Ruffed Grouse

Upland Game Birds

Eastern Wild Turkey

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Wild Turkey and Upland Game Birds 2006-2007 Annual Report

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INTRODUCTION

The Wild Turkey and Upland Game Bird Project manages populations and habitats of wild turkeys, ruffed grouse, bobwhite quail, and ring-necked pheasants. Although each of these species are managed differently due to their unique ecology, they are all important in providing recreational opportunities in Maryland through hunting and other wildlife-dependent recreation.

Less than 50 years ago, only a few hundred turkeys remained in Maryland following years of unrestricted hunting and habitat loss. Fortunately, the DNR initiated a restoration effort that resulted in what many would rank among the most successful wildlife conservation success stories in the state's history. Wild turkeys now number over 30,000, providing recreation for over 15,000 turkey hunters and countless wildlife enthusiasts and citizens. Turkey hunting alone results in an economic benefit to Maryland of nearly $5 million every year. The Upland Game Bird Project monitors population levels, develops hunting regulations, and conserves habitat that will keep these birds around for future generations.

A different and more daunting challenge faces the Upland Game Bird Project with bobwhite quail. Although the distinctive whistle of the bobwhite was once a common sound in Maryland's agricultural areas, the number of quail is now less than 10% of what it was just 40 years ago. Despite widespread belief that foxes, hawks, or agricultural chemicals are to blame, the main culprit is simply loss of habitat. If the brushy thickets and grasslands that quail depend on are not restored, not only will their "bob-white" call be missed, but a treasured part of our hunting heritage and symbol of rural Maryland life will be gone forever. One of the greatest challenges of the Upland Game Bird Project is ensuring that these magnificent birds are here to stay. Habitat is being lost at an alarming rate and farmers and landowners will need to make difficult decisions about their land and how they use it if we hope to reverse the decline. We assist landowners to create habitat in their fields and forests, work within our agency to improve our network of public lands, and educate the public about what they can do to help.

As with quail, ruffed grouse need a specific type of habitat to survive. Grouse are restricted to the western mountainous counties and are primarily found in young forests. They inhabit areas that have been timbered or where wind or insect damage has created a mosaic of thick, brushy forests that have good cover and abundant food. These types of habitat are becoming increasingly rare in certain places, so the Upland Game Bird Project works to make sure that young forests remain a valuable component of our mountain landscapes.

WILD TURKEY

2006 Poult Production

Wild turkey reproductive success varies from year to year, largely dependent on weather conditions during the nesting and early brood rearing period. Ultimately, reproduction affects population growth rates, hunter success, and fall and spring harvests. For these reasons, it is important to monitor how many young turkeys, or poults, are produced each year. Turkey reproduction is monitored annually using 2 separate summer turkey observation surveys. For a detailed description of the surveys, see the 2006 Maryland Wild Turkey Observation Survey Summary.

A total of 3,957 wild turkeys were counted in 592 observations by the 79 individuals or groups that returned turkey observation survey forms in 2006. Turkey productivity, as indexed by the number of poults seen per adult hen, was average or below-average throughout most of Maryland (Table 1). The Appalachian Plateau (Garrett County) and Ridge and Valley regions (Allegany and Washington counties) experienced the highest production with 3.7 and 3.6 poults observed per hen, respectively. Productivity was approximately 25% below average in the remainder of state with poult to hen ratios ranging

from 2.1 in the Piedmont region to 2.4 in the Coastal Plain region. Poor nesting success and early poult survival appears to have limited production in areas East of the mountains. The percent of hens observed with poults was exceptionally high in the western region (72%- 81%) but fewer hens appeared to have nested successfully in the Piedmont (39% brood hens) and Coastal Plain. Poor early reproductive success is also evident by examining the indices in June, when only 41% of hens were seen with broods and poult per hen ratio was 2.1. However average brood size was high (9.1 poults per brood), suggesting that poult survival in the late brooding period was above-average. It should be noted that the Blue Ridge and Piedmont estimates of productivity are typically based on much smaller samples than the other regions, making definitive conclusions in those areas more difficult.

The data suggest that turkeys experienced average nesting success and poult survival in the western region. Heavy rains and cold temperatures during the nesting and early brood-rearing period have long been thought to hinder turkey reproduction. In the Central, Southern, and Eastern regions, heavy rains during the peak of the hatch likely impacted nesting and early poult survival on a localized basis. Anecdotal observations suggest spotty reproductive success; observers in some counties saw few poults while other observers in nearby counties saw large numbers of broods.

