

Illegal Turkey Hunting in Mississippi

John T. Forbes, *Social Science Research Center, Mississippi State University, Mississippi State, MS 39762*

R. Gregory Dunaway, *Social Science Research Center, Mississippi State University, Mississippi State, MS 39762*

George A. Hurst, *Department of Wildlife and Fisheries, Mississippi State University, Mississippi State, MS 39762*

Bruce D. Leopold, *Department of Wildlife and Fisheries, Mississippi State University, Mississippi State, MS 39762*

Abstract: Wild turkey (*Meleagris gallopavo*) hunting has gained popularity as turkey populations have risen. Consequently, there is a greater chance that illegal turkey hunting will impact turkey populations. Our objectives were to determine the extent of illegal turkey hunting in Mississippi and identify potential violators. We conducted a mail survey of turkey hunters ($N = 4,026$) who hunted in Mississippi during the 1994 spring gobbler-only season. A response rate of 55% was obtained. Logistic regression analysis was used to predict the probability of a hunter violating a regulation. We entered 20 independent variables into the model and 6 significantly predicted turkey hunting violations.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 51:553–559

Wild turkey (*Meleagris gallopavo*) populations have made a remarkable comeback in the United States since the 1930s. The efforts of state wildlife agencies, the National Wild Turkey Federation (NWTf), and concerned sportsmen have returned the wild turkey to nearly all of its original range in the United States as well as areas not previously inhabited by turkeys (Kennamer and Kennamer 1996). Populations had grown to more than 4.2 million turkeys in North America (including all subspecies) by 1994 (Kennamer and Kennamer 1996). In Mississippi, the population had increased to more than 350,000 by 1989 (Kennamer and Kennamer 1990).

Hunter numbers have fluctuated in Mississippi, reaching a high of 63,516 turkey hunters in 1987 (Hurst 1995). There were 42,627 turkey hunters in the state who spent 356,210 man-days hunting in 1995. Characteristics and attitudes of turkey hunters have been obtained in Mississippi (Palmer et al. 1990, Forbes et al. 1996, Forbes 1997, Godwin et al. 1997) and other states (Vangilder et al. 1990, Cartwright and Smith 1990). Forbes et al. (1996) and Godwin et al. (1997) examined turkey

hunter attitudes toward potential regulation changes in Mississippi. Thackston and Holbrook (1996) stated that determining hunter attitudes and incorporating this into management practices for wild turkeys was essential. We believe that proactive agencies which determine turkey hunter attitudes toward potential regulation changes will have a better rate of compliance with regulations. Forsyth and Marckese (1993) conducted personal interviews with known poachers in Louisiana and found that poachers engage in illegal activity for 5 reasons. These reasons included trouble-making, excitement, smartness, toughness, and autonomy, which are the same reasons others engage in other forms of crime and deviance (Miller 1958). Little literature has examined the extent of illegal wild turkey hunting. Our objectives were to: (1) determine the extent of illegal wild turkey hunting and (2) attempt to model wild turkey hunters to predict the probability of violations.

This project was supported by the Mississippi Chapter, National Wild Turkey Federation, Forest and Wildlife Research Center, and Social Science Research Center, Mississippi State University. We thank C. Shropshire of the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP) for providing turkey hunter names and addresses. This paper is a contribution of the Mississippi Cooperative Wild Turkey Research Project.

Methods

A random sample of sportman's license holders ($N = 4,026$) was obtained from the MDWFP for hunters who purchased this license in 1994. Only hunters who had indicated on their license renewal application that they hunted turkeys were included in the sample (C. Shropshire, pers. commun.).

A mail survey consisting of 41 questions about attitudes, hunting characteristics, illegal behavior, and demographic characteristics was used to achieve our objectives (Forbes 1997). We used a modified Total Design Method (TDM) to design and implement the survey (Dillman 1978). Because some of the questions requested information which might be considered incriminating and in order not to intimidate respondents, only 1 first class mailing was used followed by a post-card reminder 2 weeks later. The survey packet consisted of a questionnaire, cover letter, and postage-paid return envelope. No study of nonresponse bias was conducted (Filion 1980).

