



Eastern Wild Turkeys in Texas: Biology and Management



Photo by Texas Parks and Wildlife Department

Eastern wild turkeys (*Meleagris gallopavo silvestris*) are one of three wild turkey subspecies in Texas, the other two being the Rio Grande (*Meleagris gallopavo intermedia*) and Merriam's (*Meleagris gallopavo merriami*).

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Introduction

Eastern wild turkeys (*Meleagris gallopavo silvestris*) are one of three wild turkey subspecies in Texas, the other two being the Rio Grande (*Meleagris gallopavo intermedia*) and Merriam's (*Meleagris gallopavo merriami*). Although eastern wild turkeys are the most widespread and numerous among the 5 subspecies in North America, Rio Grande wild turkeys are most abundant in Texas. These subspecies occupy varying habitats that best suit their life history requirements (Figure 1). Eastern wild turkeys mainly occupy the Pineywoods and Post Oak Savannah ecoregions of eastern Texas, with a 30-40 inch rainfall zone representing their western boundary (Box 1).

Historically, eastern wild turkeys occupied nearly 30 million acres in eastern Texas, but unregulated overharvest of both turkeys and timber led to their near extirpation from the region by 1900. Despite decades of restoration attempts, wild turkey populations remain low in eastern Texas. Early attempts by Texas Parks and Wildlife Department (TPWD)

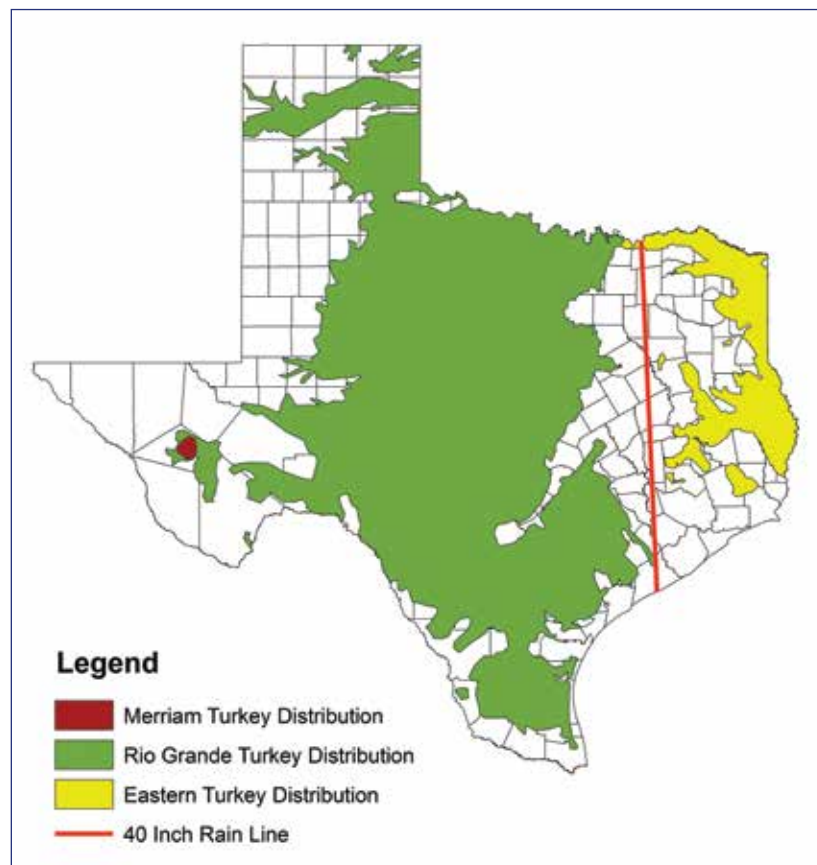


Figure 1. Distribution map of the three wild turkey subspecies in Texas. Map by Texas Parks and Wildlife Department.

Box 1. Pineywoods and Post Oak Savannah Ecoregions

The Pineywoods are bordered on the south by the Gulf Coastal Prairies and Marshes and Post Oak Savannah and extend east and north into Louisiana, Arkansas, and Oklahoma. The land is gently rolling to flat with acidic to highly acidic sandy and sandy loam soils. Common overstory and midstory tree species include loblolly (*Pinus taeda*), longleaf (*P. palustris*), and shortleaf pines (*P. echinata*), oaks (*Quercus* spp.), southern magnolia (*Magnolia grandiflora*), elms (*Ulmus* spp.), hickories (*Carya* spp.), silver leafed maple (*Acer saccharinum*), and sweetgum (*Liquidambar* spp.). Understory species include buttonbush (*Cephalanthus occidentalis*), American beautyberry (*Callicarpa americana*), yaupon (*Ilex vomitoria*), flowering dogwood (*Cornus florida*) and native tallgrass species.

The Post Oak Savannah contains patches of oak woodland within grasslands and is a transition zone between the tallgrass communities of the Blackland Prairie to the west and the pine forests of the Pineywoods to the east. The Post Oak Savannah ecoregion covers approximately 12,500,000 acres and consists of gently rolling to hilly terrain. Dominant vegetation of this ecoregion includes oaks and hickories, with tallgrass species such as little bluestem (*Schizachyrium scoparium*), indiagrass (*Sorghastrum nutans*), brownseed paspalum (*Paspalum plicatulum*), and switchgrass (*Panicum virgatum*). Native invasive species include eastern red cedar (*Juniperus virginiana*) and yaupon. Bottomland soils are clay to sandy loam, and upland soils are sandy loam to sand.

Most of the original Tall Grass Prairie species were replaced by exotic, introduced grasses, such as bermudagrass (*Cynodon dactylon*), bahiagrass (*Paspalum notatum*) and others, as forage for livestock production. Although beneficial for this endeavor, these grasses had little value for wildlife, resulting in fewer species present and lower populations.



Figure 2. The release of wild turkeys during a super stocking in eastern Texas. Photo by Texas A&M AgriLife Extension Service.

included releases of pen-reared birds and later, Rio Grande wild turkey from the west. In the 1940s, restoration efforts focusing on pen-raised turkeys likely failed due to the inability of these birds to survive and reproduce on the landscape. Today, the practice of releasing pen-raised turkeys into the wild is illegal in Texas.

