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Earl Says...

Why do I keep chasing turkeys? Seriously, why do we keep spending so much money, time and sleepless days trying to outwit a bird with a brain the size of a walnut?

Last week I was hunting at my buddy's property in Central Florida and after doing some careful scouting we knew just where the birds would be roosted in the morning. This was going to be a slam dunk hunt and I would be back at the house drinking coffee waiting on the others in camp. Yeah right.

The next morning, I did my part and set up perfectly in the woods across the pasture from where I believed they would be roosted. The birds did their part when three gobblers sounded off from my owl hooter. Within a few minutes, the three gobblers were joined on the ground by at least a dozen hens and/or jakes. Man did those birds put on a show! Only problem was they never came closer than 100 yards to me. Talk about frustrating.

I guess if it was meant to be, I would have given one of those birds a ride home in the back of the truck. But that's why they call it hunting and not killing. And the sad thing is.....I'll be back!



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Fire Ants and their Implications to North American Wildlife

By Ryan Shurette



If you spend any time outdoors you are probably familiar with the painful itching sting of the infamous fire ant. To make matters worse they never seem to come alone. If I had a dime for each of the curse words this little insect has caused, I would most likely be very wealthy. But the inconvenience they cause to us directly through their occasional stinging is nothing compared to the ecological toll they can have on native wildlife. Many people nowadays do not even realize that fire ants were completely absent on the North American landscape just a few short decades ago. We have for the most part just accepted this pest as part of living in the South. Truth be known, however, the fire ant is one of the world's worst invasive insect species. Its wicked reputation in the United States is well deserved. Fire ants simply don't belong here. These aliens are not only a nuisance to humans, pets, and livestock

directly, but they also pose significant threats to crops, native animal species, and even entire food webs in many parts of the United States. In this article we will examine the origin and biology of fire ants, discuss their impacts to native species since their relatively recent arrival in this country, and provide some considerations for their control.

Introduction

There are actually two species of imported fire ants in the United States. Depending on where in the country you are located, you might encounter the **Black imported fire ant** (*Solenopsis richteri*), or the more common **Red imported fire ant** (*S. invicta*). Both are native to the central and southeastern parts of South America, in the countries of Argentina, Paraguay, Uruguay, and Brazil. The black species is thought to be fairly limited in its invasive range to northern Alabama and Mississippi and into

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The Red imported fire ant is believed to have first arrived in North America by hitching a ride in the cargo hold or ballast of a shipping vessel, most likely in the port of Mobile, sometime between 1935 and 1945. From there it has marched steadily and largely unchecked across the southern landscape. Public domain image by Alex Wild.

southern Tennessee, with a few outlying pockets in the Carolinas and west into Arkansas. The black imported fire ant is thought to be slightly more cold-tolerant and possibly a little less aggressive than its cousin. The black and red species can hybridize, and this does occur where ranges overlap. The Red imported fire ant on the other hand is now widespread and abundant across the entire Southeast and several surrounding states. It has recently made its way west into Arizona and even California, and it has not finished expanding its range. This highly invasive species is believed to have first arrived in North America by hitching a ride in the cargo hold or ballast of a shipping vessel, most likely in the port of Mobile sometime between 1935 and 1945. From there the Red imported fire ant (hereafter referred to simply as fire ant) marched steadily and largely unchecked across the southern

landscape. Without the threat of predation by many of its native South American predators (primarily ant-eaters), the fire ant has not only become common, it has become unnaturally abundant in most of its new range. According to the USDA Agricultural Research Service, the density of the current fire ant population in many areas of the Southeast is several times higher than the natural densities observed in its native South American grassland habitats. In heavily saturated habitats in southern states, the number of fire ant colonies (mounds) can grow to more than 900 mounds per acre, and each colony can contain up to a quarter million ants. That can spell bad news for many of our native wildlife species, and even domestic animals.

Fire ants, like all other ants, are members of the Formicidae family and they are closely related to bees, wasps, and hornets (collectively all these related stinging insects belong to the order Hymenoptera). There are believed to be about 20,000 species of ants, with more than 13,000 currently known to science. Like many other ant species found across the globe, fire ants live in large colonies in the soil. Moist habitats are usually favored over dry xeric sites. In many situations the fire ants' nest will not be visible since it is typically constructed under large rocks, logs, or other objects. If no cover is available, they push up soil and carve intricate tunnel pathways in raised earthen mounds, located above the subterranean chambers and refugia where the queen is (or multiple queens are) found. The vertical structure of the mound and underground tunnel systems allow eggs and larvae to be stationed according to moisture and temperature gradients, and as weather conditions dictate. Like honeybees, the

vast majority of the colony is made up of "worker" ants. All workers are sterile females that are genetically very similar to each other (typically sharing $\frac{3}{4}$ of their genetic information, whereas human sisters typically share no more than $\frac{1}{2}$ of their genetic code). This biological strategy of haplodiploidy is believed to have shaped the selfless nature of a colony through time. It is the worker ant's sole purpose to protect the colony as "itself", and forage and fight for the wellbeing of the queen and colony as a whole. Male fire ants develop from unfertilized eggs and are winged, along with fertile females, which are produced by the colony to be future queens. As both sexes of winged individuals take flight during the warmer months of the year, they can often disperse significant distances from their home colonies with the aid of the winds. After aerial mating occurs the males die in short order, and the newly fertilized queens tunnel underground to start a new colony. Some strains of

Red imported fire ants have single queens and some have multiple queens, the latter typically being more invasive, with regards to competition with native ants and expansion into new areas.

In addition to sheer numbers, fire ants are equipped with the ability to deliver a particularly nasty sting. Stinging is used as both a defense mechanism as well as an offensive hunting weapon. When a swarm of fire ants attack an intruder, for example, they have been demonstrated to coordinate (either through mechanical or pheromone cues) their initial stinging to maximize the shock and awe of the event. I don't know anyone who just stands in one place when a couple dozen fire ants initiate the signal to strike. The venom of the fire ant is chemically engineered to immobilize prey and cause pain in a defensive situation. The venom is comprised of a cocktail of insoluble alkaloids (solenopsin) mixed with over 45 other known toxic proteins,



If no cover is available, fire ants push up soil and carve intricate tunnel pathways in raised earthen mounds, located above the subterranean chambers and refugia where the queen is (or multiple queens are) found. The vertical structure of the mound and underground tunnel systems allow eggs and larvae to be stationed according to moisture and temperature gradients. Photo in public domain.



As both sexes of winged fire ants (fertile males and queens) take flight during the warmer months of the year, they can often disperse significant distances from their home colonies with the aid of the winds. After aerial mating occurs the males die in short order, and the newly fertilized queens tunnel underground to start a new colony. Photo credit: Lamiot; Pollinator; no changes made. https://commons.wikimedia.org/wiki/File:Fire_ant_queens_3589.jpg



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some of which are allergens. It is these allergens that are capable of causing anaphylactic reactions in some humans. Other antimicrobial

proteins in the venom are used for controlling bacterial growth in the colony or for laying down chemical “scent trails” for other workers to follow. Fire ants have strong horizontally opposing mandibles that are used to bite, in order to get a grip to more effectively deliver the stinging injection from their abdominal stinger.

Red imported fire ants are survivors. They are omnivorous and opportunistic and feed on a wide variety of both vegetable and animal matter. They can survive and effectively multiply by scavenging on dead animals, fruits, insects, garbage, as well as larger animal prey. They can also infest and cause significant damage to many kinds of domestic crops (corn and sorghum are just two examples), and their mounds themselves can wreak havoc on farm equipment. Fire ants are very adaptable to changes in weather and environmental conditions. Although their native South American ranges typically consist of warm climate zones, the species is also cold tolerant to some degree. By burrowing beneath the ground, most fire ant colonies can persist

through the year in the southern part of the US. In the northern extent of the current range, however, (including parts of Arkansas, Tennessee, Oklahoma, and Virginia), as many as 90% colony mortality can occur during cold winters. Fire ants are also able to cope surprisingly well with flooding events and when the nest becomes flooded with rainwater, the colony comes to the top and flees the mound, and worker ants then link themselves together around the queen. They can raft together in floating mats comprised of as many as 100,000 individual ants. This behavior has been commonly observed following widespread flooding such as during hurricanes in Texas, Mississippi, and other coastal states.

