

Characteristics and Attitudes of Wild Turkey Hunters in Mississippi

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Abstract: Wildlife management is the interaction of wildlife populations, habitats, and people. The eastern wild turkey (*Meleagris gallopavo silvestris*) is an important wildlife resource. However, quantitative data on the human dimensions of wild turkey management are scarce. Therefore, we surveyed 2,143 Mississippi turkey hunters by mail to determine characteristics of this group, examine attitudes towards regulations and management issues, and determine how hunter characteristics influenced attitudes. We received responses from 1,524 participants (71.1%). The average respondent was male, a Mississippi resident, 39 years old, had completed at least some college education, and had hunted turkeys for 13 years. Respondents hunting on private land reported higher harvest rates (0.73) and hunter success (0.44) than public land hunters (0.38 and 0.27, respectively). Attitudes towards 17 questions dealing with turkey hunting regulations or pertinent management issues were reported. Attitudes were significantly influenced by hunter characteristics. Surveys should be used to provide wildlife managers information on user-group characteristics and attitudes. This information can be used to plan and implement more comprehensive and proactive wildlife management programs.

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Modern wildlife management is an interaction of 3 elements: wildlife populations, habitats, and people (Giles 1978). Regulation of people (i.e., user-groups) is

frequently the most effective tool available to natural resource managers. However, when faced with management decisions, managers have often placed emphasis on obtaining sound population and habitat data, while having limited information concerning the human dimensions involved.

The eastern wild turkey is an important wildlife resource in Mississippi, with an estimated 41,472 hunters spending approximately 341,000 days pursuing wild turkey during the 1993 spring gobblers-only season (Shropshire 1994). Long-term (1983–1996) research projects have provided quantitative data on wild turkey populations and habitats in Mississippi (Hurst 1995, Leopold et al. 1996). However, detailed characteristics of hunters using this resource are inadequate (Palmer et al. 1990). Additionally, information on hunter attitudes towards regulations and issues which may affect turkey hunting is relatively limited (Cartwright and Smith 1990, Vangilder et al. 1990, Forbes et al. 1996). Therefore, we surveyed Mississippi turkey hunters to determine characteristics of this group, to examine attitudes towards regulations and management-related issues, and to determine how hunter characteristics influenced attitudes.

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Methods

We distributed surveys to 2,143 wild turkey hunters in June 1993 following guidelines for mail surveys (Dillman 1978). The initial mailing consisted of a cover letter, survey booklet, and a postage-paid return envelope. The survey consisted of 37 questions which addressed hunter characteristics (1–20) and attitudes (21–37) toward pertinent issues and regulations. This survey instrument was mailed to randomly selected participants from 2 sources: known turkey hunters who had responded to a previous statewide mail survey conducted by the MDWFP to assess harvest and hunter effort for all game species ($N = 968$) and resident turkey hunters who completed a legible permit card on any state Wildlife Management Area (WMA) during the 1993 spring (18 March–1 May) turkey season ($N = 1,000$). If a hunter was listed in both sources of potential survey participants, we censored that individual from 1 source to ensure that a single individual could not be sampled more than once during this study. Additionally, all 175 non-resident turkey hunters who completed a legible WMA permit card during the 1993 spring season were sampled. A follow-up mailing was sent to non-respondents 1 month after the initial mailing. We did not survey non-respondents to evaluate possible non-response bias (Filion 1980). Percentages were adjusted for non-responses to individual questions.

We used logistic regression (Myers 1990) to assess influence of hunter characteristics on attitudes. Logistic regression is appropriate because it uses a binary response variable with categorical and continuous regressors (Press and Wilson 1978). Only respondents answering all questions concerning characteristics were used in

this analysis. The response variable was either support for (included strongly and mildly supported) or opposition to (included strongly and mildly opposed) a particular question. Non-committal answers (no opinion) were excluded from this analysis. To ensure equal prior probabilities for support and opposition, we used equal sample sizes for both categories in each question. For each question, we determined that category with the lowest sample size and randomly selected an equal sample for the remaining category (Gray and Kaminski 1994, Miller et al. 1994).