Rio Grande wild turkeys were translocated to eastern Texas in an attempt to restore the species. These turkeys were not historically present in this area and were poorly adapted to the local habitat conditions. Due to the lack of success of Rio Grande wild turkey and pen-reared birds, only eastern wild turkeys have been translocated to this region since 1979.

Development of the cannon net, and later the rocket net, increased the effectiveness of restoration efforts by state wildlife agencies. This enabled the trapping and translocation of large numbers of wild turkeys to areas having suitable habitat, which greatly enhanced restocking efforts. However, the effects of the early translocations and potential genetic mixing are not well known. When DNA from approximately 300 wild turkeys from across eastern Texas was examined, researchers found a hybridization zone between eastern and Rio Grande subspecies along the Red River in

northeastern Texas. Outside of the hybridization zone, 96% of the turkeys were eastern wild turkeys, relieving concern about the genetic purity of the current population in eastern Texas.

Although large numbers of eastern wild turkeys have been released, poor reproductive performance of translocated turkeys in the 1990s heightened concerns regarding long-term stability, expansion, and persistence of relocated wild turkey populations. Prior to the late 2000s, all wild turkey translocations involved traditional block-stocking (15-20 turkeys per site) and supplemental-stocking

Hybridization – Mixing of genetic information resulting from the reproduction by individuals of different subspecies

(translocation of additional birds 1-3 years after block stocking). Research conducted at Texas A&M University, using survival and recruitment data, provided the foundation for a new translocation approach called “super-stocking” and highlighted shortcomings of block and supplemental-stocking techniques. Super-stocking involves

translocating approximately 80 wild turkeys per site, with 20 gobblers and 60 hens, and an even mix of juvenile and adult birds (Table 1; Figure 2). Texas Parks and Wildlife Department couples super-stocking with a habitat evaluation technique to assure released birds are in the best available habitat. Collaborative research among Stephen F. Austin State University, Texas A&M University, and TPWD, has shown that super-stockings appear to hold promise as an effective restoration tool. This approach has a higher chance of success because larger populations can better cope with difficulties such as poor nesting success and natural mortalities.

Table 1. Common terms used to describe male and female turkeys of different life stages.

Common Terms for Wild Turkeys	
Poult	Turkey of either sex from hatching until 8 weeks old
Jake/Jenny	Male/female turkey between 8 weeks and 1.5 years old
Hen	Female turkey
Tom	Male turkey
Gobbler	Adult male turkey
Brood	Family group including hen and poults
Brood Flock	A flock of turkeys consisting of multiple hens with poults

Physical Characteristics

Wild turkeys have 5,000 to 6,000 feathers covering their bodies (Figure 3). These feathers provide insulation, lift during flight, touch and sensation, ornamentation, and waterproofing. Feathers are replaced during four molts, resulting in five different plumages – natal, juvenile, first basic, alternate (first winter), and basic (adult). Feather color in males is typically an iridescent copper, bronze, red, gold and green. Female plumage coloration is similar but duller than males, which gives them a browner appearance. Adult turkeys go through a molt every year to replace their basic plumage but do not lose the ability to fly.

Males have beards – a group of black, fibrous bristles that project from the neck above the breast (Figure 4). Unlike true feathers, the beard does not molt but instead grows for the bird's entire life.



Figure 3. Wild turkeys have 5,000-6,000 feathers covering their body. The primary feathers on the wing provide lift during flight. Photo by Texas Parks and Wildlife Department.

Beards are first visible at 6-7 months of age as they emerge past the breast feathers, and grow about 3-5 inches per year. Beards begin to wear off due to ground friction after about two years of age. Although beards are generally thought of as a male characteristic, 1-5% of females also have beards, which are typically much shorter – only about 7 inches and are sparsely bristled.



Figure 4. Wild turkey beards are a group of black, fibrous bristles that project from the neck above the breast. Photo by Texas Parks and Wildlife Department.

Legs and feet of both sexes are covered with scales rather than feathers. These scales attain maximum clarity between 1 and 1 ½ years of age and are similar in color to human fingernails. Over time, less melanin pigment is deposited in the scales, which gives the legs of older birds a pink or red appearance. Male turkeys are characterized in part by spurs, which grow on the lower third of the legs and, over time, develop from a small rounded bump to a sharp pointed projection up to 2 inches in length (Figure 5). Growth of spurs in males can be used as an indicator of relative age; small, rounded spurs ½ inch or smaller indicate a jake, and long, pointed spurs indicate a gobbler. There are reports of gobblers either lacking a spur or having multiple spurs, but this is rare.



Figure 5. The growth of spurs on the legs of males can be used as an indicator of relative age in wild turkeys. Photo by Texas Parks and Wildlife Department.

Gobblers normally stand about 40 inches tall and weigh 17-21 pounds, and hens stand about 30 inches tall and normally weigh 8-11 pounds. Poults begin life very small and weigh only about 2 ounces at hatching. Young grow rapidly, with males weighing between 9-11 pounds by the time they are 5-6 months of age. Wild turkeys have excellent vision and the arrangement of their eyes on the sides of their head allows a 360° field of vision with only slight head movements. Wild turkeys are legendary for their visual acuity in noticing movement, although their night vision is poor. The wild turkey hearing is keen, as opposed to their sense of taste and smell, which are poorly developed.

Eastern wild turkeys can be differentiated from Rio Grande wild turkeys by the coloration on the tips of the tail feathers and the upper tail coverts (feathers of the lower back, covering the base of the tail feathers). The feather tips are buff or tan for Rio Grande wild turkey, whereas the tips of the Eastern wild turkey fans are dark brown (Figure 6).

Wild turkeys can run up to 12 miles per hour and in many cases prefer running as a method for escape rather than flying. Their speed enables them to become airborne very quickly, and flights for an adult may last from 200 yards to 1 mile. Poults develop quite rapidly and are capable of flying into roost trees at 10-14 days of age.



