel for flood control that allows large amounts of water out during flooding without erod-

Besides underwater stumps, there is lots of bare sand present in the Litteral Zone for fish to use as spawning areas. No additional gravel spawning beds are needed here.

ing the dam. A gate valve is a nice additive, but does increase cost, for lowering lake levels as needed to do work on dam, dry up organics (muck) along the edge in the future, lower water levels to dry out weeds or expose and spray excessive submerge vegetation reducing the acreage needing treated and lowering herbicide costs, or to increase outflow during an excessive high-water event by increasing the volume leaving the lake.

Most extras such as dock, fish attractors, fish feeders, adding lime and aeration system or fountain can be installed either with lake empty or full. A dock is easier to install while water is down. You can install the dock posts only (leaving extra at top), prior to refilling and installing the decking and cutting off posts after water has raised to full pool. This way you can place the dock as high or low to the water as you want. If you know the waterbody will fluctuate a lot, placing it as close to water when full is advised, because most of the time it will be lower than full pool. If water will stay fairly steady despite rainfall amount it can be placed higher knowing the water level will never be much lower than it currently is. If fish attracters will be made from natural materials such as brush, stumps or gravel (spawning beds), or concrete culverts install prior to filling so material can be driven to spot, weighted down or spread with a tractor or dozer. If artificial materials are used, they can be easily thrown overboard and sank from a boat once lake is full and exact depths will be known. Adding gravel beds, using #57 river gravel, if not a lot of exposed sand or gravel already exists will help with bass and bream spawning. These should be placed in three-to-six feet deep water around the lake shoreline. Shoreline or dock feeders can be temporarily installed closer to the waterline if fish are stocked early (before full), and permanently installed once water levels stabilize at full pool. They should be placed high enough not to get flooded should an excessive rainfall event occur. Installing a small gravel boat ramp is easiest before the lake is at full pool. Extend the gravel several feet down into lake bed to assure a safe launch site even during low water. If the pH is traditionally below 6.5 you can easily add agricultural limestone as directed. It is much easier to add lime to an empty lake so you can drive a spreader into lake bed than when full. Aeration and fountains can be installed prior to refilling, but are easier to install once the lake has filled. This way there is no mistake of installing electrical outlets or pump motors at a shoreline level when they become vulnerable to water damage during a flood. Any electrical outlets need to be placed approximately three-to-four feet above the emergency outflow to assure they are protected.

In six years, fish this size can be achieved in substantial numbers, if the plan is followed and you have patience. Cutting corners to speed things up can cost you more time and money on the back end.

If nothing has changed upstream, and you have good baseline water chemistry data, checking the water chemistry is not necessary prior to stocking, but you may want to for peace of mind. We know fish already thrived here, so no reason they will not again.

The upland vegetation, before it refills, will grow and the lake will look terrible. If they are upland plants, they will die once they are in water. The dead plants will provide habitat for aquatic organisms and insect larvae. If you can stock the forage fish before it is full, those plants and small organisms

attached to them will feed the newly stocked, young forage fish that will eventually feed the largemouth bass. You will need to monitor the aquatic vegetation as the water rises, identifying plants and making decisions if they need treating or not. If it refills slowly, aquatic shoreline plants will thrive, but then, depending on if they are emergent or submergent, may die off being covered with water, water too deep, or water too dark to allow plants to grow under the surface. Willows are common during reflooding. It is one species that needs to be monitored closely and treated accordingly, so it does not take over during the refilling process. If left unchecked, it requires major work after it reaches full pool, including drone and helicopter treatments to get rid due to neglect. Most aquatic plants should come back, but new ones may start growing, and that is when the decision of desirable vs. undesirable has to be made, and whether action with herbicide or mechanical removal is needed. If adding plants to improve or replace what was there, only choose native, non-invasive plant species to ensure low maintenance in the future. If cypress trees are desired and not already present, planting some around the shoreline in shallow water areas is a great addition.

