

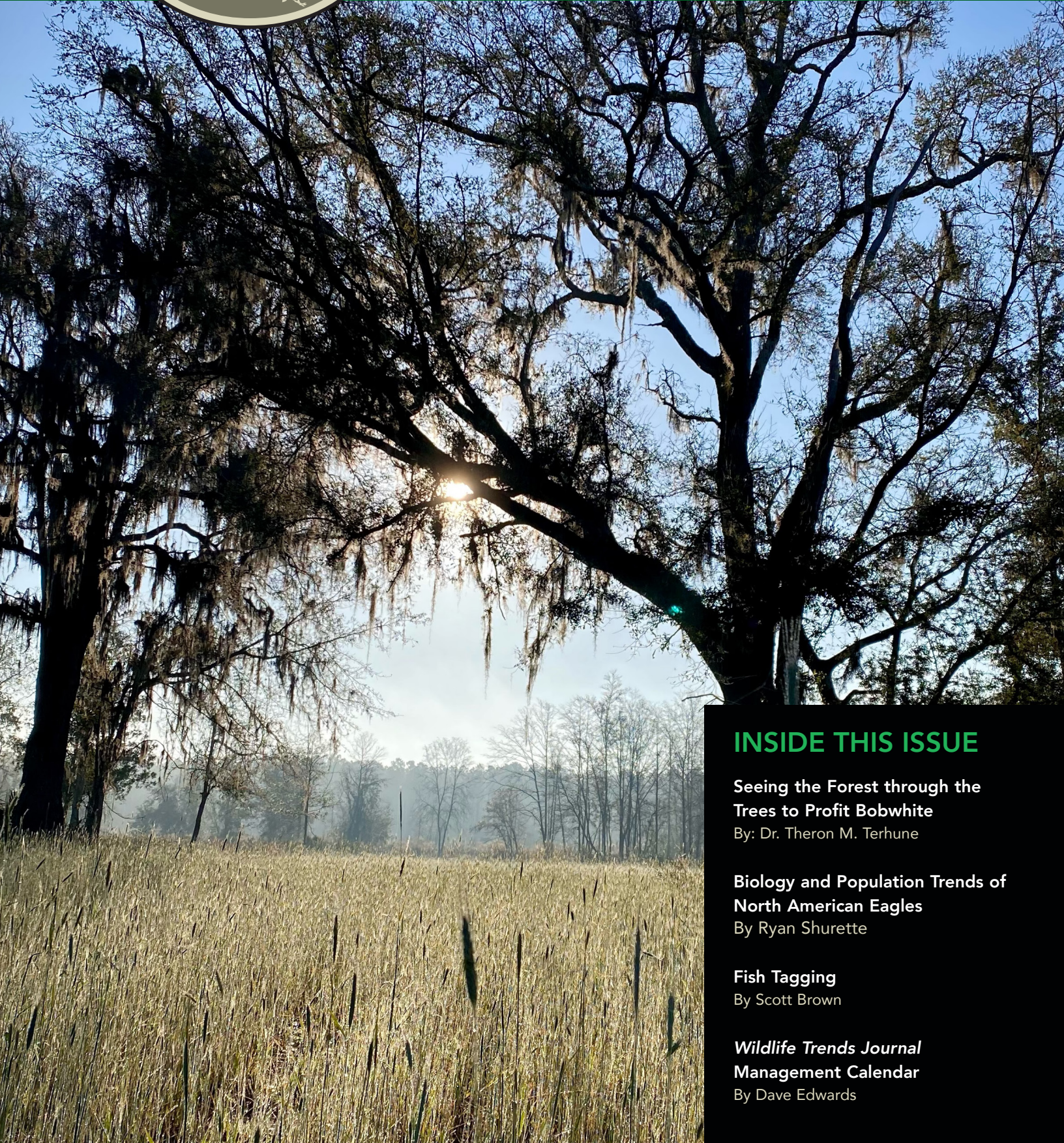
PRACTICAL WILDLIFE MANAGEMENT INFORMATION



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## Earl Says...

**I**t's turkey time and all is right with the world! That majestic bird with a brain the size of a marble outsmarts me most every time but I just can't help myself chasing them through the woods.

The thing I hear most from hunters these days are the dwindling numbers of birds verses just a few years ago. There are many reasons we have heard why this is happening such as poor habitat, predators, fire ants, etc. The good news is there are several research projects going on to help us as landowners and land managers. As the results of these projects are known we'll be sure to publish the findings here and hopefully have more birds to hunt.

In the meantime, good luck getting your bird this year and watch out for those no shoulders!



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# Seeing the Forest through the Trees to Profit Bobwhite

By Dr. Theron M. Terhune



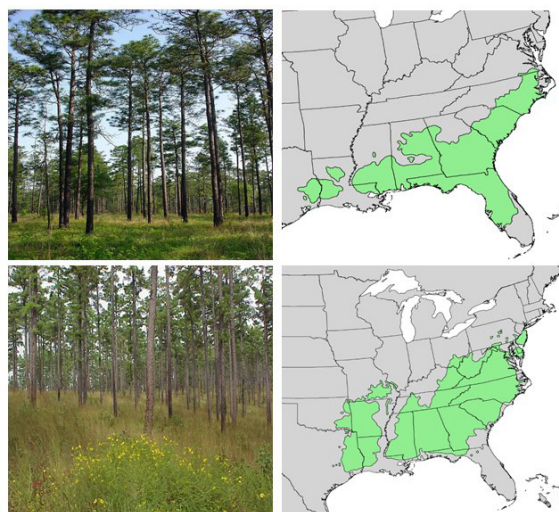
Dr. Theron Terhune is a Wildlife Biologist and Research Scientist at a privately-owned property near Wilmington, NC and a Research Fellow at the Spatial Informatics Group – Natural Assets Laboratory (SIG-NAL). He received a B.S. and M.S. degree from Auburn University in Wildlife Science and a Ph.D. in Forestry and Natural Resources at the University of Georgia. Theron has studied gamebirds and fire-affiliated species for more than 20 years during which he has published 65 scientific articles in peer-reviewed journals and 34 popular magazine articles.

## Part I: Let there be Light!

To the uninitiated, a saunter through a healthy mature forest is truly a magnificent experience. One can appreciate the aesthetic juxtaposition of light and shadow cast like a prism through the towering pines of the southeastern quail woods whilst gazing in amazement at the contrasting colors from sky to ground. And, as if frozen in time, remain awestruck in the middle of a sea of wiregrass and tall majestic, flat-top pines unaware of any other human existence with the distant Bob-White call echoing through the forest. Indeed, there was a time when this experience was quite the norm, but I fear it is becoming more an anomaly with each passing day. In the Southeast, the majority of the historic quail land was

comprised of pine forest, predominantly Longleaf Pine (nearly 90 million acres; see Figure 1) and/or Shortleaf Pine (~281 million acres; see Figure 1), but today only 2-4% of their historic range remains.

To the erudite, the same stroll through the woods evokes not only tranquility but chaos. The intricate familiarity with the fundamental law of ecology that “everything is connected to everything else” incites both management chal-



### Longleaf Pine

- 60 – 90 M acres historically
- Now <3 M acres (~3% of historic range)
- One of the most diverse and endangered ecosystems in NA

### Shortleaf Pine

- ~281M acres historically
- Now ~6 M acres (~2% of historic range)
- Inhabit numerous fauna/flora

Figure 1. Historic ranges and amount of Longleaf Pine and Shortleaf Pine in North America.

lenges and opportunities while the din of songbirds overwhelm the soul with a sense of urgency to catalog every behavior and resource consumed. Taming one's emotions simplifies the understanding that light and shadows prised by the tall pines not only paint a beautiful canvas but also illuminate the management path for the Prince of Gamebirds.

Herbert L. Stoddard, undistracted by technology, observantly understood the concept and importance timber density had on bobwhite abundance. He stated that “the density of timber stands should receive constant attention on the well-managed quail preserve.” Timber density impacts the amount of sunlight penetrating the canopy and reaching the forest floor, affecting ground cover quantity and quality. Removal of fire coupled with intensive silvicultural practice is a major reason why many of the southeastern forests contain high volume timber stands and extreme canopy closure not carrying good numbers of bobwhite – the timber essentially “chokes” out the sunlight and reduces understory vegetation needed by bobwhite to produce quality cover for protection from predators, nesting, brood-rearing, and foraging.

