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CHARACTERISTICS AND SUCCESS OF SOUTH DAKOTA
ARCHERY DEER HUNTERS

BY

KELLY BRIAN McPHILLIPS

A thesis submitted
in partial fulfillment of the requirements
for the degree Master of Science
Major in Wildlife and Fisheries
(Wildlife Option)

South Dakota State University
1983

CHARACTERISTICS AND SUCCESS OF SOUTH DAKOTA
ARCHERY DEER HUNTERS

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable for meeting the thesis requirements for this degree. Acceptance of this thesis does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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CHARACTERISTICS AND SUCCESS OF SOUTH DAKOTA

ARCHERY DEER HUNTERS

Abstract

KELLY BRIAN McPHILLIPS

Two mail questionnaires were sent to South Dakota archery deer hunters after the 1981 archery deer season. One questionnaire was sent to a random sample of all bowhunters, and the second to a sample of bowhunters failing to return the South Dakota Department of Game, Fish and Parks (SDGFP) mandatory big game hunter report card. Success rate of bowhunters killing deer and crippling rate of deer by bowhunters were determined. A profile of the average bowhunter was developed. The SDGFP bowhunter reporting system was evaluated.

Success rates from the 2 questionnaires (29% and 19%) were significantly different from each other and from success rates as derived from SDGFP report card returns (42% and 12%). Twenty-one percent of all bowhunters crippled at least one deer. Crippling rate was calculated as a proportion relative to total harvest of bow killed deer. A comparative study of success and crippling by rifle hunters is needed to fully assess the effects of crippling on the South Dakota deer resource.

Profile information revealed that the average age of bowhunters was 31. Men comprised 97% of the sample. Each hunter spent 15.8 days bowhunting deer and \$192.00 to pursue that sport. Eighty-three percent used compound bows and 88% had hunted deer with a firearm as well as

with a bow. Twenty-one percent of the sample had never had archery instruction indicating the need for a broader based hunter education program.

Initial response rate to both questionnaires (74% and 66%) was significantly greater than response to the SDGFP mandatory big game hunter report card mailed with each license (38%). A study should be initiated to determine the effects of end of season mailing of SDGFP hunter report cards.

ACKNOWLEDGEMENTS

My sincere appreciation is extended to Dr. Raymond L. Linder, Leader, South Dakota Cooperative Wildlife Research Unit, and Dr. W. Alan Wentz, for their leadership, friendship, and confidence in my ability to pursue this project.

I would also like to extend sincere thanks to many others for their help on various stages of the project. Dr. W. Lee Tucker receives my many thanks for his assistance in statistical analysis and evaluation. Thanks go to Dr. Robert M. Dimit and Dr. Robert P. Davison for the many hours spent on questionnaire design. Also, to Scott E. Norelius and M. Gregory Weaver, many thanks for their friendly encouragement along the way. I seize this opportunity to formally thank the many South Dakota Department of Game, Fish and Parks, Wildlife Division staff members for their helpful suggestions and support.

My parents receive my warmest thanks in appreciation for their unfailing support and financial sacrifice throughout a long college career.

I would like to make a special acknowledgement to Nell, for whom words are never enough.

Funding for this project was provided by the South Dakota Department of Game, Fish and Parks as Pittman-Robertson project W-75-R (07525) through the South Dakota Cooperative Wildlife Research Unit (U.S. Fish and Wildlife Service, South Dakota Department of Game, Fish and Parks, South Dakota State University, and the Wildlife Management Institute, cooperators).

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INTRODUCTION

Bowhunting is a rapidly expanding form of recreation. Approximately 2 million United States sportsmen hunted with bow and arrow in 1980 (U.S. Department of Interior and Department of Commerce 1982). In the same year, 8,109 South Dakota archery deer licenses were sold (Vaa 1981). The number of archery deer licenses available to South Dakota residents is unlimited.

Archery deer hunting is a quality form of recreation and one of the highest recreation per kill activities among the consumptive uses of wildlife (Haugen 1948, Garland 1972, Haberland and McCaffery 1976, Gladfelter et al. 1983). Since bowhunting is important in South Dakota, information is needed to understand characteristics of the bowhunter and to determine the impact of the archery season on the deer herd. The American Archery Council (AAC) reported results of surveys from membership lists of archery organizations in the 48 contiguous states and developed a profile of the "average" archer (Archery World 1979). However, bowhunters are not a homogenous group and those belonging to an organized club may not represent the average bowhunter, therefore a survey of all South Dakota bowhunters is desirable.

Success rate of archery deer hunters in South Dakota is determined from mandatory hunter report cards sent to each permittee at the time the license is purchased. The cards are returned at the time of a kill or at the end of the season, often about 3 months later. In 1980, only 35% of South Dakota bowhunters returned the cards. Success rate of the non-reporting hunters is unknown and is estimated as 28% of

the success rate of reporting bowhunters (South Dakota Department of Game, Fish and Parks 1980). This estimate is based upon differences in success rate of reporting and non-reporting rifle deer hunters from eastern South Dakota (Kranz 1974). An evaluation of the report card system is necessary in order to obtain an accurate estimate of deer harvested by archery hunters.

Knowledge of crippling loss is important in managing a deer herd. Reported crippling rates during archery deer seasons in the United States vary considerably, from 100% in Colorado (Tully and Gilbert 1957) to 6.6% in New York (Severinghaus 1963). Crippling rates were reported as 50% in Virginia (Downing 1971) and 10% in Wisconsin (DeBoer 1957). In Iowa, the amount of crippling increased as the number of bowhunters increased.

The objectives of this study were to: (1) evaluate reporting systems for bowhunters, (2) develop a profile of South Dakota archery deer hunters, (3) estimate the deer harvest by bowhunters, and (4) determine crippling rate and crippling loss rate of deer by bowhunters in South Dakota.

METHODS

Two mail questionnaires (profile questionnaire and non-reporter questionnaire) were used to survey the bowhunters of South Dakota. Mail questionnaires are a valid method for deriving harvest data and related information (Hawn and Ryel 1969) and answers given on questionnaires are considered as accurate as answers given during telephone or personal interviews (Filion 1978). Both questionnaires were pretested on a random sample of bowhunters following procedures described by Dillman (1978) and Filion (1978).

Specific terminology pertaining to this investigation is used in the following manner. Non-reporting bowhunters and/or non-reporters will refer to bowhunters failing to return mandatory big game hunter report cards to South Dakota Department of Game, Fish and Parks (SDGFP). Questionnaire, survey, or survey form will be used interchangeably. Crippling is defined as the wounding of a deer that is not retrieved. Rate of crippling is the percent of bowhunters crippling at least one deer during the season. Crippling rate is the number of deer hit and not retrieved divided by the total number of harvested deer plus the number crippled. Crippling loss rate is the number of deer hit and not retrieved minus the number of deer harvested that had been previously arrow wounded divided by the number of deer harvested plus the numerator. Neither crippling rate nor crippling loss rate necessarily equals the number or rate at which deer are lost to the population. Fatal woundings are a portion of the crippling rate, but they are an unidentified portion.

