

# Landowner Views of Elk in Western North Carolina

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## Executive Summary

### Introduction

A quantitative study to understand landowners' views of elk was conducted to provide objective information on the sociological aspects of elk management in western North Carolina. The purposes of this study were to describe western North Carolina landowners' experiences with elk, general support for and opposition to elk in western North Carolina, opinions of possible outcomes of elk living in western North Carolina, opinions of possible elk management actions, and likelihood of participating in elk viewing and elk hunting.

### Methods

We used a stratified random sampling design to survey 17,218 landowners. The data source was 2012 land parcel data collected from the individual counties and maintained by the North Carolina Department of Agriculture and Consumer Services. Nine strata were selected consisting of three geographic regions and three parcel size categories.

### Results

#### *Response rate*

- The survey response rate, calculated by omitting undeliverable addresses and deceased persons, was 40.5%.
- Survey response rates were greater from landowners of larger parcels than smaller parcels.

#### *Landowner characteristics*

- Overall western North Carolina results showed that 75% of landowners' largest individual parcels were less than 14 acres and 75% of landowners indicated that the total number of acres owned in western North Carolina were less than 15 acres.

#### *Elk on or within five miles of landowners' largest tracts of land*

- Over all survey responses, 3% of landowners indicated that wild, free-roaming elk lived on or within five miles of their largest tracts of land in western North Carolina.
- Within Haywood County, 21% of landowners of 0 to 2 acre parcels, 23% of landowners of > 2 to 15 acre parcels, and 27% of landowners of > 15 acre parcels indicated that wild, free-roaming elk lived on or within five miles of their largest tracts of land.
- Over all survey responses, 3% of landowners have seen or heard elk on the largest tracts of land they owned in western North Carolina.
- Within Haywood County, 13% of landowners of 0 to 2 acre parcels, 16% of landowners of > 2 to 15 acre parcels, and 20% of landowners of > 15 acre parcels have seen or heard elk on the largest tracts of land they owned.
- Over all survey responses, 1% of landowners indicated that elk damaged fences, crops,

gardens, trees or other property on the largest tracts of land they owned in western North Carolina.

- Within Haywood County 3% of landowners of 0 to 2 acre parcels, 5% of landowners of > 2 to 15 acre parcels, and 12% of landowners of > 15 acre parcels indicated elk damaged their property.

#### *Support and opposition for elk*

- Landowners' levels of support or opposition for elk on or within five miles of their lands were measured at the beginning and end of the survey. At the beginning of the survey, 72% of landowners indicated support for wild, free-roaming elk living on or within five miles of their largest tracts of land. At the end of the survey, 68% indicated support for elk on or within five miles of their largest tracts of land.
- Seventy-three percent of landowners supported elk living on private lands in western North Carolina.
- Eighty-eight percent of landowners supported elk living on public lands in western North Carolina.
- Forty-eight percent of Haywood County landowners of > 15 acre parcels who had wild, free-roaming elk living on or within five miles of their largest tracts of land either strongly supported (26%) or supported (22%) wild, free-roaming elk living on or within five miles of their largest tracts of land compared to 39% who either strongly opposed (27%) or opposed (12%).
- Forty percent of Haywood County landowners of > 15 acre parcels who have seen or heard elk on the largest tracts of land they owned either strongly supported (25%) or supported (15%) elk living on or within five miles of their largest tracts of land compared to 39% who either strongly opposed (29%) or opposed (12%).
- Twenty-two percent of Haywood County landowners of > 15 acre parcels whose properties have been damaged by elk either strongly supported (12%) or supported (10%) elk living on or within five miles of their largest tracts of land in western North Carolina with 64% either strongly opposed (47%) or opposed (17%).
- Support varied among Haywood County landowners of > 15 acre parcels who owned working lands. For example, at the start of the survey, 46% of this group of landowners who used their lands for cropland either strongly opposed (31%) or opposed (15%) elk living on or within five miles of their largest tracts of land while 32% either strongly supported (18%) or supported (14%) elk living on or within five miles of their largest tracts of land. At the close of the survey, the majority of this group of landowners did not change their opinion of elk living on or within five miles of their largest tracts of land. Twenty-eight percent of this group also either strongly opposed (18%) or opposed (10%) elk living on publicly owned lands and 56% either strongly supported (26%) or supported (30%) elk living on publicly owned lands.

#### *Opinions of possible outcomes of elk in western North Carolina*

- 76% of landowners indicated "Elk may be returned to part of their historical range" would be a positive possible outcome of elk living on or within five miles of their largest tracts of land in western North Carolina.

- 66% of landowners indicated “People may be able to view elk within five miles of your largest tract of land in western North Carolina” would be a positive possible outcome of elk living on or within five miles of their largest tracts of land in western North Carolina.
- 44% of landowners indicated “Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina” would be a negative possible outcome of elk living on or within five miles of their largest tracts of land in western North Carolina.
- The possible outcomes that received the most positive responses were consistent across all strata.
- The possible outcomes that received the most negative responses mostly were consistent across strata. However, 39% of Haywood County landowners of parcels > 15 acres indicated the possible outcome: “People may be able to hunt elk within five miles of your largest tract of land in western North Carolina” was negative. This same percentage (39%) indicated that the possible outcome, “Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina” was negative. These two possible outcomes were among the possible outcomes that received the most negative responses from Haywood County landowners of parcels > 15 acres.

#### *Interaction levels between people and elk*

- Over all survey responses the most frequently checked preferred level of interaction between people and elk was “elk are sometimes sighted, a low number of elk are present for viewing and other wildlife activities, but occasional damage to property occurs” (46%).
- The most frequently checked situation that would most likely cause landowners to ask/tell an authority to reduce the number of elk/human interactions was “Elk are regularly sighted, many elk are present for wildlife activities, and regular damage to property occurs” (46%).
- Results were similar across all strata.

#### *Elk/human conflicts*

- 84% of western North Carolina landowners considered providing information on preventing problems with elk either very acceptable or acceptable if elk are sighted, heard bugling, or leave hoof prints on a landowner’s property.
- 41% of western North Carolina landowners considered frightening elk either very acceptable or acceptable while 34% indicated this option was either unacceptable or very unacceptable under this scenario.
- 32% of landowners considered allowing landowners to kill elk either very acceptable or acceptable while 44% considered this option either very unacceptable or very unacceptable under this scenario.
- Within the geographic regions, landowners of large parcels indicated that allowing landowners to kill elk causing problems was more acceptable than landowners of small parcels from all three geographic regions.

#### *Likelihood of participation in elk viewing and elk hunting*

- 28% of landowners indicated they would be either very likely or likely while 65% indicated they would be either unlikely or very unlikely to hunt elk if elk hunting were allowed in North Carolina.
- 29% of landowners indicated they would be either very likely or likely while 44% indicated they hunt or have other members of their household or immediate family hunt elk on their land.
- 12% of landowners indicated they would be either very likely or likely to allow people other than members of their household or immediate family to hunt elk on their land. Of western North Carolina landowners of parcels > 15 acres: 69% of Haywood County landowners; 69% of Jackson County, Madison County, and Swain County landowners; and 57% of the remaining western North Carolina county landowners were either very unlikely or unlikely to allow people other than members of their household or immediate families hunt elk on their lands.
- 5% of landowners indicated they would be either very likely or likely to lease their land for hunting. Of western North Carolina landowners of parcels > 15 acres: 78% of Haywood County landowners; 80% of Jackson County, Madison County, and Swain County landowners; and 71% of the remaining western North Carolina county landowners were either very unlikely or unlikely to lease their lands for elk hunting.
- 69% of landowners indicated they would be either very likely or likely to make a special trip to view elk.
- 43% of landowners would be either very likely or likely to allow people other than members of their household or immediate family to view elk on their lands.

#### **Management considerations**

- Overall, western North Carolina landowners supported elk in western North Carolina although few landowners have knowledge of elk or experience with elk.
- Landowners may not oppose hunting as an elk management tool; however they demonstrated strong reluctance to allow people other than members of their household or immediate family access to their lands for hunting.
- Because most tracts of land owned by western North Carolina landowners were relatively small compared to what is needed to support a huntable herd of elk and that the majorities of landowners of parcels > 15 acres in each geographic region indicated they were unlikely to allow people other than their families or immediate household to hunt on their properties, finding lands in western North Carolina that could support a huntable herd of elk herd will be extremely challenging.
- For several survey questions, including questions asking about property damage caused by elk and support for or opposition to elk, Haywood County landowners of parcels > 15 acres views of elk differed from other landowners. As the elk population expands and more western North Carolina landowners have interactions with elk, it should be expected that support for elk will decline.

- Considering all responses, a huntable herd of elk would most likely be supported and accessible to hunters if established on public land.
- When preparing broad-scale communications about an expanding elk herd it will be important to emphasize that elk may be returned to its native range.
- Government agencies and nongovernmental organizations may collaborate to implement strategies such as fencing, aversive conditioning, and habitat management, in addition to lethal control to assist landowners whose properties have been damaged by elk. Lethal control may be controversial as a management strategy thus defining the conditions under which landowners may kill elk will be important to develop as part of an elk management plan.

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## **Introduction**

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2001 and 2002, elk were reintroduced into the Great Smoky Mountains National Park (Park). Today there are about 140 elk in western North Carolina, with elk living both within the Park and on private lands outside of the Park.

A quantitative study to understand landowners' views of elk was conducted to provide objective information on the sociological aspects of elk management in western North Carolina. The purposes of this study were to describe western North Carolina landowners' experiences with elk, general support for and opposition to elk in western North Carolina, opinions of possible outcomes of elk living in western North Carolina, opinions of possible elk management actions, and likelihood of participating in elk viewing and elk hunting.

## **Methods**

### *Survey Instrument Design*

Commission staff designed and tested a survey instrument to describe landowners' views of elk in western North Carolina. In order to test the survey instrument, we conducted cognitive interviews with a convenience sample (persons known by Commission staff prior to the interviews) of western North Carolina landowners. During cognitive interviews, we examined how well questions and directions were interpreted in order to improve survey instrument wording and design. The final survey instrument contained questions on property characteristics, landowner interactions with wild, free-roaming elk, support for and opposition to elk in western North Carolina, opinions of possible outcomes of elk living in western North Carolina, opinions of elk viewing and hunting, and landowner demographics.

### *Sample Selection*

The target population was western North Carolina landowners. Western North Carolina was defined as North Carolina counties either entirely or partly contained within the contiguous section of the Southern Blue Ridge Ecoregion (Figure 1). We used a stratified random sampling design. Nine strata were selected consisting of three geographic regions and three parcel size categories (Table 1). We used a stratified random sampling design to ensure that landowners of the three parcels sizes were represented in the results, understand the views of landowners from the area immediately within the current known range of elk (Haywood County) and the likely expansion area (Jackson, Madison, and Swain counties), the remaining western North Carolina counties), and compare responses of the strata.

A sample of 1,920 landowners was selected from 8 of the 9 strata. The Haywood County, > 15 acres parcel stratum contained 1,858 landowners, thus surveys were mailed to all 1,858. In total, the sample consisted of 17,218 landowners. The data source was 2012 land parcel data collected from the individual counties and maintained by the North Carolina Department of Agriculture and Consumer Services. Government landowners were excluded from the sampling

frame. If a survey was returned by a government landowner that was overlooked during the development of the sampling frame, that survey was counted as ineligible. Additionally, landowners may own more than one parcel. When landowners owned more than one parcel, the record that contained the largest parcel owned by a landowner was included in the sampling frame.

### *Survey Implementation*

A modified version of the Tailored Design Method (Dillman et al. 2009) was used to administer the survey. Landowners were sent up to three full survey packet mailings and one follow-up postcard after the first mailing. The first full survey packet mailing (cover letter, survey instrument, and business reply return envelope) was mailed on July 22, 2013. Reminder postcards were sent to all survey recipients one week after the first mailing. Nonrespondents were sent follow-up mailings four weeks and eight weeks after the first mailing. The survey closed October 14, 2013.

### *Data Analysis*

Data were analyzed using SPSS 21.0 (IBM 2012). We calculated frequency distributions and percentages of respondents in each category for every survey question within each of the nine strata and for western North Carolina overall. To generate western North Carolina overall estimates, we weighted the data from the nine strata to represent the population (Lohr 2010). Crosstabulations and chi-square tests ( $\chi^2$ ) were used to determine whether views of elk significantly differed between the strata and other study population variables. A probability value ( $P$ )  $\leq 0.05$  was used to indicate statistically significant differences. When  $> 20\%$  of cells in crosstabulations had expected values  $< 5$  or when any cells had expected values  $< 1$ , categories were omitted or combined. Adjusted residuals were calculated to determine which cells in crosstabulations were significantly different from expected values. An adjusted residual with an absolute value  $\geq 2.0$  was evidence against independence in the cell (Agresti and Finlay 1997). For comparisons with two ordinal variables, when chi-square tests had  $P \leq 0.05$ , phi was calculated for  $2 \times 2$  tables and Cramer's V was calculated for larger tables (Vaske 2008). In general, we considered a Cramer's V statistic of 0.10 worthy of reporting in that it suggested some relationship in applicable crosstabulations. Due to rounding, not all percentages total 100%.

### *Nonresponse Bias*

Nonresponse bias occurs when nonrespondents differ from respondents, which, in turn, may bias the data or conclusions generated from the survey. We did not have demographic characteristics (e.g., age, sex) available for the sampling frame thus comparing demographic characteristics of respondents to that of a known population was not possible. Dillman et al. (2009) recommends either following up with nonrespondents using a different survey mode or delivery method. We only had mailing addresses, thus contacting nonrespondents using a different delivery mode was not possible.

The continuum of resistance model assumes respondents who reply to later mailings may be similar in characteristics and opinions to nonrespondents (Filion 1976). We compared responses to key questions based on survey mailing wave. We did not adjust data based on the assumptions of the continuum of resistance model, but did note where nonresponse bias may be present.

## **Results**

### *Overall Frequency Distributions*

See Appendices A through J for response frequencies for all survey questions for western North Carolina and each of the nine strata.

### *Response Rate*

The survey response rate, calculated by omitting undeliverable addresses and deceased persons, was 40.5%. Response rate differed by stratum (Table 2). In general, within each of the three geographic regions, landowners of parcels > 15 acres responded to the survey at a greater rate than landowners of parcels 0 to 2 acres.

### *Nonresponse Bias*

In eight of the nine strata, respondents indicated that they had a greater knowledge of elk in the first mailing compared to the later mailings. This result is similar to McClafferty's (2000) finding through a nonrespondent telephone follow-up survey that nonrespondents were more likely than respondents to indicate that they had little knowledge of elk. For five of the nine strata, respondents reported more support for wild, free-roaming elk living on or within five miles of their largest tracts of land (survey beginning) in the first mailing than the later mailings. See Appendix K for results.

### *Western North Carolina Landowner Characteristics*

At the time of survey administration, ninety-four percent of respondents owned land in western North Carolina. Most (85%) landowners resided in North Carolina, 66% were male, and 93% were white. The mean age of landowners was 61 years. Forty-five percent had a minimum formal education level of Bachelor's or graduate degree. Forty-eight percent indicated having a gross household income of \$60,000 or higher. Eighty-three percent of landowners participated in one of the listed outdoor activities and 4% indicated they participated in some outdoor activity not listed.

Sixty-one percent of landowners lived on the largest tract of land they owned. Overall, 80% of landowners indicated their largest tracts of land were located in a rural area outside city or town limits and 29% reported their land was less than five miles from a national forest, national park, state park, state forest, or state game land. Landowners indicated that the uses of their largest tracts of land were: a residence – 69%, hay or pasture land – 14%, growing ornamental plants or gardens for non-commercial use – 11%, timber production – 10%, livestock production

– 5%, cropland – 4%, orchards – 2%, Christmas tree production – 1%, commercial horticulture – 1%, and vineyard – 1%. Thirteen percent wrote a use not listed on the survey.

### *Knowledge of the elk population in North Carolina*

Respondents were asked to report their knowledge level of elk on a five-point scale ranging from very little knowledge to expert knowledge. The most frequently reported knowledge level was “very little knowledge” (39%). However, in the three Haywood county parcel size strata and the three Jackson County, Madison County, and Swain County parcel size strata the most frequently reported knowledge level was “average knowledge.” Respondents from the three parcel size strata in the remaining western North Carolina counties most frequently reported “very little knowledge.”

### *Elk on or within five miles of landowners’ largest tracts of land*

Over all survey responses, 3% of landowners indicated that wild, free-roaming elk lived on or within five miles of their largest tracts of land in western North Carolina. Within Haywood County, 21% of landowners of 0 to 2 acre parcels, 23% of landowners of > 2 to 15 acre parcels, and 27% of landowners of > 15 acre parcels indicated that wild, free-roaming elk lived on or within five miles of their largest tracts of land. The percentages of landowners from the remaining six strata who indicated wild, free-roaming elk lived on or within five miles of their largest tracts of land ranged from 0% to 7%.

Over all survey responses, 3% of landowners have seen or heard elk on the largest tracts of land they owned in western North Carolina. Within Haywood County, 13% of landowners of 0 to 2 acre parcels, 16% of landowners of > 2 to 15 acre parcels, and 20% of landowners of > 15 acre parcels have seen or heard elk on the largest tracts of land they owned. The percentages of landowners from the remaining six strata who have seen or heard elk on the largest tracts of land they owned ranged from 2% to 5%.