### Is there an ideal timber stand target to maximize bobwhite abundance?

When it comes to timber density and management recommendations for bobwhite, a common saying is: “Less is more!” That is, the overly simplistic tenet implies the less timber the more quail one should expect. This notion comes from some compelling data collected in north Florida and southwest Georgia whereby fall bobwhite densities have been correlated with timber density such that, on average, low timber densities

typically yielded higher quail numbers (see Figure 2). A standard recommendation for balancing timber and quail is using a relationship between timber volume (measured in basal area) and bobwhite abundance whereby an

***“The density of timber stands should receive constant attention on the well-managed quail preserve.”***

*”-- Herbert L. Stoddard, The Bobwhite Quail, Its Habits, Preservation, and Increase, 1931*

optimum, industry standard for thinning infers relative bobwhite abundance (see Figure 3). The pedagogical approach to timber stand management strives for a balance of timber and quail by targeting a long-range timber volume of 40-60 BA. These data,

understory vegetation conditions, impacting bobwhite abundance. Additionally, timber volume measured using a basal area (m<sup>2</sup>/ha or ft<sup>2</sup>/acre) factor prism can be difficult to understand for the non-forester and even more challenging to link to explicit management targets such as quail per acre. For example, tree species (longleaf vs shortleaf vs loblolly) and tree age (immature vs mature) can have similar basal area (aka timber volume) but quite different forest stand and understory vegetation structure (see Figure 4) and associated bobwhite abundance.

Over the years, in working on properties from south Florida to New Jersey, I have found that the “less is more” philosophy applies well in some circumstances, but often falls short of the mark. A dangerous management approach is assuming that all properties are

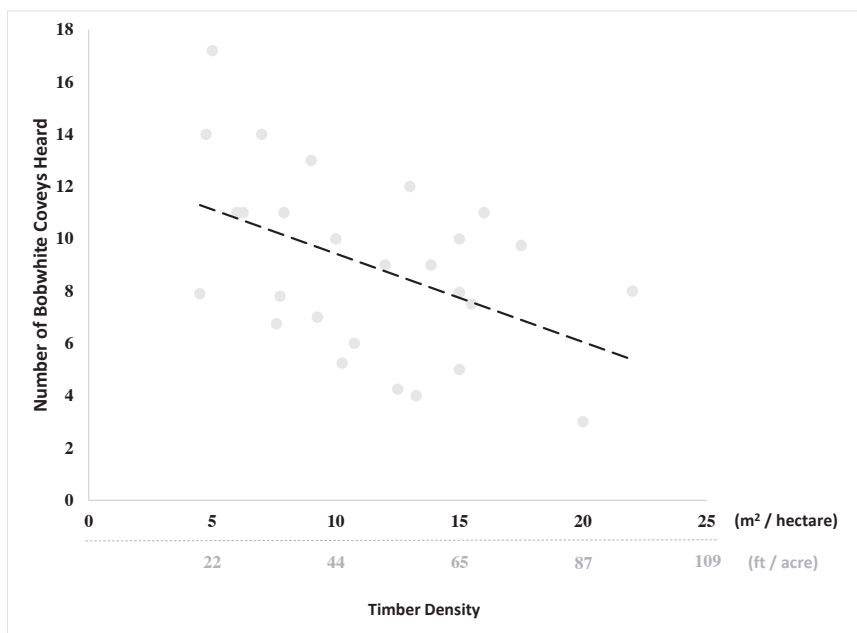


Figure 2. The relationship of the number of bobwhite coveys heard at a listening point and timber volume (m<sup>2</sup>/ha and ft<sup>2</sup>/acres) measured using a basal area factor prism, representing that on average as timber volume increases bobwhite abundance decreases.

however, are limited in scope both temporally and geographically, not accounting for numerous factors that contribute to uncertainties associated with desirable forest and

created equal and as such that there is an industry standard for management prescriptions throughout a region or even within a prop-

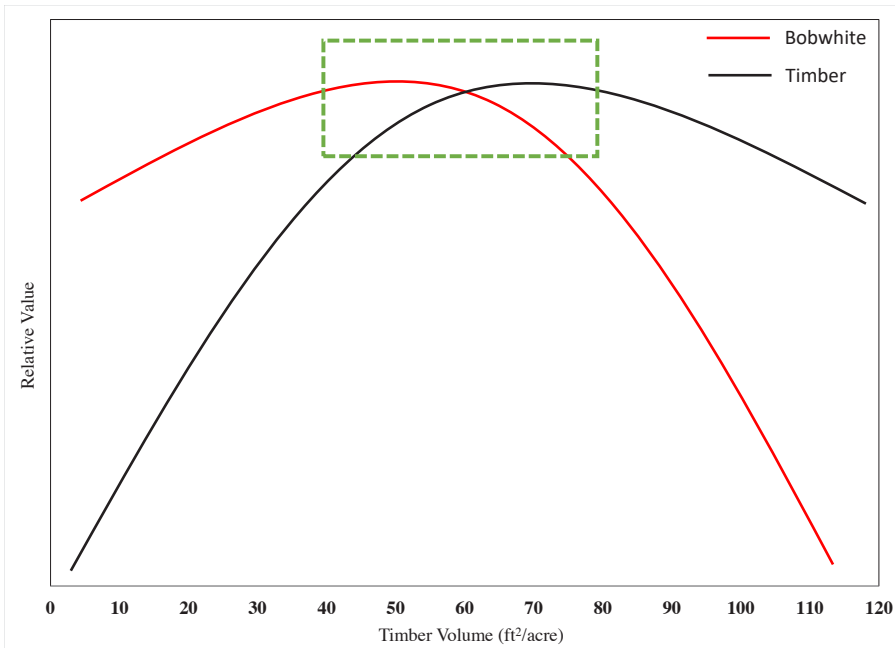


Figure 3. The relative relationship between timber volume and bobwhite abundance with the optimal timber volume to balance timber production and bobwhite abundance such that it is recommended the long-term average timber volume should be between 40 and 80 (ft<sup>3</sup>/acres); however, this industry standard recommendation is more applicable for high quality sites and not always transferrable to lower quality sites and does not consider varying tree species.

erty. In fact, some philosophical approaches to timber management, like the Stoddard-Neel Approach, not only view each property as unique requiring unique management strategies but also that each individual stand of timber is ecologically unique, requiring deliberative thought and intentional

management to produce desired forest conditions. While the end goal is often the same (i.e., in this case to produce more birds), the means to reaching it may be quite different depending on site conditions such as soil quality and annual rainfall. As such, managing timber to afford adequate light to



Figure 4. Varying forest structure and understory vegetation composition and structure for similar basal area (for 40 and 60) for mature and immature forests.

the forest floor fostering a healthy, diverse herbaceous understory is a good strategy when bobwhite is a primary management objective. Allowing the proper amount of light through the tree canopy will provide the mechanics for a healthy forest and proper vegetation conditions for bobwhite.

*“The bobwhite might probably be called the ‘fire bird,’ so closely is it linked ecologically with fire in the coastal pinelands.”*

– Herbert L. Stoddard, *Memoirs of a Naturalist*

### So, how much light is needed to produce quality ground cover for bobwhite?

Although bobwhite do not “need” pine timber or other trees for survival and reproduction, there are several benefits to them, especially in the Southeast. These benefits include, but are not limited to, 3 important roles that pines provide for bobwhite and-or facilitate their management: burnability, forest and understory vegetation balance, and food source. Stoddard imputed that “the bobwhite might probably be called the ‘fire bird’ so closely is it linked ecologically with fire.” In a previous article, I took this notion a bit farther by suggesting that “you can apply fire and not have wild quail, but you cannot sustain abundant wild quail populations without the proper application of fire in the Southeast.” As such, applying the proper application of prescribed fire is critically important when managing for bobwhite in southeastern piney woods

Although fire is arguably the most economically and ecologically important tool in our management arsenal, the bobwhite manager must keep the forest structure and timber volume in proper condition

to facilitate its use. Thus, the “constant [and careful] attention” to the density of timber should focus on allowing enough light to the forest floor to facilitate fire and foster fire-affiliated plants. An overly dense timber stand will shade out the understory vegetation, depleting ground-level fuel for burning and suffocating valuable wildlife food and cover plants. In contrast, timber stands too sparse may reduce burnability due to a lack of residual pine needles that aid in carrying fire as well as reduce seed scarification and subsequent vegetation response.

