

SUPPORT FOR, ATTITUDES TOWARD, AND BELIEFS ABOUT A BAN ON LEAD SHOT IN THE FARMLAND ZONE OF MINNESOTA

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SUMMARY OF FINDINGS

The purpose of this study was to determine level of support or opposition to a ban on lead shot in the farmland zone of Minnesota and the attitudes and beliefs about such a ban. In addition we collected information about small game hunting participation and involvement. Data were collected from 2 study strata: the 7-county Twin Cities metropolitan area and the non-metropolitan areas of the state. Respondents were about equally divided in their support for a ban of using lead shot in the farmland zone within the next 5 years with 42% indicating they are likely to support a ban and 44% reporting they are unlikely to support a ban. Support for a ban was strongly correlated with attitudes toward a ban, and respondents with different attitudes toward a ban differed on their beliefs about the outcomes of such a ban.

INTRODUCTION

In a recent report to the Minnesota Department of Natural Resources (MNDNR), the Nontoxic Shot Advisory Committee (NSAC) agreed that further restrictions on the use of lead shot are inevitable at some future time. While no consensus on specific regulations was reached, the NSAC did agree that more restrictive regulations on the use of lead shot in shotgun hunting are warranted. Five viable options were identified as deeming further consideration, including a ban on using lead shot throughout the farmland zone of Minnesota.

The NSAC recognized that for more restrictive regulations to be implemented successfully, the impacted public must be well-informed and accepting of such regulations. The purpose of this study was to provide information about small game hunter perceptions and knowledge of using toxic/non-toxic shot and help identify appropriate message points for information and education programs addressing the issue of restricting the use of lead shot. Specific objectives of this study were to:

1. Identify levels of use of lead and non-toxic shot in the farmland zone by small game hunters;
2. Identify support/opposition for a ban on the use of lead shot in the farmland zone;
3. Identify attitudes toward a ban on the use of lead shot in the farmland zone;
4. Identify the key beliefs affecting attitudes toward a ban on lead shot
5. Identify the influence of conservation/stewardship values in shaping attitudes and beliefs about restricting the use of toxic shot;
6. Develop and test the effectiveness of targeted messages in changing attitude, beliefs, and behaviors concerning restrictions on the use of toxic shot.

This summary only highlights results for support for, attitudes toward and beliefs about a ban on lead shot in the farmland zone of Minnesota. For complete research results, including a copy of the survey instrument, please refer to Schroeder et al. (2008).

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METHODS

The population of interest in this study included all Minnesota residents who hunt small game. The sampling frame used to draw the study sample was the MNDNR's Electronic Licensing System (ELS). A stratified random sample of Minnesota resident small game hunters in the ELS was drawn. The initial study sample was stratified by residence of individuals (determined by ZIP code) and included 1) 800 individuals who lived in the seven-county Minneapolis/St. Paul metropolitan area, and 2) 1,200 individuals who lived outside the metropolitan area. The target sample size was $n = 400$ for the metropolitan region and 600 from the non-metropolitan region ($n = 1,000$ statewide).

Data were collected using a mail-back survey following a process outlined by Dillman (2000) to enhance response rates. The data collection instrument was a 12-page self-administered survey with 11 pages of questions. The questionnaire addressed the following topics:

- small game hunting activity and involvement,
- shotgun and shot use and preferences,
- beliefs, attitudes, and norms about lead shot,
- trust in the Minnesota Department of Natural Resources and media resources, and
- environmental values.

To measure and understand attitudes and beliefs about banning lead shot in the farmland zone, we followed the Theory of Reasoned Action (Ajzen and Fishbein 1980; Fishbein and Manfredo 1992). This approach has been used to examine a variety of wildlife management issues such as wolf reintroduction in Colorado (Pate et al. 1996) moose hunting in Anchorage (Whittaker et al. 2001), and lethal control of deer in Cuyahoga Valley National Park, Ohio (Fulton et al. 2004).