Over all survey responses, 1% of landowners indicated that elk damaged fences, crops, gardens, trees or other property on the largest tracts of land they owned in western North Carolina. Within Haywood County 3% of landowners of 0 to 2 acre parcels, 5% of landowners of > 2 to 15 acre parcels, and 12% of landowners of > 15 acre parcels indicated elk damaged their property. The percentages of landowners from the remaining six strata who indicated elk damaged their properties ranged from 0% to 1%.

### *Support and opposition for elk*

Landowners were asked whether they supported or opposed elk living on or within five miles of their largest tracts of land at the beginning and end of the survey. At the beginning of the survey, 72% of landowners indicated support for wild, free-roaming elk living on or within five miles of their largest tracts of land. At the end of the survey, 68% indicated support for elk on or within five miles of their largest tracts of land. Seventy-three percent of landowners supported elk living on private lands and 88% supported elk living on public lands in western North Carolina.



Although the majority of landowners from all nine strata supported elk in western North Carolina, landowners of large parcels expressed more opposition to elk than landowners of smaller parcels. At the beginning of the survey, 25% of Haywood County landowners of parcels > 15 acres either opposed (10%) or strongly opposed (15%) elk living on or within five miles of their largest tract of land while 13% of landowners of 0 to 2 acre parcels opposed (8%) or strongly opposed (5%) elk living on or within five miles of their largest tract of land. Similar patterns were found in responses from the other two geographic regions. See Table 3, Table 4, and Table 5 for full results.

Haywood County > 15 acre parcel landowners' levels of support for or opposition to wild, free-roaming elk in western North Carolina were examined for relationships with responses to questions that asked whether elk lived on or within five miles of respondents' largest tracts of land, whether landowners have heard or seen elk on or within five miles of respondents' largest tracts of land, and whether elk have caused damage to landowners' properties. Additionally, these landowners' levels of support were examined in relation to land use. Their responses were examined in more detail than the other strata because they had the most reported experience with elk and likely will be the landowners most immediately affected by possible elk expansion. In general, landowners who had elk living and/or had heard and seen elk on or within five miles of their largest tracts of land expressed more opposition to elk than those who did not have elk on or near their property (Table 6 and Table 7). Additionally, landowners whose property has been damaged by elk expressed more opposition to elk than landowners who have not experienced property damage (Table 8).

Forty-eight percent of Haywood County landowners of > 15 acre parcels who had wild, free-roaming elk living on or within five miles of their largest tracts of land either strongly supported (26%) or supported (22%) wild, free-roaming elk living on or within five miles of their largest tracts of land compared to 39% who either strongly opposed (27%) or opposed (12%). Forty percent of Haywood County landowners of > 15 acre parcels who had seen or heard elk on the largest tracts of land they owned either strongly supported (25%) or supported (15%) elk living on or within five miles of their largest tracts of land compared to 39% who either strongly opposed (29%) or opposed (12%). Twenty-two percent of Haywood County landowners of > 15 acre parcels whose properties had been damaged by elk either strongly supported (12%) or supported (10%) elk living on or within five miles of their largest tracts of land with 64% either strongly opposed (47%) or opposed (17%) elk living on or within five miles of their largest tracts of land.

Opinion often varied among Haywood County landowners of > 15 acre parcels who owned working lands. For example, at the start of the survey, 46% of this group of landowners who used their lands for cropland either strongly opposed (31%) or opposed (15%) elk living on or within five miles of their largest tracts of land while 32% either strongly supported (18%) or supported (14%) elk living on or within five miles of their largest tracts of land. At the close of the survey, the majority of this group of landowners did not change their opinion of elk living on or within five miles of their largest tracts of land. Twenty-eight percent of this group also either strongly opposed (18%) or opposed (10%) elk living on publicly owned lands and 56% either strongly supported (26%) or supported (30%). See Table 9, Table 10, Table 11, and Table 12 for full results.

### *Opinions of possible outcomes of elk in western North Carolina*

Ten possible outcomes of elk living in western North Carolina were listed in the survey and landowners were asked to indicate on a five-point scale how positive or negative they believed each outcome would be if there were elk living on or within five miles of their largest tracts of land in western North Carolina. An “unsure” option was provided. The outcomes were listed as possible outcomes (i.e., not definite outcomes) of elk living in western North Carolina. The purpose of this series of questions was to gauge how landowners may view each possible outcome if that possible outcome were to occur.

Over all western North Carolina landowners, after combining “very positive” and “positive,” the outcomes that received the most positive responses included “Elk may be returned to part of their historical range” – 76% positive, “People may be able to view elk within five miles of your largest tract of land in western North Carolina” – 66% positive, and “Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism” – 62%. Within all nine individual strata the outcome that consistently received the most positive responses was “Elk may be returned to part of their historical range.” The outcomes that received the most negative responses after combining “negative” and “very negative” included “Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina” – 44% negative, “Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina” – 43% negative, and “Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina” – 40% negative.

Responses varied slightly between strata (Table 13, Table 14, Table 15, Table 16, Table 17, Table 18). For example, the outcomes that received the most positive responses from landowners of parcels > 15 acres in Haywood County included the outcomes listed above but also “Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina.” The outcomes that received the most negative responses from landowners of parcels > 15 acres in Haywood County included the outcomes listed above but also “People may be able to hunt elk within five miles of your largest tract of land in western North Carolina.”

### *Interaction levels between people and elk*

Landowners were presented with four situations that described increasing levels of interactions between people and elk. The four situations ranged from no elk exist on or within five miles of their largest tracts of land to elk are regularly sighted, present for viewing and other wildlife activities, but with regular damage to property. Over all survey responses the most frequently checked preferred situation was “Elk are sometimes sighted, a low number of elk are present for viewing and other wildlife activities, but occasional damage to property occurs” (46%; Appendix A, question 15). The most frequently checked situation that would most likely cause landowners to ask/tell an authority to reduce the number of elk/human interactions was “Elk are regularly sighted, many elk are present for wildlife activities, and

regular damage to property occurs” (46%). This same pattern was found in the nine individual strata.

### *Elk/human conflicts*

Landowners were asked how acceptable or unacceptable three management options would be if elk are sighted, heard bugling, or leave hoof prints on a landowner’s property. The three management actions included providing information to landowners on preventing problems with elk, frightening elk using tools such as fireworks or dogs, and allowing landowners to kill elk. Eighty-four percent of western North Carolina landowners considered providing information on preventing problems with elk either very acceptable (54%) or acceptable (30%). Forty-one percent of western North Carolina landowners considered frightening elk either very acceptable (11%) or acceptable (30%) while 34% indicated this option was either unacceptable (23%) or very unacceptable (11%). Thirty-two percent of landowners considered allowing landowners to kill elk either very acceptable (12%) or acceptable (20%) while 44% considered this option either very acceptable (19%) or very unacceptable (25%). Within the geographic regions, landowners of large parcels indicated that allowing landowners to kill elk causing problems was more acceptable than landowners of small parcels from all three geographic regions (Table 19, Table 20, Table 21).

Landowners were asked how acceptable or unacceptable the same three management options would be if elk ate hay, knocked down fences, or disturbed livestock on a landowner’s property. Sixty-eight percent considered providing information to landowners on preventing problems with elk either very acceptable (39%) or acceptable (29%). Forty-eight percent considered frightening elk using tools such as fireworks or dogs either very acceptable (15%) or acceptable (33%). Opinion was nearly split on whether landowners should be allowed to kill elk under this scenario. Thirty-six percent considered allowing landowners to kill elk either very acceptable (14%) or acceptable (22%) while 39% considered this option either unacceptable (20%) or very unacceptable (19%). Although there was no majority opinion of allowing landowners to kill elk, landowners of large parcels indicated that allowing landowners to kill elk causing problems was more acceptable than landowners of small parcels in all three geographic regions (Table 22, Table 23, Table 24).

### *Likelihood of participation in elk viewing and elk hunting*

Landowners were asked about the likelihood of their participation in elk hunting. Twenty-eight percent of landowners indicated they would be either very likely (18%) or likely (10%) while 65% indicated they would be either unlikely (14%) or very unlikely (51%) to hunt elk if elk hunting were allowed in North Carolina. Twenty-nine percent of landowners indicated they would be either very likely (16%) or likely (13%) to hunt or have other members of their household or immediate family hunt elk on their land. Twelve percent of landowners indicated they would be either very likely (5%) or likely (7%) to allow people other than members of their household or immediate family to hunt elk on their land. Five percent of landowners indicated they would be either very likely (2%) or likely (3%) to lease their land for hunting. Within the individual strata, minorities of landowners would allow people other than members of their

household or immediate family to hunt on their lands. Similarly, within the individual strata, small percentages of landowners would lease their lands for hunting. See Appendices A through J for results from individual strata.

Landowners of parcels > 15 responses were examined in more detail because these landowners own lands that may have the potential to support a huntable elk herd. The likelihood of landowners hunting or allowing members of their household or immediate family to hunt elk was nearly split among landowners of parcels > 15 acres from all three geographic regions. However, the majorities of these landowners were unlikely to allow people other than their household or immediate family to hunt elk on their lands or lease their lands for elk hunting (Table 25). Sixty-nine percent of Haywood County landowners of > 15 acre parcels; 69% of Jackson County, Madison County, and Swain County landowners of > 15 acre parcels; and 57% of the remaining western North Carolina county landowners of > 15 acre parcels were unlikely to allow people other than members of their household or immediate families to hunt elk on their lands.

Landowners were asked about the likelihood of their participation in elk viewing. Sixty-nine percent indicated they would be either very likely (38%) or likely (31%) to make a special trip to view elk. Forty-three percent of landowners would be either very likely or likely to allow people other than members of their household or immediate family to view elk on their lands. Two percent of landowners would either be very likely or likely to charge people to view elk on their land.

### *Approval of hunting*

The majority (71%) of landowners either strongly approved (36%) or approved (35%) of legal, regulated hunting in general. Additionally, the majority (51%) of landowners either strongly approved (22%) or approved (31%) of elk hunting in general. Forty-six percent of landowners either strongly approved (19%) or approved (27%) of elk hunting on or within five miles of their largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting.

## **Discussion**

Elk were reintroduced into North Carolina when approximately 50 elk were released into the Park in 2001 and 2002. Since 2001 the herd has expanded to approximately 140 elk with elk living both in the Park and on private lands. This study focused on landowners' views of elk in western North Carolina. The results of the study will be used in combination with other sources of biological and socioeconomic information and data to inform elk management in North Carolina.

### *Landowner, land use, and property characteristics*

Most (85%) landowners resided in North Carolina, 66% were male, and 93% were white. The mean age of landowners was 61 years which was older than the estimated average age derived from Census data of the residential population of western North Carolina (49.3 years).

Although the residential population of western North Carolina was not the study population, it is important to note that the average age of landowners was greater than the average age of the resident adult population in western North Carolina.

Survey response rates were greater from landowners of larger parcels than smaller parcels. This may be an indication that landowners of large parcels found the survey topic, landowner views of elk, a more salient issue than landowners of smaller parcels. Some research suggests that the saliency of the survey topic is one factor that motivates survey recipients to participate in surveys (Groves et al. 2004, Roose et al. 2007).

Elk will be seen and will cause damage on more private property as the elk population continues to expand in western North Carolina; therefore it is important to understand the diversity of human land uses. We asked landowners for the size of their largest tract of land, the uses of their largest tract of land, and the distance of their largest tract of land from public lands. We asked these questions because landowners of larger tracts of land have the potential to be directly impacted by the presence of elk in western North Carolina. The majority of land holdings in western North Carolina are relatively small. Overall western North Carolina results showed that 75% of landowners' largest individual parcels were less than 14 acres and 75% of landowners indicated that the total number of acres owned in western North Carolina were less than 15 acres (Appendix A, question 2 and question 3). Additionally, the majority of the sampling frame consisted of landowners who held relatively small parcels (Table 1).

Many landowners used their property as working lands. For example over all western North Carolina, 14% of landowners indicated they used their largest tracts of land as hay or pasture land. Within Haywood County, 47% of landowners of parcels > 15 acres indicated they used their largest tracts of land as hay or pasture land.

### *Support for and opposition to elk population in western North Carolina*

Overall, landowners supported elk in western North Carolina although few landowners have knowledge of elk or experience with elk. The majority of landowners (72%) supported elk living on or within five miles of their largest tracts of land, (73%) supported elk on private lands in western North Carolina, and 88% supported elk living on publicly owned lands in western North Carolina. However, very few western North Carolina landowners have seen or heard elk on the largest tracts of land they owned (3%) or have had experience with property damage caused by elk (1%). Additionally, 67% of western North Carolina landowners rated their knowledge of elk as "some knowledge" or less.

It is expected that support for elk may decline as the elk population expands, additional western North Carolina landowners have negative interactions with elk, and additional damage occurs. Landowners who have not had experience with elk and who are interested in having elk on the landscape may change their views once they have interactions with elk. However, additional management strategies and communication from the Commission may help maintain support. At the time of survey administration, the majority (58%) of Haywood County landowners of > 15 acre parcels supported elk on or within 5 miles of their largest tracts of land. Of the landowners in this stratum who have seen or heard elk on the largest tract of land they owned, support for elk living on or within five miles of landowners' largest tract of land was split with 40% supporting and 41% opposing. Of the landowners in this stratum who have

experienced damage caused by elk on the largest tract of land they owned, the majority (64%) expressed opposition for elk on or within 5 miles of their largest tract of land.

Survey results indicated that landowners may show more support for elk on public lands than private lands. Similar to overall western North Carolina results, Haywood County landowners of parcels > 15 acres demonstrated more support for elk on public lands. The majority (61%) of this group of landowners who have seen or heard elk on their largest tracts of land supported elk on public land. Fifty percent of this group of landowners who experienced damage caused by elk to their property supported elk on public lands. Thus, landowners who have experience and knowledge of elk may support elk in western North Carolina, just not on or near their lands. In order to implement current and develop successful management strategies for elk on private lands, it is important to identify the experiences and concerns that landowners have had with elk on their lands and that may have best addressed those concerns.

Landowners of working lands (e.g., livestock production, pasture lands) may be more likely than landowners who do not use their lands as working lands to express opposition to elk. Results showed that within Haywood County, landowners of parcels > 15 acres who used their largest tracts of land primarily for cropland (other than hay or pasture land), more landowners opposed elk (46%) than supported elk (32%) on or within 5 miles of their largest tracts. Thus management strategies for assisting agriculture producers may be different than non-producer landowners.

#### *Views of possible outcomes of elk in western North Carolina*

In order to communicate effectively about elk with landowners in western North Carolina and develop management strategies for an expanding elk herd, wildlife managers need to understand how landowners perceive the possible outcomes. The possible outcome “Elk may be returned to part of their historical range” received the most positive ratings from landowners across all nine strata. The next three possible outcomes that landowners rated positively included outcomes related to elk viewing, tourism opportunities, and the aesthetic nature of elk. The possible outcomes with the most negative ratings were related to the chance for automobile-wildlife collisions and disease transmission. Thus, when preparing communications about an expanding elk herd it will be important to emphasize that elk may be returned to its native range and highlight the recreational opportunities associated with an expanded elk herd. Additionally, wildlife managers may consider maintaining current and publicly available information regarding how to avoid elk-human conflicts such as automobile-wildlife collisions.

Some elk-human conflicts occur today and likely will continue to occur as the elk population expands in western North Carolina. Over all western North Carolina landowner responses, approximately a third (32%) of western North Carolina landowners indicated allowing landowners to kill elk was acceptable if elk were sighted, were heard bugling, or left hoof prints on a landowner’s property. Forty-four percent indicated killing elk was unacceptable under this scenario (Appendix A, Question 16Aiii). The result that nearly one-third of landowners indicated it is acceptable to allow landowners to kill elk for actions such as being sighted, bugling, or leaving hoof prints on a landowner’s property is interesting and may warrant further investigation.

There was no majority opinion of acceptability of killing elk in any strata if elk ate hay, knocked down fences, or disturbed livestock on a landowner's property. However, landowners of parcels > 15 acres demonstrated more support for killing elk than landowners of smaller parcels in all three geographic regions (Appendix A, Question 16).

Government agencies and nongovernmental organizations may collaborate to develop strategies in addition to lethal control to assist landowners whose properties have been damaged by elk. Lethal control may be controversial as a management strategy thus defining the conditions under which landowners may kill elk will be important to develop as part of an elk management plan.

### *Elk Hunting and Elk Viewing*

Because hunting is an important wildlife management tool, wildlife managers need to understand landowners' approval levels for elk hunting, landowners' likelihood of hunting, and their interest in allowing hunting on their lands. The majority of landowners approve of hunting in general (71%) and elk hunting in general (51%). A substantial minority (28%) of landowners demonstrated interest in hunting. However, majorities of landowners in each geographic region of parcels > 15 acres indicated they were unlikely to allow people other than their immediate family or household to hunt elk on their lands or lease their lands for elk hunting. Given that most tracts of land owned by western North Carolina landowners were relatively small (Appendix A, questions 2 and 3; Table 1) compared to what is needed to support a huntable elk herd and that the majorities of landowners in each geographic region of parcels > 15 acres indicated they were unlikely to allow people other than their families or immediate household to hunt on their properties, finding lands in western North Carolina that could support a huntable herd of elk herd will be challenging.

