NJ Division of Fish and Wildlife
Bureau of Wildlife Management

WILD TURKEY RESEARCH PROJECT REPORT
2003

A summary and analysis of harvest information, population data, hunter survey data, trapping operation data, nuisance turkey situations, scientific research investigations, and management implications for Eastern Wild Turkeys in New Jersey.

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Introduction

New Jersey's current wild turkey resource is the result of twenty-eight years of sound management practices based upon scientific investigations including intensive harvest data collection, surveys and scientific research. New Jersey's turkey population, currently estimated at 23,000 - 25,000 birds, has increased substantially since the first release of 23 birds in 1977. Division biologists, with the assistance of volunteers, have utilized state-of-the-art techniques and equipment to ensure that turkeys inhabit all suitable areas. The New Jersey Fish and Game Council makes sound decisions concerning hunting season structures based upon current data analysis and recommendations of Division biologists. All of these aspects continue to contribute toward the future success of the eastern wild turkey in New Jersey.

New Jersey has seen record turkey harvests for many years. The spring gobbler season is the most liberal it has ever been, and three years of low productivity (2001 - 2003) due to poor spring weather conditions will necessitate a close inspection of the current status compared to long-term data. It is especially important that the Fish and Game Council and Division biologists utilize the extensive database to ensure that current and future generations will continue to benefit from the successes of wild turkey restoration.

This report focuses on all aspects of wild turkey management in New Jersey. Information on season structures, permit issuance, hunter success rates, harvest data, population estimates, hunter survey data, wild turkey productivity, gobbler mortality, trapping operations, and nuisance turkeys is included.

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Section 1: Spring / Fall Turkey Harvest Analysis

Objective

The objective of this section is to summarize the data collected during the 2003 spring and fall turkey seasons and to present an analysis of that data so that management concerns can be addressed and long term trends can be compared.

Summary

2003 Spring Gobbler Season:

The 2003 Spring Gobbler Season kept the same season structure and permit quotas as 2002. This stability in season parameters will enable a comparison of these two years. Yearly changes in season structure and permit quotas (as has happened often since 1981) adds variability that is difficult to quantify. The 2003 spring turkey season permit quota was 29,250 for the six-week season. Permittees were selected at random from all applications received during the period February 1-22, 2003. Permits remaining after the lottery were available for sale at Division offices just before and during the season. Fifty-five mandatory checking stations were in operation during the season. Spring hunters reported harvesting 3,591 gobblers, a decrease of 4.9% from the 3,779 birds taken in 2002. New Jersey held its second Youth Turkey Hunting Day on April 12, 2003 that was open to hunters 16 years of age and younger. The harvest on the youth day was 94 birds, compared to 152 in 2002.

2003 Fall Turkey Season:

The 2003 Fall Turkey Season was open in THA's 1-11, 20 and 21 for birds of either sex. This was the second year that the season was one, six-day segment as opposed to two, three-day segments (this allows hunters more time to find and pattern fall flocks). Permittees were selected at random from all applications received during February of 2003. Forty-two mandatory checking stations were in operation during the fall season. For the first time, THA 21 was opened to fall hunting by the Fish and Game Council, since the spring harvest in THA 21 has occurred at a density of over three birds per square mile of habitat and has been steadily increasing over time. Fall hunters reported harvesting 177 wild turkeys, a decrease of 14.9% from the 2002 fall harvest of 208 birds.

Discussion

New Jersey's mandatory turkey checking stations continue to provide one of the most detailed turkey harvest data sets in the northeast. Our 23 years of spring harvest data and 7 years of fall harvest data have allowed managers to view trends in harvest and prescribe management strategies such as increasing or decreasing season length and permit quota. Adding to our ability to track results and prescribe changes, our spring season has remained the same for two years (and will remain the same for 2004), making comparisons among the last few years highly valuable and relevant. A listing of mandatory check stations appears in Appendix A.

2003 Spring Gobbler Season

Season Structure:

The 2003 Spring Gobbler Season involved a six-week season structure plus one youth day. Season dates for the various hunting segments were:

Youth Turkey Hunting Day: Saturday, April 12

Segment A:	Monday, April 14 – Friday April 18
Segment B:	Monday, April 21 – Friday April 25
Segment C:	Monday, April 28 – Friday May 2
Segment D:	Monday, May 5 – Friday May 9
Segment E:	Monday, May 12- Friday May 16
	Monday, May 19 – Friday May 23
Segment G:	Saturday, April 19, April 26, May 3, May 10, and May 17

Hunting hours for the spring season were 1/2 hour before sunrise until 12 noon daily. Eighteen Turkey Hunting Areas (THA's) were open for hunting. A total of 29,250 hunting permits were available in the lottery. In addition to the lottery, farmers were issued 1,100 permits, and youth hunters were issued 1,071 permits that did not affect the quota. Lottery permits were selected by random computer drawing from all usable applications received. Permits were valid for one weekday segment or the Saturday segment. Hunters were allowed to apply for only two permits through the mail. Permits not allocated through the mail-in lottery were sold over the counter (Table 1), and hunters could purchase additional permits over the counter while permits lasted. Farmer permits and first lottery youth permits were issued above the established quotas. The total number of permits issued was 21,694. Hunters holding multiple permits were allowed to harvest one gobbler per permit; however, only one gobbler could be harvested per day.

Spring Harvest Data:

The 2003 harvest of 3,591 gobblers was 4.9% lower than the previous record harvest of 3,779 birds taken in 2002. Figure 1 details the spring harvest by THA. Weekly and daily harvest information is presented in Figures 2 and 3. The harvest per permit segment in each THA is separated out in Table 2. The first week of the season (April 14-18) produced the highest percentage (30.4%) of gobblers taken during the season. (Figure 3)

The largest harvest of gobblers (643) was taken in THA 20 (Table 2.), followed by THA 21 with 414 birds, THA 8 with 369 gobblers and THA 11 with 307. This is the first season that THA 21 had the second highest harvest, testament to the fact that turkey populations are thriving there. Fifteen of eighteen Turkey Hunting Areas produced harvests in excess of 100 birds. Wild turkey gobblers were harvested in 19 of 21 New Jersey counties (Table 3). Based on the number of permits sold, the statewide success rate was 16.5 percent (Table 4) which is lower than the long term average for New Jersey (Table 5). Success rates vary greatly between THA and region and appear to be related to wild turkey abundance. Since the entire state experienced low productivity in 2003, it is likely that 2004 success rates will again be below the five-year average of about 18%. The highest success rates in 2003 occurred in THA 21, with 27.8% of permits sold in that zone resulting in a harvested bird. Turkey Hunting Area 12 in central New Jersey had the lowest hunter success rate (8.9%).

The result of low turkey productivity (3.0 poults per hen) in 2002 showed up in the 2003 gobbler harvest. The low statewide juvenile/ adult ratio in the harvest (0.43) suggests that fewer juvenile gobblers were available for harvest in 2003 than in previous years that had good productivity. This can be compared with the 1996 juvenile/ adult harvest ratio (.74) that occurred the year after excellent productivity (5.6 poults per hen in 1995). On average, the juvenile/adult ratio was slightly higher in southern THA's, which corresponds with slightly higher productivity measured in southern counties in 2002. As is normal, juveniles made up a greater proportion of the harvest during the A segment (30.7%) than in the E segment (22.1%) which corresponds to a decrease in testosterone in juveniles during the course of the season that decreases responsiveness to calling. Age data is presented in Tables 6 and 7.

The mean dressed weight of adult gobblers was 8.8 kgs. (19.41 lbs.), and the mean dressed weight of juvenile gobblers was 6.47 kgs (14.27 lbs.). The average beard length of adult gobblers was 23.39 cm (9.21 in.). Those of juveniles averaged 9.78 cm. (3.85 in.).The mean spur length among adult gobblers (age 2 or older) taken in 2003 was 2.41 cm (0.95 inches) (Table 8). This average spur length suggests that many of the adult gobblers taken in 2003 were three years of age or older. These values are similar to averages in the past two seasons. Measurements remain fairly consistent statewide with a few exceptions (Table 9). Weights of adults in areas with poor turkey habitat, THA's 6,15 and 16, were lower on average than the rest of the state. Beard lengths are notably longer in areas with less snowfall (southern THA's). Also, spur lengths on average are slightly longer in southern areas possibly due to fewer rocky habitats available to wear spurs down; however, the differences are slight and statistical testing will be performed during the next year to note if the difference is significant.

The bulk of the wild turkey harvest was taken on private property. Hunters reported harvesting 2815 birds (78.4 %) on private land, 616 birds (17.2 %) on state property, 137 birds (3.9 %) on federal property and 16 birds (0.5 %) on county or municipal land.

