



The Wild Turkey in Alabama

Alabama Department of
Conservation and Natural Resources



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The Wild Turkey in Alabama

by

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Lastly, but foremost in my thoughts, I thank my father, Carol F. Barnett, an accomplished woodsman and turkey hunter, for mentoring and instilling in me as a young child, during all those early hunting adventures, the intrinsic value of a beautiful spring sunrise filled with gobbles of the wary wild turkey.

Steve Barnett

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Steven and Victoria live in Bay Minette with their daughter Elizabeth and son Jake.



The Alabama Division of Wildlife and Freshwater Fisheries dedicates this publication to those individuals who led the charge of the wild turkey conservation movement in Alabama to bring this magnificent animal from the brink of extinction to the levels that we enjoy today. We also dedicate this book to the memory of James R. Davis, a wildlife biologist who was on the front line of the early wild turkey investigations and restoration activities in the state.

Jim Davis was born in Montgomery in 1929. He attended Alabama Polytechnic Institute from 1947 to 1951, receiving his B.S. in Game Management. He was called to Active Duty with the U.S. Army in July 1951 and took part in two campaigns during his service with the Second Infantry Division in Korea. He later received his M.S. in Game Management from Auburn University in 1955 for his work on the food habits of the bobcat in Alabama. Jim began his career with the Alabama Division of Wildlife and Freshwater Fisheries (then Game and Fish Division) in 1955. He was a District Supervisor in southwest Alabama and played a vital role in the early days of wild turkey investigations and restoration efforts. Jim later served as Chief of the Wildlife Section from 1984 until his retirement in 1989. During his 34-year career, Jim authored publications on white-tailed deer, wild turkeys, gray squirrels, and mourning doves. He oversaw the publication of special reports on woodchuck, ruffed grouse, and the golden eagle. Jim was the first president of the Alabama Chapter of The Wildlife Society in 1978-79 and was instrumental in getting the chapter started. He had a keen interest in wild turkey management and was passionate about hunting turkeys in not only Alabama but across the United States and in Mexico. Jim served on the National Wild Turkey Federation's first Technical Committee created in 1975 made up of state agency wildlife biologists. Following his retirement, Jim remained active on his Covington County property until his death in May 2005.



Jim Davis with an adult gobbler he harvested at the Scotch Wildlife Management Area in Clarke County, Alabama. Photo courtesy of Jimmy Brown.

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PREFACE

The Eastern wild turkey is a commonly encountered species throughout Alabama. Once believed to thrive only in large, unbroken expanses of forestlands, the wild turkey has proven to be quite adaptable to a wide range of landscapes and habitat management applications. Like many other wildlife species, turkeys do best in diverse habitat settings. The success of population expansion by turkeys is directly related to the amount and quality of brood rearing habitat. However, knowledgeable wildlife managers apply a holistic approach by understanding that all components of the habitat must be managed year round across the landscape without focusing on any single feature. Wild turkey numbers have soared from near extinction levels in the early 1900s to an estimated 500,000 in Alabama in 2007. This phenomenal increase is a result of proper management embedded in restoration, protection, research, and partnerships with landowners and conservation organizations.

With an increased number of gobblers echoing in the springtime woodlands and more fall flocks scratching in the leaf litter for acorns, the number of hunters pursuing this wary bird has increased. Larger harvest levels can be linked to more hunters afield as well as more birds available to harvest. The earliest Alabama mail survey records from the 1963-64 season reflected that close to 37,000 hunters spent about 148,000 man-days hunting in the combined fall and spring seasons and harvested about 16,000 gobblers. In contrast, the 2006-07 combined fall and spring seasons indicated about 58,000 hunters who spent close to 495,000 man-days harvesting about 72,000 gobblers.

The increase in turkey numbers and turkey hunters has greatly affected the economy in Alabama. Recent nationwide studies of the economic impact of spring turkey hunting revealed that about \$2 billion is spent annually by nearly 3 million hunters on licenses, permits, firearms, hunting gear, and travel-related expenses. These expenditures average about \$800 spent by each spring turkey hunter per season. To put this in Alabama-specific terms, the studies indicate about \$45 million is spent annually for spring turkey hunting based on the 56,800 reported spring turkey hunters in 2007.

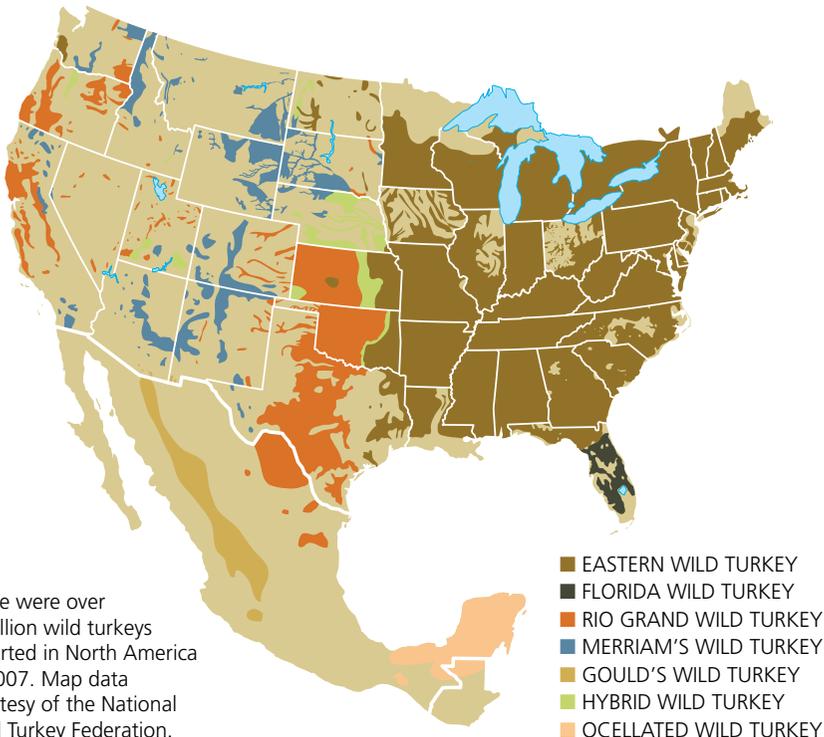
However important the economic value may be, the value not measured by dollars is what defines having the wild turkey as part of the landscape. The intrinsic worth of the wild turkey and other wildlife is linked to a much larger conservation picture. Maintaining healthy populations of wildlife such as turkeys and their habitats will help ensure an overall healthy ecosystem. Aldo Leopold (1966) stated in *A Sand County Almanac* that, "...a system of conservation based solely on economic self-interest is hopelessly lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but are essential to its healthy functioning".

In order to maintain and enhance wild turkey populations in Alabama today and in the future, it will be up to landowners and land managers to follow the "land ethic" that Leopold spoke of and to apply it across the landscape through habitat conservation and management. Alabama's current turkey population is a testament to the fact that many landowners continue to follow a responsible and forward-thinking land ethic. Wild turkey enthusiasts throughout the state enjoy numerous gobbles reverberating in the spring from the Appalachian Mountains to the Mobile-Tensaw Delta as a result of management efforts. These current experiences may offer a glimpse of the past. When William Bartram trekked through the southeast in the mid 1700s, he reported in his *Travels* (Harper 1998), in reference to wild turkey gobbling in the spring, that, "The high forests ring with the noise... of these social centinels (sentinels), the watch-word being caught and repeated, from one to another, for hundreds of miles around; insomuch that the whole country, is for an hour or more, in an universal shout."

This book is provided as a tool to assist landowners and land managers in Alabama with the application of habitat enhancement strategies for wild turkey management. In addition, it can be used to guide harvest structures and how to collect harvest data. Hunters as well as individuals with a general interest in wild turkeys will also find this publication to be a valuable source of information.

TAXONOMY

The Eastern wild turkey, *Meleagris gallopavo silvestris*, found in Alabama is one of the five subspecies of wild turkey in the family Meleagrididae that occur in North America. The eastern wild turkey inhabits the eastern half of the United States. It was named by L.J.P. Vieillot in 1817 using the subspecies word *silvestris*, which means “forest” turkey. Other subspecies of *Meleagris* include *M. g. osceola*, the Florida turkey located in the southern half of Florida; the Merriam’s wild turkey *M. g. merriami* of the mountain regions of the western United States; *M. g. intermedia*, the Rio Grande wild turkey, which is found in the south-central plain states; and the fifth recognized subspecies of the wild turkey, the Gould’s *M. g. mexicana*, which is located in northwestern Mexico and parts of southern Arizona and New Mexico. The ocellated turkey *M. ocellata* is a different species that occurs in the Yucatan Peninsula of eastern Mexico as well as adjacent countries of Guatemala and Belize.





Eastern Wild Turkey
Meleagris gallopavo silvestris



Chapter One

Physical Characteristics

PHYSICAL CHARACTERISTICS

Wild turkeys are classified as gallinaceous birds along with grouse, quail, and pheasants. This group of birds spends the majority of daily activities, such as foraging, mating, and nesting, on the ground. They all have strong feet and legs for running and scratching as well as rounded wings that enable short bursts of flight. Like other Galliformes, turkeys are sexually dimorphic meaning that the male is larger and more colorful than the female as a function of courtship and display. The female's drab coloration serves as camouflage to elude predation, which facilitates successful nesting.

ADULT CHARACTERISTICS



PLUMAGE

The adult turkey is covered with between 5,000 and 6,000 feathers in patterns called feather tracts (pterylae) (Marsden and Martin 1945).

Feathers range in size from hair-like filoplumes to large stiff, quill-like wing feathers (remiges) and tail

feathers (retrices). Besides for flight, feathers of various shapes function as body covering, insulation, and waterproofing. Feathers also facilitate tactile sensation for sensory organ protection, and function as ornamentation for display and recognition.

Many feathers exhibit iridescence, most prominently in gobblers, with varying colors of red, green, copper, bronze and gold. The brightness and angle of light as well as body movements determine the level of feather iridescence. Generally, body feathers of gobblers are black tipped, giving the male an overall black appearance at a distance. The hen has a duller appearance due to brown tipped body feathers. Contour breast feathers are square tipped in males and are more rounded in females.

The head and neck area of gobblers is basically naked with very few feathers



NWTF

The breast feathers of gobblers (*Top*) are blacked-tipped. Hen breast feathers (*Below*) are buffed-tipped.



NWTF



A gobbler's head and neck is basically featherless and characterized by red, white, and blue coloration.

NWTF



The head and neck area of a hen is feathered to some extent with a mostly blue coloration.

on bare skin protuberances called caruncles. These bare skin areas of the gobbler's head and neck are one of the most distinguishing characteristics of the sexes. Males have red, white, and blue colorations that are most evident in the breeding season.

Unlike the gobbler, the hen is feathered in the head and neck region. The female exhibits a smaller, dull blue colored head and less prominent caruncles as compared to an adult male.

Uncharacteristic colorations have been reported in wild turkeys. There are four abnormal color phases: smokey gray phase, melanistic (black) phase, erythritic (red) phase, and the very rare albinotic (white) phase. These unusual plumage colorations are reported infrequently in Alabama.

WEIGHTS

An adult Eastern wild turkey gobbler will average between 16 to 20 pounds, while the average adult hen will weigh between 8 to 10 pounds. Based on hunter harvest records kept by the National Wild Turkey Federation (NWTFF), a gobbler weighing close to 26 pounds was documented in Lauderdale County in 2006 as being the heaviest in Alabama. The heaviest Eastern wild turkey reported weighed over 35 pounds and was harvested in Iowa in 2001.



BEARDS

The beard, primarily found on males, is a brush-like cluster of keratinous fibers, similar to hair, that hang from the midline of the upper breast (Lucas and Stettenheim 1972). It is often considered

a modified feather; however, the beard does not molt as a feather does. Another suggestion is that the beard is a specialized part of skin that grows throughout the life of a turkey. Filaments of the beard originate from a raised oval of skin known as a papilla (Lucas and Stettenheim 1972). Multiple beards sometimes develop from multiple papillae resulting in several distinct beards on a turkey.

Most gobblers have beards visible beyond the breast feathers at 6 to 7 months of age. The beard continues to grow at a rate of about 3 to 5 inches per year. However, the tip of



Beard lengths increase as a gobbler ages but normal wear and breakages makes aging difficult beyond a juvenile bird.

the beard will begin to wear off at 2 years of age due to ground friction during foraging and other daily activities. Gobblers with a longer skeletal structure, resulting in greater height, tend to have longer beards because of ground clearance. Beard thickness depends on the number of bristles stemming from the papilla. The normal color of an adult turkey beard is black throughout its length. Juvenile male beards often have reddish or blonde tips. This color disappears in older gobblers as the bristles grow in length and wear off at the tip. Some beards of adult males will be partially or completely broken off horizontally, which is usually associated with a lack of the black pigment melanin resulting in brittle beard filaments.

Even though the papilla from which the beard grows is present on hens, female turkeys do not normally have beards. Research has shown that hens with beards may range from 1 to 29 percent of females from different populations (Lewis 1967, Williams and Austin 1988).

NWTF wild turkey harvest records indicate that the longest typical beard on a gobbler in Alabama was over 17 inches in length and was taken in Tuscaloosa County in 2001. Based on these records, the longest typical beard for an Eastern wild turkey was reported by a hunter in Texas in 2007 at over 22 inches.



SPURS

Spurs are located on the lower scaled sections of gobbler legs. There is usually one spur on each leg. Spurs are used for fighting associated primarily with the spring breeding season in order to establish dominance. The spur of an adult male has a bony core and is covered by keratin. As a gobbler ages

the shape of the spur will gradually change from round and blunt to curved and sharp. The length of spurs can be used to determine age to some extent. Generally, juvenile males have spurs less than $\frac{1}{2}$ inches, a 2-year-old male will have spurs up to $\frac{3}{8}$ inches, and 3-year-old plus males may have spurs 1 inch and longer.



Spur length is a more reliable aging index than beard length but growth rates are not constant and vary among gobblers based on genetics, habitats, and other factors.



JOHNNY PONDER

Some gobblers are reported with multiple spurs.

Most spurs are black but can vary in color from black and reddish, pink, off-white, or a combination of these colors. Rarely, a hen will be reported with spurs or a gobbler with multiple spurs. Some adult gobblers have been observed without spurs.

According to NWTf wild turkey harvest records, the longest typical spurs reported

in Alabama were on birds taken in Choctaw (1992) and Perry (1978) counties. Each of these gobblers had spurs that were $1\frac{7}{8}$ inches in length. Based on NWTf harvest records, the longest typical spurs reported for the Eastern wild turkey were $2\frac{1}{4}$ inches long from Iowa (2001) and Kentucky (1999) gobblers.



SENSES

Turkey hunters can attest to the fact that wild turkeys possess excellent vision. Turkeys have the ability to detect the slightest movement and many turkey hunters have learned this the hard way. The rate of assimilation of detail in the field of vision of the wild turkey is very rapid (Lewis 1967). With eyes on the side of its head, a turkey has predominately monocular, periscopic vision. A turkey needs only to turn its head and view an object from different angles to determine distances, which allows for a 360-degree field of vision. Night vision is poor and turkeys are reluctant to leave the roost at night. Nocturnal birds such as owls have a preponderance of rods in the retina associated with night vision. Turkeys are diurnal (daytime) birds and have mostly cones in the retina for daytime vision (Dukes 1947). Turkeys do perceive colors, the extent of which is unknown.

The wild turkey has an acute sense of hearing. Field observations indicate that turkeys can hear lower frequencies and more distant sounds than humans can.

Taste and smell are poorly developed in turkeys as compared to humans. Turkeys have fewer taste buds but can differentiate simple tastes such as sweet and bitter. The olfactory lobes in the brain of a turkey are small, which accounts for a poor sense of smell.



MOBILITY

Wild turkeys have powerful legs that enable them to run well. In fact, heavy adult gobblers prefer to run rather than fly to elude danger. Ground speeds in excess of 12 mph allow the turkey to spring into the air to take flight in an instant (Mosby and Handley 1943). Flying speeds of up to 55 mph have been reported (Mosby and Handley 1943). Continuous wing beats of turkeys rarely exceed 200 yards in flight distance, but gliding associated with wing beats may permit turkeys to fly up to a mile with little difficulty.

POULT AND JUVENILE CHARACTERISTICS

PLUMAGE

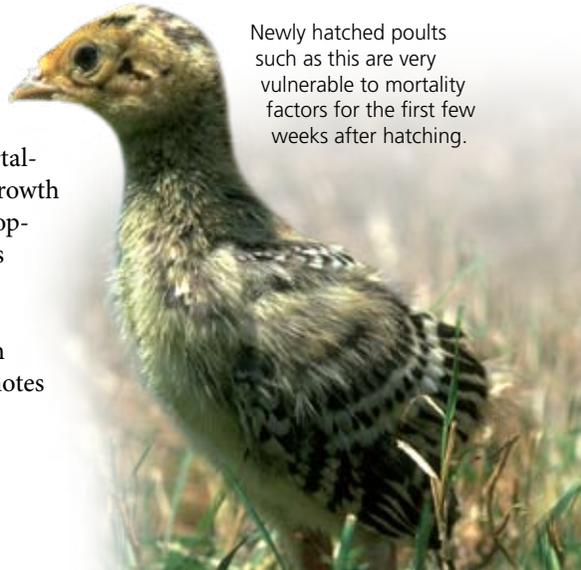
At hatch, a turkey poult is covered with yellowish brown natal down and has seven small primary flight feathers (Williams 1981). At about three weeks of age the flight feathers are well developed. The first body feathers are brownish and the poult may appear similar to a young grouse. A young turkey will go through four plumages and three molts (feather replacements) by the first winter. At three months of age the young turkey will first attain adult colored plumage.

