

## THE WILD TURKEY IN MASSACHUSETTS

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The Wild Turkey (Meleagris gallopavo), like many other species of wildlife, suffered dramatic fluctuations in numbers and distribution in the centuries following the European colonization of America. These changes were particularly severe in the heavily settled and cleared Northeast, and its native Wild Turkey populations were eradicated by about 1850.

This alarming trend continued nationwide, and by the 1930's all four subspecies in the United States were declining throughout their range. The trend began to reverse after World War II, when intensive programs of hunting-season regulation, habitat acquisition, biological investigation, and restocking were initiated. These efforts were astonishingly successful. Within the past 25 years, the estimated nationwide Turkey population has swelled from about 320,000 in 1952 to about 1,300,000 in 1974, and the number of states permitting some form of open season has climbed from 15 to 39.

The two eastern races of the Turkey have nearly doubled their occupied range since the 1930's and huntable populations have been established in at least 16 states beyond the recorded limits of ancestral range. Turkeys are found in some regions of at least 45 states and two more (New Jersey and Maine) are attempting restoration projects this year. Massachusetts has had studies underway since 1959, with a few populations established locally since 1965. Recent releases of wild-trapped birds in the southern Berkshires increase the possibility of reintroductions in areas of suitable habitat elsewhere in the Commonwealth.

### LIFE HISTORY OF THE EASTERN WILD TURKEY

Description. The Wild Turkey is essentially a streamlined version of its domestic counterpart, being distinguished by a long neck, legs, and tail, and having a flat, narrow, sparsely feathered head. Adult Wild Turkeys are black to blackish-bronze and are tinted with metallic shades of green and purple on the upper neck, back, breast, and upper wing feathers, with the primary feathers dark brown barred with white. The blackish-brown tail feathers are square-ended and have a sub-terminal black band. Head coloration varies from bluish-gray to reddish, depending on the emotional state of the bird. Adult males (and rarely females) have a spur on the posterior side of the lower leg and a beardlike tuft of bristles arising from the breast. Eleven adult hens captured in Massachusetts between September and March averaged 9.6 (8.2-11.0) pounds live weight, while seven adult toms taken from November to February averaged 19.0 (16.5-22.0) pounds.

Reproduction. Wild Turkeys are promiscuous maters. In early spring, as daylight hours lengthen, males begin gobbling and strut about pompously with engorged wattles, fanned tail, and dragging wing tips. Gobbling serves as an expression of territoriality and to announce the tom's availability to the hen. In the Northeast, gobbling extends from mid-March to early May, usually peaking in mid-April. Gobbling is usually most intense from daybreak to shortly after sunrise.

Hens are bred several times during the season, and begin to lay shortly after

the first mating. The nest is merely a shallow leaf-lined depression, usually next to a stump or under a tangle of vines or fallen branches. The nest location is often at the edge of a field or clearing and is usually not far from water. Clutch size ranges from about 10 to 15 eggs that hatch after an incubation period of 27-28 days. Three nests found in central Massachusetts in early May contained 12, 13, and 15 eggs each.

Nest success for the Wild Turkey is about 40-45 percent, which is usual for ground-nesting species. Turkey poults are precocial and can feed and follow the hen about within hours after hatching, although they must be brooded by the hen for two or three weeks during cool or inclement weather. In Massachusetts broods are first seen from mid-May to late June, with most appearing in the first weeks of June. About 20-25 percent of the brood may be lost between June and September. Hen and poults remain together throughout the summer. Then usually in late fall, young toms split off to form their own flock while one or more groups of young and adult hens will join together in a larger flock.

Food Habits. Wild Turkeys feed most heavily upon plants, though animal foods are also regularly taken. Preferred plants in the Northeast include acorns, beechnuts, hickory nuts, ash seeds, black cherries, grapes, dogwood fruits, fern spores and fronds, and grass and sedge seeds. Mast crops are utilized heaviest in the fall and winter, with tubers and blossoms important in the spring diet and ripening fruits and seeds in summer. Animal food is of lesser importance to the adult Wild Turkey, but newly-hatched poults are heavily dependent on protein-rich invertebrates for several weeks. Insects (especially grasshoppers) and other arthropods are the principal animal foods taken.