2003 Fall Turkey Season

Season Structure:

A one-week structure was again used for the 2003 Fall Turkey Season. The dates were:

Segment H: Monday, October 27– Saturday, November 1

Hunting hours for the Fall season were ½ hour before sunrise until ½ after sunset daily, and unlike hunting during the spring, dogs are allowed for fall hunting. Selected THA's were open to Fall hunting (THA's 1-11, 20 and 21). When a THA exhibits a stable or increasing spring harvest over time, and that harvest occurs at a rate of at least one bird per square mile of habitat, the THA may be opened for fall hunting. This reasoning was used when the Fish and Game Council opened THA 21 to fall hunting for 2003, since the harvest here was steadily increasing over time and was occurring at a density of over three turkeys per square mile of habitat. A total of 3,840 permits were available. Farmer permits were issued above established quotas. Only one bird of either sex could be harvested per permit.

Fall Harvest Data:

New Jersey's sixth fall turkey season consisted of a one week segment: October 27 – November 1, 2003. The number of permits issued (for THA's 1 – 11, 20 and 21) was 3,459 (Table 11) and the harvest was 177 birds (Table 12). The statewide hunter success rate for the 2003 season was 5.1 percent, which is likely a result of the conservative season structure.

Due to a poor poult per hen ratio (1.8 poults per hen) tallied during the period May through September 2003, a harvest that favored adults was predicted. Adults are favored in the fall harvest in years of poor productivity since fewer juveniles are available. Typically, juvenile males make up the largest component of the fall harvest in good productivity years (Steffen and Norman 1996; Roberts et al. 1995). In 2003, the highest harvest was adult males (53), followed by adult females (51), juvenile females (45), and juvenile males (28) – Table 12. The ratio of males to females in the harvest was 0.8: 1.

The 2003 harvest of 177 turkeys was 14.9 percent lower than the previous harvest of 208 birds taken in 2002. Daily harvest information is presented in Table 12.

Typically, the first day of the fall season produces the highest percentage of birds taken during the season. In 2003 however, possibly due to rainy conditions early in the fall season, the highest harvest day was the final day (Saturday) with 27.1% of the total. The first day of the season (Monday) produced only 17.5 % of the total harvest.

The largest harvest of turkeys, 67, was taken in THA 20 (Table 12), followed by THA 21 with 19 birds, and THA 8 with 16 birds. Wild turkeys were harvested in 9 of 21 New Jersey counties (Table 3).

Detailed information for Section 1 may be found in the following tables and graphs:

Section 2: Wild Turkey Productivity

Objective

To determine the success of nesting hens and overall turkey productivity by using statewide poult count surveys. This information can be used as an index with which to base management decisions concerning the fall season structure and to predict the age structure in spring and fall harvests. The index is also valuable to view population trends as in one method utilized in New Jersey based on Mosby, 1967.

Summary

Since 1978, poult counts have been used as a measure of productivity for wild turkeys in New Jersey. Although the sample size varies from year to year, the methodologies have remained consistent. Poult count data is averaged to create a Productivity Index (PI) which can be compared to other years and is also used in population modeling. The PI can also be used with some degree of accuracy to predict the age structure of the fall harvest in that year. The 2003 PI was 1.82, which is the lowest productivity index recorded in New Jersey since 1985, when the index was first calculated in New Jersey.

Discussion

To conduct poult counts, Division personnel and volunteers from the Wildlife Conservation Corps and the National Wild Turkey Federation count all adult hens and young seen in the course of their daily travels. As a rule, poult counts begin in late May, when young turkeys begin to hatch, and end in late September after the poults are sixteen weeks of age. The survival rate of juvenile turkeys increases dramatically when they reach sixteen weeks of age (Van Gilder 1992; Mosby 1967). Sightings were recorded on data forms provided by the turkey project. Observers were asked to record sightings of lone hens as well as those with poults to provide the most accurate PI possible. The PI for any given year is an average of the number of poults seen per hen.

The PI can range from 0 (no production) to about 7 (excellent production). In general, a PI greater than 4.00 poults per hen is considered good since this will potentially result in an increase in population due to the high number of poults produced. The months of May and June, a critical time for New Jersey poults, were two of the wettest on record (only three days with sunshine were recorded in May, 2003). In 2003, observers reported seeing 644 hens accompanied by 1,172 poults for a statewide PI of 1.82. This very poor PI can be attributed to these severe weather conditions. This wet weather at a critical time did not bode well for poult survival (Hubbard et al 2000; Roberts et al 1995). Wild turkeys will re-nest if conditions are less than optimal early in the summer; however, the remainder of 2003 was also quite wet and cold and many re-nesting attempts probably proved futile.

Productivity Index Compared to Age Structure of the Spring Harvest

Although the age composition in the harvest is influenced by various factors, the PI can generally be used to predict percentages of juvenile and adult birds in the harvest. One year old and two year old gobblers are vulnerable to harvest, with two year old birds being most vulnerable. The age classes occur at varying density from year to year based on the productivity in previous years.

Table 1. Productivity Index and Age structure of gobblers harvested during the Spring Turkey Season since 1990*.

YEAR	PRODUCT. INDEX	% JUV. BIRDS	% 2 YR OLD	% 3 YR OLD +	TOTAL HARVEST
1990	3.40	40.4	25.8	33.8	546
1991	6.02	35.4	24.7	39.9	652
1992	5.20	59.6	20.2	20.2	877
1993	5.89	35.7	41.8	22.5	1007
1994	5.33	42.4	36.8	20.8	1398
1995	5.56	36.4	38.6	25.0	1581
1996	4.09	38.0	38.2	23.8	2007
1997	3.75	24.5	47.0	28.5	2013
1998	4.53	29.3	36.6	34.1	2420
1999	6.00	23.6	38.5	37.9	2532
2000	4.11	25.7	35.0	39.3	2754
2001	3.00	20.2	39.0	40.8	3078
2002	3.07	25.4	32.4	42.1	3779
2003	1.82	30.2	13.3	55.7	3591

* Only harvested gobblers with a recorded spur measurement were included here.

The productivity index was very good in 1991 following poor reproduction in 1990. The birds produced in 1991 were jakes in 1992, where they constituted 59.6% of the harvest. The remaining birds were two year olds in 1993, when they made up over 40% of the harvest (compare this to the two year old harvest in 1992 – only 20% of the total).

The productivity index was very good in 1995 followed by fair reproduction in 1996. The birds produced in 1995 were jakes in 1996, where they constituted 38.0% of the harvest. The remaining birds were two year olds in 1997, when they made up 47.0% of the harvest (compare this to the two year old harvest in 1998 – only 36.6% of the total).

The productivity index was very good in 1999 followed by fair reproduction in 2000. The birds produced in 1999 were jakes in 2000, where they constituted 25.7% of the harvest. The remaining birds were two year olds in 2001, when they made up 39.0% of the harvest (compare this to the two year old harvest in 2002 – only 32.4% of the total).

Productivity Index Compared to Age Structure of Fall Harvest

The following chart presents information comparing the productivity index to the juvenile/ adult ratio in the fall harvest. For most years, a low productivity index results in a harvest that favors adults (2001, 2002, and 2003). In years with productivity indices less than 4.0 poults per hen, the population estimate declines and a lower proportion of juvenile birds is available for harvest (Eriksen et al 1997). A productivity index greater than 4.0 poults per hen translates into a fall harvest that favors juvenile birds (1998 and 1999) due to availability of juveniles.

Table 2. Productivity Index and age structure of wild turkeys harvested during the Fall Turkey Season since 1997.

YEAR	PRODUCT. INDEX	TOTAL HARVEST	JUVENILES	ADULTS	JUV. / AD. RATIO
1997	3.75	168	84	84	1 : 1
1998	4.53	152	85	67	1.26 : 1
1999	6.00	143	79	64	1.23 : 1
2000	4.11	212	75	136	0.55 : 1
2001	3.00	258	125	133	0.94 : 1
2002	3.07	208	47	161	0.29 : 1
2003	1.82	177	73	104	0.71 : 1

Section 3: New Jersey's Wild Turkey Population

Objective

To estimate the New Jersey Eastern Wild Turkey population so that sound management plans concerning this species can be prescribed.

Summary

Several wild turkey population models are currently being used by turkey biologists in the northeast. Over time, these models present trends in turkey populations, and are important as indices than as actual population estimates. As New Jersey's turkey hunting seasons are now as liberal as they have ever been, it is important to delineate turkey population trends so that the species is not over-harvested. The Mosby population model (Mosby 1967) places the winter 2003/2004 NJ population at 10,675 and is considered to be a low estimate. The "10% rule" population estimation method places New Jersey's statewide population at 35,910 birds. Using the gobbler mortality study data, a population estimate of 19,570 birds is derived. This section explores these three methods of population estimation for wild turkeys and addresses a fourth that is currently being developed for New Jersey by research scientists at Virginia Tech. University.

Discussion

Division biologists have employed summer productivity (poult counts) and winter weather conditions to estimate New Jersey's wild turkey population since 1979. While this method uses empirical data, it is considered conservative because the estimate of winter mortality is subjective, and the model does not allow for highly varied winter conditions from year to year. Using this method, the 2003 wild turkey population for New Jersey is 10,675 birds.

