PRACTICAL WILDLIFE MANAGEMENT INFORMATION

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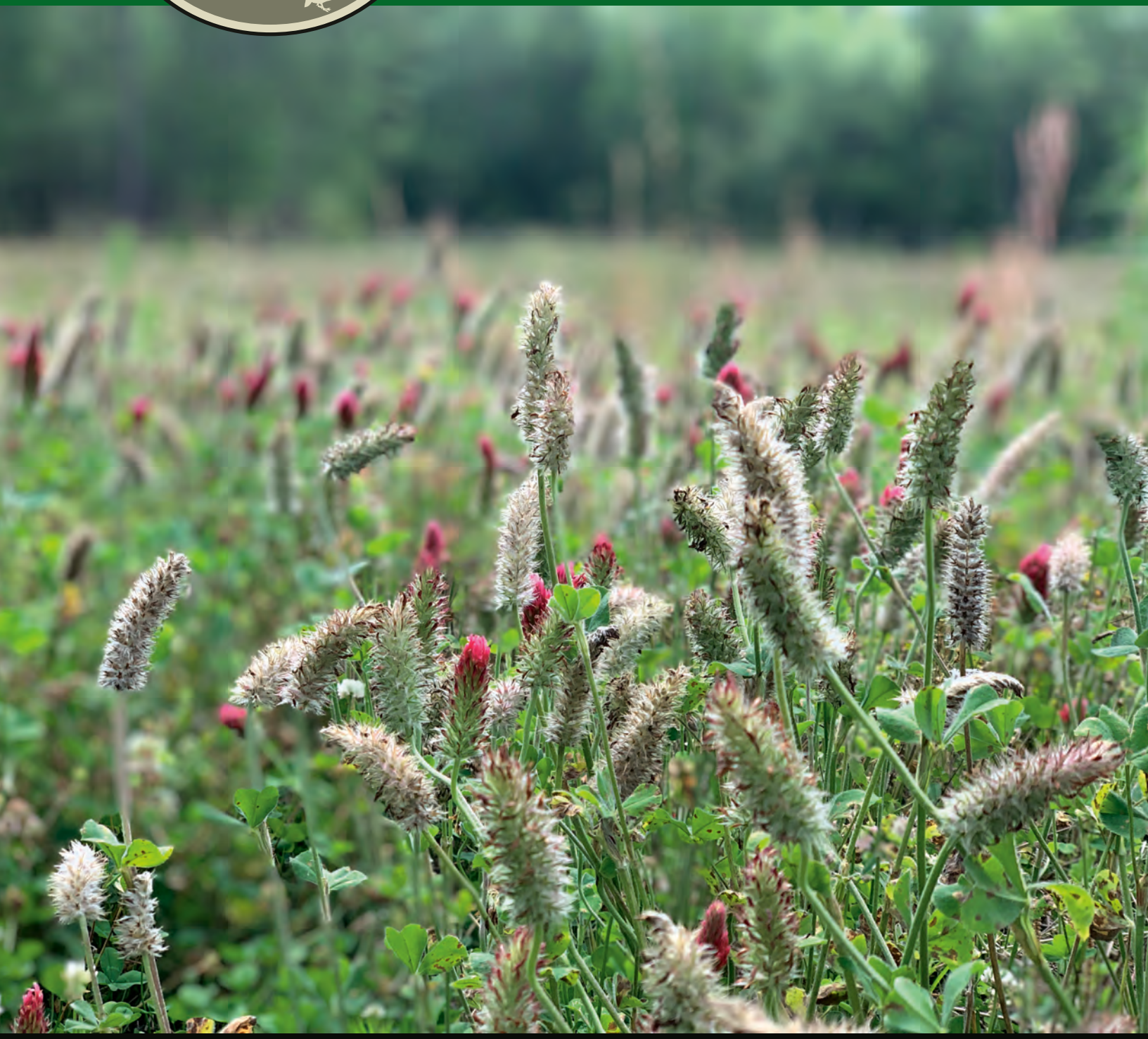

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Earl Says…

As a member of the State Board for the National Wild Turkey Federation here in Alabama, I can tell you we have funded many ongoing research projects to help find the reasons for the decline of turkeys in America.

You've seen many articles we've published in past issues and hopefully they have helped you in promoting quality habitat for all wildlife including wild turkeys. We would love to hear from you on any any success stories and management practices you've done on your property to hold and protect turkeys.

Call or write me and we'll be glad to share your ideas and we promise to continue providing you with the latest research-based information for all wildlife – especially my favorite, the wild turkey.

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P.O. BOX 640596
PIKE ROAD, ALABAMA 36064
www.wildlifetrends.com
800-441-6826

PUBLISHER/EDITOR
Andy Whitaker

DESIGN
Walker360
2501 East 5th Street
Montgomery, AL 36107
(334) 832-4975

CONTRIBUTING AUTHORS
Dave Edwards
Dana Johnson
Brant C. Faircloth
Wes and Leslie Burger
Dr. Wes Wood
Theron Terhune
Marion Barnes
Ted DeVos
Bryan Burhans
Keith Gauldin
Rodney Dyer
Dr. Keith Causey
Ron Jolly
Dr. Stephen Ditchkoff
Tes Randle Jolly
Kevin Patterson
Ryan Basinger
G. Ryan Shurette
D. Clay Sisson
Kent Kammermeyer
Allen Deese
Scott Brown
Dr. Larry W. Varner
Jason R. Snavely
Steve Tillmann
Mark Thomas

For Wildlife Trends editorial, advertising, or change of address:
1-800-441-6826
info@wildlifetrends.com

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Cover Photo by Dave Edwards

Chinese Tallow Trees

By Keith Gauldin

Colorful fall foliage of Chinese Tallow Tree and associated seed clusters which coin this tree as the Popcorn Tree.

Wildlife Biologist Keith Gauldin has spent the last 30+ years managing renewable natural resources through employment with state and federal wildlife agencies and as a self-employed consultant. He resides with his wife, Marianne, on rustic farmland in rural Alabama. Gauldin's writings have been published in previous issues of Wildlife Trends Journal.

April of 1978 arrived with an Arbor Day initiative, and numerous fourth graders from Edgewood Elementary, including myself, excitedly received their small bare-root twig with instructions to go forth and plant in celebration of trees. I did so in a small opening between my neighbor's house and mine. As the tree was tended and rapidly put on vertical growth, I was enamored by the color transition when fall approached. Its leaves parlayed from a pale green to brilliant shades of red, orange, and sometimes purple, and its white seed heads were reminiscent of popcorn. I enjoyed seeing the cardinals flock there throughout the winter to consume those numerous seeds. And so, through an innocent elementary school program, the Chinese tallow tree made its way to Homewood, Alabama, and became a naturalized component with negative effects despite my positive intentions. Little did I know the scourge I had introduced to my idyllic suburb.

While this storyline may be unique to me personally, it's not unique at all in the grand scheme of introduced exotic invasive species, be they animals or plants. The Chinese tallow tree is not indigenous, and like other invasive species that are not native to a particular area, it has the potential for inflicting great environmental and/or economic harm. This tree quickly establishes itself into new areas and can easily outcompete native vegetation – forming a monoculture of tallow trees devoid of native plants and the benefits they offer to the natural community. For decades, the prolific Chinese tallow tree's seeds are dispersed by birds and waterways into new areas that are also quickly claimed and dominated. Despite its attractive fall foliage, this species has the potential to negatively impact native animal and plant communities and ecosystems, cause extinctions of native flora and fauna, reduce biodiversity, affect hydrology, alter habitats, and compete with natives for finite resources.

The **Chinese Tallow Tree** (*Triadica sebiferum*), also known as the Popcorn Tree, Chicken Tree, Tallow Tree, or Florida Aspen is native to East Asia, Taiwan, and Japan. The tree was introduced to the United States in the 18th century, a tragedy often credited to Benjamin Franklin, primarily for the ornamental attributes of its foliage and seed clusters and practical uses of its seed oil for making soap. Though its negative consequences far outweigh it being viewed in a

Close up of waxy coated Chinese Tallow Trees seeds commonly consumed and dispersed by birds.

positive light, the tree has yielded some gains in the honey production industry and also recently provided a source for bioenergy efforts. Its ability to outgrow most native counterparts and disperse rapidly has led to its naturalization throughout most of the coastal plain from South Carolina to Texas. Along the way, its negative effects have earned it a spot on the list of detrimental invasive plants in many states.

A member of the Spurge (Euphorbiaceae) family, the Chinese tallow tree is a monecious plant with male and female flowers on a single plant for both pollen and seed-bearing, making them self-pollinating. It's a relatively fast-growing medium-sized deciduous tree that may reach heights of 40'-50' but is more typically in the 25'-35' range. Its pale green leaves range from 1.5" – 3.5" in length and 1.5"-3" in width and can vary from roundish to ovate to heart-shaped with pointed tips, arranged alternately on the branches. Autumn leaves transition to yellow, red, scarlet, and purple hues. The white to greenish-yellow flowers are arranged in spikes roughly 7" in length and are heavily used by bees and other insects. Fruits are roughly .5" and form a three-lobed cluster containing seeds covered in a white waxy coating. The seed clusters resemble white popcorn and hang on to attract birds throughout the winter.