Variable reduction was conducted in 2 phases. First, a correlation analysis was used on all pairs of independent variables (i.e., characteristics questions). One variable of all variable pairs with an $r \geq 0.4$ was randomly discarded (Brennan et al. 1986, Miller et al. 1994). Next, an initial logistic regression on this model was conducted to identify significant variables ($\alpha = 0.10$). Non-significant variables were discarded and the model was reanalyzed. Remaining independent predictor variables were entered into a logistic regression model. A model was developed for each attitude question ($N = 17$).

Results

Hunter Characteristics

A response was received from 1,524 turkey hunters (71.1%). Most (98.7%) respondents were male, and ages ranged from 8–79 ($\bar{x} = 39.5$, $SE = 0.34$, Table 1). Most (52.3%) hunters had completed at least some college education, and 67.6% of household incomes were between \$10,000 and \$50,000.

Most (78.9%) hunters were Mississippi residents, and 53.4% belonged to a private hunting club or leased land for hunting turkeys and other wildlife. However, only 1.8% reported leasing land for turkey hunting only. The average respondent had hunted turkeys for 13 years, while 32.1% hunted ≥ 5 years and 67.8% reported ≥ 15 years of experience. Only 15.3% of respondents were members of the National Wild Turkey Federation (NWTf), and 25.7% were checked by a conservation officer during the 1993 spring turkey season.

Some (37.3%) respondents reported managing private or leased lands for wild turkeys. Of those purporting management, 95.9% planted food plots, 48.3% limited turkey harvest, and 31.1% managed timber (e.g., thinning, prescribed burning).

Magazines were the most utilized source of information on turkeys and turkey hunting (68.1%), followed by videos (41.9%), contact with state wildlife department personnel (12.9%), books (11.6%), and workshops or seminars (7.5%). Respondents could check >1 answer for this question.

Hunter Effort and Harvest Characteristics

Hunter effort and success differed on private versus public land (Table 2). Harvest/hunter, harvest/effort, and hunter success rates were higher on private lands. Number of gobblers harvested/hunter ranged from 0–5 on public land ($\bar{x} = 0.38$, $SE = 0.02$), and 0–7 on private land ($\bar{x} = 0.73$, $SE = 0.03$). One percent of respondents admitted to harvesting over the legal season bag limit of 3 gobblers.

Table 1. Socioeconomic characteristics of Mississippi spring turkey hunters, 1993.

Characteristic	Respondents	
	N	%
Sex		
Male	1,458	98.7
Female	19	1.3
Age		
0–20	83	5.6
21–40	743	50.5
41–60	533	36.2
>60	113	7.7
Household income		
<\$10,000	98	7.2
10,000–24,999	334	24.6
25,000–49,999	584	43.0
50,000–74,999	241	17.8
>75,000	101	7.4
Education		
<12 years	184	12.6
High school graduate	481	32.9
Some college	433	29.6
College graduate	241	16.5
Post-graduate studies	123	8.4

Table 2. Wild turkey hunting parameters for private and public lands in Mississippi during spring 1993.

Parameter	N ^a	Private land	Public land
Harvest per hunter (gobblers)	1,330	0.73	0.38
Hunter success rate (proportion harvesting ≥1 gobbler)	1,330	0.44	0.27
Harvest rate by number of gobblers harvested	1,330		
0		0.56	0.73
1		0.22	0.19
2		0.13	0.06
3 (Mississippi season limit)		0.08	0.02
>3		0.01	0.00
Hunter effort days per hunter	1,501	9.30	8.38
Hunter effort rate (proportion of respondents by days hunted)	1,501		
≤10 days		0.81	0.84
11–20 days		0.16	0.13
≥20 days		0.03	0.03
Harvest per hunter day	1,330	0.10	0.06

a. Number of survey respondents for this question.