Logistic regression analysis was used to identify illegal wild turkey hunters in Mississippi. All 6 regulations being measured were grouped together and responses were analyzed as either the regulation was violated (1) or was not violated (0). Logistic regression analysis allowed using categorical predictor variables and did not require the assumptions of a normal distribution or homogeneity of variance (Afifi and Clark 1990). Chi-square tests were performed between the dependent variable (violations) and each of the 20 independent variables thought to affect hunter behavior (Tables 1, 2). Variables that were significant ($P \leq 0.05$) were entered into the logistic regression equation.

Because few ($N = 21$ to 115 depending on violation) respondents reported they had violated at least 1 of the 6 regulations treated in the survey, the variance of the sample regarding these questions was small. To attempt to correct this problem, we

took a random sample of non-violator respondents ($N = 255$) that was equal to the sample size of violator respondents ($N = 255$). A regression was then performed with the subset of data with equal numbers of violators and non-violators.

Results

Overall, 11.4% ($N = 255$) of respondents reported they had violated at least 1 regulation and 31.7% ($N = 81$) of these hunters reported they had violated more than 1 regulation (3.6% of all respondents). Chi-square tests against these responses revealed that 7 independent variables were significant at predicting if the hunter would violate (Table 3). However, 1 of the variables had to be eliminated from analysis because 2 of the 7 response categories did not have enough respondents.

Turkey hunters who hunted more days were 14.3% more likely than those that hunted fewer days to report they had violated 1 of the 6 regulations ($P < 0.05$). Hunters who felt hunting was very important to him or her were 5.8% less likely to be a reported violator. Older hunters were 1.4% less likely than younger hunters to violate turkey hunting regulations. Hunters who were married were 40.3% less likely than those that were not married to be a violator ($P < 0.05$). Turkey hunters who had a higher income were 8.9% less likely than those with a lower income to violate a regulation. Finally, turkey hunters who were members of a conservation organization were 56.1% more likely than those who were not to be a violator of at least 1 of the regulations. The model correctly classified 59.1% of respondents and was significant ($\chi^2 = 25.23$, $df = 6$, $P < 0.001$). The goodness of fit statistic was 480.8 ($df = 481$) and the pseudo- R^2 was 0.572. This model was significant at predicting if a turkey hunter would violate a hunter regulation.

Discussion

Overall, 11.4% ($N = 255$) of respondents violated at least 1 regulation. The most violated regulation was harvesting or attempting to harvest a turkey one-half hour before sunrise, and the least violated was harvesting or attempting to harvest a hen. Six variables significantly predicted if a hunter would violate a turkey hunting regulation. Older married hunters were less likely to violate regulations as were hunters that felt turkey hunting was very important. Interestingly, hunters who were members of a conservation organization (e.g., Audubon Soc.) were more likely to violate a regulation than those who were not members of such an organization. Gray and Kaminski (1994) found that membership in conservation organizations, including Ducks Unlimited, were not significant predictors of duck hunting violations in the Mississippi Flyway. Membership in the NWTF was not a significant predictor of violations in our study. There was no difference in violations among the state's 6 management districts, although most hunters (29.4%) hunted in district 4. From a management standpoint, this model gives administration 2 choices to attempt to reduce violations. First, programs that could make turkey hunting more important to a hunter (i.e., taking a youngster hunting) may reduce illegal behavior in some individuals. Second, and perhaps most importantly, managers could publish popular articles in magazines of conservation

Table 1. Summary statistics for categorical variables for a mail survey of 2,236 Mississippi wild turkey hunters in 1994.

Variable	Percentage
1. Who taught you how to turkey hunt?	
a. Self	51.0
b. Parent	10.2
c. Grandparent	1.4
d. Friend	29.9
e. Other	5.4
2. How often did you hunt in the 1994 spring turkey season?	
a. 1 day	4.2
b. 2-5 days	24.8
c. 6-10 days	21.2
d. 11-15 days	15.1
e. 16-20 days	10.9
f. More than 20 days	12.7
3. Did you hunt on:	
a. Private land	62.7
b. Public land (wildlife management areas)	3.4
c. Public land (national forests, wildlife refuges, etc.)	3.5
d. Public and private	19.2
4. Where did you hunt? (Map provided on survey)	
a. District 1	11.2
b. District 2	9.3
c. District 3	15.5
d. District 4	29.7
e. District 5	23.0
f. District 6	11.3
5. How important is turkey hunting to you?	
a. Very important	47.1
b. Important	41.3
c. Not important	10.5
6. Are you a member of a hunting club?	
a. Yes	86.6
b. No	11.4
7. Are you a member of the National Wild Turkey Federation?	
a. Yes	16.5
b. No	82.0
8. Are you a member of any other conservation organization?	
a. Yes	35.8
b. No	62.7
9. Sex?	
a. Male	97.1
b. Female	1.8
10. Marital status?	
a. Married	79.7
b. Single	12.3
c. Divorced	6.7
11. What is your average annual household income before taxes?	
a. Less than \$10,000	3.3
b. \$10,000 to \$25,000	14.7
c. \$25,001 to \$50,000	39.7