This tree is able to inhabit and thrive within a wide range of habi-

Release of Chinese Tallow Tree seedlings from abundant dormant seeds following the herbicide control of adult parent trees.

Chinese Tallow Tree first year seedling, note pale green color that can be used to distinguish these plants from others at a distance.

tats from upland to lowland, swamps, floodplains, bottomland forests, riverbanks, agricultural lands, ditches, pastures with acidic to alkaline soil types, and can even tolerate the salinity of coastal areas. While they can grow in shade, they proliferate in full sunlight. Their only limitations appear to be related to extreme cold and/or very dry conditions. Once introduced to an area, their propensity for dominating landscapes lies within their reproductive potential. Trees can initiate seed production as early as three years of age and can continue to do so until death. It has been documented that an average adult tree can easily produce over 100,000 seeds annually. Once a parent tree dies or topples over, the new canopy break of sunlight quickly reveals a carpet of its seedlings with a notably high germination rate, which choke out native competitors.

Example of lateral root sprouts of Chinese Tallow Tree parent tree.

The tree's spread is also facilitated by multiple species of birds that eagerly consume the "popcorn" and deposit it to flourish elsewhere. Rivers and streams have been cited as another source of movement for massive seed crops to associated banks and islands. Intermittent flooding can carry seeds to infest inundated areas.

Though there are numerous routes and mechanisms for its management and control, once established, the Chinese tallow tree will be close to impossible to completely eradicate. Given this tree's invasive nature and ecological impact, effective management and control strategies are crucial. Here are a few key approaches:

Early Detection and Response

First, be vigilant in surveillance of your property and learn to identify the tree and determine its prevalence. Its pale-green leaves may contrast the darker green color of surrounding vegetation and assist in detection. Once its presence is confirmed, implementing a prompt and aggressive control plan, hopefully prior to heavy infestations, is the most efficient plan to prevent further spread of the Chinese tallow tree.

Mechanical Control

The actual physical removal of the trees can be effective for smaller infestations. This involves pulling smaller seedlings by hand and cutting down mature trees. However, this method is labor-intensive and only practical for a limited number of seedlings and smaller trees. Once a seedling establishes a deep taproot, which is rather quick, it can be difficult to remove in its entirety. If the roots are severed and remain in the soil,

new sprouts can originate from the severed lateral roots. Heavy equipment can be used to remove the mass of older age class infestations, but can lead to more plants through time resulting from the new sprouts from severed roots and seed stock.

Mowing and Mulching

Mowing by bushhogs or flail mowers can be counterproductive and increase the density of seedlings by stimulating sprouts from the resulting cut stems and lateral roots. Although when used in conjunction with chemical control, this method can improve access to treat the entire area of infestation.

Prescribed Fire

Fire is typically only effective where only a few individuals are present in areas of sufficient fuel litter to carry it. Individual stems will likely only be top-killed by the burn and usually return from root sprout. In dense stands, fuel litter is usually not adequate to carry a fire.

Grazing

Grazing is not recommended as the plant is toxic to cattle and goats will only consume it when other options are extinguished.

Biological Control

While Chinese tallow trees are resilient to pathogens and insects, ongoing research has documented a bagworm, nematode, and several species of fungi which have damaging effects on this species. It is doubtful that any widespread application of them will be implemented.

Chemical Control

The most effective treatment for managing and controlling Chinese tallow tree is accomplished with the assistance of modern chemistry using herbicides. The market has numerous herbicides that can selectively control this species and be applied in various ways to impart minimal negative impacts to native plants.

Stump cut treatment of Chinese Tallow Tree. Note hand sprayer for small infestations and backpack sprayer use for larger quantities and dye for marking treated stumps.

Every herbicide has a label on the container that provides important information regarding its safe use. Herbicides should always be handled and applied according to this label, which typically describes application methods, mix rates, precautions, timing of application, storage, and other relevant information. Always read these labels and follow the directions. In addition, follow label recommendations for personal protective equipment (PPE) such as long-sleeved shirts, eye protection and nitrile gloves to avoid herbicide contact with skin.

As with other nonnative invasive plant species, techniques for applying herbicides vary according to the growth stage of the Chinese tallow tree. Most treatments should be timed to occur from mid-summer to fall before leaves change colors. Any earlier and the treatment will likely be less effective due to sap flow during the tree's spring growth. Control efforts will likely require repeated applications to be effective in controlling the spread. As this tree can readily grow adjacent to aquatic areas, herbicides must be appropriate for use in such places. Herbicides should also be applied in a manner to avoid negative impacts to adjacent native plants, though in some cases, collateral damage may be unavoidable. Control efforts will require vigilant oversight and a determination to follow through to ensure effective control of this tree.

Herbicides are applied in various techniques according to the particular label, including:

- **Foliar Broadcast** – Hand-held pump sprayers, backpack sprayers, or those sprayers mounted on ATV's, UTV's, or tractors are all effective modes of carrying foliar products. This method is typically used on infestations of seedlings and younger age class trees. Herbicides should be

used during times of low wind to minimize impacts to adjacent native species and along with a non-ionic surfactant to assist in penetrating leaf surfaces. Dye additives will aid in identifying treated areas and avoid double application and waste of product.

Foliar applications should be conducted mid-summer until early fall prior to leaf color change for optimal intake by the plant. Leaves should be sprayed to ensure complete wetting of the surface but not excessively to avoid runoff and wasting of product. The later in the growing season for treatment appears to be more effective. As with other treatment methods, multiple year applications can be anticipated for effective control. Foliar applications work well in areas where older parent trees have been killed from earlier treatments and released a carpet of sprouting seedlings. Although the sheer number of seedlings can seem overwhelming, they can be easily controlled through foliar spraying.

Products containing glyphosate (Accord, Razor or Roundup), Imazamox (Clearcast), Imazapyr (Arsenal, Habitat), Picloram+2,4-D (Grazon) and Triclopyr (Garlon 3A) have all been found effective in this application. When using herbicides with the active ingredients of Imazapyr or Imazamox be careful, as they are soil active and will likely injure or kill adjacent native plants. Treated areas will likely require more than one growing season to revegetate, so be aware of the features of these active ingredients.

Bark injection, aka. Hack and Squirt, method of herbicide treatment. Note PPE and downward oriented hack with machete act to hold herbicide for better absorption.

- **Basal Bark –**
Basal bark treatments involve a selective herbicide mixed with a vegetable oil such as methylated seed oil, commonly referred to as MSO, to aid the herbicide in penetrating the bark. This method involves applying the product in a band extending from 10” to 18” from the bottom of the tree covering the entire bark surface in this area. While not as effective in the early growing season, this method can be used throughout the year, particularly during the winter, though it is effort-intensive. Herbicide containing Triclopyr (Garlon 3A, Garlon 4) or premixed products such as Pathfinder II can be used for this application. Backpack sprayers enable the applicator to have the mobility to maneuver through the treatment area while also having sufficient herbicide to treat numerous trees. This method is more suitable for treating small to medium-sized trees.

- **Bark Injection –**
Bark injection, commonly referred to as hack and squirt, is recommended on trees 2” in

diameter and above. This technique involves using a machete, hatchet, or brush axe to make a downward cut in the bark into the woody portion of the tree and apply 1-2 ml of herbicide in each hack. The downward direction of the cut acts to hold the product until it is absorbed. Using the ratio of 1 cut into the bark per 3" diameter, distribute cuts evenly around the tree, going around the tree but taking care to not girdle it. This method can be used to treat a large number of trees in a short amount of time and typically uses much less product.

Products such as Triclopyr (Garlon 3A), Glyphosate (Accord, Roundup), Imazapyr (Arsenal, Habitat), and Imazamox (Clearcast) are all effective. Take caution when using those soil active products as native plants can be impacted through adjacent root stock. Timing is most effective during the fall and winter, avoiding early spring when sap flow will prevent efficient uptake of the chemical. This method has been a personal favorite due to the low quantity of herbicide required and large areas that can be covered in a short amount of time.

- **Cut and Stump Spray** – This method can be used from younger saplings to larger adult trees in lower densities and involves felling the tree low to the ground, typically with chainsaw or handsaw, and treating the cut surface, especially the outer edge, of the remaining stump. It is important to apply herbicide as soon as possible to the stump surface to ensure maximum effectiveness. This technique is a preferred control method when selectivity is desired, and can be accomplished with little to no impact on surrounding vegetation. A drawback of this method is that it's labor intensive and time consuming. Timing of this application can be performed practically year-round with the exception of early spring when cut stumps will not readily absorb herbicide treatment due to upward sap flow.