Effects on Native Species

Research by Allen et. al. (2004) and many others over the past few decades has revealed some interesting, and alarming, trends regarding fire ants’ impacts on many native North American wildlife species. Native wildlife often find it hard to cope when they’re faced with an enemy they are not adapted to, and didn’t co-evolve with. Much of the research on fire ants has looked at implications to ground nesting bird species, especially bobwhite quail. We know that ants can sometimes have negative effects on bobwhite nests, typically predated the chicks when they are pipping, or emerging from the egg (Meyers, et. al., 2014). The odor of hatching birds causes a rapid response from ants if they are in the vicinity. Even native ant species are known to predate hatching bobwhite chicks in some cases. Red imported fire ants, however, can reach extremely high densities and are very aggressive in their nature, and therefore may have the potential to affect bobwhite survival rates and productivity in some locations. To investigate these effects,

Haines et. al., (2017) examined nest predation of radio-tracked bobwhites in Albany, Georgia and Tall Timbers Research Station in Florida. This study looked at over 23 years' worth of nest fate data (approximately 3,200 bobwhite nests). Their results showed the average nest loss from fire ants to be about 5% across the Georgia study sites and only about 2% in the Florida sites. However, some of the sites in the Georgia study showed nest loss rates as high as 15% due to fire ant predation. These numbers suggest that fire ants may be fairly limited in their impacts in some locations, and significant in others, depending on soils and other environmental factors. Fire ants can be bad news for quail in other ways as well. Besides outright mortality in nests and hatching chicks, fire ants can also cause injury and stress in young chicks. And they may also reduce invertebrate food sources (soft bodied insects and other arthropods)

that might otherwise be available to chicks, juvenile, and adult bobwhites. Apparently, even consuming fire ants in the diet can have negative effects, including weight loss and reduced survival, on individual bobwhites (Meyers, et. al., 2014). Allen et al. (1995) examined population trends for bobwhites in Texas from the mid-1960's into the early 1990's. They noted stable bobwhite numbers in counties that were not infested with fire ants and in those areas that were infested with ants, quail numbers declined significantly. In fact, in that same study, 75% of the declines were statistically explained by fire ant presence, and by time since infestation, for the given county. Allen et al. also showed that by reducing the fire ant infestations across a property, bobwhite populations increased significantly, although this might not be the case in every situation. In a separate study by Dabbert et al., (2002), 38% of the bobwhite chick mortality they observed was caused

by fire ants. There is certainly some variability between these studies, but collectively they suggest fire ants are capable of having negative impacts in some cases on quail.

Other ground nesting birds have also been shown to be affected by fire ant depredation. Species known to be impacted include Prairie chickens, Least terns, Great egrets, Cliff swallows, Wood ducks, and others. Late-nesting clutches (laid when temperatures are higher and the weather is often drier), seem to be the most impacted. One Texas study found that a drastic reduction (up to 90%) in ground-nesting waterbird clutches (gulls, black rails, and herons) was due to fire ant predation. Brown pelicans in Georgia were also observed to abandon their nests when ants moved in. Interestingly, data about fire ants' impacts on Wild turkeys is limited. Most biologists assume that there is some correlation between fire ant presence and reduction in turkey

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Fire ants are also able to cope surprisingly well with flooding events and when the nest becomes flooded with rainwater, the colony comes to the top and flees the mound, and worker ants then link themselves together around the queen. They can raft together in floating mats comprised of as many as 100,000 individual ants. This behavior has been commonly observed following widespread flooding such as during hurricanes in Texas, Mississippi, and other coastal states. Photo by National Park Service.

recruitment, but it has been largely undocumented and seemingly under-researched. With declining populations of wild turkeys in the Southeast, there is a need to learn more about the role they may be having on recent Wild turkey trends. Impacts to birds are not restricted to those species that nest on the ground. Fire ants can climb onto tree boles and even into the forest canopy, and they have been documented to prey on songbird nests. Campomizzi et. al. (2009) conducted a field study to determine nest survival in White-eyed vireo and Black-capped vireo in central Texas. These birds do not typically nest high in the canopy but do nest well off the ground. In 2006 and 2007 they monitored 71 nests, (44 White-capped vireo and 27 Black-capped vireo). They experimentally applied insecticide and physical barriers at the individual vireo nests. These treatments increased nest survival from 10% to 31% for the White-eyed vireo and

from 7% to 13% for the Black-capped vireo at their study sites. Competitive reduction of insect biomass by fire ants is also certain to influence other insectivorous birds and mammals. By affecting the net populations of these first level herbivores, fire ants may have the potential to disrupt entire food webs in some ecosystems. Population declines due to insect prey competition from ants has been observed in insect-eating birds such as the loggerhead shrike. The true impacts to the myriad of other species that feed exclusively on insects and other invertebrates are not yet fully understood.

In addition to having effects on many bird species, fire ants have also been demonstrated to cause mortality and other life-threatening issues for several reptiles and amphibians. Since these animals also lay eggs, and oftentimes in moist soil habitats, there is a real risk of predation by fire ants for

many herp species. Fire ants were observed to predate hatchling gopher tortoises (Landers, 1980) for example as they pipped and emerged from their eggs and attempted to make their way through the soil. Numerous snakes and lizards are known to be negatively affected by the invasion. Rare and declining species like the Texas horned lizard, southern hognose snake, and rough green snake have all been documented as being susceptible to ants. These species were relatively common prior to the widespread fire ant invasion, and they are now all uncommon. I remember seeing and catching dozens of docile rough green snakes each summer in central Alabama during the 1980's, whereas nowadays I see maybe one every few years. This trend is likely at least partially due to a decline in open herbaceous understory habitat in this part of the state, but it makes one wonder how much is also due to the saturation of those habitats by fire ants. Conners (1998) observed significant mortality in the eggs of green snakes from ants, and even observed mound-building on top of clutches of eggs.

Research on fire ants' impacts on sea turtles has probably received the most attention of any category of North American reptiles. Allen et al. (2001) found fire ants on 13 out of 18 of the specific known sea turtle nesting beaches in Florida. In a Georgia study conducted by R. A. Moulis in 1997 looking at loggerhead turtles, the researchers found that even though a small percentage (11%) of turtle nests on their study sites were infested with fire ants, the impacts on those infested nests were significant. Just as in birds, fire ants attacked the hatchlings just after pipping and caused significant mortality in those nests. Parris et al. (2002) also noted predation of Florida green turtle

hatchlings, in addition to life threatening injuries such as blinding. Even eastern box turtles can and have been documented as being killed by fire ants since its natural defense behavior is not to flee, but to hunker down and close its shell. This allows fire ants to swarm the individual box turtle in large numbers and they are small enough to enter the crevices in the shell (Allen et. al., 2004). It is thought that amphibian impacts are just as high as some reptile species. In South Carolina, Todd et. al. (2008) conducted a field study looking at marbled and mole salamanders in different forest management conditions. They found that clear-cuts and heavily disturbed forests were much more prone to infestation by fire ants and that the amphibians that remained and attempted to reproduce in these disturbed areas were likely to be predated. Even small mammals are at risk of mortality from fire ant swarms. Masser and Grant, (1986) reported an average of 13% mortality in live-trapped rodents. Trapped hispid cotton rats, pygmy mice, and white-footed mice all suffered attacks and mortality from fire ants. Some researchers have noted behavioral responses (to stinging fire ants) in whitetail deer fawns that might cause them to be more at risk of predation. While mortality from fire ants to newborn fawns is probably very rare, they were observed to bleat and react erratically, and to move more overall, which could theoretically make them more easily detectable by large predators like coyotes, dogs, and bobcats.

Interestingly, fire ants do have mutually beneficial relationships with some species of wildlife. In butterflies belonging to the Lycaenidae family, for example, the developing caterpillars are sought out and brought into the mound by the worker ants. Instead

of preying on them however the ants feed and care for them as they develop and pupate. The Lycaenid caterpillars are treated with such hospitality only because they secrete a sugary substance that the worker ants feed on during the caterpillar's stay in the colony. Similar

mutualistic behaviors are observed in at least one species of metalmark butterfly in the Riodinidae family. Several species of aphids are also "tended" by fire ants for their sugary secretions also (a substance called honeydew). Fire ants can sometimes also serve indirectly ben-



Many ground nesting birds have been shown to be affected by fire ant depredation. Species known to be impacted include Northern bobwhites, Prairie chickens, Least terns, Great egrets, Cliff swallows, Wood ducks and others. Interestingly, data about fire ants' impacts on Wild turkeys (shown here) is limited. Photo by R. Shurette



While adult gopher tortoises (shown here) are generally not at risk, fire ants have been observed to predate the hatchlings as they emerged from their eggs and attempted to make their way up through the soil. Photo by R. Shurette

eficial roles to humans and wildlife since they do feed on some undesirable parasites like ticks, flies, mites, and chiggers. They can also effectively reduce the populations of agricultural insect pests. However, these benefits rarely outweigh the negatives.