You want to stock bream/panfish and minnows in the fall or spring and bass 6-12 months later. Catfish can be stocked whenever the hatchery has them available, but are cheaper when they bring other fish and can be smaller without big bass present. For new lake stockings we also add either fathead minnows and/or mosquitofish for small bass, and big bluegill forage to start. Once bream and minnows are stocked, turn feeders on immediately dispensing small pellet sized, high protein feed to expedite growth and encourage reproduction prior to predator (largemouth bass striped bass hybrids, crappie) introduction. We recommend stocking 750-1,000 per acre bluegill/redear mix, 1,000 per acre mosquitofish and fathead minnows. Once the bream get to about six inches switch feed to a mixed size pellet so all forage fish present can benefit.

Stocking a predator with no forage size present that is consumable is a waist of money, and you are not gaining anything, just losing time. There are a couple ways to stock your bass. Options are pure Northern, pure Florida, or the F1 Cross (Tiger/Gorilla bass). Occasionally we have stocked 25 per acre Northern or F1 Cross, and are following up two years later with 15-20 per acre pure Florida females. We fin clip the pure Florida females so they are never removed during the small bass removal process. Fin clips are visible the fish's entire life, where Floy or Dart tags eventually fall out or break off. Bringing in fish from outside waterbodies, especially the predators, does not expedite anything, it just slows things down and may require additional stocking later to regain a balanced population. Buying and stocking trophy bass is another frequent question. No one wants to sell their prize largemouth bass, unless they are doing away with the lake, or selling the property. It took them many years to grow them. In some states, moving bass is illegal whether caught from the nearby public reservoir or river, or paying to have them electrofished from another private lake and brought to you. If a large, old bass, is stocked in your lake, there is no guarantee how long it will live, or if anyone will ever catch it before it dies. Another point, your new lake probably does not have enough big forage to support big predators yet, while continuing to repopulate the forage population.

If your lake is green with a good algae bloom, stock a load, per 10 acres of threadfin shad the year after the largemouth bass are stocked. At this same time, stock about 500 per acre small golden shiners. Two years after the largemouth bass have been stocked, you can add 10-25 lbs. per acre of crawfish, if the habitat will support them and budget allows it. They are usually pretty big, so allow the bass to grow before stocking. If your waterbody is suitable for black crappie, stock them a year after the threadfin shad and golden shiners go in at a rate of 25 per acre. With proper forage stocking and a supplemental feeding program, bluegill can be spawning in 6-8 months and over 8 inches in 10 months. If you wait on stocking predators, we have seen largemouth bass grow more than 16 inches, with a few "shooters" (fast growers), to 18 inches in year one and three-to-four pounds in two years. Black crappie can reach almost 10 inches by end of year two.

It does take a little time before you see large bluegills, redear sunfish, largemouth bass, catfish, crappie or whatever your desired species are, but following proven guidelines and performing management tasks to upkeep the waterbody once complete, will ensure a long successful time to enjoy your lake. The more habitat and forage (fish or feed), the faster everything grows and multiplies.

WHEN A PASTIME BECOMES A PASSION.

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MEMBER FARM CREDIT

Wildlife Trends Journal Management Calendar

By Dave Edwards

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

Strategies that ensure quality food sources are available this time of year are the result of management implemented months ago or over time.