A 2nd, more intensive survey is conducted in the western fall-hunted section of the state. Observers not only record the number of turkeys seen, but also record the mileage driven each month. The western region survey results agreed with statewide survey and suggested productivity in the Western Region was on par with the long-term average (Table 2). A productivity index of 3.3 poults per hen was observed, higher than 2005's estimate of 2.9 and similar to the long-term average of 3.1. The percent of hens observed with broods increased through the survey period to a high of 95%, suggesting late-nesters faired better than early-nesters. Approximately 8.2 poults were observed per brood (Note that broods from different hens that travel together are counted as 1 brood). The number of broods seen per 1,000 miles driven was higher than average at 0.9. The number of turkeys seen per 1,000 miles increased from 2005's index of 8.2 to 10.0 in 2006.

2006 Fall Season

Maryland's fall turkey season is limited to the western 3 counties of the state. Fall turkey hunters reported taking 205 wild turkeys during the 1-week season, representing a 50% increase from the 2005 harvest of 137 turkeys. (Figure 1, Table 3). Allegany and Garrett counties reported the highest harvest with 80 turkeys each, followed by Washington with 45 turkeys reported. Favorable weather during the season and average or slightly above-average reproduction in the summer of 2006 likely contributed to the increase. Long term declines in fall harvest are likely related to a decreasing hunter participation. The most recent hunter mail survey estimates that fall hunter numbers have declined from 15,000 in 1975 to 2,000 in 2005.

2007 Spring Season

Maryland's 2007 regular spring turkey season occurred April 18-May 23 and a 1-day youth hunt was held on April 14. Hunters reported taking 2,455 wild turkeys, representing an 18% decrease from the 2006 harvest of 3,008 turkeys (Figure 1, Table 4) update.. Annual surveys conducted by DNR indicated that reproductive success was below-average across much of the state during the summers of 2005 and 2006. The lack of 1 and 2-year old gobblers was also evident in the age structure of the harvest. An unusually high percentage of gobblers taken in the last 2 spring seasons were adults. Junior hunters harvested 102 turkeys during the 1 day youth hunt, down considerably from last year's youth day total of 168.

As in the past, a large portion of the harvest (37%) occurred during the 1st week. While most hunters took their birds on private land, a fair number of turkeys (18%) were taken on Maryland's public hunting areas. Leading the state in harvest again this year were the western mountain counties of Garrett (303), Washington (269), and Allegany (259). However, Charles (209), Dorchester (205), and Worcester (196) counties also reported respectable numbers.

Although spring turkey hunting in Maryland has grown tremendously in popularity since the 1970's, it appears that participation in this season has stabilized and possible declined in the past several years. The most recent hunter mail survey (2005) estimated that about 10,000 spring turkey hunters hunted approximately 48,000 days. About 25% of spring gobbler hunters are successful in bagging a turkey.

Population Status

A variety of data is used to monitor Maryland's wild turkey population. If seasons and bag limits are relatively constant, spring harvest has been shown to be an accurate method to estimate, or index, turkey densities and population trends. A Breeding Density Index (BDI) has been calculated for each county based on the spring harvest over the last 3 years (Table 4). The BDI provides a relative index to turkey densities by county.

The Western Region's vast forests have traditionally harbored the highest densities of turkeys in the state and are still a stronghold (Table 4). However, turkey densities in some lower Eastern Shore counties have equaled densities in the mountains, demonstrating that wild turkeys are adaptable birds that are able to flourish in a variety of habitats. Low to moderate densities are found throughout the remainder of the state. The central, more urbanized region of Maryland supports the fewest turkeys.

Trend analysis is used to determine where spring harvests are increasing, decreasing, or stable over the last 10 years. Wild turkey harvests have been substantially increasing in 12 of Maryland's 23 counties, indicating that populations there are likely still growing (Table 4). Counties exhibiting the most rapid population growth include Anne Arundel, Harford, St. Mary's, Prince George's, Baltimore, and Caroline. Harvest in 8 counties has remained stable and harvests have declined in 3 counties. Although the decreasing harvest trend may appear to indicate a problem in Garrett, Allegany, and Calvert county, the trend is only an index to turkey populations and other factors may be causing the decline. Recently, turkeys have become well-established in many non-traditional areas and it is likely that many hunters that used to travel to hunt in Garrett, Allegany, and Calvert counties are now staying closer to their homes to hunt. Therefore the decline is most likely a result of lower hunter participation. Additionally, Calvert county is undergoing extensive land development, surely limiting habitat in the county. So although there may be fewer turkeys there, the density of turkeys in suitable habitat appears to be stable. Hunter success rates and other sources of data confirm that turkey populations remain strong in these counties despite harvest drops.