Free-flowing seeps and springs are an important source of food for Wild Turkeys in winter, with skunk cabbage, water-mat, violets, and ferns being among the aquatic or emergent plants utilized. Seeps also act as mast traps, enabling Wild Turkeys to find acorns and other foods without scratching through layers of deep snow.

Food items are also often available above the snow. During the severe winter of 1976-77, with deep snow and most seeps frozen, Wild Turkeys were feeding upon such fare as the berries of highbush cranberry, barberry, and bitter-sweet, seeds of burdock and spires, and the fiddleheads of sensitive fern.

Limiting Factors: Weather. Cold spring rains can critically affect the survival of Wild Turkey broods, particularly during the first few weeks. The poults are not only vulnerable to chilling, but may suffer from a lack of food since the rains may severely depress local insect populations.

Generally, severe winter weather conditions can be tolerated by Wild Turkeys. Experiments with penned birds have shown that Wild Turkeys can survive at least 15 days without food. However, mortalities sometimes occur during extended periods (two weeks or more) of low temperatures and deep fluffy snow. When these conditions persist, Wild Turkeys may remain on the roost until they succumb rather than risk getting bogged down in the snow. The losses that occur usually take place in high valleys or plateaus from which Wild Turkeys cannot readily fly to open slopes, plowed roads, or seeps.

Wild Turkeys in Massachusetts' Quabbin Reservation were baited for census

purposes during winters throughout the 1960's. Supplemental winter feeding, using dried cob corn, was also conducted intermittently from about 1965-1970. These artificial feeding programs were terminated after 1970. Although the program did bring some additional birds through the winter, it was also detrimental to the overall restoration study. Weakened, poor-quality birds were surviving and subsequently breeding, thus lowering the vigor of the stock. The Wild Turkeys were becoming dependent on artificially provided grains, rather than adapting to the natural foods, and potential disease-transmission conditions were created by concentrating birds in a small area. Future supplemental feeding programs are unjustified and should not be conducted.

Limiting Factors: Predation. Predation rarely has a serious impact on Wild Turkey populations. Most reported predation mortalities are of weakened or inferior stock, or are scavenged carcasses of birds dead from other causes. Nest predation is occasionally high but does not seem to affect significantly overall reproductive success. Predation might be of concern in marginal or newly-established populations, in areas where unfavorable conditions force birds into inferior range, or where birds are already weakened by extreme weather conditions. In Massachusetts, investigators verified eight (two adult, six juvenile) losses to predators in the Quabbin Reservation between January 1960 and December 1966. Bobcat, Goshawk, and Bald Eagle took one Wild Turkey each, Great Horned Owl probably two, and three succumbed to unidentified avian or mammalian predators.

Limiting Factors: Parasites and Diseases. Several parasites and diseases have been recorded in Wild Turkeys. Under natural conditions, heavy losses seldom occur. However, serious consequences can result when domestic or introduced game-farm stock is allowed to mingle with wild birds. Blackhead, coccidiosis, and avian tuberculosis are among the debilitating diseases which can be transmitted in this manner. Wild Turkeys may also occasionally be afflicted by aspergillosis, a fungal disease; Leucocytozoon, a malaria-like blood parasite; and by gapeworms, tapeworms, and intestinal roundworms.

Habitat and Range. The Wild Turkey today is much more adaptive to variations in cover types than had been assumed in the 1930's. This diversity in habitat utilization hinders generalizations about the vegetal composition of Wild Turkey range. It is safe to assume, however, that the eastern birds are more suited to mature or nearly mature forests than to brush or shrub-stage woodland. Open stands of timber also seem more preferred than areas with a dense understory.

Most occupied habitat in the Northeast consists of hardwood forest types; mast-producing species such as oak, beech, hickory, and black cherry are frequently an important, though not an essential, component of Wild Turkey range. Free-flowing seeps and runs are often important features of winter habitat, while mountain ridges and wooded swamps provide refuges. Well-scattered forest openings, preferably comprising 10-50 percent of the total range, appear to be preferred for nesting and brood rearing.