WEIGHTS

A wild turkey poult weighs less than 2 ounces at hatch but the growth rate post hatch is rapid. A young turkey will gain over 1 pound per month during the first three months of life. After three months, the juvenile male will weigh about 3 pounds, slightly more than the female juvenile (Mosby and Handley 1943). The growth rate is accelerated between three and seven months with weight gains of about 1 pound every two weeks. At around five to six months of age, young gobblers will weigh between 9 and 11 pounds. A juvenile hen will weigh about 8 pounds at seven months of age.

MOBILITY

Wild turkeys are flightless upon hatching, which leaves them vulnerable to predation and other mortality factors. However, due to rapid growth in flight feathers (wings), the developing poult can fly up to low branches at eight to 12 days of age. Mobility in terms of ground speed and flight improves as a juvenile grows, which aids in evading predators and promotes survival into the first fall season.



Newly hatched poult such as this are very vulnerable to mortality factors for the first few weeks after hatching.



Chapter Two

Behavior

BEHAVIOR

VOCALIZATION AND COMMUNICATION

Research has shown that a turkey's vocabulary consists of 28 distinct calls (Williams 1984). The obvious call that is specific to the male turkey is the gobble. Both sexes can emit common calls such as yelps, clucks and putts. Gobblers are typically used in the spring breeding season by males to attract females, but gobblers also gobble to assert dominance in areas of other competing males during the mating season. Males also gobble as a response stimulus to other calls from owls, crows, woodpeckers, coyotes etc. or loud noises such as trains, thunder and gunshots. Calls such as yelps, clucks and putts are used throughout the year. In the spring mating season, receptive hens will primarily use yelps and clucks in response to gobblers heard. The putt or alarm putt is used to communicate a threat and results in an alert posture with head up or an immediate flush through running away or taking flight.

Most turkey hunters carry a repertoire of calling devices to imitate the vocalizations of wild turkeys such

as box calls, diaphragm mouth calls, glass calls, slate calls, turkey wingbone calls, gobble tubes and several other types. Many hunters have discovered a biologically sound reason for carrying a wide array of calls. A particular gobble that may not respond to one type hen call may respond to another call due to the difference in the "voice" of the caller.

Hunters use a wide assortment of calling devices such as this box call to imitate hen calls produced in the breeding season and lure in gobblers.



INM/TF



INM/TF

BREEDING SEASON

COURTSHIP

Breeding behavior, such as gobbling and strutting, is triggered by increased periods of daylight in late winter. These activities are also stimulated by warming trends. This pre-courtship activity will occur before spring dispersal while gobblers are flocked together. Hierarchy or pecking order within flocks is formed by fighting to establish dominance, hence the term “boss” gobbler. Winter flocks will establish these complex social orders both within and between flocks of the same sex.



NATE

Gobblers establish dominance in pre-courtship rituals to establish pecking orders

As daylight periods increase and warming trends continue, gobbling and strutting behavior intensifies into the spring mating season. There are usually two peaks of gobbling associated with the mating season. The first peak is at the onset of breeding when gobblers are searching for hens, while the second peak occurs later when most hens are incubating (Bailey and Rinell 1967). A two-year study of gobbling activity in Alabama at the Fred T. Stimpson Sanctuary in Clarke County measured peak periods of the number of gobblers heard as well as the number of gobbles emitted. The survey was conducted for two hours starting 30 minutes before sunrise each morning. The first average peak of gobblers heard occurred about March 19 (three gobblers), with the second average primary peak observed around April 6 (eight gobblers). The highest number of gobbles emitted was on April 5 (46 gobbles). In Alabama, the gobbling (breeding) season begins in March and lasts well into May (Davis 1976).



DENNIS HOLT

Strutting is part of courtship display to attract hens in the mating season.

Gobbling activity is highly variable. The number of different males gobbling as well as the number of gobbles emitted may vary greatly from day to day. Even during peak periods of gobbling on days of optimum weather conditions (mild, calm and clear), some turkeys remain silent. In one Alabama study, little gobbling was heard on rainy and windy mornings (Davis 1971). The only fairly

consistent observation regarding gobbling reflected in the study is that peak gobbling usually occurs between 30 minutes before and 30 minutes after sunrise.

The primary function of gobbling is to attract hens for mating (Williams 1984). Hens respond to gobbling by yelping and the use of other vocalizations such as clucking. Hunters often become dismayed when gobblers do not come completely into their calling setups. This often occurs because normally hens go to the gobbler's position. Depending on environmental conditions, altitude, and landscape features, gobbling can be heard from about a one-mile distance. Typically, most gobbling activity occurs from the roost site because an elevated perch usually enables the gobbler to be heard over longer distances to attract hens and establish dominance.

The strutting of a gobbler intensifies in the presence of hens and is characterized by tail feathers fanned out, outer primary wing feathers dragging the ground, and drumming. Drumming is a short range, low frequency hum emitted by the gobbler as part of the mating ritual associated with strutting. Many hunters describe the drum as a low pitched “vroom” sound that coincides with quivering of the feathers. A receptive hen will submit to breeding through a crouching posture allowing the gobbler to mount her back to facilitate copulation.



Wing tip drag marks in the sand on each side of the gobbler tracks are indicative of strutting.

NESTING

NEST SITE SELECTION

Hens tend to select nest sites based on undergrowth characteristics rather than by general habitat types (Holbrook et al. 1987). Nests are often located at the base of a tree or next to a log with vegetation sufficient to conceal the nest but allow the hen to view her surroundings from ground level. In optimum habitat conditions, the nest will be near a grassy opening or woods road that will provide brood rearing habitat post hatch. Successful nest



Vegetation characteristics surrounding successful nests typically conceal incubating hens from predators.

sites in a Mississippi study tended to have less lateral vegetation screening, were closer to grassy roads, and located nearer edges in forested habitat as compared to unsuccessful nest sites (Seiss et al. 1990).



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A typical clutch of wild turkey eggs. Hens will leave the nest to feed periodically.

LAYING AND INCUBATION

A hen will lay an average of 11 eggs over the course of about two weeks, usually at a rate of one egg per day. Concealment of the nest is usually achieved by the hen covering the eggs with leaves until the clutch is complete. In the early stages of laying, the hen will leave the nest to feed during the day; however, time spent away from the nest decreases as the clutch nears completion. Continuous incubation has been observed to begin after the last egg is laid or the next day (Williams et al. 1972). Poults begin to hatch after approximately 26 days of incubation. The hatching process for the entire clutch lasts roughly two days before the poults are ready to follow the hen to brood range.

BROODS

Upon leaving the nest site, a hen will usually move her brood to a nearby grassy road or opening. Poults can follow the hen and feed themselves within a day of hatching. Openings with herbaceous vegetation that harbor insects are the primary feeding areas for early developing poults. The hen is on constant alert while moving to brood range and during feeding periods. If a hen perceives a threat from a potential predator, an alert call is given and the poults will freeze until the threat has passed. The hen will then vocalize an assembly call to the poults to reassemble the brood group. Predators cause the major portion of brood losses

Poults feed almost exclusively on high protein insects in herbaceous openings for several weeks after hatching.



NWTF

from hatch until the fall season with most predation losses occurring in the first few weeks post hatch. Inclement weather also accounts for mortality of young poults. Survival begins to increase when poults are able to fly up to roost at about two weeks of age and continues to increase as the poults grow and mobility improves.

The size of a brood's home range increases as the poults grow (Hillestad and Speake 1971). These ranges are small when poults are down-covered and increase with growth and feather development until the formation of fall flocks. Over the course of the summer brood-rearing period, these home ranges can be several hundred acres. The habitat quality may affect the size of the brood range. Good brood habitat would suggest sufficient nutritional requirements are found over smaller ranges, which may result in less movement between habitat types and subsequently smaller brood ranges.

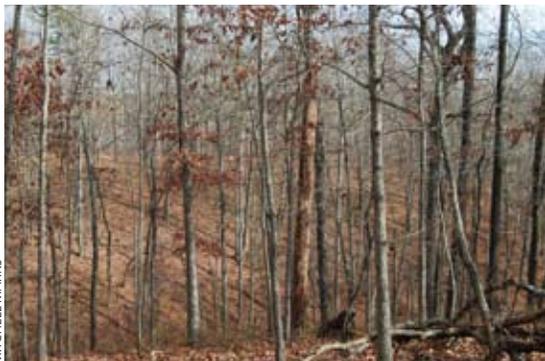


NWTF

Poult survival increases when they can fly up to roost at about 2 weeks of age.

FALL AND WINTER

Typically, there is a shift between summer brood range and fall flock habitat. Brood rearing habitat usually consists of various types and sizes of openings that provide insects for developing poults. By the fall, range shifts normally occur that involve movements into more forested habitats. At this time, juveniles are eating not only insects, but also seeds, as well as hard and soft mast. The better the fall mast crop the smaller the range of these brood flocks. In years of poor mast production, turkey flocks will seek these food items over a larger area. Several broods may remain together by the fall and winter to form large flocks. Pecking orders will be established by early autumn and juvenile gobblers (jakes) will begin dominance rituals that will become evident as dominant jakes grow into old "boss" gobblers.



MITCHELL MARKS

Fall habitats comprised of mast producing hardwoods are important for turkeys.



Chapter Three

Food Habits and Nutrition

FOOD HABITS AND NUTRITION

POULTS

A young turkey is considered a poult from the time it hatches until it is four weeks old. Unlike the familiar picture of the mother bird bringing a worm to the tiny featherless babies who remain in a nest, turkeys are precocial birds, which means that immediately after hatching they are feathered and walking. A turkey hen does not bring food to her poults. She leads them to feeding areas and watches out for predators, but the poults must find their own food.



The primary feeding method of poults is the peck. Poults have been observed pecking within the first hour after hatching. Pecking can be divided into four categories:

1. **Peck chase** – The poult pecks. If the item moves, the poult chases.
2. **Stalk peck** – The poult spots a food item, moves to within striking distance, and pecks.
3. **Jump peck** – The poult jumps up and pecks an object overhead.
4. **Peck tug** – The poult grabs and tugs (Hurst 1992).

Although adult turkeys are well known for scratching through the leaf litter in search of food, poults don't scratch.

Most poults exhibit grab and run behavior (the poult grabs the food item and runs away to keep other poults from stealing it) after the first day (Healy 1978). Poults will grab small food items and eat them whole. If a larger item, such as a grasshopper or cricket is caught, the poult will shake it hard, throw it on the ground repeatedly, peck and crush until it is in small enough pieces to eat (Hurst 1992).

In Alabama, broods usually begin feeding after the dew dries. They generally feed all morning, take a rest at midday, and then continue feeding until roost time. Feeding rates are greatly dependent on food availability. When food is abundant, poults will dust, preen and take more rest breaks. When food is scarce, they will feed constantly (Nenno and Lindsey 1979).

Poult will drink water from dew, puddles, and other shallow water sources, such as tire ruts. They generally seem to avoid streams and large bodies of water. Poults usually obtain much of their moisture needs from their diet. The average moisture content of summer foods was found to be 72 percent in one study (Exum et al.1985).



JIM O'CONNOR/ISTOCK

The grasshopper is an important protein source for turkeys, especially poults, in the spring and summer.

The first four weeks of a turkey's life are a time of very fast growth and almost constant feather molting. Because of this, poults require significant amounts of protein. The major source of protein in a poult's diet is insects. In an insect-rich environment, the insect percentage of the poult diet will be anywhere from 79 to 90 percent (Hurst and Stringer 1975).

Poult also eat plant material. If the percentage of available insects decreases, the amount of plant material in the diet increases. In pine plantations across south Alabama, poult droppings consisted of 60 percent insect remains and 40 percent fruit and seeds of blackberry, huckleberry and noseburn (Exum et al. 1985).

JUVENILES

After four weeks, young turkeys are classified as juveniles. Their growth rate slows, and they begin to take on the familiar turkey shape. Hens and their broods will often feed together in multiple brood flocks. Feeding habits of juveniles remain similar to that of poults in that they still do more pecking than scratching.

As the growth rate slows so does the young turkeys' need for protein. There are few studies of the food habits and diets of juvenile turkeys. One study in Alabama found that plant materials increase as a percentage of the diet as turkeys grow older (Hamrick and Davis 1971). Another Alabama study found that the four most consumed foods were blackberries and the seeds of carpet, Bahia and crab grasses (Blackburn et al. 1975).

Blackberries are a much favored summer mast item for many wildlife species, including turkeys.



As juvenile turkeys grow, they gradually move toward a diet similar to the adult consisting of 75 to 85 percent plant material, and the rest arthropods. Juveniles will drink from pools or puddles, but they still get the bulk of their water from their diet. Water is not usually a limiting factor for turkeys in Alabama (Exum et al.1985).

ADULTS

Adult turkeys eat a wide variety of food items. One hunter in a flooded bottom-land hardwood shot a gobbler that had a crop full of crawfish. A hen killed by a great horned owl was found to have eaten 23 cicadas. Two gobblers shot in Mississippi had been feeding on green anoles (Hurst 1992).

Adult turkeys use several methods to get their food. In the winter, after the best berries and mast have been eaten, turkeys begin scratching. They use their powerful legs and feet to scatter the leaf litter so that they can locate any overlooked acorns or hidden insects. Turkeys can also dig into the ground to uncover tubers such as chufas. Chufas are commonly planted to attract or hold turkeys in an area.

In other seasons of the year, turkeys will pluck individual fruits, insects, and buds; strip grass seeds from stems; jump and grab fruit or insects overhead. They will fly up into trees and eat buds and flowers. They will wade into shallow water for plants or arthropods. In addition, they will readily eat clovers, grasses, corn, wheat, oats, or other cereal grains planted as crops.

Turkeys feed individually and in flocks. A hen with poults feeds as a unit. As discussed in the juvenile feeding habits section, hens will often join with other hens and young turkeys to form multiple brood flocks. When flock feeding, they cover ground at a rate of anywhere from 300 yards to 2 miles an hour (Lewis 1973). Nesting hens usually feed alone. During the breeding season, gobblers will feed alone or in groups. Often they do not eat much, being more interested in breeding than eating, and living mostly on energy stored in the breast.



Bare ground areas reveal where turkeys were scratching in woodland habitat in search of food items.

Acorns are one of the most preferred hard mast items in the turkey's fall and winter diet.



NWTF

NUTRITIONAL NEEDS

Adult turkeys meet their nutritional needs by eating a wide variety of foods. When describing food types, biologists often refer to hard or soft mast. Hard mast includes nuts or nut-like items such as acorns, pecans, hickory, beech, and pine seeds. Soft mast is berry-like, such as dogwood fruits, black gum fruits, poison ivy berries, grapes, French mulberries, blackberries, huckleberries and blueberries. Turkeys in Alabama eat both, as well as insects, snails, leafy green vegetation and grass seeds.

What a turkey is eating also depends on the time of year. In the fall, as grass seeds and insects become less available, turkeys move into forested areas in search of mast. Incubating hens in southwest Alabama were found to eat mainly blackberries, other fruits, grass seeds and animal matter. Turkeys in areas dominated by pine plantations were found to eat green foliage plants, followed by grass seeds, soft mast and insects (Kenamer and Kenamer 1990).

Hens have special nutritional needs. They need more protein, calcium, and phosphorus in order to lay eggs. Insect consumption increases to meet protein needs prior to laying. Calcium and phosphorus are supplied by succulent spring growth that provides other important vitamins and minerals as well (Schorger 1966).

In short, turkeys, like people, are opportunistic omnivores. They have certain preferences, but they can and will eat just about anything. Around 80 percent of an adult turkey's diet will be plant material. The rest will be whatever they can catch.



RONI EAKES

Black gum is found throughout Alabama, and is an important soft mast for turkeys.



MITCHELL MARKS

Blueberries are another important soft mast item.



Boott's Sedge (*Carex picta*), a forage plant locally named turkey sedge for its attractiveness to wild turkeys, is found primarily in north Alabama.

MANAGEMENT IMPLICATIONS AND SUPPLEMENTAL FEEDING

Across Alabama, many turkey hunters and landowners are concerned with food availability and its effect on turkey numbers. Consequently, many of them attempt to mitigate food scarcity, real or perceived, with supplemental feeding programs. This is usually unnecessary and ill advised, often producing unintended consequences.

Alabama is blessed with an abundance of natural food sources for the wild turkey. The Southeast has the highest biodiversity of any area in the United States. Biodiversity is the amount of *different* species in a given area. Where you might find five common tree species in a forest of the Great Lakes Region, in Alabama you might find 50.

There is also a great diversity of habitats in Alabama. A turkey could easily wander from a river bottom, across a ti-ti thicket, through a managed pine plantation and end up on a hickory-beech-magnolia hillside, all in a morning's feeding.



A juvenile gobbler feeding on cracked corn. Not only is hunting by aid of bait illegal in Alabama, the bait may facilitate the spread of disease.

Climate also plays a role. Turkeys at the northern limits of their range have been known to starve during periods of deep, fluffy snow, but that isn't a problem in Alabama. Food sources of one kind or another are available year round.

You might well need to take some steps to increase food availability for turkeys, but throwing out corn is not the answer. Artificial feeding unnaturally concentrates the turkeys in a small area, which is bad for several reasons.