d. \$50,001 to \$75,000	22.5
e. More than \$75,000	15.8
12. Which of the following best describes your job?	
a. Blue collar (technical)	28.3
b. Blue collar (non-technical)	11.6
c. Professional	20.5
d. White collar	21.3
e. Farmer	4.2
f. Student	2.4
g. Small business owner	7.4
h. Unemployed	2.5
13. What type of area were you raised in?	
a. Farm	38.6
b. Country (non-farm)	21.8
c. Town	14.1
d. Small city	15.0
e. Medium city	3.2
f. Large city	5.9
14. What type of area do you live in now?	
a. Farm	19.6
b. Country (non-farm)	34.6
c. Town	14.9
d. Small city	19.0
e. Medium city	3.8
f. Large city	6.8
15. Have you ever been written a citation for a turkey hunting violation?	
a. Yes	1.4
b. No	97.2

organizations that explain the costs of poaching to the poacher, as well as to the larger society. It is important that these hunters realize that poaching reduces the enjoyment of the sport for other hunters and tarnishes the image of hunting to the general public.

Exceeding the bag limit for gobblers is the most important concern for many state wildlife agencies (C. Shropshire, pers. commun.). Turkey populations are perceived by the public to suffer from excess harvest by hunters. In 1994, the harvest

Table 2. Summary statistics for continuous variables for a mail survey of 2,236 wild turkey hunters in Mississippi in 1994.

Variable	Min	Max	Mean
1. How many years have you hunted wild turkeys?	0	64	12.08
2. How many gobblers did you harvest in Mississippi during the 1994 spring gobbler season?	0	23	1.04
3. Age?	17	82	41
4. How many children do you have living at home?	0	14	0.97
5. How many years of school have you completed?	0	26	13.34

Table 3. Logistic regressions coefficients for significant predictor variables of violators of wild turkey hunting regulations in Mississippi in 1994 (1 = yes, 0 = no).

Variable	β	SE	Exp(β)
1. How often did you hunt in the 1994 spring gobbler season?	0.1336 ^a	0.0670	1.1429
2. How important is turkey hunting to you? (1 = not important, 3 = very important)	-0.0595	0.1708	0.9422
3. Age	-0.0145	0.0088	0.9856
4. Marital status (1 = married, 0 = not married)	-0.5169	0.2506	0.5964
5. What is your average annual household income before taxes?	-0.0896	0.1025	0.9143
6. Are you a member of any other conservation organization (i.e., Ducks Unlimited, Audubon Society, etc.)	0.4451 ^a	0.1953	1.5607
7. Constant	0.8452	0.5345	

Model $\chi^2 = 25.225$ ($df = 6$, $P < 0.001$)
 Goodness of fit = 480.759 ($df = 481$)
 Pseudo- $R^2 = 0.5715$

a. Significant at $P < 0.05$

limit in Mississippi was 3 gobblers per season, and we found that 64 hunters harvested 191 gobblers over the bag limit. By extrapolating the number of illegal hunters and number of birds over the limit to the total number of turkey hunters, we conclude that only 1 gobbler over the limit was killed per 14 square miles. On average, this could hardly be considered to have a biological effect on turkey populations in Mississippi. Violations of regulations do have sociological effects, however, because the opportunity for other hunters to harvest a gobbler is reduced by each one harvested over the limit by a poacher. Based on our data, we also expect approximately 4,659 illegal turkey hunters in the state, who hunted 21,250 illegal days in 1994. Approximately 2% of turkey hunters accounted for 88.3% of these days. This illustrates the main problem conservation officers face in the field. Forsyth (1993) conducted personal interviews of game wardens in Louisiana and found they consider the experienced poacher the most difficult to catch. Poachers who were inexperienced and those who hunted with several people were the most likely to get caught. Based on our results, and the fact that enforcement man-power and resources are limited, targeting known, high-rate offenders would be the most beneficial to turkey populations in the state.