A second method that has been used to estimate population employs an estimate of the percentage of males harvested during the spring season. In general, the spring harvest in any area is believed to comprise 10% of the entire turkey population (Healy and Powell 1999; Van Gilder 1992). Thus, the spring harvest multiplied by a factor of 10 will result in an estimate of the turkey population, at least in huntable areas. For 2003, the spring harvest of 3,591 males could be extrapolated into a population estimate of 35,910 wild turkeys by using this "10% rule" estimation technique.

A third method to estimate New Jersey's wild turkey population takes into account results of the ongoing gobbler mortality study. During the past year, mortality of birds in the study area due to hunting was determined to be 36.7%. Using this percentage, an extrapolated statewide population estimate of males is 9,785. (The total spring 2003 harvest of 3,591 males is 36.7% of 9,785, the total estimated male population). When this figure is doubled to consider a 50/50 sex ratio, a total population

of 19,570 is achieved. Of course, this estimate has its limitations for two reasons: first, the gobbler mortality study has been conducted in a relatively small geographic area of New Jersey and there are likely statewide differences in population density and hunting pressure; second, it is not known whether the age structure of the birds in the mortality study accurately represents the age structure of males in the total population.

These three population estimates are limited due to high numbers of variables that are difficult to pin down. The estimate based on the productivity index is probably low, while the estimates based on harvest and mortality study data may be high. New Jersey's current wild turkey population is estimated to be 25,000 birds.

A fourth model is being created by a graduate student at Virginia Polytechnic Institute. This model will use many aspects of the data that has been collected by the New Jersey wild turkey research project since 1977 and will utilize many density dependent parameters.

Section 4: Turkey Hunter Attitude and Recreational Survey

Objective

Spring turkey hunters in 2003 were surveyed to monitor hunting permit use, hunter interference and safety/satisfaction levels/attitudes towards regulations and management practices, and to collect information on socio-economic status, educational background, and past hunting experience. In addition, an attempt was made to glean information about youth hunters through questions in this survey. The actual survey mailed in 2003 may be found as Appendix B.

Summary

A postal survey consisting of 30 questions was mailed to 3,000 hunters who received permits for the spring 2003 turkey hunting season. Recipients of the survey were selected at random from among all permittees. Usable returns were received from 1,448 hunters (48.3% return). The average number of days each permit was used was three. Female hunters are increasing slightly over time, while the number of new turkey hunters is decreasing. As has been the trend, decoy use is increasing over time. A safe hunting environment is very important to turkey hunters. Overall, 21% of respondents claim they experienced interference while hunting. Youth hunters were surveyed as well. The success rate on the youth turkey hunting day amongst respondents was 25%.

Discussion

Survey Response:

The survey sample consisted of 3,000 randomly selected spring gobbler hunters pulled from a permit recipient base (farmer + regular) of 10,632 individuals. By early fall 2003, 1,448 completed and usable survey returns were received (48.3% return). Survey forms were mailed within a few months of the selection of permit recipients. This minimized the chance for undeliverable survey forms. Two undeliverable surveys were returned in 2003.

Permit Use:

It appears that permit use was higher in 2003 than it was in 2001. The average number of permits actually utilized by hunters in 2003 was 2.04 permits per hunter (1.57 in 2001). There were substantial over-the-counter permit sales in 2003 - close to 7,000 permits were sold - this may account for some of this increase. Seven hundred and ten individuals (49.0%) hunted with only one permit. Four hundred and thirty-nine hunters (30.3%) utilized two permits. Two hundred forty-four individuals (16.9%) utilized three

(or more) permits. The number of hunters that utilized three or more permits was only 12.1% in 2001.

Permit use tended to be consistent throughout the season and remains consistent over time. The average number of days hunted with the first permit was 3.1, as the survey has shown for several years. Those with a second permit used it an average of 3.1 days, and those with a third permit hunted an average of 3.5 days (similar to 1997,1998 and 2001 survey data).

Table 1. Average Number of Days Afield for Each Permit Held - 2003 Spring Season.

Segment	1st Permit	2nd Permit	3rd Permit
A	3.0	2.4	3.3
B	2.9	3.0	3.1
C	3.3	2.8	3.4
D	2.6	2.8	3.3
E	3.3	2.9	3.4
G	3.2	2.7	2.6

Note that the average time spent hunting with a third permit is greater than the amount of time spent hunting with the second permit. A possible explanation for this is hunters that buy three permits for turkey hunting are more likely to be more avid turkey hunters and spend more time afield than those who purchase only two.

Hunting Statistics:

Questions concerning type of firearm used and type of land hunted (public/private) were not asked in 2003.

The upward trend in artificial decoy use continues. One thousand twenty-five spring turkey hunters (72%) noted they used decoys in 2003. Of these, 73% reported that the use of a decoy increased their chances of success. In 1997, 55% reported using decoys, while 59% reported using decoys in 1998 and 67% reported using decoys in 2001. Electronically-operated decoys have been recently offered by sporting goods companies, but are forbidden at this point in time in NJ since the safety implications of their use in other states has yet to be determined.

Hunter Success and Enjoyment:

Hunter interference and safety is a concern in New Jersey, especially as permit quotas and hunter densities have increased. In 2001, hunters were asked to define interference by selecting from a list of possible "interference breaking points" where they thought interference was taking place. The survey response showed that hunters' definitions of interference differed widely. Some hunters felt that someone parked in the spot they had thought about parking in would be considered interference. In 2003, this survey asked hunters if they saw other hunters while afield, and then simply, was their hunting experience, in their opinion, diminished by the presence of another hunter. The

average number of hunters seen in the field was 2.32. The percentage of hunters that felt they had been interfered with was 21.4% (down from 25% in 2001).

Hunters were also asked whether they experienced what they consider to be an unsafe hunting situation while they hunted and on what type of land this situation occurred. Out of the 1448 respondents, 99 reported experiencing an unsafe hunting situation (64 had one experience/ 27 had two experiences). The interesting aspect was that the land type on which these unsafe situations occurred was evenly divided (50-50) between private and public land.

Hearing and seeing wild turkeys while hunting contributes to hunter enjoyment. Hunters were asked to report the number of days they heard gobbling while hunting (bear in mind that the average number of days hunted per permit in 2003 was about 3.1). On average, hunters reported gobbling activity on 2.2 days with their first permit, 2.0 days with their second permit, and 2.4 days with their third permit. Among private land hunters, hunters reported gobbling activity on 2.3 days with their first permit, 2.1 days with their second permit, and 2.3 days with their third permit. Among public land hunters, hunters reported gobbling activity on 2.1 days with their first permit, 1.9 days with their second permit, and 2.4 days with their third permit. Successful hunters reported hearing twice the number of birds more on days than did unsuccessful hunters. For those hunters who harvested turkeys, the average number of days gobblers were heard for that permit was 2.5, while those who did not harvest turkeys only heard gobblers on 2.1 days per permit.

Hunters were asked to rank five items (1 through 5) in a preferred order of importance with one being most important and five being least important. The items were:

a) being able to hunt during the first week of the season
b) hunting without seeing another hunter afield
c) seeing many birds/ hearing many gobbles
d) harvesting a bird
e) a safe hunting environment

About 900 respondents answered the question correctly, the other respondents used a number more than once. Results for both subsets were similar to the results overall. The majority of respondents saw safety as a top priority during the spring season (#1 appeared next to safety 1,079 times). Next most important to spring hunters was seeing birds and hearing gobbles (483 responses of #1). The least important factor was being able to hunt the first week of the season. Also, hunters who did not harvest a turkey were twice as likely to respond that harvesting was important to them. Of the hunters who held a permit for the first week of the season, 26.6% felt it was very important to them to hunt the first week. Of the respondents who did not have a permit for the first week, 17.0% felt it was important to them to hunt the first week.

In all, respondents reporting harvesting 483 turkeys during the 2003 spring season (33.4% of respondents). In 2001, 35.4% reported harvesting a turkey. The number of hunters who shot one bird was 355 or 24.5%. the number of hunters who killed two birds was 78 or 5.4%. The number of hunters that reported killing three birds was 30 or 2.0%.

Based on the total number of permits held by respondents (1871), the overall success rate was 25.8%. This success rate differs markedly from the success rate found when comparing the total actual harvest with the total number of permits sold (approximately 17% in 2003) and represents a bias in survey response (hunters who harvested turkeys are probably more likely to fill out and send in a survey).

Hunter Expenditures:

No hunter expenditure data was collected in this survey.

Hunter Opinion:

Certain questions on the survey form pertain to hunter opinions of several issues related to New Jersey wild turkey management.

