

THE WILD TURKEY: AN ASTONISHING SUCCESS STORY

James E. Cardoza

Massachusetts Division of Fisheries and Wildlife
Westborough, Massachusetts, USA

Introduction

The wild turkey (Phasianidae: *Meleagris gallopavo*) represents one of the most significant wildlife restoration successes in North American history (Lewis 1987). This bird has not only been restored to virtually all of its ancestral range, but has been successfully introduced to suitable habitats elsewhere on the continent. I discuss the near extirpation of the wild turkey in North America, its eventual restoration and recovery, and some cautions for the future.



Original Distribution

Prior to the coming of Europeans, the wild turkey was widespread in eastern and central USA and Canada from southern Maine west through southern Ontario to central South Dakota, south to eastern Arizona, and east to Florida (Schorger 1966). In Mexico, it was largely confined to mountainous areas south to Veracruz and northern Jalisco. Six subspecies are recognized. The South Mexican turkey (*M. g. gallopavo*), from which domestic birds were derived, is apparently extinct in the wild.

Decline and Near Disappearance

The wild turkey was unquestionably abundant in appropriate habitats and the pre-Columbian population may have been >10.2 million birds (Schorger 1966). Josselyn (1865) saw three score broods sunning themselves in southern Maine in 1638 or 1639, while Lawson (1966) reported a “gang” of several hundred birds in a North Carolina swamp in 1701. J.J. Audubon (Audubon 1960) reported several hundred along the upper Mississippi River in the winter of 1810-11 and Lane (1926) reported flocks of 3000 birds in Oklahoma as late as 1877. This abundance did not last, however. As early as the 1660s, Josselyn (1865) lamented that “...the English and the Indians hav[e] now destroyed the breed, so that ‘tis very rare to meet with a wild turkie in the woods”. The vast hardwood forests were rapidly cleared for agriculture and settlements, and the wild turkey’s habitat dwindled (Kennamer et al. 1992). At least in New England, and probably elsewhere, this habitat loss was likely a greater threat than market gunning (Miller and Sherro 1987). In southern New England, some 70-80% of the land was cleared for agriculture between 1820 to 1850 (Bromley 1935). Mosby (1949) attributed the alarming decline of the wild turkey to a combination of habitat loss, destruction of mature nut-producing trees, excessive kill,

over-grazing by livestock, nest flooding, unfavorable climatic changes, and predation.

Growing Concerns and Subsequent Restoration

By the 1930's, the wild turkey was threatened throughout most of its range and there were serious concerns that it would soon vanish as a game species (Mosby 1975). Initial management efforts were largely concerned with restocking, principally with pen-reared stock (Blakey 1937). These efforts often failed. By 1948, the eastern (*M. g. silvestris*) and Florida (*M. g. osceola*) subspecies were found in only 19 states and occupied only 12% of their original range (Mosby 1949). The total USA population of the bird in 1951 was estimated at only 320,000 birds, with a legal harvest of 47,000 in 15 states (Mosby 1975). This dismal picture was soon to change, however, as vigorous restoration programs gained strength. The population nearly tripled to about 1.3 million birds by 1974, with an annual legal hunting kill of 137,000 birds in 39 states (Mosby 1975). By 1999, there were 5.4 million turkeys in 49 of the 50 states, including 10 beyond the limits of ancestral range (Tapley et al. 2001a). Turkeys were also restored to the province of Ontario in Canada with small numbers also found in Alberta, British Columbia, Manitoba, and Quebec as a result of natural range expansion from the USA (Wunz 1992). Gould's turkey (*M. g. mexicana*) is relatively secure in Mexico and has been reintroduced to Arizona. All 49 states with turkey populations, as well as four Canadian provinces, now have some form of regulated hunting season with 2.66 million hunters and an annual harvest of 740,000 birds (Tapley et al. 2001b). Turkeys have shifted from a near-vanished species to an abundant and highly valued game resource in about 70 years. What are the reasons for this astonishing recovery?