Thirty-seven percent of respondents reported calling in ≥ 1 turkey that was harvested by another hunter. Ten percent of respondents reported wounding 1 turkey that was not retrieved, and 2% wounded >1 bird. Most hunters (90.0%) did not flush a hen off a nest during the 1993 hunting season. Only 3.2% reported flushing >2 hens off a nest. Most (55.3%) respondents usually hunted both morning and afternoon, 42.9% hunted only mornings and 1.8% hunted only afternoons.

Hunter Attitudes

Respondent support was greater than opposition for the following regulations: being required to purchase a \$10 wild turkey stamp in addition to a hunting license (funds to be spent on wild turkey research and management), an optional or mandatory turkey hunter safety course, mandatory turkey tagging system, limiting number of hunters/day on public areas, not allowed to harvest subadult gobblers (<2 years old) on public areas, walk-in only areas on public land, being allowed to use turkey decoys, and not being allowed to run any dogs during turkey season (Table 3). Respondents generally opposed a state-wide fall either-sex turkey season, limiting hunting to half-day (mornings only), using rifles during spring season, and legalizing baiting for turkey hunting.

Most (66.4%) respondents thought that hunter orange should not be required while turkey hunting. However, 23.6% believed that turkey hunters should be required to wear hunter orange while walking, 5.2% supported attaching orange bands to the nearest tree during hunts, and 2.4% would support wearing orange at all times. Most (63.6%) hunters thought the current Mississippi bag limit of 3 gobblers/spring season was an appropriate regulation. Other hunters supported changing the season bag limit to 1 (3.1%), 2 (17.9%), 4 (7.3%), and 5 (6.3%) gobblers/season.

Table 3. Response (%) of wild turkey hunter attitudes towards regulations and pertinent issues relating to wild turkey management in Mississippi, 1993.

Regulation	Response					
	Strongly support	Mildly support	Neither support or oppose	Mildly oppose	Strongly oppose	Do not know
Turkey stamp (921) ^a	35	19	9	7	29	1
Mandatory tagging (918)	38	12	27	6	10	7
Optional safety course (919)	43	21	25	3	5	3
Mandatory safety course (916)	27	14	22	13	21	3
Limiting hunters on public areas (910)	24	14	20	9	26	7
Fall either-sex season (911)	22	13	8	7	47	3
Adult gobblers only (911)	34	14	15	13	21	3
Half-day hunting (910)	10	8	12	11	57	2
Walk-in hunting (914)	62	10	14	4	7	3
Turkey decoys (912)	42	24	22	3	8	1
No dogs in turkey season (911)	85	3	3	2	6	1
Use of rifles (911)	6	4	7	4	78	1
Legalizing baiting (913)	6	6	9	7	71	1

a. Number of survey respondents for this question.

Most (86.2%) hunters expressed an interest in attending wild turkey seminars or workshops in their area. Respondents thought that the worst problems facing the wild turkey in Mississippi were predators (34.4%), illegal harvest (31.8%), habitat loss (25.6%), disease and parasites (9.6%), overharvest (7.6%), herbicides and pesticides (1.0%), and other factors (4.0%) (respondents could check >1 answer for this question).

Turkey hunter attitudes were significantly influenced by hunter characteristics (Table 4). For example, education level influenced support for an optional turkey hunting safety course. Hunters who called in more turkeys, spent more days hunting on public land and had higher education levels supported a mandatory turkey hunting safety course. Mississippi residents showed stronger opposition to a mandatory course than nonresidents.

Hunters who spent more days hunting on private lands and those with higher income and education levels supported requiring the purchase of a \$10 turkey stamp. NWTF members were more likely to oppose a mandatory turkey stamp than nonmembers. Hunters with higher education levels and NWTF members supported requiring some use of hunter orange, while respondents with more hunting experience were more likely to oppose hunter orange.