The questions on this survey asked the respondent on how many days he/she harvested or attempted to harvest a turkey under a particular circumstance. It is unlikely that each of the attempted violations resulted in an illegally harvested bird. Therefore, it may be difficult to accurately estimate the impact of illegal harvest on the turkey population based on these 6 questions (estimates for exceeding the bag limit were not based on attempted harvests). Perhaps future research should address the issue of birds that were actually harvested rather than harvests and attempted harvests of turkeys. While the intent to commit an illegal act is still present in attempting to harvest a turkey, there is no effect on the population if the bird is not harvested.

The violations asked on this survey directly related to potential impacts to the turkey population. Sigler (1995) suggested that many other types of violations do not directly impact wildlife populations (i.e., improper tagging of harvested animals). Future research should include violations which do not directly impact turkey populations to get a more comprehensive view of wildlife violations.

Literature Cited

- Affifi, A. A. and V. Clark. 1990. Computer-aided multivariate analysis, second ed. Van Nostrand Reinhold Co., New York, N.Y. 505pp.
- Cartwright, M. E. and R. A. Smith. 1990. Attitudes, opinions, and characteristics of a select group of Arkansas spring turkey hunters. Proc. Natl. Wild Turkey Symp. 6:177-187.
- Dillman, D. A. 1978. Mail and telephone surveys: the total design method. John Wiley and Sons, New York, N.Y. 325pp.
- Filion, F. L. 1980. Human surveys in wildlife management. Pages 441-454 in S. D. Schemnitz, ed. Wildlife management techniques manual, 4th ed. The Wildl. Soc., Washington, D.C.
- Forbes, J. T. 1997. Characteristics and illegal behavior of wild turkey hunters in Mississippi. M.S. Thesis. Miss. State Univ. Mississippi State, Miss. 63pp.
- , K. D. Godwin, and G. A. Hurst. 1966. Wild turkey hunter attitudes toward potential regulation changes in Mississippi. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 50:457-465.
- Forsyth, C. J. 1993. Chasing and catching "bad guys": the game warden's prey. Deviant Behavior. 14:209-226.
- and T. A. Markese. 1993. Thrills and skills: a sociological analysis of poaching. Deviant Behavior 14:157-172.
- Godwin, K. D., R. S. Seiss, C. C. Shropshire, D. A. Miller, G. A. Hurst, and B. D. Leopold. 1997. Characteristics and attitudes of Mississippi wild turkey hunters. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 51: (In press).
- Gray, B. T. and R. M. Kaminski. 1994. Illegal waterfowl hunting in the Mississippi Flyway and recommendations for alleviation. Wildl. Monogr. No. 127. 60pp.
- Hurst, G. A. 1995. An ecological study of the wild turkey on Tallahala Wildlife Management Area, Mississippi, 1983-1993. Compl. Rep., Fed Aid in Wildl. Restoration, Proj. W-48, Study No. 30. Jackson, Miss. 65pp.
- Kenamer, J. E. and M. C. Kenamer. 1990. Current status and distribution of the wild turkey, 1989. Proc. Natl. Wild Turkey Symp. 6:1-12.
- . 1996. Status and distribution of the wild turkey in 1994. Proc. Natl. Wild Turkey Symp. 7:203-211.
- Miller, W. 1958. Lower class culture as a generating milieu of gang delinquency. J. Social Issues 14:5-19.
- Palmer, W. E., G. A. Hurst and J. R. Lint. 1990. Effort, success, and characteristics of spring turkey hunters on Tallahala Wildlife Management Area, Mississippi. Proc. Natl. Wild Turkey Symp. 6:208-213.
- Sigler, W. F. 1995. Wildlife law enforcement, 4th ed. Wm. C. Brown Publ., Dubuque, Iowa. 342pp.
- Thackston, R. E. and H. T. Holbrook. 1996. Responsive management survey of turkey hunting on Georgia wildlife management areas. Proc. Natl. Wild Turkey Symp. 7:253-257.
- Vangilder, L. D., S. L. Sheriff, and G. S. Olson. 1990. Characteristics, attitudes, and preferences of Missouri's spring turkey hunters. Proc. Natl. Wild Turkey Symp. 6:167-176.