1. **Disease Transmission.** Turkeys can infect each other through direct contact, or they can be infected through droppings that pile up around feeders.
2. **Increased Poaching and Predation.** A lot of the food will be eaten by other wildlife. In addition, predators may be coming in for an easy turkey meal. This can also include human poachers. If they are already trespassing, the fact that shooting turkeys over bait is illegal is unlikely to bother them.
3. **Increased Exposure to Toxins.** Mycotoxins, such as Aflatoxin and Fumonisin occur in grain crops. Crops contaminated with these toxins, rendering them unsuitable as human or domestic food, often find their way into commercial wildlife feeds and may ultimately poison turkeys (Fischer and Davidson 2005).



CHRIS GREENE

Feed too contaminated for livestock is often sold as "wildlife" food. Tainted feed may contain high levels of aflatoxins that are poisonous to wild turkeys.

The best solution is to manage available habitat in such a way as to increase natural food sources. This is the solution endorsed by The Wildlife Society (2007). Wildlife openings can also provide brood habitat and help other species of wildlife as well. There is a further discussion of wildlife openings in the habitat management section.

Chufa planted for turkeys on an Alabama WMA. There is no other wildlife planting so closely associated with turkeys.



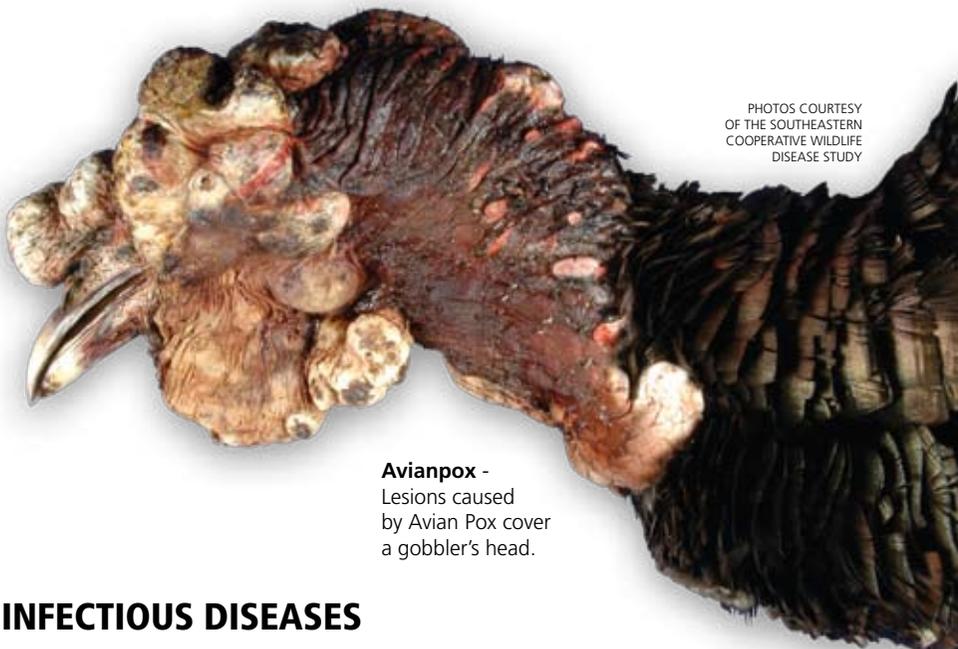


Chapter Four

Diseases, Parasites and Toxins

DISEASES, PARASITES, AND TOXINS

Turkeys, like all other living creatures, are subject to a variety of diseases and parasites. It is beyond the scope of this book to detail every illness turkeys have been known to suffer. Some of the more common and/or serious problems that can affect turkeys are listed.



PHOTOS COURTESY
OF THE SOUTHEASTERN
COOPERATIVE WILDLIFE
DISEASE STUDY

Avianpox -
Lesions caused
by Avian Pox cover
a gobbler's head.

INFECTIOUS DISEASES

Avian Pox is an infectious virus that affects both wild and domestic turkeys. Also known as Fowl Pox, it causes warty lesions on unfeathered parts of the bird. Turkeys usually develop lesions either on the outer skin (dry pox) or in the mouth and trachea (wet pox). Occasionally both types of lesion are present (Davidson 2006).

Avian Pox is a serious poultry disease. The wet form usually causes more fatalities than the dry form, but in rare cases, the dry form causes lesions that may cover the eyes, rendering the turkey blind. This is usually fatal as well (Davidson and Wentworth 1992). Other symptoms include respiratory distress and weight loss. Any of these problems also make the bird more likely to be caught by a predator.



The wet form of Avian Pox in the mouth and trachea usually leads to more fatalities than the dry form (outer skin).

Several means of transmission occur in the wild. Skin to skin contact or contact with shed skin particles in dusting areas can spread Avian Pox. The most common vector, though, is mosquitoes. Mosquitoes bite an infected turkey, ingest the virus with the blood, and then inject it into the next turkey they bite. This is why Avian Pox is most prevalent in warmer months in the coastal plains, when the mosquitoes are most active (Davidson 2006). Avian Pox does not affect humans. Another virus that can affect turkeys is *Lymphoproliferative Neoplasms* (transmissible tumors). The tumors are usually not visible at a distance. Symptoms include ruffled feathers, listlessness, diarrhea, drooping wings and trembling. Like Avian Pox, *Lymphoproliferative Neoplasms* are spread by direct contact and mosquitoes. They are widespread, but not very significant in terms of turkey mortality. They also do not affect humans.

Infectious sinusitis is caused by the *Mycoplasma gallisepticum* organism. The major symptom is swollen sinuses, which makes it difficult for the turkey to breathe. Transmission comes from direct contact with an infected turkey. Humans cannot catch it from turkeys. Infectious sinusitis is rare in wild turkeys. It usually involves contact with domestic turkeys. It is, however, a serious problem in domestic turkeys, and could cause major wildlife health issues in wild turkeys were it ever established in wild flocks.

Salmonellosis is an infectious and contagious disease of many animals. The most common symptom of diarrhea is well known. It can lead to emaciation in turkeys. Transmission of salmonella is fecal to oral. In other words, food is contaminated by droppings of sick birds and consumed by other birds. Salmonella is not a serious problem in wild turkeys. Only occasional infections have been reported, with just two reports coming from Alabama (Davidson and Wentworth 1992). However, salmonella is one of the few illnesses that a human could contract from a turkey.

Birds infected with salmonella should not be eaten. Since the symptoms are vague, any sick turkeys should not be eaten. Theoretically, thorough cooking should kill all the bacteria, but cross contamination of cooking utensils is always a possibility.

West Nile Virus is a new disease to the United States. It arrived with much publicity in the summer of 1999. Spread by mosquitoes, it can cause encephalitis in humans and horses, often with fatal results, especially in horses. It also causes death in some species of birds. There was great concern among farmers who had horses and/or domestic turkeys that this disease could threaten them. Wildlife managers were also concerned that the disease might negatively influence wild turkey populations.

Researchers at the Southeast Poultry Research Laboratory tested domestic poultry to discover just how susceptible turkeys are to West Nile Virus. They concluded that turkeys are not among the bird species that are susceptible to

West Nile, and that neither domestic nor wild turkeys will be a host or reservoir for the virus (Erickson 2006). Avian influenza, commonly referred to as bird flu, is another virus that appears primarily in birds. The strain known as H5N1 has been known to pass from birds to people who are in very close contact with the infected birds. Avian influenza viruses pass among birds worldwide, especially migrating waterfowl. Birds carry the viruses, but don't usually get sick from them. Bird flu is very contagious among birds and the H5N1 variety does affect turkeys, but to date there have been no documented cases of H5N1 in wild birds in the continental United States. Most of the birds that have contracted the bird flu have been domesticated birds in Europe and Asia. Wild turkeys are unlikely to be major carrier of bird flu, as they don't come into contact with people or waterfowl on a regular basis.

But what about the turkey hunter who does come into contact with the bird? Bird-to-human transmission of bird flu is very rare. Most cases occur where people and their poultry are living in very close proximity.

If hunters follow the routine precautions as outlined by the U.S. Department of Agriculture, there is very little chance of contracting *any* disease from a wild turkey. Do not handle or eat sick birds. Wear rubber or disposable latex gloves while handling and cleaning birds, wash hands with soap and water, and thoroughly clean knives, equipment and surfaces that come in contact with game. Do not eat, drink or smoke while handling animals. All birds should be thoroughly cooked (well done or 160° F).

PARASITES

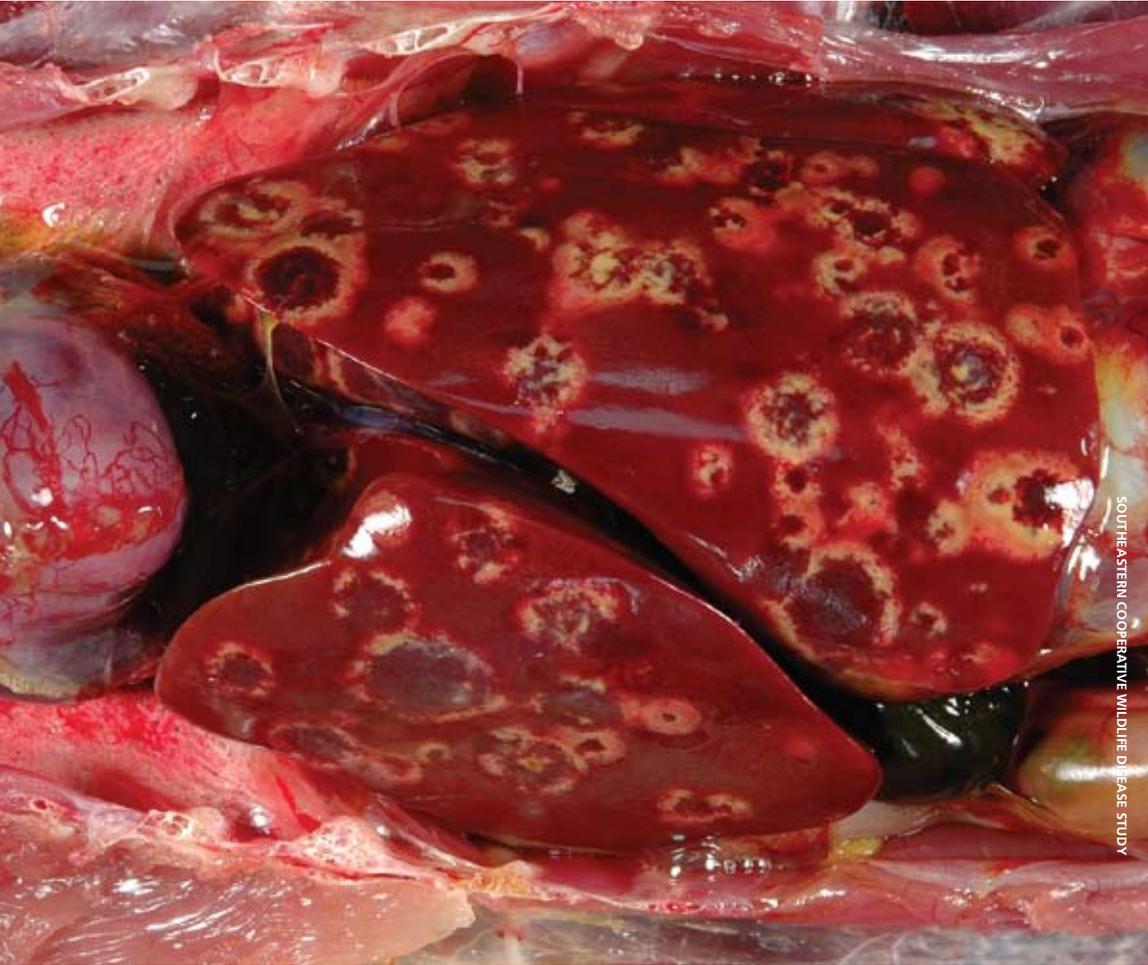
Turkeys are also susceptible to parasites. There are at least 10 species of tapeworm that can infect turkeys. They also harbor the common nematode *Ascaridia dissimilis*. A turkey can carry many of these nematodes without apparent ill effect. Lice, ticks, mites and louse flies are also common on wild birds. Most infestations are not a health issue for turkeys, although very heavy tick loads have been known to cause poult mortality in some regions (Davidson 2006).

The parasite that is most lethal to turkeys is a protozoa, *Histomonas meleagridis*. It causes Histomoniasis, or Blackhead. Blackhead disease can infect many different species of galliform birds. Some birds, such as turkeys and ruffed grouse, suffer high mortality rates. Other birds, such as chickens and ring-necked pheasants, carry the parasite without becoming sick.



Blackhead - Liver of a turkey showing distinct areas of necrosis due to Histomoniasis (Blackhead) infection. See closer view on page 40

PHOTO COURTESY OF THE SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY



Blackhead - Liver of a turkey showing distinct areas of necrosis due to *Histomoniasis* (Blackhead) infection.

These protozoa have a very complex life cycle, being one of the few parasites that use another parasite, a cecal nematode, as a host. Earthworms also play a part.

Mortality rates in turkeys can top 75 percent. Introduction of carrier species into areas with wild turkeys should be avoided. This includes pen-raised game birds that may have come into contact with carrier species. There is no danger to humans from *Histomoniasis* (Davidson and Wentworth 1992).

Another parasitic disease that occurs in pen-raised birds and can infect wild birds is *Syngamus trachea*, or gapeworm. This tracheal roundworm can block the air passages, causing the birds to pant for air with an open, gaping mouth, giving this disease its common name, “gapes.” There are no human health implications (Davidson and Wentworth 1992).

TOXINS

Aflatoxins are poisons produced by the fungi *Aspergillus*. They are found in contaminated corn and other small grains. Anyone who uses corn for supplemental feeding should be aware of aflatoxins. The negative effects of this poison on humans and animals are dependent on dosage, and include liver damage, compromised immune systems, cancer and death. Aflatoxins have also been shown to stop egg production in domestic turkeys. Lab results from an experiment conducted at the Southeast Cooperative Wildlife Disease Study found that even aflatoxin contamination as low as 100 parts per billion caused decreased immune function in wild turkey poults (Quist et al. 2000).

Caution should be used when buying “wildlife” corn. The above-mentioned study found aflatoxin in three of 31 bags of corn offered by retailers in Georgia for use as wildlife feed. Unfortunately, corn that is too contaminated for other uses often ends up as “wildlife” food. Supplemental feeding is not recommended as a turkey management practice.

One other fungus is feather fungus. While not a health issue, it can cause ragged and broken tail feathers. This can make for an unhappy hunter when his trophy is missing several tail feathers.

To find out more information or to read about less common wildlife diseases or parasites, the Southeastern Cooperative Wildlife Disease Study, based in Athens, Georgia, provides an excellent comprehensive field manual of wildlife diseases.



Corn piles such as this are susceptible to the *Aspergillus* fungus which produces aflatoxin. Aflatoxins have the potential to be detrimental to wild turkeys



Chapter Five

Predators

PREDATORS

PREDATOR IMPACTS ON TURKEYS

Turkeys are part of the larger ecosystem. They have evolved physiological adaptations such as coloration, acute eyesight, and keen hearing that aid them in avoiding predators. They have developed behavioral and reproductive strategies to minimize risk. Predators have also adapted and evolved. Neither predators nor prey have an overwhelming advantage. Predation of adult turkeys does not usually have a significant effect on the population.

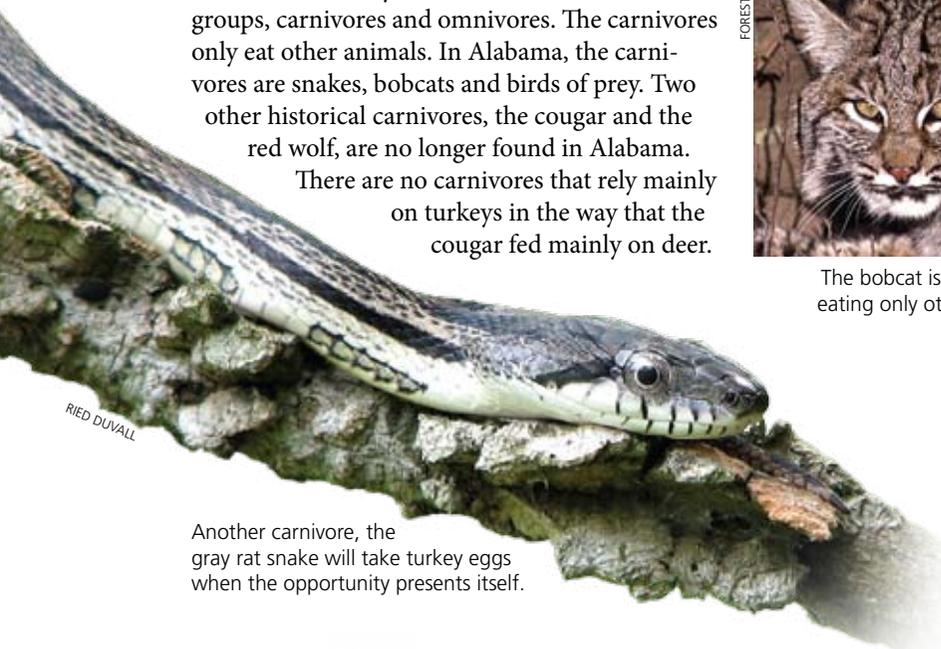
Predators of turkeys can be divided into two groups, carnivores and omnivores. The carnivores only eat other animals. In Alabama, the carnivores are snakes, bobcats and birds of prey. Two other historical carnivores, the cougar and the red wolf, are no longer found in Alabama.

There are no carnivores that rely mainly on turkeys in the way that the cougar fed mainly on deer.

FOREST IMAGES



The bobcat is a carnivore, eating only other animals.



