

OPINIONS OF ELK VIEWERS ON A PROPOSED PENNSYLVANIA ELK HUNT

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Abstract: The Pennsylvania elk herd has grown to the size where a hunting season is being considered. Visitors to the principal elk viewing areas were asked their opinions about an elk hunt. Their responses were analyzed with respect to their personal profile and the characteristics of their visit. While roughly half the public supports a hunt, specific subgroups were found to have strong opinions on either side of the issue. People who accept hunting as a game management tool were more likely to approve of the proposed elk season.

Introduction

Elk, *Cervus elaphus canadensis*, were indigenous to Pennsylvania prior to the late 1800's. However, the original herds were eliminated by 1877 (Shoemaker 1939), largely as a result of unregulated hunting pressures and the wide-scale harvest of the state's forests.

The resurgence of second growth hardwoods throughout much of the state during the early 1900's gave cause for the re-introduction of elk to the new forest system. From 1913 to 1926, 177 Rocky Mountain elk (*C. e. nelsoni*) were introduced to northcentral Pennsylvania (Bryant and Maser 1982, Gerstell 1936, Latham 1954). A hunting season was established in 1923 and continued until 1932, when declining elk numbers caused it to be suspended. Through a concerted management effort, led by the Pennsylvania Game Commission, the herd increased to nearly 300 animals by 1996. In its 1999 survey, the Commission totaled nearly 500 elk (Cogan, 1999).

The current success of these unique animals has not gone unnoticed by the public. Elk are a source of continued interest and pride among residents and visitors to their range (Strauss et al. 1998, Lord et al. 1999). However with the expanded herd size, has come a call for reestablishing an elk hunting season. The Pennsylvania Game Commissions released its Elk Hunt Advisory Committee's

report in April of 2000. That report supports the establishment of an Elk Season (Cogan 2000).

In 1997, a study of the economic impacts of tourism associated with elk viewing was initiated by the School of Forest Resources at Penn State, supported by the Rocky Mountain Elk Foundation. As a part of this study, visitors were asked if they would support an elk hunting season.

Procedures

Random on-site interviews of the elk viewing public were conducted during a two year period from Fall of 1997 through Summer of 1999, in the Benezette/Winslow Hill observation area of Elk County, Pennsylvania. Over 900 surveys were conducted on 78 survey days over the two year period. These surveys ascertained the origin, travel itinerary, party size, expenditures, and allied recreational interests and expectations of the elk viewers in the area (Strauss, et al. 1998, Lord et al. 1999). Viewers were also asked their opinion about an elk hunting season. The response to this question was analyzed with respect to the demographics of the elk viewers.

Results

In responses to the question, "Would you support limited elk hunting outside of the major viewing areas?", 54% of the non residents responded positively (Table 1). Among resident viewers, only 45% supported a limited hunt.

Table 1. Percent of respondents approving an elk hunting season.

	Non Resident	Resident	Total
Hunter	63	52	62
Non Hunter	40	26	39
Grand Total	54	45	53

Twelve variables from the visitor survey were examined simultaneously with a logistic regression¹ to determine whether any sub-group of visitors were more likely to support or reject the elk hunting question. Three of these variables, age, total expenditures, and annual visitor days of elk viewing, were introduced as quantitative variables, with the remainder used as categorical variables.

The logistic regression indicated that six variables were statistically significant in predicting whether a person accepted or rejected the elk hunting proposal (Table 2). These included hunting over the past year, memberships in a local sportsmen's club, the National Rifle Association,

¹The logistic regression model analyzes the effects of a set of independent variables on a dichotomous (0,1) response variable.

Rocky Mountain Elk Foundation, the individual's age, and residence in the study region. Visitor days of elk viewing, expenditures on the trip, local cabin ownership, trip

importance, and membership in other conservation groups were not significant. Gender was of moderate importance.

Table 2. Results from the logistic regression of visitor characteristics influencing response to the question: Would you support limited elk hunting outside the major viewing areas?

Variable	Significance Level*
Hunter	0.001
Local Sportsmen's Clubs	0.006
National Rifle Association	0.029
Age	0.046
Resident of Region	0.048
Rocky Mountain Elk Foundation	0.053
Gender	0.225
Trip Importance 1	0.759
Trip Importance 2	0.432
Cabin	0.754
Conservation	0.923
Elk Days	0.972
Expenditures	0.993
Error	

*The significance level (p-value) indicates the probability that the variable had no effect on opinions on the elk hunting question. The lower the value, the more significant the variable. Trip importance was categorized as two variables by the model to account for the three possible values.

As might be expected there was, a strong correlation between some of the independent variables (Table 3). Of particular interest was local cabin ownership, which was correlated with the number of annual days viewing elk (0.201) and with trip importance (0.256). Another important relationship was the strong negative correlation between gender and hunting experience (-0.326).

As a follow-up, chi-square tests of independence were performed on the individual variables to determine whether the mean response of those within a particular group was significantly different from those outside the particular group when evaluated alone (Table 4). Because of the high correlations, these individual results may differ from the logistic regression.

Hunters

Participation in hunting over the past year, i.e. "hunters", was the most significant factor in explaining opinions about an elk season ($p = 0.001$). A Pennsylvania elk hunt was approved by 62% of hunters as compared to 39% of non-hunters. The 61% opposition rate among non-hunters was the highest among all tested groups. Mean approval among hunters and non-hunters was statistically different ($p < 0.001$).

Sportsmen Organizations

Visitors having membership in a local sportsmen's club were more likely to support a Pennsylvania elk hunt, with 66% approving. Non members had a 48% approval rating. The mean response among members and non members was statistically different.