  Products containing Glyphosate (Accord, Roundup), Triclopyr (Garlon 3A, Pathfinder), Imazapyr (Arsenal, Habitat), have all been proven to be effective with this treatment. Just keep in mind that the soil active characteristics of certain products, though quite effective, can negatively impact adjacent non-target native plants. Be sure to combine a dye with the mix to avoid multiple treatment of cut stumps and wasting of product. As with other herbicides, be sure to only apply according to the product's label.

As you learn more and accrue experience about effective techniques for invasive species management, make the effort to pass on this knowledge. If you see a Chinese tallow tree on a neighbor's property, consider discussing with them its negative impacts and effective control. Engaging local communities and raising awareness about the invasive nature of Chinese tallow trees is essential for reducing their spread. Encouraging responsible landscaping practices and promoting the use of native plant species can contribute to long-term management efforts. Managing and controlling the spread of this species requires a multi-faceted approach, including early detection, mechanical and chemical control, biological interventions, and community involvement. Your purposeful actions to curb the spread of the Chinese tallow tree will have long-lasting effects on the natural community well into the future.

References

Radford, A. E., H. E. Ahles, & C. R. Bell 1968. *Manual of the vascular flora of the Carolinas.*

Lowenstein, N., D. Russell & S. Enloe 2022. Management Options for Chinese Tallowtree. Alabama Cooperative Extension System.

Godfrey, R. K. 1988. *Trees, shrubs, and woody vines of northern Florida and adjacent Georgia and Alabama.* University of Georgia Press, Athens, Georgia.

James H. Miller 2010. A Field Guide for the Identification of, A Management Guide for Invasive Plants in Southern Forests, USDA Forest Service.

Buthod, A., J. Irby, K. Hickman, L. Goodman 2021. The Exotic, Invasive Chinese Tallow. Oklahoma State University Extension.

Jubinsky, G. & L. C. Anderson 1996. *The invasive potential of Chinese tallow-tree (Sapium sebiferum Roxb.) in the southeast.*

Kline, W. N. & J. G. Duquesnel 1996. *Management of invasive exotic plants with herbicides in Florida.*

What Causes Fish Kills and How to Prevent Them

By Scott Brown

Scott Brown is a Biologist and regular contributor to Wildlife Trends Journal with over 35 years experience in research and managing natural resources throughout the Southeast. Scott founded Southern Sportsman Aquatics & Land Management in 2007 and now has clients from Texas to Florida and into the Carolinas. Contact him at tazmanlabs1@gmail.com or 336-941-9056.

The scene no lake owner wants in their lake, floating fish. There are a lot of reasons fish kills occur. Identifying the cause afterwards, and how to lower the probability that one will happen is one key to being a good lake manager.

Occasionally lake managers must deal with a fish kill. Fish kills occur naturally or can be man-made. To a lake owner there is no more helpless feeling than seeing fish at the surface pipping (sucking atmospheric oxygen). A fish kill from natural causes is a little easier to accept, but it still hurts to see large numbers of dead quality sportfish that unexpectedly sets your progress back on your waterbody. A fish kill can occur any time of year, can affect all species, only one species or maybe one size class within one species. Preventive measures can be taken to reduce fish kills, and if one does occur, certain steps should be taken to minimize the effects and identify the cause, to prevent them in the future.

The majority of fish kills are Dissolved Oxygen (DO) related. A DO fish kill can occur naturally or be a side-effect of man's actions. Fish kills can also be caused by pollution or poisonous substances washing into the waterbody. In some instances, the spilled substance may not be toxic to fish, but it abruptly alters the water chemistry make-up and fish become severally stressed or die. There are very few aquatic labeled herbicides toxic to fish, but there are several pesticides and herbicides labeled for upland use that are toxic to fish.

Natural Caused Fish Kill

Oxygen is added to water through the atmosphere (diffusion) and photosynthesis by aquatic plants, including algae. During night and heavy overcast days, plants do not put out oxygen, and DO levels drop until sunlight intervenes and plants begin to put out oxygen again. Natural occurring fish kills are almost always low DO related, that was created by heavy rains, consecutive cloudy days or lake turnover. When things remain dry in a watershed, vegetation grows and dies. Heavy rains can wash dead plant material and other organics into the waterbody creating an instant drain on the avail-

able DO. Larger waterbodies are able to handle this initial, short lack of DO, while smaller waterbodies experience a greater effect, and the fish feel the impact more. Fish can detect these DO drops and move into higher oxygenated areas, where feasible in large waterbodies. Recent flooded areas will experience an initial low DO. Decomposing plant and animal material removes oxygen from the water. As the DO drops, decomposition will slow, but fish become stressed and/or die from lack of oxygen. This is why when many natural drops in DO occur, by the time a scientist can conduct water chemistry, testing parameters have come back up to acceptable or desirable levels and nothing appears to be wrong. The warmer the water, the less oxygen it can hold, which is why more fish kills occur during summer months in the South. For optimum health, warm water fishes generally require a 5 ppm (parts per million) DO or higher. If DO drops below 2 ppm, fish are already severally stressed and begin to die.

A productive waterbody is always desired when striving for a quality or trophy fishery. Waterbodies with an algae bloom produce many more fish than lakes without. Planktonic algae and other aquatic plants release oxygen into the water through photosynthesis, however, this also can create an environment for a fish kill. Green waterbodies receiving several days of overcast weather experience a planktonic algae die-off. The planktonic algae and zooplankton (microscopic animals) die and begin to decompose. This decomposing uses up dissolved oxygen, leaving fish with little or none.

Another natural occurring fish kill that causes a drop in DO is lake turnover. These generally happen in the fall, but have occurred in late spring with a warm period followed by an extended cool period. The process of water cooling too quickly and sinking, displacing the warmer less oxygenated water on the bottom towards the surface. Usually a lake becomes stratified (layering) during the summer with cooler less oxygenated water settling at the bottom. This abrupt mixing of lower DO bottom water with surface water, and possibly organic muck being churned up causes the DO throughout the water column to become depleted. Depending on the severity, the fish may only become stressed, or can die if oxygen levels remain too low for too long. Although rare, this can be triggered by high wind for an extended period of time also turning the lake over.

Water temperature can also cause stress or a fish kill. Even native fish can experience too hot or too cold, and become stressed and/or die. The threadfin shad has a cold temperature tolerance of about 45o F, and golden shiner around 37o F. Other fish like trout and yellow perch cannot tolerate water temperatures above certain degrees and they become stressed and/or perish when that temperature is reached for too long. These are all instances of fish on the edges of

Each species reacts differently to various types of fish kills. Threadfin shad are usually one of the first species at the surface pipping when there is a low Dissolved Oxygen situation.

All types of activities around your lake can make it a high or low risk for a fish kill. Nutrient overload from row crops or livestock can cause a fish kill.

their natural ranges or stocked outside of their natural home range for management purposes. Yellow perch (warm tolerance of about 77oF) and trout (warm tolerance of about 68oF) have become popular in developing trophy lakes as supplemental forage for largemouth bass where they do not overpopulate due to temperature die-off every summer or winter, depending on the fish being used and your location. Tilapia, a common non-native species used as forage has a cold tolerance of about 55o F. Many times, with cold water die-offs, few or no fish will be observed floating, they will sink and never float due to lack of bloating from cool water temperatures.

Toxic algae are less abundant in small private waterbodies than larger open systems. There are many species of algae, but only a few are toxic to fish. These occur naturally, but in recent times have become more frequent with the aid of human activities from excessive nutrient loading in aquatic ecosystems. These can be observed where the algae gather at the surface in a blue-green, red or brown color and looks like paint has been dumped into the water. There are a few species of brown, red and blue-green algae toxic to fish, but a lot of fish kills thought to be caused by algae, is the DO lowering effects of an algae die-off, as opposed to the actual algae killing the fish.

Die offs related to spawning are also not uncommon in lakes on the edge of poor water chemistry. Spawning is a strenuous and stressful time, and fish become more susceptible to bacteria, fungus, and parasites during and post spawn. Usually, the fish begin eating and overcome these, but on occasion, a few fish may die from the spawning process.

In Northern climates, small ponds that stay frozen too long can experience fish die-offs, usually related to lack of oxygen due to no photosynthesis, no atmospheric oxygen contacting the water surface and no wind agitation.

If you have grass carp, their life expectancy is 12-15 years. If they were all stocked the same year and there are a lot of them, they may

Grass carp live 12 - 15 years. If all are stocked at once, you may experience a large die off from natural causes (old age) that seems threatening, but this is the kind of fish kill that is desired, if you are going to have one.

all die in a short period of time the same year.