The Profile Questionnaire

Names of 977 (11%) resident bowhunters were randomly drawn from 9,092, resident 1981 archery deer season applications. Bowhunters received a letter and record sheet on which to keep track of their activities (Appendix A). Second letters and the profile survey form (Appendix B) were mailed on 2 January 1982, immediately following the close of the archery deer season. One follow-up letter (including another copy of the profile survey) (Appendix C) was mailed to non-respondents. All bowhunters were informed of the voluntary status of their participation. Each respondent returning a questionnaire became eligible for the drawing of a compound bow and quiver to be given away.

The 3-page, 42 question profile survey was designed following McKenzie et al. (1975), Dillman (1978), Filion (1978), and suggestions by Lee Gladfelter (Iowa Conservation Commission), Dr. Robert M. Dimit (Professor, Rural Sociology, South Dakota State University), and SDGFP-Division of Wildlife Staff.

The Non-reporter Questionnaire

A random sample of 499 (9%) non-reporters was generated from the 5,595 individuals failing to return their mandatory big game hunter report cards to SDGFP at the end of the hunting season. Each individual was notified of the voluntary nature of their participation. Non-reporters were mailed a cover letter and an 8-question, 1-page survey form (using a format and suggestions similar to that followed for the profile questionnaire) on 5 February 1982 (Appendix D). No reward

was offered as a means of incentive. One-follow-up packet was mailed to each person failing to respond to the survey 2 weeks later (Appendix E). Those still failing to return a questionnaire were contacted by telephone. Non-reporters contacted by telephone (61) were only asked for harvest data in order to analyze hunter success rate.

Wording inconsistencies and unforeseen analysis problems prohibited the use of questions 8, 10, 27, and 37 in the profile questionnaire.

RESULTS AND DISCUSSION

Survey Return Rates

Initial response to the profile survey was (74%) significantly different ($\chi^2 = 12.14$ $P < 0.01$) from initial response to the non-reporter survey (66%) (Table 1). However, final response rates between the profile (91%) and non-reporter (96%) questionnaires were not significantly different ($\chi^2 = 0.406$ $P > 0.01$).

South Dakota Department of Game, Fish and Parks sends the mandatory big game hunter report card in the license packet to each license applicant and each bowhunter is responsible to keep that card until the season closes 2 or 3 months later. Response rate to SDGFP's report card (38%) was significantly different from the comparable initial response rates to the profile survey ($\chi^2 = 462.90$ $P < 0.01$) and the non-reporter survey ($\chi^2 = 144.57$ $P < 0.01$). Time lag in reporting an event may act to depress response rate (Webb and Loadholt 1971). Solicitation of bowhunting activity immediately following season closure by report card, might reduce or eliminate this effect. Gladfelter (1982) reported that of 1,988 Iowa bowhunters, 77% returned a report card that was mailed at the end of the season (this included 1 follow-up mailing).

Profile Information

Demographics

Age brackets listed on the questionnaire most often checked by respondents (n = 885) were 20 - 29 (39%) and 30 - 39 (28%) (Table 2). Using median ages of bracketed age groups, the average bowhunter was

Table 1. Response rates to the profile and non-reporter surveys and the South Dakota Department of Game, Fish and Parks (SDGFP) report card.

Survey	No. Mailed	RESPONSE			
		Return from <u>initial mailing</u>		<u>Total return</u>	
		Number	Percent	Number	Percent
Profile	977	725	74	977	91
Non-reporter	499	327	66	477	96
SDGFP ¹	9,092			3,497	38

¹Hunter report card issued with license to be returned by hunter.

Table 2. Ages of 885 South Dakota bowhunters, 1981.

Age group	Number	Percent
< 20	140	16
20-29	349	39
30-39	251	28
40-49	97	11
50-59	33	4
60-69	13	> 1
70 or older	2	< 1

31 years of age. McKenzie et al. (1975) reported an average age of 26 for North Dakota bowhunters. Archery World (1979) reported that 20 - 29 (37.4%) and 30 - 39 (31.6%) were the most frequently represented age brackets. Tennessee Valley Authority (1982) reported that 31 years was the average age of bowhunters at Land Between the Lakes, Kentucky.

Ninety-seven percent (860) of South Dakota bowhunters were male. McDowell (1980) reported a 99.1% male component in the New Jersey bowhunter population while Tennessee Valley Authority (1982) reported 97%.

The size of community in which bowhunters reside varied from rural to urban populations of 50,000 or larger. Rural bowhunters represented 22%, while those in towns of 10,000 - 49,999 represented 26%. Twelve percent lived in metropolitan areas (50,000 or more) and the other 40% lived in towns with populations of less than 10,000.

Eighty-two percent of South Dakota bowhunters surveyed were high school graduates and 42% had some college education. Archery World (1979) reported in Wisconsin that 51.5% were high school graduates and 35.9% had attended college.

The survey of South Dakota bowhunters revealed that 77% were employed and 16% were full time students. Unemployed bowhunters represented 5% of the population sampled. Two percent were retired or full time homemakers. Archery World (1979) reported 7.2% students and 5.1% unemployed while 87.1% were employed.

Expenditures

The average bowhunter spent \$192.27 for archery hunting in 1981 (Table 3). The \$15 license fee is not included in the estimate. Bows and arrows, and fuel each represented 34% of the expenditure. The projected total spent by 9,092 resident South Dakota bowhunters in 1981 was \$1,748,573.

Bowhunting History and Background

Twenty percent of South Dakota bowhunters were first-year hunters (initiates) in 1981. Archery World (1979) reported that 3.4% were initiates while McDowell (1980) reported 13.5% to be initiates. Of the more experienced hunters, 32% had hunted 2 - 3 years, 16% had hunted 4 - 5 years, and 32% more than 5 years. Of the 869 bowhunters sampled, 66% (576) had purchased a South Dakota archery deer permit the year before.

Of 870 bowhunters, 768 (88%) also hunted deer with a firearm. Archery World (1979) reported that 77.3% of the bowhunters hunted deer with a firearm. In South Dakota, 63% hunted for deer with a bow more often than they hunted all game with a firearm in 1981.

Six hundred twenty-eight (73%) of the respondents hunted only deer with their bow, while 25% (210) also hunted small game and 7% hunted other big game. Small game hunting or shots at small game may have been undertaken incidental to deer hunting and may not have been a separate activity.

Table 3. Expenditures reported by 879 South Dakota bowhunters, 1981.

Item	Cost	Standard deviation	Percent of total expenditure
Bows and arrows	\$ 65.78	\$ 76.97	34
Accessories	15.55	21.37	8
Clothing	13.73	25.35	7
Footgear	7.90	19.15	4
Overnight accommodations	2.50	15.33	1
Meals	11.62	24.04	6
Fuel	64.72	65.03	34
Miscellaneous	10.47	22.60	6
Total	\$192.27		

It was found that 29% of the respondents had no archery instruction, 52% were taught by friends or parents, and 29% had learned from a book. Bowhunters taught by a certified instructor represented 25% of the sample respondents.