The minimal area needed to support a self-sustaining Wild Turkey population depends on the pressures to which that population is subjected. Token numbers carefully managed and protected have been established in urban parks of a few hundred acres; however, such isolated stockings are unusual and impractical in most circumstances. Generally, an exploited population requires a minimum of about 15,000 acres of contiguous habitat, with 30,000-50,000

acres being more nearly ideal. The annual range of individual flocks varies with the availability of food, but may approximate four to nine square miles.

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Wild Turkeys were particularly abundant in presettlement Massachusetts and were probably found throughout the state except on the offshore islands and in the extreme northern Berkshires. The state's pre-Columbian Wild Turkey population has been estimated at about 39,300 birds, based upon a density of five birds per square mile and 7867 square miles of occupied range. William Wood (1634), an elderly resident, was impressed by the abundance of turkeys, commenting " ... sometimes there will be forty, threescore, and a hundred of a flocks, sometimes more and sometimes lesse ... ". The trader Thomas Morton (1937) agreed, writing that "Turkies there are, which divers times in great flocks have sallied by our doores ... ".

As settlement progressed, however, the woodlands were rapidly razed to open land for farms and villages, and Wild Turkeys became more and more restricted to isolated pockets of habitat on the less accessible hills and mountain ridges. This extensive and unselective decimation of the forest not only reduced the Wild Turkey's available range, but also made them more vulnerable to unrestricted persecution by professional market hunters who exploited the birds year-round. As early as 1672 Wild Turkeys were considered "very rare" in eastern Massachusetts and gobblers selling for 16 pence each in 1717 jumped to about 12 1/2 cents each by 1820.

By the late 18th century, few Wild Turkeys remained east of the Connecticut River, though one flock surprisingly persisted near Concord until about 1815. Wild Turkeys were still plentiful along the Connecticut River valley and in the southern Berkshires in 1800, but they faded rapidly in the following decades as land clearing reached its maximum. By the 1840's, Wild Turkeys were found only on the slopes of the Holyoke Range. These meagre flocks soon vanished also, and the last known native Wild Turkey was killed in 1851 on Mt. Tom. A few vague reports of stragglers continued until the 1870's, but these birds, if indeed present, were probably escaped domestics.

Soon after the Wild Turkey's extirpation, land use patterns in the Commonwealth shifted as farms were abandoned or neglected for the lure of the California gold fields, the bustle of city factories, or the strife of the Civil War. Nearly a third of a million acres of cropland were abandoned between 1860 and 1870 alone, and by 1910 commercial loggers were at work on once productive farmland. The depleted woodlands had gradually reverted to potential Wild Turkey habitat, but no birds remained to occupy it.

By the early 1900's, wildlife management had progressed to the propagation stage, and the state Fish and Game Commissioners were attempting to replenish scattered wildlife populations by captive breeding programs. Wild Turkeys were raised at the Wilbraham Game Farm as early as 1914, and at least 37 birds were released near Mt. Tom between 1915 and 1918. The program met with little success, however, and active efforts were discontinued after 1916.

In 1922, 65 turkeys of unknown origin were released by private individuals on Naushon Island, Dukes County. Additional releases of small numbers of birds were made in 1923, 1938 and 1940. A population was successfully established, though most birds lacked wildness and remained dependent on man. A few birds

are still present on the island today.

A second state attempt commenced in 1935. Thirty-five immature Wild Turkeys were obtained from a private New Jersey game farm and released in Beartown State Forest in South Lee. About 56 additional birds were released between 1936 and 1937, and at least one brood was produced in the wild in 1936. Additional game-farm birds were released in Savoy in 1935, Dalton in 1936, and Monterey in 1938. Although single birds and small groups persisted until about 1940, little reproduction took place and no population was established. The reasons for failure are not known, but the poor quality of the stock was certainly implicated.

The Division of Fisheries and Game obtained about 300 game-farm Wild Turkey eggs from the state of Pennsylvania in 1946. Hatching success was poor. Thirteen birds were released in the spring of 1947 on Prescott Peninsula in the Quabbin Reservation. At least one brood was produced that summer and 37 additional poults were released in the fall. However, the Wild Turkeys were seen infrequently after November and not at all by the following January. Again, the reasons for failure are unknown, but low-quality game-farm stock and poaching are both suspect.

