Hunter Opinions Regarding Mourning Dove Management on Alabama Public Lands

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Abstract: The importance of public lands for mourning dove *(Zenaida macroura)* hunting in the Southeast may increase as other dove hunting opportunities decrease. Maximimizing satisfaction of dove hunters on public lands requires knowledge concerning hunter opinions and preferences. We documented dove hunter satisfaction on state Wildlife Management Areas (WMAs) in Alabama with respect to habitat and hunter management. Crops planted were the primary management concern; hunters preferred corn and browntop millet for dove hunting. Most dove hunters encountered unsafe conditions primarily blamed on crowding, but safety problems detracted little from overall hunting satisfaction. Hunters generally were satisfied with regulation enforcement and season starting date. Low success or perceived likelihood of success did not appear responsible for a low percentage of dove hunters using WMAs, and these factors seemed unimportant to overall satisfaction. Hunter density on dove fields should be limited to assure safety, and hunter education should emphasize safety issues associated with dove hunting. Planting browntop millet and corn in dove fields may increase hunter satisfaction on WMAs, but we recommend improved public relations programs that educate hunters regarding dove hunting safety, dove food preferences, and dove nutritional needs.

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Mourning dove hunting is one of the most popular and financially important forms of hunting in the United States (Baskett and Sayre 1993), particularly in southern states (George 1993). A survey of state wildlife agencies indicated that $\leq$10% of dove hunting occurred on public lands in most southern states, and blamed limited public land availability for this low percentage (Baskett 1993*a*, George, 1993). However, changes in land uses and landowner attitudes are reducing opportunities to hunt

mourning doves in many areas (Braun et al. 1993, Russell 1993), and with these changes, management for mourning dove hunting opportunities on state WMAs may become increasingly important. Management that maximizes hunter benefits and satisfactions on these areas requires knowledge of current dove hunter attitudes and factors affecting them.

Our goal was to determine opinions of hunters regarding mourning dove management on state-managed lands in Alabama. Alabama historically has been among the top 5 states in dove harvest and hunter success (Sadler 1993). The Alabama Department of Conservation and Natural Resources currently offers mourning dove hunting on 28 public areas including WMAs, public/community hunting areas, and refuge areas (hereafter WMAs). We wanted to identify effects of 6 management issues (crops planted, hunter safety, regulation enforcement, season length/timing, perceived dove population trends, and hunting success) on hunter satisfaction, and determine hunter preferences with respect to these issues. Of these, crops planted and hunter safety were of particular interest. Planting crops to attract doves for hunting is a major component of dove management in Alabama (Waters 1983, 1986; Baskett 1993*b*, George 1993), and widespread safety problems occurred during dove hunts on public land in Virginia (Bromley et al. 1989).

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Methods

This study was part of a 1996 mail survey of Alabama hunters primarily focused on dove hunting. We selected a random sample of 2,400 licensed Alabama hunters (proportionately stratified by 7 hunting license types: annual state hunting, annual state combination hunting/fishing, annual county, non-resident annual, non-resident trip, lifetime hunting, lifetime combination hunting/fishing) from the combined population of those purchasing hunting licenses in 1995–1996 and those holding lifetime licenses at that time. Questionnaires were mailed in August 1996, and follow-up postcards were mailed to non-respondents 1 week later, following the Dillman "total design" method (Dillman 1978). A second questionnaire was mailed to each non-respondent ($N=1,379$) 4 weeks later, and a third questionnaire was mailed to each remaining non-respondent ($N=996$) in mid–October. Following the final mailing, we attempted telephone surveys of 148 randomly-selected non-respondents to estimate non-response bias.