Allowing adequate sunlight to the forest floor will also promote herbaceous (forb and legumes) plants to flourish, but opening the tree canopy too much may reduce herbaceous diversity as some plants do well with partial shade. Therefore, a balance of sunlight and shade will promote, depending on soil quality and annual rainfall, vegetation diversity increasing quantity and quality of habitat cover and food resources for bobwhite and other wildlife. In addition, I have observed where thinning too much, too fast can result in vegetation deficiencies. For example, on a site in the low coun-

try of South Carolina, excessive thinning resulted in altered surface-level hydrologic imbalances, an increase in grass composition and a reduction in herbaceous cover.



Figure 5. On sites with high quality soils, higher timber volume (this stand has a basal area of 80 ft<sup>2</sup>/acres and an average of 15 ft between canopies) and greater canopy closure can yield excellent quality herbaceous cover.

Similarly, some wiregrass areas with lower quality sandy soils, heavy thinning can also reduce herbaceous plants associated with reduced nutrients, lower germination rates, decreased seed and fruit production, and shorter water retention rates. Lastly, pine seeds are an excellent food source for bobwhites. On average, every 3 – 7 years, depending on region, tree species and weather, heavy pine-

cone crops yield an abundance of pine seeds which are hardy and nutritious, lasting throughout the harsher winter months (December – March). During these years, bobwhite highly select for pine seeds even sometimes over supplemental food like milo, wheat, and corn.

Taken collectively, I recommend constantly monitoring your timber volume and keeping as much pine timber as possible to increase burnability while allowing adequate light to penetrate the canopy, reaching the forest floor, and facilitating a healthy and diverse herbaceous understory. In my experience this is best accomplished by assessing the amount of canopy closure or canopy openness rather than using basal area measurements. The amount of allowable canopy closure will largely be dictated by soil quality such that higher quality soils can sustain higher timber volumes or higher canopy closure (i.e., less canopy openness and sunlight penetration resulting in more shade on the ground; see Figure 5). On low quality (sandier) sites, a minimum target of 30 – 60 feet between pine canopies (or a minimum of 40 - 70% canopy openness) should provide adequate sunlight to reach

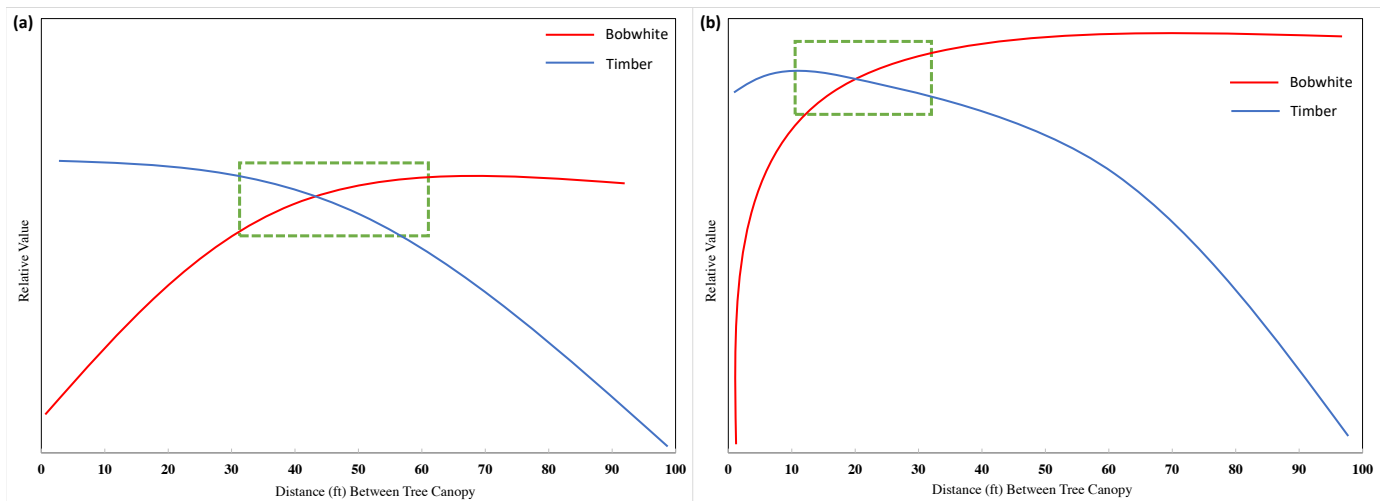


Figure 6. The relationship between relative bobwhite abundance and distance between tree canopies on (a) low-quality and (b) high-quality sites. On average, high-quality sites can yield higher bobwhite numbers with greater timber volume and less distance between tree canopies than those on low-quality sites.

the forest floor to foster quality herbaceous understory to profit bobwhite (see Figure 6a). However, on high quality sites, a lower target of 10 – 30 feet between tree canopies (or minimum of 70 – 90% canopy openness) should suffice to afford enough sunlight for quality vegetation growth for most bobwhite management objectives (see Figure 6b). Assessing canopy closure can be done quickly without tools and crude estimation; however, for more precise measurements, I recommend monitoring canopy closure using 1 of the numerous apps available for mobile devices. Three apps I have found useful for assessing the canopy closure are: (a) CanopySurvey; (b) Canopeo; and (c) CanopyApp. These apps provide various ways to evaluate canopy closure (e.g., % canopy closure, distance between canopies, etc.) accurately and consistently and/or assess the amount of sunlight penetration. Collecting 15-20 points for each timber stand should provide a reliable measurement to help guide decisions on the need for timber stand improvements or timber thinning. When canopy closure surpasses that of the recommended tolerance levels (see Figure 6 a, b), a timber thinning may be warranted.



*Some sites can carry high timber volume with quality understory vegetation, but a key is to ensure that adequate bare ground and spacing (see insert) facilitates good bobwhite movement through the cover.*

### Take Home Message

The amount of sunlight reaching the forest floor impacts ground cover quantity, composition, and quality which affects bobwhite abundance. Therefore, constant monitoring of timber volume is warranted to best guide management decisions regarding timber stand improvements for timely selective thinning. Although basal area works well as a target for foresters, it is not ideal for many wildlife prescriptions for varying reasons – a better but also not a perfect metric is canopy closure. This concept is so important that, whenever possible, I try to schedule

consultation site visits on sunny days and during the middle of the day to permit evaluation of sunlight penetration and amount of shadow germane to cover quality.

In the Southeast, pine timber, while not required by bobwhite, improves burn conditions while providing a value-added food source for bobwhite during some years as well as enhances the aesthetic of the forest. Although there is not a one-size fits all approach to management of pine timber – less is not ALWAYS more – to maximizing bobwhite abundance, and constantly monitoring canopy closure and understory vegetation quality will aid in determining appropriate management actions such as selective and timely thinning to keep the forest in balance while profiting bobwhite. Given that many of today’s timber stands lack sufficient light to grow quality understory vegetation profitable to bobwhite, monitoring and managing sunlight penetration and canopy closure is essential. If you want more bobwhite, then ... Let there Be Light!



*Crops extracted from 9 wild bobwhite quail harvested during the same hunt; 6 of the 9 crops contained a high proportion of pine seeds (dark black seeds, circled in red) which are highly nutritious and often preferred by bobwhite.*

*In the next Wildlife Trends issue, we will discuss the Hard Line on Hardwoods and Bobwhite Management in Part II of this article.*



# Biology and Population Trends of North American Eagles

By Ryan Shurette



G. Ryan Shurette is a Certified Wildlife Biologist and Owner/ Guide of DragSmoker Fishing Guide Service. Contact him at 256-404-5814.