The Bowhunter Survey has also been used since 2003 to gather information on turkey populations and other game species in Maryland.

RUFFED GROUSE

Population Status and Hunting

Ruffed grouse inhabit the forested mountains of Garrett, Allegany, Washington, and Frederick Counties. They have been a traditional staple for Western Region upland game bird hunters for decades. Data suggests that ruffed grouse populations in Maryland have remained somewhat stable since the mid-70s. However, the number of Maryland grouse hunters continues to decrease. This parallels the decline in participation of other small-game hunting, such as quail, squirrel, and rabbit. The DNR's Hunter Mail Survey for the 2005-2006 season reported an estimated 1,200 grouse hunters in Maryland. The typical grouse hunter spent about 3 days afield and harvested an average of 1 grouse per day in the 2005-06 season. Although the number of grouse hunters has declined in recent years, success rates have remained stable or increased in the last few years.
The Bowhunter Survey data also suggest that grouse populations have increased over the last few years, particularly in Garrett County. Bowhunters reported seeing about 3.5 grouse per 100 hours in the 2006-07 season, significantly higher that the 1.5 grouse per 100 hours observed in 2003-04. Grouse densities are lower in Allegany and Washington, but populations have remained relatively stable according the bowhunter survey. Bowhunters in the region reported seeing between 0.5 and 0.8 grouse per 100 hours over the last 5 years.

Appalachian Cooperative Grouse Research Project

From 1996-2002, Maryland DNR participated in the Appalachian Cooperative Grouse Research Project (ACGRP). This long-term research project included study areas in Maryland, Virginia, West Virginia, Ohio, Kentucky, North Carolina, Pennsylvania, and Rhode Island. The major objective of this cooperative research effort was to determine factors influencing ruffed grouse populations in the Appalachian region of the ruffed grouse range. Research included determining grouse survival rates, reproductive rates, and causes of mortality. An additional goal of the project was to determine the effect (if any) that late season grouse hunting may have on the population.

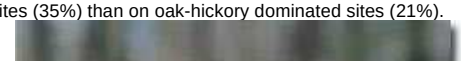
Final Appalachian Cooperative Grouse Research Project Report

Maryland Study Site (Mt. Nebo WMA) Data Summary

Overall, data were collected on 3,118 ruffed grouse captured on the 12 study sites from September 1996 through October 2002. General results indicated that the ecology of Appalachian ruffed grouse differs from northern ruffed grouse populations (i.e., Great Lake States) where aspen offers good food and aspen forest management creates an abundance of cover. Adult survival tended to be higher in the Appalachians, but reproductive success was lower. Within the Appalachians, grouse populations differed between areas dominated by mixed-mesophytic cover types and oak-hickory dominated sites.

Specific, significant findings of the ACGRP include:

- Spring pre-breeding diets in Great Lake States ruffed grouse were dominated by aspen buds whereas in the Appalachians diets were more variable, with oak mast, herbaceous and evergreen leaves, and flowers being most prevalent. Appalachian diets tended to be of lower nutritional quality than that of northern birds feeding on aspen.
- The nutritional condition of females in the Appalachians prior to nesting was quite variable, and body fat levels showed a strong relationship to acorn availability, with higher body fat being found where acorns were available. When female body fat was less than 11% chick survival was lower.
- Nest success ranged from 52% to 87% across the sites and years studied. Successful nests tended to be over 100 m from openings in pole-size timber stands with dense understories.
- Chick survival was extremely low compared to studies from other areas. Chick survival to 35 days averaged 22%. Chick survival was higher on mixed-mesophytic sites (35%) than on oak-hickory dominated sites (21%).
- A radio-telemetry study of chick survival found that



mortality of 118 chicks was evenly distributed between exposure (44%) and predation (44%).
- Nest and re-nest rates were lower in oak-hickory areas (86% and 3.2%, respectively) than in mixed-mesophytic sites (100% and 45%, respectively).
- Overall adult survival was 43% across all sites and years. Annual survival rates were higher on oak-hickory sites (50%) than mixed-mesophytic sites (39%). Survival was higher in the spring-summer period and lower in fall-winter, and did not differ between age or sex classes.
- A hunting experiment was conducted on 7 sites over the 6-year study. Hunting mortality on these sites was compensatory. Hunting was only 12% of all mortality on average, and ranged from 0% to 35% across sites and years; we cannot conclude or infer that hunting would be compensatory at higher harvest rates.
- The primary cause of adult mortality was avian predation (44%) followed by mammalian predation (26%).
- Ruffed grouse generally selected early successional habitats, or sites that had the high stem densities characteristic of early successional habitats. Females with broods selected sites that had higher than average herbaceous cover and greater arthropod abundance than random sites.
- Home ranges were calculated for 1,054 grouse based on 67,814 telemetry locations. Adult and juvenile females and juvenile males had larger home ranges than adult males. Females with broods had larger home ranges (39 ha) than females whose broods failed (15 ha). In oak-hickory sites, both female and male home ranges increased following years of acorn failure (20 ha to 52 ha in females and 7 to 27 ha in males).