RIED DUWALL

Another carnivore, the gray rat snake will take turkey eggs when the opportunity presents itself.

Omnivores are animals that eat a variety of foods. They will take eggs, plants, carrion or live animals. Omnivores found in Alabama include coyotes, foxes, rodents, crows, opossums, raccoons and skunks. Contrary to popular belief, coyotes are not major predators on turkeys. During West Virginia's 5-year Wild Turkey Survival Study, only one incidence of coyote predation was noted (West Virginia Division of Natural Resources 2003). Researchers from Mississippi State University (2000)



The raccoon is another omnivore that relishes turkey eggs.

found similar results. Bears, armadillos and wild hogs have also been known to disrupt nests. Omnivores are usually opportunistic: they eat whatever they can find or catch.

Three other turkey predators remain; the free-roaming or feral cat, the free-roaming or feral dog, and humans. A feral cat is a menace to songbirds but no threat to an adult turkey; however, they can prey on poults. Feral dogs are more of a problem because they can take bigger prey and typically range farther than cats. In one study, dogs accounted for 29 percent of known deaths in a group of 111 poults (Speake et al. 1985).

Adult gobblers are most impacted by human predation, or as we call it, hunting. During the fall and spring season, gobblers are the only turkeys that are legally harvested. Most hunters prefer to take an adult gobbler, although jakes are also legal. With the extirpation of the cougar and wolf, an adult gobbler's main predator is the human. However, legal hunting is not a limiting factor in turkey populations.

Young turkeys and hens are more vulnerable to non-human predators than the gobblers. A hen nests on the ground, and stays on the ground with her poults until they are old enough (about two weeks) to fly up and roost in a tree. This is the most dangerous time for hens and poults.

Roughly half of all nesting attempts end in failure, due to abandonment or predation. When nesting is successful, approximately half the poults are dead within two weeks of hatching. Predation accounts for much of this mortality. One Ala-



The gray fox sometimes preys on turkey nests.

bama study found that species causing the most nest predation were raccoons, followed by dogs, opossums, crows, snakes, skunks and gray foxes. Bobcats killed three incubating hens, but did not eat the eggs (Speake 1980).

The same study found that jakes were taken by golden eagles, bobcats, gray foxes and dogs. Another study by Speake and Metzler (1985) on two areas in North Alabama found that of 400 poults hatched, 279 died. Predators were thought to have killed 111. Of predators that could be identified, free ranging dogs were responsible for 32 fatalities, raccoons 14, bobcats and gray foxes 11 each. Broad-winged and red-tailed hawks took a total of 21 poults. A screech owl took one.

At first glance, these figures are alarming. It may seem that predation is a significant limiting factor on turkey populations and that controlling predators must be undertaken to increase turkey numbers. But, is this so?

PREDATOR CONTROL

Studies show that turkeys can withstand predation. Predator control is usually ineffective and cost prohibitive. It can also have unintended consequences, such as the authors' experience of working on an area where control of larger predators led to an explosion of cotton rats and rattlesnakes.

There are no predators that feed exclusively on turkeys. The predation of turkeys is usually opportunistic, in that the predator comes across a turkey and succeeds in catching and eating it. Predator control should therefore involve minimizing predator-prey contact.

By maintaining quality habitat—especially by providing adequate herbaceous cover during nesting season—the number of poults that survive can be increased (Metzler and Speake 1985).

Predator control may be effective in the short term where new populations have been introduced and predator numbers are high, and it can be done cost effectively. Legal trapping of fur-bearers, such as raccoon and fox should be encouraged. Feral dogs and cats should be removed when feasible, and pets should not be allowed to roam freely. Feral hogs should also be controlled, as they can disrupt turkey nesting. As hog populations increase and expand they may have more impact on turkeys than has historically been recognized.



Crows are considered avian predators on turkey eggs.



Chapter Six

Population Dynamics

POPULATION DYNAMICS

Population dynamics is the term biologists use to describe the changes in the size of a group of some organism, in this case wild turkeys. A population is a group in a defined area. All the turkeys in Alabama make up a population. So do all the turkeys in Baldwin County, or all the turkeys in the Bankhead National Forest.

A population's size depends on three factors:

1. **Reproduction:** the birth of new individuals.
2. **Mortality:** the death of members of the population, and
3. **Emigration and immigration:** the movement of individuals in or out of the population.

Populations fluctuate over time. Turkey numbers are highest in the fall and lowest in the spring.



REPRODUCTION

NESTING

In most years, nearly every hen will attempt to nest. If the first attempt is disrupted, some hens will try to renest. The renesting rate of Eastern wild turkeys varied from 32 percent to 66 percent in six studies (Vangilder 1992). In most cases, juvenile hens renest at a lower rate than adults do. A hen is also more likely to renest if the nest is lost during laying, and less likely if she has already begun incubation (Williams and Austin 1988).

HEN SUCCESS

The hen is considered successful if the eggs hatch. The hen success rate is calculated by adding first nest success and renest success rates. Roughly one-half of all nesting attempts fail. This also varies widely from year to year, depending on weather conditions and predation rates.

CLUTCH SIZE AND HATCHING SUCCESS

Clutch size is the number of eggs laid. Wild turkey hens lay an average of 11 eggs, usually one per day. Second nests often have fewer eggs. Egg fertility of wild turkeys is high. Most eggs are viable, and will hatch if given the opportunity (Vangilder 1992).



NATE

About half of all Eastern wild turkey nesting attempts are successful.



Poults are especially susceptible to prolonged periods of wet cold weather.

MORTALITY

NATURAL MORTALITY

Poult mortality averages 50 percent in the first two weeks of life (before they can fly up to roost). Speake et al. (1985) found that predation accounted for 82 percent of known causes of death on a study area in north Alabama. Exposure, starvation and flood induced drowning accounted for the rest.

Brood survival is heavily influenced by habitat structure (Metzler and Speake 1985). The poults need to be free to move and eat, but be out of sight of predators. As the poults get older, and especially after they can fly, survival increases.

HARVEST MORTALITY

As discussed in the section on predators, humans are now the major predator of adult gobblers. Humans impact adult gobblers most heavily because of the way hunting seasons are established. Also, adult gobblers do most of the gobbling, allowing hunters to locate them more easily. Turkeys are not monogamous. One dominant gobbler will naturally mate with many hens, so removing some gobblers but leaving hens will not negatively affect populations. A subset of harvest mortality is poaching, or illegally killing turkeys. Some studies have indicated that poaching is a major source of mortality in some parts of Alabama (Yarrow, and Yarrow 1999). Hunting legally and ethically and reporting poachers will help keep this impact to a minimum.



Hunting seasons are established to minimize harvest impact on the turkey population while maximizing hunting opportunities.



Chapter Seven

Population Management

POPULATION MANAGEMENT

RESTORATION HISTORY IN ALABAMA

EARLY EFFORTS

In the early 1940s, research directed towards restocking wild turkeys in the state was conducted in Clarke County at the Salt Springs Game Sanctuary (now the Fred T. Stimpson Wildlife Sanctuary). Since state wildlife agencies were just beginning an effort to restock populations, methods to achieve the desired results of repopulating wild turkeys throughout the state were unclear. Through trial and error, the Alabama Division of Wildlife and



Uncontrolled hunting and habitat destruction led to near extinction levels of wild turkeys nationwide by the early 1900s. By the early 1940s, Alabama began down the road to recovery through wild turkey restoration efforts statewide.

Freshwater Fisheries (WFF) first began restoration efforts by propagating wild turkeys that would be used for release on potential range. Wild turkeys were trapped on the Salt Springs Sanctuary, pinioned so they could not fly and placed in a specially designed pen facility on 80 acres. The idea was that poults, raised by hens on the site, would be released on unoccupied range. However, it was soon discovered that a high fence could not hold even pinioned birds. Trapping and relocating wild turkeys in each stocking attempt was the key to success. The road to Alabama's successful restoration efforts began in September of 1943 when eight wild turkeys were trapped at the Salt Springs Sanctuary and relocated to the Ted Joy Preserve in Jefferson County (Davis and Widder 1985).

Many states, including Alabama, experimented with pen-raising "domestic" wild turkeys, and like in all other states, "turkey farming" as a means of restoration was a complete failure. The pen-raised restocking project taught us that there are no shortcuts or quick fix approaches to wildlife restoration. Fortunately, this effort was discontinued and no long-term, widespread problems relating to diseases or parasites introduced from domestic to wild turkeys were discovered. To guard against the spread of diseases and parasites, a regulation is in place in Alabama prohibiting the release into the wild of any turkey (domestic or wild) that originated from outside the state or within the state.

TRAPPING METHODS

One of the first trapping techniques used was the pole trap that consisted of open-spaced small logs placed horizontally to form a box shape with some type of funnel design that served as a door for turkeys to enter. The top was left open

during pre-baiting and covered with netting during trapping attempts. Although not very effective, the pole trap could be set and left unattended and checked once each day.

The second turkey trap design developed was the net or drop-door trap. This trapping technique proved to be much more effective than the pole trap partly because the opening (door) provided a more natural setting due to a large (12 foot wide) entrance for turkeys to freely travel to and from the bait site. The sides and top were constructed using mesh wire or netting to form a box shape. The trap door consisted of mesh netting rolled up on a pole to the top of the opening and held in place by a simple trigger mechanism. A well-concealed trapper would pull the latch to trap turkeys on the bait.



One of the major disadvantages of both the pole and drop-door traps was their fixed positions. These designs were not portable, so the trapper could not easily move the traps as turkey foraging habits changed.

The third trapping technique developed and still in use by WFF personnel is the cannon net. The cannon net trap consists of a 30- by 60-foot nylon net (4-inch by 4-inch mesh) that is shot over turkeys feeding at a pre-baited site. The net is pulled



KEITH GAULDIN

This photo illustrates the preparation of cannon net equipment before trapping including one of three partially buried cannons, projectile, black powder charge, rain flap, and net.

ABOVE: Cannon net deployed over turkeys at bait site.

by three projectiles attached to the leading edge of the net and fired from three cannons loaded with black powder charges. When properly deployed, the net will spread over the turkeys at the bait site. This setup requires that an observer be positioned in a ground blind to set off the charges when turkeys are on bait at the optimum moment (all turkey heads down at the bait line). Following successful deployment of the net, the trapper and other assisting personnel remove turkeys from the net to collect data and place the turkeys in transport boxes if relocation to other areas is the objective.

The major advantage of the cannon net is portability, being able to move the trapping equipment as turkey movement patterns



TES RANDIE JOLLY

Wild turkey trapper Fred Pringle cradles adult gobbler removed from the cannon net after deployment at the Fred T. Stimpson Wildlife Sanctuary. Mr. Pringle was awarded the NWTf's prestigious Joe Kurz Wildlife Manager of the Year Award for 2002 recognizing his outstanding contributions to wild turkey restoration.

change. In addition, the cannon net setup offers complete concealment. The net, cannons and other components are completely camouflaged, which over the years has proven to be very effective in trapping the wary wild turkey.

Other portable trapping methods have been developed such as the rocket net and the rocket box. Both methods are similar to the cannon net in that each net is deployed by an explosive charge.

The rocket box is self-contained in a highly portable "box" for ease of setup and portability between multiple trap sites. However, the rocket net and rocket box do not have the complete concealment advantage as compared to the cannon net.

Tranquilizing drugs such as alpha-chloralose mixed with bait have also been used to immobilize wild turkeys as a trapping method. One of the advantages of drugs is that the turkeys are easily handled, reducing trapping stress and possible mortality. Some disadvantages include turkeys eating more of the treated bait than was allotted per bird expected at the bait site; turkeys flushing from the trap site prior to succumbing to the effects of the drug; and the necessity of holding the turkeys until the effects of the drug have disappeared, which may be as much as 24 to 48 hours.

TRANSPORTING AND RELEASING

In Alabama, specially designed wooden crates that fit in the bed of a pick-up truck, as well as waterproof cardboard turkey transport boxes provided by the National Wild Tur-

Wild turkeys trapped for restoration purposes are placed in transport boxes before shipping.



NWTf

key Federation (NWTF), are used in restoration efforts in-state. Biological data are collected from each captured wild turkey. Additionally, all turkeys are marked with at least a legband that identifies each individual. Following data collection, the turkeys are placed in transport boxes or crates in preparation for relocation. To reduce trapping stress to turkeys, the birds are usually transported to the release site the same day they are trapped. In the event that turkeys are trapped in the evening, transporting to the release site normally occurs the following morning. Turkeys trapped using drugs are held until they fully recover.

STOCKING NUMBERS

When wild turkey restoration efforts were initiated in the state in the early 1940s, there was no knowledge of how many hens and gobblers would constitute a successful stocking. Some of the early restocking efforts were very large; sometimes as many as 40 turkeys were trapped and released for restoration purposes. Restoration efforts early in the program were conducted on large tracts of suitable habitat, so dispersal of large releases was not a problem. Later in the program, it was discovered that smaller stockings (about 10 hens and five gobblers) were just as effective in repopulating an area as the larger stockings, required less effort, and were conducive to stocking more areas in a shorter time. Research conducted in Lee County found that the smaller stocking technique employed by the WFF was sound (Speake et al. 1969).



BILLY POPE

Many of the wild turkeys that have been released throughout Alabama were trapped at the Fred T. Stimpson Wildlife Sanctuary in Clarke County.

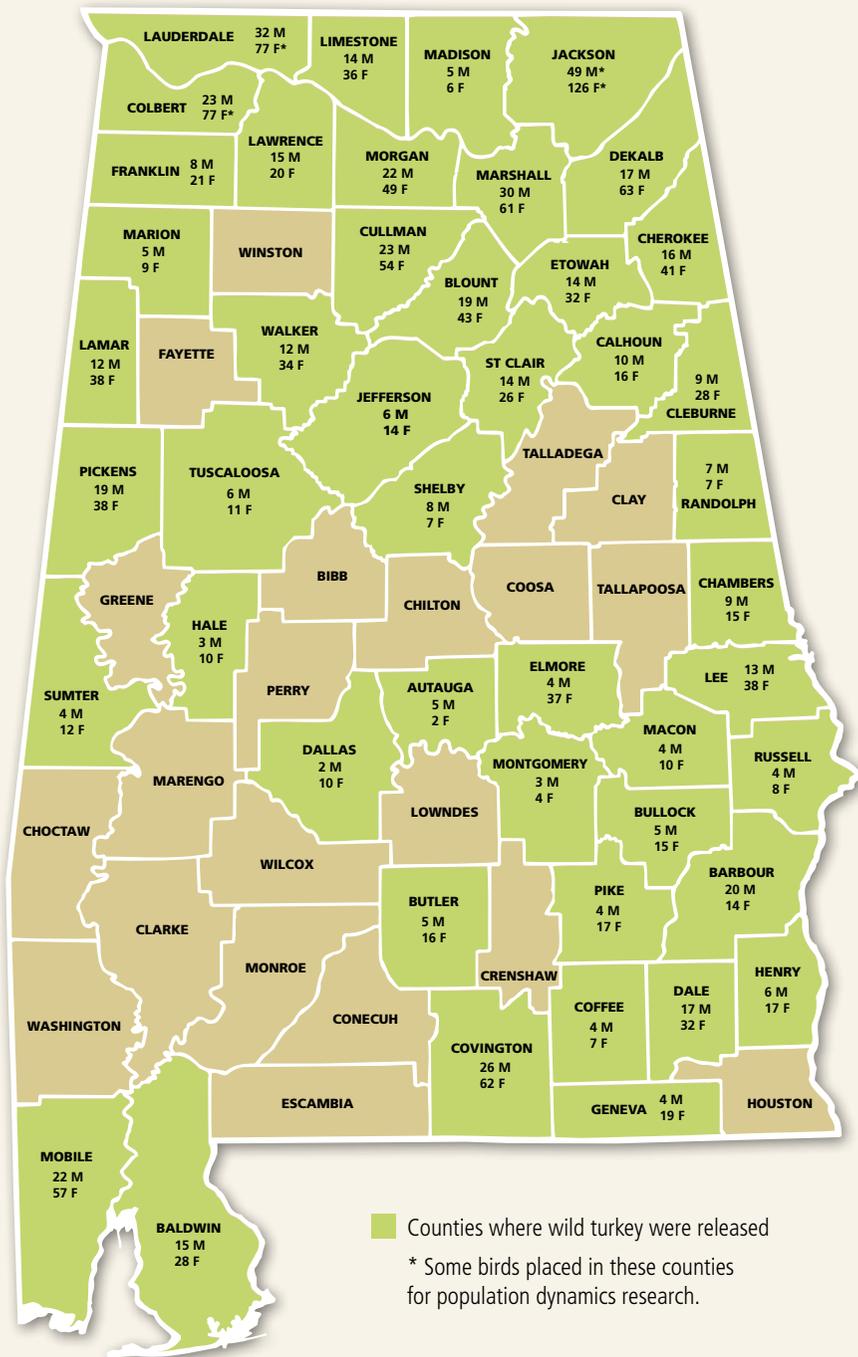
WILD TURKEY SOURCES AND RELEASES

Most of the wild turkeys that we enjoy in Alabama today originated from stockings of birds trapped from the Fred T. Stimpson and Upper State Wildlife Sanctuaries in Clarke County. These areas are owned by the WFF and were established for the primary purpose of restocking deer and turkeys into unoccupied range in the state. There were a few other sources of wild turkeys within the state, but those represent a very small percentage of total restoration efforts. Wild turkey releases did not occur in 21 Alabama counties. Most of these counties have had a history of good turkey habitat and consequently good turkey populations, so stocking was not necessary.