*Bald eagles are endemic to North America and occur from Alaska throughout most of Canada and the lower 48 states and down into northern Mexico and Baja California. Photo in public domain.*

**I**t seems that eagles have always been important to the people of North America, even to some of the early inhabitants that first hunted and foraged here. Many early Native American cultures considered eagles sacred, and a symbol of strength, bravery, and truth. Their feathers were highly revered, and they have been collected and used as spiritual symbols in ceremonies, dances, and as regalia for hundreds of years. They are still held in high regard and used by many American Indians and Alaska Natives today. In June of 1782, the Bald eagle was selected by the Second Continental Congress to be the National Symbol of sovereignty and freedom for the United States. Since then, it has

appeared on official documents, our national currency, public buildings, and the US government seal. For some reason, the image of an eagle soaring against a background of wild scenery seems to instill admiration and fascination in those who see it, whether in person or even through a photograph. Even during times when eagles competed with humans for food resources, we have seemed to venerate and admire them. In this article we will examine the biology and ecology, as well as historic and current distribution trends, of the two native species of North American eagles.

In addition to our native **Golden eagle** (*Aquila chrysaetos*) and **Bald**

**eagle** (*Haliaeetus leucocephalus*), there are actually two other species of eagle that occasionally are seen within the continental US, and we will briefly mention them here. The **White-tailed eagle** (*Haliaeetus albicilla*) is similar to the Bald eagle in many respects but is native to Europe, Russia, and parts of Greenland and China. Adults have white tail feathers like Bald eagles but do not have white plumage on the head. They hunt for fish primarily, although they are opportunistic and will also eat carrion or steal from other birds of prey. **Steller's sea eagles** (*Haliaeetus pelagicus*) also show up from time to time in parts of coastal Alaska, straying from their native breeding grounds in eastern Russia or their



Adult Bald eagles have dark brown or black body plumage, white plumage on the head and tail, as well as large yellow beaks and bright yellow eyes. Young Bald eagles typically express brown plumage mottled with white, but lack the snow-white head and tail feathers. Juveniles also have dark eyes and black beaks that turn lighter and eventually to bright yellow with age. Photos in public domain.

wintering grounds of Japan. In fact, one vagrant individual has been spotted living in the Maine to Rhode Island coast area of New England for the past few months this winter. This individual is believed to have been blown off course by a storm. With a wingspan of 8 ft, this giant eagle has dark brown plumage with striking white shoulders and a white tail. It also has a broad distinctive yellow beak

that begins high on the forehead. Like the other sea eagles, the Steller's hunts fish (mainly salmon) and also steals from other birds and animals.

The **Bald eagle** is probably the most well-known of our eagles. They are large and heavy birds. Adults can be 40 inches long, with average wingspans of 80 inches, and can weigh up to 13 lbs. After

they reach maturity in 4 or 5 years, Bald eagles will have dark brown or black body plumage, white plumage on the head and tail, as well as large yellow beaks and bright yellow eyes. Juveniles appear much differently from adults regarding their plumage coloration. Young Bald eagles typically express brown plumage mottled with white, but lack the snow-white head and tail feathers. Juveniles also have dark eyes and black beaks that turn lighter and eventually to bright yellow with age. Two subspecies are described (the *leucocephalus* subspecies in the southern parts of the US and into Mexico, and the *alascanus* subspecies in the north and Canada), but they interbreed across the continent and are very similar. Bald eagles are endemic to North America and occur from Alaska throughout most of Canada and the lower 48 states and down into northern Mexico and Baja California. They do not occur in Hawaii or other continents of the world. They inhabit both saltwater environments in coastal ecosystems as well as freshwater habitats in lacustrine (forested areas surrounding lakes or water) and riparian ecosystems. However, they may also seasonally utilize upland habitats away from water. Bald eagles feed primarily on a diet of fish and carrion. Since they are large and powerful (and have long sharp talons), they also regularly employ the strategy of chasing and stealing fish and other prey items from other predatory birds and mammals. And since they tend to share the same kinds of habitats, **Ospreys** tend to be one of the most common victims of such crimes. When faced with a hungry eagle, the Osprey may try to evade its aggressor using aerial acrobatics for a while, but they usually give up and drop their fish so the eagle will leave them be. Bald eagles are known to target several different

species of fish, and the relative importance of their specific use is governed obviously by region and location. In Alaska and along the Pacific Coast, salmon and trout are usually the most important food items. In Florida, mullet and catfish were noted by Broley (1947) to be important prey species. Within inland areas of the Southeast and other regions, lake and riverine fish species are targeted, depending on local abundance and season. In central Alabama, above the fall line, I typically see preference for smaller individuals of white and striped bass (*Morone* spp.), their hybrids, and centrarchids (bass and sunfishes) in lakes and larger rivers, and for spotted bass and redhorse sucker (*Moxostoma* sp.) in smaller creeks. In addition to fish, it is not uncommon for Bald eagles to pursue and kill waterbirds like American coots, ducks, and even herons and egrets. Many observations (especially with the number of game cameras out now) have been made of them also actively targeting Wild turkeys, especially in winter when food resources may be scarcer. Many people would be surprised to learn that our National Symbol also quite regularly employs the strategy of scavenging. In salmon country there can be hordes of dead fish available for the taking, and it is typical to see eagles of that region seasonally line the banks alongside hungry bears, feasting on salmon following the spawning runs. Carrion typically makes up a large percentage of the annual diet, with road-killed and hunter discarded deer carcasses being some of the most common meals in the inland US populations. They have even been observed eating whale carcasses along the northern Pacific Coast. Eagles that regularly feed on deer carcasses that have been discarded by hunters, or on unrecovered deer that have been shot, will eventually end

up ingesting some amount of lead, which sometimes leads to lead toxicity disease or egg embryo mortality. Lead poisoning in eagles is more common than one might think, with recent studies suggesting as many as half the population of both Bald and Golden eagles having at least some amount detectable in the blood.

Bald eagles are monogamous birds and pairs may stay together for many years. Courtship behaviors intended to strengthen pair bonds are performed by the pair in flight, and these activities include talon locking and acrobatic cartwheeling, as well as soaring together at high altitudes. Bald eagles establish territories (territory size depends on food and habitat availability) which they will defend them from other eagles. Nesting usually occurs adjacent to, or within a few hundred yards of, a large water body or marsh, in one of the tallest trees available. In the Southeast, longleaf, loblolly and other yellow pine species are the most preferred varieties. In other regions, cypress or other tall trees may be the best available resource. In extreme southern Florida, red mangroves and their snags are often selected, because they are the tallest natural vegetation available. Bald eagles usually build upon existing nests from previous seasons, rather than constructing new ones. Therefore, they can grow to be sizable structures, and the largest known Bald eagle nest was recorded in Florida at just shy of 3 tons! About a week after copulation, a clutch of 1 to 3 plain whitish eggs is laid, with a day or two in between each egg. Seasonality of nesting and egg laying varies by region, with Alaskan birds laying in April-May and Florida eagles starting as early as late October or early November. Bald eagle chicks begin to hatch in about 35 days and the chicks pip in

the order of being laid. The chicks remain at the nest for about three months before they are ready to fly. The adults do still feed them for a while longer after fledging. Juveniles typically disperse from their natal territory and live a nomadic life until they reach adulthood. A large number of southern-born juvenile Bald eagles have been documented to migrate north to the Great Lakes area before returning to the South as sub-adults.