Why Restoration Worked

The North American model of wildlife conservation emerged in the late 19th century from concepts promoted by far-sighted sportsmen (Reiger 1975, Trefethen 1975). This model ultimately drove a system of sustainable development of renewable natural resources which is unparalleled elsewhere in the world (Geist et al. 2001). This brilliant system affirmed that publicly owned resources can be conserved rather than degraded. The key components of the model are: (1) wildlife as a public trust resource, (2) elimination of market hunting, (3) allocation of wildlife to the public by law, (4) wildlife only to be killed for legitimate purposes, (5) wildlife considered an international resource, (6) wildlife policy must be science-based, and (7) hunting is a democratic phenomenon.

Specific policies and actions which directly contributed to the restoration of the wild turkey include:

1. By the 1880s, most states and provinces had established basic game laws, with the authority to set seasons, bag limits, and other regulatory controls gradually becoming entrusted to quasi-independent game commissions, rather than to political legislative bodies. Fee-based hunting licenses were implemented in the early 1900's and full-time game enforcement officers were hired to enforce wildlife conservation laws.

2. The U.S. Federal Aid in Wildlife Restoration Act (PR) of 1937 derives funds from federal excise taxes on sporting arms and ammunition and returns those funds proportionately to the states for wildlife restoration and research. By law, such funds cannot be diverted for any other purpose. Fifty years later, over \$2 billion had been devoted to these purposes (Williamson 1987), with the wild turkey receiving an ample share.

3. The U.S. government began acquiring land for National Wildlife Refuges in 1903 and National Forests in 1905. Land acquisition picked up in the 1930's in the aftermath of the Dust Bowl and the Depression. By 1987, states had used PR land acquisition monies to purchase 1.6 million and manage 20.2 million hectares of habitat for wildlife (Williamson 1987). These efforts to check habitat loss and degradation bolstered the return of the wild turkey.

4. After several failures— which slowed restoration efforts for almost 20 years— biologists learned that wild-trapped turkeys, rather than pen-reared ones, were the only suitable stock for restoration (Leopold 1944, Wunz 1973). Many of the wild turkey's survival skills represent learned, rather than instinctive, behaviors. Consequently, pen-raised turkeys which are isolated from normal parental influence cannot develop these skills and are maladapted to a wild environment. Bailey and Putnam (1979) found that over the previous 30 years about 796 releases of 330,000 pen-raised birds and 968 releases of 29,000 wild-trapped birds were made in 36 states. About 36 (4.5%) of the pen-raised releases were successful, resulting in about 23,500 km² of occupied range, whereas 808 (83%) of wild-trapped releases succeeded, occupying 520,500 km² of range. The superiority of the wild-trapped stock is evident.

5. Although the plains-dwelling Rio Grande (*M. g. intermedia*) and Merriam's (*M. g. merriami*) turkeys could be taken in drop-front or drop-net traps (Glazener 1964), trap-and-transplant of eastern and Florida turkeys was largely unsuccessful until the introduction of the cannon net. This versatile device, originally developed for the capture of waterfowl (Dill and Thornsberry 1950), was soon adapted for the live capture of turkeys (Holbrook 1958). More powerful rocket-propelled nets were soon developed (Hawkins et al. 1968, Eriksen et al. n.d.) and

further revolutionized the safe, rapid, and efficient capture of turkeys for research and restoration.

A View to the Future

Despite these remarkable accomplishments, we can't afford to be complacent. In the short term, the wild turkey is secure and thriving. In the long term, there are several concerns which have implications for turkeys as well as other wildlife.