Bowhunting organizations are represented throughout South Dakota by nationally affiliated organizations (National Field Archery Association and Professional Archers Association) or state and local affiliates (South Dakota Bowhunters Association, Inc.). South Dakota Bowhunters Association members are often members of tournament oriented clubs or local hunting clubs. Of 870 responding bowhunters, 128 (15%) belonged to an archery organization. Archery World (1979) reported an increase in bowhunter/archery organization membership from 10% of archers sampled in 1976 to 40% of archers sampled in 1978.

Equipment

South Dakota bowhunters may legally use longbows, recurve bows, or compound bows. Compound bows were used by 83% of the respondents (724 of 876). Longbows were used by 1% and recurve bows by 16%. McKenzie et al. (1975) reported that 3.4% of the North Dakota bowhunters used compound bows in 1974. Gladfelter et al. (1983) reported an increase in use of compound bows from 32% in 1976 to 82% in 1981, by Iowa bowhunters. Tennessee Valley Authority (1982) reported that 86% of the bowhunters used compound bows.

Success rate ($\chi^2 = 0.575$ $P > 0.01$) and crippling ($\chi^2 = 0.048$ $P > 0.01$) was not significantly different between compound bow users and non-compound users. Compound bow users in Iowa were found to be more

successful than users of other bow types in Iowa (Gladfelter et al. 1983) and compound bow users crippled more deer.

The majority (66%) of bowhunters sampled owned the bow they used in 1981 for more than 1 year. Fewer than 20% owned their bow for less than 4 months prior to the 1981 archery deer season.

Shooting without sights is popular among South Dakota bowhunters. Fifty-five percent of the 875 respondents did not use sights, 41% used "pin" sights, more than 3% used range finder sights, and less than 1% used telescopic or lighted sights. Tennessee Valley Authority (1982) reported that 65% of the bowhunters used sights in Land Between the Lakes.

Mechanization and gadgetry were not used extensively by the South Dakota bowhunter population. Mechanical string releases were used by 5% of the sample respondents.

A variety of broadhead arrow points produced by several manufacturers is available to the bowhunting public. Of the broadheads used by 875 bowhunters sampled, 63% (549) used 4 blades, 20% (176) used 3 blades, 6% (49) used 2 blades, 3% (31) used more than 4 blades, and 8% (70) had no preference. McKenzie et al. (1975) reported that 66.7% of North Dakota bowhunters (n = 6,913) used a 2-cutting edge style broadhead in 1974

Preparation

Five hundred thirty-one bowhunters (60%) took 1 - 5 scouting trips prior to the first time they bowhunted in 1981. Eighteen percent took more than 5 trips and 22% did not scout at all.

Familiarity with performance of equipment is essential to acquiring shooting ability. Tennessee Valley Authority (1982) reported that bowhunters practiced an average of 20 hours prior to hunting. Nine percent of the South Dakota bowhunters did not practice between 1 August and the first time they bowhunted in 1981. Twenty-six percent practiced 1 - 5 hours, 22% practiced 6 - 10 hours, 16% practiced 11 - 20 hours, and 27% practiced more than 20 hours before they hunted. Seventy-three percent of 838 respondents reported that they practiced during the season.

Hunting Methods

The most popular hunting method used by bowhunters was hunting alone from a stand (57%). Group or party hunting was used as the primary method by 21% of the respondents. Hunting alone and stalking or still hunting were used by 21%, and 1% used some other method of hunting. In Wisconsin 53.6% used stands (Jackson and Norton 1982). Tree stands were used by 64% (534) of 836 bowhunters that hunted from a stand in South Dakota. A ground blind was used by 22%, and 14% did not use a blind.

Jackson and Norton (1982) found that 37% of the Wisconsin bowhunters hunted as a group. Of 835 responding South Dakota bowhunters, 62% hunted in groups at some time. Virtually all bowhunters comprising that 62% (94%) hunted in 2 - 6 person drives. Jackson and Norton (1982) reported that 65% hunted in a group situation in Wisconsin and that 89.8% of these were part of 2 - 6 person drives.

Desire to harvest only a buck animal was expressed by 20% (169) of the sample. Thirty-three percent selected any deer and 47% hunted bucks only early in the season and any deer late in the season. Stormer et al. (1979) and Downing (1981) expressed concern over the intent of deer hunters, especially bowhunters, to harvest males at a rate greater than they exist in the population resulting in potential herd degradation.

Five hundred eighty-six (70%) of 836 bowhunters hunted deer in the county where they lived. Of 838 bowhunters, 77% traveled less than 31 miles to their respective hunting sites (Table 4). Jackson and Norton (1982) reported that in Wisconsin more than 40% traveled from 1 - 25 miles to their hunting site. Suitable hunting locations can be found virtually anywhere in South Dakota; bowhunters have the option to hunt close to home.

Three hundred ninety-nine (48%) of the 833 respondents hunted in the evening and in the morning. Seventy-two percent hunted mornings and 82% hunted evenings. Garland (1972) reported that 76.3% of the deer harvested by Vermont bowhunters were taken in the evening.

If legal shooting hours were changed to close at 4 p.m. as in Minnesota, a considerable portion of the recreational opportunity would be denied South Dakota bowhunters. A reduction in bowhunter license sales might also result.

A steady decline in deer bowhunter activity was evident during the season. Seventy percent hunted during October, 55% in November, and 36% in December. Nine percent (72) hunted all season (n = 834).

Table 4. Approximate one-way distance to hunting areas of 838 South Dakota bowhunters, 1981.

Miles one way	Hunters	
	Number	Percent
1 - 10	347	41
11 - 30	303	36
31 - 50	116	14
> 50	72	9

Most activity might be expected in October as temperatures are warm and few other hunting seasons are open at the start of the month. Also, those bowhunters who are successful in bagging a deer will have stopped hunting.

Mean number of days hunted per month by 826 bowhunters decreased from 7.09 days in October to 3.65 days in December (Table 5). Mean number of days hunted throughout the season was 15.82 (standard deviation 11.97). South Dakota bowhunters reported a mean of 13.4 days hunted on their SDGFP big game hunter report card (Vaa 1982).

Attitudes

In answer to the question concerning the SDGFP reporting system, 497 (58%) bowhunters chose to continue the present licensing and mailing system. Non-reporting bowhunters responding to the identical question showed 79% (n = 375) preferring a change to post-season mailing. Non-reporters may have responded to the post-season mailing question as a means of developing an excuse. "I forgot to mail it" (Table 6) was checked by 49% of the non-reporters (n = 354).

The idea that bowhunters are more "dedicated" than firearm deer hunters is not a new one. Archery World (1979) reported that "dedicated" was the most commonly used adjective to describe bowhunters by firearm deer hunters. Six hundred thirty-five (75%) of 850 South Dakota bowhunters reported that they would continue to hunt deer with a bow if they were forced to choose between hunting deer with a bow or firearm. Similarly, 80% of 864 reported they would continue to bow hunt if they were restricted to a more primitive bow than the compound (i.e. recurve or longbow). Jackson and Norton (1982) used several attitude oriented questions to determine why bowhunters

Table 5. Mean days hunted as reported by 826 South Dakota bowhunters, 1981.