Chemical and Biological Control of Fire Ants

Many land managers are interested in preventing fire ants in unoccupied areas, as well as treating them in infested habitats. While most landowners simply tolerate them on their property, in some cases where high infestation densities exist (30+ mounds per acre), treatments may be worth the effort if wildlife benefits are paramount. Chemical treatment of large habitat tracts can be costly, but by focusing on open disturbed lands, borders, and pastures, the efforts can be focused and concentrated in the zones where the

highest fire ant densities would occur. According to the Texas A&M Extension Service, fire ant populations “can be suppressed in pastureland for \$10 to \$17 per acre per year application”. Just as with herbicides and all other pesticides, insecticides are sold with a label that governs their use and provides instruction for their application. Always follow label directions and restrictions for the type of land use in which you are making the application. For example, in cattle pastures (agricultural lands) there are some granular broadcast bait formulations (including hydramethylnon, s-methoprene, and pyriproxyfen) that can be used on an annual or biennial routine to reduce the number of colonies, whereas fenoxycarb is only registered for non-agricultural rangelands. Fenoxycarb prevents immature insects from developing into a reproductive adult because it mim-

ics juvenile hormone. Individual mound treatments using carbaryl formulations (also known as Sevin powder), can be used in addition to the bait broadcast treatments. This product is also registered for use in agricultural fields and hay pastures. Roadside edges, powerline rights of way, and food plots are other places where treatments might be made depending on infestation levels. Rarely are treatments made (or needed) in heavily wooded areas or largely undisturbed forest stands.

Several biological control options are also being studied, with some showing promise. Typically, a combination of fire ant parasites and predators are used in these experiments to shift the competitive advantage from fire ants to native ants. When this shift is made, native ants can outcompete and even search out and predate the fire ant queens, suppressing their popula-

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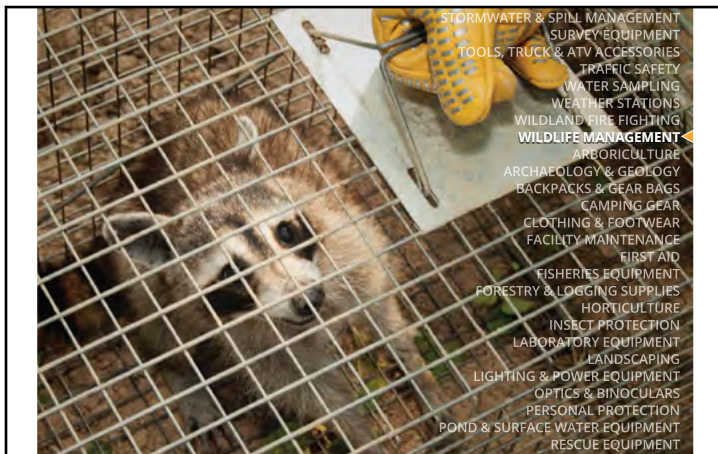
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tions. A microscopic protozoan named *Kneallhazia solenopsae*, for example, infects both Black and Red imported fire ants in their native South American ranges, and it was recently discovered in Florida fire ants. Research is underway to propagate this protozoan so that it can potentially be used as a biocontrol agent. Several fungi are also being studied, along with some parasitic insects, including the phorid fly, *Solenopsis daguerri*, another potentially effective biocontrol insect, is a parasitic ant species which has a very bizarre strategy for survival. This species gains access to the fire ant colony by mimicking the pheromones of the colony ants, and then seeks out and physically takes control of the queen by clasping her with its jaws and legs. It then deceives the fire ant workers by mimicking the queen's chemical scent and it is fed and tended to by the fire ant workers, tricking them into raising an army of more parasitic ant queens. These parasitic queens eventually emerge and disperse to infect more colonies on the landscape. These ants are currently being studied for use here in the United States to help control infestations. Even though there is some promising data coming from this and the other chemical and biological control trial programs, it is not likely that we will be saying goodbye to this aggressive exotic insect any time soon, unfortunately.



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Turkeys For Tomorrow

Who Is It, What Is It and What Can It Do?

By Ron Jolly
Photos by Tes Jolly



Ron Jolly (ronjolly22952@mindspring.com) is an award-winning outdoor writer and video producer living with his wife, Tes, on their farm near Tuskegee, Alabama. Tes (www.jollysoutddorvisions.com) is herself an award-winning writer and outdoor photographer. You've seen lots of her work in past issues of *Wildlife Trends Journal*.

State wildlife agencies are statutorily charged with the management and protection of our wildlife resources and through cooperation with private landowners and other organizations are responsible for one of the greatest conservation success stories of all time, the restoration of the wild turkey.

In June, 2020, a group of veteran turkey hunters gathered at White Oak Plantation near Tuskegee, Alabama for a reunion of old friends. The purpose of the gathering was to enjoy good food, an adult beverage (or two) and catch up on old times. We were also there to discuss the situation facing wild turkeys across the United States.

That conversation took place on Saturday, June 13. In the room, 12 men and 2 women with a combined turkey hunting experience of almost 500 years seriously deliberated the state of turkey hunting in their home state and formulate a question that he or she felt, if properly addressed, could improve turkey populations in his or her area. Most of the participants, including

my wife Tes and myself, are longtime members of the **National Wild Turkey Federation** and support that mission. The first question that evolved was “is there more we can do to help wild turkeys?”

From that round-table discussion I was able to formulate and write a story for *Wildlife Trends Journal* called “*What Is Happening to Wild*

Turkeys In The South” It appeared in the July/August 2020 issue. Six months later *Turkeys For Tomorrow*, a new non-profit conservation group, hatched from that egg.

A Plan Comes Together

The big challenge in how to go about addressing the issues wreaking havoc on America’s wild turkey resource was where to start. Our group is all from the southeastern part of the United States; Arkansas, Alabama, Mississippi and Louisiana. In the aforementioned article published in *Wildlife Trends Journal*, questions were raised that we felt, if addressed properly, might reverse the decline in wild turkey populations. We all knew we did not have the number of turkeys in our home states so why not start in our own back yard?

July and August of 2020 were spent discussing and searching for logical ways a small group of concerned hunters could unite around a single cause—helping turkeys. Through that process we quickly realized the monumental task we faced. We also realized we would need a lot of help.

During this time of organizing, we decided to structure our organization with the election of officers and a board of directors. Due to the Covid 19 pandemic we could not meet in person and began virtual meetings on a regular schedule. To say those early meetings were chaos would be like saying water is wet but we learned how to move forward our agenda of making a difference for wild turkeys. We gelled as a group and began to function efficiently and make progress as to who we were and what we wanted to be.

I had no idea how hard it would be to get to even a good starting point. That came in one of those clumsy Zoom meetings when we decided

on the name for the organization, **Turkeys For Tomorrow**. We decided we would not be a member organization. Instead, *Turkeys For Tomorrow* (TFT) considers contributors Partners. We decided we would not hold banquets or conventions. All these decisions were made to keep overhead low and the organization debt free. I’d like to tell you that was easy but I’d be lying.

Once the name for the organization was chosen the next step was a mission statement. If I said that was simple, I’d be lying again. In fact, the mission statement is the result of many writes, edits, re-writes and discussions. Finally, everyone was satisfied. Turns out our mission statement is the glue that holds *Turkeys For Tomorrow* together.

The foundation of *Turkeys For Tomorrow* is its mission statement:

We support and promote science, conservation, education and hunting traditions for America’s wild turkey resource while working alongside likeminded organizations, state wildlife agencies, hunters, landowners and universities to ensure we all have turkeys for tomorrow.

Building on a Solid Foundation

Once the Mission Statement was finalized, TFT began seeking opportunities to implement the mission. It quickly became apparent to us that the logical way forward was to work with universities and state wildlife agencies. These professionals already had skin in the game in the form of trained personnel, equipment and ongoing research. We concluded that all that was missing was adequate funding. To secure funding, we went to the source of funding for the most successful wildlife management program of all time, the **North American Model of Wildlife Management**. That source is the American hunter.

Hunters have funded all the great wildlife management programs in the United States since the passage of The Wildlife Restoration Act (Pittman/Robertson Act) in 1937. Hunters voted to approve an 11% excise tax on long guns and ammunition and 10% on pistols. This tax is collected by the federal government and is shared to individual states in the form of a 3-1 match for dollars raised by states through



Hen turkeys with broods of near-grown poults are vital to the reversal of the downward trend in turkey populations across the United States.



Hunters provide the lion's share of the funds needed by state agencies through the purchase of hunting licenses and matching federal funds generated from the Pittman Robertson Act.



In recent years some states have adjusted season openers and bag limits in an effort to ensure enough hens are bred to increase poults on the ground.

the sale of hunting licenses. To date, the Pittman-Robertson Act has generated over \$12.5 billion that has gone to states for the specific purpose of wildlife and wildlife habitat management. This powerful tool is how state agencies garner the lion's share of their funding

Another little-known fact is that contributions from non-profit organizations to state agencies for wild-

life management projects are eligible for those 3-1 matching funds. Raising funds and working with state agencies to identify projects and requiring agencies to apply for matching funds and spend the money on the identified project was the most practical and efficient approach for TFT.

A Good Starting Point

Initially, Turkeys For Tomorrow will

focus its efforts on the southeastern United States. The Southeastern Association of Fish and Wildlife Agencies (SEAFWA) is comprised of 17 states and territories. They are: Alabama, Arkansas, Florida, Georgia, Tennessee, West Virginia, Louisiana, Mississippi, Missouri, Texas, Oklahoma, Puerto Rico, Georgia, South Carolina, North Carolina, the Virgin Islands, Kentucky and Virginia.