Figure 6. Eastern wild turkey (left) have dark brown tail feather tips, while Rio Grande wild turkey (right) are buff or tan. Photos by Texas Parks and Wildlife Department.



Figure 7. Wild turkeys nest in sites with 20-26 inches of vegetative cover. Yellow ring shows location of a successful nest. Photo by Texas A&M AgriLife Extension Service.

Population Dynamics

Nesting Ecology

Breeding behavior of wild turkeys is triggered primarily by the increase in daylight that occurs during spring. Males gobble and strut to attract females. Whereas the gobble can be heard from a considerable distance, the strut is a relatively close-range visual signal that is often made after a gobbler has located a hen. A gobbler is persistent in his courtship efforts and may strut repeatedly for hours until the hen signals her receptiveness or willingness to breed.

Breeding season generally occurs from March – June and egg-laying typically begins in late March to early April. Most hens will attempt to nest every year, with nests containing about 10 eggs. Hens generally lay 1 egg each day until the clutch is complete. After laying eggs, hens will spend 28 days incubating. Hens will incubate eggs from 23 hours a day to several days without leaving the nest site. When they do leave the nest, hens are absent only an hour or less to eat, drink, and defecate. Hens begin incubating nests from early April to mid-June. Most studies in eastern Texas have reported variable nest success, with most studies reporting low nest success (25-38%). Hens

may re-nest a second time if their first nesting attempt is abandoned or disrupted by predators.

Nest Site Selection

Wild turkey nests have the general appearance of a shallow depression on the ground (Figure 7). Although hens may scratch the nest area or use their beaks to place and rearrange vegetation, very little is done to create a nest bowl similar to songbirds. Since nesting is the most vulnerable time for hens, areas with adequate screening cover between 20-26 inches tall are chosen to conceal the nest and the hen from potential predators. Grasses and forbs generally serve as nesting cover for hens in open habitats; however, nesting cover in forested habitats is provided by a dense layer of shrubs, young trees, and vines (Table 2). In eastern Texas, hens like to nest in forests that have been burned from 3 months to 3 years prior to the nesting season. Although upland forest stands are commonly used by nesting hens, hens also nest in other habitat types, including clearcuts, rights-of-way, and pastures. In contrast to the frequent use of upland sites during the reproductive period, wild turkeys generally do not nest in bottomland hardwood forests.

Table 2. Common grass, shrubs, and trees found near wild turkey nests in eastern Texas.

Shrubs/trees	Ground cover
American beautyberry	Blackberry
Yaupon	Bracken fern
Sweetgum	American beautyberry
Loblolly pine	Muscadine
Winged sumac	Greenbrier
Sassafras	Bluestem grasses
Eastern baccharis	Yaupon
Privet	Panicgrass

Poult Survival and Brood-rearing Habitat

It takes about 24 hours for a poult to break through and emerge from its shell, and an additional 12 to 24 hours before the poult is ready to follow the hen away from the nest site (Figure 8). Hens begin vocal communication with poults in the days leading up to hatching. Poults quickly imprint on the hen before she leads them from the nest in search of food. Broods spend most of the daylight hours feeding on insects and other invertebrates, which dominate their diet during the first few weeks of life. Because young turkeys are not able to fly and roost in trees until they are about two weeks old, they are highly susceptible to predation. In addition to predation, starvation, birth defects, and inclement weather can all be sources of poult mortality. Typically less than 50% of poults survive past 1-month of age.

Because the first two weeks of life is when most poult mortality occurs, the close proximity of nest sites to high quality brood-rearing habitat is important. Poults must travel with the hen to these areas shortly after hatching, and finding and accessing quality brooding habitat aids survival. Although hens and their broods will use a variety of habitats, they generally select areas that provide abundant ground cover, 12-24 inches in height, to shield their poults from predators. Broods often spend considerable time in upland forests that have been thinned and/or burned, but seem to prefer open areas such as native or restored prairies, utility rights-of-way, and pastures that contain tall herbaceous cover. Closed canopy forests generally receive less use by broods due to the lack of sufficient ground cover and lack of adequate

food resources. Open herbaceous areas consisting of vegetation 8-24 inches tall are important to wild turkey broods because they provide screening cover as well as an abundant supply of invertebrates, like grasshoppers, beetles, and spiders, which are the primary food source for poults. Turkey poults need 9-12 grams of invertebrates each day to meet protein requirements for growth. For perspective, this equates to about 50-100 grasshoppers each day. This requirement increases as poults grow larger, but diets also begin to diversify after 2-4 weeks of life to include more vegetative matter.



Figure 8. A hen and her poults are called a brood. Photo by Stephen F. Austin State University.

Brood Movements and Home Range Size

Due to physical limitations, hens with young poults generally restrict their movements, making the availability of brood-rearing habitats extremely important to poult survival. During their first month of life, broods generally occupy areas ranging in size from 500-1,000 acres, and make daily movements that range from 150-500 yards. Turkey broods often travel to open areas with herbaceous vegetation shortly after hatching (Figure 9). In instances where these areas are not readily available, hens with broods must often travel considerable distances in order to reach them, or occupy larger home ranges of less suitable habitat, which can negatively impact brood survival (Figure 10). Broods generally have greater daily movements in forested areas, which suggest that resources in these areas are more limited than in open areas.