When asked about turkey population levels, only 92 of 1448 (6.4%) reported that population levels were "too high." Nine hundred eighty-six respondents (68.1%) claimed that populations were "about right," while 339 respondents said that turkey populations were "too low." There is a correlation between successful hunters and the response about turkey populations. The success rate for those who thought turkey populations were "too high" was 43.5%, while the success rate for those who thought populations were "too low" was 20.3%. These results are very similar to 2001 results. There also seems to be a correlation between the response to the population question and the Turkey Hunter Area that the hunter frequented. Turkey densities in THA's 14 and 16 tend to be the lowest in the state. Respondents who hunted in THA's 14 and 16 reported 66 and 45 percent of the time respectively, that populations were "too low." By comparison, respondents who hunted in high density turkey areas such as 8 and 20, reported that turkey populations in their area were too low only 17 and 8 percent of the time, respectively. Survey respondents are reporting low densities in areas where turkey populations are actually low.

Most survey respondents reported that there were not too many turkey hunters (31%) and that the season length (currently six weeks) was just right (60%).

Hunter Demographics:

New Jersey turkey hunters are predominantly male; however, the percentage of male turkey hunters is decreasing as female hunters increase in number. In 2003, 96.8% of turkey hunters were male (down from 97.2% in 2001, 98.4% in 1997 and 97.6% in 1998). The average age of turkey hunters is 46 (up from 45 in 2001). Eighty-eight percent of turkey hunters in 2003 were over 30 years of age (up from 84% in 2001).

This survey sought to collect information on youth hunters. New Jersey held its second youth turkey hunting day in 2003. Eighty-nine of the survey respondents were 16 or younger. The number of these that participated on the youth turkey day was 69. Of

these, 17 harvested turkeys and 2 said it was their first hunting experience of any kind (one of these two said the youth day encouraged them to try other hunting seasons). Seven of the 89 respondents were female. Of these, 6 participated on the youth day and one harvested a bird.

Spring turkey hunters in New Jersey reported living an average distance of 22 miles from their hunting areas. The number of respondents from each county is as follows:

Atlantic	40	Middlesex	84
Bergen	52	Monmouth	53
Burlington	62	Morris	88
Camden	56	Ocean	63
Cape May	15	Passaic	49
Cumberland	100	Salem	88
Essex	21	Somerset	33
Gloucester	90	Sussex	121
Hudson	7	Union	29
Hunterdon	115	Warren	93
Mercer	59		

Experience of turkey hunters averaged six and a half years, with 89.6% having more than one year of experience. This percentage has climbed from earlier levels of 78% in 1997, 81% in 1998 and 86% in 2001, indicating that fewer people are becoming involved in turkey hunting as years pass.

The actual 2003 survey is presented in Appendix B.

Section 5: New Jersey Wild Turkey Gobbler Survival Study

Objective

To determine the frequency of various causes of mortality of eastern wild turkey males in New Jersey. To determine if these mortality types can be used as indices to predict harvest trends or to formulate a more restrictive or a more liberal spring season structure.

Summary

Since the winter of 2000, the Division has monitored mortality on 168 wild turkey males in Sussex and Warren Counties. Major mortality factors influencing New Jersey's wild turkey gobblers are hunting and predation which, when combined with several other lesser mortality factors, produce an average annual mortality of about 50% (considered an acceptable rate by most wild turkey biologists).

Discussion

The New Jersey wild turkey gobbler survival study, funded by the New Jersey Division of Fish and Wildlife and the National Wild Turkey Federation, began in the winter of 2000 with the capture of 51 wild turkey gobblers in northwestern New Jersey. These gobblers, after being banded and fitted with radios, were released at the capture sites and monitored by Division personnel, students, and volunteers a least once per week. Townships involved in the study include Andover, Frankford, Fredon, Hampton, Lafayette, Walpack, and Wantage in Sussex County.

Since 2000, one hundred and sixty-eight birds have been captured in Sussex County and tracked with radio telemetry gear. Some of these birds were censored since they lost radios. Several radios died out during the course of the study. Some birds that lost radios came back as band returns during the spring season. These birds are tracked at least once per week to determine if they have perished and what the cause was.

We have attempted to retain as high a sample as possible in continuing to study wild turkey gobblers (50 radioed birds as of March of each year is our goal). Our ability to trap birds is the major factor influencing sample size. Nonetheless, this research has presented an interesting view of gobbler mortality factors and average mortality levels. For example, it is noteworthy that mortality due to hunting rose to 35% in 2003 (Table 1), while the Sussex County spring gobbler harvest fell 15% and the statewide gobbler harvest dropped by 5%. A possible explanation for this situation is that since

productivity as declined in recent years (Table 2), fewer birds were available for harvest statewide in 2003; however, our sample size was again close to 50 birds. It is likely that we had radioed a larger percentage of the total local gobbler population at each site in 2003 than we did in 2000 (following two good productivity years). This is an indication that our turkey population has dropped from 2000 levels. It is probable that if a similar sampling scheme is achieved for 2004, the percentage of radioed birds harvested during our next spring season will again be high. After this past year's poor productivity (1.8 poults per hen), it is likely that the statewide gobbler harvest in 2004 will be lower than in 2003.

Since 2000, several mortality factors have been detected in our wild turkey males. The following section discusses these factors in order of frequency:

- Spring Harvest – Since 2000, forty gobblers were killed in NJ spring turkey seasons. This mortality source is probably just as significant as predation. No birds were harvested during fall seasons.

- Unknown Cause – Several birds were retrieved too late to determine the actual cause of mortality. It is likely that many of these were a result of predation.

- Coyote Predation – Twelve times since 2000, enough evidence was gathered at the site of mortality to suggest that the gobbler was killed by a coyote. Coyotes typically break large bones on the bird whereas smaller mammalian predators will not. Scat is often found near kills, but scavenging must be ruled out in order to diagnose correctly. Coyotes typically chew the radio and antenna and often drag the carcass a considerable distance.

- Vehicle Collisions – Since 2000, 10 of the study birds have been killed by vehicles. Four of these occurred along a 500 foot stretch of Route 23 in Wantage Twp.

- Avian Predation – Five times since 2000, enough evidence was gathered at the site of mortality to suggest that the gobbler was killed by a red-tailed hawk, or much more likely, by a great horned owl. Typically, the heads and necks of these birds are cleaned of soft tissues and the bones remain. The rest of the carcass is intact. In one case, wing marks of an avian predator were found adjacent to a dead gobbler.

- Harvest in other states – Five birds originally captured in the Delaware Water Gap National Recreation Area have been harvested in the PA hunting seasons (three spring and two fall).

- Avian Pox – This viral ailment was detected in three of the Newton area study birds in 2000. The summer of that year was very wet and conditions were prime for the arthropods that spread this disease. Avian Pox was not detected after 2000 in study individuals, but has been detected in other wild turkeys in New Jersey in subsequent years.

- Crippling Loss – Three birds were determined to have been crippled and lost during the spring hunting season. One of these was found the next day and turned in by the hunter. Another was analyzed by Division Pathologist, D. Roscoe who found pellets and pellet wounds in the neck and body of a bird that was found dead in a field in May. These birds are considered harvest mortality.

- Poaching/Illegal Harvest – Twice since 2000, project personnel surmised that turkeys were killed illegally. One of these incidents involved a transmitter that was buried in mud. It is possible that these represent vehicle mortality incidents and that the birds were taken and the radios hidden.

Table 1. Percentage of Wild Turkey Gobblers Killed by Hunters/ Other Mortality Factors

YEAR	BIRDS WITH RADIOS (as of March of each year)	TOTAL MORTALITY	HUNTING MORTALITY	% HUNTING MORTALITY	% OTHER MORTALITY
2000	51	25	3	5.9	43.1
2001	45	23	11	24.4	26.6
2002	36	17	8	22.2	25.0
2003	51	37	18	35.3	37.3

Table 2. Age Structure of Wild Turkey Gobblers in the Study as of March of each Year

YEAR	PRODUCT. INDEX poults/hen	TOTAL BIRDS TRACKED (as of March)	JUVENILE BIRDS	2 YEAR OLD BIRDS	3 YEAR OLD + BIRDS
1998	4.53	-	-	-	-
1999	6.00	-	-	-	-
2000	4.11	51	28	4	19
2001	3.00	45	9	17	19
2002	3.07	36	7	10	19
2003	1.82	51	17	16	18

Table 3. Age Structure of Gobblers Available for Harvest in the Spring Season and the Age Structure of Harvested Gobblers

YEAR	2000		2001		2002		2003	
	Avail.	Harvest	Avail.	Harvest	Avail.	Harvest	Avail.	Harvest
Juveniles	28	2	9	0	7	1	17	4
2 yr.	4	0	17	6	10	2	16	8
3 yr. +	19	1	19	5	19	5	18	6
TOTAL	51	3	45	11	36	8	51	18

The New Jersey spring gobbler season, with higher permit quotas and a six week duration, has never been as liberal as it is now. Our limited fall season (both structure and interest) helps to justify this liberalization since very few hens are harvested in the fall (the fall season in New Jersey has little effect on the turkey population, so a more liberal spring season is possible). High harvests of hens during fall turkey seasons in other states have a dramatic impact on turkey populations in those states (Healy and Powell 1999; Little et al 1990). It is important that the gobbler component of the turkey population is not over-harvested. This study will continue for another year to develop a better understanding of how spring hunting is impacting the New Jersey gobbler population. It is possible that future spring season harvest totals (if the season structure remains constant) will rise and fall in accordance with productivity.