Why the southeastern United States? First, that is where the founders of TFT live. The Southeast is where we hunt and where our observations of the decline in turkey populations occur. Additionally, each state or territory in the Southeastern Association of Fish and Wildlife Agencies employs at least one turkey and/or upland bird biologist. These experts combine their knowledge and expertise into what they call the **Wild Turkey Working Group**. This group works collaboratively to address and solve issues they have identified. This cooperative effort allows the group to choose issues to investigate and research, and provides a larger view of the issues. State agencies are funded by license sales and matching federal funds. In recent years the decline in license sales has threatened state agencies' ability to fulfill their obligations to manage and protect wildlife populations.

This is where *Turkeys For Tomorrow* hopes to help. We want to work with the Wild Turkey Working Group and let them tell us where funding is most needed. Once that project is identified and approved by the TFT board of directors, TFT will apply as much funding as possible directly to that project. In return we will require the state agency in which the funding is dedicated to sign a Memorandum of Understanding stating the agreement

of cooperation between the state and TFT. Also, the state must agree to apply for matching federal funds, spend the funds only on the identified project, provide itemized accounts of when and where the funds are spent and provide regular updates on progress. In turn, TFT will post quarterly reports of expenditures and progress on our turkeysfortomorrow.org website. This builds transparency between the agency, TFT and our Partners, *Turkeys For Tomorrow* will operate on an 80/20 split of contributions. \$.80 of each dollar contributed by Partners will be spent to help wild turkeys, \$.20 of each dollar will be used to grow and operate TFT.

Added Value

Another avenue of support TFT brings to the table is high profile men and women in the outdoor industry. We believe hard decisions will have to be made by state agencies to reverse the downward trend

in turkey populations. Those decisions include loss of hunting days and reduced harvest of birds. These decisions are the last thing any state wildlife agency wants to impose on hunters. It's a PR nightmare for those agencies.

We believe bringing the voices of celebrities like Preston Pittman, Ray Eye, Jim Ronquest, Donald Devereaux Jarrett, David Cardin, Coates Head and Kevin Matthews will unite hunters behind the science of those hard decisions and help state agencies get the job done sooner. We believe adding the support of former state agency directors such as Corky Pugh (Alabama), Curtis Taylor (West Virginia) and Mike Knoedl (Arkansas) bolsters the agency that made that hard decision and will help hunters accept and support the decisions made. Outdoor communicators like Big Daddy Lawler, Steve Long, Jim Spencer, Larry Rea, Allen White,

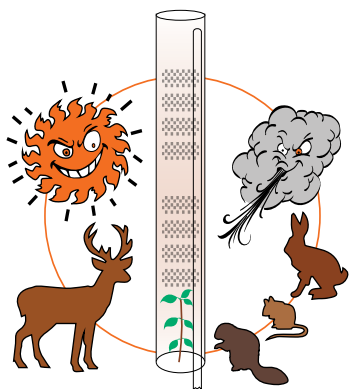
Glynn Harris, Mike Giles, Jill Easton and Tes Randle Jolly, the list goes on and on, will get the word out explaining the whys and hows of the problems and solutions.

For years many hunters I know have suspected there were problems occurring with wild turkeys. TFT wants to help state agencies and universities identify those issues. Mississippi has just published that there is a decline in wild turkey populations in that state. Arkansas has moved back spring season opening day three consecutive years. Georgia is considering shortening their season and lowering the bag limit. Alabama plans to reduce the limit from five to four, move opening day back five days, and implement a study on the why and how to fix declining turkey populations in the state.

In a speech delivered at the Plenary Session of the Wild Turkey

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Symposium in 2015, Dr. Jim Miller, Professor Emeritus, Department of Wildlife, Fisheries & Agriculture, Mississippi State University, expressed concerns about many of the issues suspected to adversely affect turkeys today. The following is Dr. Miller's letter to *Turkeys For Tomorrow*:

*I am not sure just who will see this, however, after reading the TFT newsletter I was reminded of the paper written from which my presentation at the Plenary Session of the 11th National Wild Turkey Symposium was made in 2015. I addressed many of the concerns I saw listed in the "If Not You--Who??" article, and even later at the request of two Retired State Wildlife Agency Directors provided them with a more specific list of reasons why the wild turkey population has declined and why it is unlikely to ever get back to that peak level again in most states. I am attaching the paper for your review and response with consideration that I think you will find they address every issue identified. I am delighted to see that *Turkeys For Tomorrow* is taking up the issue of what changes need to be made. I think if the attached paper is examined, you will see that I previously tried to share these concerns with the professional wildlife community several years back. Best wishes and I look forward to hearing from someone after they have reviewed them.*

Respectfully,

Jim

James E. "Jim" Miller

*Dept. Wildlife, Fisheries & Aquaculture
Mississippi State University*

The paper from which that speech was derived can be read in full on the News page at www.turkeysfortomorrow.org.

It's Not Too Late

When European settlers arrived in America there were an estimated ten million wild turkeys. Due to clearing of land for agriculture and excessive, unregulated hunting, wild



The mating ritual of a wild turkey gobbler is one of the most beautiful spectacles found in nature.

turkey populations suffered severe decline. In 1920 eighteen of the 39 states that constituted the wild turkey's range had totally lost their turkey population. In the 1930's an estimated 30,000 birds were all that were left in the United States.

As early as 1929 state agencies began trying to address the decline in turkey populations. Hundreds of thousands of farm raised birds were released into the wild. These efforts were a total failure to the pen raised bird's inability to survive in the wild. In the 1950's a man named Herman "Duff" Holbrook from South Carolina discovered how to trap turkeys using a canon net. Since that time more than 200,000 wild turkeys have been trapped and relocated into habitats in 48 states.

In 2020 there were an estimated 6.5 million turkeys in the United States. Some estimates say that number is down 10-15% from the heyday in the late 1990's and early 2000's, but that is not the only change that has occurred in the turkey woods. Today, there are 6 million turkey hunters. We have developed better calls, camouflage, ammunition and decoys. We have

phones in our pockets that put GPS mapping in the palm of our hands with the swipe of a screen and click of an app. Trail cameras capture images of turkeys as they move from place to place in their everyday lives and text the image to your phone. Bottom line is we are a lot better at killing turkeys today.

Hunters, private landowners, organizations like the **National Wild Turkey Federation** and state wildlife agencies brought wild turkeys back from the brink once. We are nowhere close to that near disaster today but why ignore the problem any longer? *Turkeys For Tomorrow* was created to help state wildlife agencies and universities solve the problems that are diminishing wild turkey populations and put resources in the hands of the professionals who can reverse these disturbing trends. It will take all of us to accomplish this lofty goal so if you are one of those people infected with the turkey hunting disease, put your shoulder to the task at hand and help us help those who make sure we all have turkeys for tomorrow!

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Practical Ways for Landowners to Manage Wildlife with Surveys and Data

By Seth Basinger



Seth Basinger is a wildlife biologist on private properties in West Alabama. He received his B.S. in Biosystems Engineering from Auburn University and a M.S. in Wildlife Science from the University of Tennessee. Seth can be contacted at sethbasinger.masonbend@gmail.com

Once heard a saying... “It’s hard to know where you are if you don’t know where you’ve been”. I actually heard that on my daughter’s favorite Disney movie, but it makes a lot of sense when it comes to wildlife management. Personally, I think the value of knowing how far you have come from where you started is important for managers. Not only does it keep you involved, but it keeps you “in-tune” with how management activities can affect wildlife. Additionally, witnessing progression over time can boost your confidence levels.

For decades, wildlife managers have used surveys of some sort to estimate populations, which in turn dictates how management activities are implemented. The animal usually determines which method of survey can be used, whether it’s camera surveys for deer, burrow surveys for gopher tortoises, or electroshocking for fish. Typically, the big picture of the survey is to try to

get a number of animals over a given area, or a density estimate. In turn, wildlife biologists and managers can use these estimates to effectively direct management efforts.

Most surveys are merely estimates of how many animals are on the landscape during the survey period, but in most cases only God knows the true number. From my experience of using surveys to manage game populations, the primary key to success is **consistency** from survey to survey. Controlling variables such as time of year, weather, bait, locations, etc. can make your data a lot less “noisy” and more reliable. When surveys are conducted over time in the same way, trends in the data can become apparent. Trend data is a very valuable resource to look at how populations may fluctuate from week to week, month to month, or, in most practical cases, year to year which mirrors reproductive periods of most animals.

The goal is to be able to compare apples to apples, therefore the more things you keep consistent from survey to survey, the more accurate the trends will be. For example, one would likely get varying results comparing a deer camera survey done pre-season vs. post-season on the same property. Two main things may affect those estimates. First, the number of bucks in the pre-season survey would likely be higher because of hunting mortality in addition to natural mortality (fighting, rutting, etc.). Secondly, the number of does and fawns estimated may be skewed because fawns are harder to differentiate in the photos from adult deer during post-season surveys.