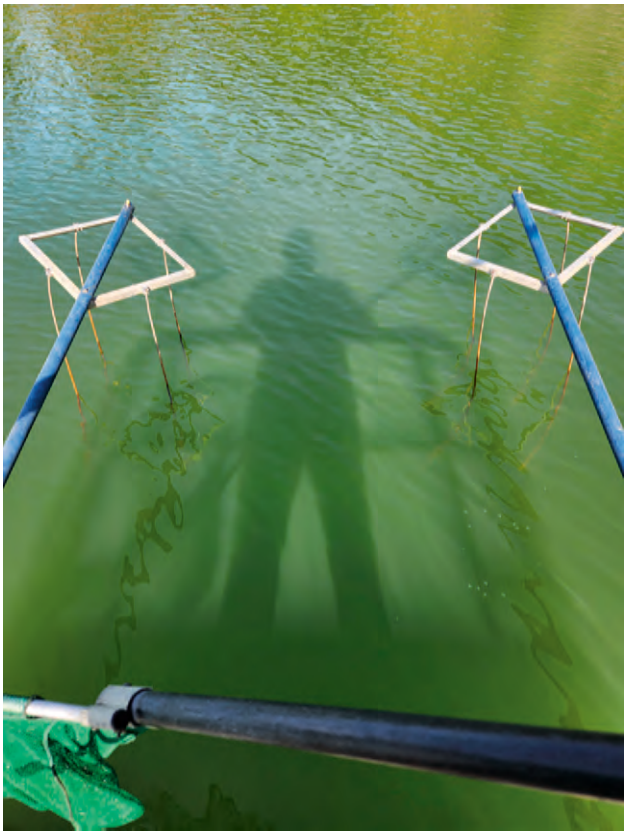
Man-Made Causes

You have already heard many previous times of fish kills being low DO related. That is also true with many man-induced fish kills. Activities in and around your waterbody affect the fish population. Many times, on private property, an activity not at the lake stresses or kills fish.

Some of the most common fish kills are caused by livestock and/or row crop run-off. Allowing livestock access to a lake being managed for quality fishing creates issues where an occasional fish kill will occur due to nutrient overload. The application of certain herbicides and pesticides along the shore and upstream can also cause issues. More herbicides used in uplands are toxic to fish than aquatic herbicides. Just the herbicide in the water can kill fish or kill the fish food source such as aquatic insects, their larvae, freshwater muscles, snails, grass shrimp, etc. This is also extended to lawn and golf course maintenance in more urban areas. Knowing the herbicide label is a must when using pesticides around water, beside killing your own fish, you can affect downstream private and public waters, which will multiply your problems.

One common and frequent man induced fish kill occurs during the process of starting up a new or recently repaired bottom aeration system. This is a gradual process. If not done properly, you create your own lake turnover and fish may die, depending on the time of year. To properly start a bottom aeration system takes six days. Begin every morning and run one hour on day one. Two hours on day two. Four hours on day three. Continue doubling the run time until the pump is running 24 hours per day. This is a difficult task if you do not live at the property, but cutting corners could set you back and require restocking, losing years and money.

Obviously other accidents where toxins get into the water can affect fish health. These are typically thought of as industrial, but can be from farm, resident and many other sources. Typically, if a fish kill is DO related, larger fish die off first and smaller individuals follow and it can be slow or quick. If it is chemically related, smaller fish usually die first, but certain species may be indicators of which type of kill you are experiencing. Investigating many fish kills, has shown patterns, which on DO related die-offs, large bass are some of the first to appear floating, while catfish, bowfin and gar are the very last to float, and it may be short lived enough that some species do not die before the DO rises back to acceptable levels. If it is a chemical induced die-off, catfish and bowfin (if present) will usually be the first species to start floating.



Algae blooms are a double-edged sword. They grow a lot more fish at a faster rate than clear water, but if too dense a big rainstorm or several consecutive cloudy days can cause an algae die-off, lowering the Dissolved Oxygen to stress or kill fish.

Overuse of well water can also stress or kill fish. Normally, if using well water sparingly to keep water levels up during a drought it is not an issue. However, if water is being taken out (irrigation mainly) as fast or faster than being put back in with a well, this can cause several issues with oxygen depleted water, drastic change in pH, rise in carbon monoxide and other parameters that can be undesirable until the well water stabilizes.

Drastic changes in pH can also stress and kill fish. This usually occurs in a system that needs liming. The less fluctuation in pH between 7 and 9 is better than it changing drastically from nighttime to daytime. If raising a pH in a small pond, do it slowly, especially if raising more than 2 points above current readings. The fish will do better and none will be lost. Liquid lime raises the pH much faster than granular, and frequently is the cause of fish kills in small ponds where the owner wanted to raise the pH, but was unaware of his actions on the fish.

Generally, not on private property, hot water discharge can stress and kill fish. This is more common

Quality and trophy fisheries need good water chemistry, habitat, genetics, and forage to reach their potential. Stress from lack of food or poor water quality slows the growth process down.

where industrial wastewater is used for some process then discharged into a creek, river or lake at elevated temperatures and fish do not respond to the drastic temperature change well.

Investigating Fish Kills

As stated earlier, winter die-offs may or may not show any signs a fish kill occurred. Whether it is small fish floating in the weeds that go undetected or larger ones that never float to be seen. This is why lake managers always stress an occasional spring or fall electrofishing survey be conducted to document the current status of the fish population. If you or no one else is at the lake for weeks at a time, a die-off can occur, fish float, birds, mammals and turtles clean up the mess before you get back.

The warning signs that a fish kill is coming may be indicated by water color. A change from green to brown or clear to brown may be the beginning of fish stress or die-off. This can be caused by lake turn-over, heavy rains or cloudy days. The brown may be suspended dirt, dying planktonic algae or bottom organics rising from a turn-over. Also, fish at the surface pipping (sucking in atmospheric oxygen). Other times, no indicators occur and dead fish just start floating.

Once dead fish begin to appear, review your own activities in and around the lake. Were there recent aquatic weeds sprayed? Was something done in the surrounding uplands? Was any water added or removed recently? What were the weather patterns the past four days or so prior to observing floaters? Then consider what may have occurred on properties up-stream from yours. Is it industrial, agricultural, residential, rural? If a low DO fish kill occurs, by the time you observe dead fish, the oxygen levels may have already risen back to acceptable levels. But not always. If it's a chemical induced fish kill, fish may appear immediately alive at the surface or float up dead in a couple days post death.

Looking at fresh dead fish or almost dead fish (usually can be dipped while at surface gasping for oxygen) can help determine if it is bacteria, fungus, virus or if the fish look completely healthy possibly DO or pollution induced. Look at the fish's outer body, gills, and inside mouth for soars or lesions. If collecting fish to take for testing at a laboratory, still alive is best, but fresh dead will work. Alive fish dipped and placed on ice is the best, because in warmer climates decomposition begins quickly and it is hard to determine what is disease and what is the start of decomposition. If pollution other than temperature is thought to be the cause, collecting specimens still alive, placing on ice and taking with water samples (also placed on ice in a clean container) to the nearest lab for testing is advised. The lab will need some

idea of what to look for. There are thousands of impurities, and they need to know what types of activities are performed in the area so they can narrow down what impurities may be in the fish. There are no blanket tests that reveal what killed the fish. At least a general idea of "industrial plants nearby that does this", "farm surrounding the lake that specializes in this". Although still fairly broad, this at least lets the lab know what it could be by what products are used in those situations.

Two common mistakes most landowners make is hitting the panic button over a few dead fish, and not realizing how many fish are in their waterbody. Throughout the year a few fish will die, both large and small of natural causes, hooking mortality, bird or mammal injuries obtained when they escaped being preyed upon. You probably won't see them, but you may. Twenty dead fish scattered around a five-acre lake over the spring spawn or over the entire summer is not a fish kill to be concerned about. Hundreds of dead fish are a concern. Most fish kills are not 100%. We have seen 18-acre lakes covered in white fish bodies, and there were survivors. Sometimes survivors of all species and sometimes some of all the same species remain. After a die-off, it is recommended to electrofish the lake, to

Well water in moderation to keep ponds from getting too low and staying cooler during a drought works well, but too much can stress and possibly kill fish.

Bottom aeration is a big help in preventing fish kills. If conditions get too poor, a fish kill may still happen, but its severity may be less and you will have fewer of them.

see what remains and to create a restocking plan (if even necessary) and a plan for preventing a reoccurrence, if feasible.