More potential for hunting opportunities may exist on public lands or lands further removed from human habitation than private lands. Currently, however, elk habitat (i.e., pastures) is limited on public lands. Additionally if elk stray onto new private lands, landowners initially may show reluctance to hunting as an elk management tool.

The majority (69%) of landowners would make a special trip to view elk if the elk population continues to expand. A plurality (43%) of landowners would allow people other members of their household or immediate family to view elk on their lands. If the elk population were to expand on public lands, there may be opportunities to develop tourism activities associated with elk viewing which may generate support for the acquisition of public lands.

### *Future needs*

This study focused on landowners who may or may not reside on their properties and their views of elk in western North Carolina. This study did not assess the views of the western North Carolina residential population, business owners, or specifically landowners of working lands. Additionally, this study did not describe the potential recreational opportunities, hunting opportunities, economic value of elk on the landscape, and economic benefits and/or damages that could result from an expanded elk herd.

### **Management considerations**

- Overall, western North Carolina landowners supported elk in western North Carolina although few landowners have knowledge of elk or experience with elk.
- Landowners may not oppose hunting as an elk management tool; however they demonstrated strong reluctance to allow people other than members of their household or immediate family access to their lands for hunting.
- Because most tracts of land owned by western North Carolina landowners were relatively small compared to what is needed to support a huntable herd of elk and that the majorities of landowners of parcels > 15 acres in each geographic region indicated they were unlikely to allow people other than their families or immediate household to hunt on their properties, finding lands in western North Carolina that could support a huntable herd of elk herd will be extremely challenging.
- For several survey questions, including questions asking about property damage caused by elk and support for or opposition to elk, Haywood County landowners of parcels > 15 acres views of elk differed from other landowners. As the elk population expands and more western North Carolina landowners have interactions with elk, it should be expected that support for elk will decline.
- Considering all responses, a huntable herd of elk would most likely be supported and accessible to hunters if established on public land.
- When preparing broad-scale communications about an expanding elk herd it will be important to emphasize that elk may be returned to its native range.
- Government agencies and nongovernmental organizations may collaborate to implement strategies such as fencing, aversive conditioning, and habitat management, in addition to lethal control to assist landowners whose properties have been damaged by elk. Lethal control may be controversial as a management strategy thus defining the conditions under which landowners may kill elk will be important to develop as part of an elk management plan.



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## Tables

Table 1. Sampling frame totals for the stratified random sample of western North Carolina landowners. From each stratum, 1,920 were randomly selected. All 1,858 Haywood County landowners of > 15 acre parcels were included in the sample.

Geographic region	Parcel size		
	0 to 2 acres	> 2 to 15 acres	> 15 acres
Haywood County	22,589	7,280	1,858
Jackson, Madison, Swain counties	21,928	14,913	5,542
Remaining WNC counties <sup>a</sup>	344,623	137,861	43,601

<sup>a</sup>Alleghany, Ashe, Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Henderson, Macon, McDowell, Mitchell, Polk, Rutherford, Surry, Transylvania, Watauga, Wilkes, Yancey

Table 2. Response rates of the nine strata. The overall response rate was 40.5%.

	Haywood 0 to 2 ac	Haywood > 2 to 15 ac	Haywood > 15 ac	Jackson, Madison, Swain 0 to 2 ac	Jackson, Madison, Swain >2 to 15 ac	Jackson, Madison, Swain > 15 ac	western NC 0 to 2 ac	western NC > 2 to 15 ac	western NC > 15 ac
Respondent	37.1% <sup>c</sup>	43.7% <sup>b</sup>	47.0% <sup>b</sup>	35.6% <sup>c</sup>	39.7%	45.3% <sup>b</sup>	30.4% <sup>c</sup>	39.5%	46.2% <sup>b</sup>
Nonrespondent	62.9% <sup>b</sup>	56.3% <sup>c</sup>	53.0% <sup>c</sup>	64.4% <sup>b</sup>	60.3%	54.7% <sup>c</sup>	69.6% <sup>b</sup>	60.5%	53.8% <sup>c</sup>

<sup>a</sup> $\chi^2 = 64.001$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.122$

<sup>b</sup>Adjusted residual  $\geq 2$

<sup>c</sup>Adjusted residual  $\leq -2$

Table 3. Haywood County landowner support and opposition for wild, free-roaming elk living in western North Carolina by parcel size category.

In general do you support or oppose wild, free-roaming elk living in the following areas		0 to 2 acres	> 2 to 15 acres	> 15 acres
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	43% <sup>e</sup>	39%	33% <sup>f</sup>
	Support	25%	29%	25%
	Neutral	16%	16%	15%
	Oppose	8%	8%	10%
	Strongly oppose	5% <sup>f</sup>	7% <sup>f</sup>	15% <sup>e</sup>
	Unsure	3%	1% <sup>f</sup>	3%
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	31%	32%	27% <sup>f</sup>
	Support	34%	33%	29% <sup>f</sup>
	Neutral	17%	18%	14%
	Oppose	8%	7%	9%
	Strongly oppose	8% <sup>f</sup>	8% <sup>f</sup>	18% <sup>e</sup>
	Unsure	2%	1%	2%
On private lands in western North Carolina <sup>c</sup>	Strongly support	38% <sup>e</sup>	34%	30% <sup>f</sup>
	Support	28%	28%	26%
	Neutral	20%	21%	20%
	Oppose	6% <sup>f</sup>	8%	9%
	Strongly oppose	4% <sup>f</sup>	6%	13% <sup>e</sup>
	Unsure	5% <sup>e</sup>	3%	3%
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	66% <sup>e</sup>	57%	48% <sup>f</sup>
	Support	24% <sup>f</sup>	28%	29%
	Neutral	6%	7%	10% <sup>e</sup>
	Oppose	1% <sup>f</sup>	3%	3%
	Strongly oppose	2% <sup>f</sup>	4%	7% <sup>e</sup>
	Unsure	1%	1%	2%

<sup>a</sup> $\chi^2 = 64.001$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.122$

<sup>b</sup> $\chi^2 = 52.209$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.110$

<sup>c</sup> $\chi^2 = 56.809$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.116$

<sup>d</sup> $\chi^2 = 65.093$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.124$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

Table 4. Jackson County, Madison County, and Swain County landowner support and opposition for wild, free-roaming elk living in western North Carolina by parcel size category.

In general do you support or oppose wild, free-roaming elk living in the following areas		0 to 2 acres	> 2 to 15 acres	> 15 acres
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	49%	51% <sup>e</sup>	42% <sup>f</sup>
	Support	28%	29%	30%
	Neutral	14%	10%	12%
	Oppose	5%	3% <sup>f</sup>	7% <sup>e</sup>
	Strongly oppose	2% <sup>c</sup>	3%	6% <sup>e</sup>
	Unsure	2%	3%	3%
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	35%	39% <sup>e</sup>	33% <sup>f</sup>
	Support	37%	36%	37%
	Neutral	13%	14%	14%
	Oppose	7%	4% <sup>f</sup>	6%
	Strongly oppose	4%	4% <sup>f</sup>	8% <sup>e</sup>
	Unsure	3%	2%	3%
On private lands in western North Carolina <sup>c</sup>	Strongly support	48% <sup>e</sup>	47% <sup>e</sup>	37% <sup>f</sup>
	Support	28%	31%	33%
	Neutral	16%	14%	17%
	Oppose	4%	4%	4%
	Strongly oppose	2% <sup>f</sup>	3%	5% <sup>e</sup>
	Unsure	3%	3%	4%
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	67% <sup>e</sup>	67% <sup>e</sup>	55% <sup>f</sup>
	Support	24%	25%	29% <sup>e</sup>
	Neutral	6%	4% <sup>f</sup>	9% <sup>e</sup>
	Oppose	1%	1%	2% <sup>e</sup>
	Strongly oppose	1%	1%	2%
	Unsure	1%	1%	2%

<sup>a</sup> $\chi^2 = 38.283$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.097$

<sup>b</sup> $\chi^2 = 21.510$ ;  $df = 10$ ;  $P = 0.018$ ; Cramer's  $V = 0.072$

<sup>c</sup> $\chi^2 = 31.102$ ;  $df = 10$ ;  $P = 0.001$ ; Cramer's  $V = 0.088$

<sup>d</sup> $\chi^2 = 43.950$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.104$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

Table 5. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties) support and opposition for wild, free-roaming elk living on or within five miles of landowners' largest tracts of land in western North Carolina by parcel size category.

In general do you support or oppose wild, free-roaming elk living in the following areas		0 to 2 acres	> 2 to 15 acres	> 15 acres
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	40%	45% <sup>e</sup>	37% <sup>f</sup>
	Support	31%	29%	29%
	Neutral	16%	12%	14%
	Oppose	6%	5%	7%
	Strongly oppose	4%	5%	8% <sup>e</sup>
	Unsure	3%	4%	4%
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	34%	36%	31% <sup>f</sup>
	Support	32%	33%	33%
	Neutral	17%	15%	15%
	Oppose	7%	7%	7%
	Strongly oppose	7%	6% <sup>f</sup>	11% <sup>e</sup>
	Unsure	3%	2%	3%
On private lands in western North Carolina <sup>c</sup>	Strongly support	39%	44% <sup>e</sup>	35% <sup>f</sup>
	Support	34%	32%	31%
	Neutral	19% <sup>e</sup>	14%	16%
	Oppose	2% <sup>f</sup>	3%	6% <sup>e</sup>
	Strongly oppose	2% <sup>f</sup>	4%	7% <sup>e</sup>
	Unsure	4%	3%	5% <sup>e</sup>
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	58%	61% <sup>e</sup>	51% <sup>f</sup>
	Support	31%	27%	29%
	Neutral	8%	6%	9%
	Oppose	1%	1%	3% <sup>e</sup>
	Strongly oppose	2% <sup>f</sup>	3%	5% <sup>e</sup>
	Unsure	1%	2%	3% <sup>e</sup>

<sup>a</sup> $\chi^2 = 25.254$ ;  $df = 10$ ;  $P = 0.005$ ; Cramer's  $V = 0.080$

<sup>b</sup> $\chi^2 = 18.642$ ;  $df = 10$ ;  $P = 0.045$ ; Cramer's  $V = 0.069$

<sup>c</sup> $\chi^2 = 47.086$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.111$

<sup>d</sup> $\chi^2 = 36.988$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.098$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

Table 6. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living in western North Carolina by whether elk lived on or within five miles of their largest tract of land.

In general do you support or oppose wild, free-roaming elk living in the following areas		Do wild, free-roaming elk live on or within five miles of your largest tract of land in western North Carolina?		
		Yes <sup>g</sup> n = 195 to 205	No <sup>g</sup> n = 355 to 367	Unsure <sup>g</sup> n = 204 to 209
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	26% <sup>f</sup>	32%	41% <sup>e</sup>
	Support	22%	29%	24%
	Neutral	13%	17%	14%
	Oppose	12%	9%	7%
	Strongly oppose	27% <sup>e</sup>	11% <sup>f</sup>	10% <sup>f</sup>
	Unsure	1% <sup>f</sup>	3%	5% <sup>e</sup>
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	25%	25%	33% <sup>e</sup>
	Support	25%	31%	31%
	Neutral	11%	17%	14%
	Oppose	13% <sup>e</sup>	9%	6% <sup>f</sup>
	Strongly oppose	26% <sup>e</sup>	16%	12% <sup>f</sup>
	Unsure	1%	2%	4%
On private lands in western North Carolina <sup>c</sup>	Strongly support	22% <sup>f</sup>	29%	37% <sup>e</sup>
	Support	20% <sup>f</sup>	30% <sup>e</sup>	26%
	Neutral	14% <sup>f</sup>	23% <sup>e</sup>	19%
	Oppose	16% <sup>e</sup>	7%	5% <sup>f</sup>
	Strongly oppose	26% <sup>e</sup>	8%	8% <sup>f</sup>
	Unsure	1%	3%	5%
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	37% <sup>f</sup>	51%	54%
	Support	26%	32%	28%
	Neutral	14% <sup>e</sup>	9%	8%
	Oppose	8% <sup>e</sup>	1% <sup>f</sup>	3%
	Strongly oppose	15% <sup>e</sup>	5% <sup>f</sup>	4%
	Unsure	1%	2%	2%

<sup>a</sup> $\chi^2 = 50.073$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.180$

<sup>b</sup> $\chi^2 = 31.873$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.143$

<sup>c</sup> $\chi^2 = 73.800$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.221$

<sup>d</sup> $\chi^2 = 49.531$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.180$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

<sup>g</sup>N sizes range because some respondents did not provide a response for all four scenarios



Table 7. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living in western North Carolina by whether respondents have seen or heard elk on the largest tract of land they owned in western North Carolina.

In general do you support or oppose wild, free-roaming elk living in the following areas		Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?	
		Yes <sup>g</sup> n = 148 to 157	No <sup>g</sup> n = 617 to 632
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	25% <sup>f</sup>	35% <sup>e</sup>
	Support	15% <sup>f</sup>	28% <sup>e</sup>
	Neutral	17%	15%
	Oppose	12%	9%
	Strongly oppose	29% <sup>e</sup>	11% <sup>f</sup>
	Unsure	1%	3%
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	23%	29%
	Support	20% <sup>f</sup>	32% <sup>e</sup>
	Neutral	15%	14%
	Oppose	15% <sup>e</sup>	8% <sup>f</sup>
	Strongly oppose	26% <sup>e</sup>	15% <sup>f</sup>
	Unsure	1%	2%
On private lands in western North Carolina <sup>c</sup>	Strongly support	22% <sup>f</sup>	31% <sup>e</sup>
	Support	14% <sup>f</sup>	29% <sup>e</sup>
	Neutral	20%	19%
	Oppose	16% <sup>e</sup>	8% <sup>f</sup>
	Strongly oppose	28% <sup>e</sup>	9% <sup>f</sup>
	Unsure	1%	3%
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	32% <sup>f</sup>	52% <sup>e</sup>
	Support	29%	30%
	Neutral	15% <sup>e</sup>	9% <sup>f</sup>
	Oppose	5%	3%
	Strongly oppose	17% <sup>e</sup>	5% <sup>f</sup>
	Unsure	2%	2%

<sup>a</sup> $\chi^2 = 44.405$ ; df = 5;  $P < 0.001$ ; Cramer's  $V = 0.238$

<sup>b</sup> $\chi^2 = 24.595$ ; df = 5;  $P < 0.001$ ; Cramer's  $V = 0.177$

<sup>c</sup> $\chi^2 = 60.960$ ; df = 5;  $P < 0.001$ ; Cramer's  $V = 0.282$

<sup>d</sup> $\chi^2 = 42.903$ ; df = 5;  $P < 0.001$ ; Cramer's  $V = 0.236$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

<sup>g</sup>N sizes range because some respondents did not provide a response for all four scenarios

Table 8. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living in western North Carolina by whether elk have damaged property on the largest tract of land the landowner owned in western North Carolina.

In general do you support or oppose wild, free-roaming elk living in the following areas		Have elk ever damaged property on the largest tract of land you own in western North Carolina?	
		Yes <sup>g</sup> n = 87 to 92	No <sup>g</sup> n = 676 to 694
On or within five miles of your largest tract of land in western North Carolina (survey beginning) <sup>a</sup>	Strongly support	12% <sup>f</sup>	36% <sup>e</sup>
	Support	10% <sup>f</sup>	28% <sup>e</sup>
	Neutral	14%	15%
	Oppose	17% <sup>e</sup>	8% <sup>f</sup>
	Strongly oppose	47% <sup>e</sup>	10% <sup>f</sup>
	Unsure	0%	3%
On or within five miles of your largest tract of land in western North Carolina (survey ending) <sup>b</sup>	Strongly support	12% <sup>f</sup>	30% <sup>e</sup>
	Support	11% <sup>f</sup>	32% <sup>e</sup>
	Neutral	12%	15%
	Oppose	23% <sup>e</sup>	7% <sup>f</sup>
	Strongly oppose	42% <sup>e</sup>	15% <sup>f</sup>
	Unsure	0%	2%
On private lands in western North Carolina <sup>c</sup>	Strongly support	9% <sup>f</sup>	32% <sup>e</sup>
	Support	12% <sup>f</sup>	28% <sup>e</sup>
	Neutral	13%	20%
	Oppose	21% <sup>e</sup>	8% <sup>f</sup>
	Strongly oppose	45% <sup>e</sup>	9% <sup>f</sup>
	Unsure	0%	3%
On publicly owned lands in western North Carolina <sup>d</sup>	Strongly support	18% <sup>f</sup>	52% <sup>e</sup>
	Support	32%	29%
	Neutral	13%	10%
	Oppose	8% <sup>e</sup>	3% <sup>f</sup>
	Strongly oppose	26% <sup>e</sup>	5% <sup>f</sup>
	Unsure	2%	2%

<sup>a</sup> $\chi^2 = 106.299$ ;  $df = 5$ ;  $P < 0.001$ ; Cramer's  $V = 0.369$

<sup>b</sup> $\chi^2 = 74.481$ ;  $df = 5$ ;  $P < 0.001$ ; Cramer's  $V = 0.308$

<sup>c</sup> $\chi^2 = 117.953$ ;  $df = 5$ ;  $P < 0.001$ ; Cramer's  $V = 0.393$

<sup>d</sup> $\chi^2 = 74.072$ ;  $df = 5$ ;  $P < 0.001$ ; Cramer's  $V = 0.310$

<sup>e</sup>Adjusted residual  $\geq 2$

<sup>f</sup>Adjusted residual  $\leq -2$

<sup>g</sup>N sizes range because some respondents did not provide a response for all four scenarios

Table 9. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living on or within five miles of their largest tracts of land in western North Carolina (survey beginning) by land use.