Our study reports results of mail survey questions posed only to those hunters who had hunted mourning doves in Alabama. Dove hunters were asked on which type(s) of land (state WMAs, federal, private) they had hunted doves. Those who had hunted on WMAs were asked their degree of overall satisfaction (very unsatisfied,

unsatisfied, no opinion, satisfied, very satisfied) with management on those lands, and their satisfaction with 6 specific management issues (crops planted, regulation enforcement, number of hunters present, number of hunting days, season start date, and season ending date). Dove hunters were asked how often (never, sometimes, often, always) they encountered unsafe conditions while dove hunting, what they believed caused these conditions (low flying birds, too many hunters, hunters too young, hunters impaired by alcohol, other), and how many people could hunt the same 2-ha field without crowding (1–2, 3–5, 6–10, 11–15, 16–20, >20). Hunters were also asked to rate crops (browntop millet, proso millet, buckwheat, sunflower, milo, corn, wheat, sorghum, other [specified]) in order of preference for dove hunting. Hunters also were asked how many times they shot a bag limit of doves during the 1995 season in Alabama, and how many total doves (did not hunt, 0, 1–25, 26–50, 51–75, 76–100, 101–125, 126–150, 151–175, 176–200, >200) they had harvested during the early (11-county south zone: early October through mid–November; other counties: mid-September through early October) and late (late December through mid-January) halves of the 1995 season in Alabama. Hunters were asked to compare (more, fewer, no change, no opinion) numbers of doves encountered during the 1995 season with 10 years ago. Follow-up telephone interviews asked non-respondents 2 questions, whether or not they had ever hunted doves in Alabama, and if so, on which types(s) of land (state WMAs, federal, private) they had hunted doves.

Among mail survey respondents who had hunted doves in Alabama, we compared preferred crop (crop ranked no. 1), frequency of encountering unsafe conditions, number of doves harvested during early and late seasons, and perceived changes in dove numbers between those who had hunted on WMAs and those who had not using G-(log likelihood) tests of independence with Williams's correction (Sokal and Rohlf 1995). We assigned numerical ranks (very unsatisfied = 1, very satisfied = 5) to responses for overall satisfaction and satisfaction with each of the 6 specific management issues, and we used Spearman's partial rank order correlation to measure the relative association of each specific issue with overall satisfaction. Among those WMA dove hunters expressing an opinion (overall satisfaction ≠ "neutral"), we used G-tests of independence with Williams's correction to test the relationship(s) between overall satisfaction (very unsatisfied or unsatisfied vs. satisfied or very satisfied) and frequency of encountering unsafe conditions (never vs. at least sometimes), number of bag limits harvested (0 vs. >0), number of doves harvested during early and late seasons (0–25 vs. > 25), and perceived changes in dove numbers (more or no changes vs. fewer). In these last analyses, we eliminated the "neutral" overall satisfaction response category and pooled the remaining 4 explanatory variables into 2 categories each to minimize number of categories with low ($N < 5$) sample sizes. We used the Statistical Analysis System (SAS Inst. Inc. 1989) and $\infty = 0.05$ for all analyses.

Results

A total of 1,178 hunters returned completed mail surveys. Response rate was 58%, eliminating 372 surveys returned undeliverable. Among mail survey participants, 728

Table 1. Relationships between dove hunter satisfaction (very unsatisfied = 1, very satisfied = 5) with specific management issues and overall dove hunter satisfaction on Wildlife Management Areas in Alabama from a 1996 survey of Alabama hunters.

	Response			Association with overall satisfaction (Spearman's partial rank order correlation, $N = 54$)	
Issue	N	$\bar{x}$	SE	r_s	P
Overall satisfaction	56	2.8	0.2		
Crops planted	56	2.8	0.2	0.542	<0.001
Regulation enforcement	57	3.6	0.1	0.258	0.073
N hunters present	56	2.9	0.2	0.216	0.135
N hunting days	57	3.2	0.1	0.123	0.399
Season starting date	57	3.4	0.1	0.287	0.046
Season ending date	57	3.2	0.2	–0.079	0.590