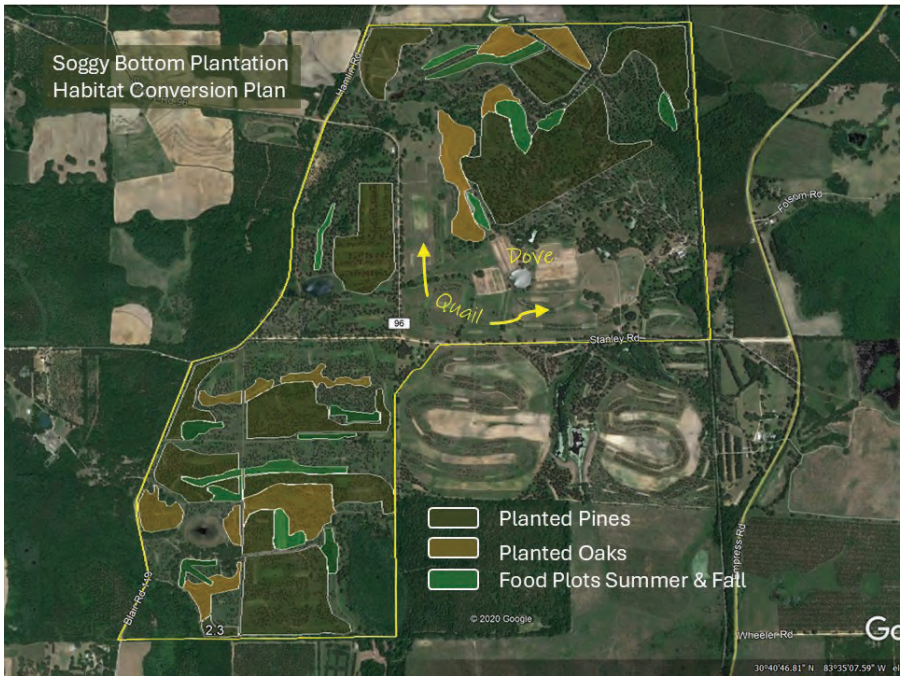
Ensure deer have quality nutrition during late winter through spring green up.

Late winter through spring green up is a nutritionally stressful period for deer in most regions. Deer have spent much of the fall going through the stresses associated with breeding activities which have worn them down, does are pregnant, much of their quality food sources have dwindled, and energy demand increases with a colder climate. Ensuring deer have access to quality food sources during this period will ensure they enter spring green up in good condition. Doing so gives them a jump start as they enter the spring green up period (one of the highest natural nutritional periods due to an abundance of fresh new growth of

Fertilizing clover can add a significant growth/nutritional boost to clover and other perennials.

plants). As such, deer can use the high nutrition from spring green up for body growth verses maintenance. Healthy deer entering spring results in bigger antlers, healthier does, increased fawn survival, etc. which is the goal of most deer management programs. Although this is within the February/March management calendar, strategies that ensure quality food sources are available this time of year are the result of management implemented months ago or over time. These strategies may include things such as thinning timber, managing natural habitats, including perennial crops in food plots, and properly managing deer herd conditions. Something that can be done now, however, is providing deer with supplemental feed which can certainly offer deer a quality food source. But before thinking about starting a supplemental feeding program for deer, you need to take care of the "more important" things first (such as items listed above). In other words, you cannot hang shutters if you do not have a house – and you will not grow big bucks and a healthy herd with supplemental feed alone. It is a

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



An up-to-date aerial photo is the first thing I want to see when someone asks me to help improve their property for wildlife or create a management plan.

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 (see previous Wildlife Trends article on how to properly collect soil samples). Your local farmers cooperative will often have soil collection bags which normally have directions on how to collect soil samples and 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. Because it can take several months for lime to effectively change the soil pH, checking the soil in late winter or early spring will give lime ample time to enhance the soil before the fall planting period. Incorporating lime during late winter (Jan/Feb) will likely enhance soil pH for summer plantings. 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 any time of year, applying it at least 4-6 months before planting will allow time for it to properly enhance the soil pH to desirable levels. Lime can be broadcasted directly on top of the soil where rain can work it into the growing zone of the soil, but disking it into the soil profile will speed the process up and is recommended.

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 in most of the Southeast), to prevent destroying nests. Unless necessary, I recommend leaving as many 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 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.

Plan and schedule timber harvest activities.

If you have timber that needs to be harvested, cutting it during the dormant season (winter) or early in the growing season (spring) enhances its wildlife value during the first year after the harvest. Harvesting timber during this period gives plants the entire growing season to regenerate resulting in increased desirable food and cover for wildlife. Conversely, if timber is harvested in the middle of summer (mid-growing season), plants do not have as much time to germinate and grow before cold weather arrives. Thus, the resulting vegetation will not provide as much bene-

Although lime can be spread any time of year, applying it at least 4-6 months before planting will allow time for it to properly enhance the soil pH to desirable levels.

fit to wildlife. Obviously, local timber markets and timber prices play a significant role in the decision to harvest timber, but if markets are right, harvesting during winter or spring will increase the wildlife value of the area during the first year.