Another example would be conducting gobbler counts on turkeys in the spring vs. the fall to get an idea of how many gobblers (and yes, I say gobblers and not toms being from Alabama) are using a property. Although I have heard a turkey gobbler in the fall before, it doesn’t

compare to a cool, crisp Alabama morning in early April when the oak leaves are as big as squirrel ears (had to throw a Tom Kelly reference in close to turkey season!). A little common sense goes a long way when collecting data and conducting surveys.

In the past, surveys have mainly been used by federal and state agencies to estimate populations. However, there are many practical methods that landowners and managers can use to aid in their management schemes. In particular, I will concentrate on practical game surveys for deer, turkey, quail, and waterfowl and how you can implement them on your property.

Deer

The white-tailed deer has likely been studied and surveyed more than any animal in the history of the North America. There are

many ways to survey deer: aerial FLIR surveys, spotlight surveys, hunter observation surveys, and my personal favorite and likely most appealing to a deer manager, camera surveys. Everyone I know who deer hunts likes to look at trail camera pictures and, in my opinion, can cause an eagerness similar to a child opening presents on Christmas morning.

Camera surveys can be used to monitor herd health, identify “shooter” bucks, and get population estimates, which is very appealing to most managers who are practicing Quality Deer Management. Without going too much into detail, cameras are deployed in a grid-like fashion (usually a camera per 100 acres) over baited sites. Deer are then captured by the cameras for 10-14 days following a pre-bait period in which

the deer get accustomed to the bait site. The total number of bucks, does, and fawns are counted in all of the pictures and the bucks are individually identified or “uniqued” based on their antler characteristics. Using the ratios of bucks, does, and fawns counted, the number of does and fawns can be estimated given the number of unique bucks identified and a density estimate can be achieved given the acreage of the survey. This may sound complicated, but it’s really simple elementary school math once you understand the process. I would recommend a Quality Deer Management Association publication called *Deer Cameras: The Science of Scouting* for any landowner looking to conduct deer surveys themselves. There are also private consultants available who will conduct camera surveys on your property.



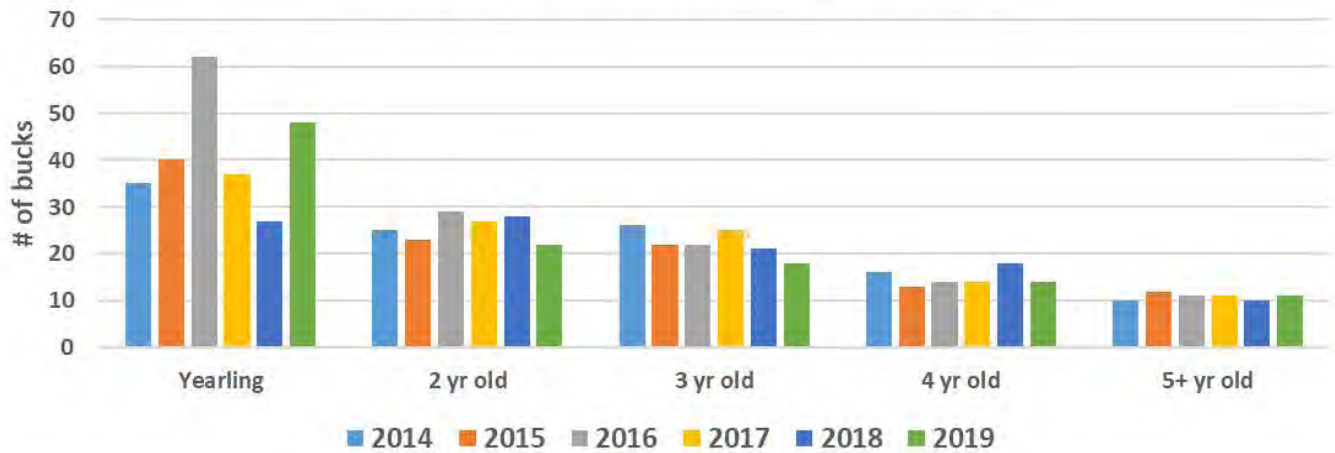
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Camera Survey Estimated Buck Age Structure



Six years of camera survey data showing the number of bucks in each age cohort

With that said, no survey method is perfect and from my experience, pre-season camera surveys underestimate the number of fawns on a given property. On the properties I manage, I generally use camera surveys to identify bucks, quantify buck and doe numbers, and generate shooter lists. I then use early season hunter observation data to make inferences on fawn recruitment and add that into the equation to get a fall deer density.

Shooter lists are extremely helpful for buck management. Hunters should have photos readily available while hunting to serve as a guide for bucks that should be harvested. For example, on a 1700-acre property in West Alabama, we have found through camera survey trends that we consistently hold 22-25 mature bucks (4 years or older) each fall, no matter how many bucks were shot the year before. The property has a high buck density and bucks end up killing each other or themselves during the rut as a result. It's a "survival of the fittest" situation with Mother Nature deciding which bucks survive to the next year.

We generally wait until a buck is at least 4 or 5 years old and close to

his maximum antler growth before adding him to the shooter list.

However, in order to make sure the bucks with the best potential make it to maturity, our philosophy the past couple of years has been to take out inferior bucks (young and old) that will compete for resources. Here is where a shooter list comes in handy to aid hunters in harvesting the correct bucks. Imagine this philosophy like playing 5-card draw poker. In the end, you can only have 5 cards, but you can turn in some of your worst cards along the way for new ones to finalize your hand. This may or may not be the situation on your property given property size, deer density, or what your neighbors shoot.

Another useful tool private landowners, managers, and hunting clubs can use to manage their deer herd is a state program called DMAP (Deer Management Assistance Program). Most states across the Southeast offer this program, however each state may have different qualifications and rules that are required to participate. In general, DMAP usually requires certain data collection such as body weights, doe lactation, hunter observations, etc. in which they will use to make inferences on the status

of your deer herd. In my opinion, if you are remotely serious about deer management then you should be collecting this data anyway. If interested, contact your agency to see what is offered in your state.

Turkeys

Most biologists and hunters agree that turkey populations have declined throughout much of the Southeast. I feel like we are at a tipping point...much of how we manage turkey populations in the near future may have long-term implications. With that said, I think it is extremely important for managers and landowners to track their turkey populations over time to keep from overharvesting and to see if management strategies are working.

Turkeys are without a doubt my favorite animal to hunt and also to manage. Since 2014, I have had the luxury of managing a large property for turkeys and seen the progression unfold in front of my eyes. Every year in July and August, we have conducted brood or poult surveys to see how successful hens were at nesting and brood-rearing that year.

If you study the graph closely, you will see that the number of poults

Buck Harvest Statistics										
Age	Live Weight		Points		Base		Length		Spread	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
0.5	0	0.00	0	0.00	0	0.00	0	0.00	0	0
1.5	1	87.00	0	0.00	0	0.00	0	0.00	0	0
2.5	3	144.67	3	3.67	6	2.69	6	11.71	2	9.125
3.5	4	164.75	4	5.50	8	3.83	8	16.22	4	14.344
4.5	5	187.40	5	8.20	10	4.21	10	18.96	5	14.9
5.5	1	206.00	1	8.00	2	4.81	2	19.50	1	16.125
6.5	0	0.00	0	0.00	0	0.00	0	0.00	0	0
7.5	0	0.00	0	0.00	0	0.00	0	0.00	0	0
8.5	0	0.00	0	0.00	0	0.00	0	0.00	0	0

1.5 year old Bucks Statistics				
	Number	Percent	Avg. Live Weight	Avg. Points
Spikes	0	0.00	0.00	0.00
Forked	0	0.00	0.00	0.00
Totals	1		0.00	0.00

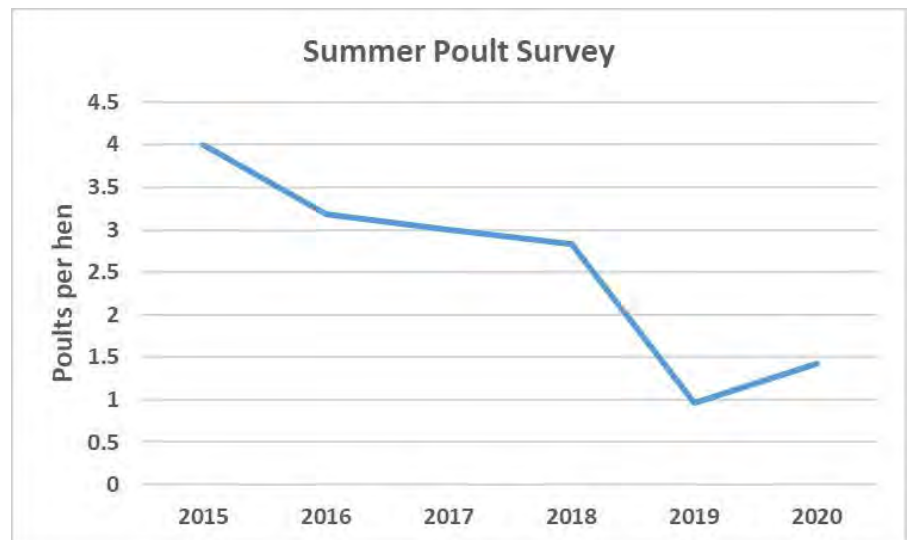
Doe Harvest Statistics			
Age	Number Harvested	Avg. Live Weight	Percent Lactating
0.5	4	56.50	0
1.5	5	99.80	0.00
2.5	10	102.70	60.00
3.5	12	115.42	66.00
4.5	2	116.00	100.00
5.5	1	118.00	100.00
6.5	0	0.00	0
7.5	0	0.00	0
8.5	0	0.00	0
Totals	34	102.56	

Example of generated DMAP harvest statistics over a hunting season

we observed per hen has actually decreased dramatically over the past six years, which is not typically what you want to see when managing for turkeys. In fact, we have hardly seen hens at all the past couple of summers during the survey! This caused me to start digging deep to find answers because we were seeing increases in birds during other times of the year.