RESTOCKING RECORDS STATUS

Through February 2006, a total of 1,936 wild turkeys have been trapped at the Fred T. Stimpson and Upper State Wildlife Sanctuaries in Clarke County and restocked in 46 Alabama counties.

Wild Turkey Releases in Alabama through February 2006



ALABAMA POTENTIAL RANGE REQUIREMENTS

It is the desire of the WFF to establish wild turkeys on potential range. The remaining acreage of suitable, unoccupied habitat in Alabama is small. Landowners or hunters who believe there is potential range should contact WFF biological staff in order to determine if there is justification for a stocking attempt. Each request for restocking is handled on a case-by-case basis.

Contact must be made with the local WFF District Office to request an on-site inspection. Guideline parameters for restocking include size of the area, quality of the habitat, human population density, current and future land uses, habitat enhancement practices, and the potential to protect the turkey population until huntable numbers are produced. If the area meets all the site-specific parameters, application for restocking will be completed. Upon approval by the proper authority, the area will be put on the waiting list to receive turkeys. Few stockings are underway currently, since most of the suitable range in Alabama is already occupied by wild turkeys.

CURRENT POPULATION

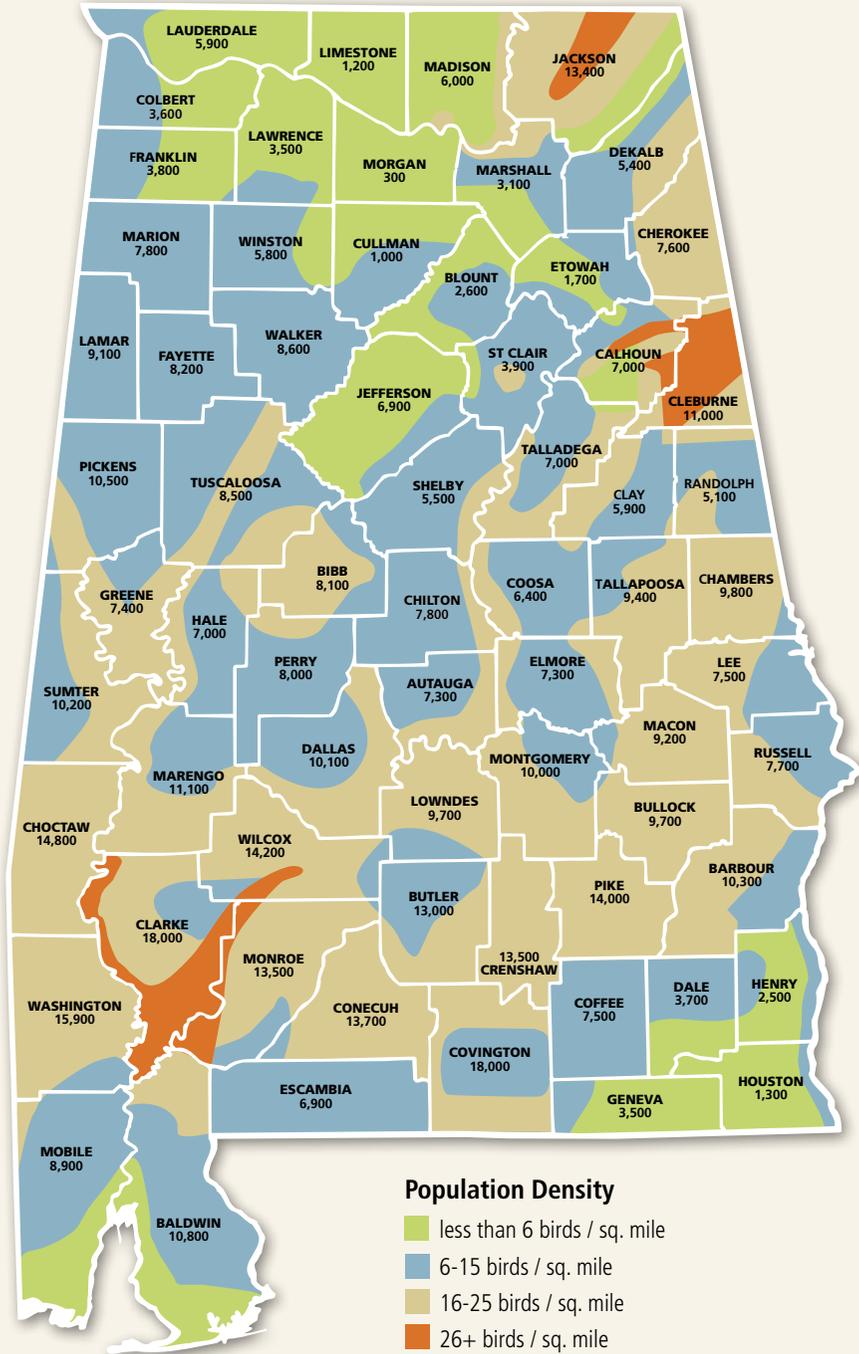
The estimated Eastern wild turkey population in Alabama is approximately 500,000 birds (2007). It must be emphasized that this number is only an estimate and is not based on a precise count. Wildlife biologists estimate turkey numbers in their regions based on various land classifications and their knowledge of habitat quality, brood rearing success, and other factors. The average number of turkeys per square mile is approximated at the county level. Wild turkey populations, like most wildlife populations, are cyclic and total numbers can vary greatly from year to year. Most of the year-to-year fluctuations are based on brood rearing success. This determines the number of new individuals that will enter the fall population. Several consecutive successful brood rearing seasons can dramatically increase the total population over time. The reverse is true in poor brood rearing years. In the “big picture” and at a landscape level, populations are driven by the quality of the habitat. The trend that we have experienced over time indicates the overall population of turkeys has grown throughout the state.



DENNIS HOLT

Many landowners and hunters are reporting increased numbers of wild turkeys on private and public lands in many regions of the state.

2005 Alabama Wild Turkey Population Density and Estimated Population by County



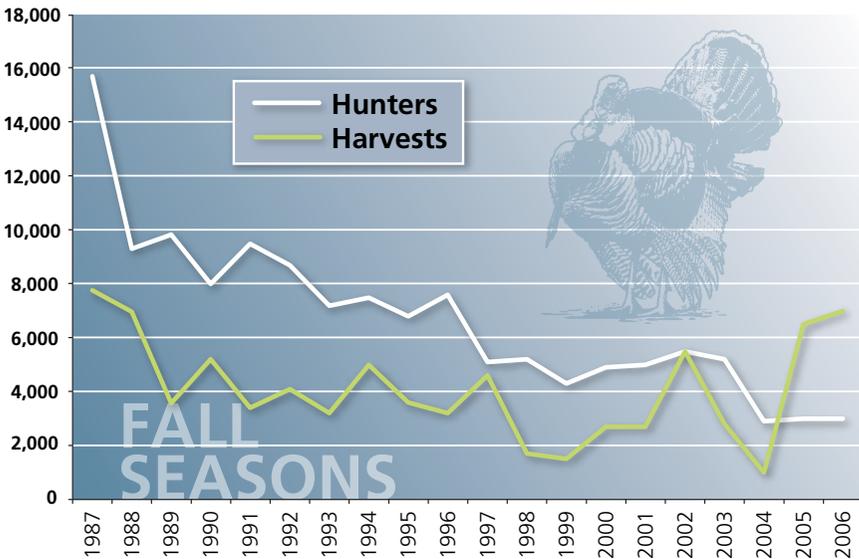
HARVEST STATISTICS

HUNTER MAIL SURVEY

At the present time, turkey harvest data is generated primarily by means of an annual statewide mail survey of a randomly selected sample of hunters. The information gathered in this questionnaire includes the number of hunters in the spring and fall seasons, harvest totals for spring and fall, hunter effort to harvest a gobbler, and the percentage of adult and juvenile gobblers in the harvest. A mail survey format, as a means of collecting harvest data, has been in place in Alabama since the early 1960s. The most valuable information gained from the mail survey is produced not by spotlighting any particular season, but by looking at the trend over time as expressed by hunter numbers and harvest totals. The WFF wildlife biologists use the harvest statistics generated by the mail survey along with research study results to make recommendations on season structures. These recommendations, coupled with tradition and hunter satisfaction, are used to best meet the needs of the public and the resource.

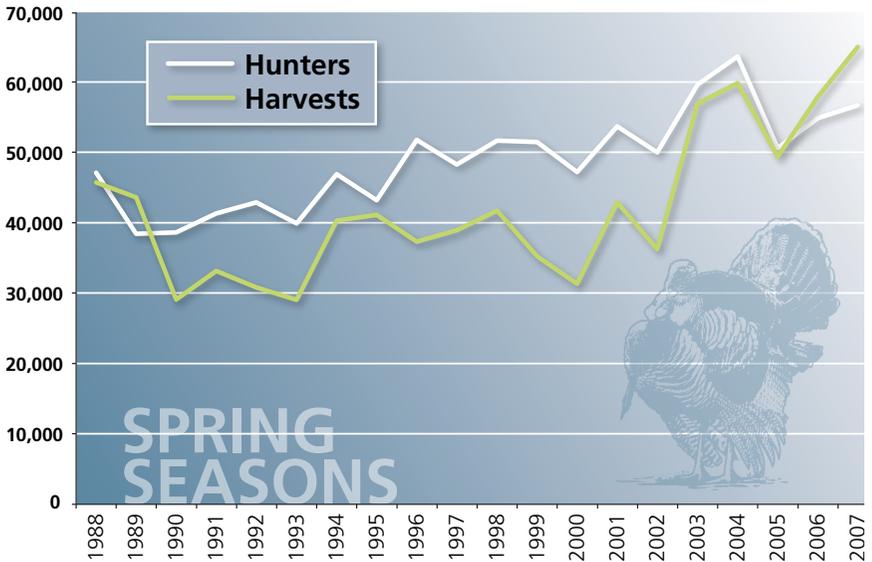


Alabama Wild Turkey Hunters and Harvests – Fall Seasons 1987-2006



This graph depicts the number of turkey hunters and harvests statewide in the fall season over a 20-year period based on the mail survey.

Alabama Wild Turkey Hunters and Harvests – Spring Seasons 1988-2007



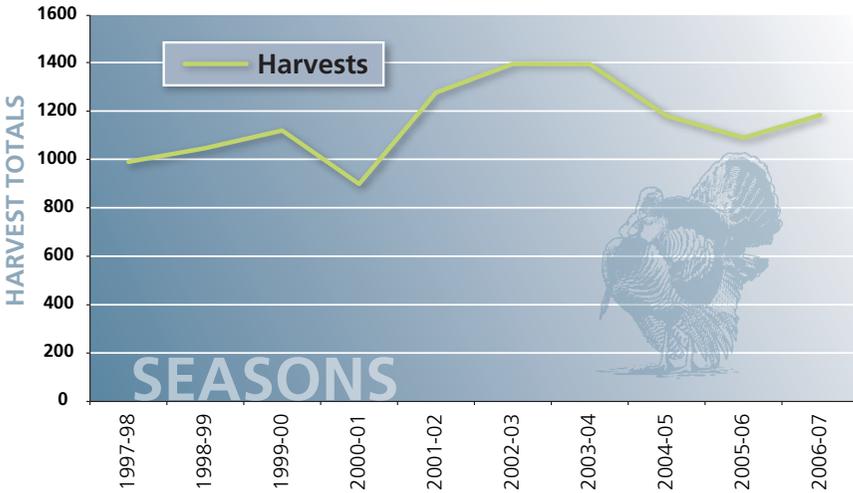
This graph depicts the number of hunters and harvests statewide in the spring season over a 20-year period based on the mail survey.

The latest mail survey results (2006-07 seasons) reveal that about 58,000 hunters (near 495,000 man-days) harvested about 72,000 gobblers annually in Alabama in the combined fall and spring seasons. The fall harvest accounts for approximately 10 percent of the total harvest. The total harvest is one of the highest reported for Eastern wild turkeys in the nation. Based on gobbler age structure information in the hunter questionnaire, the percentage of adult gobblers in the harvest is about 91 percent and the percentage of juveniles (jakes) is about 9 percent.

WILDLIFE MANAGEMENT AREAS

Turkey harvest statistics are generated annually for Wildlife Management Areas (WMAs) that have spring turkey seasons. Hunters are required to report turkey harvests at the check stations or by contacting the Area Wildlife Biologists. A statewide WMA season report is generated and reflects the harvest statistics for each season. This report provides data on the number of man-days hunted, the known legal harvest, the estimated legal harvest, and hunter effort measured in man-days per turkey harvested for all the WMAs. Similar to the mail survey, the information in this report is evaluated over several years (trend) in order to make season and harvest recommendations.

Alabama Wildlife Management Area Turkey Harvest 1997-98 to 2006-07



This graph reflects 10 years of spring harvest estimates on Wildlife Management Areas.

The most current (2006-07) spring season data for 29 WMAs indicate that close to 16,000 man-days were hunted resulting in an estimated harvest of nearly 1,200 gobblers. An average of about 13.8 man-days was required to harvest a turkey on all WMA hunts according to the latest report.

HUNTER EFFORT

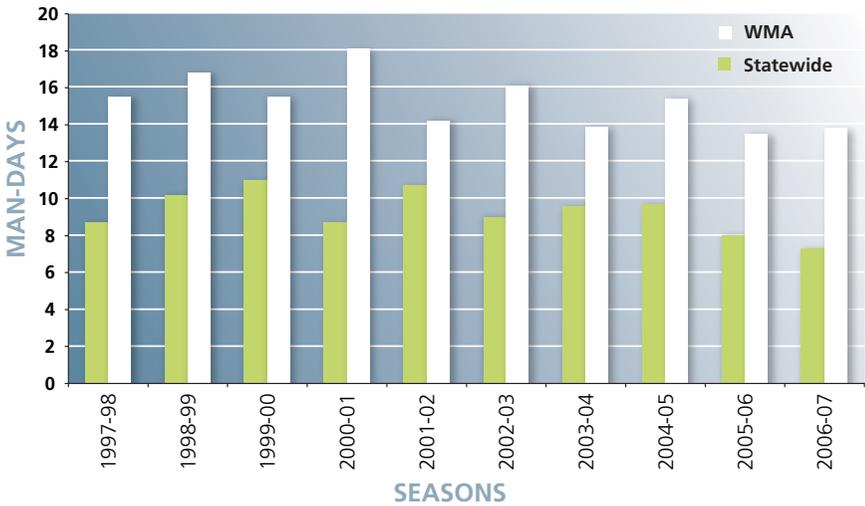
In both the statewide and WMA harvest reports, hunter effort is measured. By using the number of man-days hunted and the number of gobblers harvested, the average number of days required to harvest a turkey is calculated. This measurement may be somewhat indicative of turkey populations over time, assuming man-days are consistent over multiple seasons. For WMAs, knowledgeable hunters will check Areas that record the fewest number of man-days to harvest a gobbler in order to optimize their chances of success.

The most consistent part of the trend data when comparing the statewide statistics to the WMA statistics is that more man-days



Spring and limited fall hunting of wild turkeys are strong traditions and a significant part of the hunting heritage in Alabama.

Man-Days Per Turkey Harvested Statewide vs. WMA - Spring Seasons 1997-98 to 2006-07



Effort to harvest a gobbler measured in man-days compared between statewide and WMAs over a 10-year period.

are required to harvest a gobbler on public land versus private land. The latest information reflects an average of about 14 man-days to harvest a turkey on a WMA as compared to about eight man-days on private land. These data suggest that harvesting a gobbler on public land may be more difficult than private land, possibly due to hunting pressure.

SEASONS

REGULAR SEASONS

The spring season in Alabama during the months of March and April is one of the longest in the nation and coincides with peak gobbling and breeding activity. Fall hunting for gobblers is scheduled in a few counties with a historical fall hunting tradition. Interestingly, the first established legal turkey seasons in the nation were in the fall season only. Alabama was the first state to experiment with a spring turkey season in the 1950s, which, since implemented, has greatly surpassed the fall season in hunting popularity in the state.

SPECIALTY HUNTS

Recent outreach initiatives through the Alabama Department of Conservation and Natural Resources have enabled the establishment of special turkey hunting



Specialty turkey hunts for youths are powerful mentoring aides.

opportunities for youth and disabled individuals. Youths under the age of 16, accompanied by a properly licensed adult supervisor may participate in a spring turkey hunt on the Saturday and Sunday prior to the regular opening date statewide on private and open-permit land. Prior to the implementation of the statewide youth turkey hunts, many of the state operated WMAs already had youth turkey hunts in place and continue to do so. Also, the first Youth Turkey Hunting Area was established in 2004 and provides unique turkey hunting opportunities exclusively for youths throughout the spring season. In addition to the special youth hunts, individuals who are properly certified as physically disabled are eligible to take part in special turkey hunts one day prior to all opening days on private lands and during spring seasons on WMAs.

HUNTING QUALITY

PRIVATE LANDS

The vast majority of wild turkeys harvested in Alabama are taken on private land, which is not surprising since most of the wild turkey habitat land base is privately owned by individual or corporate landowners. Private landowners who manage habitat for wild turkeys and other wildlife experience the highest wild

The primary author's father, Carol F. Barnett, proudly displays a fine gobbler harvested on private land in north Alabama during a spring hunt.



turkey populations and some of the best hunting opportunities throughout the state. Many of these tracts are leased by hunting clubs that primarily target deer hunting and receive light to moderate turkey hunting pressure. However, with the recent surge of turkey hunting opportunities, many hunters have taken a keen interest in hunting wild turkeys as well as other game species on leased properties. The overall result has been an increasing number of turkey hunters and subsequent higher gobbler harvests statewide. As previously stated, the harvest of gobblers requires fewer man-days on private land than on public land according to hunting pressure data trends.