NRA Membership

Visitors holding membership in the NRA were significantly more likely to approve of a Pennsylvania elk season than were non members ($p < 0.001$). The 70% approval rating by NRA members was the second highest of any significant sub-group. Non NRA members were slightly less likely than the general population to approve of the hunt (49% approving).

Age

The respondent's age proved to be a significant variable in the logistic regression, with younger visitors (<60 years old) more likely to approve of a Pennsylvania elk hunt than older visitors (>60 years old).

Local Residency

Residents of the two-county area were less likely to approve of an elk hunting season. Only 45% of residents approved of an elk hunt, with 55% opposed. In contrast, 54% of the non residents were in approval. The logistic regression assigned a significance level of 0.048 to this variable. However, the individual chi-square test produced a less significant 0.156 level. This situation indicated that residency became more significant after accounting for the effects of several other variables in the logistic regression. Over the two-year study, 90% of the visitors were non residents and 10% were residents.

RMEF Members

Only 7% of the audience reported themselves to be RMEF members. This audience, however, had the highest percentage approving a Pennsylvania elk hunt (79%). As

might be expected, non-RMEF members were similar to the general audience, and had a 51% approval.

Gender

Although gender was only moderately significant in determining opinions about a Pennsylvania elk hunt ($p = 0.225$ in the regression), the chi-square test indicated women's opinions on a Pennsylvania elk hunt to be significantly different from men's. The lower significance level in the logistic regression was due to the high correlation of gender with other variables. Once these stronger predictors are in the model, including gender did not add much more information. The 44% approval among women was the second lowest significant approval rate.

A caveat is in order. Only 27% of the groups interviewed had female respondents. Since 66% of the groups

interviewed were family groups, a male bias may be found in the responses.

Cabin Owners

The opinion of local cabin owners was of interest even though they did not prove to be significant in the logistic regression. A Pennsylvania elk hunt was approved of by 63% of cabin owners. Non-cabin owners had a 52% approval. The chi-square test indicated a moderately significant ($p = 0.033$) difference between local cabin owners and non owners. Similar to the situation with gender, if combined with the other variables in the logistic regression, local cabin ownership did not add significant information to the analysis. For example, 78% of cabin owners were hunters, as compared to 61% of the general public, and, as such, the hunting variable had a stronger influence.

Table 3. Pearson correlation matrix for the independent variables in the logistic regression.

	Elk Days	Hunter	Expenditures	Cabin	Resident	Trip Importance
Elk Days	1.000					
Hunter	0.071	1.000				
Expenditures	-0.104	0.084	1.000			
Cabin	0.201	0.102	0.012	1.000		
Resident	0.347	0.052	-0.165	-0.051	1.000	
Trip Importance	0.064	0.028	-0.146	0.256	-0.009	1.000
Gender	-0.005	-0.326	-0.028	-0.027	0.010	-0.118
Age	0.046	-0.076	-0.032	0.060	-0.004	0.061
NRA	0.044	0.213	-0.021	0.015	0.057	0.063
Local Sportsmen's Club	0.006	0.264	0.050	0.088	-0.019	-0.025
Rocky Mountain Elk Foundation	0.018	0.167	0.060	-0.002	0.167	0.015
Conservation Club	0.005	-0.082	0.066	-0.056	-0.066	-0.021

	Gender	Age	NRA	Local Sportsmen's Club	Rocky Mountain Elk Foundation	Conservation Club
Trip Importance						
Gender	1.000					
Age	-0.059	1.000				
NRA	-0.104	0.046	1.000			
Local Sportsmen's Club	-0.131	0.038	0.254	1.000		
Rocky Mountain Elk Foundation	-0.076	-0.008	0.048	0.069	1.000	
Conservation Club	0.056	-0.041	-0.050	-0.122	0.054	1.000

Table 4. Tests of significant factors affecting opinions about elk hunting.

Variable	Number of Respondents	Penna. Elk Hunt Approval (%)	Significance Level
Hunted in Past Year	522	61.9	0.000
No Hunting in Past Year	330	39.1	
Local Sportsmen Club Members	258	65.9	0.000
Non Member	594	47.5	
NRA Member	166	69.9	0.000
Non Member	686	49.0	
Resident of Region	65	44.6	0.156
Non Resident	787	53.7	
RMEF Member	56	78.6	0.000
Non Member	796	51.3	
Men	445	60.4	0.000
Women	165	43.6	
Local Cabin Owner	759	63.4	0.033
Not a Local Cabin Owner	93	51.8	

Summary and Conclusions

On the question of whether elk viewers would approve a limited elk hunt outside the major viewing areas, their opinion was mixed. Although the general audience provided a 53% approval rating, this was a narrow margin. The primary support for a Pennsylvania hunt was found among those belonging to the RMEF (79% approval), the NRA (70%) and other sportsmen's groups (66%). This was probably to be expected in that these groups largely accept the concept of hunting as a management tool. Hunting was also basic to their recreational preferences. Cabin ownership, while not significant in the logistic regression, was significant when tested alone with the t-test. This indicated that other predictors (e.g. hunting, membership in RMEF, NRA or other sportsmen organizations) were better at explaining variations in people's opinion.

In terms of those opposed to an elk hunt, 55% of the region's residents did not approve. Although local residency was not very significant by itself, it was a significant element when combined with the other variables in the logistic regression. The other noted group in opposition to elk hunting was women, with 56% against such a strategy. However, the opinions of this group may be better predicted by other characteristics as demonstrated by the relatively low significance in the logistic regression.

This analysis identified categories of people having either positive or negative opinions on a proposed elk hunt. However, we do not know the specific reason for their accepting or rejecting this proposal. This question was also asked prior to the announcement of a specific hunting proposal. Consequently, people were responding to a hypothetical hunting season. It is possible that as the details of a specific proposal become known, the viewing public's opinions will change.

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