Management suggestions include:

- Maintain current harvest levels and seasons; populations are not limited by current hunting levels.
- Increases in populations are most likely to come from habitat management. In mixed-mesophytic areas "traditional" early successional grouse management will likely be successful. This should emphasize using timber harvest techniques that will provide a diversity of young-aged stands interspersed among mature forests.
- In oak-hickory dominated sites, forest management should strive to provide both food (acorns) and cover (early successional habitat) needs of grouse in close proximity.
- Roads can be managed by gating and planting preferred herbaceous foods to supplement existing natural foods.

BOBWHITE QUAIL AND RING-NECKED PHEASANT

Population Status

Once a mainstay for upland game bird enthusiasts in much of the state, northern bobwhite (often called bobwhite quail) and ring-necked pheasant populations have declined significantly in the last few decades. Information on trends of quail and pheasant populations comes from two sources. The Breeding Bird Survey estimates quail and pheasant population trends and is coordinated by the United States Fish and Wildlife Service (USFWS). It also monitors the status of many other breeding birds. The Maryland hunter mail survey is used to monitor trends in game harvest, number of hunters, and days spent hunting. This survey is based on a random sample of hunting license buyers in Maryland.

The Breeding Bird Survey estimates a population decline of nearly 5% per year for quail since the mid-1960s and an even steeper fall for pheasants. This equates to more than a 90% reduction in numbers of both species over the last 40 years. Quail populations have suffered most severely in central and western Maryland but less so on the lower Eastern Shore. The number of quail harvested by hunters has dropped from over 200,000 per year in the mid-1970s to around 1,200 in the 2005-06 season.

The sharp decline of quail and pheasants is not a problem specific to Maryland. Every eastern state within their range has experienced similar drops. It is likely that a combination of factors have interacted to suppress these game birds. Without a doubt, habitat loss and fragmentation has been, and continues to be, the greatest detriment to upland game birds. Quail and pheasants are early-successional species, meaning they inhabit areas that have recently been disturbed. Fallowed fields, brushy fencerows, and recently cleared forests are examples of early-successional habitats. Throughout the middle part of the 1900s, this type of habitat was abundant. However, farming became more efficient and forests matured. Cleared hedgerows, fields that are tilled every year, suburbia, and old forests result in little suitable habitat for these species.

With fewer acres of habitat, predators, pesticides, and "clean-farming" methods become more detrimental to quail populations. As these birds become concentrated in smaller areas of habitat, predators become more efficient. Predators will always take their share of quail and eggs; but if the population is large, the effect is minimal. Increased use of herbicides and insecticides kill naturally occurring food sources that are required by upland birds to survive. Furthermore, advancements in farming technology allow farmers to harvest hay and other crops sooner, more quickly, and "cleaner" than in the past. These methods potentially destroy nests, kill birds, and leave little or no cover after crop harvest.

Habitat Incentives for Landowners

In order to reverse the decline of quail and pheasants, a large-scale, landscape-level change is needed. Such a change is possible with the variety of landowner incentives currently available. The Conservation Reserve Enhancement Program (CREP) was authorized by the 1996 Federal Farm Bill, and then reauthorized in 2002, to provide financial incentives to remove agricultural lands from production. The CREP has dual benefits of protecting water quality and providing wildlife habitat. After enrolling acreage in the CREP, landowners receive an annual rental payment for the life of the 10 or 15-year contract. Sign-up bonuses and other incentives are also provided depending on the type of enrollment. Native warm season grasses are being planted in many of the buffers, providing abundant nesting and brood-rearing habitat for upland birds. By the end of 2006, over 70,000 acres of agricultural land in Maryland had been converted to grass buffers or riparian forest buffers. Over 40,000 acres of linear buffers have been planted on the Eastern Shore, the traditional core of bobwhite populations, providing much-needed connection between pockets of existing habitat.