Section 6: Wild Turkey Trapping Operations

Objective

Our objectives were to capture gobblers to augment the sample size for the cause specific gobbler mortality study, and to capture birds and liberate them into areas where habitat enhancement is taking place, but supplemental releases of turkeys have not been made, thus completing the wild turkey reintroduction program.

Summary

The supplemental release technique has been used in THAs 21 and 22 since 1993. Since then, a series of releases of wild turkeys in combination with habitat enhancement techniques in northern Cape May County has led to a stable population even years after the last release was made in 1996. The habitat in other areas in the Pine Barrens region has been recently enhanced. Supplemental releases of turkeys were scheduled for these areas (predominantly Ocean County) in 2002 and 2003. In 2003, eighty turkeys (Table 2) were released in the enhanced areas (the goal was 105 + birds that were needed to meet the 2002 goal which was not completely realized). Twenty male turkeys were captured to increase the sample size of individuals in the cause specific gobbler mortality study.

Discussion

Habitat enhancement in Pine Barrens areas has taken place in recent years. In locales where this enhancement has taken place and turkeys have been transferred in a series of supplemental releases, turkey populations are viable years later. Prior to the supplemental releases and habitat enhancement that took place in these areas, turkey populations were too low in density and decreased over time (Devlin et al 1996). The supplemental releases increased densities of birds in these areas (densities that could overcome the limitations of the habitat), and a stable population resulted without additional releases of birds. Eastern wild turkeys continue to occupy nearly all available range in New Jersey. The Pine Barrens region of southern New Jersey continues to support low densities of turkeys, but the birds are faring better in areas of the Pine Barrens where supplemental releases have taken place and where habitat enhancement is practiced. The most notable successes in wild turkey restoration work in this region are the southeastern counties of Cape May and Cumberland. Both of these counties contain areas of poor soils and oak-pine and pine-oak habitats typical of the Pine Barrens. Supplemental releases of turkeys made in these areas in the mid-1990's, with the help of habitat enhancement, have proven successful.

Turkey Hunting Area (THA) 22 in Cape May and eastern Cumberland Counties has exhibited a stable spring harvest for many years even though the last supplemental release was made in 1996 (Tables 1 and 3). First opened to spring gobbler hunting in 1984, THA 22 yielded a harvest of only four gobblers. A decline in harvest over the next

three seasons required turkey project biologists to close the spring season in 1987, study hen survival and productivity between 1994 and 1997, and begin experimenting with the supplemental release technique in 1994. Re-opened to spring gobbler hunting in 1997, THA 22 produced a harvest of 36 toms. Since 1998, spring harvests in THA 22 have averaged 75 birds. State-owned Wildlife Management Areas in this Turkey Hunting Area are now being managed using brood habitat management techniques such as plantings (to date: sorghum, rye, wheat, sunflowers and clover) and prescribed burns (areas of 200 acres adjacent to planted areas).

Table 1. Turkey Hunting Area 22 - Supplemental Releases and Spring Harvest

RELEASE YEAR	# BIRDS RELEASED	PERMITS AVAILABLE	SPRING HARVEST
1994	34	0	0
1995	15	0	0
1996	21	0	0
1997	0	150	36
1998	0	400	74
1999	0	400	77
2000	0	400	79
2001	0	610	73
2002	0	720	96
2003	0	720	113

Turkey Hunting Area 21, in western Cumberland County also appears to have benefited from the supplemental release technique. Originally opened for spring gobbler hunting in 1986, this area typically reported harvests of 25-30 gobblers through the early 1990's. Supplemental releases of 25 birds in 1993 and 1994 and habitat management have stimulated population growth. The spring gobbler harvest in Area 21 has increased to over three hundred gobblers (the harvest total for spring 2003 in THA 21 was 414 birds, which is the second highest total by THA for 2003). Plantings and prescribed burns have taken place since 1995 on state owned lands (Bevans WMA and Union Lake WMA) in this area.

This combination of supplemental releases *and* habitat enhancement in the form of plantings and controlled burns, have allowed turkey numbers to increase in these areas and produce stable gobbler harvests over time. Other areas in Pine Barrens habitat have undergone initial releases in recent years, but without supplemental releases and habitat enhancement it is doubtful that these releases will meet production expectations years from now.

Trapped Wild Turkeys, 2003

The following table summarizes the results of the 2003 trapping efforts (for transfer, mortality study, and nuisance). One of the 2003 goals was to provide 105 supplemental release birds for the Pinelands sites. In addition, the 2002 goal for transfers was not met (only 80 of 105 birds were captured in 2002); there were ample birds available due to 2003 trapping efforts so that both the unmet goal from 2002 and the current goal for 2003 were largely realized. Forty-two of the 217 captured birds were males which were fitted with radios for the Gobbler Mortality Study. Forty-six turkeys were captured to abate suburban nuisance situations. Specific information concerning each turkey trapped is found in Appendix C.

Table 2. Trap Site Capture/ Disposition Summary – 2003

County of Capture	Township of Capture	# Females Captured	# Males Captured	# Females Transferred	# Males Transferred	# Males for Gobbler Study
Cumberland	Bridgeton	24	11	24	11	-
Essex	West Orange	3	1	3	1	-
Hunterdon	Raritan	6	3	6	3	-
Mercer	Hopewell	-	7	-	7	-
Sussex	Byram	9	11	9	0	11
Sussex	Frankford	18	11	18	0	11
Sussex	Fredon	29	9	29	0	9
Sussex	Walpack	18	3	0	0	3
Sussex	Wantage	18	3	-	0	3
Warren	Frelinghuysen	13	-	13	-	-
Warren	Knowlton	-	9	-	2	7
TOTALS						

Release Locations for Supplemental Releases

Release locations included Beaver Swamp WMA in Cape May County, Colliers Mills, WMA in Ocean County, and Greenwood Forest WMA (Howardsville section) in Ocean County. The Howardsville location is currently being managed by the Bureau of Land Management in the Central Region with perennial plantings and controlled burns, and at this time is primed for supplemental releases of hens. Plantings are perennial covers such as clover at this time, and it is hoped that other perennials such as chufa and warm season grasses can be added as well.

Beaver Swamp WMA, located on the Cape May peninsula is managed with burns and plantings at this time. Only one release has occurred at this site (14 hens and 8

gobblers in 1999). This area will benefit from the supplemental release program. Five hens were released here in 2002.

A large area of turkey habitat in Burlington County, Chesterfield Township, is surrounded by major highways. A release of turkeys at this site occurred in 1996. This location has never seen a supplemental release, and at this time would benefit from an additional release of hens.

The Lakehurst Naval Aviation and Engineering Station has implemented large-scale controlled burns on their grounds. Turkey populations there are increasing, especially along its border with Colliers Mills WMA (John Joyce pers. comm.). The controlled burns at Lakehurst are creating better turkey habitat at that location. Lakehurst has received one supplemental release of 25 birds on their grounds so far.

Table 3. Supplemental Release Sites: 2003

LOCATION	LAST RELEASE	# BIRDS Proposed 2003	# BIRDS Released 2003
Colliers Mills WMA	1999	25	25
Greenwood Forest WMA	1999	25	25
Beaver Swamp WMA	1999	25	23
Chesterfield Twp.	1996	15	14
Lakehurst N.A.E.S.	N/A	15	22
Total	-	105	109

Section 7: Nuisance Wild Turkeys

Objective

To track the number and type of NJ nuisance turkey complaints and develop and utilize strategies to abate damage and nuisance situations.

Summary

In recent years, the number of complaints reported to the NJ Division of Fish and Wildlife's Wildlife Control Unit concerning wild turkeys has risen. These complaints can generally be separated into two categories: those that concern agricultural crop damage and those that concern suburban nuisance. Only one complaint regarding agricultural crop damage was received in 2003. Thirty-seven complaints about nuisance turkeys were received in 2003.

Discussion

The Wildlife Control Unit spent approximately 214 hours working on nuisance turkey situations in 2003. Each situation is assigned a two-letter code which represents the type of complaint that occurred. The codes are as follows: sightings (ST); general nuisance (NU); aggressive birds (AG); tame birds (TA); injured turkeys (IJ); game farm turkeys (GF); and agricultural damage (AD). Table 1 shows the number of complaints received in each category in 2003. Table 2 shows the number of complaints received by county.

Table 1. Turkey Complaints Received in 2003 by Code.