Based on the Theory of Reasoned Action, 2 key determinants of an attitude are the personal beliefs about a given action leading to particular outcomes and the evaluation of those outcomes. More explicitly, the relationship between an attitude toward a given action and personal beliefs is defined by the following equation:

$$A_{\text{action}} = f(\sum b_i e_i)$$

Where; A_{action} is the attitude toward a particular action;

b_i is the belief that the action will lead to a particular outcome (e.g., using non-toxic shot will cost me more money); and

e_i is the respondents evaluation of that outcome (e.g., how negative or positive is this additional expense)

A product of the beliefs and evaluations (BE product) is formed for each of the n outcomes. The overall attitude toward an action is the sum of all the BE products. Thus, an attitude toward the action is determined by the combination of multiple beliefs and evaluation of potential outcomes of an action.

RESULTS

Survey Response Rate

Of the 2,000 questionnaires mailed, 54 were undeliverable and 10 were sent to individuals whom had moved out of the state. Of the remaining 1,936 surveys, a total of 920 were returned, resulting in an overall response rate of 47.5%. Response rates for the metropolitan and non-metropolitan regions are summarized in Table 1.

Statewide Estimates

The study sample was drawn using a stratified random sample defined by metropolitan versus non-metropolitan residence. For this reason the data had to be weighted to reflect the proportion of the population in each region when making overall estimates (Table 2). In order to address nonresponse bias, statewide data is also weighted based on differences in responses to the main survey and the shortened survey used to gauge nonresponse bias.

Attitudes About Banning Lead Shot in the Minnesota Farmland Zone

Statewide, respondents were almost evenly split in their intention to support a ban on lead shot for hunting small game in the Minnesota farmland zone within the next 5 years—44.2% said it was unlikely that they would support such a ban, while 42.2% indicated that it was likely (Table 3). On average, metro respondents were somewhat more supportive of the ban than non-metro respondents.

Respondents were asked a series of questions concerning whether a ban on lead shot in the farmland zone would be harmful or beneficial, bad or good, and foolish or wise. About 45% of respondents indicated that the ban would be beneficial (Table 4), good (Table 5), and wise (Table 6). There were no significant differences between metro and non-metro respondents on these questions.

Respondents were asked to rate the likelihood of 11 possible outcomes of banning lead shot for small game hunting in the Minnesota farmland zone, using the scale -3=extremely unlikely to +3=extremely likely (Figure 1 and Table 7). Items addressed environmental effects and impacts to hunters. There were no differences on any of these items between metro and non-metro respondents, therefore, Table 7 and 8 provide only the combined statewide findings.

Responses suggest that many small game hunters may perceive both environmental benefits and challenges to hunters as likely outcomes of a ban on lead shot in the farmland zone. Over half of the respondents felt that it was likely that banning lead shot for hunting small game in the farmland zone in Minnesota would: (a) help protect wildlife from lead poisoning, (b) benefit the quality of the environment, (c) prevent the spread of lead in the natural environment, (d) improve awareness about the dangers of lead in the environment. However, over half the respondents also thought it was likely that a ban would: increase crippling and wounding loss for small game hunting and require using less effective shot while hunting small game. Over three-fourths of respondents felt that the ban would require hunters to use more expensive ammunition. Over 40% of respondents felt that a ban would be unnecessary government regulation and would make it more difficult for some people to hunt. Nearly three-fourths of hunters said a ban is something most hunters would adjust to after a few seasons. About half of the hunters felt that it was likely that a ban would improve the image of hunters and that it was unlikely that a ban would decrease hunting opportunity in Minnesota.

Respondents were also asked to rate how good or bad 11 outcomes of banning lead shot would be using the scale -3=extremely bad to +3=extremely good (Figure 2 and Table 7). The majority of respondents felt that environmental benefits were good outcomes. Over 7 in 10 respondents felt that it was good to: (a) protect wildlife from lead poisoning; (b) benefit the quality of the environment; (c) prevent the spread of lead in the natural environment; and (d) improve awareness about the dangers of lead in the environment. However, over two-thirds of respondents felt the following outcomes for hunters were bad: (a) unnecessary government regulation; (b) increasing wounding loss for small game hunting; (c) using less effective shot while hunting small game; (d) using more expensive ammunition; (e) making it more difficult to find shells for their shotgun; and (f) decreasing hunting opportunities. Nearly three-fourths of respondents felt that improving the image of hunters was a good outcome. Nearly half of respondents felt that hunters adjusting to using non-lead shot was a good outcome, but over one-third were neutral about this outcome.