Month	Number of Days Hunted			
	Mean number	Maximum number	Minimum number	Standard deviation
October	7.09	30	0	5.86
November	5.08	30	0	5.52
December	3.65	25	0	4.67
All season	15.82	75	0	11.97

Table 6. Reasons claimed for failing to return mandatory Big Game Hunter Report Card by 354 non-reporters in South Dakota, 1981.

Reason	Number	Percent
I lost the card	86	24
I forgot to mail it	173	49
I didn't think it was important	33	10
I didn't know it was mandatory by law to return it	47	13
Other	15	4

participated in the sport. They reported that challenge (34.2%) rated highest followed by low hunting pressure (20.0%). Similarly they found that 80.8% would miss bowhunting more than most or all other interests, if for some reason they were unable to bow hunt for deer.

Crippling and failure to retrieve deer are problems of concern to wildlife managers (Stormer et al. 1979, Gladfelter et al. 1983). When posed with the question, "Do you feel that wounding by other archery deer hunters is a problem in South Dakota?", 671 bow hunters (78%) responded "no".

1981 Archery Deer Harvest

Success

Twenty-nine percent of 840 bowhunters were successful in harvesting a deer during the 1981 archery deer season (Table 7). Gladfelter (1982) reported a success rate of 26% for 1981 Iowa bowhunters. A significant difference existed between success rate from this study and the 42% ($\chi^2 = 39.97$ $P < 0.01$) rate reported on SDGFP report cards (Vaa 1982) (Table 7). The difference indicates that successful hunters returned SDGFP report cards at a greater rate than unsuccessful hunters biasing the success rate estimate. McKenzie et al. (1975) reported that in North Dakota successful bowhunters returned report cards at a rate greater than unsuccessful bowhunters.

I found that 19% of the non-reporters were successful (Table 7). Success rates of reporters (profile survey) and non-reporters (non-reporter survey) were significantly different ($\chi^2 = 13.40$ $P < 0.01$). Chi-square analysis revealed a significant difference ($\chi^2 = 24.20$

Table 7. Success rates of 1981 bowhunters responding to profile, non-reporter, and South Dakota Department of Game, Fish and Parks (SDGFP) report card surveys.

	Survey			
	Profile	Non-reporter	SDGFP Reporters ¹	SDGFP non-reporters
Number successful	240	93	1,463	657
% successful	29	19	42	12
Number unsuccessful	600	385	2,034	4,938
% unsuccessful	71	81	58	88

¹As calculated from SDGFP report card returns.

P < 0.01) in the non-reporter success rate reported in this study (19%) and the non-reporter success rate (12%) used by SDGFP to estimate harvest for non-reporters (Vaa 1982) (Table 7).

The number of successful hunters in the SDGFP report card survey added to the quantity of the non-reporter success rate found in this investigation (19%) multiplied by the number of non-reporters, gives a more accurate estimate of total harvest than is currently computed by SDGFP. Vaa (1982) reported a projected kill of 2,120 deer by 1982 resident bowhunters. The harvest estimate is more likely 2,552. The actual non-reporter success rate when used in conjunction with the success of reporters yields an overall success rate of 28%. The final result is an underestimation of total harvest where the figure 2,120 is 83% of 2,552, the total deer harvested by 1981 South Dakota bowhunters as calculated from my data.

Alternate Expressions of Harvest and Success

I found that 1.84 deer were harvested per 100 hunter days. Stormer et al. (1979) reported 4.36 deer harvested per 100 hunter days in Indiana. South Dakota bowhunters (840) took an average of 4 shots at deer during the season and 1 deer was harvested per 13.8 shots.

Unretrieved Deer

Crippling Loss Rate

Inadequate data were obtained to analyze crippling loss rate. Only 1 individual reported harvesting a previously arrow-wounded deer. However, many bowhunters do not butcher their own deer. Jackson and Norton (1982) found that 76% of the bowhunters skinned and 62%

butchered their own deer in Wisconsin. Arrow wounds might also go unnoticed unless each individual was reminded to look for such wounds which are necessary to determine crippling loss rate.

Rate of Crippling

One hundred seventy-five bowhunters (21%) (n = 840) reported hitting and failing to retrieve at least 1 deer. Of the 416 non-reporters sampled, 95 (23%) hit and failed to retrieve at least 1 deer. No significant difference existed in the rate of crippling between the profile and non-reporter groups ($P > 0.01$). Gladfelter (1982) reported that rate of crippling by Iowa bowhunters was 21.0%. McKenzie et al. (1975) reported that 4.9% of the 1974 North Dakota bowhunters sampled "fatally" hit and failed to retrieve a deer. Severinghaus (1963) reported average fatal crippling as 6.6% on Howland Island, New York. No attempt was made to determine whether or not a hit was a fatal wound in this study.

Other reported rates of crippling include 100% in Colorado (Tully and Gilbert 1957) and 50% in Virginia (Downing 1971). Haberland and McCaffery (1976) and Losch and Samuel (1976) deduced from literature data that 10% to 20% was the normal rate of crippling throughout the United States.

Two hundred twenty deer were hit and not retrieved by 175 individuals from the random sample of 1981 bowhunters. Ninety-five non-reporters hit 118 deer that were not retrieved. There was no significant difference ($P > 0.01$) between the 2 groups. One bowhunter in the profile group reported hitting 5 deer and failing to retrieve

all 5, while the maximum number of deer hit and not retrieved by non-reporters was 4.

Crippling Rate

Crippling rate reported by 1981 South Dakota bowhunters was 48% from the profile survey and 56% from the non-reporter survey. No attempt was made to detect differences since no difference was found in the number of deer crippled per bowhunter by each group. A crippling rate of 58% in Indiana was calculated from data reported by Stormer et al. (1979).

Alternate Expressions of Crippling

Stormer et al. (1979) reported 6 cripples per 100 hunter days and 14 deer crippled for every deer harvested in Indiana. We found 1.7 cripples per 100 hunter days and a 0.92 deer crippled per deer harvested. In South Dakota 1 deer was crippled for each 15 shots taken.

Relationship Between Success and Crippling

Within the profile group of bowhunters successful hunters crippled significantly more deer than unsuccessful hunters ($\chi^2 = 27.41$ P < 0.01) (Table 8). Stormer et al. (1979) also reported that successful bow hunters crippled more deer than unsuccessful bow hunters. Successful bowhunters may cripple deer frequently because as a group they may be more capable and knowledgeable hunters than are unsuccessful hunters and have more opportunities to shoot at deer. Gladfelter et al. (1983) thought that successful bowhunters may be more willing to admit crippling an animal than unsuccessful bowhunters. They found consistent rates of crippling regardless of number of years of experience and

suggested that training or field experience would not affect rates of crippling.

Recreational Opportunity and Harvest

According to Talsma (1982) 50,513 deer licenses were sold in South Dakota in 1981 (including non-residents); 9,417 (19%) of these were archery deer licenses. Harvest of 2,224 deer by all bowhunters (as calculated by SDGFP) represented 9% of the total statewide deer harvest (25,509) for the 1981 seasons. The archery deer season, with 83.2 man days of recreation per deer harvested, represented 70% of the recreation undertaken by all deer hunters in South Dakota during 1981.