1. Habitat destruction and alteration is now the major cause of species endangerment (Noss and Murphy 1995) but uncontrolled human population growth (Gehrt 1996) threatens the ability of our planet to sustain itself. Despite falling fertility rates, the global human population is expected to reach 7.3 to 10.7 billion by 2050 (Kluger 2000). This will place immense demands on the land base and turkeys and turkey enthusiasts must compete with these demands for a variety of human needs that may be incompatible with the needs of wildlife.
2. Recruitment in wild turkey populations is highly variable and associated with annual fluctuations in nest survival. Weather extremes may seriously affect nest and poult survival (Roberts and Porter 1998a, 1998b). Long-term climatic changes (Bradley et al. 1987, Gardiner 1998) are forcing shifts in the distributions of plants and animals which bode poorly for the earth's ecosystems. Such climatic changes may well induce weather extremes which affect wild turkey distribution and survival.
3. The social aspects of wildlife management are growing more intense as we enter the 21st century, driving the need for further investment in human dimensions. The implementation of the stake-holder concept (Decker et al. 1996) and public involvement and participation in decision-making (Guynn and Landry 1997) will be essential components of natural resource conservation. At the same time, we must guard against commercialization, nuisance animals, and other actions which devalue wildlife (Geist et. al 2001).
4. Exotic diseases (Cunningham 1996, Daszak et al. 2000) are a growing threat in the face of global economics and rapid intercontinental transportation. Epizootics which threaten domestic turkeys may elicit an aggressive emergency response by national agriculture agencies, resulting in programs to depopulate the domestic birds' wild congeners. Disease monitoring protocols and cross-border quarantines are essential for safeguarding wild populations.

Literature Cited

- Audubon, M.R. 1960. Audubon and his journals. v. 1. Dover Publications, New York, New York, 532pp.
- Bailey, R.W. and D.J. Putnam. 1979. Biologically speaking: 1979 turkey restoration survey. *Turkey Call* 6(3):28-30.
- Blakey, H.L. 1937. Wild turkey management on the Missouri Ozark range. *Transactions of the North American Wildlife Conference* 2:494-498.
- Bradley, R.S., H.F. Diaz, J.K. Escheid, P.D. Jones, P.M. Kelly, and C.M. Goodess. 1987. Precipitation fluctuations over Northern Hemisphere land areas since the mid-19th century. *Science* 237:171-175.
- Bromley, S.W. 1935. The original forest types of southern New England. *Ecological Monographs* 5:61-89.
- Cunningham, A.A. 1996. Disease risks of wildlife translocations. *Conservation Biology* 10:349-353.
- Daszak, P., A.A. Cunningham, and A.D. Hyatt. 2000. Emerging infectious diseases of wildlife— threats to biodiversity and human health. *Science* 287:443-449.
- Decker, D.J., C.C. Krueger, R.A. Baer, Jr., B.A. Knuth, and M.E. Richmond. 1996. From clients to stakeholders: a philosophical shift for fish and wildlife management. *Human Dimensions of Wildlife* 1(1):70-82.
- Dill, H.H. and W.H. Thornsberry. 1950. A cannon-projected net trap for capturing waterfowl. *Journal of Wildlife Management* 14:132-137.
- Eriksen, B., J. Cardoza, J. Pack, and H. Kilpatrick. n.d. Procedures and guidelines for rocket-netting wild turkeys. National Wild Turkey Federation, Edgefield, South Carolina, Technical Bulletin 1.
- Gardiner, D.M. 1998. Potential impacts of climate change. *Transactions of the North American Wildlife and Natural Resources Conference* 63:38-43.
- Gehrt, S.D. 1996. The human population problem: educating and changing behavior. *Conservation Biology* 10:900-903.
- Geist, V., S.P. Mahoney, and J.F. Organ. 2001. Why hunting has defined the North American model of wildlife conservation. *Transactions*

of the North American Wildlife and Natural Resources Conference
66:175-185.

Glazener, W.C. 1964. The Texas drop-net turkey trap. *Journal of Wildlife Management* 28:280-287.

Guynn, D.E. and M.K. Landry. 1997. A case study of citizen participation as a success model for innovative solutions for natural resource problems. *Wildlife Society Bulletin* 25:392-398.