Historically, Bald eagle populations were thought to be somewhere around 100,000 nesting eagles. Declines began in the early 1800's due partly to a reduction of waterfowl and other prey items. People also regularly shot Bald eagles in an attempt to protect livestock and game populations. Further declines were noted from the widespread use of DDT, an organochlorine pesticide that was heavily used after World War II. Before the discontinuation of its use, DDT moved effectively up the food chain and bioaccumulated in several species of predatory birds (including Peregrine falcons), causing egg-shell thinning and low reproduction success. By the early 1960's less than 500 breeding pairs of Bald eagles remained. As concern for their well-being grew across the country, they were listed under the Endangered Species Preservation Act in the late 1960's and then again in 1978 under the Endangered Species Act, after it was passed. Alaska was not included in this designation since the species remained abundant there. Remarkably, in a period of twenty years the Bald eagle rebounded significantly, and in 1995 the Fish and Wildlife Service (FWS) down-listed it from "endangered" to "threatened". A decade or so later, the species was announced as recovered and consequently removed from the federal



*Eastern Golden eagles have recently been found to be more common than previously thought, especially in the Southeast. GPS transmitter technology has allowed researchers to clearly track seasonal movements and migration behaviors of eastern Golden eagles. Photo credit Alabama Department of Conservation and Natural Resources.*

list altogether in 2007, when the number of nesting pairs approached 10,000 in the lower 48 states. Since then, the population has exploded to more than 316,000 individual birds and more than 71,000 breeding pairs, according to a 2021 report by the FWS. Alaska's current population estimate varies by source, but ranges from 30 to 50 thousand birds in most estimates.

**Golden eagles** are different from Bald eagles, or other species of fish eagles, in that they are primarily

birds of mountains or open arid habitats. Golden eagles, as adults, are typically characterized by chocolate brown body plumage, dark wings, and a golden sheen around the nape (back of the head or neck). Juveniles will have dark brown plumage with white wing patches visible from below in flight (caused by the bicolored secondary wing feathers), as well as an obvious white inner tail band. Juveniles also usually have a more noticeable golden mantle at the nape, and brighter yellow cere at the base of

the beak. Golden eagles have feather-covered legs (as opposed to the yellow bare-scaled legs of the Bald eagle). The talons are long and formidable, with the hind claw alone (called the hallux) averaging over two inches long. The Golden's claws measure significantly longer than those of Bald eagles, as they are an adaptation to killing a wider variety of (and sometimes larger) prey items. A Golden eagle's talons have been estimated to exert a force of over 500 pounds per square inch, which is more than 15 times the grip pressure of a human hand. Both Bald and Golden eagles also have extraordinary binocular vision and other anatomical features that allow for a very acute sense of sight. They are daytime hunters and are very adept at detecting movement, even at very long distances.

Unlike the Bald eagle, Golden eagles also have a large natural inter-continental range that spans much of the world's Northern Hemisphere. They are the national bird of several foreign countries (including Mexico, Germany, and Austria). The species occurs across parts of Europe, northern Africa, and the massive expanses of Asia, including northern China, Mongolia, and the Russian Steppes (Ferguson-Lees and Christie, 2001). In the mountainous regions of the Himalayas, Golden eagles have been recorded at more than 20,000 feet in elevation (Watson, 2010). In North America, they are a fairly common sight in many parts of the western US, where they are a top predator of the high plains, deserts and dry mountain habitats. Within our continental populations, their breeding range is concentrated mainly across the western half of the United States and well into Mexico, parts of western Canada (primarily Alberta, British Columbia, and Yukon provinces),



*Golden eagle nests are often built on cliff or bluff ledges, and they will use large trees when ledges are not available. Photo credit USGS.*

and throughout Alaska. Northeastern Canada (mainly northern Quebec and Newfoundland) also hosts breeding populations in summer. The species can actually be found year-round in many of these arid habitats in western US and Mexico. Golden eagles do venture outside of these regions, however. In the eastern US they were thought to be very rare until recently.

Golden eagles are generalists and they have a long and diverse list of prey items (including many mammals, birds, amphibians, reptiles, fish, and even insects). In North America, jackrabbits, hares, ground squirrels, and prairie dogs are some of the most important species, but larger prey like young deer, antelope, and other ungulates are also on the list. Mammals are thought to make up more than 80% of the diet in North America. The average prey size is about 3 pounds across the entire range. They may hunt alone, in pairs, or in small packs (Ferguson-Lees and Christie, 2001). As with the Bald

eagle, carrion is also important to Golden eagles, especially in winter. White-tailed deer carcasses have been shown to be very important to the wintering populations in the East.

Golden eagle nests are often built on cliff or bluff ledges, and they

will use large trees when ledges are not available. Nests are constructed from sticks and are added to in successive years, growing to 2m in diameter. In some parts of the world there are no available trees and therefore they must nest on the ground (Ellis 2020). The adults will defend the nest to the best of their ability. The breeding season spans March – August throughout the majority of its range, and in southern areas begins as early as November; whilst in the most northerly regions it will start as late as April (Ferguson-Lees and Christie, 2001).

Concentrated efforts began recently (about 15 years ago) to investigate and document eastern Golden eagle population and migration patterns. With the availability of more advanced and smaller GPS tagging and tracking technologies, it has been possible to “map” the migration patterns of individual birds. Organizations like Conservation Science Global began collaborating with federal and state wildlife agencies and universities across eastern states in the



*Golden eagles are generalists and they have a diverse list of prey items. In North America, jackrabbits, hares, ground squirrels, and prairie dogs are some of the most important species. Photo credit USFWS.*



*Typical Golden eagle habitat in the western United States. Photo credit USGS.*

mid-2000's to deploy bait/camera stations and monitor the sites over the following weeks, especially in winter. Typically, road-killed white-tailed deer are collected and used as bait. Positive hits at the bait/camera sites turned out to be quite common and wintering Golden eagle detections in the Southeast were found to be more commonplace than many researchers once thought. If or when one or more Golden eagles showed up at the bait site, a trapping strategy was developed to capture select individuals, and fit them with a GPS transmitter before releasing them unharmed. This system allowed researchers to clearly track the daily and seasonal movements and migration behaviors of these eastern Golden eagles. Eagles migrate during only the daytime hours, but they can travel hundreds of miles in just a few days. In 2019 one adult female (named Coosa) was

wearing a transmitter fitted from her capture on the Talladega National Forest, and she travelled 1,400 miles over a six-week window. The maps depicting the various routes taken by different birds showed that most eastern individuals chose to travel the Appalachian chain when departing from southern states like Alabama and Georgia in springtime, up into Maine and northeastern Canada. Others strayed westward into and beyond the Great Lakes regions.

The data shows that the migration routes of the tracked eagles deviate very little from year to year, and most return to the very same field each winter.

The core of the wintering population of eastern birds is thought to concentrate in the Appalachian Mountains themselves, and by flying over these upland habitats

during the dormant season (while many trees have no leaves), the birds can effectively spot living prey as well as carrion.

Golden eagles seem to be more sensitive to human disturbance (especially during nesting season) than Bald eagles. Urbanization and development has fragmented Golden eagle habitats across much of its former range, especially in Europe and Asia. Golden eagles were also affected by the aforementioned DDT situation in the US and were also until recently regularly shot by sheep and cattle ranchers. A Golden eagle is large enough to take lambs and other young livestock, and a report from Wyoming Agriculture Statistics indicated that they killed at least 40,000 lambs or sheep from 1997 to 2002. To the contrary, some researchers suggest this species actually has an overall beneficial impact to livestock operations, by reducing prey levels and competing



In addition to our native Golden and Bald eagles, there are two other species of eagle that occasionally are seen within the continental US. The White-tailed eagle and the Steller's sea-eagle (shown here) show up from time to time in parts of coastal Alaska. Photo in public domain.

with coyotes, wolves, and other potential livestock predators and other nuisance species (such as magpies and ravens).

Unlike the Bald eagle population explosion seen in recent years, Golden eagles have not seen the same trends, and they are declining in many parts of their range and have been extirpated altogether from other areas. The species is not listed as Endangered or Threatened however and it is estimated that currently there are still 200,000 to 250,000 individuals worldwide. In the US there is an estimated 25,000 to 30,000 individuals, with the majority living in the West. All North American eagles are protected under the Migratory Treaty Act and the Bald and Golden Eagle Protection Act, and direct shooting and trapping has diminished in the US as a result.