With electrofish sampling we can document over harvest and/or past fish kills that the landowner knew nothing about. We recently looked at a lake in central Georgia. New landowner, but lake was over 30 years old. We collected uncountable numbers of bluegill, redear sunfish, mosquitofish and golden shiners. None of which were over one year old. Not a single largemouth bass. The previous landowner when asked, admitted to heavily spraying the pond in July the year before with herbicides preparing it for sale. The pond is shallow and was covered in weeds. There were no weeds in it at the time of our visit. The fish kill was or very close to 100% on largemouth bass. We never saw one, despite the amount of forage present. A couple adults of the species present must have survived and repopulated the lake with no predators. At another property in North Florida, we electrofished a seven-acre lake that was covered in duck weed about 6 weeks prior to us sampling it. The lake was clean of the duckweed, but our electrofishing revealed only two largemouth bass weighing six pounds each, but not looking healthy. Not another fish was observed. This made no sense since the lake was in good shape the previous fall. Just prior to pulling out the boat I decided that we should take a few DO readings around the lake. The DO was almost zero from top-to-bottom in the water column, everywhere, rendering it still unable to support fish. When pressed, the manager admitted that under the direction of the owner, after we advised him not to treat, but wait for fall, due to causing a possible fish kill, they treated the entire lake for duckweed, and hence got rid of the weeds and the fish in one costly mistake. That was an awkward situation for everyone at the boat ramp.

Preventing Fish Kills

Determining what causes a fish kill is important, so it can be avoided in the future. There is little that can be done if a fish kill is in progress. If it is low DO, then temporary aeration can be added to help. Depending how large the lake is, this may make it less severe, stop it from further damage, or may have little effect and the fish kill continues until it runs its course.

If you are lucky enough to catch a low DO event early, adding surface aerators will add oxygen to the water and help the fish through it. Surface aerators range from a 110-volt fan on a float that vigorously agitates the water to commercial surface aerators that run via tractor PTO. We have seen these types help on waterbodies up to about 25 acres. If you are amongst a fish kill, do not install a bottom aeration system. This will expedite the die-off and increase its damage as opposed to slowing it down or stopping it.

Preventing fish kills start with lake design. Always dig the waterbody deep enough to avoid hot water throughout the water column and low DO periods during summer. Build a lake in an area where it will receive plenty of clean run-off to keep it full. Leave vegetated buffer areas around the lake especially between undesirable run-off and waterbody. Do not allow livestock in water or have areas of waste immediately next to the pond. If feasible, construct livestock accessible waterbodies and build some waterbodies livestock excluded. This can be done with fencing or by creating banks so steep they cannot get in.

When treating aquatic vegetation, avoid treating large percentages of the lake during the hottest parts of the year. Spray large areas during spring and fall, and only spot treat during summer to avoid a low DO fish kill from decomposing plants. If spraying large areas in summer is needed, divide into thirds, spray every 2-3 weeks apart to reduce the initial strain of decomposing plants.

When performing spraying around or upstream of your waterbody, know the label and be aware of possible effects on your waterbody if it gets washed into the lake 24, 72 hours, or even several days after treatment. Can it kill fish directly, or indirectly? Never use upland herbicides or insecticides just prior to a heavy rain event. We have seen this tragedy occur near agricultural fields, orchards, nurseries, housing developments and golf courses. The pesticide may not have negative effects on fish, but it may kill off their food.

If you own a deep lake or an older one with high organic materials in it, consider installing a surface or bottom aeration system. Aeration will greatly reduce the chances of a low DO fish kill, but it can still happen under the right conditions.

We hope you never experience a fish kill, but knowing how and why they occur can help you prevent them, and if one does occur can help you evaluate, identify the cause and rectify the problem(s) so it doesn't happen again.

Considerations When Choosing a Hunting Property

By Matt Petersen

Matt Petersen, owner of Petersen's Wildlife Management, is a wildlife and land manager. Contact him at petersen-swildlife@yahoo.com.

Often times the large-antlered/mature buck property can be the hardest to find due to all the variables that are in play in getting bucks to maturity and at the same time producing quality antlers.

One of the best parts of my job as wildlife manager is getting to see and work on so many unique properties across the mid-south. I work with many different landowners who all have distinctive goals for their properties and, more often than not, are willing to work and spend their hard-earned money to reach these goals. Unfortunately, I sometimes look at a property with a landowner that is poorly equipped, or even not all, to meet their stated goals. For me personally, this is a tough reality that I have to convey to the property owner. I tell folks all the time that I've never seen a hunting property that can't be made better, but all farms have different "ceilings", if you will, meaning that some can be much better than others. Some can also be much easier to get into top shape for wildlife than others. This article will lay out some points to consider when selecting a hunting property and make sure you don't have to receive the news that the land you chose doesn't have the ability to meet your goals.

Wants/Desires/Goals

It seems like every article I write I mention the word goals somewhere in it. Setting goals for anything you are doing is an important start to keeping a project on track and reaching an objective. Sitting down and taking the time to create a list of goals, wants, and desires for the property will allow you to form a checklist and be sure that the farm can check all the boxes. A good example of a type of farm that has a similar checklist is one I label as a

Having ATV trails suitable for all skill levels of riders is a hallmark of a quality recreational farm.

recreational farm. What I mean by recreational is that this type of farm isn't specialized in just one type of activity, such as mature buck hunting, turkey hunting, quail hunting, etc.; this type of farm checks many boxes and ends up being an awesome place for friends, family, and kids to enjoy the outdoors and spend lots of time together. I have a handful of properties that fit this bill and they all include good deer hunting, turkey hunting, dove hunting, fishing, duck hunting opportunities whether it be impoundments or ponds, ATV trails, shooting ranges, tractors, and equipment on site, as well as lodging on the farm. As you can imagine, these places are a lot of fun since they offer so many outdoor activities to be enjoyed year-round. The issue with a farm like this is that in order to produce all these opportunities, they have to meet certain criteria. If you want fishing, you obviously need to have bodies of water on the farm – creeks, ponds, or rivers running through it. Same can be said for duck hunting although impoundments can be built if the land allows. Dove hunting requires larger fields for best results (2+ acres ideally) and power lines or adjacent cutovers or larger fields often improve the area's ability to draw large numbers of doves. Quail in my area of the Southeast require patchwork areas of "old field" or young forest type vegetation to thrive and even be present on the landscape. Even turkeys, although not to the extent of quail, can exist in pockets across the Southeast with higher populations in certain areas and low to no birds in others. Some properties with rolling hills and lots of changes in elevation can make ATV travel a challenge and will limit who can navigate the trails. Lodges can be built nearly anywhere, but an issue I see is can power be run to them in a cost-effective manner. I've seen many landowners buy a farm just to realize it will be $20-$50K just to run power from the closest powerline to their only build site.

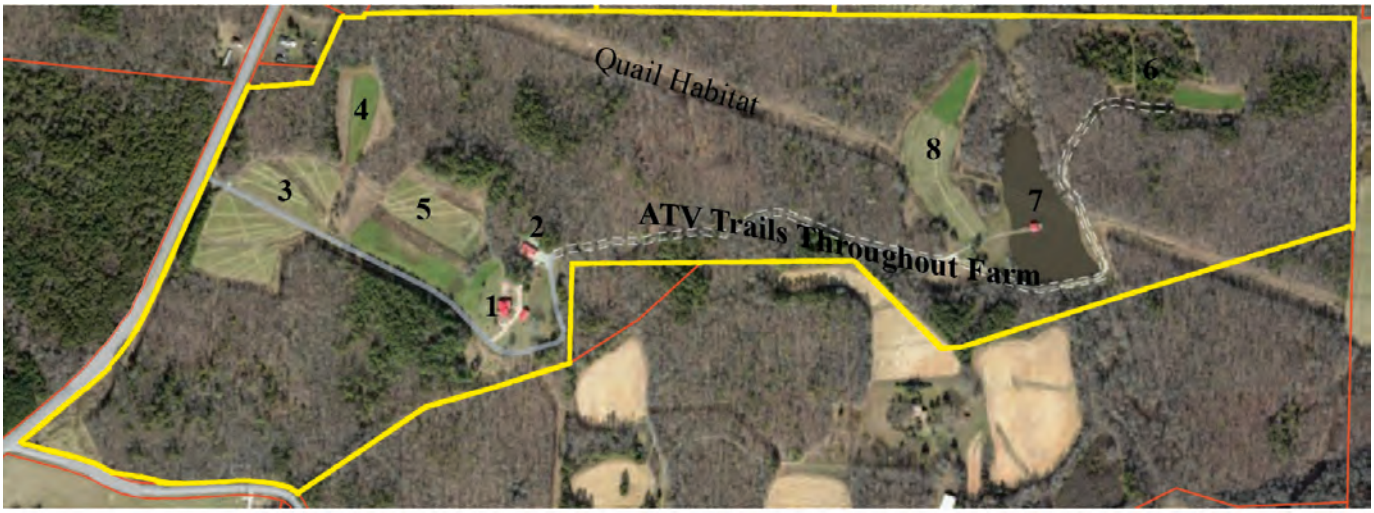
Another common goal, want or desire I see, and likely more than any other, is the mature buck property. So many landowners rank the goal of wanting to grow and harvest the best quality mature bucks on their property year after year above anything else. The issue with this is you often have to forget about lots of other activities on your farm if that is truly your main goal. An example would be hosting a dove hunt. In central NC, our opening day of dove season is always the first Saturday in September. The hunt starts at sunrise and ends 30 minutes after sunset. Most hunts will consist of multiple hunters that are mixes of family and friends and can range from a handful of participants to 30 or more people, depending on field size. As you can imagine, a lot of shooting can take place along with walking around looking for lost birds, talking, hollering to one another, and so on. The issue is that the opening day of deer season is always the Saturday following the opening weekend of dove. I can tell you from personal experience along with many accounts from my clients that deer, especially mature bucks, don't like this type of intrusion and will often change the pattern they had previously been on to avoid the area that was just hunted. With deer there are no absolutes, but this is a common phenomenon. I hear clients make comments every year like "we haven't seen that big ten since the dove hunt. He was in the soybeans all summer but after the hunt he vanished". Old, mature bucks get old for a reason in heavily hunted parts of the midsouth and they equate human intrusion to danger and will react accordingly to avoid it. Mature bucks also prefer to bed and spend most of their daylight hours in patches of cover that are rarely, if ever, intruded on by hunters. If a landowner is constantly riding ATV's, horses, or walking in these areas, chances are a mature buck in heavily hunted areas will simply re-locate to an adjacent patch of similar cover that is less traveled. Keep in mind that killing a mature buck is much easier if you can hunt them close to where they are bedding. They often don't move much in daylight during the majority of hunting season so being close to their core area is important. Also, having this suitable bedding cover that is undisturbed on your farm is important when trying to get bucks to older age classes in areas that get hunted hard. If the neighbors shoot young bucks, a guy that likes to harvest mature bucks only better have the right bedding cover for these deer to utilize and he must stay out of it. This will allow these bucks to have a safe haven on his farm and allow them to be protected as much as possible from the neighbors that would harvest them and take them before they reach maturity.