Two-letter Code	Number of Complaints Received
ST	0
NU	18
AG	16
TA	1
IJ	1
GF	0
AD	1
TOTAL	**36**

Table 2. Number of Turkey Complaints by County

County	Number of Complaints	County	Number of Complaints
Bergen	7	Middlesex	5
Burlington	1	Passaic	6
Camden	1	Salem	1
Cumberland	2	Somerset	3
Essex	1	Sussex	1
Gloucester	1	Union	2
Hunterdon	2	Warren	4

In general, people do not call to report sightings. Nuisance calls, occurring mostly in suburban areas, are frequent and involve many scenarios, including excessive numbers of birds in back yards, excessive excrement (droppings) in yards, roosting on rooftops, flying up onto cars and scratching paint, digging in lawns and eating newly planted lawn seed, pecking at windows (sometimes turkeys beat themselves against windows and leave copious blood on the house), and pecking at cars on roads or at intersections (some birds or small flocks actually cause traffic accidents due to their affinity for walking in roadways).

Complaints about aggressive birds are frequent as well and involve birds that chase people and pets, sometimes causing bodily harm. These situations usually arise in the spring at the onset of breeding, when elevated blood testosterone levels in male turkeys causes aggressive behavior. Generally, these "attack turkeys" will avoid individuals who do not show signs of fear. Turkeys seem to be able to detect fear in people, and there are often a few people in each afflicted neighborhood who bear the brunt of the attacks.

The origin of these nuisance and attack "wild" turkeys can be difficult to ascertain. Years ago, such deviant birds were considered to be of "game farm" or domestic origin. In fact, many nuisance flocks can be traced to individuals that found or bought wild turkey eggs, incubated them, and then liberated the resulting adults for flock reestablishment or for "stocking" for hunting clubs, etc. This type of situation does not account for all nuisance turkey activity however, as nuisance situations are becoming increasingly prevalent in many suburban areas without evidence of an individual or group rearing and releasing turkeys.

A current theory concerning the origin of nuisance wild turkeys is that they are actually wild birds that have adapted to life in a suburban environment through many successive generations and have become so accustomed and habituated to people that they lose fear of people and eventually become a nuisance. These birds receive little negative feedback from people and thus react to people in suburban areas as they would any other wildlife in their environment such as deer, dogs, etc. It should also be noted that when these suburban birds are encountered in wooded areas adjacent to the backyards they frequent, they react quite differently to people who draw near them. Turkeys in suburban backyards will often tolerate close approach by people, but when the same birds are encountered in nearby wooded areas away from the houses, they flee as readily as wild birds would when people approach. The birds' reactions when trapped

and transferred also supports the theory that wild birds can adapt to suburban situations. When turkeys are reared from eggs and subsequently released, they lose some of their wild fear and wariness. When these birds are captured by Wildlife Services personnel and then released from their transport boxes, they often walk out of the box and behave like domestic turkeys. True wild birds do not behave in this fashion; however, and true suburban wild turkeys, when captured and released, will fly fast and far away from the transport box just like their cousins from more rural habitats. The habits, habitat requirements, nesting strategies, brood rearing needs, and survival of these suburban wild turkeys will be a possible subject of study for the NJ Division of Fish and Wildlife's Wild Turkey Research Project in future years.

Currently, suburban turkeys that exhibit negative behavior such as attacking people and pets and causing traffic accidents due to their affinity for pecking at car headlights, are either captured and euthanized or shot under field conditions. Since it is difficult to determine whether these birds come from domestic or wild stock, the problem is not relocated elsewhere. The Division will not tolerate turkeys that exhibit these behaviors due to the likelihood that they will attack other people and cause accidents at other locales where they are released. In 2003, eight turkeys were euthanized because of these behaviors.

Turkeys that cause hardships during the winter months because they frequent certain backyards (sometimes 100-200 birds) are often captured and then released. These birds do not exhibit aggressive behaviors, but can cause problems due to excessive droppings and roosting on homes. These turkeys are probably of wild origin and fly from their transport boxes upon release. During 2003, in an effort to alleviate damage of this type from three suburban sites in New Jersey, the research project captured and relocated 54 wild turkeys. The Wild Turkey Research Project will be experimenting with different techniques in 2004 that involve roost dispersion (use of pyrotechnics, lasers, etc. to drive birds from their traditional roosting/ staging areas) to abate nuisance situations, with hopes that these techniques will prove less cost and labor intensive than trapping the birds with rocket nets and drop nets.

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APPENDIX A. (2003 Wild Turkey Check Stations)

* Denotes station was not open for the Fall 2003 Turkey Season.

Station Name	Location	County	Station Number	Turkeys Checked
Ted's Taxidermy	Buena	Atlantic	38	89
Pine Barrens Stove & Sport Shop*	Pemberton	Burlington	6	12
Mike's Sporting Goods*	Hainesport	Burlington	9	16
Nixon's General Store*	Tabernacle	Burlington	16	12
Sportsman's Center	Bordentown	Burlington	29	116
Atco Sports Center*	Atco	Camden	20	58
Belle Plain Supply*	Belle Plain	Cape May	13	61
Fletcher's Corner*	Villas	Cape May	15	37
Busnardo's Sport Center	Bridgeton	Cumberland	21	69
Blackwater Sports Center	Vineland	Cumberland	26	261
Maurice River Sport Center	Millville	Cumberland	49	175
Van Meter Archery Co.	Bridgeton	Cumberland	63	100
A & M Meats	Mullica Hill	Gloucester	2	7
Slim Fins And Furs	Hopewell	Mercer	69	25
Lakeside Deli	Clinton	Hunterdon	10	18
Sportsman's Rendezvous	Flemington	Hunterdon	30	115
Boan's Marine	Lambertville	Hunterdon	39	27
Clinton WMA	Hampton	Hunterdon	43	9
The Corner Store	Baptistown	Hunterdon	48	71
Carousel Deli and Bakery	Ringoes	Hunterdon	53	67
Jim Brown's Auto Body	Quakertown	Hunterdon	56	36
Jugtown Mountain Campsites	Asbury	Hunterdon	61	47
Trigger and Reel Sport Shot	Ewing	Mercer	33	14
Sayreville Sportsmen	Sayreville	Middlesex	18	30
All Seasons Sports and Taxidermy*	Jamesburg	Middlesex	55	34
Earle Weapons Station*	Colts Neck	Monmouth	51	9
Cream Ridge Sports Shop*	Cream Ridge	Monmouth	52	56
Parsippany Bait and Tackle	Parsippany	Morris	7	25
Picatinny Arsenal	Rockaway	Morris	34	8
The Country Sportsman	Riverdale	Morris	37	75
Buck-N-Bass	Jefferson	Morris	42	110
R & S Sports	Budd Lake	Morris	47	5
River Run Taxidermy Studio	Long Valley	Morris	54	17
County Line Sport Shop	Hackettstown	Morris	65	97
Jackson Sporting Goods*	Jackson	Ocean	12	0
Tips Hardware*	West Creek	Ocean	68	13
Lakehurst Naval Station*	Lakehurst	Ocean	40	0
Brick Armory*	Brick	Ocean	72	0
Frank's Tackle	West Milford	Passaic	11	84
Monksville Biat & Tackle	Ringwood	Passaic	44	1
North American Archery	Monroeville	Salem	23	279
Joe and Sandy's Country Store	Canton	Salem	24	77
Bradway's Farm Market	Salem	Salem	70	154
Hillsborough Shooting Center	Belle Meade	Somerset	50	59
Glad-Pack Sunoco	Peapack-Gladstone	Somerset	67	48
Hainesville General Store	Hainesville	Sussex	1	43
Stokes Sport Shop	Branchville	Sussex	3	244

Station Name	Location	County	Station Number	Turkeys Checked
Simon-Peter Bait and Tackle	Newton	Sussex	32	218
Stillwater Supply	Stillwater	Sussex	35	19
Sig Borstad Hunting Supply	McAfee	Sussex	64	48
Mastodon Sport Shop	Vernon	Sussex	66	19
Hi-Way Sports Shop	Washington	Warren	5	165
The Owl's Nest	Warren Glen	Warren	17	168
The Big K	Johnsonburg	Warren	22	17
Alpine Meats	Blairstown	Warren	36	27

APPENDIX B. (2003 Turkey Hunter Harvest Survey)

<first page on State letterhead on mailed version>

Division of Fish and Wildlife
PO Box 400
Trenton, NJ 08625-0400
Martin J. McHugh, Director
www.njfishandwildlife.com

May 30, 2003

Dear New Jersey Spring Gobbler Hunter:

The New Jersey Division of Fish and Wildlife, Wild Turkey Research Project is attempting to collect information about your experiences while turkey hunting. We are also interested in your opinions on changes in wild turkey management in New Jersey. Your name was selected at random from all the people who received permits to hunt in New Jersey this spring. Please complete the survey form and return it in the enclosed envelope by July 15, 2003.

Your opinions on the future direction of wild turkey management in New Jersey are very important. Thank you for your participation in the 2003 survey.