PUBLIC LANDS

Excellent turkey hunting opportunities exist on public lands throughout Alabama. These properties include United States Forest Service (USFS) lands (National Forests) and WMAs operated by the WFF. Other governmental and private corporate entities also offer public hunting for turkeys. The state-operated WMAs provide exceptional spring turkey hunting opportunities across the state. They generally receive more turkey hunting pressure than private lands based on hunting pressure data. Generally, the heaviest pressure in terms of man-days hunted occurs in the first two weeks of the spring season.

Hunting pressure tends to taper off afterwards. Most WMAs will provide hunters with a high quality hunting experience as pressure dwindles during the season. Turkey hunters who consistently harvest turkeys on public land are aware that turkeys on public land, when pressured, tend to act and react differently to hunting set-ups and calling intensity compared to private land turkeys. Consequently, being able to change hunting tactics and adapt to call-shy gobblers marks a successful hunter.

In terms of a quality spring hunting experience on private or public land, most turkey hunters will agree that hearing turkeys gobble and the challenge of the hunt are a better measure of the experience than the actual harvest.



MITCHELL MARKS

Biological data are recorded on harvested turkeys at Wildlife Management Areas such as this gobbler checked in at the Freedom Hills WMA. Turkey hunting is excellent on many Alabama WMAs.



Chapter Eight

Research and Surveys

RESEARCH AND SURVEYS

With a wild turkey population close to 500,000 and an annual harvest averaging about 62,500 gobblers (2002-03 to 2006-07), Alabamians are experiencing great opportunities to view and hunt these majestic birds across many diverse landscapes throughout the state. Over time, biologically sound research has played a vital role in guiding the population recovery and management applications in many regions of the state that had few or no wild turkeys present as recently as 1940. As restocking progressed from initial restoration efforts, the Alabama Division of Wildlife and Freshwater Fisheries (WFF) began to explore the reasons why some stockings into seemingly suitable wild turkey range were not as successful as other stockings into similar habitats.

The advent of radio telemetry greatly enhanced the ability of biologists to answer these questions. By radioing captured gobblers, hens, and poults, biologists were able to track the seasonal movements of wild turkeys through various habitat types. This research brought new insight of seasonal habitat needs at the microhabitat level. For example, a north Alabama study showed that wild turkey broods that were radio-marked a few days post hatch in suitable habitat would select specific grassy openings near the nest site to feed on insects (Metzler and Speake 1985). These investigations revealed that herbaceous vegetation of sufficient height was utilized by broods to conceal them from predators. The same type research applied in habitat without suitable brood range found that poults

Turkeys equipped with transmitters have enabled researchers to monitor activities such as habitat use and nesting ecology.



Game camera deployment during wild turkey production survey at the Conecuh National Forest.





Game camera photo of hens, poults, and gobblers during research project conducted at the Conecuh National Forest.

experienced increased mortality from predators, increased energy expenditures in traveling from nest site in search of openings, and increased risk of mortality due to environmental factors. In relation to the life cycle of the wild turkey, research data have given biologists the tools to make habitat recommendations to guide management from springtime nest to the adult turkey.

Future research in Alabama will focus more on population dynamics issues rather than habitat requirements that were addressed in earlier studies. With an increase in the wild turkey population and an associated increase in the number of hunters and harvest levels, biologists are beginning to look at the sustainability of the current harvest over time considering hunting quality and hunter satisfaction. In order to find answers to these questions, an accurate means of measuring productivity of juveniles into the fall population will be needed. In cooperation with the United States Geological Survey's (USGS) Fish and Wildlife Research Unit at Auburn University, standardized methods to measure productivity and other population dynamic factors are being tested. Grand et al. (2007) began testing a rigorous systematic survey design that measures recruitment of juveniles into the fall population using game cameras. Other potential studies linked to productivity may include research on quantifying gobbler harvest rates in the state.

The kind of data that future research yields will help guide the WFF in making recommendations relating to statewide seasons and bag limits. Hopefully, these investigations will ensure sustainable wild turkey populations and maintain high quality hunting opportunities.



Chapter Nine

Habitat Management

HABITAT MANAGEMENT

HABITAT REQUIREMENTS

Habitat requirements are the environmental factors an organism needs to live. In human terms, habitat requirements might be a house to live in, a safe neighborhood, a grocery store to shop for food, and good schools. A turkey needs a place to nest, a place they can raise their young safely and find food for them, and a place to stay in the fall and winter.

For many years, biologists thought that turkeys were birds of the deep wilderness. When turkeys began to be scientifically studied in the 1940s, the only places turkeys could be found were large forested tracts. At the first Wild Turkey Symposium in 1959, turkey habitat requirements were summarized as lots of timberland and little human disturbance (Shaw 1959).

By the late 1960s, though, evidence emerged that cast doubt on this theory. Great improvements in law enforcement and turkey capture and translocation allowed turkey numbers to increase. Turkeys expanded into agricultural areas where there was little tree cover. Based on these developments, a re-evaluation was needed.



CHRIS COOK

An unbroken stretch of forest, once thought to be the kind of habitat necessary for turkeys.

Below: Turkey flock feeding in an agricultural field.



Many studies were done on turkey habitat requirements during the 1970s. During the 1980s, computers began to be used to construct mathematical habitat models. Turkeys were one of the first wildlife species to be modeled this way. Interesting, but what does it mean for the average landowner interested in managing for turkeys?

Turkeys require two major components in their habitat: a combination of trees and grasses. They need trees for roosting at night, resting during the day, escape cover and food. Grasses provide food for adults, and most importantly, bugging areas for poults (Porter 1992). Turkeys do need space. Good quality habitat can support one bird per 20 to 30 acres or a flock for every 640 acres (Yarrow and Yarrow 1999). Habitat requirements can be further broken down by seasonal and reproductive needs.

NESTING HABITAT

Nesting habitat is important for turkey success. A hen needs a nest site that will keep her out of sight of predators while she is sitting on the ground. Turkeys like to nest in forested areas with an open overstory and a well-developed understory. Power line rights-of-way through forests are often preferred sites for nesting, as are other areas of herbaceous vegetation amid forests such as wildlife openings.

Nesting turkeys need cover that is at least 36 inches high (Porter 1992). Graduate research at Auburn University found that nesting sites were often in areas of transition from field to forest. They included fallow fields, utility rights-of-way, small forest clearings, and pine forests under periodic burning schedules (Peoples 1999).



CHRIS COOK

This is an edge area, ideal for nesting turkeys.



CHRIS COOK

A fallow field is an example of brood habitat.

BROOD-REARING HABITAT

Brood habitat has several important components. The environment must provide sufficient insects. It must allow for efficient foraging throughout the day. There must be cover high enough to hide the poults from predators, but the cover must also be low enough to allow the hen to see predators. Native herbaceous plants should be encouraged. Turf forming grasses such as Bermuda, bahia, fescue and orchard grass may restrict poult movements and do not generally make good brood rearing habitat. Bunch grasses that include Indiangrass, switchgrass and little bluestem are better choices.



L. GLASCOCK

**Little
bluestem**

Indiangrass

These native grasses, Indiangrass and little bluestem, should be encouraged or planted wherever possible. Native plants generally are better adapted to our climate and require less maintenance than non-natives.

JENNIFER ANDERSON

LITTLE BLUESTEM, INDIANGRASS
AND SWITCHGRASS ON PAGES
72 AND 73 COURTESY OF THE
USDA-NRCS PLANTS DATABASE



ROBERT H. MOHLERBROCK

Native grasses such as switchgrass provide excellent brood rearing habitat.

In Alabama, turkey hens using old fields were found to raise the most poults (Metzler and Speake 1985). The height of vegetation is another key factor. Vegetation heights of 12-28 inches are ideal (Songer 1987). Closed canopy pine plantations, when interspersed with agricultural fields and hardwood drains, can also provide suitable habitat for broods (Morgan et al. 2006).

FALL AND WINTER HABITAT

During the fall and winter, turkeys are looking for food and cover. During the fall, turkeys need plenty of food in order for the young to maintain their growth, and for both juveniles and adults to build fat stores for the winter months.

Mast is the primary fall food, and acorns are a preferred turkey food. When at all possible, oaks should be maintained in the habitat. A mixture of different oaks is preferable, as different species of oaks may bear heavily one year and not at all the next. White oak acorns mature in one growing season and red oaks in two. Diversity of species increases the chances that at least some oaks will bear in any given year.



Mast-producing hardwoods are an important habitat area for turkeys in the fall and winter.

White oak acorns mature in one growing season.

Other mast producers, such as beech, black gum, pecan, wild cherry, chinkapin, and dogwood provide essential food supplies, especially in years of acorn failure. When possible these trees should be retained as well.

In Alabama, protected winter roosting sites are not as important as they are further north. Winter roost sites are often on the upper third of a sloped hillside, putting the turkeys out of the wind, but allowing the cold air to drain down the hill underneath them. The major feature of any roost site is horizontal structure 30 to 100 feet above the ground (Porter 1999).



CHRIS EVANS

Chinkapin nuts can be an important mast producer, especially in years when acorn crops fail.

HABITAT ENHANCEMENT TECHNIQUES

Many management techniques are within the reach of the average landowner to maintain and improve turkey habitat. The first step is to evaluate what you already have. Aerial photographs and topographic maps are very useful in this regard. Also, check and see what features are present on adjoining lands. Turkeys do not recognize boundary lines, and will go wherever necessary food and cover are found. Once a preliminary habitat assessment is made, the planning process can begin. The following enhancement techniques may prove helpful for many Alabama landowners. A professional wildlife biologist can assist landowners with more detailed and customized management prescriptions as described in the Wild Turkey Management Guidelines section.

WILDLIFE OPENINGS

Wildlife openings, or “food plots” as they are commonly called, provide critical habitat for many wildlife species including the wild turkey. However, the term “food plot” is a misnomer. For turkeys, wildlife openings are year-round habitat components for cover and foraging. Openings can be planted with herbaceous forages or manipulated to encourage native plants important to turkeys.

Some of the first considerations before establishing wildlife openings are the number, location, size and shape. Generally, irregularly shaped openings of at least one acre in size should be distributed throughout



Pushing out a permanent wildlife opening using a bulldozer.

the property. Anywhere from 1 to 5 percent of the total land acreage in wildlife openings is generally recommended and areas with more openings often support larger turkey populations. In broad terms, it is reasonable to suggest that poorer habitat types require more openings and higher quality habitat types require less.

Successful wildlife openings begin with the soil, so conduct a soil test prior to planting. It will reveal the amount of lime and fertilizer needed for each opening. Properly limed and fertilized wildlife openings will provide maximum plant growth and nutritional quality. Fertilizer is not as effective when soil pH is low, so proper liming can make more nutrients available to your plantings. Soil test kits are available from the Natural Resource Conservation Service (NRCS) or the Alabama Cooperative Extension Service (ACES) and the soil analysis is inexpensive. Lime should be applied at least one month before planting to allow the soil time to reach the optimum pH level. It may take up to a year to raise the pH level in some soil types.

Another significant ingredient for a successful planting is a thoroughly prepared seedbed. This is especially important for planting some of the small seeded varieties such as clover. Seedbeds that are smooth and clod free will enhance germination through seed to soil contact. Like most commercially available wildlife seeds today, the choices for turkeys are numerous. Although there are others listed in the appendices, three forages are highlighted that have been tried and proven in Alabama for wildlife openings specific to turkeys, namely clover, chufa and millet. Most clovers are cool season forages



Cool season planting of various clover types in mixes is highly recommended. This photo illustrates that as crimson clover (red flowers) food production decreases in May, food production of Osceola ladino clover (white flowers) increases, providing high protein forages throughout the warm season.



KEVIN MCKINSTRY

Clover must be inoculated prior to planting for maximum efficiency in fixing nitrogen. The inoculant must be specific to the variety of clover planted.

with regard to planting season, but provide wildlife with the highest nutritional potential in the spring and summer months. Clovers are legumes that take nitrogen from the air and incorporate it into the soil. The overall result is more nutritious forage.

A necessary but often overlooked requirement for planting clover is seed inoculation. Inoculants enhance the clover's nitrogen-fixing ability and must be specific to the type of clover planted. Some clovers can be purchased preinoculated but there will be less seed per pound for this convenience. The small seeds of clover require a shallow planting depth. Use a broadcast spreader or drill designed for small seeds. Top sowing across a soft, freshly harrowed seedbed is also acceptable and cultipacking usually improves germination. With reseeding clovers such as crimson and red, productive stands can be achieved by mowing, fertilizing, or lightly harrowing in late summer without replanting. Ladino is a perennial that should not require annual harrowing.



Chufa planted in a roadbed at an Alabama WMA.

There is not a supplemental forage more closely associated to wildlife than chufa is to turkeys. Chufa is a sedge that produces tubers that are relished by turkeys. In addition to or in the absence of acorns, chufa provides excellent nutrition in the fall through early spring. It is a warm

The chufa tubers. This underground tuber is highly favored by turkeys.



DAVE NELSON

season forage best suited to sandy to loamy soils on upland sites. Chufa can be planted as early as May and turkey flocks will be digging up the tubers by October. The seed is rather large and should be planted by broadcasting or using a drill and harrowed several inches deep. Although chufa does best on a “new” site, one that has not been planted in chufa before, harrowing and fertilizing chufa as new plants begin to emerge in the spring in subsequent years can produce good volunteer stands. Youngblood (1999) found that disking year-old chufa plots three times in the spring and early summer can produce an excellent volunteer stand.



Proso and browntop millet mixes can be planted in roads and wildlife openings to enhance brood range.

Millets like brown-top and proso have the potential to improve brood-rearing habitat for turkeys. A very effective use of millet is planting linear wildlife openings such as old roads. Hens will take poults to grassy openings to feed on protein-rich insects and, as the poults grow, they will also eat the seeds. Millet grows to a height that provides the brood cover from predators. It is another warm-season forage planted in the spring and should be harrowed lightly in a smooth seedbed.

Mowing, harrowing, and fertilizing native forages, such as beggarweed, blackberry, and deertongue can also be incorporated into a management plan to provide diversity and reduce planting costs.

BROOD HABITAT

A common limiting factor for wild turkey populations is brood habitat. Poults survival will increase when ample insect producing areas are available in openings, roads, and forest settings. The less distance a hen must take her brood to reach bugging areas, the fewer poults she will lose. These production areas serve a twofold purpose by providing food and cover for the hens and poults. Fewer poult losses due to predators will occur when brood habitat is sufficient. Herbaceous openings should be dispersed throughout the landscape. While 1 to 5 percent of the habitat in maintained openings such as fallow fields is a minimum suggestion, 3 to 10 percent has been cited as a more intensive strategy for managing turkeys (Yarrow and Yarrow 1999).

Before creating new openings, see what may already be available for conversion into wildlife openings. Daylighting roads (clear cutting along both sides of a road for 30 to 50 feet) and closing them to vehicles during the brood-rearing season offers an excellent opportunity for planting with grasses and legumes. These areas can be especially important in areas of high density pine plantations. The meandering effect of most roads provides prime brood-rearing areas. Utility company rights-of-way are also good areas to manage for broods.

PRESCRIBED FIRE

One of the most cost effective methods of improving forestlands for turkeys is controlled burning.

DAVE NELSON



Cutting in lime with a tractor to improve soil pH in a linear opening (road).



Meandering roads are excellent areas to manage for broods. This millet is just the right height to shield poults while allowing the hen a clear line of sight.

CHRIS COOK



Browntop millet planted in a power line right-of-way.



NWTF

A prescribed burn performed to improve habitat.

When properly planned and executed, prescribed fire can promote more native forage plants and create more brood habitat for turkeys than other habitat enhancement techniques. Many native plant species important to turkeys such as grasses and legumes have evolved with fire and respond well to it. Burning rotations vary depending on the site but average about three years for turkey management. Miller and Conner (2007) recommend fire return intervals of three to seven years in intensively managed pine plantations. Fire can be a renewing force to improve wildlife habitats when properly applied. Prescribed fire applied to create a patchwork of burned and unburned areas stimulates productive new plant growth while retaining adequate cover for wildlife. Fire has played an important role in influencing the development of some ecosystems and associated wildlife.

The most difficult part of burning is finding the optimum conditions, including humidity, wind speed, wind direction, and burn index. Some areas may not lend themselves to controlled burning. The purpose of a control burn determines when to burn. Winter burns are best for stimulating herbaceous growth, but growing season burns may be needed for dense brush control. Growing season burns may destroy some turkey nests; however, the long-term benefits to the habitat usually outweigh these losses.

Unless the land manager is certified in the use of prescribed fire, the expertise of the Alabama Forestry Commission or a private contractor is recommended.

SELECTIVE HERBICIDES

Selective herbicides that are more environmentally friendly are becoming increasingly popular for habitat management. Products with the active ingredient imazapyr have proven effective in controlling hardwood brush without affecting legumes. Proper herbicide use can also



CHRIS EVANS, BUGWOOD.ORG

Cogongrass must be controlled with repeated applications of imazapyr and/or glyphosate based products. If left untreated, cogongrass will spread and wildlife habitat will be lost. It has been called the worst invasive weed in the world.

enhance the capacity of seed-bearing plants to produce heavier and more nutritious seeds in the absence of competing brush. In treated areas, flowering plants will thrive and attract insects, which in turn attract poults. One application of some chemicals may remain active in the soil up to 10 years, making herbicide use cost effective. However, unlike prescribed fire, herbicides do not reduce the amount of dead wood nor recycle nutrients in the soil. Remember to follow the label instructions and be aware of the requirements for using certain herbicides.