Table 8. Frequency of crippling and success reported by 840 South Dakota bowhunters, 1981.

Number of deer crippled per hunter	Unsuccessful Hunters		Successful Hunters	
	Number	% of total	Number	% of total
0	499	83	166	70
1	89	15	56	23
2	7	1	13	5
3	3	< 1	3	1
4	2	< 1	1	< 1
5	0	0	1	< 1

CONCLUSIONS

Bowhunting represents a majority of the recreational opportunity for deer hunting in South Dakota, but only a minority of the deer harvested. These bowhunters are a heterogeneous group that come from different size communities, with varied levels of education, and are involved in the sport of deer bowhunting at different levels of intensity. They use different types of equipment with various degrees of success and behave differently except that they all pursue deer with a bow and arrow.

Almost 30% of the bowhunters have had no archery instruction. The potential exists for a broader based hunter education system in South Dakota. Bowhunter education should treat the areas of ethics, equipment, and deer anatomy.

Success of bowhunters was not related to type of bow or other equipment used. Regulation changes concerning use of equipment does not appear necessary at the present time.

The low response rate of bowhunters to the SDGFP report card results in an underestimation of projected harvest. Return of report cards by a higher percentage of successful bowhunters than unsuccessful biases the estimate derived from report card data. Changing to an end of season mailing and reporting scheme of randomly sampled bowhunters with follow-up as needed should be tested with the SDGFP report card to determine the effect on response rate.

Success rate of non-reporters found in this investigation should be used by SDGFP to determine harvest by non-reporters. In the future non-reporters could be sampled periodically in a random fashion (perhaps every 5 years) to detect need for further modification of the success rate.

Twenty-one percent of all bowhunters hit and failed to retrieve at least 1 deer. Crippling of deer by bowhunters, approximately 1 unretrieved deer per 1 harvested deer, poses little threat to the South Dakota resource.

Crippling loss rate is still unknown. A means for determining the loss rate of deer to bowhunters and to the deer population (fatal crippling) should be investigated. Analysis of factors affecting rate of success and crippling might be possible through multi-variate analysis of data collected in this study on equipment used, hunting methods employed, and attitudes of the South Dakota archery deer hunters.

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APPENDIX A



South Dakota
Cooperative Wildlife Research Unit

ARCHERY
DEER
RESEARCH

SOUTH DAKOTA STATE UNIVERSITY, P.O. BOX 2207, BROOKINGS, SOUTH DAKOTA 57007-1696

As a fellow bowhunter I am asking for your help. The South Dakota Cooperative Wildlife Research Unit at South Dakota State University has specially selected you to participate in an important archery deer hunter research project. At the end of the Archery Deer Season we are going to mail you a survey form that should require 20 minutes or less to complete. If you return the completed survey you will be entered in a drawing for a Jennings T-Star compound bow with an Ace-in-the-Hole quiver.

The survey will cover such areas as your experiences during the 1981 Archery Deer Season, background, hunting methods, archery equipment, expenditures, your bowhunting history, and some management questions. This information is important to the overall management of the deer resource in South Dakota. The accumulated data will provide biologists with information that will aid them in better understanding the attitudes and methods of South Dakota archery deer hunters, will enable big game biologists to more accurately measure bowhunter use and effects on the deer resource, and provide justification for the sport as a valid management tool.

Your Archery Deer License number will accompany your survey form to facilitate data analysis. Publication of results will be in the form of frequencies or averages to insure confidentiality of each individual's response.

Enclosed with this letter is a sheet to assist you in keeping track of your bowhunting activities throughout the 1981 Archery Deer Season. This record sheet will make it easier for you to complete the survey questions at the end of the season.

The drawing for the bow, in February, will include all individuals who return a completed survey within the allotted time period. Your cooperation is extremely important to the future of the South Dakota Archery Deer Season! I wish you the best of luck this season.

Sincerely,

Kelly B. McPhillips
Wildlife Research Biologist
S.D. Coop. Wildlife Res. Unit

KBM/aam
Enclosure

1981 ARCHERY DEER SEASON

RECORD SHEET

CIRCLE THE DAYS OF EACH MONTH THAT YOU ARCHERY DEER HUNT.

OCTOBER										NOVEMBER							DECEMBER				
		1	2	3			1	2	3	4	5	6	7			1	2	3	4	5	
4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12	
11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19	
18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26	
25	26	27	28	29	30	31	29	30						27	28	29	30	31			

SCORE NUMBER OF SHOTS TAKEN AT DEER EACH MONTH. EXAMPLE: 44

OCTOBER	NOVEMBER	DECEMBER
---------	----------	----------

KILL DATE _____
(Month/Day/Year)

check (✓) one:

- WHITE-TAILED BUCK
 WHITE-TAILED DOE
 MULE DEER BUCK
 MULE DEER DOE

Approximated Bowhunting Expenditures for 1981 (to the nearest dollar)

Item	Amounts	Total
Bows and Arrows _____		\$ _____
Accessories _____		_____
Clothing _____		_____
Footgear _____		_____
Overnight Accommodations _____		_____
Meals _____		_____
Fuel _____		_____
Miscellaneous _____		_____

APPENDIX B



South Dakota
Cooperative Wildlife Research Unit

ARCHERY
DEER
RESEARCH

SOUTH DAKOTA STATE UNIVERSITY, P. O. BOX 2207, BROOKINGS, SOUTH DAKOTA 57007-1696

2 January 1982

The Archery Deer Season has come to a close. I hope you had ample opportunity to enjoy it. Enclosed is a copy of the 1981 Archery Deer Survey discussed in the letter we sent you earlier in the season. Your time and effort are greatly appreciated. Instructions are self-explanatory. Please be sure to complete all questions on both sides of the sheets.

Please return the survey at your earliest convenience in the enclosed addressed, stamped envelope. If your completed survey is not received prior to 18 January 1982, you will be contacted a second time. On receipt of your survey you will be entered in the drawing for the Jennings T-Star compound bow. Thanks again!

Sincerely,

Kelly B. McPhillips
Wildlife Research Biologist
S.D. Coop. Wildlife Res. Unit

KBM/aam

Enclosures: 1 envelope
1 survey form

1981 ARCHERY DEER HUNTER SURVEY

SOUTH DAKOTA COOPERATIVE
WILDLIFE RESEARCH UNIT
South Dakota State University
P.O. Box 2207
Brookings, SD 57007

A study to determine the characteristics and success of
South Dakota's archery deer hunters.

LICENSE #

INSTRUCTIONS: Please check (✓) the appropriate response or provide the number where necessary for each question.
If your answer is ZERO please enter "0". Some questions may have more than one answer.