Because broods use larger openings more frequently than small (i.e., < 1 acre) food plots, the size of openings created for brood habitat is an

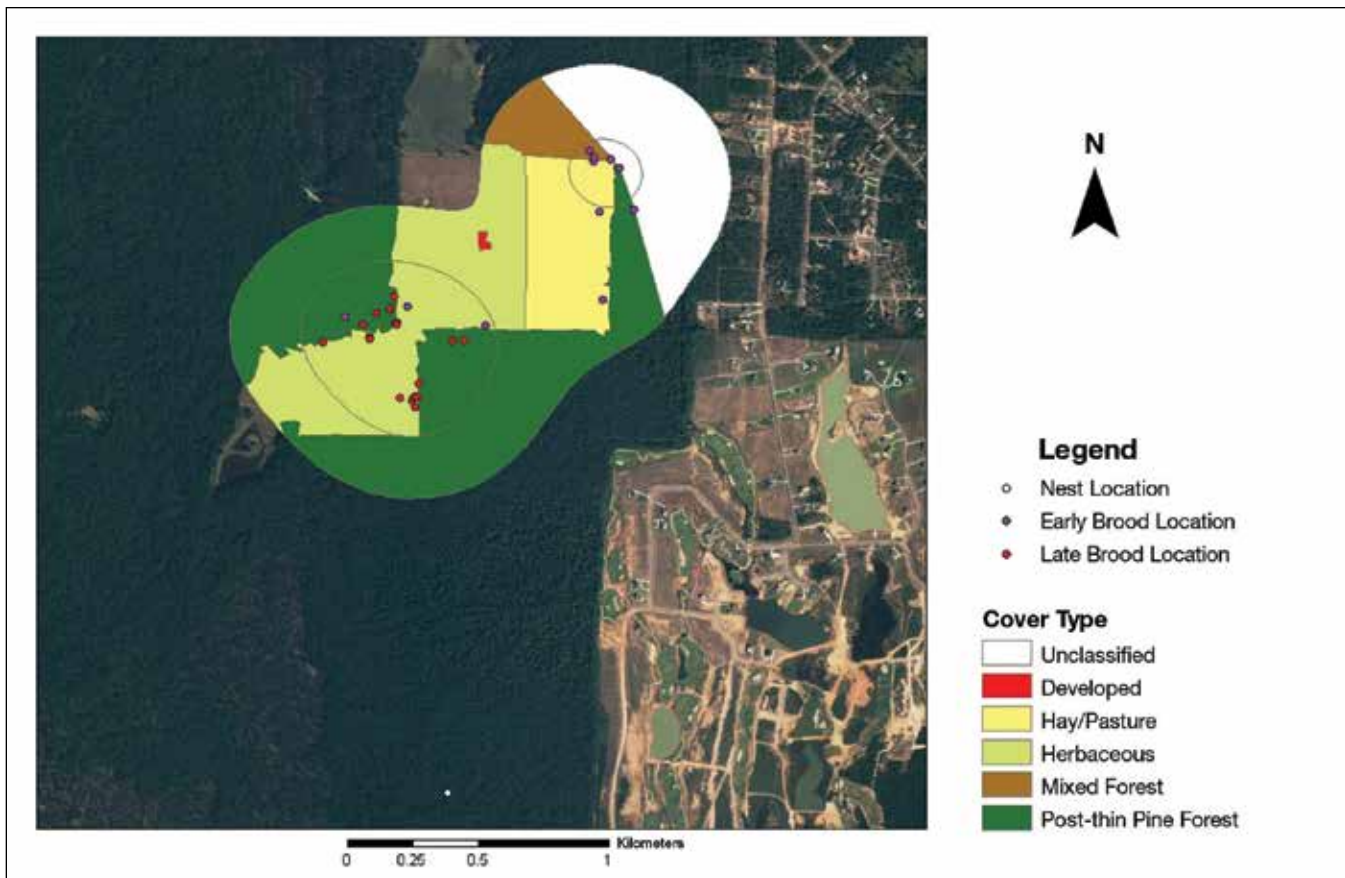


Figure 9. Radio-locations of a wild turkey brood in Montgomery County, Texas from days 1-14 after hatching (purple dots above) and from 15-28 days after hatching (red dots above). The nest (white dot above) was located in a thinned pine forest. Shortly after hatching, the brood moved to hay/pasture and open herbaceous habitats and largely remained there for the next 28 days. From Isabelle, 2010.

important consideration. Better brood habitats generally consist of openings that range from 5-30 acres in size, and should serve as a general benchmark for the creation of new openings (Figure 11). Providing a minimum of 12 to 25% of an area in properly maintained openings seems ideal for wild turkeys. The distribution and availability of openings among forested cover types reduces the distance that wild turkey broods must travel, limiting exposure to predators. A combination of thinned/burned forests and open areas results in nesting and brood-rearing habitats in close proximity, which is important to wild turkeys during the spring and early summer.

Depredation Effects

Predation is a major source of mortality for wild turkeys. Many different avian, mammalian, and reptilian species prey on eastern wild turkeys at various life stages (Table 3; Figure 12). Studies have shown that more than half of all wild turkey nests are lost to predation or abandonment.

Table 3. Documented animals that prey on eastern wild turkeys and their nests in Texas.

Predator	Prey on:		
	Nests	Poults	Juvenile and adult turkeys
Birds			
American Crow	✓		
Great-horned Owl	✓	✓	✓
Blue jays	✓		
Red-tailed Hawk		✓	✓
Reptiles			
Snakes	✓	✓	
Mammals			
Bobcat	✓	✓	✓
Coyote	✓	✓	✓
Feral Pig	✓		
Gray Fox	✓	✓	✓
Nine-banded Armadillo	✓		
Opossum	✓		
Raccoon	✓	✓	✓
Striped Skunk	✓		