Using ANOVA, we compared the beliefs about the outcomes of a ban on lead shot in the farmland zone between respondents who were likely to oppose to those who were unlikely to support such a ban. We found significant differences in the beliefs and evaluations of all 11 outcomes at $p < 0.001$ (Table 8).

LITERATURE CITED

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Table 1: Response rates for each management region.

	Initial sample Size	Number invalid	Valid sample size	Number of full surveys returned	Response rate %	Number of shortened surveys returned	Total response rate %
Metropolitan region	800	25	775	376	48.5%	53	55.4%
Non-metropolitan region	1,200	39	1,161	539	46.4%	100	55.0%
Total	2,000	64	1,936	915	47.3%	153	55.2%

Table 2: Proportion of state small game hunters by region of residence in Minnesota.

	Sample		Population	
	Frequency	Proportion	Frequency	Proportion
Statewide	915	100%	297,114	100%
Metro	376	41%	92,105	31%
Non-metro	539	59%	205,009	69%

Table 3: Likelihood of supporting a ban on lead shot to hunt small game in the farmland zone.

	N	Extremely unlikely	Quite unlikely	Slightly unlikely	Neutral	Slightly likely	Quite likely	Extremely likely	Mean
Statewide ¹	873	22.0%	14.9%	7.3%	13.5%	12.8%	16.4%	13.0%	3.8
Metro	369	17.1%	14.4%	6.8%	10.6%	14.9%	19.2%	17.1%	4.2
Non-metro	522	22.2%	15.1%	7.3%	14.4%	11.7%	16.9%	12.5%	3.8
$\chi^2 = 11.078$ n.s.; Cramer's V = 0.112									F = 7.308**; $\eta = 0.090$

¹ A stratified sample based on region of residence was drawn. Statewide data is weighted to reflect metropolitan/non-metropolitan proportions in the population and to correct for non-response bias.

n.s. = not significant, *p < 0.05, **p < 0.01, ***p < 0.001

Table 4: Supporting a ban on lead shot to hunt small game in the farmland zone: HARMFUL/BENEFICIAL

	N	Extremely harmful	Quite harmful	Slightly harmful	Neutral	Slightly beneficial	Quite beneficial	Extremely beneficial	Mean
Statewide ¹	870	8.3%	3.8%	6.2%	35.0%	18.4%	15.4%	12.9%	4.5
Metro	370	7.8%	2.7%	7.6%	28.4%	21.1%	16.5%	15.9%	4.7
Non-metro	522	7.9%	4.0%	5.2%	36.0%	18.0%	16.1%	12.8%	4.5
$\chi^2 = 9.510$ n.s.; Cramer's V = 0.103									F = 1.464 n.s.; $\eta = 0.041$

¹ A stratified sample based on region of residence was drawn. Statewide data is weighted to reflect metropolitan/non-metropolitan proportions in the population and to correct for non-response bias.

n.s. = not significant, *p < 0.05, **p < 0.01, ***p < 0.001

Table 5: Supporting a ban on lead shot to hunt small game in the farmland zone: BAD/GOOD

	N	Extremely bad	Quite bad	Slightly bad	Neutral	Slightly good	Quite good	Extremely good	Mean
Statewide ¹	872	11.2%	7.2%	8.8%	27.6%	15.7%	16.2%	13.3%	4.3
Metro	370	9.2%	6.8%	8.6%	24.3%	16.2%	18.1%	16.8%	4.5
Non-metro	523	11.1%	6.9%	8.4%	28.1%	16.1%	16.4%	13.0%	4.3
$\chi^2 = 4.400$; n.s. Cramer's V = 0.070									F = 2.775 n.s.; $\eta = 0.056$