Land Use	n	In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western NC? (survey beginning)					
		Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
A residence for you or someone else	382	31%	24%	17%	9%	17%	3%
Growing ornamental plants or gardens for non-commercial use	104	28%	23%	14%	12%	22%	1%
Hay or pasture land	364	23%	21%	20%	13%	21%	3%
Cropland (other than hay or pasture land)	85	18%	14%	22%	15%	31%	0%
Livestock production	211	21%	18%	19%	14%	25%	3%
Timber production	302	29%	26%	14%	9%	20%	3%
Christmas tree production	a	25%	13%	50%	0%	13%	0%
Vineyards	a	20%	10%	20%	0%	50%	0%
Orchards	29	17%	21%	24%	10%	28%	0%
Commercial horticulture	a	17%	17%	0%	50%	17%	0%
Operating a hotel, motel, or bed and breakfast	a	20%	40%	20%	0%	0%	20%
Operating a commercial campground	a	50%	50%	0%	0%	0%	0%
Operating a golf course	a	0%	100%	0%	0%	0%	0%
None of the above	67	46%	30%	10%	3%	7%	3%
Other (please specify)	105	42%	25%	13%	10%	8%	2%

<sup>a</sup>Sample size ≤ 10

Table 10. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living on or within five miles of their largest tracts of land in western North Carolina (survey ending) by land use.

Land Use	n	In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western NC? (survey ending)					
		Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
A residence for you or someone else	384	28%	26%	15%	10%	20%	1%
Growing ornamental plants or gardens for non-commercial use	100	29%	25%	11%	9%	26%	0%
Hay or pasture land	367	20%	23%	18%	12%	24%	2%
Cropland (other than hay or pasture land)	85	14%	19%	21%	12%	34%	0%
Livestock production	213	17%	25%	18%	13%	26%	2%
Timber production	300	25%	29%	14%	10%	19%	2%
Christmas tree production	a	25%	25%	25%	13%	13%	0%
Vineyards	a	22%	11%	22%	0%	44%	0%
Orchards	28	21%	25%	18%	4%	32%	0%
Commercial horticulture	a	17%	0%	17%	67%	0%	0%
Operating a hotel, motel, or bed and breakfast	a	0%	40%	40%	20%	0%	0%
Operating a commercial campground	a	50%	50%	0%	0%	0%	0%
Operating a golf course	a	0%	100%	0%	0%	0%	0%
None of the above	69	30%	41%	12%	1%	9%	7%
Other (please specify)	108	34%	32%	11%	6%	13%	3%

<sup>a</sup>Sample size ≤ 10

Table 11. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living on private lands in western North Carolina by land use.

Land Use	n	In general do you support or oppose wild, free-roaming elk living on private lands in western NC?					
		Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
A residence for you or someone else	377	27%	27%	20%	9%	15%	3%
Growing ornamental plants or gardens for non-commercial use	102	25%	27%	18%	11%	19%	1%
Hay or pasture land	353	22%	22%	22%	12%	18%	3%
Cropland (other than hay or pasture land)	83	17%	13%	24%	16%	29%	1%
Livestock production	208	20%	18%	25%	14%	22%	2%
Timber production	300	27%	26%	18%	10%	17%	3%
Christmas tree production	a	25%	13%	50%	0%	13%	0%
Vineyards	a	20%	20%	10%	0%	50%	0%
Orchards	29	21%	28%	14%	14%	24%	0%
Commercial horticulture	a	17%	33%	33%	17%	0%	0%
Operating a hotel, motel, or bed and breakfast	a	0%	40%	40%	0%	0%	20%
Operating a commercial campground	a	50%	50%	0%	0%	0%	0%
Operating a golf course	a	0%	100%	0%	0%	0%	0%
None of the above	67	37%	34%	13%	1%	9%	4%
Other (please specify)	101	38%	25%	18%	10%	6%	4%

<sup>a</sup>Sample size ≤ 10

Table 12. Haywood County landowners of > 15 acres support and opposition for wild, free-roaming elk living on public lands in western North Carolina by land use.

Land Use	n	In general do you support or oppose wild, free-roaming elk living on publicly owned lands in western NC?					
		Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
A residence for you or someone else	378	47%	30%	10%	3%	8%	2%
Growing ornamental plants or gardens for non-commercial use	103	49%	25%	11%	3%	12%	1%
Hay or pasture land	356	37%	32%	15%	4%	11%	2%
Cropland (other than hay or pasture land)	80	26%	30%	16%	10%	18%	0%
Livestock production	206	33%	32%	16%	5%	12%	2%
Timber production	296	40%	33%	11%	3%	11%	2%
Christmas tree production	a	50%	50%	0%	0%	0%	0%
Vineyards	a	30%	20%	10%	10%	30%	0%
Orchards	30	33%	33%	7%	10%	17%	0%
Commercial horticulture	a	20%	60%	0%	0%	0%	20%
Operating a hotel, motel, or bed and breakfast	a	40%	60%	0%	0%	0%	0%
Operating a commercial campground	a	50%	50%	0%	0%	0%	0%
Operating a golf course	a	100%	0%	0%	0%	0%	0%
None of the above	68	60%	32%	3%	1%	1%	1%
Other (please specify)	100	57%	29%	6%	5%	1%	2%

<sup>a</sup>Sample size ≤ 10

Table 13. Percentages of western North Carolina and Haywood County landowners who responded “very positive” or “positive” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Haywood County landowner responses are presented by parcel size category.

Possible outcomes of elk living on or within five miles of your largest tract of land might include:	Percentages of landowners who responded “very positive” and “positive” combined			
	Western North Carolina landowners	Haywood County landowners		
		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may be returned to part of their historical range	76%	79%	73%	66%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	66%	67%	59%	53%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	62%	68%	60%	52%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	58%	58%	59%	53%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	48%	48%	46%	39%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	37%	26%	33%	34%
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	16%	15%	17%	22%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	16%	14%	20%	25%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	6%	6%	8%	13%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	6%	5%	10%	14%

Table 14. Percentages of western North Carolina and Haywood County landowners who responded “very negative” or “negative” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Haywood County landowner responses are presented by parcel size category.

	Percentages of landowners who responded “very negative” and “negative” combined			
	Western North Carolina landowners	Haywood County landowners		
Possible outcomes of elk living on or within five miles of your largest tract of land might include:		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	44%	43%	39%	39%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	43%	43%	41%	43%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	40%	40%	36%	39%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	36%	39%	35%	35%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	35%	48%	41%	39%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	20%	24%	23%	31%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	12%	11%	17%	23%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	11%	11%	16%	21%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	9%	10%	13%	17%
Elk may be returned to part of their historical range.	6%	5%	9%	13%



Table 15. Percentages of western North Carolina and Jackson County, Madison County, and Swain County landowners who responded “very positive” or “positive” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Jackson County, Madison County, and Swain County landowner responses are presented by parcel size category.

Possible outcomes of elk living on or within five miles of your largest tract of land might include:	Percentages of landowners who responded “very positive” and “positive” combined			
	Western North Carolina landowners	Jackson County, Madison County, and Swain County landowners		
		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may be returned to part of their historical range.	76%	80%	78%	75%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	66%	69%	71%	65%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	62%	69%	65%	62%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	58%	65%	66%	60%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	48%	50%	51%	47%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	37%	37%	36%	37%
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	16%	13%	14%	15%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	16%	14%	12%	17%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	6%	4%	5%	6%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	6%	5%	6%	8%

Table 16. Percentages of western North Carolina and Jackson County, Madison County, and Swain County landowners who responded “very negative” or “negative” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Jackson County, Madison County, and Swain County landowner responses are presented by parcel size category.

Possible outcomes of elk living on or within five miles of your largest tract of land might include:	Percentages of landowners who responded “very negative” and “negative” combined			
	Western North Carolina landowners	Jackson County, Madison County, and Swain County landowners		
		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	44%	44%	37%	42%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	43%	45%	41%	45%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	40%	47%	40%	43%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	36%	30%	33%	35%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	35%	40%	39%	38%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	20%	20%	18%	22%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	12%	6%	9%	14%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	11%	9%	8%	13%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	9%	8%	7%	9%
Elk may be returned to part of their historical range.	6%	3%	5%	8%

Table 17. Percentages of overall western North Carolina and western North Carolina (excluding Jackson, Madison, Swain, and Haywood Counties) landowners who responded “very positive” or “positive” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Western North Carolina (excluding Haywood, Jackson, Madison, and Swain Counties) landowner responses are presented by parcel size category.

Possible outcomes of elk living on or within five miles of your largest tract of land might include:	Percentages of landowners who responded “very positive” and “positive” combined			
	All western North Carolina landowners	Western North Carolina excluding Haywood, Jackson, Madison, and Swain Counties		
		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may be returned to part of their historical range.	76%	77%	76%	70%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	66%	66%	68%	63%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	62%	61%	64%	59%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	58%	57%	57%	55%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	48%	46%	50%	50%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	37%	34%	42%	44%
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	16%	16%	18%	21%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	16%	14%	18%	21%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	6%	5%	7%	7%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	6%	6%	8%	10%

Table 18. Percentages of overall western North Carolina and western North Carolina (excluding Jackson, Madison, Swain, and Haywood Counties) landowners who responded “very negative” or “negative” combined when asked to indicate how positive or negative a list of outcomes would be if there were elk living on or within five miles of their largest tract of land. Western North Carolina (excluding Haywood, Jackson, Madison, and Swain Counties) landowner responses are presented by parcel size category.

Possible outcomes of elk living on or within five miles of your largest tract of land might include:	All western North Carolina landowners	Percentages of landowners who responded “very negative” and “negative” combined		
		Western North Carolina landowners excluding Haywood, Jackson, Madison, and Swain Counties		
		0 to 2 ac	> 2 to 15 ac	> 15 ac
Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina	44%	45%	40%	38%
Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina	43%	45%	42%	40%
Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina	40%	40%	38%	37%
Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees	36%	36%	35%	33%
People may be able to hunt elk within five miles of your largest tract of land in western North Carolina	35%	36%	32%	31%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	20%	20%	20%	20%
Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	12%	11%	12%	14%
People may be able to view elk within five miles of your largest tract of land in western North Carolina	11%	11%	11%	12%
Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina	9%	10%	9%	10%
Elk may be returned to part of their historical range.	6%	6%	5%	8%

Table 19. Haywood County landowner acceptability by parcel size category of three potential management options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property.

How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very Acceptable	56%	55%	49% <sup>e</sup>
	Acceptable	30%	30%	29%
	Neutral	6%	5%	7%
	Unacceptable	3% <sup>e</sup>	4%	6% <sup>d</sup>
	Very unacceptable	2% <sup>e</sup>	3%	6% <sup>d</sup>
	Unsure	3%	3%	3%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very Acceptable	10%	10%	12%
	Acceptable	26%	30%	31%
	Neutral	26%	24%	20%
	Unacceptable	22%	22%	21%
	Very unacceptable	12%	9%	12%
	Unsure	5%	5%	4%
Allow landowners to kill elk causing problems <sup>c</sup>	Very Acceptable	8% <sup>e</sup>	12%	19% <sup>d</sup>
	Acceptable	16% <sup>e</sup>	19%	20%
	Neutral	13%	16%	16%
	Unacceptable	23%	20%	20%
	Very unacceptable	34% <sup>d</sup>	30%	20% <sup>e</sup>
	Unsure	6%	4%	4%

<sup>a</sup> $\chi^2 = 38.460$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.097$

<sup>b</sup>Not significant

<sup>c</sup> $\chi^2 = 70.107$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.134$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$

Table 20. Jackson County, Madison County, and Swain County landowner acceptability by parcel size category of three potential management options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property.

How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very Acceptable	58%	60% <sup>d</sup>	52% <sup>e</sup>
	Acceptable	30%	27%	31%
	Neutral	7%	5%	7%
	Unacceptable	1% <sup>e</sup>	2%	3% <sup>d</sup>
	Very unacceptable	1% <sup>e</sup>	3%	3%
	Unsure	3%	2%	3%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very Acceptable	11%	10%	13%
	Acceptable	29%	29%	31%
	Neutral	21%	23%	22%
	Unacceptable	22%	22%	20%
	Very unacceptable	12%	12%	10%
	Unsure	5%	3%	4%
Allow landowners to kill elk causing problems <sup>c</sup>	Very Acceptable	10%	11%	15% <sup>d</sup>
	Acceptable	15%	16%	21% <sup>d</sup>
	Neutral	16% <sup>e</sup>	19%	23% <sup>d</sup>
	Unacceptable	21%	21%	17%
	Very unacceptable	34% <sup>d</sup>	30%	21% <sup>e</sup>
	Unsure	4%	4%	4%

<sup>a</sup> $\chi^2 = 22.063$ ;  $df = 10$ ;  $P = 0.015$ ; Cramer's  $V = 0.075$

<sup>b</sup>Not significant

<sup>c</sup> $\chi^2 = 42.814$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.108$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$

Table 21. Western North Carolina (excluding Haywood, Jackson, Madison, and Swain counties) landowner acceptability by parcel size category of three potential management options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property.

How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very Acceptable	53%	56% <sup>d</sup>	49% <sup>e</sup>
	Acceptable	30%	30%	30%
	Neutral	9%	8%	8%
	Unacceptable	2% <sup>e</sup>	2% <sup>e</sup>	6% <sup>d</sup>
	Very unacceptable	2% <sup>e</sup>	2%	3% <sup>d</sup>
	Unsure	4%	3%	3%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very Acceptable	10%	12%	12%
	Acceptable	30%	32%	27%
	Neutral	20%	24%	24%
	Unacceptable	24%	20%	21%
	Very unacceptable	12%	8%	10%
	Unsure	5%	3%	5%
Allow landowners to kill elk causing problems <sup>c</sup>	Very Acceptable	12%	12%	17% <sup>d</sup>
	Acceptable	18% <sup>e</sup>	25%	30% <sup>d</sup>
	Neutral	19%	19%	16%
	Unacceptable	20%	17%	15%
	Very unacceptable	26% <sup>d</sup>	21%	17% <sup>e</sup>
	Unsure	5%	5%	5%

<sup>a</sup> $\chi^2 = 29.894$ ;  $df = 10$ ;  $P = 0.001$ ; Cramer's  $V = 0.089$

<sup>b</sup>Not significant

<sup>c</sup> $\chi^2 = 38.979$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.106$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$

Table 22. Haywood County landowner acceptability by parcel size category of three potential management options if elk eat hay, knock down fences, or disturb livestock on a landowner's property.

How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very acceptable	42%	40%	36% <sup>e</sup>
	Acceptable	29%	29%	26%
	Neutral	12%	11%	10%
	Unacceptable	10%	11%	14% <sup>d</sup>
	Very unacceptable	4% <sup>e</sup>	5%	11% <sup>d</sup>
	Unsure	3%	3%	3%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very acceptable	13%	15%	17%
	Acceptable	33%	32%	32%
	Neutral	20%	21%	18%
	Unacceptable	19%	20%	17%
	Very unacceptable	11%	8%	13%
	Unsure	5%	4%	4%
Allow landowners to kill elk causing problems <sup>c</sup>	Very acceptable	9% <sup>e</sup>	17%	23% <sup>d</sup>
	Acceptable	18%	20%	24% <sup>d</sup>
	Neutral	18%	17%	14% <sup>e</sup>
	Unacceptable	23%	19%	19%
	Very unacceptable	28% <sup>d</sup>	23%	16% <sup>e</sup>
	Unsure	5%	4%	4%

<sup>a</sup> $\chi^2 = 32.342$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.090$

<sup>b</sup>Not significant

<sup>c</sup> $\chi^2 = 72.641$ ;  $df = 10$ ;  $P < 0.001$ ; Cramer's  $V = 0.136$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$



Table 23. Jackson County, Madison County, and Swain County landowner acceptability by parcel size category of three potential management options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property.

How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very acceptable	44%	44%	41%
	Acceptable	29%	28%	27%
	Neutral	14%	13%	12%
	Unacceptable	7%	8%	11%
	Very unacceptable	4%	5%	6%
	Unsure	3%	3%	3%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very acceptable	14%	15%	16%
	Acceptable	32%	32%	33%
	Neutral	20%	22%	23%
	Unacceptable	19%	18%	14%
	Very unacceptable	11%	10%	10%
	Unsure	3%	3%	4%
Allow landowners to kill elk causing problems <sup>c</sup>	Very acceptable	11% <sup>e</sup>	12%	18% <sup>d</sup>
	Acceptable	20%	22%	22%
	Neutral	19%	21%	23%
	Unacceptable	21%	19%	18%
	Very unacceptable	25% <sup>d</sup>	22%	16% <sup>e</sup>
	Unsure	5%	4%	4%

<sup>a</sup>Not significant

<sup>b</sup>Not significant

<sup>c</sup> $\chi^2 = 31.362$ ;  $df = 10$ ;  $P = 0.001$ ; Cramer's  $V = 0.092$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$

Table 24. Western North Carolina (excluding Haywood, Jackson, Madison, and Swain counties) landowner acceptability by parcel size category of three potential management options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property.