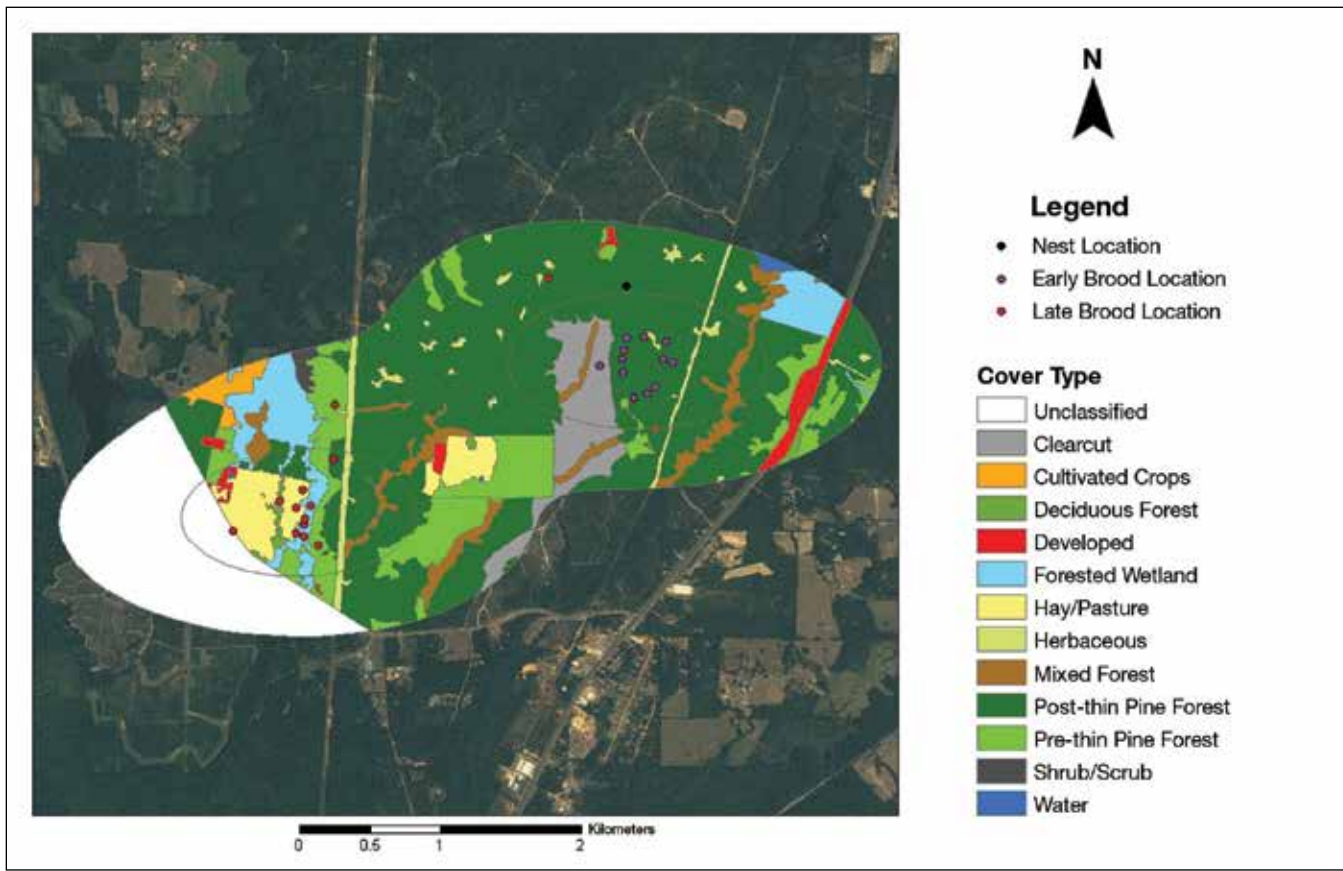


Figure 10. Radio-locations of a wild turkey brood in Nacogdoches County, Texas from days 1-14 after hatching (purple dots above) and from 15-28 days after hatching (red dots above). The nest (black dot above) was located in a thinned pine forest. After hatching, the brood spent most of the next 2 weeks in similar habitat before moving to hay/pasture, where it spent the majority of the next 2 weeks. From Isabelle, 2010.



Figure 11. Openings 5-30 acres in size consisting of native grasses and forbs, and within close proximity of woody escape cover, provide excellent brooding habitat for wild turkeys. Photo by Texas A&M AgriLife Extension Service.



Figure 12. Bobcats and red-tailed hawks are examples of eastern wild turkey predators. Most birds are protected by law. Photos by Texas A&M AgriLife Extension Service and Texas Parks and Wildlife Department.

One study, using artificial nests and trail cameras in the Pineywoods, found that American crows (*Corvus brachyrhynchos*) depredated the most wild turkey nests, followed by raccoons (*Procyon lotor*). Predation is a substantial source of poult mortality, especially during the first 2 weeks of life when they cannot fly. Eastern wild turkey hens are not known for defending nests, but instead rely on their cryptic behavior, appearance, and excellent eyesight to avoid predation. Gobblers may be more vulnerable during the breeding season when they are vocalizing and displaying.

Diseases and Parasites

Eastern wild turkeys are susceptible to numerous diseases and parasites. Aspergillosis, histomoniasis, mycoplasmosis, salmonellosis, lymphoproliferative disease, and coligranuloma are diseases known to afflict wild and domesticated birds. Avian influenza has impacted the poultry industry worldwide and affects domesticated fowl in the U.S., but researchers have found that wild turkeys are rarely infected by this disease. Poultry produc-

ers must remain vigilant to control influenza outbreaks and keep domesticated birds separate from wild turkeys to reduce the risk of disease transmission. The potential for disease transmission is one of several reasons the release of pen-raised turkeys into the wild is illegal in Texas.

Avian pox is a common viral infection that affects both wild and domestic birds. A common symptom of avian pox is wart-like growths that most frequently appear on unfeathered areas such as the feet, legs, eyelids, bill, and upper respiratory tract (Figure 13). Lesions that occur in the mouth or trachea can limit foraging and cause weakness and respiratory distress; wart-like growths on the head can cause blindness. Any of these symptoms can lead to mortality or increase susceptibility to predation. Avian pox can be transmitted by mosquitos or among birds when the virus contacts the eyes, mouth, respiratory tract, or cuts on the skin. Wild turkeys that show these or any signs of illness should not be consumed.



Figure 13. Avian pox causes lesions on the heads of wild turkeys. Photo by Texas Parks and Wildlife Department.