I believe as nesting and brood-rearing habitat improved, especially in the woods after intense timber thinning, fire, and herbicide regimes, hens chose to keep poults away from roads. Roads provide easy traveling for turkeys, but also can expose a mother hen and poults to increased predation risks (bobcats, coyotes, hawks, etc.). As a result, hen observations have declined during the recent surveys.

Additionally, whenever a hen has been observed in a recent survey, she usually didn't have a brood, which is probably why she was more apt to use the road in the first



Six years of poults survey data showing the average number of poults per hen observed during July and August

place. Therefore, I had a hard time buying into what the poult survey data was showing and pulled in other sources to verify.

To test my theory, we analyzed all the photographs from our fall deer camera surveys and counted turkeys in the pictures to see if trends could be detected in the fall population over time. Sure enough, this past year we counted nearly 4 times the number of turkeys compared to where we started in 2014! Based on the increasing number of turkeys we observe on the property each year, it did not make sense that nesting and brood-rearing success could be decreasing so dramatically. Sometimes you have to read between the lines on what data may be telling you and pull in other sources to make your best educated conclusion.

Trail cameras can be useful tools to inventory your turkey population without having to be there. There have been several studies recently on using trail cameras to get population estimates for turkeys. Personally, I don't think the technology is there yet to accurately do it, but I also don't think we are far off either. However, you can get a sense of how many birds may be

using an area from using cameras. Also, isn't it nice to get a wad of "blown-up" gobblers sent to your phone while you're in the office?

Additionally, spring gobbler counts can also give valuable insight to how many males may be using your property. This information can be useful in determining harvest quotas to prevent overharvesting. This is simply just going and listening at daylight when gobbling activity is getting ramped up and counting the total number of different birds you hear gobbling. I suggest listening within earshot of good roost areas, and using stealth to not "bump" birds. You should also listen on quality mornings when it's not windy or raining and birds are a little more vocal. Remember, the goal is identifying how many different birds are gobbling, not how many times a single bird gobbles. Therefore, after you give one spot 10 minutes or so, move to another spot. Gobbling activity usually decreases as the morning wears on, so it is wise to stop completely after an hour or so and also to start in different places the next time. Compare this data from year to year to monitor which direction gobbler numbers may be trending.

Quail

Similar to turkey gobbler counts, annual spring (mating) and fall (covey) call counts can be done by landowners to determine how quail are using the property over time. Generally, observers will have a pre-determined route with listening stations approximately 1/2 mile apart so that there is no overlap in birds heard. Also, you need to listen with low wind and good weather starting at daybreak and lasting about an hour or two. Listen several days in a row to build a good data set and use consistent techniques in subsequent years.

There are benefits to both spring and fall surveys, but they do have their differences which could be used for specific purposes. In the spring survey, the observer listens for the "bobwhite" mating call of single males in search for females. The peak mating season may be different depending on which state you are in, but generally in Alabama, males are most vocal around early June. In my opinion, spring surveys may be more applicable for landowners because males are very vocal and can be heard easier and longer after daybreak.

On the other hand, fall surveys revolve around listening for established coveys (a social group of 10-20 birds), which is useful in establishing fall/winter hunting criteria. Generally, these covey calls ("koi-lee") are not as vocal and as distinguishable as spring "bobwhite" calls.

I didn't go deep into detail, but there is a lot more information out there on procedures for conducting these surveys. I recommend starting with your state agency first and then researching information available online to see what works for you. Again, keep track of spring or fall quail surveys over time to monitor how populations may be fluctuating.

Waterfowl

Surveying waterfowl can likely be the most frustrating and sometimes misleading for a manager in the Deep South (at least it is to me!). Waterfowl numbers are primarily driven by weather and everyone knows that the colder it gets up north, the more migrating waterfowl we get to see. Therefore, it's difficult to quantify if your management efforts are paying off if you don't get consistent weather from year to year.



Trail cameras can give hunters and managers a good idea of how many turkeys (especially gobblers) are using their property

There are several techniques biologists use to survey waterfowl numbers. Most of the surveying done by state agencies are done aerially. However, you can simply watch or scan your waterfowl impoundments or wetlands with binoculars once a week and count how many you see. Or, you can use observation or harvest logs from hunts as data.

Once again, trail camera observations can be used in place of human observations with waterfowl too. Cameras allow you to record waterfowl numbers without having to be there, and without risking getting seen. From my experience, it is most effective to set up the camera on a “time-lapse” setting to take a picture every 30-60 minutes because ducks sometimes have trouble triggering a motion sensor. Additionally, managers can get a sense of the time of day waterfowl are arriving to plan their hunt accordingly. You may have time to get to the “honey-do” list after all!

Managers can use the total waterfowl numbers observed or harvested by species from year to year to make inferences on the success of specific management plans. Just be sure to record weather conditions and time of year considering this could have big impacts on the species and quantity of ducks.

Final Thoughts

Some of the most common questions I receive from managers are along the lines of... “How many deer should I kill a year off my property”, or “How many turkeys can I kill a year and still maintain quality hunting?” I wish there were concrete answers to these questions, but the real answer is “it depends”. There are several variables that factor into this equation such as habitat quality, reproductive success, predator numbers, property size, what your neighbors shoot, etc.

Bobwhite Quail Fall Covey Count Data Sheet

This data sheet can be used to record the number and location of quail covey’s heard during the fall covey count. Counts should be conducted on clear, calm mornings. Arrive at the listening point 45 minutes before sunrise and end the survey at official sunrise. The area surveyed is equal to 196 acres per listening point based on an average listening radius of 550 yards.

Observer Name: _____
Survey Date: _____
Start Time: _____
End Time: _____
Listening Point Location: _____
% Cloud Cover: _____
Temperature: _____
Wind Speed: _____



Covey ID	Time of Call	Approximate Distance from Listening Location	Number of Birds in Covey (If Flushed)
Sample - Covey A	6:36 AM	60 Yards to the SW	12

Total # of Individual Coveys Heard: _____ **Average # of Birds per Covey:** _____

Adjusted Covey Estimate:

Total # of Coveys Heard	x	Adjustment Factor*	=	Fall Covey Index

*To adjust for social calling behavior, multiply the number of coveys heard by the following factors:

Number of Coveys Heard	Factor
1	0.53
2	0.85
3 - 4	0.87
5 or more	0.94

For example, if you heard three coveys calling during the survey the calculation would be:
 $3 \times 0.87 = 2.6$
 Your adjusted covey estimate would be 2.6 coveys for the 196 acre survey area.

Approximate Birds per Acre Estimate:

Acres Surveyed	÷	# of Coveys Heard	x	Avg. # of Birds/Covey	=	Acres/Bird

Example of a fall covey survey data sheet obtained online

that are specific to a given property. However, by surveying your wildlife before and after you introduce a management activity (such as harvesting, trapping predators, prescribed burning, etc.), then you will likely have a good idea if there were positive or negative implications to what you did. Just remember, consistency with your surveying methods and examining trends are the keys to success.

Also, realize that surveys don’t necessarily need to be scientific to be effective. For example, when you

check your food plots and they are mowed down like a putting green, then you probably either have too many deer or not enough food available. Or, perhaps you haven’t seen a turkey track on your roads in quite some time, but the roads are absolutely covered in sign of predators such as coyotes, bobcats, and raccoons. Don’t make things more complicated than they are sometimes and use common sense. What’s important is putting time in the field, paying attention, and keeping records to see how your management is paying off.

Spring Lake Management

By Scott Brown



Scott Brown is a Biologist and regular contributor to Wildlife Trends Journal with over 30 years experience in research and managing natural resources throughout the Southeast. Scott founded Southern Sportsman Aquatics & Land Management in 2007 and now has clients from Texas to Florida and into the Carolinas. Contact him at scott@southernsportsmanaquaticsandland.com or (336) 941-9056.