In conclusion, Bald and Golden eagles are some of our largest native bird species and they perform predatory roles at the top of the food chain. These two raptors occupy a variety of habitat

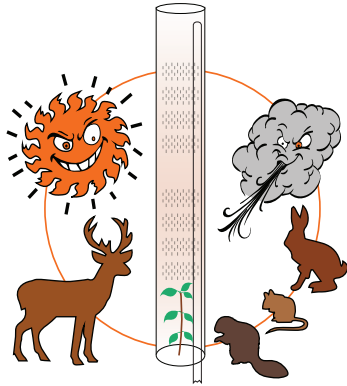
niches across North America, with fish and aquatic species being the prey focus of the Bald eagle, and terrestrial mammals being the primary prey category of the Golden eagle. However, both species are opportunistic and will take advantage of carrion and the freshly killed prey of other predators. There have been dramatic population swings seen in Bald eagles over the past decades ranging from near extinction numbers to the current populations, which are thought to surpass even the historic levels. Golden eagles have remained somewhat more stable over the past hundred years in the US, probably since western regions are less populated by humans, but they have shown declining numbers in many areas. As we learn more about their ecology, migration patterns, and seasonal use of different regions, we can use this information to make conservation decisions about the species. Protections aimed at their continued success should keep these species around for future generations to view and enjoy.

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*T-Bar Anchor tags are the most common fish tags. Tagging largemouth bass may be something you want to add to your lake management toolbox.*

## Fish Tagging

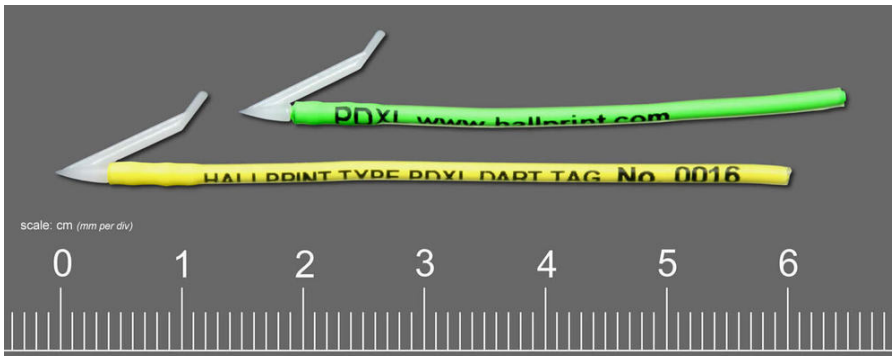
By Scott Brown

**M**ore and more landowners are beginning to request tagging of largemouth bass as an additional technique to document various parameters of growth and population dynamics. Some are just doing it for curiosity and the added excitement of catching a tagged fish, while some are using highly sophisticated ways to track growth, estimate populations and even document fish movement between encounters. Tagging fish is a technique usually reserved for biological professionals performing university research or State or Federal agencies working on public waters, but it is gradually being incorporated by lake owners/managers, and becoming popular among the weekend lake managers. We conduct it for a few clients, but all with big waterbodies and a few

of those have Bass Clubs on them helping us with recapture data, which is the most important part of a tagging study.

Tagging studies can be used to track growth of individual fish in a particular species, document movement over time, or to estimate a species' population number. Most commonly, landowners tag largemouth bass to document growth of individuals over time. Largemouth bass are either caught with hook & line or electrofished. The fish is measured, weighed, date of capture and location of capture recorded, then tagged and released. The most common and economical technique is tagging bass 10 inches or greater with a T-Bar Anchor tag. When the fish is recaptured, it is again measured, weighed and tag number

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



*Dart Tags are commonly used by biologists wanting to track growth of fish in the future when recaptured by hook & line or electrofishing. (Photo provided by Hallprint Fish Tags)*

looked up, which will show how much it has grown since the last time you touched it. When using this technique to track movement, each fish caught on rod & reel or electrofished, must have all the previous mentioned data recorded, plus where it was captured and must be released in the same location it was caught. In the future, when recaptured, comparison of its

original location and locations after that can be compared. This is rarely done on private waterbodies, as it will only render meaningful results if the waterbody is large. The final use may be to conduct a population estimate by conducting several days of electrofishing to tag or mark all individuals and continue several more days of electrofishing a few weeks later to

create a population estimate for a waterbody. A more common technique used in fish population estimate work is simply clipping a pelvic or pectoral fin. This lets the researchers know it is a recapture. I have never heard of a private lake owner running a fish population estimate, even for largemouth bass, as the data is generally unnecessary to make sound fish management decisions on smaller waterbodies and expensive for the landowner to have conducted. **Length Frequency and Relative Weight** (fish condition) calculations along with forage size and abundance are usually used to determine how many, how healthy and what size bass should be removed opposed to a population estimate.

Other things like catchability between sub species can be tracked. If you are stocking Florida pure

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strain into a lake with only known Northern strain, tagging some already present and tagging those being stocked can in the future determine if there was a difference in which gets caught more frequently. Recording the bait being used when catching tagged fish to see what possible future forage to stock over others. Using tagging data to monitor bass growth from certain forage being stocked in different years is also useful. Which forage species put more weight and increases growth the most on individual bass, allowing managers to maybe stock the higher growth forage exclusively in the future, promoting the fastest growth rates without spending funds on less productive forage. If you are only stocking adult or female largemouth bass, tagging them all and monitoring each individual's growth and eventually removing the slow growers could be done so only fast growing, larger individuals remain in the population.

There are advanced technology external radio tags that allow researchers to track location, movement and other things such as recording depth and water temperature that the fish have been using. Fish movement can be triggered by many factors such as water temperature, dissolved oxygen, wind, sunlight, pH, forage availability changes, etc. These tags are now tiny compared to 30 years ago and external, eliminating post-surgery tagging mortality. This information tells researchers if fish are using deep water refuges, how thermoclines impact fish movement and where fish are at various times of the day and year. They also now have mortality sensors to let you know the tag hasn't moved for a certain time period and that the fish either died or dropped the tag. These are much more expensive tagging techniques where the tags

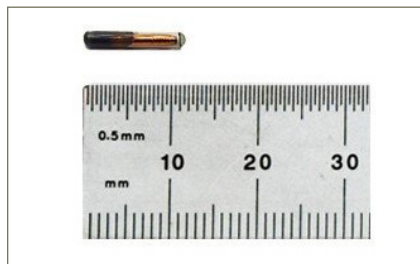


*Clipping a fin to make biologists aware that this fish has a PIT Tag (Passive Integrated Transponder) in it makes for quicker workup. The fin grows back with wavy fin rays and will keep this trait throughout the fish's life.*

may cost over \$100 each and the telemetry scanner to track them in the thousands of dollars price range. These tagging techniques are more reserved for researchers, not managers. There is currently a private lake in Florida being studied where anglers for decades claimed is full of trophy largemouth bass rarely observed by biol-

ogists during traditional fish survey techniques. Scientists have started catching these "Hawks" in 30-plus feet deep water and tagging them, tracking their movements and recording depths and water temperatures they prefer, and movement.

There are three common tags used on largemouth bass, the **T-Bar Anchor Tag**, the **Dart Tag** and the **PIT** (Passive Integrated



*A PIT Tag (Passive Integrated Transponder) the size of a grain of rice, gets inserted into the fish that will provide its identification number for the entire fish's life. (Photo provided by Biomark)*



*A PIT Tag (Passive Integrated Transponder) being inserted into a largemouth bass. These tags last longer than any other tag, but is much more expensive to use.*



*After the PIT Tag (Passive Integrated Transponder) is inserted, the fish must be scanned, and the number recorded and assigned to that individual.*