Sincerely,

<signed on mailed version>

Lawrence Herrighty, Chief
Bureau of Wildlife Management

cc: Enclosures

NEW JERSEY SPRING TURKEY HUNTER SURVEY

NJ Division of Fish and Wildlife

1. Circle the Turkey Hunting Area(s) in which you hunted this spring.

1st Permit:	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	20	21	22
2nd Permit:	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	20	21	22
3rd Permit:	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	20	21	22

2. Circle the Hunting Period(s) in which you hunted this year (Y = youth turkey day).

1st Permit:	Y	A	B	C	D	E	G
2nd Permit:	Y	A	B	C	D	E	G
3rd Permit:	Y	A	B	C	D	E	G

3. How many days did you spring turkey hunt in New Jersey this year?

   With Your 1st Permit: _____

   With Your 2nd Permit: _____

   With Your 3rd Permit: _____

4. Based on question #3, on how many days did you hear gobbling while hunting?

   With Your 1st Permit: _____

   With Your 2nd Permit: _____

   With Your 3rd Permit: _____

5. In which **county** do you reside? _____

6. Turkey populations where you do most of your hunting are: (circle one)

   Too high About right Too low

7. How many years have you hunted for wild turkeys in New Jersey? _____

8. How many spring turkey hunting permits did you obtain for New Jersey this year? _____

9. How many gobblers did you harvest in New Jersey this spring? _____

10. How many hens did you see while turkey hunting in New Jersey this spring? _____

11. On what **one** type of land do you do **most** of your turkey hunting? (circle one)

    Public land Private land

12. Did you use a decoy this year when hunting turkeys? (circle one)

    Yes No

13. If yes, do you believe that use of a decoy increased your chance of success while spring turkey hunting? (circle one)

Yes No

14. How many other hunters did you see in the field during the spring season? _____

15. Did you experience interference from another hunter this season (was your hunting experience diminished because of the presence of another hunter)? (circle one)

Yes No

16. How many times did you experience what you consider to be an unsafe hunting situation involving another hunter this turkey season? _____

17. If you experienced an unsafe hunting situation during this turkey season, what land type were you hunting on?

circle one: a). Private Property b). State Land

c). Federal Land d). Municipal/ County Land

18. During the spring gobbler season, do you believe there are: (circle one)

a). Too many hunters b). Many hunters but not a problem

c). Not very many hunters d). Not sure or no opinion

19. The length of the spring gobbler season (currently six weeks) is: (circle one)

a). just right b). not long enough

c). too long d). Not sure or no opinion

20. Please rank the following 1 through 5 with **1** being **most** important to you as a turkey hunter and **5** being **least** important to you as a turkey hunter

_____ being able to hunt during the first week of the season
_____ hunting without seeing another hunter afield
_____ seeing many birds/ hearing many gobbles
_____ harvesting a bird
_____ a safe hunting environment

21. What is your age? _____

22. If you are 16 or younger, did you hunt on the youth turkey hunting day (April 12, 2003)?

(circle one) yes no

if yes, complete questions 23 – 25 --- if no, skip to question # 26

23. Did you harvest a turkey on youth turkey hunting day (April 12, 2003)?

(circle one) yes no

24. Was hunting on youth turkey day your first hunting experience of any kind?

(circle one) yes no

25. If yes, has hunting on youth turkey day encouraged you to hunt other game species as well?

(circle one) yes no

26. How far is it (one way) from your residence to where you turkey hunt?
_____miles

27. What is your gender? (circle one) male female

28. What is your educational background? (circle one)

a). still attending elementary, middle, or high school

b). completed high school

c). did not complete high school

d). some college or technical training

e). college graduate

f). completed graduate work

29. Do you belong to any of the following organizations? (circle all that apply)

a). National Wild Turkey Federation

b). New Jersey Federation of Sportsmen's Clubs

c). Other (any other sportsmen's groups or organizations)

d). None

30. Please circle the one statement which best fits your view of the current spring turkey season format:

a). I am happy with current permit quotas and the six-week season length.

b). I would rather see lower permit quotas during the six-week season

c). I would rather see a shorter season with current permit quotas.

d). I am happy with both the six-week season length and the current permit quotas.

Thanks for your cooperation in completing this survey.

APPENDIX C. (Turkeys Trapped During 2003)

Tag #	Capture Date	Capture County	Capture Township	Sex	Age	Beard Length	Spur Length	Wt.	Release Site	Remarks
199	1/16/03	HUNTERDON	RARITAN	M	A	9.75	1.19	19.5	HOWARDSVILLE	
5192				F	A			12	HOWARDSVILLE	
200				M	A	8.12	1.12	18	HOWARDSVILLE	
5194				F	A	8		12	HOWARDSVILLE	
201				M	A	9.5	0.87	21.5	HOWARDSVILLE	
5193				F	J			9	HOWARDSVILLE	
5195				F	A			11	HOWARDSVILLE	
5200				F	A			12	COLLIERS MILLS	
5285				F	A			12	COLLIERS MILLS	
5286	1/17/03	SUSSEX	FRELINGHYSEN	F	A			11	HOWARDSVILLE	
5287				F	A			10.5	HOWARDSVILLE	
5288				F	A			11	HOWARDSVILLE	
5289				F	A			10	HOWARDSVILLE	
5290				F	J			9	HOWARDSVILLE	
5291				F	A			11	HOWARDSVILLE	
5292				F	A			10	HOWARDSVILLE	
5293				F	A			10	HOWARDSVILLE	
5294				F	A			12	HOWARDSVILLE	
5295				F	A			10.5	HOWARDSVILLE	
5296				F	A			10	HOWARDSVILLE	
5297				F	J			10	HOWARDSVILLE	
5298				F	A			10	HOWARDSVILLE	
202	1/21/03	SUSSEX	FREDON	M	A	8.75	0.62	19	ON SITE	MORTALITY
201				M	J	2.5		14.5	ON SITE	MORTALITY
203				M	A	9.75	0.75	19.5	ON SITE	MORTALITY
204				M	A	6.75	0.75	18	ON SITE	MORTALITY
205				M	A	7.87	0.62	18	ON SITE	MORTALITY
206				M	A	8.5	0.75	19	ON SITE	MORTALITY
5299	1/21/03	SUSSEX	FRANKFORD	F	A			11	HOWARDSVILLE	
5191				F	A			10.5	HOWARDSVILLE	
5300				F	A			10	HOWARDSVILLE	
7001				F	A			11	HOWARDSVILLE	
7002				F	A			11.5	HOWARDSVILLE	
207				M	J	2.5	0.12	15.5	ON SITE	MORTALITY
7003				F	A			10.5	LAKEHURST	
7004				F	A			9.5	LAKEHURST	
7005				F	A			11	LAKEHURST	
7006				F	A			10	LAKEHURST	
7007				F	J			9.5	LAKEHURST	
7008				F	J			9	LAKEHURST	
7009				F	A			10.5	LAKEHURST	
7010				F	A			12	LAKEHURST	
208				M	J	2.75	0.12	13.5	ON SITE	MORTALITY
7011				F	J			9	LAKEHURST	
7012				F	A	7.25		11	LAKEHURST	
7013				F	A			10	LAKEHURST	
7014				F	A			10	LAKEHURST	
7015				F	J			9	LAKEHURST	
209	1/21/03	SUSSEX	BYRAM	M	A	8.75	0.62	20.5	ON SITE	MORTALITY
210				M	A	9.25	0.75	22	ON SITE	MORTALITY
211				M	A	9.37	0.75	22	ON SITE	MORTALITY

212				M	A	8.75	0.75	23	ON SITE	MORTALITY
1830	1/21/03	SUSSEX	WANTAGE	F	A				ON SITE	
1831				F	A				ON SITE	
1832				F	A				ON SITE	
1833				F	J				ON SITE	
1834				F	J				ON SITE	
1835				F	A				ON SITE	
1836				F	A				ON SITE	
1837				F	A				ON SITE	
1838				F	A				ON SITE	
1839				F	J				ON SITE	
1840				F	A				ON SITE	
1841				F	A				ON SITE	
1842				F	A				ON SITE	
7016	1/22/03	SUSSEX	FREDON	F	A			12	CAPE MAY	
7017				F	A			10.5	CAPE MAY	
7018				F	A			10.5	CAPE MAY	
7019				F	A			10.75	CAPE MAY	
7020				F	A			12	CAPE MAY	
7021				F	A			10.5	CAPE MAY	
7022				F	A			13	CAPE MAY	
7023				F	A			11	CAPE MAY	
7024				F	A			10	CAPE MAY	
7025				F	J			9	CAPE MAY	
7026				F	J			9.5	CAPE MAY	
7027				F	J			9.5	CAPE MAY	
7028				F	A			12	CAPE MAY	
7029				F	A			11.5	CAPE MAY	
7030				F	J			9.5	CAPE MAY	
7031				F	J			10	CAPE MAY	
7032	1/22/03	SUSSEX	WANTAGE	F	A	4.25		11	ON SITE	
7033				F	A	2.37		11	ON SITE	
7034				F	A	5.75		12	ON SITE	
213	1/24/03	SUSSEX	BYRAM	M	J	1.5	0.25	16	CAPE MAY	
214				M	J	1.75	0.25	14.5	ON SITE	MORTALITY
215				M	J	1.87	0.12	16	ON SITE	MORTALITY
216				M	J	1.5	0.12	13.5	CAPE MAY	MORTALITY
217				M	J	2.25	0.12	16	ON SITE	MORTALITY
218	1/28/03	SUSSEX	WANTAGE	M	A	10	1	22	ON SITE	MORTALITY
219				M	A	9.5	1	22.5	ON SITE	MORTALITY
220				M	A	9.75	1.12	20	ON SITE	MORTALITY
7035				F	A	5.75		11.5	LAKEHURST	
7036				F	J			9	LAKEHURST	
7037				F	A			12.5	LAKEHURST	
7038				F	A			11.5	LAKEHURST	
7039				F	A			12	LAKEHURST	
7040				F	A			11.5	LAKEHURST	
7041				F	J			10	LAKEHURST	
7042				F	A			12.5	LAKEHURST	
7043				F	A	6.75		11	CAPE MAY	
7044				F	A			10.5	CAPE MAY	
7045				F	A			11	CAPE MAY	
7046				F	A			12.5	LAKEHURST	
230	1/31/03	SUSSEX	FREDON	M	J	2.75	0.12	13	ON SITE	MORTALITY
231				M	J	2.25	0.25	15.5	ON SITE	MORTALITY
232				M	J	1.75	0.25	16.5	ON SITE	MORTALITY
7057				F	A			10.5	CHESTERFIELD	