Hunting Effects

Eastern wild turkeys were historically hunted by Native American cultures in eastern Texas prior to European settlement. Early European settlers would take turkeys year-round by trapping, shooting, or by other means. As early as the 1880s, citizens were recognizing significant declines in turkey populations in eastern Texas. In 1881, the Texas Legislators established the first turkey season, which closed hunting for 3.5 months of the year. In 1903, legislation placed a bag limit of 25 turkeys per year. In less than 4 years another

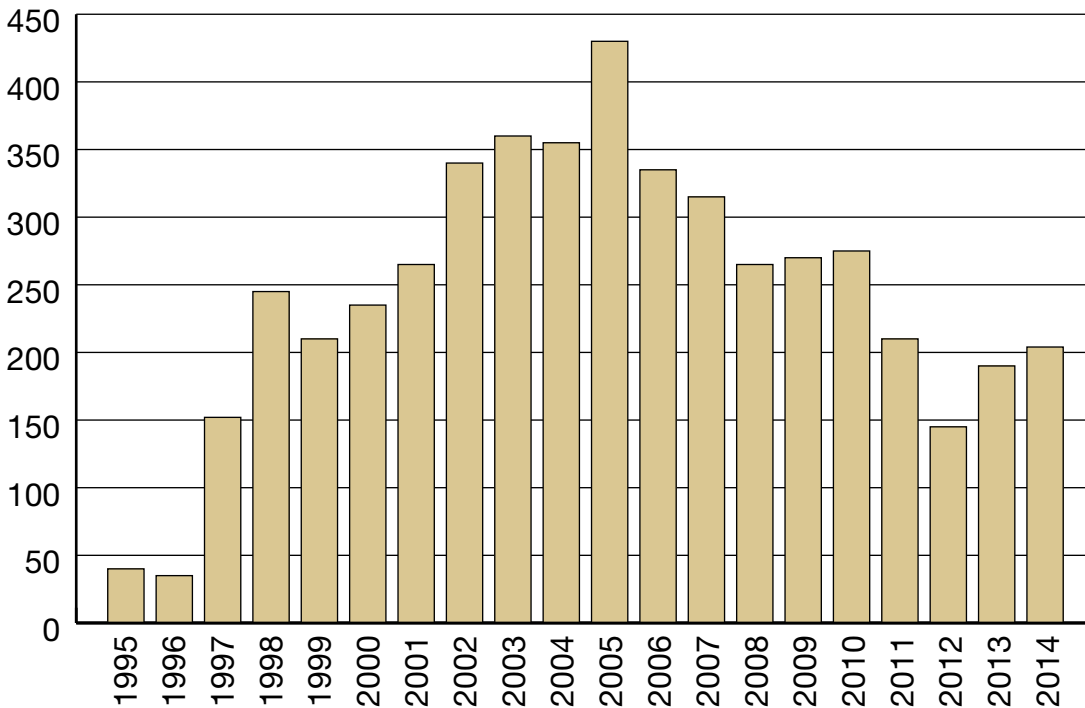


Figure 14. The number of harvested eastern wild turkeys checked at mandatory check stations from 1995 to 2014 in eastern Texas.

law was passed restricting harvest to 3 turkeys per year, and again in 1919 a new law was passed to protect hens. Unfortunately, these legislative actions did little to protect Texas' declining populations and in 1941 the eastern turkey season was closed. By 1942, the Game, Fish and Oyster Commission (predecessor to TPWD) surmised there were less than 100 eastern wild turkeys remaining in Texas. While unregulated hunting and liberal bag limits were once detrimental to wild turkey populations, current hunting regulations assure that hunting is no longer influential on population declines. The modern hunting season for eastern wild turkey has only been open since 1995 and as of 2014 only 28 counties have an open season (Figure 14). The season timing ensures that most hens are incubating eggs when the season opens, which protects hens from accidental or illegal hen harvest. Hunters may only take 1 gobbler each year and hens are not part of the legal bag.

Habitat Requirements

Eastern wild turkeys require both forests and open grasslands to meet their basic needs. Trees provide mast (fruits and nuts) and roosting sites, while grasslands provide seeds and attract insects, which are especially important food items

for poults (Table 4; Figure 15). Grasslands also provide ground cover that offers protection from predators during nesting and brood-rearing. Water is not typically a limiting factor for wild turkeys, who obtain water from creeks, ponds, and food items.

Habitat Management

Management activities directed towards improving nesting and brood-rearing habitats will likely have the greatest impact on the success of wild turkey populations in eastern Texas. These birds respond favorably to management practices conducted at regular intervals, such as forest thinning

Table 4. Common food items for wild turkeys in eastern Texas.

Soft mast (fruits and nuts)	Grasses and Forbs
Oaks	Beggarweeds
Hickories	Crab grass
American beautyberry	Panic grasses
Sassafras	Paspalums
Plum	Partridge pea
Wild grape	Croton (aka goat weed or dove weed)
Dogwood	Ragweed
Blackberry	Wild beans



Figure 15. Partridge pea (left) and American beautyberry (right) are valuable food items for eastern wild turkeys. Photos by Texas A&M AgriLife Extension Service.



Figure 16. Timber thinning should be done in this forest to open the canopy and allow sunlight to reach the ground. Photo by Texas A&M AgriLife Extension Service.



Figure 17. Mulchers and other heavy equipment can be effective for reducing canopy coverage, allowing more beneficial and diverse understory vegetation to grow. Photo by National Wild Turkey Federation.

and burning. Since eastern wild turkeys are located in a high-rainfall area with abundant ground cover, prescribed fire, forest thinning, mowing, mulching, spraying brush with herbicides, and grazing are important tools for wildlife managers. Natural resource professionals (Texas A&M AgriLife Extension Service, TPWD, Texas A&M Forest Service (TFS), USDA – Natural Resources Conservation Service) can provide expertise on many habitat management practices.