Transponder) tag. Two are inexpensive, while the PIT Tag is more costly along with the reading scanner. The T-Bar Anchor tag lasts 1-3 years depending on the quality of tags you purchase and the habitat. They are inserted using a gun that pushes the base into the fish, then you gently rotate and pull out. When released, the “T” inside the fish prevents it from pulling out. Depending on the tag quality, over time, the tube the identification number is on may separate from the anchor part and fall off. Depending on the habitat, if it is rocky and/or full of logs, the constant rubbing and bending of the tag can cause it to break off at the skin surface. Usually there is scaring at the sight where an old tag used to be. We insert our T-Bar Anchor and Dart Tags about two-thirds of the way back next to the dorsal fin. When inserting either T-Bar Anchor or Dart tags, we like the anchor on one side of the pterygiophore (part of fin rays below the skin surface in the muscle tissue) and the outside portion on

the other side. This way the anchor is not just being held by tissue, but also by cartilage which assures it will not fall out shortly after releasing. Some researchers will double tag fish on both sides of the dorsal fin as a backup in case one falls out or gets broken off. T-Bar Anchor tags are inserted with a small gun with a hollow needle, while Dart Tags are inserted with a large hollow needle. Once pushed into the fish, the double barbed tag tip prevents it from backing out. The pointy tip is slid at an angle from the rear of the fish at the injection site to go under the scales before penetrating the skin to minimize harm to the fish. Tags going through scales become loose and can cause skin irritation which may loosen the tag over time. Dart tags can last 2-4 years. T- Bar Anchor tags can cost \$1-\$2 each depending on tag quality with just a number printed on them and up to \$2-\$3 each if you also want property or lake name on it. The tagging gun costs about \$50. Dart tags run \$2-\$2.50 each and more if you

want other printing included and the insertion needle under \$10. Depending on your budget and how many fish you expect to tag (determined by waterbody size and minimum length of fish to be tagged), may dictate which tag type you use. When you are tagging fish on thousands of acre reservoirs, the T-Bar Anchor is more economical than Dart tags or PIT tags. After a few months of being out, both these tags will have algae to start growing on them making them easy to overlook and hard to read at a quick glance. Sometimes scraping algae off the tag with your fingernail is required to make numbers legible.

As stated earlier, PIT tags are less invasive and will last up to 75 years, which for fish is well beyond their life expectancy. PIT tags are about the size of a grain of rice and are inserted under the skin into the body cavity or under the cheek plate. This chip is the same as used when microchipping dogs and cats. We insert our PIT Tags under the skin on one side or the other of the dorsal fin about two-thirds of the way back. To let us know the individual is PIT tagged, we cut the



*Here is a beautiful female largemouth bass fitted with her new “jewelry” (T-Bar Anchor tag). Hopefully, a biologist or an angler will cross paths again in a year, two or three to document how much she has grown, or to see where she moves to in this 2,700-acre reservoir.*

pectoral fin with sharp scissors on the same side of the fish that the tag is inserted. Once the fin is cut, it will regrow, but the fin rays do not grow back straight, but wavy. It only then requires a quick glance at the designated fin in the future to

let us know if the fish needs scanning or not with the reader wand. This reduces time in the future of having to scan every 10-inch bass caught on rod & reel or collected while electrofishing. They do have dart tags with PIT Tags in them, but why risk the chance of it falling out when the fin clip will last, like the PIT Tag, the fish’s entire life. The PIT Tags cost \$5-\$8 each (with most companies requiring a 100-unit minimum order, insert gun \$50 and the scanner is about \$750-\$900.

If you are taking largemouth bass out of your waterbody under a certain size, do not tag fish below that length. Only tag fish that will provide valuable data over time and not risk smaller ones being recaptured and removed to reduce population numbers. Tagging fish that could be removed in the near future is a waste of time and money. Also, if a largemouth bass is collected over 13 pounds, not PIT tagging it is recommended, as it is probably near the end of its life and could be wasting an expensive



*A close up of common T-Bar Anchor tags after inserting one into a largemouth bass. Due to price, this is the most frequently used type of tag when a large number of fish will be tagged.*

tag on a short-lived fish, but that decision will be made by the person running the tagging program.

Whether fish are collected with rod & reel or electrofisher, once the fish is to shore or in the boat it should be placed in fresh water and aerated if many are to be collected at one time before workup. Measure the fish to the nearest 1/32 or 1/64 (or even more accurate in millimeters). Bass are usually measured by **Total Length**, which means gently pinching the tail, tip of mouth at zero, and recording the longest tip at tail. Weigh the fish on an accurate scale to the smallest English units available (or even better in grams). Metric units are much more accurate and now there are apps to easily convert from Metric to English. If

tracking future movement also record location. Tag fish, record tag number (or scan and record reader results) and quickly release with minimal handling and time out of water in adequately deep enough water for it to swim away. If tracking movement with T-Bar Anchor or Dart tags, release fish in the same location on lake it was captured or recaptured.

The most common mistake made when conducting tagging work is that the recapture information is not recorded. This is the most important part of the tagging study. It has been our observation that many go through the work and spend the money to get a good portion of tagged fish in their population, but then do not follow through with

measuring, weighing, documenting recapture location and recording the tag numbers when caught while angling. Angling hours are generally a lot more than electrofishing hours, or in most cases electrofishing minutes per year. It is more likely that recapture encounters will come from anglers, not the electrofishing crew. It is a little bit time consuming, and you need a measuring board and decent scale, but if you tag, you must perform the more important follow up, or else you waste your time and money tagging.



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# Wildlife Trends Journal Management Calendar

Dave Edwards



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

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

property”/destination food sources for deer. By incorporating some visual barriers throughout these fields, deer will feel more comfortable and enter them earlier and spend more time in them during daylight...which will result in better hunting. Visual screens prevent deer from seeing across the vast open field which makes the field appear smaller and more secluded. If possible, screens should be planted in a way that allows hunters can see the majority of a field or plant species that are relatively low so that hunters can see over them while in a stand. While planting hedgerows of wildlife friendly

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*Establishing soft edges along field edges is a great way to enhance the wildlife value of a food plot.*

shrubs or trees is a more permanent option, a common way to create visual screens is by planting rows of summer annual crops such as corn, Egyptian wheat, or tall growing millets. To establish “visual breaks” simply plant several 8-16ft wide strips of the wheat or corn in the fields during the summer planting period. I have used this strategy with great success on larger food plots or agriculture fields. As you get closer to hunting season, you may need to mow “shooting lanes” through these strips to assist hunters in seeing and/or shooting deer.

Another option is to consider stra-



tegitally planting relatively large areas of corn within larger fields then incorporating fall annual food plot strips later. The strategy behind planting corn in this case is to create a large area of cover within the field so that deer feel very secure and will use the field all times of the day. As food plot planting time approaches, senders or a wagon wheel design can be mowed out within the corn and planted in attractive fall crops. The corn field portion serves as a cover (and of course contains highly attractive corn) while the lanes/ senders or wagon wheels provide very attractive food and allow hunters to see deer. This is a very effective strategy for seeing and harvesting mature bucks. Mature bucks simply feel secure within the lanes of fall crops because they are only a jump or two away from good security cover. For this to be effective, you must consider the stand location and what makes sense. Cutting the lanes through the corn to plant fall food plots is best as a two-person job. That is, one person stays in the stand and directs the tractor operator to ensure the lanes are created in the right places.

### **Establish mineral licks for deer**

If minerals are lacking in the native habitat (or in the soils), deer will readily use mineral licks throughout the growing season (spring/summer). There are many commercial products available to use in mineral licks that are pre-mixed or you can create your own. A recipe I often use is mixing 50# Dicalcium Phosphate, 50# Calcium Carbonate, and 50# Trace Mineral Salt. These ingredients can be found at most farmers cooperative stores. To mix the minerals simply add each to a wheelbarrow or 3-point spreader and mix well using a shovel. This mix will be enough



*If properly managed, annual clovers are great re-seeders*

to create about 3-4 mineral licks. A good rule of thumb is to establish 1 lick per 200 acres. Rather than simply stirring minerals into bare ground, I prefer to create mineral lick sites using a small stack of half rotten logs and pour the minerals over the pile. Using this method, the rain will leach the minerals into the logs. It is also a good idea to dig a small trench around the stacked logs to contain the minerals and prevent run-off. The dirt can be added to the mineral mix and added to the pile. Deer will simply eat the rotten wood that is satu-

rated in minerals. As the pile deteriorates due to deer use, simply add a few more logs and minerals to the pile. If deer on your property do not use the licks, don't worry. This probably means that they are acquiring adequate minerals from native plants and do not need supplemental minerals.