Hunters who harvested more turkeys on public land, spent more time hunting public land, leased hunting land and were NWTF members opposed limiting the

Table 4. Regression statistics for variables selected in logistic regression analysis as predictors of support or opposition to regulations pertaining to wild turkey hunting in Mississippi, 1993.

Regulation	N	Variable ^b	Regression statistics ^a			
			B	SE	P	SB
Mandatory tagging	264	Intercept	-0.573	0.722	0.428	
		Morning hunter	-0.312	0.147	0.031	-0.167
		Resident	0.783	0.383	0.041	0.152
		Information	-0.198	0.915	0.031	-0.163
		Income	0.345	0.144	0.016	0.184
Wild turkey stamp	626	Public hunt	0.060	0.021	0.001	0.230
		Intercept	0.268	0.646	0.678	
		Private hunt	0.028	0.012	0.017	0.113
		NWTF	-0.758	0.266	0.004	-0.144
		Income	0.326	0.097	0.001	0.177
Optional safety course	128	Education	0.191	0.081	0.018	0.120
		Intercept	-0.861	0.462	0.062	
Mandatory safety course	574	Education	0.318	0.152	0.044	0.205
		Intercept	-0.532	0.369	0.150	
		Turkeys called	0.095	0.048	0.050	0.099
		Public hunt	0.043	0.013	0.001	0.163
		Resident	-0.414	0.230	0.071	-0.086
Use of hunter orange	566	Education	0.239	0.078	0.002	0.148
		Intercept	1.273	0.585	0.030	
		Education	-0.215	0.078	0.006	-0.135
		NWTF	-0.434	0.252	0.085	-0.086
		Years hunted	0.055	0.011	0.000	0.252

Table 4. (continued)

Regulation	N	Variable ^b	Regression statistics ^a			
			B	SE	P	SB
Use of rifles	190	Intercept	-1.081	1.147	0.346	
		Lease	-0.395	0.155	0.011	-0.216
		Years hunted	-0.027	0.015	0.067	-0.162
		NWTF	1.142	0.559	0.041	0.194
Morning only hunting	326	Intercept	0.389	0.460	0.398	
		Morning hunting	-0.818	0.124	0.000	-0.449
		Income	0.411	0.126	0.001	0.228
Fall either-sex hunting	666	Intercept	0.713	0.597	0.233	
		Public hunt	-0.074	0.014	0.000	-0.284
		Private hunt	-0.036	0.012	0.003	-0.146
		Resident	-0.560	0.232	0.016	-0.115
		Years hunted	-0.025	0.009	0.005	-0.136
		NWTF	0.604	0.238	0.011	0.121
Adult gobblers only (public areas)	548	Intercept	1.451	0.552	0.009	
		Private hunt	0.053	0.014	0.000	0.219
		Lease land	-0.388	0.095	0.000	-0.212
		Years hunted	0.029	0.009	0.001	0.166
		NWTF	-0.776	0.263	0.003	-0.157
Limit hunter density (public areas)	592	Intercept	3.431	0.639	0.000	
		Public harvest	-0.172	0.084	0.039	-0.114
		Public hunt	-0.067	0.015	0.000	-0.248
		Lease land	-0.253	0.089	0.004	-0.139
		Resident	0.754	0.238	0.002	-0.164
		NWTF	-0.837	0.259	0.001	-0.168
Walk-in hunting (public areas)	154	Intercept	0.424	1.611	0.793	
		NWTF	-0.957	0.716	0.182	-0.147
		Income	0.248	0.209	0.235	0.128
		Education	0.277	0.170	0.104	0.167
Use of bait	244	Intercept	-2.192	0.959	0.022	
		Public hunt	-0.070	0.023	0.003	-0.245
		Years hunted	-0.041	0.015	0.006	-0.223
		NWTF	1.603	0.485	0.001	0.295

a. *B* = regression coefficient, SE = standard error of regression coefficient, *P* = probability that *B* is zero, SB = standardized estimate of regression coefficient.

b. Morning hunter = participant hunted mornings only; Information = sources of information; Public hunt = participant hunted more on public land; (b) private hunt = participant hunted more on private land; Turkeys called = number of turkeys participant called in during the 1993 season; NWTF = National Wild Turkey Federation member; Lease land = leased land for turkey hunting.

number of hunters/day on public areas. Mississippi residents were more supportive than nonresident hunters of regulations to limit hunter density on public land. Older hunters and respondents who hunted more days on private land supported not harvesting subadult turkeys on public areas. Hunters who leased hunting land and NWTF members tended to oppose this measure.