Timber Thinning/Brush Management

Historically, pine forests in eastern Texas had fewer trees than today's pine plantations. Natural disturbances like fire served to thin the number of pines, allowing them to grow larger, leading to open canopies with understories dominated by native grasses and forbs. Today's closed canopy forests have little or no ground cover, thus reducing their value to wild turkeys and in some cases precludes them from using the area (Figure 16). Timber thinning, which removes only a portion of the forest canopy, stimulates the growth of the remaining trees and opens the canopy, allowing sunlight to reach the ground. Thinning not only benefits wild turkeys by promoting grass and forb growth, but improves the health, yield, and profitability of the stand. Land managers seeking to improve wild turkey habitat should thin forest stands early (generally 12-15 years of age in commercial pine stands), with subsequent thinning every 5-10 years. Thinnings can be in the form of a commercial operation or as a pre-commercial management action using chain saws, herbicides, or heavy equipment such as dozers and mulchers (Figure 17). Texas Forest Service provides assistance in planning timber management activities. Other openings in pine forests, like clearcuts, rights-of way, roadsides, and small food plots provide important areas for wild turkeys.

Without regular forest management, native shrubs such as yaupon, and trees like eastern red cedar, sweetgum, and others can aggressively take over the mid-story in eastern Texas (Figure 18). These plants form dense thickets that restrict sunlight from reaching the ground, prevent herbaceous plant growth, and reduce useable space for wild turkeys. Dense thickets can be detrimental to

turkeys by serving as visual obstructions, as well as decreasing mobility to escape from predators. Some midstory vegetation is desirable, but without active, purposeful management it can become a dominant component of the forest plant community. Herbicides can be used in conjunction with prescribed fire or as a standalone practice to minimize coverage and increase useable space for wild turkeys.

For small-scale control, the most effective way to eliminate yaupon with herbicide is either basal application or cut-stump treatment. Basal application is performed by spraying the lower 12-18 inches of the trunk until completely wet, whereas the cut-stump method involves cutting and removing the top of the tree followed by spraying herbicide on the stump (Figure 19). For large-scale mid-story control, foliar applications of various herbicides from a helicopter, skidder, backpack sprayer or ATV-mounted sprayer can be effective for managing many species of shrubs and trees. For recommendations on which herbicides to use for various species and the rates of application, see AgriLife Extension publication ERM-1466 *Chemical Weed and Brush Control* available at the AgriLife Bookstore, or visit with your local natural resource professionals.

Prescribed burning and grazing management are methods for maintaining open areas in forestlands. However, there are situations where these activities may not be feasible or done frequently enough to sustain open habitat. In these circumstances, shredding may serve as an alternative (Figure 20). Shredding can be used to reduce weed competition in restored native grasslands and prairies the first few years after seeding. Make sure to elevate the mower deck to 12-14 inches to maintain established native grasses. Shredding more than half of the plant could compromise its health. In areas of eastern Texas where creating open areas is not feasible, the removal of trees along lightly-traveled private roads, a practice referred to as 'day-lighting,' can provide open habitat for wild turkeys (Figure 21).

Shredding can be used to create structural diversity and establish travel corridors in areas domi-



Figure 18. In absence of disturbance, yaupon and other shrubs may dominate midstory vegetation and restrict sunlight which inhibits the growth of grasses and forbs. Photo by Texas A&M AgriLife Extension Service.



Figure 19. Basal application on the lower 12-18 inches of a yaupon tree can be useful to open the understory of wooded areas. Photo by Texas A&M AgriLife Extension Service.

nated by dense grasses. Maintenance of 'day-lighted' roadways is a good example. If shredding, take care not to shred too low to maintain adequate cover and reduce moisture loss from the soil, which is necessary for grass and forb growth. Shredding and haying are both common practices in eastern Texas. However, shredding is often over utilized to create or maintain a park-like appearance. Manicured, single species pastures provide little if any brood rearing cover for wild turkeys. This practice also tends to spread and promote less desirable exotic grasses, which often form monocultures that can impede movement of turkey poults during this crucial life stage. Shredding can also leave areas of deep thatch, which can impede both poult mobility and germination of beneficial plants. When done correctly, shredding leaves a patchwork of tall grasses and forbs and travel areas.



Figure 20. Shredding is an alternative method for maintaining open habitats in the absence of prescribed burning or grazing. Photo by Texas A&M AgriLife Extension Service.



Figure 21. Daylighting is a way to increase open space for wild turkeys by removing trees along roads. Photo by Texas Parks and Wildlife Department.



Figure 22. Shred in strips or blocks to create a diversity of plant species in a field or pasture. Photo by Texas A&M AgriLife Extension Service.

If shredding or haying, do so after July 1, when most wild turkey nesting activities are done, therefore the risk of destroying nests is reduced. Shred in strips or blocks, but avoid shredding the entire pasture during a single summer (Figure 22). In larger pastures or hay meadows, focus shredding and haying several hundred feet from the forest edge, especially if conducted during the April-June nesting season.

Prescribed Burning

Prescribed burning promotes food production for wild turkeys by increasing the amount of seed-producing grasses and forbs, as well as attracting insects, which are a staple for wild turkey poults (Figure 23). Prescribed fire can improve the ground-level plant structure essential for wild turkeys by rejuvenating grasses and forbs and reducing woody plants in the forest midstory (Figure 24).

In eastern Texas, prescribed burning upland sites on a 2-3 year rotation is beneficial for wild turkeys by creating structural diversity of vegetation for nesting, brood-rearing and escape cover. Because wild turkeys begin initiating nests as early as late-March in eastern Texas, prescribed burning of nesting cover should cease at this time to minimize nest disturbance. Due to the lengthy reproductive period, growing season burns should not be conducted before mid-July in nesting and brood rearing cover areas to minimize disturbance. Along with prescribed burn timing, managers should consider the scale of burning efforts and their influence on the availability of nesting habitats. Areas burned just prior to the nesting season potentially reduce the availability of nesting habitat in the short-term. As such, managers interested in creating habitat for wild turkeys during the reproductive period should use an approach that does not result in the elimination of nesting habitat across large areas. Several small acreage burns (<250 acres) result in a diversity of cover types and likely reduce the distance wild turkey hens must travel to reach nesting or brood rearing habitat.



Figure 23. Prescribed burning invigorates plant communities and reduces fuel loads lessening the danger from wildfires. Photo by Texas Parks and Wildlife Department.