Invasive herbaceous species, such as cogongrass, will likely require repeated applications of imazapyr and/or glyphosate based products for effective control. Cogongrass must be controlled, or wildlife habitat will be lost. Cogongrass has been called the worst invasive weed in the world, and it forms the most exclusive stands of any invasive weed. Cogongrass spreads over thousands of acres each year, and is shade tolerant, giving it the ability to multiply into interior forests. It has also been reported to suppress the growth of competing vegetation (allelopathy). Like our native pine ecosystems, cogongrass is fire adapted. But cogongrass fires burn up to 20 percent hotter than natural fires in pine ecosystems. This restricts natural succession, and favors cogongrass reproduction. (Loewenstein and Miller 2007). Cogongrass has no place in turkey habitat or any other wildlife landscapes.

DISKING AND MOWING

Disking, mowing, and roll drum chopping are also effective treatment methods but are not as cost effective as controlled burning or herbicides. A combination of disking, mowing, and roll drum chopping, along with controlled burning and/or herbicides, will improve the natural habitat for turkeys. Another enhancement method already discussed is disking to rejuvenate chufa plots. Also, strip disking in fields and along roads can encourage native grasses



CHRIS COOK

Drum chopping can facilitate clearing areas too thick for turkeys to utilize.

and forbs important to turkeys. These management prescriptions may reduce costs associated with planting wildlife openings.

TIMBER MANAGEMENT

Approximately two-thirds of Alabama is covered by some type of forest. These forests provide most of the habitat available for the state's wildlife resources. The composition and condition of these forests have a major influence on the quality of wildlife habitats and the wildlife species that occur.

In the natural process of plant succession, one type of habitat replaces another over time. Early successional habitats are characterized by plants that are prolific in growth. Weeds, grasses, vines, and shrubs rapidly occupy bare ground that is exposed to the sun. These plants grow profusely and produce tremendous amounts of seeds, fruits, forage and cover for wild turkey and other wildlife. Without the occurrence of natural disturbance (high winds, wildfire or floods) or active management (harvesting, thinning or prescribed burning) early successional habitats are relatively short-lived. If undisturbed, trees soon take over, and a site returns to forest. When mature, the forest ecosystem is very stable, but not very productive. Most of its energy is used just maintaining itself. Wildlife productivity is relatively low. Diverse habitats characterized by various ages and types of forest are most productive for wild turkey and many other wildlife species.

Woodland stands managed with periodic fire and timber harvest promote good habitat.





Bottomland hardwoods are important for their mast production and serve as travel corridors between different habitat types used by turkeys.

Almost half of Alabama's forests are hardwood types such as oak, hickory and gum. Although hardwoods are abundant, all of this forest type is not high quality turkey habitat. Over the years, some of the best trees for timber and wildlife have been removed. Because of the mast they produce, the most valuable hardwoods for wildlife are oaks. When forests are managed with periodic thinning and other practices that favor oaks, mast production and future oak regeneration are enhanced.

Mast producing hardwoods are important to wildlife, but only provide part of the habitat requirements needed by wild turkey and other wildlife. Wild turkeys, for example, feed heavily on acorns in the fall and winter but need succulent sprouts, herbaceous forages, fruits and ripened seed heads of grasses and weeds in other seasons. These foods are deficient in mature hardwood forests because of shading by the canopy, but are abundant in clearcuts and young forests. Well distributed clearcuts create early successional habitats that provide an abundance of seeds, fruits, forage and cover for turkey and other wildlife. However, some important mast producing trees should be retained during timber harvest operations including clearcut prescriptions, when possible.



Timber harvest plans should consider retaining trees such as these oaks for acorn production that is important to turkeys and other wildlife.

Forests are dynamic ecosystems that are in a constant state of change and in need of management. Plant succession follows a natural process. In forests that are not managed, the usual progression is toward a very stable forest that is made up of shade tolerant species that have limited uses for wild turkeys. The oak component in hardwood stands needs to be managed at regular intervals to ensure consistent growth, density, and mast production capability in the forest.

Pine forests make up more than one-third of the state's timberland. Managed pine forests can provide excellent wildlife habitat and allow for more wildlife management opportunities than hardwood forests. Periodic thinning of pines improves growing conditions for the trees that remain and contributes to forest health. Opening the forest canopy permits more sunlight to reach the forest floor. This stimulates lush new growth of a variety of plants that many wild animals, including turkeys use for food and cover.



Timber stands such as pine plantations that are not thinned or controlled burned shade out most herbaceous plants and result in poor habitat.

Timber stand improvement should begin early in regenerated stands with the use of release cutting. Release cutting and release covers all operations designed to regulate the species composition and/or improve the growth and survival of very young stands. During the release treatment, undesirable species are removed from the stand through mechanical and/or chemical methods. Examples of this treatment would include the removal of red maple stems with a machete and the subsequent application of an approved herbicide to the red maple stump. Release cuttings are usually limited to stands that are not past the sapling stage.

Improvement cuttings are nonregenerative cuttings in stands older than sapling age. Improvement cuttings are usually prescribed in stands that have not been managed and are quite similar to thinnings. *Thinnings* are partial cuttings in even-aged aggregations of trees. *Thinnings* are used to improve future growth, protect forest health, and promote mast production by regulating stand density.

Restoration of longleaf pine ecosystems should always be encouraged where at all feasible. Longleaf pine forests were dominant across the southeastern coastal plain before European settlement. They were a result of natural fire events and the use of fire by native cultures. The frequency and intensity of fire sustained an open canopy forest with a diverse groundcover of native grasses, wildflowers, and shrubs. Wildlife, including wild turkeys, was abundant and thriving in this system. Current conservation efforts to restore fire-dependent ecosystems such as longleaf pine have the potential to increase suitable habitat for a number of wildlife species.

Just remember that this is an ongoing commitment. Longleaf pine ecosystems and other timber management regimes with open stands will promote good brood rearing and foraging habitats if managed properly. However, if left unchecked, a thick understory may develop that can restrict turkey movements. The use of controlled burning or herbicides to keep woody and herbaceous undergrowth suppressed is vital to the maintenance of these stands.



Longleaf pine ecosystem on the Coosa Wildlife Management Area.

Planting hard and soft mast tree seedlings has the potential to improve food production and habitat diversity.



TREE PLANTING

In areas where oaks and other important wildlife trees are limited, planting these species is a good alternative. With the use of a tree planter or dibble bar, nut and fruit trees can be planted in areas with sufficient sunlight and clear of brush. Field edges, roadsides, fencerows, windrows and wildlife openings provide excellent sites. Plant a variety (remember the word diversity) of oaks and fruit trees. This ensures some food production even if one or more types of trees fail in poor mast years. Trees to consider for turkeys and other wildlife species include dogwood, chinkapin, hawthorn, persimmon, plum, and a variety of oaks, both red and white. Provide a mix of short- and long-term mast producers. For example, a gobbler sawtooth oak may produce acorns as early as five years but a white oak may take 20 plus years. A good rule of thumb to improve seedling survival is to purchase the largest and most vigorous nursery stock possible, use tree shelters, and limit competition around the seedlings.

PROTECTION

Without protection through state seasons, bag limits and enforcement efforts, habitat management practices to increase turkey populations would be of little value. Effective law enforcement has been one of the key elements in the return of the wild turkey. Poachers who break the laws and regulations steal from lawful hunters and should be reported. Programs such as the Alabama Wildlife Federation funded Game Watch number to report poachers help deter poaching. The Alabama Chapter of the National Wild Turkey Federation provides a reward for information leading to the arrest and conviction of persons illegally killing a wild turkey.



The Alabama Chapter of the National Wild Turkey Federation offers monetary rewards for information leading to the arrest and conviction of turkey poachers.

Landowners should mark boundary lines and erect gates to deter unwanted disturbance and poaching. Avoid planting wildlife openings along boundary lines or within view of public roads where turkeys may be easily seen. Limiting vehicle access during the brood-rearing season will reduce disturbance to turkeys. Also, walk-in use areas should be encouraged to promote a quality hunting experience by limiting interference to hunters and turkeys.

Other ways to protect turkeys have already been mentioned in other sections of this book. Don't expose turkeys to domestic poultry diseases by releasing game farm birds or releasing any other purported wild turkey stock in Alabama. It is illegal. Don't spread disease or aflatoxin poisoning with feeding stations to attract turkeys.



Chapter Ten

Wild Turkey Management Guidelines for Landowners

WILD TURKEY MANAGEMENT GUIDELINES FOR LANDOWNERS

HABITAT AND HARVEST STRATEGY

LANDOWNER ASSISTANCE CONTACTS

The Wildlife Section of the Alabama Division of Wildlife and Freshwater Fisheries (WFF) fields a staff of professional wildlife biologists in all six WFF Districts in the state who can assist landowners in developing wild turkey management plans. After contacting the district office in the region of the state where your property is located, a wildlife biologist will be available to answer questions regarding wild turkeys. Upon request, an on-site visit to the property may be conducted to provide recommendations that address habitat improvements and harvest structures. The details of a wild turkey management plan are tailored to fit the needs and objectives of the landowner. Some landowners may only desire generalized written guidelines while others require comprehensive management plans. These may include site-specific recommendations for various components of the property and layered maps that identify habitat types and site recommendations.



See page 93 to find the contact for your district office.



JAKE BARRETT

A wildlife biologist can provide an on-site visit for a landowner to offer habitat recommendations.

A wildlife biologist will be better equipped to make meaningful and beneficial recommendations through an on-site visit. Follow-up visits may be needed as recommendations are implemented or if management objectives change.

The National Wild Turkey Federation (NWTf), a conservation organization, offers many avenues for the private landowner regarding habitat management assistance through various publications and outreach programs. The NWTf staff includes regional biologists that may assist state wildlife biologists in developing management plans and incorporating programs available to landowners. WFF staffs wildlife biologists who serve on the NWTf Technical Committee, functioning as liaisons between WFF and the NWTf. This partnership significantly enhances WFF's capacity to develop and implement various habitat programs on public and private lands.

At the local level, the Alabama Chapter of the NWTf has supported and assisted with the funding of numerous projects. They have been the major conservation organization partner in the state for wild turkey projects, contributing substantial grants for habitat enhancement and land acquisition since 1985.

HARVEST STRUCTURE

The thrill of hearing and pursuing adult gobbling turkeys in the spring has been reflected in the mail survey results. According to the latest figures (2006-07), about 91 percent of the gobbler harvest was adult birds. It must be noted however, that every population of turkeys is going to experience mortality that is not related to hunting, such as predation. Although most of these losses occur within a few weeks post hatch, some juveniles between 1 and 2 years old succumb to natural mortality. This means that not every jake passed over will survive to the next spring as a gobbling adult. By balancing this knowledge with the desire to introduce newcomers such as children and other novice to turkey

KIM NIX



The Alabama Chapter of the National Wild Turkey Federation has partnered with the Alabama Division of Wildlife and Freshwater Fisheries to support and fund public land purchases across the state.



The harvest of jakes provides a great opportunity for encouraging youth and other novice turkey hunters.

hunting, landowners can establish harvest regimes that allow harvests of jakes without adversely affecting the population composition.

For instance, on an annual basis, a landowner with good quality habitat may have a high population of close to 20 birds per square mile (640 acres). A general assumption can be made that much of this number correlates to good recruitment of juveniles into the fall population. If brood sex ratios were near a 50-50 ratio and survival was good by spring, then a gobbler composition of jakes and adults may be about 10 birds per square mile. Following this hypothesis and a conservative spring harvest rate of 30 percent, at least three gobblers could be harvested per 640 acres regardless of age class. Wildlife biologists can assist landowners with gobbler harvest strategies specific to their objectives considering the turkey population and habitat quality for each property.

Most veteran turkey hunters would agree that the gobble of an adult male and the challenge of hunting mature gobbling birds is a primary goal of managing habitat and populations for hunting purposes. Although a male-only harvest structure of turkeys usually does not affect the overall population, intense hunting pressure and over-harvest of adult males may affect the gobbler age composition and the hunting quality. Depending on the habitat quality, the turkey population in the area, the size of the tract, and the number of turkey hunters, landowners may need to implement bag limits that are more restrictive than the state bag limit. Considering these factors may assist to achieve hunting expectations and quality. This harvest strategy is somewhat comparable to quality deer management in terms of voluntary, selective, and conservative harvests of males in order to favor older age class gobblers in the population.

DATA COLLECTION

HARVEST DATA

Without collecting accurate harvest data, the private landowner will have no idea of the physical condition, food habits, population trends, and age class structures of wild turkeys. Although not as clearly defined as deer harvest data (age and physical condition), information gathered from harvested gobblers can greatly impact management decisions.

Each gobbler should be weighed using accurate scales. As a check, periodically place a known weight on the scales to confirm their accuracy. Weights of juvenile and adult gob-



MITCHELL MARKS

Hunters should keep accurate data collected from harvested turkeys including weights, beard lengths, and spur lengths.



Hunters should keep accurate data collected from harvested turkeys including weights, beard lengths, and spur lengths.



blers do vary from year to year and while the fluctuations in weights may be more subtle as compared to deer, they do relate to physical condition. Anecdotal information from some of Alabama's Wildlife Management Areas suggest that gobbler weights may vary from spring season to spring season based on the availability of mast (acorns, etc.) and other high quality forages.

The age of gobblers can be estimated with a moderate degree of accuracy by measuring the length of beards and spurs with a ruler. The most reliable distinction using beard and spur length is between jakes and adult gobblers. For management applications, this is all that is needed. Generally, the beards of Eastern wild turkey jakes are less than 6 inches, while adult beards are usually over 6 inches in length. Likewise, the spurs of jakes are usually less than 1/2 inch while adult spurs are typically over 1/2 inch in length. The accuracy of using beard and spur length decreases as gobblers age due to varying growth rates of beards and spurs over time among gobblers. These differences are linked to nutritional, genetic, and environmental factors. However, it is acceptable among turkey hunters, in terms of bragging rights, to estimate the age of old gobblers based on spur and beard lengths in the absence of a foolproof biological aging technique.

The crop is one of the first digestive tract organs of a wild turkey. By examining, identifying, and separating plant and animal food items in the crop of a harvested turkey, a manager can determine forage preferences and availability.



Above: By examining the crop, hunters and land managers can determine foraging habits of gobblers. The food items in this crop included yellow jessamine flowers, honeysuckle leaves, and Boott's sedge (*Carex picta*) seed heads.



Left: This gobbler had been foraging in a crimson clover wildlife opening prior to harvest as evidenced by its stuffed crop. Clovers are highly preferred by wild turkeys and other wildlife.

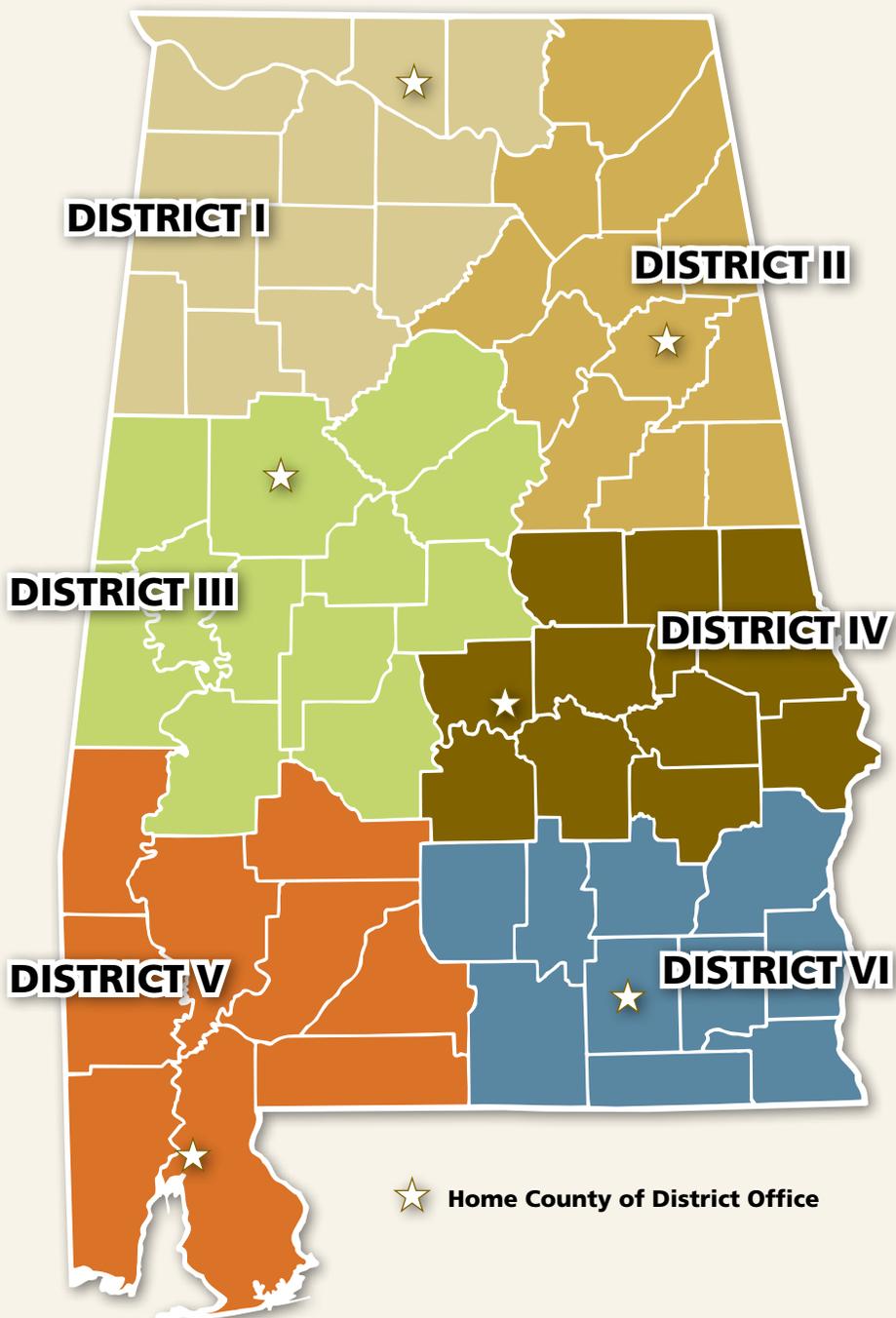
KEITH GAULDIN

This information can guide habitat management practices for the landowner as well as provide the hunter with insight on habitat and forage preferences to aid hunting strategies.