How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property?		0 to 2 acres	> 2 to 15 acres	> 15 acres
Provide information to landowners on preventing problems with elk <sup>a</sup>	Very acceptable	38%	38%	36%
	Acceptable	30%	30%	26%
	Neutral	14%	14%	14%
	Unacceptable	9%	10%	12%
	Very unacceptable	5%	5%	8%
	Unsure	4%	3%	4%
Frighten the elk using tools such as fireworks or dogs <sup>b</sup>	Very acceptable	15%	15%	16%
	Acceptable	32%	35% <sup>d</sup>	27% <sup>e</sup>
	Neutral	19%	23%	22%
	Unacceptable	18%	16%	18%
	Very unacceptable	10%	8% <sup>e</sup>	12% <sup>d</sup>
	Unsure	5%	3%	6%
Allow landowners to kill elk causing problems <sup>c</sup>	Very acceptable	14%	16%	18%
	Acceptable	19% <sup>e</sup>	26%	28% <sup>d</sup>
	Neutral	20%	21%	19%
	Unacceptable	21% <sup>d</sup>	18%	15% <sup>e</sup>
	Very unacceptable	19%	15%	15%
	Unsure	7%	4%	5%

<sup>a</sup>Not significant

<sup>b</sup> $\chi^2 = 20.847$ ;  $df = 10$ ;  $P = 0.022$ ; Cramer's  $V = 0.078$

<sup>c</sup> $\chi^2 = 25.119$ ;  $df = 10$ ;  $P = 0.005$ ; Cramer's  $V = 0.084$

<sup>d</sup>Adjusted residual  $\geq 2$

<sup>e</sup>Adjusted residual  $\leq -2$

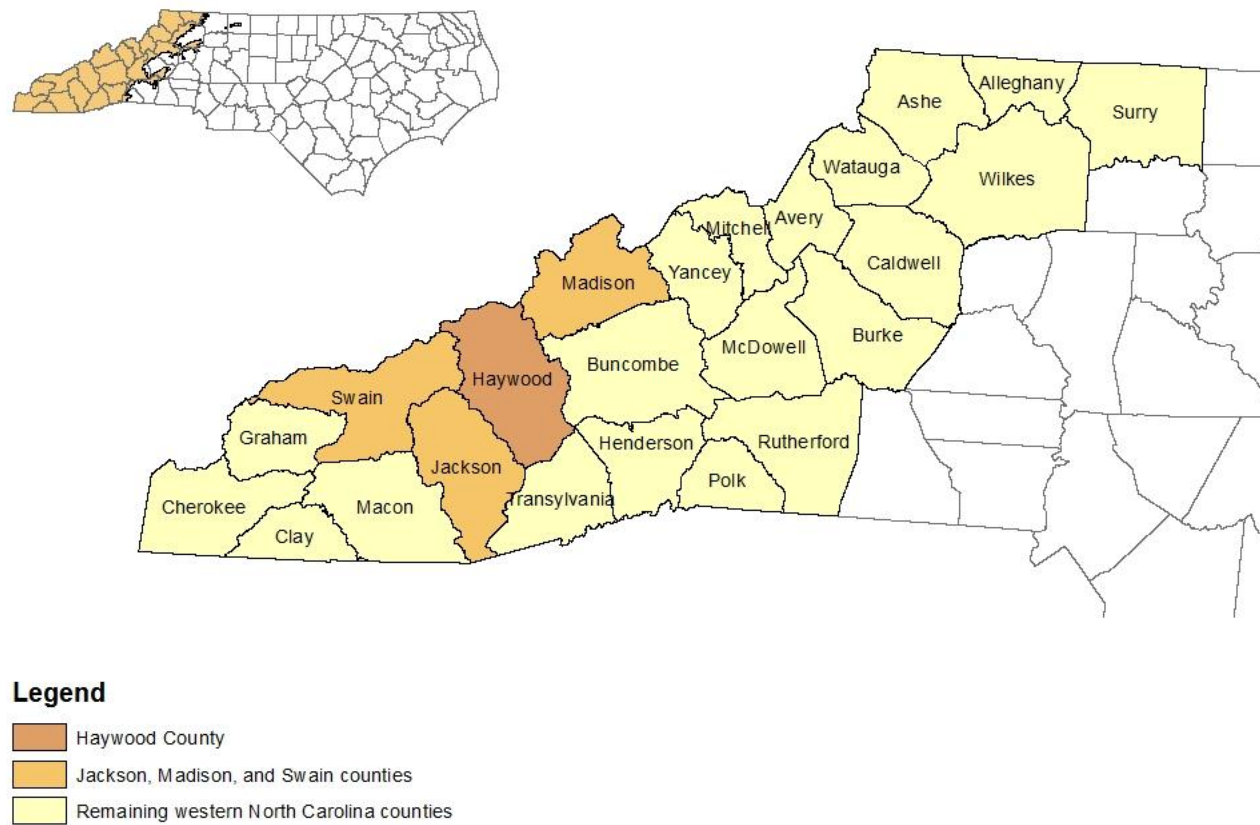
Table 25. Landowners' of parcels > 15 acres likelihood of allowing elk hunting and elk viewing on their lands.

If there were elk on or within five miles of your largest tract of land in western NC, how likely or unlikely would you be to . . .		Haywood County	Jackson, Madison, Swain counties	Western NC counties <sup>a</sup>
. . . hunt or have other members of your household or immediate family hunt on your land?	Very likely	21%	21%	26%
	Likely	17%	17%	20%
	Neutral	6%	8%	8%
	Unlikely	14%	15%	13%
	Very unlikely	36%	34%	26%
	My land is unsuitable for this activity	5%	4%	6%
. . . allow people other than members of your household or immediate family to hunt elk on your land?	Very likely	7%	5%	8%
	Likely	10%	11%	16%
	Neutral	7%	9%	11%
	Unlikely	18%	20%	21%
	Very unlikely	51%	49%	36%
	My land is unsuitable for this activity	7%	6%	7%
. . . lease your land for elk hunting?	Very likely	3%	3%	4%
	Likely	4%	4%	6%
	Neutral	6%	6%	8%
	Unlikely	19%	20%	21%
	Very unlikely	59%	60%	50%
	My land is unsuitable for this activity	10%	8%	9%
. . . allow people other than members of your household or immediate family to view elk on your land?	Very likely	15%	16%	19%
	Likely	21%	32%	32%
	Neutral	12%	15%	15%
	Unlikely	16%	12%	13%
	Very unlikely	30%	21%	16%
	My land is unsuitable for this activity	5%	3%	5%
. . . charge people to view elk on your land?	Very likely	2%	2%	2%
	Likely	1%	2%	2%
	Neutral	6%	8%	9%
	Unlikely	20%	24%	23%
	Very unlikely	60%	58%	56%
	My land is unsuitable for this activity	11%	7%	8%

<sup>a</sup>excluding Haywood, Jackson, Madison, and Swain counties

## Figure

Figure 1. Geographic regions of western North Carolina sampling strata.



## **Appendix A: Frequencies western North Carolina combined**

## Landowner Views of Elk in Western North Carolina



### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

94 Yes (**continue to question 2**)

6 No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 3.2 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 15.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 3.0 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 14.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

61 Yes

39 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

80 Rural area outside city or town limits

11 Small city or town with less than 5,000 people

6 Medium city with 5,000 to 19,999 people

4 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 69 A residence for you or someone else
- 11 Growing ornamental plants or gardens for non-commercial use
- 14 Hay or pasture land
- 4 Cropland (other than hay or pasture land)
- 5 Livestock production
- 10 Timber production
- 1 Christmas tree production
- 1 Vineyards
- 2 Orchards
- 1 Commercial horticulture
- 0 Operating a hotel, motel, or bed and breakfast
- 0 Operating a commercial campground
- 0 Operating a golf course
- 9 None of the above
- 13 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 29 Less than 5 miles
- 21 5 to 10 miles
- 26 11 to 30 miles
- 12 More than 30 miles
- 13 Unsure



## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	42	30	14	6	5	3
(B) On private lands in western North Carolina	40	33	18	3	3	4
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	59	29	7	1	2	1

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

3 Yes  
98 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

1 Yes  
99 No

(12) How would you rate your knowledge level of elk? (**check one**)

39 Very little knowledge  
28 Some knowledge  
27 Average knowledge  
6 Much knowledge  
0 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	23	25	25	12	8	8
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	17	20	23	18	17	5
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	2	4	36	25	15	19
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	31	35	17	6	5	6
(E) Elk may be returned to part of their historical range . . . . .	41	35	14	3	3	5
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	30	32	19	7	5	8
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	5	11	39	24	12	10
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	5	11	33	29	15	7
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	25	33	23	5	4	10
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	2	4	33	26	17	17

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

3 Yes  
67 No  
30 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

22 Situation A  
22 Situation B  
46 Situation C  
11 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

9 Situation B  
7 Situation C  
46 Situation D  
38 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	54	30	9	2	2	3	
(ii) Option B	.....	11	30	21	23	11	4	
(iii) Option C	.....	12	20	19	19	25	5	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	39	29	14	10	5	4	
(ii) Option B	.....	15	33	20	18	10	5	
(iii) Option C	.....	14	22	20	20	19	6	

## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

38 Very likely  
31 Likely  
11 Neutral  
11 Unlikely  
8 Very unlikely  
2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

18 Very likely  
10 Likely  
7 Neutral  
14 Unlikely  
51 Very unlikely  
1 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	16	13	6	15	29	22
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	5	7	7	19	38	24
(C) ...lease your land for elk hunting . . . . .	2	3	4	18	43	30
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	18	25	12	12	17	16
(E) ...charge people to view elk on your land . . . . .	1	1	5	20	52	21

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	36	35	13	7	7	2
(B) Elk hunting in general . . . . .	22	31	21	12	10	4
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting . . . . .	19	27	16	16	17	4

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

35 Strongly support  
33 Support  
16 Neutral  
7 Oppose  
7 Strongly oppose  
3 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

68 Wildlife watching  
54 Hiking  
43 Fishing  
23 Hunting  
31 Camping  
35 Boating  
14 None of the above  
4 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

86 Yes (**continue to question 24**)  
15 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 3 Less than a high school graduate
- 18 High school graduate or GED
- 21 Some college or trade school
- 13 Associate or trade school degree
- 23 Bachelor's or four-year degree
- 22 Graduate or professional degree

(26) Are you male or female?

- 66 Male
- 34 Female

(27) In what year were you born?

- 61 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 97 White
- 1 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 21 Prefer not to answer
- 4 Less than \$20,000
- 12 \$20,000 to \$39,999
- 14 \$40,000 to \$59,999
- 14 \$60,000 to \$79,999
- 10 \$80,000 to \$99,999
- 8 \$100,000 to \$119,999
- 16 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**



## **Appendix B: Haywood County, 0 to 2 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

96 (n = 626) Yes (**continue to question 2**)

4 (n = 29) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 1.3 acres (25<sup>th</sup> quartile = 0.8 acres; 75<sup>th</sup> quartile = 2.5 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 1.2 acres (25<sup>th</sup> quartile = 0.8 acres; 75<sup>th</sup> quartile = 2.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

69 Yes

32 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

64 Rural area outside city or town limits

17 Small city or town with less than 5,000 people

17 Medium city with 5,000 to 19,999 people

2 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 79 A residence for you or someone else
- 11 Growing ornamental plants or gardens for non-commercial use
- 5 Hay or pasture land
- 1 Cropland (other than hay or pasture land)
- 3 Livestock production
- 2 Timber production
- 0 Christmas tree production
- 0 Vineyards
- 0 Orchards
- 0 Commercial horticulture
- 0 Operating a hotel, motel, or bed and breakfast
- 0 Operating a commercial campground
- 0 Operating a golf course
- 8 None of the above
- 11 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 24 Less than 5 miles
- 32 5 to 10 miles
- 31 11 to 30 miles
- 5 More than 30 miles
- 8 Unsure

## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	43	25	16	8	5	3
(B) On private lands in western North Carolina	38	28	20	6	4	5
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	66	24	6	2	2	1

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

13 Yes  
87 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

3 Yes  
97 No

(12) How would you rate your knowledge level of elk? (**check one**)

25 Very little knowledge  
29 Some knowledge  
38 Average knowledge  
9 Much knowledge  
1 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	19	29	22	12	12	6
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	11	15	21	22	26	5
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	1	5	35	26	14	19
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	29	38	19	6	5	3
(E) Elk may be returned to part of their historical range . . . . .	43	36	13	3	2	4
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	31	37	16	6	5	5
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	5	9	38	27	12	9
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	5	10	34	27	16	8
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	25	33	25	5	5	8
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	2	3	33	26	17	19

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 21 Yes
- 52 No
- 27 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 18 Situation A
- 24 Situation B
- 49 Situation C
- 9 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 6 Situation B
- 9 Situation C
- 51 Situation D
- 35 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	56	30	6	3	2	3	
(ii) Option B	.....	10	26	26	22	12	5	
(iii) Option C	.....	8	16	13	23	34	6	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	42	29	12	10	4	3	
(ii) Option B	.....	13	33	20	19	11	5	
(iii) Option C	.....	9	18	18	23	28	5	



## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 41 Very likely
- 32 Likely
- 9 Neutral
- 9 Unlikely
- 8 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 12 Very likely
- 9 Likely
- 6 Neutral
- 11 Unlikely
- 61 Very unlikely
- 2 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	10	11	4	11	32	32
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	3	5	5	14	37	36
(C) ...lease your land for elk hunting . . . . .	1	2	4	13	37	43
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	16	23	10	10	14	27
(E) ...charge people to view elk on your land . . . . .	1	1	5	14	47	33

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	30	32	17	7	12	2
(B) Elk hunting in general. . . . .	14	26	23	16	19	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting . . . . .	13	23	19	17	26	2

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 32 Strongly support
- 34 Support
- 17 Neutral
- 8 Oppose
- 8 Strongly oppose
- 2 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 69 Wildlife watching
- 54 Hiking
- 42 Fishing
- 19 Hunting
- 31 Camping
- 28 Boating
- 14 None of the above
- 4 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 83 Yes (**continue to question 24**)
- 17 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 1 Less than a high school graduate
- 15 High school graduate or GED
- 21 Some college or trade school
- 17 Associate or trade school degree
- 25 Bachelor's or four-year degree
- 22 Graduate or professional degree

(26) Are you male or female?

- 60 Male
- 40 Female

(27) In what year were you born?

62 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 98 White
- 0 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 0 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 20 Prefer not to answer
- 4 Less than \$20,000
- 14 \$20,000 to \$39,999
- 17 \$40,000 to \$59,999
- 15 \$60,000 to \$79,999
- 8 \$80,000 to \$99,999
- 8 \$100,000 to \$119,999
- 14 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**

## **Appendix C: Haywood County, > 2 to 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

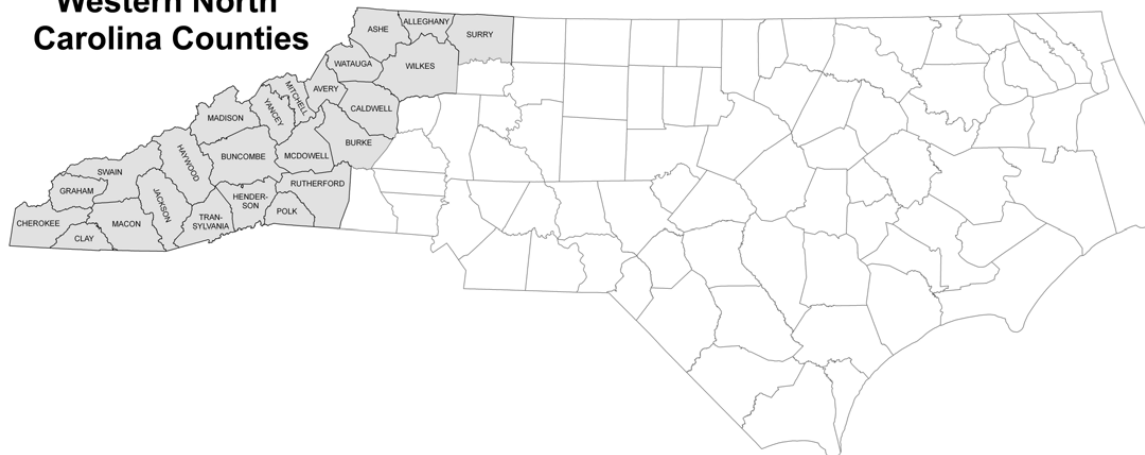
## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

97 (n = 768) Yes (**continue to question 2**)

3 (n = 21) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 6.0 acres (25<sup>th</sup> quartile = 3.5 acres; 75<sup>th</sup> quartile = 12.4 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 5.4 acres (25<sup>th</sup> quartile = 3.0 acres; 75<sup>th</sup> quartile = 11.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