Grazing

Throughout much of Texas, livestock production is the leading agricultural land use. Therefore, grazing management and the cultural practices typically associated with this activity can have significant impacts on habitat needs of many wildlife species. This is particularly true for species that rely both on diverse native grasslands and forests to meet their needs, such as the eastern wild turkey.

Due to the high average rainfall and sandy to sandy loam soils, livestock management in eastern Texas is typically centered on cow-calf grazing on introduced pasture grasses. Introduced pasture grasses include varieties of bermudagrass (Coastal, Tifton, Common, Jiggs and Giant) and bahiagrass both of which are non-native grasses (Figure 25). Introduced pastures are typically managed intensively in a monoculture of a single grass species. For the producer to maintain productive pastures, they must frequently fertilize and control weeds through herbicide application and/or shredding, which require substantial financial inputs. Consequently, this constant pasture manipulation lowers plant species diversity and keeps vegetation at a short height. This results in a loss of protective cover needed for wild turkey nesting and foraging for seeds and insects. Although many common pasture and grazing management practices can

create challenges for wild turkeys, there are several management techniques that can be beneficial.

Since pastures are readily used by wild turkeys during the nesting and brood-rearing season, vegetation in these areas should be maintained at a minimum height of 20 inches. To accomplish this, livestock producers should first set a proper stocking rate to match the forage production. Producers will need to be flexible with herd numbers to match the conditions on the land, especially during drought years. To aid landowners, Texas A&M AgriLife Extension Service has developed the smartphone app “Stocking Rate Calculator for Grazing Livestock” to quickly and easily make this determination.

Rotational grazing systems are one way to keep vegetation at a beneficial height for wild turkeys during the nesting and brood-rearing periods. Openings may be used as nesting habitat from April to July; therefore, managers should avoid manipulating these areas during this period. Burning, mowing, or grazing a portion of openings on a property in late-summer and allowing them to remain fallow for the rest of the year is an ideal way to maintain wild turkey habitat.

Rising fuel and fertilizer prices could make management of introduced grass pastures less econom-



Figure 24. Native grasses and forbs grow rapidly after prescribed burning. This site was burned 6 months prior. Photo by Texas A&M AgriLife Extension Service.



Figure 25. Bahiagrass, recognized by its forked seed head, is a common introduced forage grass in eastern Texas. When it forms a solid stand it has limited value for wild turkey. Photo by Texas A&M AgriLife Extension Service.

ically viable. Reduced input costs and the added value of wildlife habitat may warrant restoration of native grasses and forbs. Native grasses such as little bluestem, big bluestem (*Andropogon gerardii*) and indiagrass are good cattle forage and do not require regular fertilization as do introduced grasses. Since restoring native grasses may cost from \$100 to \$200 per acre, it is important to fully understand the process before making the initial investment. Natural resource professionals can be helpful in providing insight and information on restoring native grasses, including sources of native seed adapted to the area. General guidelines for the restoration process can be found in the Extension publication SP-469 *Native Grassland Restoration in the Middle Trinity River Basin* available at the AgriLife Bookstore.

Predator Management

Predator management will have little benefit if wild turkey habitat is in poor condition. High quality nesting and brood-rearing habitat is essential and will have a longer term impact on wild turkey production over short term gains from predator control. Predator reduction may only give short term success, as the “vacuum” created by removal may be quickly filled by other predators moving in from surrounding areas. Past predator control studies have shown variable results, with some wild turkey populations benefitting and others not. It is also important to realize that some predator species, such as coyotes (*Canis latrans*) and bobcats (*Lynx rufus*), may actually benefit wild turkeys by reducing other more numerous species that destroy nests, such as raccoons and opossums (*Didelphis virginiana*). Therefore, predator control should be considered based on the circumstances for each property.

Many birds, including hawks, owls, eagles and vultures are protected by state and federal law and cannot be killed or harassed in any way. The best way to lessen bird predation, and other predators for that matter, is to have high quality nesting and brood-rearing habitats. Nest predation by mammals, such as raccoons, skunks (*Mephitis mephitis*), armadillos (*Dasypus novemcinctus*), and opossums increases as the availability of other food sources is reduced. Therefore, initiating control prior to and during nesting season may help nest success by limiting depredation by mammalian predators. See Extension publication B-6146 *Predator Control as a Tool in Wildlife Management* for a complete discussion on predator control methods and regulations.

Feral hogs (*Sus scrofa*) are an exotic, invasive species that are known to depredate wild turkey nests. The need for feral hog control should be an integral part of every land management program. The Wildlife and Fisheries unit of Texas A&M AgriLife Extension Service has publications, videos, and a smartphone app to provide landowners with the information they need to remove feral hogs from their property. To learn more, visit the Feral Hogs Community of Practice website at <extension.org/feral_hogs>.

Conclusion

Open areas containing native grasses and forbs, intermixed with thinned and/or burned upland forests can provide high-quality eastern wild turkey habitat year-round. These birds often have home ranges exceeding 1,500 acres. Since property sizes less than 500 acres is common for eastern Texas, cooperative efforts among neighbors to provide habitat for wild turkeys will be particu-

larly important. Landowners working with each other and with local natural resource professionals to manage wild turkey habitats are of utmost importance to ensure that wild turkey habitats are protected on the proper scope and scale on the landscape. These cooperative efforts will also help to expand populations and ensure that this magnificent bird remains an important part of our region's wildlife community.

Suggested Readings

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These videos are available on the WFSCAgriLife YouTube Channel, Eastern Wild Turkey Playlist:

- History of Eastern Wild Turkey
- Eastern Wild Turkey Restoration: A Landowner's Perspective
- Nesting Requirements and Management for Eastern Wild Turkey
- Managing Understory and Openings for Eastern Wild Turkey
- Habitat Management for Eastern Wild Turkey
- Managing Eastern Wild Turkey Nesting and Brooding Cover in Post Oak Woodlands



Photo by Charlene Manning

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