(62%) had hunted mourning doves in Alabama. Of these, 90% had hunted doves only on private land. Only 8% had hunted doves on state WMAs. Of those who had hunted doves on WMAs, 85% also had hunted doves on private land and 22% also had hunted doves on federal land. One hundred telephone interviews with non-respondents were completed (12% of non-respondents, excluding undeliverables). Non-response data indicated that our mail survey overestimated by 2% the percentage of Alabama hunters who had hunted doves and the percentage of dove hunters who had hunted doves on WMAs. Among telephone survey participants, 57% had hunted doves in Alabama, and 2% of those dove hunters had hunted doves on WMAs. Assuming that these percentages were representative of all non-respondents to the mail survey, 60% of our total sample (respondents and non-respondents, excluding undeliverables) had hunted doves in Alabama, and 6% of those dove hunters had hunted doves on WMA.

Among mail survey participants (hereafter "hunters"), dove hunters generally were neutral ($\bar{x} = 3.0 \pm 0.2$) regarding overall satisfaction and satisfaction with specific management aspects on state WMA's (Table 1), but responded positively ($\bar{x} \geq 3.4$) to regulation enforcement and season starting date. Satisfaction with crops planted contributed strongly to overall satisfaction; season starting date contributed less strongly but significantly (Table 1). Regulation enforcement, number of hunters present, number of hunting days, and season ending date did not contribute to overall satisfaction. Satisfaction was not related ($G \leq 2.3$, $P \geq (0.129)$ to unsafe conditions, number of bag limits, number of doves harvested during early or late seasons, or opinions regarding numbers of doves in 1995 compared with prior years.

Hunters on WMAs did not differ from private or federal land hunters regarding preferred crops for hunting, frequency with which unsafe conditions were encountered, number of doves harvested during early and late seasons, and perceived trends in dove numbers over the last 10 years (Table 2). Corn was the most popular crop over which to hunt doves, followed by browntop millet and wheat; all other crops ranked first among ≤7% of hunters. Most (≥64%) hunters on both WMAs and non-WMA lands had encountered unsafe conditions sometimes while hunting, but few (≤15%) had encountered them more frequently. Among WMA hunters who reported unsafe

Table 2. Comparison of selected characteristics between dove hunters who had hunted on Alabama Wildlife Management Areas (WMAs) and other dove hunters from a 1996 survey of Alabama hunters.

	WMA hunters		Other hunters			
Characteristic category	Frequency	%	Frequency	%	G^a	P^a
Most preferred crop for dove hunting					3.6	0.608
Corn	27	47.4	221	38.4		
Browntop millet	14	24.6	175	30.4		
Wheat	5	8.8	83	14.4		
Milo/Sorghum	4	7.0	25	4.3		
Sunflower	3	5.3	34	5.9		
Other	4	7.0	38	6.6		
Frequency of encountering unsafe conditions					2.8	0.424
Never	12	20.3	153	23.6		
Sometimes	38	64.4	442	68.2		
Often	7	11.9	43	6.6		
Always	2	3.4	10	1.5		
N doves harvested—early season					1.9	0.763
0	2	4.5	7	1.5		
1–25	21	47.7	243	52.6		
26–50	11	25.0	113	24.5		
51–75	6	13.6	51	11.0		
>75	4	9.1	48	10.4		
N doves harvested—late season					4.1	0.247
0	7	23.3	56	21.3		
1–25	11	36.7	135	51.5		
26–50	10	33.3	47	17.9		
>50	2	6.7	24	9.2		
N doves compared with 10 years ago					0.6	0.743
More	8	26.7	64	22.6		
Fewer	19	51.4	178	62.9		
No Change	3	8.1	41	14.5		

a. Results of *G*-tests of independence with William's corrections.

conditions (N=47), most thought too many hunters (68.1%) and/or low-flying doves (63.8%) were responsible, whereas 25.5%, 17.0%, and 21.3% thought young hunters, alcohol, or other factors were responsible, respectively. Hunters on WMAs generally thought 3–5 (37.3%) or 6–10 (36.2%) hunters could hunt the same 2-ha field without crowding; 23.2% of WMA hunters thought that ≥11 hunters could hunt the same field. Harvest generally was higher during the early season than during the late season among WMA and non-WMA hunters, and most hunters of both types generally believed that there were fewer doves in 1995 compared with prior years (Table 2).