7058				F	A			10.5	CHESTERFIELD	
7059				F	A			10.5	CHESTERFIELD	
7060				F	J			9	CHESTERFIELD	
7061				F	J			10.5	CHESTERFIELD	
1817				F	A			9.5	WHITTINGHAM	
1818				F	J			10	WHITTINGHAM	
1819				F	A			10	WHITTINGHAM	
1820				F	A			10.5	WHITTINGHAM	
1821				F	A			10	WHITTINGHAM	
1822				F	A			10.5	WHITTINGHAM	
1823				F	A			11	WHITTINGHAM	
1824				F	J			10	WHITTINGHAM	
233	2/12/03	SUSSEX	FRANKFORD	M	A	8.87	1	20.5	ON SITE	MORTALITY
234				M	J	2.87	0.12	15.5	ON SITE	MORTALITY
235				M	J	2.37	0.25	16	ON SITE	MORTALITY
236				M	A	8.5	0.87	18.5	ON SITE	MORTALITY
237				M	J	3.25	0.12	15.5	ON SITE	MORTALITY
7047	1/30/03	SUSSEX	BYRAM	F	A			11.5	CHESTERFIELD	
7048				F	A			10.5	CHESTERFIELD	
7049				F	J			11	CHESTERFIELD	
7050				F	A			12.5	CHESTERFIELD	
7051				F	A			12.5	CHESTERFIELD	
7052				F	J			9.5	CHESTERFIELD	
7053				F	J			10	CHESTERFIELD	
7054				F	J			10	CHESTERFIELD	
7055				F	J			10.5	CHESTERFIELD	
221	1/31/03	WARREN	KNOWLTON	M	A	8.62	0.75	19.5	ON SITE	MORTALITY
222				M	A	8.5	0.75	19	ON SITE	MORTALITY
223				M	A	8.25	0.75	19	ON SITE	MORTALITY
224				M	A	7.5	0.75	15	ON SITE	MORTALITY
225				M	A	8.5	0.75	15.5	ON SITE	MORTALITY
226				M	A	8.87	0.87	20	ON SITE	MORTALITY
227				M	A	8.87	0.87	19	ON SITE	MORTALITY
228				M	A	8.25	0.62	19.5	CAPE MAY	
229				M	A	8	1	20	CAPE MAY	
238	2/26/03	SUSSEX	FRANKFORD	M	J	2.12	0.12	15	ON SITE	MORTALITY
7201	2/26/03	SUSSEX	WALPACK	F	A			10.5	ON SITE	
7202				F	A			8.5	ON SITE	
7203				F	A			8.5	ON SITE	
7204				F	A			8.5	ON SITE	
7205				F	J			7	ON SITE	
7206				F	A			8.5	ON SITE	
7207				F	J			7.25	ON SITE	
7208				F	A			10	ON SITE	
7209				F	A			8	ON SITE	
2210				F	J			7	ON SITE	
2211				F	A	5.5		8	ON SITE	
2212				F	A			10.25	ON SITE	
2213				F	J			8	ON SITE	
2214				F	A			8.5	ON SITE	
2215				F	A			9	ON SITE	
2216				F	A			9	ON SITE	
2217				F	A			8	ON SITE	
2218				F	A	7.25		10	ON SITE	
239				M	J	2	0.12	13	ON SITE	MORTALITY
240				M	J	3	0.12	13	ON SITE	MORTALITY
241				M	J	2.12	0.25	15	ON SITE	MORTALITY

242				M	J	3.12	0.12	15	ON SITE	MORTALITY
243	2/28/03	SUSSEX	FRANKFORD	M	J	2.87	0.25	14.5	ON SITE	MORTALITY
244				M	J	4.25	0.25	16	ON SITE	MORTALITY
245				M	J	0.75	0.12	13	ON SITE	MORTALITY
246	3/8/03	SUSSEX	BYRAM	M	A	8.5	0.87	23.5	ON SITE	
247				M	A	10	0.75	26.5	ON SITE	
248	3/18/03	ESSEX	WEST ORANGE	M	J	3.75	0.12	18	BLACK RIVER	NUISANCE
7219				F	J			9.5	BLACK RIVER	NUISANCE
7220				F	A			12	BLACK RIVER	NUISANCE
7221				F	J			8.5	BLACK RIVER	NUISANCE
7222	3/26/03	CUMBERLAND	BRIDGETON	F	A			14	PEASLEE WMA	NUISANCE
7223				F	A			12	PEASLEE WMA	NUISANCE
7224				F	A			12	PEASLEE WMA	NUISANCE
7225				F	A			13	PEASLEE WMA	NUISANCE
249				M	J	2.5		20	PEASLEE WMA	NUISANCE
7226				F	A			14	PEASLEE WMA	NUISANCE
7227				F	A			15.5	PEASLEE WMA	NUISANCE
7228				F	A			13	PEASLEE WMA	NUISANCE
250				M	J	4		20	PEASLEE WMA	NUISANCE
7229				F	J			12	PEASLEE WMA	NUISANCE
251				M	J	4		19	PEASLEE WMA	NUISANCE
7230				F	J			10.5	PEASLEE WMA	NUISANCE
7231				F	A			14.5	PEASLEE WMA	NUISANCE
252				M	J	4		21	PEASLEE WMA	NUISANCE
253				M	J	2.5		19	PEASLEE WMA	NUISANCE
254				M	J	4.5		17.5	PEASLEE WMA	NUISANCE
7232				F	J			12	PEASLEE WMA	NUISANCE
7233				F	A			13	PEASLEE WMA	NUISANCE
255				M	J	3		16.5	PEASLEE WMA	NUISANCE
7234				F	A			13.5	PEASLEE WMA	NUISANCE
7235				F	A			14	PEASLEE WMA	NUISANCE
7236				F	A			14	PEASLEE WMA	NUISANCE
7237				F	A	3.5		15	PEASLEE WMA	NUISANCE
7238				F	A	4		14	PEASLEE WMA	NUISANCE
7239				F	A	3.25		12	PEASLEE WMA	NUISANCE
7240				F	J			10	PEASLEE WMA	NUISANCE
7241				F	A			14.5	PEASLEE WMA	NUISANCE
7242				F	J			12	PEASLEE WMA	NUISANCE
7243	4/2/03	CUMBERLAND	BRIDGETON	F	A	5.25		13.5	PEASLEE WMA	NUISANCE
256				M	J	4.75	0.25	21	PEASLEE WMA	NUISANCE
7244				F	J			9.5	PEASLEE WMA	NUISANCE
257				M	J	3.75	0.25	17	PEASLEE WMA	NUISANCE
258				M	J	4	0.25	16	PEASLEE WMA	NUISANCE
259				M	J	3	0.25	19	PEASLEE WMA	NUISANCE
7245				F	A			13.5	PEASLEE WMA	NUISANCE
260	4/9/03	MERCER	HOPEWELL	M	J	3.5	0.25	17	CLINTON WMA	NUISANCE
261				M	J	3.87	0.12	19	CLINTON WMA	NUISANCE
262				M	J	4.12	0.25	18.5	CLINTON WMA	NUISANCE
263				M	J	4	0.12	17	CLINTON WMA	NUISANCE
264				M	J	5	0.25	22	CLINTON WMA	NUISANCE
265				M	J	3.5	0.12	19	CLINTON WMA	NUISANCE
266				M	J	4.75	0.12	18.5	CLINTON WMA	NUISANCE