¹ A stratified sample based on region of residence was drawn. Statewide data is weighted to reflect metropolitan/non-metropolitan proportions in the population and to correct for non-response bias.

n.s. = not significant, *p < 0.05, **p < 0.01, ***p < 0.001

Table 6: Supporting a ban on lead shot to hunt small game in the farmland zone: FOOLISH/WISE

	N	Extremely foolish	Quite foolish	Slightly foolish	Neutral	Slightly wise	Quite wise	Extremely wise	Mean
Statewide ¹	871	13.5%	8.6%	8.5%	24.2%	16.5%	16.2%	12.4%	4.2
Metro	369	10.6%	7.9%	8.7%	22.0%	17.3%	18.2%	15.4%	4.4
Non-metro	523	13.8%	8.4%	8.0%	24.3%	16.4%	16.6%	12.4%	4.2
$\chi^2 = 4.307$ n.s.; Cramer's V = 0.069									F = 3.266 n.s.; $\eta = 0.060$

¹ A stratified sample based on region of residence was drawn. Statewide data is weighted to reflect metropolitan/non-metropolitan proportions in the population and to correct for non-response bias.

n.s. = not significant, *p < 0.05, **p < 0.01, ***p < 0.001

Table 7: Mean beliefs about and evaluations of outcomes of a ban on lead shot for hunting small game in the Minnesota farmland zone.

Outcome	Mean belief ¹	Mean evaluation ²	Mean B*E
Banning lead shot for hunting small game in the farmland zone in MN...			
...would help protect wildlife from lead poisoning.	.469	1.617	2.139
...would benefit the quality of the environment.	.373	1.716	1.739
... would be unnecessary government regulation.	.314	-1.254	-.965
...would increase crippling and wounding loss for small game hunting.	.537	-1.252	-1.284
...would require using less effective shot while hunting small game.	.713	-1.497	-1.612
...would require using more expensive ammunition.	1.669	-1.252	-2.841
...would improve the image of hunters.	.155	1.272	1.003
...would prevent the spread of lead in the natural environment.	.778	1.577	2.086
...is something most hunters would adjust to after a few seasons.	1.042	.565	1.887
...would decrease hunting opportunity in Minnesota.	-.394	-1.662	.541
...would improve awareness about the dangers of lead in the environment.	.550	1.382	1.955

¹ Beliefs rated on a scale of -3 (extremely unlikely to +3 (extremely likely)

² Evaluations rated on a scale of -3 (extremely bad) to +3 (extremely good)

Table 8: Mean beliefs about and evaluations of outcomes of a ban on lead shot for hunting small game in the Minnesota farmland zone, *by likelihood to support a ban*.

Outcome	Mean belief ¹		Mean evaluation ²		B*E	
	Oppose	Support	Oppose	Support	Oppose	Support
Banning lead shot for hunting small game in the farmland zone in MN...						
...would help protect wildlife from lead poisoning.	-0.683	1.676	0.996	2.279	.384	4.240
...would benefit the quality of the environment.	-0.771	1.565	1.216	2.268	-.202	3.956
... would be unnecessary government regulation.	1.213	-0.652	-1.667	-0.947	-3.077	.993
...would increase crippling and wounding loss for small game hunting.	0.973	0.116	-1.441	-1.202	-2.449	-.187
...would require using less effective shot while hunting small game.	1.336	0.130	-1.919	-1.183	-3.270	-.110
...would require using more expensive ammunition.	2.174	1.204	-1.784	-0.795	-4.513	-1.340
...would improve the image of hunters.	-0.824	1.121	0.670	1.912	-.616	2.744
...would prevent the spread of lead in the natural environment.	-0.199	1.769	1.237	1.999	.449	3.937
...is something most hunters would adjust to after a few seasons.	0.212	1.889	-0.250	1.405	1.075	3.061
...would decrease hunting opportunity in Minnesota.	0.421	-1.238	-1.849	-1.575	-1.086	2.238
...would improve awareness about the dangers of lead in the environment.	-0.386	1.484	0.808	2.001	.581	3.574