61 Yes

39 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

89 Rural area outside city or town limits

5 Small city or town with less than 5,000 people

5 Medium city with 5,000 to 19,999 people

1 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 68 A residence for you or someone else
  - 12 Growing ornamental plants or gardens for non-commercial use
  - 21 Hay or pasture land
  - 4 Cropland (other than hay or pasture land)
  - 7 Livestock production
  - 8 Timber production
  - 1 Christmas tree production
  - 1 Vineyards
  - 2 Orchards
  - 1 Commercial horticulture
  - 1 Operating a hotel, motel, or bed and breakfast
  - 1 Operating a commercial campground
  - 1 Operating a golf course
  - 10 None of the above
  - 13 Other (please specify):
- 

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 28 Less than 5 miles
- 29 5 to 10 miles
- 31 11 to 30 miles
- 3 More than 30 miles
- 8 Unsure



## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	39	29	16	8	7	1
(B) On private lands in western North Carolina	34	28	21	8	7	3
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	57	28	7	3	4	1

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

16 Yes  
84 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

5 Yes  
95 No

(12) How would you rate your knowledge level of elk? (**check one**)

20 Very little knowledge  
30 Some knowledge  
38 Average knowledge  
11 Much knowledge  
1 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	22	24	25	13	10	6
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	12	21	22	19	22	4
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	3	5	39	23	13	17
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	26	33	21	10	6	3
(E) Elk may be returned to part of their historical range . . . . .	36	37	15	5	4	4
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	28	32	19	11	6	5
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	9	11	36	24	11	8
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	6	11	36	27	12	8
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	24	35	22	8	5	6
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	4	6	33	26	15	17

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 23 Yes
- 50 No
- 27 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 19 Situation A
- 23 Situation B
- 49 Situation C
- 9 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 7 Situation B
- 10 Situation C
- 49 Situation D
- 34 None of the above

## Dealing with Elk/Human Conflicts

- (16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

- (A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	55	30	5	4	3	3	
(ii) Option B	.....	10	30	24	22	9	5	
(iii) Option C	.....	12	19	16	20	30	4	

- (B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	41	29	11	11	6	3	
(ii) Option B	.....	15	32	21	20	8	4	
(iii) Option C	.....	17	20	17	19	23	4	

## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 36 Very likely
- 32 Likely
- 10 Neutral
- 11 Unlikely
- 10 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 13 Very likely
- 11 Likely
- 6 Neutral
- 17 Unlikely
- 51 Very unlikely
- 2 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	15	13	6	15	34	17
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	5	6	5	21	44	20
(C) ...lease your land for elk hunting . . . . .	2	1	3	18	50	26
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	14	25	12	15	23	12
(E) ...charge people to view elk on your land . . . . .	2	1	5	17	59	16

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	32	34	15	8	10	2
(B) Elk hunting in general .....	18	28	21	14	16	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	17	25	16	17	23	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 32 Strongly support
- 33 Support
- 18 Neutral
- 7 Oppose
- 8 Strongly oppose
- 2 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 66 Wildlife watching
- 56 Hiking
- 39 Fishing
- 22 Hunting
- 33 Camping
- 33 Boating
- 13 None of the above
- 5 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 80 Yes (**continue to question 24**)
- 20 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 2 Less than a high school graduate
- 16 High school graduate or GED
- 22 Some college or trade school
- 16 Associate or trade school degree
- 22 Bachelor's or four-year degree
- 22 Graduate or professional degree

(26) Are you male or female?

- 68 Male
- 32 Female

(27) In what year were you born?

63 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 97 White
- 0 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 2 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 19 Prefer not to answer
- 4 Less than \$20,000
- 14 \$20,000 to \$39,999
- 12 \$40,000 to \$59,999
- 14 \$60,000 to \$79,999
- 10 \$80,000 to \$99,999
- 7 \$100,000 to \$119,999
- 21 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**



**Appendix D: Haywood County, > 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

98 (n = 815) Yes (**continue to question 2**)

2 (n = 19) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 46.0 acres (25<sup>th</sup> quartile = 26.0 acres; 75<sup>th</sup> quartile = 97.5 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 40 acres (25<sup>th</sup> quartile = 23.0 acres; 75<sup>th</sup> quartile = 75.5 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

50 Yes

50 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

96 Rural area outside city or town limits

2 Small city or town with less than 5,000 people

1 Medium city with 5,000 to 19,999 people

0 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 49 A residence for you or someone else
- 13 Growing ornamental plants or gardens for non-commercial use
- 47 Hay or pasture land
- 11 Cropland (other than hay or pasture land)
- 27 Livestock production
- 38 Timber production
- 1 Christmas tree production
- 1 Vineyards
- 4 Orchards
- 1 Commercial horticulture
- 1 Operating a hotel, motel, or bed and breakfast
- 2 Operating a commercial campground
- 2 Operating a golf course
- 9 None of the above
- 14 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 34 Less than 5 miles
- 26 5 to 10 miles
- 29 11 to 30 miles
- 4 More than 30 miles
- 8 Unsure

## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	33	25	15	10	15	3
(B) On private lands in western North Carolina	30	26	20	9	13	3
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	48	29	10	4	7	2
(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?						
20 Yes						
80 No						
(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?						
12 Yes						
88 No						
(12) How would you rate your knowledge level of elk? ( <b>check one</b> )						
21 Very little knowledge						
25 Some knowledge						
41 Average knowledge						
12 Much knowledge						
1 Expert knowledge						

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	17	23	24	15	16	5
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	12	22	23	18	21	4
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	5	8	30	22	17	18
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	21	32	21	10	11	5
(E) Elk may be returned to part of their historical range . . . . .	31	35	17	5	8	4
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	20	32	19	11	12	6
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	13	12	32	19	16	9
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	9	13	33	23	16	6
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	19	34	23	8	9	8
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	5	9	28	23	20	15

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 27 Yes
- 47 No
- 27 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 23 Situation A
- 28 Situation B
- 40 Situation C
- 9 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 10 Situation B
- 11 Situation C
- 51 Situation D
- 28 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	49	29	7	6	6	3	
(ii) Option B	.....	12	31	20	21	12	4	
(iii) Option C	.....	19	20	16	20	20	4	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	36	26	10	14	11	3	
(ii) Option B	.....	17	32	18	17	13	4	
(iii) Option C	.....	23	24	14	19	16	4	



## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 29 Very likely
- 26 Likely
- 12 Neutral
- 15 Unlikely
- 17 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 17 Very likely
- 10 Likely
- 7 Neutral
- 18 Unlikely
- 48 Very unlikely
- 1 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	21	17	7	14	36	5
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	7	10	7	18	51	7
(C) ...lease your land for elk hunting . . . . .	3	4	6	19	59	10
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	16	21	12	16	30	6
(E) ...charge people to view elk on your land . . . . .	3	1	6	20	60	11

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

		Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general		36	36	12	6	7	3
(B) Elk hunting in general	.....	22	30	19	14	12	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting	.....	19	29	16	13	20	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 27 Strongly support
- 29 Support
- 15 Neutral
- 9 Oppose
- 18 Strongly oppose
- 2 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 60 Wildlife watching
- 54 Hiking
- 42 Fishing
- 26 Hunting
- 34 Camping
- 29 Boating
- 17 None of the above
- 4 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 86 Yes (**continue to question 24**)
- 14 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 3 Less than a high school graduate
- 15 High school graduate or GED
- 20 Some college or trade school
- 12 Associate or trade school degree
- 26 Bachelor's or four-year degree
- 25 Graduate or professional degree

(26) Are you male or female?

- 68 Male
- 32 Female

(27) In what year were you born?

65 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 99 White
- 0 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 21 Prefer not to answer
- 4 Less than \$20,000
- 12 \$20,000 to \$39,999
- 14 \$40,000 to \$59,999
- 15 \$60,000 to \$79,999
- 9 \$80,000 to \$99,999
- 6 \$100,000 to \$119,999
- 20 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**

**Appendix E: Jackson, Madison, Swain Counties, 0 to 2 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

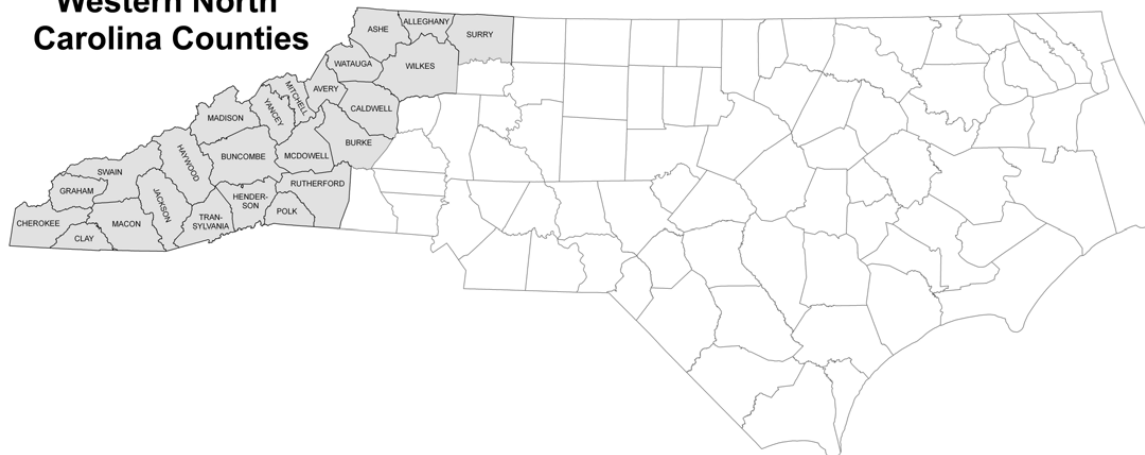
## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

97 (n = 602) Yes (**continue to question 2**)

3 (n = 21) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 1.8 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 4.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 1.5 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 3.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

62 Yes

38 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

80 Rural area outside city or town limits

17 Small city or town with less than 5,000 people

3 Medium city with 5,000 to 19,999 people

0 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 75 A residence for you or someone else
  - 12 Growing ornamental plants or gardens for non-commercial use
  - 6 Hay or pasture land
  - 2 Cropland (other than hay or pasture land)
  - 3 Livestock production
  - 5 Timber production
  - 1 Christmas tree production
  - 1 Vineyards
  - 1 Orchards
  - 0 Commercial horticulture
  - 0 Operating a hotel, motel, or bed and breakfast
  - 3 Operating a commercial campground
  - 3 Operating a golf course
  - 11 None of the above
  - 14 Other (please specify):
- 

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 36 Less than 5 miles
- 22 5 to 10 miles
- 26 11 to 30 miles
- 5 More than 30 miles
- 11 Unsure



## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	49	28	14	5	2	2
(B) On private lands in western North Carolina	48	28	16	4	2	3
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	67	24	6	1	1	1
(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?						
5 Yes						
96 No						
(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?						
1 Yes						
99 No						
(12) How would you rate your knowledge level of elk? ( <b>check one</b> )						
34 Very little knowledge						
26 Some knowledge						
32 Average knowledge						
7 Much knowledge						
1 Expert knowledge						

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	26	24	24	12	8	6
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	15	22	21	20	20	3
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	1	3	34	31	16	15
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	35	34	18	6	3	5
(E) Elk may be returned to part of their historical range . . . . .	45	35	13	2	1	4
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	37	32	18	4	2	6
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	3	11	42	27	11	7
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	3	10	38	31	13	5
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	29	36	22	5	3	6
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	1	4	36	29	16	15

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 7 Yes
- 56 No
- 38 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 13 Situation A
- 26 Situation B
- 50 Situation C
- 11 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 5 Situation B
- 7 Situation C
- 46 Situation D
- 42 None of the above

## Dealing with Elk/Human Conflicts

- (16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

- (A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	58	30	7	1	1	3	
(ii) Option B	.....	11	29	21	22	12	5	
(iii) Option C	.....	10	15	16	21	34	5	

- (B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	44	29	14	7	4	3	
(ii) Option B	.....	14	32	20	19	11	3	
(iii) Option C	.....	11	20	19	21	25	5	

## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 40 Very likely
- 29 Likely
- 12 Neutral
- 11 Unlikely
- 6 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 14 Very likely
- 8 Likely
- 8 Neutral
- 13 Unlikely
- 56 Very unlikely
- 1 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	11	11	6	12	34	26
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	3	6	5	16	42	29
(C) ...lease your land for elk hunting . . . . .	1	2	4	11	47	36
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	19	21	12	10	16	21
(E) ...charge people to view elk on your land . . . . .	1	1	6	17	49	26

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	31	36	17	8	8	1
(B) Elk hunting in general .....	17	27	26	16	12	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	15	24	17	20	22	2

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 36 Strongly support
- 37 Support
- 14 Neutral
- 7 Oppose
- 4 Strongly oppose
- 3 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 72 Wildlife watching
- 61 Hiking
- 44 Fishing
- 20 Hunting
- 31 Camping
- 39 Boating
- 10 None of the above
- 6 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 71 Yes (**continue to question 24**)
- 29 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 2 Less than a high school graduate
- 14 High school graduate or GED
- 15 Some college or trade school
- 13 Associate or trade school degree
- 26 Bachelor's or four-year degree
- 31 Graduate or professional degree

(26) Are you male or female?

- 60 Male
- 40 Female

(27) In what year were you born?

63 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 97 White
- 1 Black or African American
- 2 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 2 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 19 Prefer not to answer
- 4 Less than \$20,000
- 10 \$20,000 to \$39,999
- 14 \$40,000 to \$59,999
- 13 \$60,000 to \$79,999
- 10 \$80,000 to \$99,999
- 8 \$100,000 to \$119,999
- 21 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**



**Appendix F: Jackson, Madison, Swain Counties, > 2 to 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

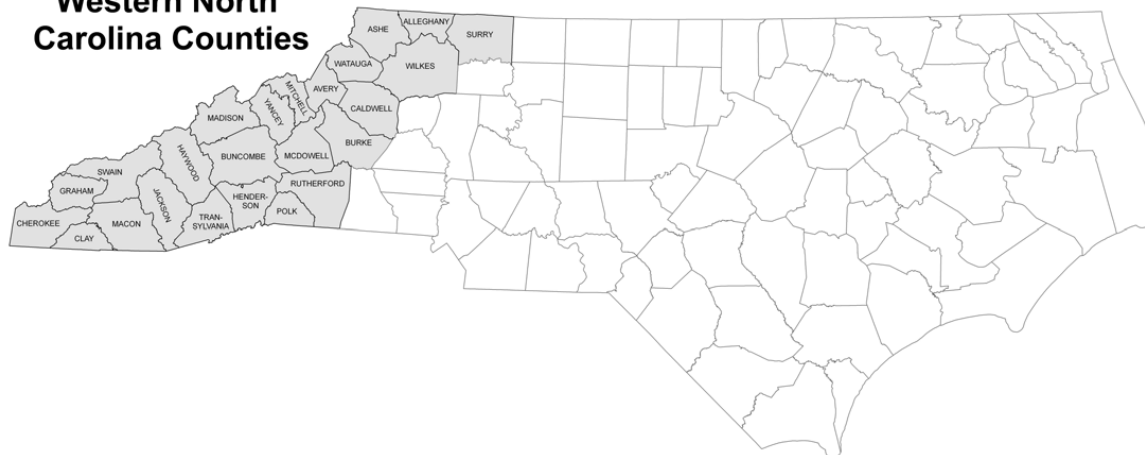
## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

98 (n = 688) Yes (**continue to question 2**)

3 (n = 18) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 7.0 acres (25<sup>th</sup> quartile = 4.0 acres; 75<sup>th</sup> quartile = 15.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 6.0 acres (25<sup>th</sup> quartile = 3.6 acres; 75<sup>th</sup> quartile = 12.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

52 Yes

48 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

94 Rural area outside city or town limits

4 Small city or town with less than 5,000 people

1 Medium city with 5,000 to 19,999 people

0 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 63 A residence for you or someone else
  - 11 Growing ornamental plants or gardens for non-commercial use
  - 14 Hay or pasture land
  - 4 Cropland (other than hay or pasture land)
  - 4 Livestock production
  - 10 Timber production
  - 1 Christmas tree production
  - 1 Vineyards
  - 2 Orchards
  - 0 Commercial horticulture
  - 0 Operating a hotel, motel, or bed and breakfast
  - 4 Operating a commercial campground
  - 4 Operating a golf course
  - 14 None of the above
  - 18 Other (please specify):
- 

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 40 Less than 5 miles
- 20 5 to 10 miles
- 22 11 to 30 miles
- 6 More than 30 miles
- 12 Unsure

## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	51	30	10	3	3	3
(B) On private lands in western North Carolina	47	31	14	3	3	3
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	68	25	4	1	2	1

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

3 Yes  
97 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

0 Yes  
100 No

(12) How would you rate your knowledge level of elk? (**check one**)

29 Very little knowledge  
31 Some knowledge  
32 Average knowledge  
8 Much knowledge  
0 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	23	28	24	9	9	7
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	14	22	22	17	22	4
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	1	4	39	27	13	17
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	31	40	16	4	4	5
(E) Elk may be returned to part of their historical range . . . . .	43	35	12	3	2	5
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	32	33	20	6	3	6
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	4	8	47	23	10	8
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	4	10	42	25	12	7
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	29	37	20	4	3	7
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	2	4	38	27	14	16

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 5 Yes
- 56 No
- 39 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 15 Situation A
- 22 Situation B
- 51 Situation C
- 13 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 6 Situation B
- 7 Situation C
- 46 Situation D
- 41 None of the above

## Dealing with Elk/Human Conflicts

- (16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

- (A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	60	27	5	2	3	2	
(ii) Option B	.....	10	29	23	22	12	3	
(iii) Option C	.....	11	16	19	21	30	4	

- (B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	44	28	13	8	5	3	
(ii) Option B	.....	15	32	22	18	10	3	
(iii) Option C	.....	12	22	21	19	22	4	



## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 44 Very likely
- 33 Likely
- 9 Neutral
- 7 Unlikely
- 7 Very unlikely
- 1 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 16 Very likely
- 8 Likely
- 8 Neutral
- 18 Unlikely
- 49 Very unlikely
- 2 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	16	12	6	17	33	15
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	4	7	6	19	48	17
(C) ...lease your land for elk hunting . . . . .	2	1	4	17	53	23
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	19	25	12	13	22	10
(E) ...charge people to view elk on your land . . . . .	3	1	4	19	60	14

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	30	37	15	6	12	1
(B) Elk hunting in general .....	19	28	25	11	15	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	16	25	19	15	22	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 39 Strongly support
- 37 Support
- 14 Neutral
- 4 Oppose
- 4 Strongly oppose
- 2 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 70 Wildlife watching
- 62 Hiking
- 46 Fishing
- 22 Hunting
- 33 Camping
- 38 Boating
- 11 None of the above
- 5 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 73 Yes (**continue to question 24**)
- 27 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 3 Less than a high school graduate
- 16 High school graduate or GED
- 19 Some college or trade school
- 12 Associate or trade school degree
- 25 Bachelor's or four-year degree
- 26 Graduate or professional degree

(26) Are you male or female?