BACKGROUND AND EXPENDITURES

1. What is your age? _____ under 20 _____ 50-59
 _____ 20-29 _____ 60-69
 _____ 30-39 _____ 70 or older
 _____ 40-49
2. Are you a male or a female? _____ male
 _____ female
3. What is the size of the community in which you presently live?
 _____ rural (open-country or farm) _____ town 5,000-9,999
 _____ town less than 1,000 _____ town 10,000-49,999
 _____ town 1,000-2,499 _____ town larger than 50,000
 _____ town 2,500-4,900
4. What is the highest grade of school you have completed? (Circle one number)
- | Grades of School | | | | | | | | | | | | College | | | | |
|------------------|---|---|---|---|---|---|---|---|----|----|----|---------|----|----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | more |
5. Are you presently: _____ employed _____ full-time student
 _____ unemployed _____ full-time homemaker
 _____ retired
- NOTE: Question 6 asks for the number of dollars spent for each item. Estimate to the nearest dollar. Refer to your record sheet.
6. In the course of archery deer hunting in 1981, approximately how much did you spend on the following items and services.
- | | |
|--------------------------|-----------------------------------|
| \$ _____ bows and arrows | \$ _____ overnight accommodations |
| \$ _____ accessories | \$ _____ meals |
| \$ _____ clothing | \$ _____ fuel |
| \$ _____ footgear | \$ _____ miscellaneous |

In accordance with the Federal Privacy Act (PL 93-579), please be advised that: 1) Your participation in this survey is voluntary and your individual response is strictly confidential. 2) This information will be used for the purpose of furthering the management of big game resources by the Department of Game, Fish and Parks. 3) The collection and distribution of such statistics as shall be necessary for the purpose of conservation is authorized by SDCL 41-3-2.

PLEASE BE SURE TO COMPLETE THE QUESTIONS ON THE BACK OF THIS PAGE !

HISTORY

7. How many years have you purchased an Archery Deer License either in South Dakota or in another state? (total number of years)
- 1 year (if 1981 was first year)
 2 - 3 years
 4 - 5 years
 more than 5 years
8. How many years have you purchased an Archery Deer License in South Dakota? (total number of years)
- 1 year (if 1981 was first year)
 2 - 3 years
 4 - 5 years
 more than 5 years
9. Did you purchase a South Dakota Archery Deer License in 1980?
- yes
 no
10. Did you kill a deer in 1980?
- yes
 no
11. Have you ever hunted deer with a firearm?
- yes
 no
12. In 1981 did you spend more days hunting deer with a bow than hunting deer and other game species with a firearm?
- yes
 no
- NOTE: Questions 13 and 14 may have more than one answer. (check as many as apply)
13. In 1981 did you hunt game species other than deer with a bow? (check as many as apply)
- yes. I hunted antelope with a bow
 yes. I hunted elk with a bow
 yes. I hunted small game with a bow (squirrels, rabbits, ducks, pheasants)
 no
14. Have you ever received any archery instruction? (check as many as apply)
- yes. from a book
 yes. from an instructor
 yes. from a parent or friend
 no
15. Do you belong to any archery organization(s) such as the National Field Archery Association, American Archery Association, Professional Archers Association, or a local archery club?
- yes
 no

CONTINUED ON NEXT PAGE

EQUIPMENT

16. What type of bow did you hunt deer with in 1981? longbow
 recurve
 compound
17. How long have you been shooting the bow you hunted deer with in 1981?
 less than 4 months
 4 - 8 months
 9 - 12 months
 more than 1 year
18. Did you use sights on your hunting bow in 1981?
 yes. I use telescopic or lighted sights
 yes. I use a rangefinder sight
 yes. I use pin sights
 no
19. Did you use a mechanical string release when you hunted in 1981?
 yes
 no
20. Do you hunt with one particular type of hunting broadhead?
 yes. it has 2 cutting edges
 yes. it has 3 cutting edges
 yes. it has 4 cutting edges
 yes. it has more than 4 cutting edges
 no. I have no particular preference for any type of broadhead

METHODS

21. How many scouting trips did you take in 1981 before the first day you hunted archery deer in 1981?
 none (0)
 1 - 2
 3 - 5
 6 - 10
 more than 10 scouting trips
22. How many hours did you practice from August 1, 1981, until the first day you hunted archery deer in 1981? (total number of hours)
 0 hours
 1 - 5 hours
 6 - 10 hours
 11 - 20 hours
 more than 20 hours

PLEASE BE SURE TO COMPLETE THE QUESTIONS ON THE BACK OF THIS PAGE !

23. How many hours did you practice with your hunting bow during the 1981 Archery Deer Season? (in hours per week)
- 0 hours per week
 1 - 5 hours per week
 6 - 10 hours per week
 more than 10 hours per week
24. Which archery deer hunting technique did you use most often in 1981? (check one)
- walk alone
 take a stand alone
 hunt as a group
 other (explain) _____
25. When you were involved in a group drive, how many other people did you USUALLY hunt with? (check one)
- I don't hunt in a group
 1 other person
 2 - 5 other people
 more than 5 other people
26. When you hunted from a stand or blind, what type did you USUALLY hunt from? (check one)
- I didn't hunt from a stand or blind
 tree stand
 ground blind
 tower
27. Do you hunt for:
- only Mule deer
 only White-tailed deer
 either White-tailed deer or mule deer
28. Do you hunt for:
- any deer
 only bucks early season, any deer late season
 only bucks
 only does
29. In which county did you usually hunt deer in 1981?
- I usually hunted in the county in which I live
 I usually hunted in a county other than the county in which I live
30. Approximately what is the usual one-way distance that you travel to hunt archery deer?
- 1 - 10 miles
 11 - 30 miles
 31 - 50 miles
 more than 50 miles

CONTINUED ON NEXT PAGE

NOTE: Questions 31 and 32 may have more than one answer. (Check as many as apply.)

31. Check the period(s) of the day during which you most often hunted archery deer in 1981. (check as many as apply)

morning
 mid-day (10 a.m.-2 p.m.)
 evening

32. Check the month(s) during which you concentrated your archery deer hunting efforts in 1981. (check as many as apply)

October
 November
 December

YOUR 1981 ARCHERY DEER SEASON

33. How many days did you archery deer hunt during each of the 3 months of the 1981 Archery Deer season? (refer to your record sheet)

October
 November
 December

34. How many deer did you hit during the 1981 Archery Deer Season that you were unable to retrieve?

total number of deer hit

35. How many shots at deer did you take throughout the entire season. (refer to your record sheet)

total number of shots

36. Did you kill a deer this season?

yes (month/day)_____ kill date
 no

NOTE: Only complete questions 37 and 38 if you killed a deer in 1981. Continue with question 39.

37. Was the deer you killed in 1981 a:

White-tailed buck Mule deer buck
 White-tailed doe Mule deer doe

38. Was there evidence that the deer you killed had been arrow-wounded earlier in the Archery Deer Season? (healed wound, fresh wound, new scar, arrow or broadhead fragment under the skin or lodged in a bone)

yes
 no

PLEASE BE SURE TO COMPLETE THE QUESTIONS ON THE BACK OF THIS PAGE !