During the 1950's several eastern states, notably West Virginia, Pennsylvania, and New York, demonstrated considerable success in restoring Wild Turkey populations by live-trapping wild birds in occupied areas and releasing them in vacant habitat. The cannon net trap, recently developed for capturing waterfowl, was readily adapted for use on Wild Turkeys and proved invaluable in obtaining the birds quickly, effectively, and in sufficient numbers. Additional progress was also made in evaluating the quality of various stock types and the suitability of release sites, thus increasing the chance of a successful stocking.

Based upon these advances, the Division decided once again to support a Wild Turkey restoration program. Federal-assistance funding was established by the Division through the Pittman-Robertson program, with the field work to be conducted by graduate students of the Massachusetts Cooperative Wildlife Research Unit at the University of Massachusetts. The study began in 1959 after an evaluation of potential release sites by biologist R. W. Bailey of the West Virginia Game Commission. Prescott Peninsula in the Quabbin Reservation was selected as the most suitable initial site, based upon the extent and quality of habitat, degree of protection, and availability to researchers.

The first releases were made in April 1960, consisting of two adult females from Greenbriar County, West Virginia, and six birds (three males and three females) trapped by permission on Naushon Island. Two broods totaling seven poults were known to be raised that summer. An additional nine juvenile females, raised from eggs provided by Pennsylvania's Allegheny Game Farm, were released on the peninsula in November. Five birds left the area, three were killed by predators, and three were lost to unknown causes, leaving 13 present in the spring of 1961. Five additional West Virginia wild-trapped birds (three males and two females) were released on the study area in March. Approximately 60 poults were produced that summer, with 48 surviving until September, bringing the fall total to about 62 birds.

Heavy winter mortality, possibly due to starvation, occurred during the winter of 1961-62, with only 17 Wild Turkeys being located that spring.

Reproduction in the summer of 1962 was fair, with 34 poults surviving until fall. High winter losses took place again in 1962-63 with 16 Wild Turkeys remaining on the peninsula in the spring of 1963.

In addition to the Quabbin studies, releases were also taking place at localities in western Massachusetts. Eleven Wild Turkeys of game-farm ancestry were trapped in Delaware County, New York, and released in the town of Mt. Washington in the southern Berkshires in January 1961. Sportsmen released 16 game-farm birds from Pennsylvania near Hayes Pond in Otis in October of the same year, and project students liberated 12 game-farm birds, nine poults captured in Quabbin in October Mountain State Forest between April, 1961, and September, 1962.

The Quabbin flock grew only slightly between 1963-65. Hatching success and poults survival showed a steady decline from 1961 to 1964 with only nine of 25 poults hatched in 1964 surviving until fall. Approximately 21 Wild Turkeys were present in the Quabbin in April, 1965, with a few more surviving off the Reservation in Shutesbury and New Salem.

The birds in Mt. Washington showed a high susceptibility to artificial feeding by local residents and became semidomestic in behavior. The October Mountain Wild Turkeys also displayed a lack of wildness. Only 12 birds were present in 1965 despite supplemental feeding by project personnel. The Otis stocking failed to establish a population, as did two released of Quabbin-strain birds on the Holyoke Range in 1964 and 1965.

Recruitment and survival in the Quabbin increased slightly from 1965-67, with 39 birds surviving until the 1966 breeding season and 43 present in April, 1967. Production, survival, and dispersal remained markedly inferior to that of pure wild-strain populations, however. Following the conclusion of graduate studies in 1967, the Wildlife Unit terminated its investigations and the Division of Fisheries and Game assumed full responsibility for the Wild Turkey restoration study.

Due to the slow progress of the project in central and western Massachusetts, plans were made for an additional release in the southeastern area of the state. West Virginia agreed to exchange wild-trapped Turkeys for raccoons, and in February and March, 1966, two gobblers and six hens were released in Miles Standish State Forest in Plymouth. Eight more birds (two toms and six hens) were trapped and transferred to the same location one year later. Unfortunately, considerable dispersal took place upon release and no verified breeding was noted after 1967. Sightings declined yearly thereafter and the last authentic report was received in 1971. Sightings thereafter were received without supporting data and probably represented escaped domestics.