Spring is the best time to get an electrofishing survey done on your lake. It is a snapshot of what species are in your pond and in what numbers. Combined with angling data, this is the best way to evaluate your lake from day one, document progress in the future and allows management techniques to be modified to continue success before problems arise in the population observed during angling. Photo Credit: Andy Whitaker

Spring is the busiest time of the year for lake managers. Lake owners in the South have the luxury of working on and enjoying their lakes in winter while Northerners have cold weather and even freezes that deter winter lake work and/or recreation. My schedule is by far the busiest from late February through June. We start electrofishing in Central to South Florida in late February to early March, and finish spring lake evaluations in the Carolinas in Late May/early June. Thank goodness not all areas start spring the same time, or else someone like myself who works large geographical areas would make it hard to service all our clients as well as we do.

Once water temperatures get above 50° F, things start becoming active and alive. Monitoring the severity of your past winters helps you determine what may need addressing in late winter/early spring this year. Did you have excessively warm or cold temperatures or lack of or excessive rainfall this past winter? Colder than normal temperatures may have caused a fish kill you are unaware of in forage species such as threadfin shad and/or golden shiners? Threadfin shad have a cold-water threshold of about 45° F and golden shiners about 35° F. Species such as largemouth bass, bluegill and redear sunfish can handle ice covering the surface, but

may have been affected by lower-than-normal Dissolved Oxygen (DO) levels. However, Copper-nose bluegill and pure Florida bass may perish in cold water temperatures when stocked farther north than they can handle. On the opposite side of the spectrum, if it was warmer than usual, certain species of vegetation may not have died back and possibly grew during winter and is already becoming a problem before spring is here. Besides seasonal weather patterns of hot or cold, flooding and drought affects your waterbody. Weather may also affect hatcheries making it harder or impossible for a while to acquire certain fish species for spring stocking such as

threadfin shad, mosquitofish, tilapia, and golden shiners, as we will probably experience in spring 2021 from the extreme cold that went across the country.

Water Chemistry

During the spring, your water chemistry should be good from top-to-bottom particularly DO, unless you have major issues. Sampling water chemistry every quarter can help you understand what kind of swings your waterbody has throughout the year and determine if any water quality issues are negatively affecting your fish population. Spring water quality issues can affect fish growth, health, reproduction, egg hatching success and fry survival.

We recommend testing in the morning for water temperature, DO, pH, and conductivity one foot below the surface and one foot off

the bottom in the deepest spot. At various locations (depending on waterbody size and number of inflows) test for ammonia, alkalinity, carbon monoxide, chlorides, hardness and salinity (if close to the coast). With the DO meter, determining if there is a line and at what depth separates good DO levels and poor, or if it is constantly good or bad from top to bottom is important. This will change with the seasons. In a lake with good water chemistry and no aeration system DO should be good top-to-bottom in spring and fall, with it stratified (layered like a cake) in the winter and summer. The depth of this separation line will vary depending on algae blooms, water clarity and substrate makeup. The farther down this line is the better, as there are more surface acres for fish to reside during these times. Checking this in spring only is a mistake as it may look good, but

during other seasons, the poor water quality section may be large and hindering the success of your fish population. If you have a suitably fitted bottom aeration system, the DO will be constant throughout the water column throughout the year.

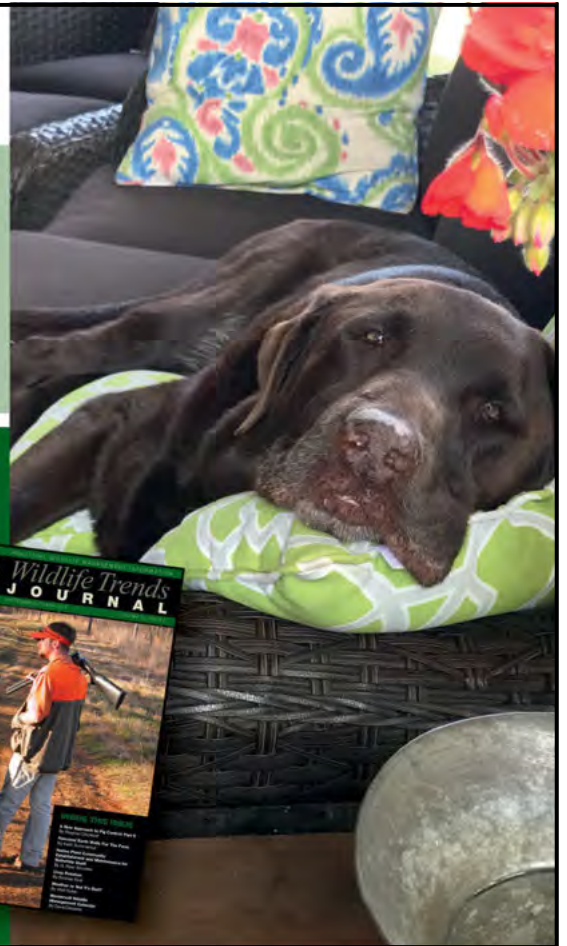
If you conduct an annual fertilizing program, or starting one is desired, begin fertilizing once water temperatures reach 55-60° F and continue throughout the growing season. Monitor the visibility every-other-week and add fertilizer as directed on the product label. Desirable visibility with a fertilization program is 18-36 inches. Any more and you can have submerged vegetation issues, any less can cause a catastrophic fish kill should the planktonic algae die off all at once. Do not over fertilize and do not stop the program mid growing season once it is started. If

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the pH is not adequate (above 6.5 minimum), we recommend liming in the fall, allowing water chemistry to adjust over winter so you can start fertilizing in the spring.

Adding an aeration system in the spring makes the startup easier than if done in summer or winter. The air temperature is not as hot while installing the equipment, and the water column DO and temperature should be fairly steady throughout making it less likely to

cause a fish kill during the startup process. Spring is a good time to service pumps and clean bubbler stones every year.

Habitat and Vegetation

Once shoreline and submerged vegetation begin to grow, immediately begin treating foreseen nuisance aquatic vegetation with herbicides to prevent excessive growth in summer and large amounts of herbicides being required later in the year. This may

be determined by historical growth, the species of plant and the past winter temperatures whether plants were killed, growth was slowed or continued at a normal rate. The sooner in spring problem vegetation is treated, the more successful the treatment. Know your plant species biology, herbicide, application rates and the effects from water temperature.

Some filamentous algae species will begin to grow underwater on the bottom before other terrestrial plants begin to grow. If treating filamentous algae is required, treat as soon as you see it appear. Like all other nuisance plant species, treating sooner rather than later is better overall for the lake and your budget. Other early growing species around the shoreline or in the water that has been a problem in the past should be treated as soon as the plants appear to be growing. A growing plant receiving foliage herbicide treatments responds much better than a dormant plant.

Spring is the best time to transplant soft tissue aquatic vegetation in or around your lake. This allows it a full growing season before winter to root and become established. Make sure plant species chosen and locations around the lake are best for your area, easy to care for, allow bank access and are aesthetically pleasing. Plant species purchased from a nursery specializing in native aquatic plants or a nearby donor site can be sources for your native species. When using a nearby donor site, be sure you properly identify the plant to prevent moving a nuisance or non-native species creating a problem for you in the future.

Early spring is also a good time to add offshore fish attractors and gravel spawning beds to help by increasing bream and bass spawning areas and providing



Late winter early spring is the time to restart your fertilization program or if pH is right, start one for the first time. Once started, it must be followed through the entire growing season, or it can cause major nuisance vegetation issues when stopped before fall.



Most people have quality largemouth bass near the top of their management strategy goals. The water temperature was 70° F on a spring April morning in Georgia when this fish was collected during a lake evaluation. The spawn had just occurred for her, but was still in progress for others. Several larger bass were observed that day due to the timing of the electrofishing.

hiding habitat for newly hatched fish and increasing survival rates, especially in waterbodies lacking good natural habitat. We have observed gravel spawning beds being used in less than five days after installation.

If you stopped supplemental feeding for winter, begin feeding once per day when water temperatures get above 55° F. Feed during the warmest part of day in 4-6 feet deep water. Begin feeding twice per day when water temperatures are between 60 and 70° F. Increase to feeding four times per day when water temperatures reach above 70° F. In some areas these water temperatures may be reached in March and others not until June. Hopefully over winter you cleaned feeders, checked timers and recharged batteries prior to restarting the feeders. If all feed dispensed is not consumed within 15-20 minutes, reduce times dispensed to reduce waste. Most feeding attracts fish, so feeding times throughout the day need to remain the same for long periods of time so the fish will be nearby when the feed is dispensed to ensure most is consumed and waste is reduced. Feeder locations can be points to sight evaluate catfish, bream and shiner populations while fish are at the surface consuming floating feed. We recommend feed with various sized pellets and floating and sinking mixed in one bag. There are various brands of feed on the market, whichever you choose, make sure it has a minimum of 30% protein. Both Purina and Sportsmen's Choice offer a mixed size and floating with sinking feed in the same bag. Be sure the feed is fresh and not moldy, certain feed molds can be toxic to fish. Depending how your batteries are stored over winter (inside, fully charged when stored and fully charged again before



Once water temperatures get above 55° F, fish feeding should resume with twice a day feeding and turned up to four times a day after water temperatures get above 70° F.