Another example of a goal, want or desire is the goal of having wild quail on a property. In the midsouth this can be a really tall order. Land use practices, such as farming, development for houses, ranching, and the overwhelming urge for rural landowners to bush hog everything has severely limited quality quail habitat. Wild quail can still be found in the Southeast but exist in pockets where suitable habitat is available to allow them to persist. A trend I've noticed on the farms I manage that have wild quail is that most are situated in areas with lots of active timber management going on in the area. I've also noticed that lots of those farms have power line right of ways running through them. Both young forest and power line right of ways often contain the young growth of trees, bushes, grasses, and forbs with a traversable understory, if you will, that small ground nesting birds like quail can navigate. These properties seem to be a highway of sorts to allow quail to move from suitable patches of cover in one area to another. Selecting a farm that already has these groups of wild birds and has timber management, and ideally those power line right of ways, is a must in having a farm with a quail population. Also, is the farm located in an area where the vegetation can be burned to keep it in an early successional state of growth? I view quail as a fire dependent species and being able to use fire on a property is a must for easily making quail-preferred vegetation. Is the property fully wooded or are there fields in place? Is the timber of the age that it can be harvested to open up the canopy and allow quail beneficial vegetation to grow?

All of these examples illustrate how wants and desires should be addressed and goals for a property set before you can determine what type of property to look for. I wouldn't say that a farm can't be all three of these examples in one, but it's rare to find one, especially if it's a smaller property. Being sure you know what you want in a property is the first step in getting it.

Location, Location, Location

Now that we have our wants, desires, and goals set, we can consider a broad area to focus the search for a property. If your wants, desires, and goals led you to the conclusion that you want more of a recreational property that will provide many different hunting, fishing, and outdoor activities year-round, I would be sure to consider living on this farm if possible or how far you're willing to travel to enjoy the property. Obviously, a farm that you can live on or is within a short driving distance from your home will get much more use



1. Lodging; 2. Equipment Storage; 3 - 6. Dove, Deer, Turkey & Quail Plots
7. Fishing & Waterfowl; 8. Dove Field with Power Line

This farm is a great example of an outstanding recreational wildlife property. It provides excellent opportunities for deer, turkeys, quail, doves, fishing, waterfowl, small game, ATV riding, as well as lodging and equipment storage onsite.

for most folks versus a farm that requires a long drive to get to. Speaking for my home state of NC, a recreational farm can be found just about anywhere within it. Keep in mind a recreational farm often doesn't have the best of any one activity, but its strength is typically having a bit of everything, or a large variety of activities offered within.

Often times the properties with very specific goals in mind are the ones that have to be very location specific if a property owner wants to meet that goal. The goal I see most is the large-antlered mature whitetail property. Again, I'll use my home state of NC as an example: NC is broken up into three regions. We have the mountains on the western third of the state, the piedmont region in the center third of the state, and the coastal plain on the eastern third of the state. If you were to look at all of the NC state record bucks for B&C and P&Y scoring, you will see that the majority of book deer come from the piedmont region of NC. If you were to walk around our state's Deer and Wildlife Expo and see all the deer mounts that folks display and also have scored that were harvested the fall before, you also would see the same trend. I would bet if you walked around that same expo and polled hunters you would get a majority answer that the piedmont region of NC is the best region to grow and harvest a large-antlered buck in the state. Obviously, all of these indicators aren't without flaws and are subject to many variables, but if you are looking for a great whitetail property that will produce large-antlered bucks in NC, the piedmont is a great place to start. From there I would narrow my search further and see if a certain cluster or group of counties were well represented in the state record books. Followed by word of mouth and from any locals or wildlife officials that represent those counties. I would also take a look at bag limits for deer and harvest structure. For example, in the piedmont region of NC a hunter can take two bucks per season, whereas in southern VA a hunter can legally harvest three. In heavily hunted areas the ability to take more bucks can often limit their overall numbers. I also would look at season dates and lengths, along with weapons and methods that are legal. In central NC we have a regional-based deer season that includes all the counties in the piedmont region. It's fairly straightforward and it's easy to see where your county lies within these regulations on a per-county basis and often counties that are close together will have different regulations for dates and weapons that are legal to harvest deer. Most of central NC has a long firearms season that starts with muzzleloader in late October and centerfire rifle starting in early November and ending on January 1st every year. It's much easier to harvest a deer with a firearm and this long gun season really hurts the mature buck population, especially when you consider its overlap with the November rut, when bucks are most vulnerable. VA has similar seasons, but some counties flip back and forth with more primitive weapons season such as bow and

These two bucks are a perfect example of the difference in antler sizes that variables such as soil type, land use practices such as farming, and timber management etc. play a role in producing quality deer. Both these bucks are mature and are top end deer in their respective region.

muzzleloader. This timing of seasons with the whitetail rut, length of season, and weapons legal to use certainly play a role in the number of bucks that can reach maturity on a farm, and it's easy to corelate the larger amount of mature bucks with areas that have firearm seasons outside of the rut, less buck tags, and often shorter seasons.

Another reason that counties in the piedmont region of NC consistently produce some of the best bucks in the state is soil type. Some of the best soil in the state can be found in the piedmont region and most areas are relatively flat, making farming very productive there. This equals more food for deer in both the farmed crops but also in more productive native growth that deer rely on. Taking the time to look at a soil map and calling the county's soil and water office to find the best soil in the area is a great idea and will be very helpful in growing quality deer.

Now that we've picked the region in a state and a county based on some of the factors listed above, we can get into the finer points of talking about the neighborhood or farms surrounding the property we may choose. The farms touching your property, landowners, land use, and hunting styles can greatly affect a manager's success in growing quality deer on their farm. I have seen this scenario play out so many times on my clients' properties as well as on my own land where the neighbors will kill young bucks year after year and lower the buck age class on all the surrounding properties. Don't get me wrong here, I don't mind what anyone harvests on their own property legally. If they want to shoot the deer and they have the tags to do so, by all means, enjoy yourself and hunt as you see fit. If you're looking to grow older age class bucks having a good set of neighbors can be helpful. I often tell the story of a property that has just shy of 60 acres that bordered a larger property of 500+ acres that a client of mine owned. The smaller property had nine different hunters that hunted it regularly and could legally harvest two deer each. That's 18 bucks total that they had every right to take. When you consider that those hunters could use bait and hunt with a rifle during the rut, there is no doubt that these hunters are going to have the opportunity to kill some bucks, especially the younger age class of bucks that often can be seen using bait piles during the day and are known to be less wary overall then mature bucks, and especially during the rut. If the goals of the smaller property hunters don't align with those of the larger farm owners, the guys with that many tags can make it really hard to get bucks into the older age classes; especially when you consider that the big bucks expand their home range in

Powerline right of ways like this one make for long highways of early successional cover that offer fantastic habitat for ground nesting birds such as quail and other wildlife alike.