¹ Beliefs rated on a scale of -3 (extremely unlikely to +3 (extremely likely)

² Evaluations rated on a scale of -3 (extremely bad) to +3 (extremely good)

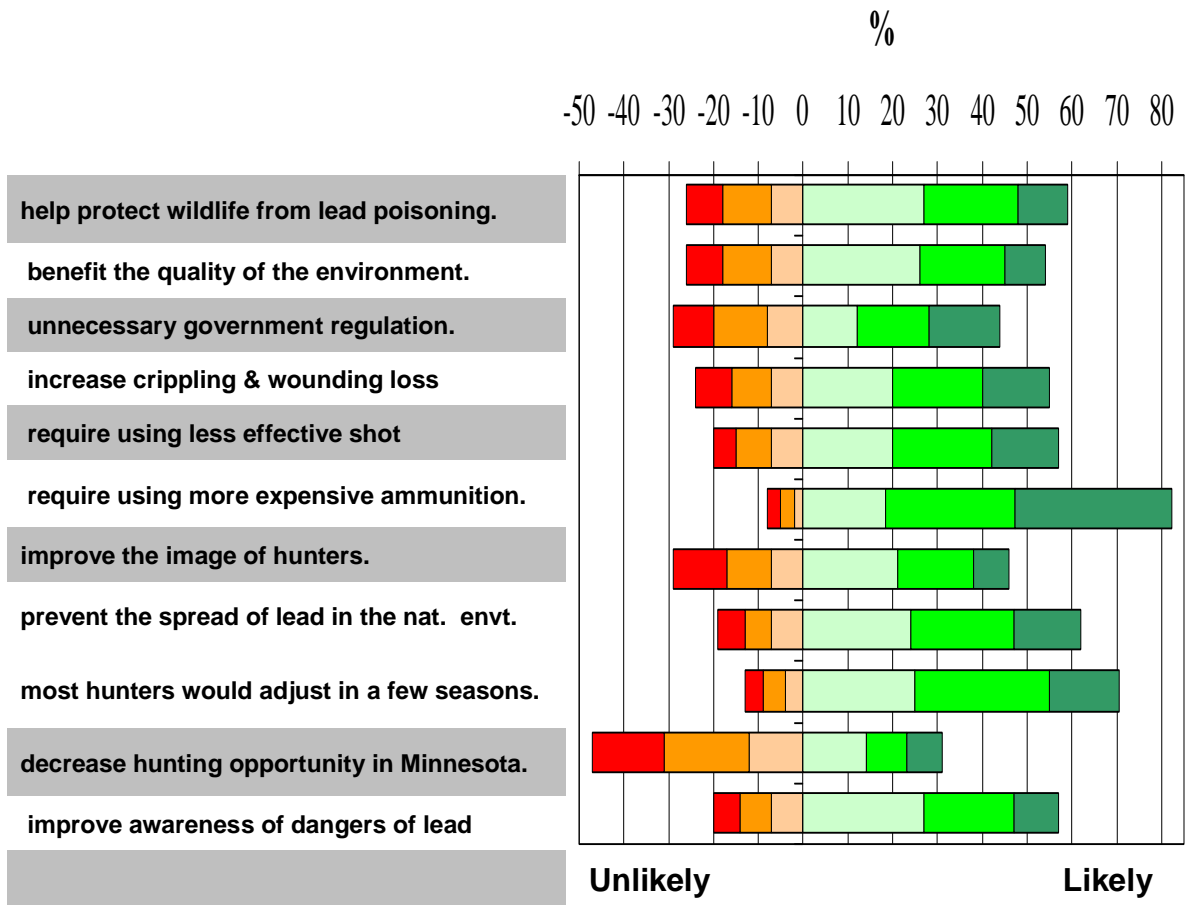


Figure 1. Beliefs about likelihood of outcomes from a ban on lead shot in the farmland zone of Minnesota (%). Dark shading “extremely” to light shading “slightly”.



Figure 2. Beliefs that the outcomes are “extremely” bad to extremely “good” (%). Dark shading is “extremely” to light shading “slightly”.