Manage water levels in duck ponds.

Although duck season may be over, leaving 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 or waterfowl impoundment, 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 and invertebrate 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.

Fertilize perennial clover plots to provide a jump start for spring growth.

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 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

Harvesting timber during winter gives plants the entire next growing season to regenerate resulting in increased desirable food and cover for wildlife.

"common" 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 a 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.

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 habitat. I have worked with many landowners that had gobblers on their property most of the 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 patchwork 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 near nesting cover around your property will help put turkeys where you want them to be. February or early March is a good time to create strutting areas. A mower, disk, fire, or combination of these are the tools of choice for this task. Fire is my preferred tool if it can 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, thinned pine rows, 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.

Obtain an updated aerial photograph of your property.

Updated aerial photographs are an invaluable tool in land/wildlife management. In fact, it is the first thing I want to see when someone asks me to help improve their property for wildlife or create a management plan. I prefer aerial photographs taken during the dormant season when deciduous trees have lost their leaves (i.e., late winter or early spring before green up). This allows you to distinctly see differences in pine or evergreen habitats and hardwoods. Infrared images taken during the growing season can do this as well, but I prefer color photos taken during winter. An aerial photo puts everything into perspective by allowing you to see the various habitats and how they are situated across the landscape of a property. While this may sound odd, it also allows you to see habitat diversity and layout of your neighbor's land which may play a role in how you manage your property. For example, if your goal was to manage for turkeys and you see on an aerial that your neighbor's property is primarily mature timber, increasing nesting habitat on your property will likely attract nesting hens (and gobblers) from the surrounding property in the spring (not that you want to "steal" turkeys from your neighbor! Ha). Also, aerial photographs often become my "drawing board" when devising plans to improve a property. That is, having a map of the entire property in front of me, I can see everything, where various habitats are on the property, where food plots are located, etc. Having this, I can visualize how hunters, deer or other wildlife use the property and/or how we can improve the property to not only ensure quality habitat is provided across the landscape, but where habitat management can be used to direct wildlife to areas for improved hunting. There are many companies that specialize in taking aerial photographs, adding geographic features (roads, property lines, habitats, etc.), and providing a custom aerial map to the customer's specifications. While using these companies is obviously more expensive than pulling your property up on something like Google Earth, the resulting map/photo will be of high quality, up-to-date, customized to your liking, and can be uploaded into GIS type programs that allow you to enter and retrieve useful information about your property (e.g., number of acres of each habitat type), and create detailed habitat management plans. While I prefer professionally flown custom maps to work with, I must admit I use free online satellite imagery (e.g., Google Earth Pro, Bing Maps, etc. more often than in the past). They are simply fast and easy to use. The downside of these images is that they are often outdated, particularly if you are actively managing timber and habitats.

Trap Predators.

Hunters are quick to blame predators such as raccoons, opossum, skunks, coyotes, fox, or bobcats where populations of game wildlife are declining. However, in most cases the cause for game species population decline is often the result of reduced reproductive performance or survival of their young due to poor habitat and/or harvest management strategies. That is, it's foolish to blame predators for poor quality deer hunting if your deer herd is "crashing" as a result of being overpopulated and is experiencing poor fawn production due to poor overall herd health. Or blame predators for a declining turkey population if you are not managing or providing quality nesting and brood rearing habitat to promote good poult survival. So before initiating efforts to remove predators, consider habitat quality and/or strategies you are applying to improve it. If habitat quality is not good, your time and money may be best spent managing habitat versus predator control. Having said this, on properties where habitat quality is generally good, intense localized predator control can increase survival/recruitment rates of species such as rabbits, quail, turkeys, and deer. Intense is the key word here. Simply throwing a few traps out on the weekends will not have much effect on predator populations. Having a significant impact will require intense trapping over a period of time that results in many predators being removed. It is also worth noting that predator populations can re-bound quickly. Similar to the response of a deer herd after an aggressive harvest, a reduced predator population with less competition for quality resources will have increased reproductive rates. Thus, trapping efforts need to be applied every year to be most effective and produce the best results.

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