- 68 Male
- 32 Female

(27) In what year were you born?

61 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 97 White
- 1 Black or African American
- 2 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 20 Prefer not to answer
- 4 Less than \$20,000
- 12 \$20,000 to \$39,999
- 17 \$40,000 to \$59,999
- 12 \$60,000 to \$79,999
- 10 \$80,000 to \$99,999
- 6 \$100,000 to \$119,999
- 20 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**

**Appendix G: Jackson, Madison, Swain Counties, > 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. (**Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

98 (n = 796) Yes (**continue to question 2**)

2 (n = 13) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? (**Note:** Please include your residence and any separate parcels.)

Median = 50.0 acres (25<sup>th</sup> quartile = 28.0 acres; 75<sup>th</sup> quartile = 91.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 42.5 acres (25<sup>th</sup> quartile = 25.0 acres; 75<sup>th</sup> quartile = 75.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

52 Yes

48 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

97 Rural area outside city or town limits

2 Small city or town with less than 5,000 people

1 Medium city with 5,000 to 19,999 people

0 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 53 A residence for you or someone else
- 16 Growing ornamental plants or gardens for non-commercial use
- 35 Hay or pasture land
- 10 Cropland (other than hay or pasture land)
- 15 Livestock production
- 37 Timber production
- 3 Christmas tree production
- 2 Vineyards
- 6 Orchards
- 1 Commercial horticulture
- 0 Operating a hotel, motel, or bed and breakfast
- 5 Operating a commercial campground
- 5 Operating a golf course
- 9 None of the above
- 15 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 42 Less than 5 miles
- 18 5 to 10 miles
- 23 11 to 30 miles
- 8 More than 30 miles
- 10 Unsure



## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	42	30	12	7	7	3
(B) On private lands in western North Carolina	37	33	17	4	5	4
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	55	29	9	3	2	2
(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?						
5 Yes						
95 No						
(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?						
1 Yes						
99 No						
(12) How would you rate your knowledge level of elk? ( <b>check one</b> )						
30 Very little knowledge						
28 Some knowledge						
35 Average knowledge						
7 Much knowledge						
1 Expert knowledge						

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	18	29	25	11	11	6
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	14	23	21	19	19	3
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	2	4	35	28	15	16
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	26	39	18	7	6	4
(E) Elk may be returned to part of their historical range . . . . .	38	37	14	4	4	4
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	26	36	20	7	7	5
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	7	10	42	23	12	7
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	5	10	37	29	13	6
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	24	36	23	4	5	7
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	4	4	33	28	17	14

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 2 Yes
- 65 No
- 33 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 18 Situation A
- 23 Situation B
- 47 Situation C
- 12 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 8 Situation B
- 9 Situation C
- 46 Situation D
- 36 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	52	31	7	4	3	3	
(ii) Option B	.....	13	31	22	20	11	4	
(iii) Option C	.....	15	21	23	17	21	4	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	41	27	12	11	6	3	
(ii) Option B	.....	16	33	23	14	10	4	
(iii) Option C	.....	18	22	23	18	16	4	

## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 36 Very likely
- 31 Likely
- 9 Neutral
- 11 Unlikely
- 11 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 15 Very likely
- 14 Likely
- 5 Neutral
- 18 Unlikely
- 46 Very unlikely
- 2 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	21	18	8	15	34	4
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	5	11	9	20	49	6
(C) ...lease your land for elk hunting . . . . .	3	4	6	20	60	8
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	16	32	15	12	21	4
(E) ...charge people to view elk on your land . . . . .	2	2	8	24	58	7

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	34	36	16	7	6	2
(B) Elk hunting in general .....	20	31	24	13	10	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	19	29	20	14	16	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 33 Strongly support
- 36 Support
- 14 Neutral
- 6 Oppose
- 8 Strongly oppose
- 3 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 70 Wildlife watching
- 62 Hiking
- 43 Fishing
- 27 Hunting
- 34 Camping
- 32 Boating
- 11 None of the above
- 4 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 81 Yes (**continue to question 24**)
- 20 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 3 Less than a high school graduate
- 15 High school graduate or GED
- 19 Some college or trade school
- 11 Associate or trade school degree
- 24 Bachelor's or four-year degree
- 27 Graduate or professional degree

(26) Are you male or female?

- 67 Male
- 33 Female

(27) In what year were you born?

63 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 98 White
- 0 Black or African American
- 2 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 22 Prefer not to answer
- 6 Less than \$20,000
- 12 \$20,000 to \$39,999
- 18 \$40,000 to \$59,999
- 12 \$60,000 to \$79,999
- 8 \$80,000 to \$99,999
- 6 \$100,000 to \$119,999
- 17 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**



**Appendix H: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties,  
0 to 2 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. **(Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

93 (n = 509) Yes (**continue to question 2**)

7 (n = 39) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? **(Note:** Please include your residence and any separate parcels.)

Median = 1.5 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 5.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 1.3 acres (25<sup>th</sup> quartile = 1.0 acre; 75<sup>th</sup> quartile = 4.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

63 Yes

37 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

72 Rural area outside city or town limits

14 Small city or town with less than 5,000 people

8 Medium city with 5,000 to 19,999 people

6 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 73 A residence for you or someone else
- 9 Growing ornamental plants or gardens for non-commercial use
- 9 Hay or pasture land
- 2 Cropland (other than hay or pasture land)
- 4 Livestock production
- 6 Timber production
- 1 Christmas tree production
- 1 Vineyards
- 1 Orchards
- 0 Commercial horticulture
- 0 Operating a hotel, motel, or bed and breakfast
- 6 Operating a commercial campground
- 6 Operating a golf course
- 8 None of the above
- 12 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 28 Less than 5 miles
- 21 5 to 10 miles
- 26 11 to 30 miles
- 12 More than 30 miles
- 13 Unsure

## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	40	31	16	6	4	3
(B) On private lands in western North Carolina	39	34	20	2	2	4
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	58	31	8	1	2	1

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

2 Yes  
98 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

1 Yes  
99 No

(12) How would you rate your knowledge level of elk? (**check one**)

42 Very little knowledge  
29 Some knowledge  
25 Average knowledge  
5 Much knowledge  
0 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	23	23	26	12	8	8
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	16	18	24	19	17	6
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	2	3	35	24	16	20
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	32	34	17	6	5	7
(E) Elk may be returned to part of their historical range . . . . .	42	35	13	3	3	5
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	30	31	19	7	4	10
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	4	10	39	24	12	11
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	5	11	31	30	15	7
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	24	33	22	6	4	11
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	2	4	32	26	19	18

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 2 Yes
- 67 No
- 31 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 23 Situation A
- 21 Situation B
- 45 Situation C
- 11 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 9 Situation B
- 7 Situation C
- 46 Situation D
- 38 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	53	30	9	2	2	4	
(ii) Option B	.....	10	30	20	24	12	5	
(iii) Option C	.....	12	18	19	20	26	5	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	38	30	14	9	5	4	
(ii) Option B	.....	15	32	19	18	10	5	
(iii) Option C	.....	14	19	20	21	19	7	



## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

38 Very likely  
31 Likely  
10 Neutral  
11 Unlikely  
8 Very unlikely  
2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

18 Very likely  
8 Likely  
7 Neutral  
13 Unlikely  
54 Very unlikely  
2 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .

13 11 5 15 27 29

(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .

4 4 6 19 36 31

(C) ...lease your land for elk hunting . . . . .

2 2 3 18 37 38

(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .

19 22 11 12 16 21

(E) ...charge people to view elk on your land . . . . .

1 1 4 20 48 27

Very likely  
Likely  
Neutral  
Unlikely  
Very unlikely  
My land is unsuitable for this activity

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	35	35	12	7	7	3
(B) Elk hunting in general . . . . .	23	30	21	12	9	5
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting . . . . .	19	27	15	17	18	5

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 34 Strongly support
- 32 Support
- 17 Neutral
- 7 Oppose
- 7 Strongly oppose
- 3 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 67 Wildlife watching
- 53 Hiking
- 42 Fishing
- 21 Hunting
- 30 Camping
- 35 Boating
- 15 None of the above
- 4 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 87 Yes (**continue to question 24**)
- 13 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 3 Less than a high school graduate
- 18 High school graduate or GED
- 21 Some college or trade school
- 13 Associate or trade school degree
- 24 Bachelor's or four-year degree
- 22 Graduate or professional degree

(26) Are you male or female?

- 65 Male
- 35 Female

(27) In what year were you born?

60 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 2 Hispanic or Latino
- 96 White
- 1 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 22 Prefer not to answer
- 4 Less than \$20,000
- 12 \$20,000 to \$39,999
- 13 \$40,000 to \$59,999
- 14 \$60,000 to \$79,999
- 11 \$80,000 to \$99,999
- 9 \$100,000 to \$119,999
- 15 \$120,000 or more

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**

**Appendix I: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties  
> 2 to 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. **(Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

96 (n = 689) Yes (**continue to question 2**)

4 (n = 26) No (**please stop here and return the survey**)

**Western North  
Carolina Counties**



- (2) How many total acres do you own in western North Carolina? **(Note:** Please include your residence and any separate parcels.)

Median = 8.0 acres (25<sup>th</sup> quartile = 4.6 acres; 75<sup>th</sup> quartile = 18.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 7.1 acres (25<sup>th</sup> quartile = 4.0 acres; 75<sup>th</sup> quartile = 15.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

61 Yes

39 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

92 Rural area outside city or town limits

5 Small city or town with less than 5,000 people

2 Medium city with 5,000 to 19,999 people

2 City or urban area with 20,000 people or more

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 62 A residence for you or someone else
- 15 Growing ornamental plants or gardens for non-commercial use
- 22 Hay or pasture land
- 5 Cropland (other than hay or pasture land)
- 6 Livestock production
- 12 Timber production
- 2 Christmas tree production
- 2 Vineyards
- 3 Orchards
- 1 Commercial horticulture
- 0 Operating a hotel, motel, or bed and breakfast
- 7 Operating a commercial campground
- 7 Operating a golf course
- 12 None of the above
- 16 Other (please specify): \_\_\_\_\_

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 28 Less than 5 miles
- 21 5 to 10 miles
- 23 11 to 30 miles
- 14 More than 30 miles
- 15 Unsure



## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	45	30	12	5	5	4
(B) On private lands in western North Carolina	44	32	14	3	4	3
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	61	27	7	1	3	2

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

2 Yes  
99 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

0 Yes  
100 No

(12) How would you rate your knowledge level of elk? (**check one**)

38 Very little knowledge  
27 Some knowledge  
29 Average knowledge  
5 Much knowledge  
1 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	23	27	23	12	8	7
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	16	23	22	16	16	3
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	2	5	38	25	13	17
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	30	38	17	6	5	4
(E) Elk may be returned to part of their historical range . . . . .	39	37	16	2	3	3
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	30	34	18	7	5	6
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	6	12	40	23	12	8
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	7	11	36	26	14	6
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	26	31	26	5	4	8
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	3	5	37	26	16	14

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 0 Yes
- 70 No
- 29 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 21 Situation A
- 21 Situation B
- 46 Situation C
- 11 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 9 Situation B
- 7 Situation C
- 46 Situation D
- 39 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	56	30	8	2	2	3	
(ii) Option B	.....	12	32	24	20	8	3	
(iii) Option C	.....	12	25	19	17	21	5	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	39	30	14	10	5	3	
(ii) Option B	.....	15	35	23	16	8	3	
(iii) Option C	.....	16	26	21	18	15	4	

## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 37 Very likely
- 30 Likely
- 12 Neutral
- 12 Unlikely
- 7 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 18 Very likely
- 13 Likely
- 6 Neutral
- 15 Unlikely
- 47 Very unlikely
- 1 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	21	17	7	14	31	10
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	7	11	8	22	40	12
(C) ...lease your land for elk hunting . . . . .	2	3	5	21	52	17
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	17	31	14	13	17	7
(E) ...charge people to view elk on your land . . . . .	2	2	5	22	59	11

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	39	32	14	6	8	2
(B) Elk hunting in general .....	23	34	20	11	10	3
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	21	28	17	15	16	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 36 Strongly support
- 33 Support
- 15 Neutral
- 7 Oppose
- 6 Strongly oppose
- 2 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 68 Wildlife watching
- 56 Hiking
- 45 Fishing
- 28 Hunting
- 32 Camping
- 35 Boating
- 12 None of the above
- 5 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 85 Yes (**continue to question 24**)
- 15 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

(25) What is the highest level of formal education you have completed? (**check one**)

- 4 Less than a high school graduate
- 19 High school graduate or GED
- 22 Some college or trade school
- 13 Associate or trade school degree
- 22 Bachelor's or four-year degree
- 20 Graduate or professional degree

(26) Are you male or female?

- 68 Male
- 32 Female

(27) In what year were you born?

61 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 98 White
- 1 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 0 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 19 Prefer not to answer
- 4 Less than \$20,000
- 12 \$20,000 to \$39,999
- 16 \$40,000 to \$59,999
- 16 \$60,000 to \$79,999
- 9 \$80,000 to \$99,999
- 7 \$100,000 to \$119,999
- 17 \$120,000 or more

Appendix I: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties, > 2 to 15 acre parcels

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**



**Appendix J: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties  
> 15 acre parcels**

## Landowner Views of Elk in Western North Carolina



Photo by: Brian Stansberry

### A Survey Conducted by the North Carolina Wildlife Resources Commission

Elk once lived throughout much of the United States, including western North Carolina. By 1800, elk were eliminated from North Carolina by loss of habitat and over-hunting. In 2000 and 2001, elk were reintroduced into the Great Smoky Mountains National Park. Today there are about 140 elk in western North Carolina, with elk living both within the National Park and on private lands outside of the Park.

This survey asks about your views on elk in western North Carolina. **We are interested in your responses even if you have had no experience with elk or have little knowledge about elk.**

## Property Characteristics

- (1) Do you own land in western North Carolina? For this survey, we define western North Carolina as the counties shaded in the map below. **(Note:** If you own land, no matter how small, in western North Carolina on which your home is located, please answer "Yes.")

97 (n = 813) Yes (**continue to question 2**)

3 (n = 29) No (**please stop here and return the survey**)

### Western North Carolina Counties



- (2) How many total acres do you own in western North Carolina? **(Note:** Please include your residence and any separate parcels.)

Median = 50.4 acres (25<sup>th</sup> quartile = 29.0 acres; 75<sup>th</sup> quartile = 100.0 acres)

- (3) How many acres is the largest tract of land you own in western North Carolina? Please add together the acreages of individually deeded parcels that are connected.

Median = 45.0 acres (25<sup>th</sup> quartile = 25.0 acres; 75<sup>th</sup> quartile = 80.0 acres)

- (4) In which county is the largest tract of land you own in western North Carolina?

\_\_\_\_\_

- (5) Do you live on the largest tract of land you own in western North Carolina?

50 Yes

50 No

- (6) Which of the following best describes the location of your largest tract of land in western North Carolina? (**check one**)

95 Rural area outside city or town limits

3 Small city or town with less than 5,000 people

1 Medium city with 5,000 to 19,999 people

1 City or urban area with 20,000 people or more

Appendix J: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties,  
> 15 acre parcels

(7) Which of the following describe your uses for the largest tract of land you own in western North Carolina? (**check all that apply**)

- 49 A residence for you or someone else
  - 10 Growing ornamental plants or gardens for non-commercial use
  - 36 Hay or pasture land
  - 10 Cropland (other than hay or pasture land)
  - 14 Livestock production
  - 39 Timber production
  - 4 Christmas tree production
  - 1 Vineyards
  - 5 Orchards
  - 1 Commercial horticulture
  - 0 Operating a hotel, motel, or bed and breakfast
  - 8 Operating a commercial campground
  - 1 Operating a golf course
  - 8 None of the above
  - 14 Other (please specify):
- 

(8) Approximately how far is the largest tract of land you own in western North Carolina from a national forest, national park (not including the Blue Ridge Parkway), state park, state forest, or state game land? (**check one**)

- 26 Less than 5 miles
- 18 5 to 10 miles
- 27 11 to 30 miles
- 15 More than 30 miles
- 14 Unsure

## Elk in North Carolina

(9) In general do you support or oppose wild, free-roaming elk living in the following areas?