MANAGEMENT

39. If you received a record sheet similar to the one you were supplied with for this study would you prefer to receive your Archery Deer Season hunter report card in the mail at the end of the Archery Deer Season or at the beginning with your license packet, as is presently the case? at the beginning of the Archery Deer Season
 at the end of the Archery Deer Season
40. Would you continue to hunt archery deer if you had to choose between a Rifle or an Archery Deer License each year? (excluding Black Hills and Sand Lake) yes
 no
41. Would you be hunting archery deer if compound bows were unavailable and you had to use the more primitive longbow or recurve bow? yes
 no
42. Do you feel that wounding by other archery deer hunters is a problem in South Dakota? yes
 no

Thank you! That is all of the questions. If you have any comments you would like to make, please feel free to use the space provided below. If you wish to receive a copy of the project results, please include your name and address on a separate piece of paper (not on the questionnaire) and we will see that you get one.

Don't forget to return your report card to S.D. Department of Game, Fish and Parks. This survey is in addition to and not a substitute for the report card you received with your license.

APPENDIX C



South Dakota
Cooperative Wildlife Research Unit

ARCHERY
DEER
RESEARCH

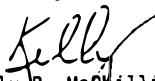
SOUTH DAKOTA STATE UNIVERSITY, P.O. BOX 2207, BROOKINGS, SOUTH DAKOTA 57007-1696

19 January 1982

According to our check list of Archery Deer License numbers, you have not completed and returned the 1981 Archery Deer Survey sent to you on 2 January 1982 by the South Dakota Cooperative Wildlife Research Unit. Another copy of the survey and an addressed stamped, return envelope have been enclosed in case you misplaced the first. Please complete the survey and return it at your earliest convenience. Your time and effort are greatly appreciated.

If you have completed and mailed the first survey and we haven't yet received it, please forgive us and disregard this letter. On receipt of your completed survey form you will be entered in the drawing for the Jennings T - Star compound bow. Thanks again.

Sincerely,


Kelly B. McPhillips
Wildlife Research Biologist
S.D. Coop. Wildlife Res. Unit

KBM/do

APPENDIX D



South Dakota
Cooperative Wildlife Research Unit

ARCHERY
DEER
RESEARCH

SOUTH DAKOTA STATE UNIVERSITY, P. O. BOX 2207, BROOKINGS, SOUTH DAKOTA 57007-1696

5 February 1982

Another Archery Deer Season has come and gone with archery deer hunters, again, having enjoyed more recreational hours than all other deer hunters in South Dakota. Except for the low return rate (35%) of archery deer hunter report cards, the season was a success. The information gathered from these report cards is important in setting a season that is acceptable to sportsmen and insures the condition of the deer resource.

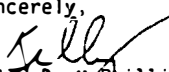
The Unit, in cooperation with the South Dakota Department of Game, Fish and Parks, is contacting a selected portion of the 1981 non-reporting archery deer hunters, including yourself. Our objectives are to determine the success rate of archery deer hunters that have failed to return the mandatory report card supplied with the license and to investigate methods which will increase the return rate of report cards by archery deer hunters.

Please take the few minutes required to complete the 8 brief questions in the survey. Enclosed is a self-addressed stamped envelope, which may be used to return the survey to the South Dakota Cooperative Wildlife Research Unit at South Dakota State University at your earliest convenience.

Your cooperation is voluntary and individual responses are kept confidential. Your license number accompanies your survey form to facilitate data analysis. The results of this survey will be published in the form of percentages or averages and not as individual responses.

Your participation is extremely important and will be very helpful to the future of the South Dakota deer resource. Thanks for your time and trouble.

Sincerely,


Kelly B. McPhillips
Wildlife Research Biologist
SD Coop. Wildlife Res. Unit

am

Enclosures: Survey form
Envelope

1981 ARCHERY DEER HUNTER SURVEY

SOUTH DAKOTA COOPERATIVE
WILDLIFE RESEARCH UNIT
South Dakota State University
P.O. Box 2207
Brookings, SD 57007

A study to determine the characteristics and success of
South Dakota's archery deer hunters.

LICENSE #

INSTRUCTIONS: Please check (✓) the appropriate response or provide the number where necessary for each question.
If your answer is ZERO please enter "0". Some questions may have more than one answer.

YOU'R 1981 ARCHERY DEER SEASON

1. How many days did you Archery Deer hunt during each of the 3 months of the 1981 Archery Deer Season?
 - _____ Days during October
 - _____ Days during November
 - _____ Days during December
2. How many shots at deer did you take throughout the entire 1981 Archery Deer Season?
 - _____ Total number of shots
3. How many deer did you hit during the 1981 Archery Deer Season that you were unable to retrieve?
 - _____ Total number of deer hit
4. Did you kill a deer in 1981?
 - _____ Yes, kill date: _____ Month/day
 - _____ No

NOTE: If you did not kill a deer in 1981 complete questions 7 and 8.
Only complete questions 5 and 6 if you killed a deer in 1981.

5. Was your deer a
 - _____ White-tailed buck
 - _____ Mule deer buck
 - _____ White-tailed doe
 - _____ Mule deer doe
6. Was there any evidence that the deer you killed had been arrow-wounded earlier in the Archery Deer Season (healed wound, fresh wound, new scar, arrow or broadhead fragment under the skin or lodged in a bone)?
 - _____ Yes
 - _____ No
7. With a non-reporting rate of more than 60% among our Archery Deer hunters, we need to find out why they are not returning their report cards. Which answer best explains why Game, Fish and Parks did not receive your 1981 Archery Deer Season hunter report card?
 - _____ I lost the card
 - _____ I forgot to mail it
 - _____ I didn't think it was important
 - _____ I didn't know it was mandatory by law to return it
 - _____ Other (explain) _____
8. If a record sheet were provided with your license to record your Archery Deer hunting activities, would you prefer to receive your Archery Deer Season hunter report card in the mail at the end of the Archery Deer season or in the beginning of the season with your license packet, as is presently the case?
 - _____ At the beginning of the Archery Deer Season
 - _____ At the end of the Archery Deer Season

In accordance with the Federal Privacy Act (PL-93-579), please be advised that: 1) Your participation in this survey is voluntary and your individual response is strictly confidential. 2) This information will be used for the purpose of furthering the management of big game resources by the Department of Game, Fish and Parks. 3) The collection and distribution of such statistics as shall be necessary for the purpose of conservation is authorized by SDCL 41-12.



South Dakota
Cooperative Wildlife Research Unit

ARCHERY
DEER
RESEARCH


SOUTH DAKOTA STATE UNIVERSITY, P.O. BOX 2207, BROOKINGS, SOUTH DAKOTA 57007-1696

22 February 1982

According to our checklist of Archery Deer License numbers, you are among the few that have not returned the survey form sent to you on 5 February 1982 by the South Dakota Cooperative Wildlife Research Unit. I have included another copy of the survey form with this letter and hope that you will take the few minutes required to answer the 8 questions.

Enclosed is a self-addressed, stamped envelope for you to return the survey form to the South Dakota Cooperative Wildlife Research Unit at South Dakota State University. Please do so at your earliest convenience. If you have completed and mailed the first survey and we haven't yet received it, please forgive us and disregard this letter. Your help and time are greatly appreciated.