Hunters who called in more turkeys, hunted more days on private land, and hunted in the morning tended to support increasing spring season bag limits. A fall either-sex turkey hunting season was supported by respondents who spent more time hunting, older hunters, and Mississippi residents, and opposed by NWTF members.

Limiting spring turkey hunting to mornings-only was supported by those who usually hunted during morning, and opposed by hunters with higher household incomes. Using rifles during the spring season was supported by older hunters and respondents leasing hunting lands, and opposed by NWTf members.

Older hunters and those hunting more days on public land supported legalizing baiting, while NWTf members opposed the measure. Using turkey decoys was supported by older hunters and opposed by those with higher household incomes. Older hunters tended to be more interested in attending wild turkey seminars and workshops.

Discussion

Hunter Characteristics

Turkey hunters participating in our survey were similar to those reported in past studies (Vangilder et al. 1990, Cartwright and Smith 1990). Vangilder et al. (1990) noted that the composite spring turkey hunter in Missouri was a male (98.1%), 39 years old, had a household income between \$15,000–\$50,000 (65.7%), and averaged 7 years of spring turkey hunting experience. Cartwright and Smith (1990) surveyed NWTf members in Arkansas reported their average participant was male (99.7%), 45 years old, had a household income between \$10,000 and \$45,000 (60.3%), and had 16 years of spring turkey hunting experience.

Baumann et al. (1990) reported percentages of resident respondents spending money on leasing land for spring turkey hunting in Missouri, Arizona, Minnesota, Pennsylvania, South Carolina, and West Virginia were 2.4, 0.3, 2.4, 2.9, 31.7, and 5.4, respectively. By comparison, 37.4% of our respondents reported spending money for turkey hunting privileges (lease costs). Monetary investment of leasing private lands for turkey hunting may give hunters an incentive to manage the resource. State agencies generally provide technical guidance to those interested in wildlife management. Wildlife agencies could target hunters leasing private lands for turkey hunting as potential cooperators in technical guidance programs.

Wildlife managers often use public seminars and personal interaction by biologists and conservation officers to educate the public on wild turkey ecology and management. Our data suggest that magazine articles and informational videos are most effective in communicating with turkey hunters.

Hunter Effort and Harvest Characteristics

Overall success rates were comparable to those reported in Missouri (Vangilder et al. 1990) and Iowa (Jackson 1989). Hunter success was higher on private land (43.7%) than public land (27.2%). Private land success rates also were higher than public lands in Iowa (52.2% private, 37.8% public) (Jackson 1989) and in Missouri (43.4% private, 34.6% public) (Vangilder et al. 1990). High hunter density on public lands may influence hunter success. Palmer et al. (1990) noted that increasing hunter effort decreased individual hunter success on a public WMA in Mississippi. Other studies (e.g., Hawn et al. 1987, Johansen et al. 1988, Norman et al. 1988, Cartwright

and Smith 1990, Kienzler et al. 1995) have reported that high hunter density negatively impacted hunter quality. Vangilder et al. (1990) reported that hunters had less problem with interference on private land compared to public land users.

Hunter Attitudes

We attempted to determine attitudes towards hunting regulations and issues currently important in Mississippi and throughout the United States. For example, Mississippi's spring season has traditionally allowed hunting from a half hour before sunrise to a half hour after sunset, while some states (e. g., Kentucky, West Virginia) have limited hunting to mornings-only. While there is no current directive to adopt a mornings-only regulation in Mississippi, obtaining information on hunter attitudes concerning this issue and others is conducive to proactive planning and comparison to other studies. It was clear that this would not be an attractive proposal in Mississippi.