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

If you included fall annual clovers such as crimson, arrowleaf or other red clovers in your fall food plots,

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

### **Clean and store prescribed burning equipment**

Now that the winter burning season is over, take time to clean and properly store equipment used so that it is in good working order the next time you burn. Burn fuel should be properly labeled and stored in a dry/cool place – actually I try to

use up all burn fuel during the burning season if possible so that I do not have to worry about storing flammable material. Take firepots apart and clean nipples and replace wicks if needed. Ensure the rubber seal on the lid is in good shape and replace any parts that show excessive wear. Clean and inspect handles, parts, and screws of fire rakes, flappers, etc. Although I use my herbicide tank/sprayer for fire suppression (water), I generally take time in late spring/early summer to clean it up and do general maintenance because I know I will be using it a good bit for herbicide applications throughout the summer. Without proper care and preventative maintenance, you are sure to have problems with prescribed fire equipment the next time you need it (I'm speaking from experience).

### **Prepare now to reduce deer hunting pressure next fall.**

Hunting pressure plays a significant role in the hunting quality (number and quality of deer seen while hunting) of your property. Hunting pressure does not necessarily mean a lot of shooting that is spooking deer. Most hunting pressure is often applied when hunters do not shoot at all. Examples of this include making full-scale scouting trips through a property during the season, spooking deer while entering or exiting a hunting stand, and hunting stands during unfavorable wind conditions. Most hunting clubs and clients managed by Tall Tines Consulting collect hunter observation data where they record the number and quality of deer they see while hunting. This helps us assess hunting quality which plays a role in our deer harvest decisions and hunting strategy recommendations. Years of hunter observation data from our clients shows that deer sightings, particu-

larly mature buck sightings, decrease as hunting pressure increases. Therefore, you should make efforts to keep hunting pressure to a minimum. One way to decrease hunting pressure is to screen hunting stands and hunter access areas with evergreen trees or other plantings to allow hunters to enter or exit the stand without impacting deer in the area. While evergreen trees work well for this application, we often plant tall standing crops such as corn or Egyptian wheat where needed to hide hunters. Because these are spring/summer plantings, you need to think ahead. That is, identify hunting stands now that need screening next fall. Strips of corn or Egyptian wheat need to be at least 10 yards wide to be effective since some of the crop plants will fall over after heavy frosts. Obviously wider strips will better conceal hunters.

### **Establish or create field borders where possible.**

Field borders are just as the name implies – the areas around the perimeter of fields where they meet woods. This area is biologically referred to as an ecotone (where two different habitats meet). These areas can be significantly enhanced for wildlife by creating a “soft edge”. Soft edges can be created using a variety of strategies. The goal is to gradually taper the abrupt edge of a mature forest along a field which increases “edge habitat” and results in an abundance of food and cover for wildlife. A 40–60-foot field border can be established by planting crops such as sorghum and millets and/or brush/shrub species along field edges. These areas provide food, travel lanes, nesting, brood-rearing, loafing, and escape cover for many wildlife species. Field borders can be managed in native grass/shrub



*Planting visual barriers in large food plots will increase daylight use by deer.*

species as well. Simply leave these areas fallow and maintain them by periodically mowing, burning, or light disking to prevent trees from encroaching. As you may know, most game species thrive and depend on edge habitat. Strategically creating field borders on food plots can enhance bow hunting opportunities as well. For example, creating an hour glass shaped planting area on a rectangular food plot, by allowing the middle edges to grow up naturally, will “funnel” deer through the pinched portion of the planted area offering bow hunters a close shot. I encourage you to check with your local NRCS office to see if you qualify for a Conservation Reserve Program (CRP). These programs

often offer incentives for landowners to install field borders. In most cases, the cost share initiative would pay for this work.

### **Control feral hog populations**

Feral hogs are very destructive and a nuisance on many properties throughout the Southeast. While hogs add additional hunting opportunities for landowners, they are difficult to control. I often hear “I’d like to have a few hogs on my property to hunt”. I agree and enjoy hunting hogs from time to time. However, if you’ve ever had hogs, you know this is not possible...you cannot have a “few” hogs. A property normally has no hogs or an overabundance of them. The reproductive potential of hogs is

extremely high in good habitats. With pregnancies lasting only 115 days, hogs generally produce 2 litters of 1-13 piglets per year, with the potential to have 3 litters! So needless to say, extreme/aggressive control is needed to simply keep up with or stabilize a hog population. There are many ways to remove hogs. Some of the most common methods include trapping, recreational hunting, and professional hunting/trapping or a combination of all. There have been many articles in *Wildlife Trends* dedicated to successful trapping methods. Hog control should be applied throughout the year or when needed. However, many landowners increase efforts during the summer to reduce disturbance and “hunting pressure” during hunting season. Besides their destructive nature on wildlife habitat, hogs can destroy



*Now is the time to make repairs to deer stands*

roads, food plots, pond dams and many other structures on your property. They can do several thousands of dollars' worth of damage in a short period of time. Controlling hogs will save you time, money, and frustration. A word of caution for those that have hogs but don't think they are a problem yet – the key word is “yet”. Once they are a problem, it is very difficult to remove enough to control the population.

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

Most recreational properties have some need for controlling water levels or water flow. Examples may include controlling water levels in fishing lakes, duck ponds, beaver pond, canals, or swamps/marshes. To do this, a wide variety of water control structures are used. Early summer is generally a good time to inspect these systems. Generally speaking, early summer is a dryer period than late summer or winter in most of the Southeast. Some of

the common things to look for include clogged pipes, deteriorated culverts, beaver dams, broken or missing flash boards, eroded banks, vegetation that is causing problems (like willows), broken valves or levers, missing or damaged stakes, broken beaver excluder fencing/cages, and damaged access docks/decks. Obviously, with so many different situations and different water control systems/structures out there each structure has its own unique things to check, repair and/or replace. The point is to do a thorough inspection and make any repairs needed during the “dry season”. It is certainly better to find and fix problems now rather than

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having to do so after your property is saturated during the wet season or when a flood event takes place and blows out weak components in your system.

### **Make repairs to deer stands**

Don't wait until you get the "fall bug" in September to start repairing deer stands. How many times have you made significant repairs including painting of stands right before hunting season started? Me too! Although fixing or performing general maintenance to deer stands is not what most hunters are thinking about during or just after turkey season, now is a great time to tackle this task. In many cases these repairs require oiling moving parts, replacing parts, and/or painting. Whether you need to use WD40 to quiet squeaks, add new tie wraps or pipe insulation, screening material, seat cushions, weld new pieces in place, or simply repaint shooting

houses or ladder stands to prevent rust, most repairs result in "stinky" results. That is, maintaining and repairing stands results in lots of foreign scents. By completing these repairs in early summer stands have several months to air out before being placed in the woods for another hunting season. Because I primarily bow hunt, I even purchase and air out tie down straps used to fasten stick ladders and lock-on bow stands this time of year so that they are "scent free" by fall. Doing this work now also reduces unnecessary scrambling to get things ready as the season approaches.

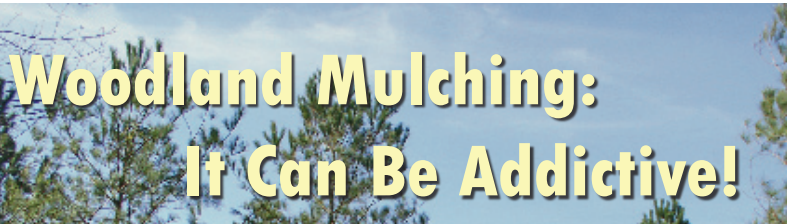
### **Prepare and plant food plot strips for turkeys and quail.**

Food strips are "food plots" for turkey, quail and other birds that wind through fields, quail courses, along fire breaks, or wooded habitat. Most supplemental food plant-

ings for quail are warm season crops and established during spring and summer. Food strips are particularly beneficial in years of low native food availability. Plantings of Egyptian wheat, Sorghum-Sudan, grain sorghum, brown-top millet, fox tail millet, and pearl millet are great crops to plant in food strips and will do well in most soil types in the Southeast. Food strips should be planted in a rotational fashion. That is, in successive years place new plots adjacent to previous years plot to create a mosaic of current year plot and stubble/annual weed community from previous years plot. Leaving the food plot stubble (not disking and replanting in the fall) will provide quality cover during fall and winter for game birds.



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