A gobbler harvest data sheet maintained each hunting season should identify date of harvest, weight, spur lengths, beard length, crop contents and physical condition comments (fat deposits, parasites, degree of wear on wing tips, etc.). Other statistics such as location harvested and time harvested may be helpful.

The importance of harvest data collection will not be apparent during any one season, but will become evident over a longer period. Harvest structure regimes can be developed using harvest data trends over multiple seasons that can be effective in managing turkey populations.

Alabama Division of Wildlife and Freshwater Fisheries District Map



District Contact Information



DISTRICT I

Colbert, Cullman, Fayette,
Franklin, Lamar, Lauderdale,
Lawrence, Limestone,
Madison, Marion, Morgan,
Walker, Winston

21453 Harris Station Rd.
Tanner, AL 35671
(256) 353-2634 or email:
dcsr.d1wff@dcsr.alabama.gov



DISTRICT II

Blount, Calhoun, Cherokee,
Clay, Cleburne, DeKalb, Etowah,
Jackson, Marshall, Randolph,
St. Clair, Talladega

4101 Hwy. 21 North
Jacksonville, AL 36265
(256) 435-5422 or email:
dcsr.d2wff@dcsr.alabama.gov



DISTRICT III

Bibb, Chilton, Dallas, Greene,
Hale, Jefferson, Marengo,
Perry, Pickens, Shelby,
Sumter, Tuscaloosa

8211 McFarland Blvd.
P.O. Box 305
Northport, AL 35476
(205) 339-5716 or email:
dcsr.d3wff@dcsr.alabama.gov



DISTRICT IV

Autauga, Bullock, Chambers,
Coosa, Elmore, Lee, Lowndes,
Macon, Montgomery,
Russell, Tallapoosa

1820C Glenwood Dr.
Prattville, AL 36066
(334) 358-0035 or email:
dcsr.d4wff@dcsr.alabama.gov



DISTRICT V

Baldwin, Choctaw, Clarke,
Conecuh, Escambia, Mobile,
Monroe, Washington, Wilcox

30571 Five Rivers Blvd.
Spanish Fort, AL 36526
(251) 626-5474 or email:
dcsr.d5wff@dcsr.alabama.gov



DISTRICT VI

Barbour, Butler, Coffee, Covington,
Crenshaw, Dale, Geneva,
Henry, Houston, Pike

3520 Plaza Dr.
Enterprise, AL 36331
(334) 347-1298 or email:
dcsr.d6wff@dcsr.alabama.gov

Report game law violations by calling
1-800-272-GAME

Summary

The vast majority of land comprising wild turkey habitat in Alabama is privately owned. This fact is not likely to change in the future. What can and will change is how well wildlife populations adapt to ever-changing land uses. The future of wild turkey populations and habitats will greatly depend on management decisions of private and corporate landowners, land managers and hunting clubs. With assistance and guidance from professional wildlife biologists, conservation organizations, and other partners, conservation minded landowners can continue to maintain and improve habitat for wild turkeys and other wildlife. We are now enjoying the fruits of the early conservation movement visionaries in Alabama who led the charge to bring the wild turkey back from the brink of extinction. We must do no less for future generations.



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ALABAMA HUNTING SURVEY ESTIMATES TURKEY - SPRING SEASONS

Year	Hunters	Man-Days	Average Man-Days	Harvest	Man-Days Per Harvest	Harvest Per Hunter
1972	23,594	125,805	5.3	10,615	11.9	0.4
1973	25,273	157,809	6.2	12,675	12.5	0.5
1974	23,983	130,730	5.5	11,178	11.7	0.5
1975	26,934	176,526	6.6	16,048	11.0	0.6
1976	27,703	150,617	5.4	17,615	8.6	0.6
1977	30,997	216,282	7.0	19,745	11.0	0.6
1978	33,114	200,129	6.0	31,267	6.4	0.9
1979	31,269	201,245	6.4	16,470	12.2	0.5
1980	34,449	217,039	6.3	19,595	11.1	0.6
1981	36,243	236,790	6.5	15,669	15.1	0.4
1982	35,925	232,428	6.5	24,702	9.4	0.7
1983	36,014	225,347	6.3	20,761	10.9	0.6
1984	39,155	299,133	7.6	26,254	11.4	0.7
1985	37,901	280,708	7.4	37,039	7.6	1.0
1986	40,784	309,279	7.6	43,833	7.1	1.1
1987	38,150	297,422	7.8	37,540	7.9	1.0
1988	47,204	359,730	7.6	45,835	7.8	1.0
1989	38,521	317,734	8.2	43,718	7.3	1.1
1990	38,713	304,193	7.9	29,138	10.4	0.8
1991	41,400	310,200	7.5	33,200	9.3	0.8
1992	43,000	387,600	9.0	30,900	12.5	0.7
1993	40,000	339,700	8.5	29,100	11.7	0.7
1994	47,000	349,100	7.4	40,400	8.6	0.9
1995	43,300	348,900	8.1	41,200	8.5	1.0
1996	51,900	361,200	7.0	37,400	9.7	0.7
1997	48,400	334,700	6.9	39,000	8.6	0.8
1998	51,800	362,400	7.0	41,800	8.7	0.8
1999	51,600	358,600	6.9	35,300	10.2	0.7
2000	47,300	345,900	7.3	31,400	11.0	0.7
2001	53,800	374,700	7.0	43,000	8.7	0.8
2002	50,100	389,800	7.8	36,300	10.7	0.7
2003	59,800	513,100	8.6	57,100	9.0	1.0
2004	63,800	575,400	9.0	60,000	9.6	0.9
2005	50,700	480,500	9.5	49,500	9.7	1.0
2006	55,000	465,400	8.5	58,000	8.0	1.1
2007	56,800	472,000	8.3	65,100	7.3	1.1

ALABAMA HUNTING SURVEY ESTIMATES TURKEY - FALL SEASONS

Year	Hunters	Man-Days	Average Man-Days	Harvest	Man-Days Per Harvest	Harvest Per Hunter
1971	17,593	84,895	4.8	8,869	9.6	0.5
1972	21,075	114,537	5.4	15,989	7.2	0.8
1973	20,334	106,753	5.2	10,059	10.6	0.5
1974	18,358	116,083	6.3	10,832	10.7	0.6
1975	19,299	91,490	4.7	13,487	6.8	0.7
1976	18,117	103,745	5.7	10,476	9.9	0.6
1977	22,264	108,289	4.9	10,863	10.0	0.5
1978	16,501	81,938	5.0	9,805	8.4	0.6
1979	17,935	112,369	6.3	11,923	9.4	0.7
1980	21,340	121,257	5.7	11,873	10.2	0.6
1981	18,454	92,547	5.0	10,979	8.4	0.6
1982	18,664	116,506	6.2	9,378	12.4	0.5
1983	17,497	103,025	5.9	17,490	5.9	1.0
1984	18,178	114,093	6.3	11,107	10.3	0.6
1985	15,529	82,564	5.3	15,424	5.4	1.0
1986	15,803	92,404	5.8	12,921	7.2	0.8
1987	15,728	86,904	5.5	7,765	11.2	0.5
1988	9,312	63,224	6.8	6,972	9.1	0.7
1989	9,837	47,795	4.9	3,568	13.4	0.4
1990	8,000	45,400	5.7	5,200	8.7	0.7
1991	9,500	49,200	5.2	3,400	14.5	0.4
1992	8,700	50,000	5.7	4,100	12.2	0.5
1993	7,200	33,800	4.7	3,200	10.6	0.4
1994	7,500	51,500	6.9	5,000	10.3	0.7
1995	6,800	39,100	5.8	3,600	10.9	0.5
1996	7,600	26,800	3.5	3,200	8.4	0.4
1997	5,100	23,000	4.5	4,600	5.0	0.9
1998	5,200	20,900	4.0	1,700	12.3	0.3
1999	4,300	18,200	4.2	1,500	12.1	0.4
2000	4,900	21,600	4.4	2,700	8.0	0.6
2001	5,000	19,900	4.0	2,700	7.4	0.5
2002	5,500	33,700	6.1	5,500	6.1	1.0
2003	5,200	42,800	8.3	2,800	15.3	0.6
2004	2,900	17,700	6.1	1,000	17.7	0.3
2005	3,000	21,900	7.3	6,500	3.4	2.2
2006	3,000	22,700	7.6	7,000	3.2	2.3

ALABAMA HUNTING SURVEY ESTIMATES TURKEY - FALL & SPRING SEASONS COMBINED

Year	Hunters	Man-Days	Average Man-Days	Harvest	Man-Days Per Harvest	Harvest Per Hunter
1963-64	36,579	148,464	4.1	15,784	9.4	0.4
1964-65	36,358	171,534	4.7	22,556	7.6	0.6
1965-66	51,629	265,499	5.1	33,849	7.8	0.7
1966-67	47,889	243,227	5.1	23,931	10.2	0.5
1967-68	52,256	252,489	4.8	39,978	6.3	0.8
1968-69	32,656	205,609	6.3	21,761	9.4	0.7
1969-70	37,918	255,649	6.7	28,188	9.1	0.7
1970-71	33,114	211,361	6.4	19,290	11.0	0.6
1971-76	No data was collected during this time period.					
1976-77	42,738	319,279	7.5	41,434	7.7	1.0
1977-78	45,789	308,513	6.7	40,556	7.6	0.9
1978-79	42,674	282,180	6.6	25,115	11.2	0.6
1979-80	46,889	328,198	7.0	30,341	10.8	0.6
1980-81	51,558	358,538	7.0	28,243	12.7	0.5
1981-82	49,201	326,796	6.6	35,441	9.2	0.7
1982-83	47,817	341,853	7.1	30,138	11.3	0.6
1983-84	49,783	408,771	8.2	45,723	8.9	0.9
1984-85	50,063	397,426	7.9	48,341	8.2	1.0
1985-86	50,945	394,432	7.7	57,712	6.8	1.1
1986-87	49,384	398,468	8.1	49,245	8.1	1.0

Continued

Year	Hunters	Man-Days	Average Man-Days	Harvest	Man-Days Per Harvest	Harvest Per Hunter
1987-88	57,578	450,351	7.8	54,265	8.3	0.9
1988-89	44,367	381,641	8.6	50,699	7.5	1.1
1989-90	45,346	353,560	7.8	33,290	10.6	0.7
1990-91	47,300	355,600	7.5	38,400	9.3	0.8
1991-92	50,100	436,800	8.7	34,300	12.7	0.7
1992-93	45,400	389,700	8.6	33,200	11.7	0.7
1993-94	51,200	382,900	7.5	43,600	8.8	0.9
1994-95	48,800	400,400	8.2	46,200	8.7	1.0
1995-96	56,100	400,300	7.1	41,000	9.8	0.7
1996-97	52,300	361,500	6.9	42,200	8.6	0.8
1997-98	54,800	385,400	7.0	46,400	8.3	0.9
1998-99	55,100	379,500	6.9	37,000	10.3	0.7
1999-00	49,800	364,100	7.3	32,900	11.1	0.7
2000-01	56,700	396,300	7.0	45,700	8.7	0.8
2001-02	54,500	409,700	7.5	39,000	10.5	0.7
2002-03	62,400	546,800	8.8	62,600	8.7	1.0
2003-04	66,900	618,200	9.2	62,800	9.9	0.9
2004-05	51,900	498,200	9.6	50,600	9.8	1.0
2005-06	56,400	487,300	8.6	64,500	7.6	1.1
2006-07	57,500	494,700	8.6	72,100	6.9	1.3

Alabama Planting Guide — Warm Season Crops Selected for Wild Turkeys

Crop	Zone	Planting Dates	*Broadcast Seeding Rates/Acre	Planting Depth
Brown Top Millet	North Central South	May 1 - Aug. 1 April 1 - Aug. 15 April 1 - Aug. 15	20 lb.	¼ inch
Chufa	North Central South	May 1 - June 30 (all zones)	40 lb.	1 inch
Cowpeas	North Central South	July 15 - Aug. 15 (all zones)	30 lb.	1 inch
Proso Millet	North Central South	May 1 - June 15 (all zones)	20 lb.	¼ - ½ inch
Egyptian Wheat	North Central South	May 1 - July 15 April 15 - July 15 April 1 - July 30	10 lb.	1 inch
Lespedeza (striate, kobe, and common)	North Central South	Feb. 15 - March 31 (all zones)	30 lb.	¼ inch
Partridge Pea	North Central South	Feb. 15 - March 31 Feb. 15 - March 15 Feb. 1 - March 15	16 lb.	¼ - ½ inch
Grain Sorghum	North Central South	May 1 - Aug. 1 April 15 - Aug. 1 April 1 - Aug. 15	20 lb.	½ inch

This table was adapted from information in *Wildlife Plantings and Practices*,
The Alabama Cooperative Extension Service Circular ANR-485

* Drilled rates are typically one-half to one-third the broadcast rates.

Alabama Planting Guide — Cool Season Crops Selected for Wild Turkeys

Crop	Zone	Planting Dates	*Broadcast Seeding Rates/Acre	Planting Depth
Alfalfa	North South	Aug. 25 - Oct. 1 Sept. 1 - Oct. 15	30 lb.	¼ inch
Arrowleaf Clover	North Central South	Sept. 1 - Nov. 1 (all zones)	6 lb.	¼ inch
Austrian Winter Pea	North Central South	Sept. 1 - Oct. 15 (all zones)	40 lb.	1-2 inches
Crimson Clover	North Central	Sept. 1 - Sept. 30 Sept. 1 - Sept. 30 Sept. 1 - Oct. 30	20 lb.	¼ inch
Ladino Clover	North Central South	Aug. 25 - Nov. 1 (all zones)	5 lb.	¼ inch
Oats	North Central South	Aug. 25 - Oct. 1 Sept. 1 - Oct. 30 Sept. 1 - Oct. 30	2 ½ bu.	1 inch
Red Clover	North Central	Aug. 15 - Oct. 15 (all zones)	10 lb.	¼ inch
Rye	North Central South	Sept. 1 - Nov. 1 Sept. 15 - Nov. 15 Sept. 15 - Nov. 15	1 ½ bu.	1 inch
Wheat	North Central South	Sept. 1 - Nov. 15 Sept. 15 - Nov. 15 Sept. 15 - Nov. 15	5 lb.	¼ inch

This table was adapted from information in *Wildlife Plantings and Practices*,
The Alabama Cooperative Extension Service Circular ANR-485

* Drilled rates are typically one-half to one-third the broadcast rates.

Alabama Planting Guide — Native Plants Selected for Wild Turkeys

Herbaceous Plants

Spacing or Seeding rates, Management
Comments (not available for all species)

Beggarweed (<i>Desmodium spp.</i>)	Manage with prescribed fire and light disking
Deer tongue (<i>Panicum clandestinum</i>)	
Greenbrier (<i>Smilax spp.</i>)	
Indian grass (<i>Sorghastrum nutans</i>)	Broadcast rate: 5 lbs/acre
Lespedezas (<i>Lespedeza spp.</i>)	¼ to ½ lb (drill on 1.5 x 3' spacing)
Little bluestem (<i>Schizachyrium scoparium</i>)	7 lbs/acre broadcast
Switchgrass (<i>Panicum virgatum</i>)	10 lbs/acre broadcast

Trees and Shrubs

Blackberry (<i>Rubus spp.</i>)	Prefers moist but well drained soil and full sun
Black cherry (<i>Prunus serotina</i>)	25' x 25', Full sun to partial shade
Black gum (<i>Nyssa sylvatica</i>)	
Beech (<i>Fagus americana</i>)	
Dogwood (<i>Cornus florida</i>)	8' x 8', Partial shade
Grape, muscadine and other species (<i>Vitis spp.</i>)	
Hawthorn (<i>Crataegus spp.</i>)	
Oaks (<i>Quercus spp.</i>)	25' x 25', Full sun
Persimmon (<i>Diospyros virginiana</i>)	
Pines (<i>Pinus spp.</i>)	Full sun
Plums, wild (<i>Prunus spp.</i>)	3 x 4', Full sun
Viburnums (<i>Viburnum spp.</i>)	
Waxmyrtle (<i>Myrica cerifera</i>)	Prefers sandy, acidic soil
Yaupon (<i>Ilex vomitoria</i>)	Full sun, well drained sandy soils

These lists were adapted from information in *Wildlife Plantings and Practices*, The Alabama Cooperative Extension Service Circular ANR-485 and *Get in the Game*, a publication of the National Wild Turkey Federation, and *Permanent Wildlife Plantings*, a publication of the Alabama Forestry Commission. These publications are available on-line.