Another source of hope for our dwindling upland bird populations came in 2005 when a new CRP practice was unveiled by the U.S. Department of Agriculture. It's called "Bobwhite Buffers" and is part of the CRP (Conservation Reserve Program) but is different in that it specifically targets bobwhite quail. This initiative has the potential to restore thousands of acres of habitat and reverse the population declines. Enrollment in the "Bobwhite Buffers" program is completely voluntary and simply requires the establishment of 35-120 foot buffers of planted or native vegetation around the perimeter of enrolled crop fields. In turn the landowner or farmer receives annual rental payments for the life of the 10-year contract as well as the satisfaction of knowing that they are helping to restore vital quail habitat. Research has shown that the edges of crop fields typically are the least productive part of the fields. This program is a win-win situation. Farmers receive supplemental income on their marginal lands and quail habitat is created. Because the "Bobwhite Buffers" program is capped at 2,100 acres in Maryland, the practice is focused in areas with the greatest potential to provide for quail habitat needs. It is limited to Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Somerset, Worcester, Charles, St. Mary's, and Calvert Counties.

Establishment of grass buffers and periodic management through disking or prescribed burning is the most efficient way to restore quail habitat.

With these and other programs, landowners now have all the options they need to make their property ideal for quail and other wildlife. Much more habitat is needed, and anyone concerned about the possible loss of quail or pheasants from Maryland's landscape should educate others about the importance of providing habitat. Support for programs like the CRP is critical to the restoration of early-successional habitat and the wildlife it supports. For more information on the Bobwhite Buffers initiative or increasing quail habitat on your property, contact DNR's Upland Game Bird Program at 410-221-8838, ext. 106 or blong@dnr.state.md.us.

Incentive programs that can be used to establish and manage quail habitat on private lands:

Program	Requirements	Benefit to Quail	Type of assistance
"Bobwhite Buffers" program	Establish planted or fallow buffers along edges of crop fields	Nesting, brood rearing and feeding habitat; Year-round habitat if shrubs included	Cost-share for establishment + annual per-acre rental payments
Landowner Incentive Program (LIP) – Grassland Initiative	Fallow eligible crop fields for 3 years (do not plant) OR plant native grasses	Nesting, brood rearing and feeding habitat	Cost-share for establishment and/or annual per-acre rental payments depending on practice
		Nesting, brood-	Cost-share for

Conservation Reserve Program (CRP)	Plant grasses, shrubs and/or trees on agricultural lands	rearing, or winter habitat depending on plantings	establishment + annual per-acre rental payments
Conservation Reserve Enhancement Program (CREP)	Establish grass, shrub and/or tree buffers on cropland near water bodies or wetlands	Nesting, brood-rearing, or winter habitat depending on plantings	Cost-share for establishment + annual per-acre rental payments + various other incentives
Wildlife Habitat Incentive Program (WHIP)	Various practices available including grass/shrub plantings, hedgerow restoration, and field edge feathering	Nesting, brood-rearing, or winter habitat depending on practice implemented	Cost-share for establishment or management

Links to Figures & Tables

Figure 1: Maryland Spring and Fall Wild Turkey Harvests, 1970-2006

Table 1. Wild turkey production estimates (poults per hen) by physiographic region - 1996-2006

Table 2. Western Region (Fall-hunted Area - Washington, Allegany, Garrett) Brood Survey Results, 1999-2006

Table 3. Maryland's Reported Fall Turkey Season Harvest, 2001-2006

Table 4. Spring Turkey Harvest Statistics, 2003-2007

Photographs (top to bottom):

- The restoration of the wild turkey ranks among the greatest conservation success stories in Maryland history. Photo courtesy of NWTF.
- Brushy thickets and weedy fields like this will need to be restored in order to reverse the decline of bobwhite quail.
- A combination of DNR staff and volunteers are used to estimate reproductive success of turkeys throughout Maryland. Photo courtesy of NWTF.
- Ultimately, reproduction affects population growth rates, hunter success, and fall and spring harvests. Photo courtesy of NWTF.
- Fall Turkey Hunter. Photo courtesy of NWTF.
- Spring Turkey Hunter. Photo courtesy of NWTF.
- Although ruffed grouse are limited to the Western mountains, they provide exciting hunting for many Maryland upland bird hunters.
- Over 3,000 grouse were equipped with radio-transmitters for the ACGRP.
- Bobwhite Quail
- Nest predators can hunt more efficiently when habitat is limited. A camera at this Virginia quail nest documented these raccoons.
- Establishment of grass buffers and periodic management through disking or prescribed burning is the most efficient way to restore quail habitat.

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