The Quabbin breeding population increased slightly to about 50 birds by 1968, and about 60 by spring 1969. Small numbers of birds were also reported from nearby New Salem, Shutesbury, and Montague. Supplemental feeding was continued in 1969-70 but terminated the following winter. As expected, considerable mortality took place and intensive investigations of the Quabbin birds were curtailed.

Wild Turkeys from the Quabbin-New Salem area were transplanted to Barre State Forest in 1966, 1967, and 1969; to Douglas State Forest in 1968-69; and to

Hatfield in 1971. Initially encouraging dispersal and reproduction was followed by a slump in populations, and at present (1976) few, if any, Wild Turkeys remain at these localities.

The poor progress of the Wild Turkey in central and western Massachusetts had now clearly demonstrated that game-farm or mixed-ancestry birds were unsuitable for use in any further restoration efforts. Numerous studies in other states confirmed this, showing that game-farm Turkeys--regardless of claims of "high quality"--lacked the inherent qualities of wildness necessary for the unsupported establishment of breeding populations. The introduction of penned stock was also demonstrated to contaminate native flocks through cross-breeding or the introduction of disease. Stockings of tens of thousands of game-farm birds in dozens of states from the early 1950's to the present resulted in successful establishment only in limited areas of Michigan and New York. Expenditures were phenomenal and returns limited. Virtually all Wild Turkey biologists now deplore any release of semi-wild birds for any purpose.

Faced with this evidence, the Division decided to continue statewide restoration efforts only if sufficient wild-trapped stock could be obtained from a state with similar habitat and climatic conditions. After several contacts, the Bureau of Wildlife of the New York Department of Environmental Conservation agreed to provide Wild Turkeys in the interest of establishing regional populations.

In March, 1972, despite mild weather which hampered baiting and trapping, New York technicians, a student assistant, and I cannon-netted seven Wild Turkeys in Allegheny State Park in western New York and transported them to Beartown State Forest in the southern Berkshires. A second effort in February and March of 1973 resulted in ten more Wild Turkeys, nine of which were toms that had dominated bait sites and precluded the capture of hens. A final attempt that fall was more successful, with five adult hens and fifteen poults being captured. All Wild Turkeys were released at the same location in Beartown Forest.

Few sightings of the birds were made in the two years following the last release. Project personnel located a few small flocks on and near the forest during winter checks and cooperators observed one small brood during the summer of 1974.

After 1975, however, reports began to increase, and the Wild Turkeys showed additional signs of dispersal from the release area. They were reported not only in the forest but in Tyringham, Monterey, Stockbridge, and other neighboring towns. At least three broods were produced in 1975, and, based upon the distribution of reports, several more in 1976. Winter survival seems very good, with the Wild Turkeys feeding on natural foods in seeps and sheltered areas, and they exhibit a high degree of wildness which probably contributes to the scarcity of sightings.

Nearby states are also conducting Turkey studies, and spillover from expanding populations may well occur. Banded birds seen in northern and western Berkshire County probably originated from releases in New York and Vermont.

Should dispersal and production of the wild-string Wild Turkeys in the Berkshires continue, I can envision successful restorations in other areas of the

state. Massachusetts does lack the extensive interspersions of pastures, abandoned fields, and hardwood ridges found in other states with high populations, but much of central and western Massachusetts is nonetheless suitable Wild Turkey habitat. Small numbers of mixed-ancestry Turkeys still remain in the Quabbin and a few birds are occasionally seen elsewhere in central Massachusetts, but they do not pose an immediate problem to the expansion of wild birds.

The evaluation of the success of the program has been difficult due to the scarcity of sightings of the birds. Reports from cooperators, followed by field checks in the winter, have been our major source of information on the status of the population. These and other applicable techniques should be continued and transplants made as feasible, so that the Commonwealth may once again support flourishing flocks of Wild Turkeys for the enjoyment of its citizens.

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