Respondents strongly supported walk-in only areas for turkey hunting on public lands. Support for this type of management was uniform over all hunter characteristic groups. Using walk-in only hunting may provide a cost-effective means for managers to address problems associated with high hunter densities. Past studies have reported support for walk-in only hunting in Mississippi (Steffen et al. 1988), Arkansas (Cartwright and Smith 1990), and Georgia (Thackston and Holbrook 1995).

High support for an optional safety course suggests the user group's concern for turkey hunting safety. However, support was lower for a mandatory course. Vangilder et al. (1990) reported similar (47.1%) support for a mandatory hunter education course for turkey hunters in Missouri.

While safety concerns were prevalent, our data were consistent with past studies that have reported opposition to mandatory use of hunter orange (Witter et al. 1982, Cartwright and Smith 1990, Vangilder et al. 1990, Taylor et al. 1995). Eriksen et al. (1985) determined that hunters wearing orange were less successful at calling in wild turkeys, while Vangilder et al. (1990) noted that hunters wearing orange were less successful at harvesting turkeys than those that never wore orange.

Mississippi currently has a limited, either-sex fall turkey season that is restricted to a relatively small region (including portions of 7 counties) within the Mississippi Delta. This area is exclusively controlled by private ownership and is accessible to few Mississippi hunters. Therefore, there is little tradition associated with fall season in Mississippi as compared to states historically permitting fall hunting (e.g., Missouri, Virginia, West Virginia). Our results suggest that Mississippi hunters generally opposed a state-wide either-sex fall season. However, many respondents (34.3%) supported this type of hunting opportunity. Hunter characteristics accounted for some variation in attitudes on this issue.

Impacts of either-sex hunting on turkey populations have been studied (e.g., Lobdell et al. 1972, Little et al. 1990). Little et al. (1990) noted that fall hunting mortality was additive to other mortality factors, and concluded that fall harvest rates of >10% could potentially reduce turkey populations. A conservative season, resulting in a harvest of <10% of the population, may have a negligible effect on the wild

turkey resource. Mississippi wildlife managers should continue to monitor hunter attitudes toward a fall either-sex turkey season, collect data on population dynamics, and develop potential strategies to offer this type of recreational opportunity without negatively impacting the resource.

Taylor et al. (1995) reported that 70% of survey participants in West Virginia were in favor of prohibiting the use of rifles for turkey hunting. Our results show similar opposition to this practice in Mississippi. Rifles are currently legal for turkey hunting in West Virginia, but illegal in Mississippi.

Conclusions and Management Recommendations

Our results suggest that characteristics and success rates of turkey hunters in Mississippi were similar to those reported in studies from other states. Hunter success and harvest rates were higher on private lands than public areas. Past studies have concluded that increased hunting pressure can negatively impact hunter success and hunter quality (e.g., Kubisiak et al. 1995, Thackston and Holbrook 1995). Managers may consider regulations to limit hunter density on public areas. Our results suggest that Mississippi turkey hunters would support this type of restriction. Using walk-in only areas for turkey hunting also may reduce hunter interference and improve hunt quality on public areas.

User-group surveys can provide a cost-effective means for wildlife agencies to obtain relevant information for program planning. Surveys should be conducted periodically to monitor changes in user-group attitudes and characteristics. This information can be used to plan and implement more comprehensive and proactive wildlife management programs.

Education of hunters and interest-groups is a high priority for wildlife agencies. Most turkey hunters in Mississippi would be interested in educational seminars or workshops in their area. Interest was also high for turkey hunting safety courses. More respondents received information on wild turkeys from magazines and videos than from state wildlife agency personnel. Managers should use popular-style magazine articles and videos to educate hunters on safety and wild turkey biology and management.

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