Hawkins, R.E., L.D. Martoglio, and G.G. Montgomery. 1968. Cannon-netting deer. *Journal of Wildlife Management* 32:191-195.

Holbrook, H.L. 1958. The Francis Marion turkey project (a progress report). *Proceedings of the Annual Conference of the Southeastern Association of Game and Fish Commissioners* 11:355-363.

Josselyn, J. 1865. *New-England's rarities discovered*. W. Veazie, Boston, 169pp.

Kennamer, J.E., M. Kennamer, and R. Brenneman. 1992. History. Pages 6-17 *in* J.G. Dickson, ed. *The wild turkey. Biology and management*. Stackpole Books, Harrisburg, Pennsylvania, 463pp.

Kluger, J. 2000. The big crunch. *Time* 155(17):44-47.

Lane, H.H. 1926. Oklahoma. Pages 490-502 *in* V.E. Shelford, ed. *Naturalist's guide to the Americas*. The Williams and Wilkins Co., Baltimore, Maryland, 761pp.

Lawson, J. 1966. *A new voyage to Carolina*. University Microfilms, Inc., Ann Arbor, Michigan, 258pp.

Leopold, A.S. 1944. The nature of heritable wildness in turkeys. *Condor* 46:133-197.

Lewis, J.B. 1987. Success story: wild turkey. Pages 31-43 *in* H. Kallman, ed. *Restoring America's wildlife, 1937-1987*. United States Fish and Wildlife Service, Washington, D.C., 394pp.

Miller, B.K. and D. Sherro. 1987. Factors influencing the disappearance of the eastern wild turkey from southern New England in the 19th century. *Transactions of the Northeast Section of The Wildlife Society* 44:8-15.

- Mosby, H.S. 1949. The present status and the future outlook of the eastern and Florida wild turkeys. *Transactions of the North American Wildlife Conference* 14:346-354.
- Mosby, H.S. 1975. The status of the wild turkey in 1974. *Proceedings of the National Wild Turkey Symposium* 3:22-26.
- Noss, R.F. and D.D. Murphy. 1995. Endangered species left homeless in Sweet Home. *Conservation Biology* 9:229-231.
- Reiger, J.F. 1975. *American sportsmen and the origins of conservation.* Winchester Press, New York, 316pp.
- Roberts, S.D. and W.F. Porter. 1998a. Influence of temperature and precipitation on survival of wild turkey poults. *Journal of Wildlife Management* 62:1499-1505.
- Roberts, S.D. and W.F. Porter. 1998b. Relation between weather and survival of wild turkey nests. *Journal of Wildlife Management* 62:1492-1498.
- Schorger, A.W. 1966. *The wild turkey. Its history and domestication.* University of Oklahoma Press, Norman, Oklahoma, 625pp.
- Tapley, J.L., R.K. Abernethy, and J.E. Kennamer. 2001a. Status and distribution of the wild turkey in 1999. *Proceedings of the National Wild Turkey Symposium* 8:15-22.
- Tapley, J.L., W.M. Healy, R.K. Abernethy, and J.E. Kennamer. 2001b. Status of wild turkey hunting in North America. *Proceedings of the National Wild Turkey Symposium* 8:257-267.
- Trefethen, J.B. 1975. *An American crusade for wildlife.* Winchester Press, New York, 409pp.
- Wunz, G.A. 1973. Evaluation of game-farm and wild-trapped turkeys in Pennsylvania. Pages 199-209 in G.C. Sanderson and H.C. Schultz, eds. *Wild turkey management. Current problems and programs.* Missouri Chapter of The Wildlife Society and University of Missouri Press, Columbia, Missouri, 355pp.
- Wunz, G.A. 1992. Wild turkeys outside their historic range. Pages 361-384 in J.G. Dickson, ed. *The wild turkey. Biology and management.* Stackpole Books, Harrisburg, Pennsylvania, 463pp.
-
- World Pheasant Association News 70:4-5, 2002.