Sincerely,


Kevin B. McPhillips
Wildlife Research Biologist
SD Coop. Wildlife Res. Unit

am

Enclosures: Survey form
Envelope

APPENDIX TABLES

Table 1. Size of community where 885 South Dakota bowhunters lived, 1981.

Community population	Number	Percent
Rural	197	22
< 1,000	134	15
1,000 - 2,499	91	10
2,500 - 4,999	66	8
5,000 - 9,999	56	7
10,000 - 49,999	229	26
50,000 or more	108	12

Table 2. Years of education completed by 887 South Dakota bowhunters, 1981.

No. years	Number	Percent
6	5	1
7	13	1
8	33	4
9	24	3
10	45	5
11	39	4
12	358	40
13	82	9
14	95	11
15	36	4
16	79	9
> 16	78	9

Table 3. Occupational status of 883 South Dakota bowhunters, 1981.

Occupational status	Number	Percent
Employed	678	77
Unemployed	42	5
Retired	11	1
Full-time student	141	16
Full-time homemaker	11	1

Table 4. Bowhunting experience reported by 870 South Dakota bowhunters, 1981.

Years experience	Number	Percent
1	176	20
2 - 3	277	32
4 - 5	142	16
5 or more	275	32

Table 5. Number of 1981 South Dakota bowhunters (N = 869) who also purchased a 1980 Archery Deer Permit.

Response	Number	Percent
Yes	576	66
No	293	34

Table 6. Number of 1981 South Dakota bowhunters (N = 870) with past firearm deer hunting experience.

Response	Number	Percent
Yes	768	88
No	102	12

Table 7. Species of game other than deer that 869 South Dakota bowhunters reported hunting with a bow, 1981. More than one species was reported by many bowhunters.

Species	Number	Percent
None	628	73
Small game	210	25
Pronghorn antelope	39	5
Elk	17	2

Table 8. Number of 1981 South Dakota bowhunters who reported some form of archery instruction (N = 870). Many bowhunters had more than one form of instruction.

Source of instruction	Number	Percent
None	251	29
Parent or friend	451	52
Book	245	29
Instructor	215	25

Table 9. Number of 1981 South Dakota bowhunters interviewed that were members of archery or bowhunting organizations.

Membership	Number	Percent
Yes	128	15
No	742	85

Table 10. Types of bows used by 876 South Dakota bowhunters, 1981.

Type	Number	Percent
Longbow	7	1
Recurve	145	16
Compound	724	83

Table 11. Length of bow ownership by 873 South Dakota bowhunters, 1981.

Length of time	Number	Percent
< 4 months	150	17
4 - 8 months	100	11
9 - 12 months	50	6
> 1 year	573	66

Table 12. Type of bow sights used by 875 South Dakota bowhunters, 1981.

Type	Number	Percent
None	487	55
Pin sights	361	41
Range finder	24	> 3
Telescopic or lighted	3	< 1

Table 13. Use of mechanical string releases by 871 South Dakota bowhunters, 1981.

Release use	Number	Percent
Yes	42	5
No	829	95

Table 14. Arrow tip broadhead types used by 875 South Dakota bowhunters, 1981.

Broadhead type	Number	Percent
2 cutting edges	49	6
3 cutting edges	176	20
4 cutting edges	549	63
> 4 cutting edges	31	3
No preference	70	8

Table 15. Frequency of preseason scouting trips taken by 876 South Dakota bowhunters, 1981.

Number of trips	Number	Percent
None	190	22
1 - 2	256	29
3 - 5	275	31
6 - 10	66	8
> 10	89	10

Table 16. Hours of preseason target practice reported by 875 South Dakota bowhunters, 1981.

Total no. hours	Number	Percent
None	76	9
1 - 5	225	26
6 - 10	196	22
11 - 20	144	16
> 20	234	27

Table 17. During season practice in hours per week reported by 838 South Dakota bowhunters, 1981.

Hours/week	Number	Percent
None	228	27
1 - 5	517	62
6 - 10	66	8
> 10	27	3

Table 18. Bowhunting strategies most often used as reported by 835 South Dakota bowhunters, 1981.

Strategy	Number	Percent
Still hunt	179	21
Take stand alone	480	57
Hunt as a group	172	21
Other	4	1

Table 19. Type of blind or stand used as reported by 836 South Dakota bowhunters, 1981.

Type	Number	Percent
Don't use blind	117	14
Tree stand	534	64
Ground blind	185	22
Tower	0	0

Table 20. Group sizes of deer drives as reported by 835 South Dakota bowhunters, 1981.

Group size	Number	Percent
Don't hunt in group	320	38
1 other person	245	29
2 - 5 other people	240	29
> 5 other people	30	4

Table 21. Deer selection by 834 South Dakota bowhunters, 1981.

Deer	Number	Percent
Any deer	270	33
Bucks only early/ any deer late season	395	47
Bucks only	169	20
Does only	0	0

Table 22. County where 836 South Dakota bowhunters reported bowhunting for deer, 1981.

County	Number	Percent
County where bowhunter lives	586	70
Other county	250	30

Table 23. Period(s) of day most often hunted as reported by 833 South Dakota bowhunters, 1981.

Period of day	Number	Percent
All day	82	10
Morning and evening	399	48
Morning	596	72
Mid-day (10 a.m. - 2 p.m.)	11	1
Evening	682	82

Table 24. Time of season primarily hunted by 834 South Dakota bowhunters, 1981.

Time of season	Number	Percent
All season	72	9
October	586	70
November	458	55
December	298	36

Table 25. Preference for pre- or post-season mailing of hunter report card by 375 non-reporter questionnaire respondents and 858 profile questionnaire respondents, 1981.

Survey	Time of mailin	Number	Percent
Non-reporters	Pre-season	78	21
	Post-season	297	79
Profile	Pre-season	497	58
	Post-season	361	42

Table 26. Reported preference for bowhunting under either a firearm or bow license for deer by 850 South Dakota bowhunters, 1981.

Choose bowhunting over firearm	Number	Percent
Yes	635	75
No	215	25

Table 27. Response of 864 South Dakota bowhunters asked if they would continue to hunt with bow and arrow if only recurve bows or longbows could be used, 1981.

Would use recurve or longbow	Number	Percent
Yes	690	80
No	174	20

Table 28. Attitudes of 856 South Dakota bowhunters towards crippling of deer, 1981.

Crippling is a problem	Number	Percent
Yes	185	22
No	671	78

Table 29. Mean number of shots taken at deer during the archery deer season by 836 South Dakota bowhunters, 1981.

Mean no. shots	Standard deviation	Min.	Max.	Sum
3.95	4.91	0	53	3,304

Table 30. Comparison of reported number of deer wounding bowhunters between non-reporter and profile questionnaires.

	Wounding	Number	Percent
Profile	Yes	175	21
	No	665	79
Non-reporter	Yes	95	23
	No	321	77

Table 31. Comparison of reported number of deer wounded and not retrieved by number of wounding bowhunters between profile and non-reporter questionnaires.

	No. bowhunters wounding deer	No. deer wounded
Profile	175	220
Non-reporter	95	118