	Strongly support	Support	Neutral	Oppose	Strongly oppose	Unsure
(A) On or within five miles of your largest tract of land in western North Carolina . . . . .	37	29	14	7	8	4
(B) On private lands in western North Carolina	35	31	16	6	7	5
(C) On publicly owned lands in western North Carolina. (Publicly owned lands include national forests, national parks, state game lands, state parks, and state forests.) . . . . .	51	29	9	3	5	3

(10) Have you ever seen or heard elk on the largest tract of land you own in western North Carolina?

2 Yes  
98 No

(11) Have elk ever damaged fences, crops, gardens, trees or other property on the largest tract of land you own in western North Carolina?

1 Yes  
100 No

(12) How would you rate your knowledge level of elk? (**check one**)

41 Very little knowledge  
27 Some knowledge  
25 Average knowledge  
6 Much knowledge  
1 Expert knowledge

- (13) Below is a list of possible outcomes of elk living in western North Carolina. Please indicate how positive or negative you believe each of the following outcomes would be if there were elk living on or within five miles of your largest tract of land in western North Carolina.  
(check one for each possible outcome)

*I believe this **possible** outcome is . . .*

**Possible** outcomes of elk living on or within five miles of your largest tract of land **might** include . . .

	Very positive	Positive	Neutral	Negative	Very negative	Unsure
(A) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through hunting	21	29	23	9	11	7
(B) People may be able to hunt elk within five miles of your largest tract of land in western North Carolina . . . . .	18	26	20	16	15	5
(C) Elk may transmit diseases to other wildlife on or within five miles of your largest tract of land in western North Carolina . . . . .	2	5	36	23	14	19
(D) People may be able to view elk within five miles of your largest tract of land in western North Carolina . . . . .	26	37	19	6	6	7
(E) Elk may be returned to part of their historical range . . . . .	36	34	16	3	5	7
(F) Elk may bring economic benefits to the communities within five miles of your largest tract of land in western North Carolina through tourism	27	32	19	7	7	8
(G) Landowners within five miles of your largest tract of land in western North Carolina, including you, may have damage by elk to fences, gardens, crops, or trees . . . . .	8	13	37	21	12	10
(H) Elk may cause an increase in automobile-wildlife collisions on or within five miles of your largest tract of land in western North Carolina . . . . .	8	13	32	25	13	9
(I) Elk may increase the aesthetic nature on or within five miles of your largest tract of land in western North Carolina . . . . .	23	32	25	5	5	10
(J) Elk may transmit diseases to livestock on or within five miles of your largest tract of land in western North Carolina . . . . .	4	6	34	23	17	17

## Elk Population

(14) Do wild, free-roaming elk currently live on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 1 Yes
- 74 No
- 25 Unsure

(15) Below are four situations that indicate increasing levels of interactions between people and elk.

Situation A	No elk exist
Situation B	Elk are <b><u>almost never</u></b> sighted Residents <b><u>rarely</u></b> have damage to fences, crops, gardens, or trees A <b><u>low number</u></b> of elk are present for wildlife viewing or other activities
Situation C	Elk are <b><u>sometimes</u></b> sighted <b><u>Occasional</u></b> damage to fences, gardens, crops, or trees A <b><u>moderate number</u></b> of elk are present for wildlife viewing or other activities
Situation D	Elk are <b><u>regularly</u></b> sighted <b><u>Regular</u></b> damage to fences, gardens, crops, or trees <b><u>Many</u></b> elk are present for wildlife viewing or other activities

(A) Which situation would you **prefer** on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 26 Situation A
- 24 Situation B
- 39 Situation C
- 11 Situation D

(B) Which situation would most likely cause you to ask/tell an authority to reduce the number of elk/human interactions on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 8 Situation B
- 9 Situation C
- 47 Situation D
- 36 None of the above

## Dealing with Elk/Human Conflicts

(16) When people and elk live in the same area, conflicts may occur. The following are some actions that wildlife managers can take when elk enter an area where people live. Please note that with each option there are some things to consider.

	Option	Considerations
Option A	Provide information to landowners on preventing problems with elk.	People must take extra precautions to avoid problems with elk.
Option B	Frighten the elk using tools such as fireworks or dogs.	The elk may not be frightened and may stay in the area. The elk may cause problems in other areas. Other elk may enter the area.
Option C	Allow landowners to kill elk causing problems.	Some people may object to killing elk. Other elk may enter the area.

(A) How acceptable or unacceptable are each of the following options if elk are sighted, heard bugling, or leave hoof prints on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	49	30	8	6	3	3	
(ii) Option B	.....	12	27	24	21	10	5	
(iii) Option C	.....	17	30	16	15	17	5	

(B) How acceptable or unacceptable are each of the following options if elk eat hay, knock down fences, or disturb livestock on a landowner's property? (**check one for each option**)

			Very acceptable	Acceptable	Neutral	Unacceptable	Very unacceptable	Unsure
(i) Option A	.....	36	26	14	12	9	4	
(ii) Option B	.....	16	27	22	18	12	6	
(iii) Option C	.....	18	28	19	15	15	5	



## Elk Viewing and Elk Hunting

(17) If expansion of elk populations in western North Carolina continues, how likely or unlikely would you be to make a special trip to view elk? (**check one**)

- 32 Very likely
- 32 Likely
- 10 Neutral
- 12 Unlikely
- 12 Very unlikely
- 2 Unsure

(18) If elk hunting were allowed in western North Carolina, how likely or unlikely would you be to hunt elk? (**check one**)

- 21 Very likely
- 12 Likely
- 8 Neutral
- 15 Unlikely
- 42 Very unlikely
- 1 Unsure

(19) If there were elk on or within five miles of your largest tract of land in western North Carolina, how likely or unlikely would you be to...(b) (**check one for each activity**)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	My land is unsuitable for this activity
(A) ...hunt or have other members of your household or immediate family hunt elk on your land . . . . .	26	20	8	13	26	6
(B) ...allow people other than members of your household or immediate family to hunt elk on your land . . . . .	8	16	11	21	36	8
(C) ...lease your land for elk hunting . . . . .	4	7	8	21	50	9
(D) ...allow people other than members of your household or immediate family to view elk on your land . . . . .	19	32	15	13	16	5
(E) ...charge people to view elk on your land . . . . .	2	2	9	23	56	8

(20) Please indicate how much you approve or disapprove of the following. (**check one for each item**)

	Strongly approve	Approve	Neutral	Disapprove	Strongly disapprove	Unsure
(A) Legal, regulated hunting in general	40	35	13	6	5	2
(B) Elk hunting in general .....	24	35	21	9	8	4
(C) Elk hunting on or within five miles of your largest tract of land in western North Carolina, if wildlife managers recommended allowing elk hunting .....	22	34	17	13	12	3

(21) In general do you support or oppose wild, free-roaming elk living on or within five miles of your largest tract of land in western North Carolina? (**check one**)

- 31 Strongly support
- 33 Support
- 15 Neutral
- 7 Oppose
- 11 Strongly oppose
- 3 Unsure

## Background Information

For us to understand people's responses to the previous questions more fully, we need to know a few things about your background. Remember you are volunteering to participate in this study and you can skip any questions you don't want to answer.

(22) In which of the following activities have you participated in the last 12 months? (**check all that apply**)

- 68 Wildlife watching
- 53 Hiking
- 41 Fishing
- 30 Hunting
- 26 Camping
- 29 Boating
- 14 None of the above
- 5 Other (please specify): \_\_\_\_\_

(23) Do you live in North Carolina?

- 87 Yes (**continue to question 24**)
- 13 No (**please skip to question 25**)

(24) In which county in North Carolina do you live?

\_\_\_\_\_

Appendix J: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties,  
> 15 acre parcels

(25) What is the highest level of formal education you have completed? (**check one**)

- 5 Less than a high school graduate
- 20 High school graduate or GED
- 19 Some college or trade school
- 12 Associate or trade school degree
- 23 Bachelor's or four-year degree
- 22 Graduate or professional degree

(26) Are you male or female?

- 72 Male
- 28 Female

(27) In what year were you born?

65 years = mean age

(28) What is your race or ethnicity? (**check all that apply**)

- 1 Hispanic or Latino
- 98 White
- 0 Black or African American
- 1 American Indian or Alaska Native
- 0 Asian
- 0 Native Hawaiian or other Pacific Islander
- 1 Other (please specify):

(29) Which of the following best represents your gross household income (before taxes) last year? (**check one**)

- 19 Prefer not to answer
- 5 Less than \$20,000
- 14 \$20,000 to \$39,999
- 14 \$40,000 to \$59,999
- 13 \$60,000 to \$79,999
- 10 \$80,000 to \$99,999
- 6 \$100,000 to \$119,999
- 19 \$120,000 or more

Appendix J: Western North Carolina excluding Haywood, Jackson, Madison, Swain Counties,  
> 15 acre parcels

Thank you for your participation!

- ☐ Check this box if you'd like us to email you when the results of the survey are posted online. Please provide your email address below.

Email address: \_\_\_\_\_

- ☐ Check this box if you'd be interested in providing additional input on elk in western North Carolina. Please provide your email address or phone number below.

Email address: \_\_\_\_\_

Phone number: \_\_\_\_\_

If you have any other comments you would like to share with us, please use the space below.

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Please use the enclosed postage-paid envelope, or mail this survey to:

**Elk Landowner Survey  
N.C. Wildlife Resources Commission  
1722 Mail Service Center  
Raleigh, NC 27699-1722**

## **Appendix K: Nonresponse bias crosstabulations**

Significant results presented below

Table 26. Haywood County, 0 to 2 acres landowner support and opposition for elk living on or within five miles of their largest tracts of land by survey mailing wave.

Response	Mailing		
	1 (n = 389)	2 (n = 153)	3 (n = 68)
Strongly support	48% <sup>a</sup>	37%	28% <sup>b</sup>
Support	25%	24%	28%
Neutral	13% <sup>b</sup>	24% <sup>a</sup>	18%
Oppose	7%	6%	15% <sup>a</sup>
Strongly oppose	4%	5%	4%
Unsure	2% <sup>b</sup>	4%	7% <sup>a</sup>

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 29.169$ ; df = 10;  $P = 0.001$ ; Cramer's V = 0.155

Table 27. Haywood County, >2 to 15 acres landowner support and opposition for elk living on or within five miles of their largest tracts of land by survey mailing wave.

Response	Mailing		
	1 (n = 501)	2 (n = 179)	3 (n = 69)
Strongly support	42% <sup>a</sup>	34%	32%
Support	29%	28%	30%
Neutral	13% <sup>b</sup>	21% <sup>a</sup>	23%
Oppose	8%	10%	9%
Strongly oppose	8%	5%	6%
Unsure	1 %	3% <sup>a</sup>	0.0%

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 18.569$ ; df = 10;  $P = 0.046$ ; Cramer's V = 0.111

Table 28. Jackson County, Madison County, and Swain County 0 to 2 acres landowner support and opposition for elk living on or within five miles of their largest tracts of land by survey mailing wave.

Response	Mailing		
	1 (n = 382)	2 (n = 136)	3 (n = 72)
Strongly support	52% <sup>a</sup>	38% <sup>b</sup>	47%
Support	27%	29%	31%
Neutral	13%	19%	11%
Oppose	6%	5%	4%
Strongly oppose	2%	4% <sup>a</sup>	0%
Unsure	1% <sup>b</sup>	4%	7% <sup>a</sup>

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 18.569$ ; df = 10;  $P = 0.046$ ; Cramer's V = 0.111

<sup>d</sup>> 20% of expected values < 5

Table 29. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties) >2 to 15 acres landowner support and opposition for elk living on or within five miles of their largest tracts of land by survey mailing wave.

Response	Mailing		
	1 (n = 432)	2 (n = 172)	3 (n = 68)
Strongly support	50% <sup>a</sup>	39%	29% <sup>b</sup>
Support	29%	28%	34%
Neutral	10% <sup>b</sup>	15%	15%
Oppose	4% <sup>b</sup>	9% <sup>a</sup>	6%
Strongly oppose	4%	3%	10% <sup>a</sup>
Unsure	3% <sup>b</sup>	6%	6%

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 27.530$ ; df = 10;  $P = 0.002$ ; Cramer's V = 0.143

Table 30. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties) >15 acres landowner support and opposition for elk living on or within five miles of their largest tracts of land by survey mailing wave.

Response	Mailing		
	1 (n = 560)	2 (n = 165)	3 (n = 70)
Strongly support	40% <sup>a</sup>	31%	26% <sup>b</sup>
Support	29%	30%	26%
Neutral	14%	15%	13%
Oppose	6%	8%	14% <sup>a</sup>
Strongly oppose	7%	10%	13%
Unsure	3%	5%	9%

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 19.905$ ; df = 10;  $P = 0.030$ ; Cramer's V = 0.112

Table 31. Haywood County, 0 to 2 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 397)	2 (n = 159)	3 (n = 60)
Very little knowledge	18% <sup>b</sup>	38% <sup>a</sup>	31%
Some knowledge	28%	30%	29%
Average knowledge	43% <sup>a</sup>	26% <sup>b</sup>	34%
Much/expert knowledge	11%	7%	6%

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 31.204$ ; df = 6;  $P < 0.001$ ; Cramer's V = 0.158

Table 32. Haywood County, &gt;2 to 15 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 508)	2 (n = 179)	3 (n = 72)
Very little knowledge	15% <sup>b</sup>	30% <sup>a</sup>	36% <sup>a</sup>
Some knowledge	32%	27%	26%
Average knowledge	40% <sup>a</sup>	34%	31%
Much/expert knowledge	13% <sup>a</sup>	9%	7%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 33.366$ ; df = 6;  $P < 0.001$ ; Cramer's V = 0.148

Table 33. Haywood County, &gt;15 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 563)	2 (n = 163)	3 (n = 77)
Very little knowledge	17% <sup>b</sup>	33% <sup>a</sup>	22%
Some knowledge	23%	29%	30%
Average knowledge	46% <sup>a</sup>	29% <sup>b</sup>	34%
Much/expert knowledge	13%	9%	14%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 28.988$ ; df = 6;  $P < 0.001$ ; Cramer's V = 0.134

Table 34. Jackson County, Madison County, and Swain County 0 to 2 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 381)	2 (n = 139)	3 (n = 73)
Very little knowledge	27% <sup>b</sup>	50% <sup>a</sup>	40%
Some knowledge	28%	20%	25%
Average knowledge	35% <sup>a</sup>	25%	29%
Much/expert knowledge	10%	5%	7%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 24.404$ ; df = 6;  $P < 0.001$ ; Cramer's V = 0.143



Table 35. Jackson County, Madison County, and Swain County &gt;2 to 15 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 463)	2 (n = 159)	3 (n = 63)
Very little knowledge	24% <sup>b</sup>	44% <sup>a</sup>	30%
Some knowledge	32%	27%	29%
Average knowledge	36% <sup>a</sup>	22% <sup>b</sup>	29%
Much/expert knowledge	8%	7%	13%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 27.522$ ; df = 6;  $P < 0.001$ ; Cramer's V = 0.142

Table 36. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties) 0 to 2 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 320)	2 (n = 135)	3 (n = 52)
Very little knowledge	36% <sup>b</sup>	47%	60% <sup>a</sup>
Some knowledge	33% <sup>a</sup>	21% <sup>b</sup>	23%
Average knowledge	26%	24%	15%
Much/expert knowledge	5%	7%	2%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 16.314$ ; df = 6;  $P = 0.012$ ; Cramer's V = 0.127

Table 37. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties) &gt;2 to 15 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 439)	2 (n = 176)	3 (n = 69)
Very little knowledge	33% <sup>b</sup>	51% <sup>a</sup>	41%
Some knowledge	28%	24%	28%
Average knowledge	32% <sup>a</sup>	24%	26%
Much/expert knowledge	8% <sup>a</sup>	2% <sup>b</sup>	6%

<sup>a</sup>Adjusted residual  $\geq 2$ <sup>b</sup>Adjusted residual  $\leq -2$ <sup>c</sup> $\chi^2 = 21.637$ ; df = 6;  $P = 0.001$ ; Cramer's V = 0.126

Table 38. Western North Carolina (excluding Haywood, Jackson, Madison and Swain counties)  
>15 acres landowner self-rated knowledge level of elk by survey mailing wave.

Response	Mailing		
	1 (n = 568)	2 (n = 168)	3 (n = 70)
Very little knowledge	37% <sup>b</sup>	47%	56% <sup>a</sup>
Some knowledge	29%	24%	24%
Average knowledge	26%	23%	17%
Much/expert knowledge	8%	6%	3%

<sup>a</sup>Adjusted residual  $\geq 2$

<sup>b</sup>Adjusted residual  $\leq -2$

<sup>c</sup> $\chi^2 = 13.117$ ; df = 6;  $P = 0.041$ ; Cramer's V = 0.090