Small game hunting is a staple of a quality all-around recreational property.

the rut. As mentioned earlier, the same specific requirements needed can be seen for a good quail population. In order to have wild quail population around, you need the proper habitat not only on your property but on the surrounding properties. Similar tactics to find this intel can be used for quail with a premium being put on timber management and land use. Again here, reliable word of mouth is key. If you can find a local source with some knowledge of the surrounding properties that's ideal for gaining some insight. I've also heard of sellers allowing potential buyers to run trail cams on the farm before purchase. The data provided by these cams would at least offer some idea of the animals that are currently using it.

Property Layout

A consideration that is often overlooked by folks when choosing a property is how it can be accessed or how it's laid out. I look at farms constantly that are excellent wildlife farms but lack the proper access and layout to allow them to be hunted proficiently. An example would be farms that have one access area from the state-maintained road. This will limit what winds a deer hunter can even drive onto his property without alerting all the deer to his presence. I've seen a few farms where the only access and parking areas need an east wind for the hunter to be able to stay undetected while using them. East winds aren't that common in central NC and this lack of access can severely limit the number of productive hunts on a farm. An example of a bad layout would be putting the preferred deer bedding in between your access and your food sources so that you have to walk through or blow your scent into the bedding areas. I see this a lot also, and although this problem can often be fixed by cutting timber, burning, reforestation, or food plot creation, it can also be expensive and require a long return interval depending on which method is required. I also experienced this with turkeys on a client's property this past spring. Trail cams were showing that a big Tom and a group of hens were

using a field in the early morning adjacent to the landowner's gate. Unfortunately, this gate is the only access to the farm, and since we have to park at the cabin there, we had to go through it. Even though we got to the farm and through the gate well before daylight, the turkeys that had been on camera in that field every day for weeks were a complete no-show that morning. That would lead me to conclude that they were roosted close to the gate that morning and decided not to make a sound and move the opposite direction at first light. Having other access points would have allowed us to enter the property somewhere else to ensure we wouldn't have spooked those birds.

Existing Infrastructure

Having good existing infrastructure is important when selecting a farm as well. Having a good road system to navigate the farm is always important in being able to properly manage it. Any infrastructure such as barns or cabins are a huge plus as well. Having dry places to store equipment, feed, seed, fertilizer, etc. is often needed, especially when traveling a good distance from your home to a farm. Having cleared fields on the property is a big consideration as well. Stump removal and grading goes anywhere from $1,000 to $10,000's an acre in my area, so having these openings in the proper place and ready to be planted should be considered before purchasing a property. Also, water sources are often overlooked when discussing existing resources on a property. Having ponds and large bodies of water on or adjacent to a farm is a must for waterfowl hunters, but every game species needs water. In areas where water is a limiting factor, this is especially important. In my area, a small pond can range from $20,000 to $50,000's to build, so having a quality water source in place is a great thing. Another consideration would be how the openings or fields on the property have been managed. For example, on properties I plant where in the recent past farmers planted tobacco, which requires deep tillage, lots of synthetic fertilizers and herbicides, I typically deal with poor soil fertility and soil health. I often have to add lots of lime to these fields to balance the pH and plant high organic matter providing food plot plantings that double as cover crops to produce lots of dead plant material to build fertility in the depleted soil. This often limits my options in what I can plant and

takes years of inputs such as fertilizer, lime, herbicides, and thoughtful management to straighten out. The flip side of this is often old pasture land or old fields that have laid fallow for years – these fields are often rich in organic matter from years of undisturbed grass growth, and livestock waste in the case of pasture land, or from the years of naturally occurring growth and death of plants in the fallow land. These areas are often very fertile and, even if the pH needs adjusting, can be planted in many types of forages and thrive.

Price

An obvious consideration is price. Everyone reading this, regardless of income, bank account or status has some kind of budget. I spoke of this topic some in a previous article in Wildlife Trends called "Climbing the Habitat Staircase", so I won't go into a great amount of detail here. That said, I do feel it's worth mentioning because I do see a recurring theme of folks using their total budget when purchasing their property. These folks are often left with very little or no budget at all to manage and improve the land. This often can lead to limited ability to reach the goals set out by the landowner and lead to dissatisfaction in the purchase. I look at it like this – visualize if you bought the nicest 4x4 truck imaginable to go off-roading in, hunting, fishing, etc. In this analogy, the "truck" is used, because all land was owned by or used by someone else before it was bought. So, you buy this gently used truck, but the only issue is that the tires are bald, and it needs a new set of good off-road tires to be able to get up and down those slick backroads and dirt paths. If you maxed your budget out on the truck and don't have the cash to buy those tires, what good is the big truck? You would be better off buying a slightly smaller or less equipped truck with a good set of tires or have the cash left over to buy the new tires versus a big truck you can't use. The same can be said about a land purchase. If you have a goal to have or maintain a quail population on your farm, you need to have enough cash to put in fire breaks so you can burn and maintain that quality quail habitat. If you want large-antlered deer on your farm, you're likely going to need enough cash to put in a few food plots to grow these deer and be sure they are still on your farm in the fall.

Along the same thinking as price, I would consider income potential on a farm, as well as the potential to work with a farmer to install food plots and help with habitat management work. On properties where farmers are actively planting fields, chances are they are paying for the privilege to do so. In the case that the farmers are planting species of crops that game animals prefer, this is a huge win-win for income potential and "free food" for the wildlife on your land. Also, there are lots of programs to provide habitat for pollinators, prevent erosion, protect mast trees, etc. that the government offers to pay or cost share to promote conservation of certain species. This can be a source of income for landowners as well.

Final Thoughts

A few topics we purposely didn't cover here are realtors, land search engines, mapping apps, etc. All of these services and sites are readily available with a generic internet search. I've found local realtors and land specialists to be very helpful with their insight on properties that fall in their coverage area. I also use multiple mapping apps regularly and find all the big names to be adequate and useful. My challenge to a person in the market for a new hunting property would be to dive deeper into a farm and make sure that this property can fill your wants and desires and meet your goals. Make sure the access is good, the property lays out well, is in a region that provides quality wildlife, ideally in a neighborhood having a similar management goal as you, or even areas that are lightly hunted, leaving excess game to utilize your property. Get an idea of what it costs to build infrastructures such as roads, fields, ponds, buildings, etc. in your area and that will allow you to grade the properties you look at and understand the cost after the sale that it will require to get your farm in shape to meet your goals. Also be sure to consider leaving some budget to manage your property after the sale so you can build it up to meet its full potential.

Owning a quality hunting property can be very rewarding and, for most folks, is a lot of fun to work on and utilize. Take the time to consider a view of these points on the front end and I have no doubt you'll be able to meet your goals and enjoy your farm sooner.

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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.

Spring is a great time to perform annual maintenance to trail cameras or send those needing repair in to be fixed.

Allow annual clovers planted in your fall food plots to seed out.

If you included fall annual clovers such as crimson, arrowleaf or other red clovers in your fall food plots, you will notice a strong burst of growth during spring and early summer. These clovers will provide excellent wildlife value through early-mid summer. Deer, turkeys, and other wildlife will eat the nutritious foliage of these clovers until the clovers die in summer. Another benefit of annual clovers is that insects are attracted to the flowers produced as the clover produces seed. Insects are an important source of protein for turkey poults and quail chicks. If properly managed, these clovers will produce seed that will germinate next fall and produce another good stand of clover. To ensure this happens, do NOT mow your food plots before the clover produces seed. We generally leave these fields alone and let them go fallow through late summer. After the clovers die, many weeds will begin to take their place. On many properties, these weeds provide some wildlife value. The next management we apply is early fall when we mow the plots as low as possible, allow the existing weeds a week or so to start growing again, then apply a glyphosate herbicide (RoundUp type herbicide) to prepare the ground for fall. When fall planting time arrives, apply needed fertilizer, lightly disk (or burn), then broadcast or drill cereal grains such as winter wheat and oats and/or other fall plot species. So, if you want to regenerate annual clovers and take advantage of the free seed produced by the crop you planted last fall, do not mow your food plots before the clover seeds out.

Check and send trail cams in for repairs.

Late spring is a great time to perform normal maintenance to trail cameras. Generally speaking, this is the period I use my cameras the least. Taking care of cameras now will ensure they are ready to be deployed in late summer to begin assessing bucks or conducting camera surveys in early fall. With over 20 years of experience using trail cameras and currently owning roughly 150 cameras, I can assure you that giving them a little TLC goes a long way in extending their life. I normally clean each camera in detail. Focus deep cleaning

If allowed to grow into early summer, annual clovers will produce seed that will germinate and produce another good stand of clover next fall.

efforts on the user panel (where you adjust settings), battery compartment, lens, and flash areas. I use an electronics spray duster (can of compressed air or liquid gas) often used to dust/clean computer keyboards. A toothbrush is a good tool to clean small debris from these areas as well. Never store cameras with batteries in them. If your camera has a rubber seal around access compartment doors (most do), pull them and clean them well. I often wipe them down with Vaseline to lubricate/condition them which gives them a better seal. If the rubber seal is dry-rotted, simply order a new one from the manufacturer. This is also a great time to send "broken" cameras back to the manufacturer for repair if needed. Obviously, there are many things that can break in trail cameras. Although we all try to handle them carefully, we are taking them into rough and bumpy environments so occasional issues will occur. By sending them in for repair now, you will avoid delayed service times later due to the typical "fall rush" in late summer/fall when most hunters start thinking about deploying cameras and remember or realize they have issues. A few of the more common problems I've encountered include flash not working properly, photos having a halo around white-out areas (like reflective deer eyes), and being out of focus. These are problems that only the manufacturer can fix.