Discussion

Our study corroborates an earlier report (Baskett 1993*a*) that a relatively small proportion of total dove hunters use public land in the South for mourning dove

hunting. Since only a small percentage of mourning dove hunting in Alabama takes place on state WMAs, dove management on these areas currently affects relatively few Alabama dove hunters.

Of the factors we studied, the greatest management concern among hunters on WMAs in Alabama was with crops planted. Corn and browntop millet were the most desired crops for hunting among dove hunters. The popularity of browntop millet for use in dove fields in Alabama has been reported previously (Waters 1983, 1986). Browntop millet is a preferred dove food (Davison and Sullivan 1963, Mahan 1978, LeBlanc and Otis 1998, S. E. Hayslette, unpubl. data) that grows well and produces high seed yield in Alabama (Hayslette and Mirarchi 2001). However, the value of corn in dove food plantings in Alabama is less clear. Although corn is important in attracting doves in several southeastern states, including Alabama (Baskett 1993*b*), it is not a highly-preferred dove food (LeBlanc and Otis 1998, Hayslette and Mirarchi 2001), and has low nutritional quality (Shuman et al. 1988). Additionally, total cost of producing corn generally is higher than that of producing browntop millet or other dove foods (D. C. Hayden, pers. commun.). Wheat was among the top 3 foods hunters preferred to hunt over, but prohibition on hunting over top-sown cool-season crops is likely to limit its future usefulness in fall dove fields. Sunflower and milo/sorghum are popular crops for dove food plantings elsewhere (Madson 1978, Mahan 1978, Bourne 1991, Baskett 1993*b*), and generally are equal to browntop millet in cost of production (D. C. Hayden, pers. commun.). These crops were, however, less popular than browntop millet, corn, or wheat among Alabama dove hunters. Although some research has documented dove preferences for sunflower equal to that for browntop millet (LeBlanc and Otis 1998), other research has demonstrated that milo, sorghum, and sunflower are less preferred by mourning doves than browntop and other millets (Hayslette and Mirarchi 2001).

Unsafe conditions are common during dove hunts on both WMAs and private/federal lands, primarily due to hunter crowding. While hunters on WMAs were somewhat dissatisfied with number of hunters present, crowding and unsafe conditions were not reported to be any more prevalent on WMAs than on other lands, and these conditions have little influence on overall satisfaction. Perhaps most hunters have come to expect crowding and occasional unsafe conditions during dove hunting, and therefore have a high tolerance for these problems. Hunter opinions regarding acceptable hunter densities in our survey support this idea. Baskett (1993*b*) recommended maintaining 1.6–8.1 ha of hunting area per stand of 2–3 hunters (1 hunter/0.8–2.7 ha) but most (59.4%) hunters in our study thought that at least 6 hunters could hunt a 2-ha field (1 hunter/$\leq$0.3 ha) without crowding. Despite safety problems, hunters on WMAs seemed satisfied with law enforcement on these areas. Our results generally agree with Bromley et al. (1989), who found numerous instances of unsafe behavior but few legal violations at public hunting areas in Virginia. As such, we perceive dove hunting safety issues to be a policy/management rather than a law enforcement problem.

Low success or perceived likelihood of success did not appear responsible for a relatively small percentage of dove hunters using WMAs in our study, since neither

parameter was greater among hunters on private or federal land than among WMA hunters, although low ($N \leq 37$) sample sizes make this conclusion somewhat tentative. Most dove hunters in Alabama are motivated by non-success-based satisfactions such as companionship, rather than by harvest-based satisfactions (S. E. Hayslette et al. 2001).