Spring electrofishing should be done around the bass spawn in your area. This assures the larger bass will be in shallower water during sampling so they can be captured and are represented in the numbers. Photo Credit: Andy Whitaker

putting out) replacing old ones in the spring is a good idea to not be down during the critical spring feeding time.

Fish

The hatcheries and weather will dictate when they can bring your ordered fish. Some fish are not available all year long, and many not until late spring or early summer, while some may not be available even when promised and once they are, it is too hot to haul them. In some instances, getting to the lake to stock can become an issue due to heavy spring rains. The best made plans can become very fluid when it comes to stocking, so be understanding and flexible. But, getting your order in as soon as possible helps to get your fish. The later you get entered on a stocking list, the more people in front of you and the fewer fish for customers closer to the bottom than the top of that list, no matter the species. As stated earlier, some years there are no fish in certain species available due to winter die offs at the supplying hatchery or natural waterbodies where the species are collected. If it does not look like your desired species will be available one year, consider selecting another available species as a substitute. There are usually alternatives, but the cost may be more or less depending on the alternate choices.

The spring is the best time to conduct an electrofishing survey, followed by fall. Spring, just before or post largemouth bass spawn assures most bass will be in the shallower water and more likely to be included in the sample, which indicates how weak or strong the population is. Sampling at this time allows for your lake manager to compile the data, create a management strategy and get started on implementing the



Early spring is a good time to add fish habitat, especially for juveniles after the spawn to protect them and increase recruitment success.



Spring stocking of forage species such as threadfin shad and this golden shiner helps with bass growth and alleviates pressure on small bream already in the lake, or soon-to-be newly hatched in the lake.

recommendations that includes stocking before the summer heat arrives.

The spring is a good time to remove largemouth bass with rod-and-reel from the designated slot and numbers recommended for the year. This also alleviates predator numbers for post spawn survival of forage also hatching during the spring. Most bass management strategies for largemouth have a bass removal component in it, and the bass are easier to catch in spring after a winter of eating very little and coming off the spawn. Many clients do not use this opportunity and then find summertime fishing harder to catch the numbers that were prescribed.

Again, for this task, spring is the best time, followed by fall then summer and winter, when it becomes harder to catch bass.

I once had a college professor tell the students that if you liked hunting more, become a fish biologist and if you like fishing more become a wildlife biologist, because fish biologists work more in the spring and wildlife biologists work more in the fall. That was definitely some great, accurate advice. I am really busy in the spring as many landowners with fish and lake work, however, he did show us fish biologists how to schedule work around spring turkey hunting, because everyone deserves to do a little bit of that too.

Wildlife Trends Journal Management Calendar

Dave Edwards



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.

Check, clean 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 perform a detailed cleaning of each camera. Focus deep cleaning 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 camera with batteries in them. If your camera has a rubber seal around access compartment doors (most do), pull them and clean them good. 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

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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.

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 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 is properly staked and upright. If fire ants have built a mound inside the base of the tube, treat them. 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 summers is important and will result in optimal growth and strength.

Plant summer food plots for wildlife

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



Late spring is a great time to perform normal maintenance or repairs to trail cameras



Spring green up is a great time to move and deep clean feeders.

very nutritious and high in much needed protein. Commonly planted summer crops for deer include many varieties of peas, soybeans, corn, lab lab, vetch, and clovers. One of my “go-to” summer 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 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 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.

Screen property lines where needed to prevent or reduce poaching.

Most landowners or hunting clubs that are aggressively managing their property for wildlife have many resources invested into developing, managing, and/or maintaining their property. Regardless of where your property is, efforts should be made to reduce or eliminate poaching. This includes properly posting your property, having secure gates, and fencing if needed. These activi-



If possible, schedule timber harvests for late winter or spring. Doing so gives these areas the entire growing season to re-vegetate resulting in better wildlife habitat.

ties relay the message that you are serious about trespassing and will curtail most trespassing. Something that many landowners or hunting clubs often overlook is using crops, shrubs, or other plants to provide natural barriers or screens to keep people from seeing into your property. Obstructing the view of your property from adjacent landowners, hunting clubs, or along highways or roads may not eliminate poaching, but will reduce the temptation.

Most properties only have a few key areas along their border that need to be screened. Some of my favorite “natural screens” include evergreen trees such as cypress, cedars, or pines. These species grow well in many soils and climates and because they are evergreen, they provide good screen during the winter months. Unless you are planting containerized trees, such as 25-gallon potted trees, most trees should be planted in the winter. An alternative, and something I often do, is to plant strips of spring/summer crops that will grow tall enough to do the job. Many of these crops can be planted in April and May depending on your location. Corn, Egyptian wheat, sorghum Sudan, switchgrass, or some of the taller native warm season grasses not only make good screens but add wildlife value to your property. If you choose this route, ensure the strip is wide enough to provide a good screen once crops mature and brown up during fall. I often make these strips 25 feet wide if the situation allows.

Move, clean & keep supplemental feeders full for deer.

For those that implement a supplemental feeding program for deer, you have probably noticed a significant decrease in feed consumption during the spring green-up period. This is a great time to move (in the same general area) and deep clean all feeders in preparation for the



Creating 1/2 to 1 acre thickets within relatively open quail habitat provides increased habitat diversity as well as loafing and escape cover.

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 source are often at its 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 verses 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.

Lime and fertilize roadsides.

Many landowners concentrate their efforts in the woods or food plots but overlook roadsides when managing a property. Roadsides can account for a great deal of acreage across a property. Liming and fertilizing natural areas along roads during spring/early summer will enhance plant growth, attraction and nutrition of these areas for wildlife. These areas not only provide quality browse for deer, but create ideal nesting and escape cover for turkeys and quail. Because wildlife are attracted to these areas it also increases wildlife viewing opportunities while riding around the property. This strategy is well suited for widened roadsides that are currently being managed (by mowing, disking, fire, roller chopping, etc.) for early successional

habitats. It may be worth noting that this is a “fine-tuning” strategy to enhance wildlife habitat once other “big picture” items such as woods, fields, etc. are being actively and properly managed. If you have undesirable vegetation or exotic plants along roadsides such as sweetgum trees, privet, cogon grass, etc., a consulting wildlife biologist or forester may be useful in helping to determine the appropriate mechanical and or chemical strategies to apply to remove these and promote wildlife friendly plants.

Conduct timber harvests early.

If you have a timber harvest scheduled for this year, late winter or early summer is the preferred time to conduct these activities. Harvesting timber during winter, if your property is dry enough, or during early summer will give these areas the entire growing season to re-vegetate resulting in better wild-

life habitat. Timber areas that are harvested late in the growing season, say July, do not have much growing season left to recover or re-vegetate which results in poorer quality wildlife habitat until the next growing season when plants can reestablish. Having said this, the wildlife value of thinning or clearcutting timber is more important than the timing of the harvest. That is, do not delay a harvest simply because it will occur during late summer. However, when possible, schedule timber harvest in late winter or early summer.

Establish photo points.

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



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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 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.

Establish thickets for quail

If you actively manage your property for quail hunting consider establishing protective “thickets” within these areas to provide quail with quality escape and travel habitat. Generally speaking, areas intensively managed as “quail woods” for hunting are maintained through annually burning, disking and mow-

ing or some combination of these. The goal of this management is to set back plant succession to an earlier stage. Plant succession is the natural progression that takes place as plants reoccupy a site over a period of years. Annual plants such as ragweed, broomstraw, croton, partridge pea, wild millets, etc. are considered “early successional species” and are some of the first to occupy a site after a recent disturbance. A mature forest is in a “climax” or late successional condition. Quail are considered a species that prefers early successional habitats. However, while these strategies provide overall great early successional habitat for quail it is also important to “protect” some habitats/areas to provide increased habitat diversity and escape cover within the actively managed areas. Doing so will allow larger plants and shrubs to establish creating excellent overhead escape, loafing, and roosting cover. Having said this, these areas need to be “disturbed”

from time to time to set back succession and prevent trees from encroaching. While every property is different, I commonly design/create these areas to be ¼ to 1 acre and ensure they are distributed roughly 150 yards apart throughout the areas being managed. If fencerows and/or ditches are present, leaving a 15-20 yard buffer on each side will create similar habitat and often creates a travel corridor or escape route for quail. For areas that receive fire every 1-2 years, simply install a firebreak around the thicket areas to keep fire out. We often refer to these as “ring-arounds” – areas we have installed a firebreak around to prevent fire from consuming vegetation within the area. To manage the “ring-arounds” and keep them from getting too overgrown we just create new ones somewhere else every 2-3 years and allow fire to set back succession in the original areas protected when we burn.



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