Establish photo points to monitor the response of habitats to management strategies being implemented.

Early summer is a great time to begin assessing habitat response from management strategies you have employed over the past year. Photographs are a great way to monitor and document the progress of these habitat enhancements. Examples of areas to monitor include areas that you have burned, harvested timber, applied understory control, strip disked, planted fruit tree orchards, and food plots. Depending on where management strategies are being applied, several photo points should be located throughout the area and maybe

Nutrient-rich supplemental feed can significantly benefit deer while they are growing antlers, fawning, and producing milk.

across your property. Make sure to take notes or mark on a map where each photo point is located so that you can take the same photo over time. Many landowners take a picture from each location every 6 months. Photographs taken over time from these locations will reveal habitat changes and progress made.

Inspect and manage recently planted hard and soft mast fruit trees.

Most soft and hard mast tree planting takes place during winter. Now that it has been a few months since these trees have received attention, it is time to check on them. With the growing season in full swing, late spring is a good time to revisit these trees to provide TLC and ensure they are set for a good first summer. Take time to inspect each tree to make sure the tree and tube are properly staked and upright. If fire ants have built a mound inside the base of the tube, treat them and remove any dirt built up inside the tube. Make sure zip ties are secure on stakes and tubes. If trees were mulched (recommended), inspect the mulch and add more if needed to reduce weed competition. Speaking of which, late spring/early summer is a good time to spray glyphosate (RoundUp) around the base of each tree to kill grasses and weeds that compete for water and nutrients. Depending on the type of fertilizer (if any), was used when the tree was planted, now is a good time to give the tree a boost. Taking care of young trees during their first couple of summers is important and will result in optimal growth and strength. As such, continue monitoring newly planted trees throughout the summer and provide TLC as needed.

Prepare and plant food strips for turkeys and quail.

Food strips are "food plots" for turkey, quail and other birds that wind through fields, quail courses, along fire breaks, or open wooded habitat. Most supplemental food plantings for quail are warm season crops and established during spring and summer. Food strips are particularly beneficial in years of low native food availability. Plantings of Egyptian wheat, Sorghum-Sudan, grain sorghum, brown-top millet, foxtail millet, and pearl millet are great crops to plant in food strips and will do well in a variety of soil types common in the Southeast. Food strips should be planted in a rotational fashion. That is, in successive years, place new plots adjacent to the previous year's plots to create a mosaic of the current year's plot and stubble/annual weed community from the previous year's plot. Leaving the food plot stubble (not disking and replanting in the fall), will provide quality cover during fall and winter for game birds.

Plant summer food plots for wildlife.

Throughout most of the Southeast, April and May are the desired planting periods for many summer crops such as millets, sorghum, peas, soybeans, etc. Because many of the seed producing grass type crops that benefit birds are summer crops, wingshooters devote a lot of energy and effort into planting during this time of year. Deer hunters are well aware of fall food plots because they are so attractive to deer during hunting season, which helps hunters observe and harvest deer, but often overlook the benefits of summer crops for deer. If you are not fortunate enough to have commercial agriculture on your property or nearby, planting summer crops will benefit your deer herd if adequate acreage is planted. Many nutrient-draining biological processes such as fawning, milk production, and antler development are taking place during summer. Most summer plantings for deer are very nutritious and high in much-needed protein. Commonly planted summer crops for deer include

Most summer plantings for deer are very nutritious and high in much-needed protein.

many varieties of peas, soybeans, corn, lab lab, vetch, and clovers. One of my "go-to" summer plantings for deer in the Southeast is forage soybeans. One mistake I often see made is trying to plant these crops on small food plots. Because they are so attractive and will receive heavy browsing pressure, plots need to be at least a couple of acres in size, preferably more. Even at low densities, deer can apply too much grazing pressure on small plots and, in many cases, eat all plants shortly after germination before the crop has a chance to establish. Regardless of whether you are planting for birds or deer, a successful planting starts with testing the soil and applying the required fertilizers and lime to ensure good soil quality. Create a clean, smooth seed bed and plant under favorable conditions. Favorable conditions mean adequate soil moisture and a good chance of rain after planting takes place. As you can imagine, weed control poses more problems in summer plantings because of the warmer soils and good growing conditions. Therefore, it is essential to monitor summer food plots for weed encroachment and treat as needed for optimal forage production. I also recommend placing a deer "excluder cage" on each food plot to monitor crop production and deer use. Most of you have used or seen these in the past, but an excluder is simply a piece of 4' tall close wire fence rolled to make a 3' diameter tube then staked to the ground. It prevents deer from browsing plants inside the cage which allows you to assess crop success and deer use.

Consider planting screens to create visual barriers in large food plots.

Deer are often reluctant to enter large open food plots or fields (3+ acres) during daylight. This is particularly true for mature bucks. Of course, a hot doe is sometimes enough to get them out there. However, when hunting these fields, you are expecting a mature buck to do something that everything in his body doesn't want to do – expose himself. Large fields have tremendous value for holding

Planting strips of crops that create visual barriers throughout large food plots helps deer feel more secure using them during daylight, which will translate into better hunting.

deer on a property and offer an abundance of food. They often serve as "anchors of the property"/ destination food sources for deer. By incorporating some visual barriers throughout these fields, deer will feel more comfortable and enter them earlier and spend more time in them during daylight… which will result in better hunting. Visual screens prevent deer from seeing across the vast open field which makes the field appear smaller and more secluded. If possible, screens should be planted in a way that allows hunters to see the majority of a field. While planting hedgerows of wildlife-friendly shrubs or trees is a more permanent option, a common way to create visual screens is by planting rows of summer annual crops such as corn, Egyptian wheat, or tall growing millets. To establish "visual breaks," simply plant several 8-16ft wide strips in the fields during the summer planting period. I have used this strategy with great success on larger food plots or agriculture fields. As you get closer to hunting season, you may need to mow "shooting lanes" through these strips to assist hunters in seeing and/or shooting deer.

Move, clean & keep supplemental feeders full for deer.

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

level and ratio of protein, calcium, phosphorus, fiber, etc., will ensure deer have a nutritious food source. Whole corn should be avoided when possible unless you are "training" deer to use new feeding stations. As a side note and tip, deer will spend more time at and use/consume more feed (which is the goal), at feeders that are located in remote/isolated areas versus those in the open (e.g., food plots). Another tip is to never hunt over a supplemental feeder. A supplemental feeder should be a safe place for deer where they feel very comfortable and secure. Remember, you want deer to spend as much time at a feeder as possible. This seems obvious, but I commonly see supplemental feeders in sight of deer stands. Take these temptations away from hunters by ensuring feeders are not seen from stands. Lastly, remember that supplemental feeding is just what the name implies – a supplement to properly managing the natural habitat and deer herd. It is often the highest hole to "patch" in your management bucket, meaning everything else should be in place before a supplemental feeding program is undertaken or implemented.

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

Most recreational properties have some need for controlling water levels or water flow. Examples may include controlling water levels in fishing lakes, duck ponds, beaver ponds, canals, or swamps/marshes. To do this, a wide variety of water control structures are used. Early summer is generally a good time to inspect these systems. Generally speaking, early summer is a dryer period than late summer or winter in most of the Southeast. Some of the common things to look for include clogged pipes, deteriorated culverts, beaver dams, broken or missing flashboards, eroded banks, vegetation that is causing problems (like willows), broken valves or levers, missing or damaged stakes, broken beaver excluder fencing/cages, and damaged access docks/decks. Obviously, with so many different situations and different water control systems/structures out there, each structure has its own unique things to check, repair and/or replace. The point is to do a thorough inspection and make any repairs needed during the "dry season". It is certainly better to find and fix problems now rather than having to do so after your property is saturated during the wet season or when a flood event takes place and blows out weak components in your system.

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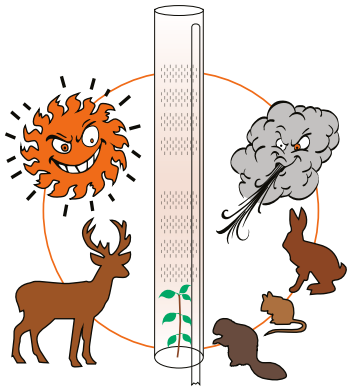

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