Management Implications

We conclude that mourning dove hunters using WMAs in Alabama generally are satisfied with most aspects of dove management. Crowding presents some degree of safety risk during some WMA dove hunts but probably does not reduce hunter satisfaction with, or discourage participation in, these hunts to an appreciable degree. We recommend that hunter density on public dove fields be limited to assure hunter safety, and that safety risks associated with dove hunting and ways to avoid or minimize these dangerous situations be emphasized in future hunter education courses. Although plantings of browntop millet and corn in dove fields may increase hunter satisfaction with management on WMAs where these crops currently are not used, we recommend efforts (state magazine articles, pamphlets at WMAs, etc.) to educate hunters regarding dove food preferences and nutritional needs. Such an approach should improve the hunting public's image of management agencies and provide for improved dove management.

Literature Cited

Baskett, R. K. 1993*a*. Hunting in the midwest. Pages 485–494 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

———. 1993*b*. Shooting field management. Pages 495–506 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

Baskett, T. S. and M. S. Sayre. 1993. Characteristics and importance. Pages 1–6 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

Bourne, W. 1991. The art and science of dove-field management. Southern Outdoors 39(5):48–49, 51–53.

Braun, C. E., N. J. Silvy, T. S. Baskett and R. E. Tomlinson. 1993. Research and management needs. Pages 507–513 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

Bromley, P. T., E. L. Hampton, and J. D. Wellman. 1989. A study of ethical and safe behavior by dove hunters in Virginia. Wildl. Soc. Bull. 17:450–454.

Davison, V. E. and E. G. Sullivan. 1963. Mourning doves' selection of foods. J. Wildl. Manage. 27:373–383.

Dillman, D. A. 1978. Mail and telephone surveys: the design method. John Wiley and Sons, New York, N.Y. 325pp.

George, R. R. 1993. Hunting in the southwest. Pages 459–474 *in* T. S. Baskett, M. W. Sayre,

R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

Hayslette, S. E. and R. E. Mirarchi. 2001. Patterns of food preferences in mourning doves. J. Wildl. Manage. 65:816–827.

———, J. B. Armstrong, and R. E. Mirarchi. 2001. Mourning dove hunting in Alabama: Motivations, satisfactions, and sociocultural influences. Human Dimensions in Wildlife 6:81–95.

LeBlanc, D. K. and D. L. Otis. 1998. Preferences by mourning doves and 2 granivorous songbirds for selected seeds. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 52:324–335.

Madson, J. 1978. The mourning dove. Winchester Press, East Alton, Ill. 114pp.

Mahan, W. 1978. The mourning dove. Pages 3–15 *in* C. Griffin, ed. Game on your land. Part 1—Small game and wood duck. S.C. Wildl. and Mar. Resour. Dep., Columbia.

Russell, D. M. 1993. Hunting in the south. Pages 475–484 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

Sadler, K. C. 1993. Mourning dove harvest. Pages 449–458 *in* T. S. Baskett, M. W. Sayre, R. E. Tomlinson, and R. E. Mirarchi, eds. Ecology and management of the mourning dove. Stackpole books, Harrisburg, Pa.

SAS Institute, Inc. 1989. SAS/STAT Guide for personal computers. Version 6. SAS Inst., Inc., Cary, N.C. 1,686pp.

Shuman, T. W., R. J. Robel, A. D. Dayton, and J. L. Zimmerman. 1988. Apparent metabolizable energy content of food used by mourning doves. J. Wildl. Manage. 52:481–483.

Sokal, R. R. and F. J. Rohlf, 1995. Biometry, 3rd ed. W. H. Freeman, New York, N.Y. 887pp.

Waters, R. E. 1983. How to attract doves for hunting. U.S. Soil Conserv. Serv., Auburn, Ala. 16pp.

———. 1986. Developing dove habitat. Ala. Treasured For. 5:26–27.