



**AN ASSESSMENT OF  
NEW JERSEY RESIDENT HUNTER OPINION  
ON CROSSBOW USE**

**Survey mailed: December 2007  
Data analyzed: January 2008**

**Division of Fish and Wildlife**  
David Chanda, Director  
Larry Herrighty, Assistant Director

**Bureau of Wildlife Management**  
Patrick C. Carr, Supervising Wildlife Biologist

by  
**Deer Research Project**  
Carole Kandoth, Principal Wildlife Biologist  
Joseph Garris, Wildlife Technician

## EXECUTIVE SUMMARY

The crossbow has become a popular hunting tool throughout the United States, with only three states in the country not permitting crossbow use of any kind. Interest in crossbows among New Jersey hunters has grown as well, as evidenced by requests to the Division of Fish and Wildlife to add the crossbow to the list of legal hunting weapons.

The Fish and Game Council acknowledged this growing interest in crossbows, as well as an objection to crossbows among some hunters. Therefore, in order to supply the Fish and Game Council with sound data on which to base its decision, the Division of Fish and Wildlife conducted a scientifically sound survey. This was done to determine the opinion of a random selection of hunters who represented all New Jersey hunters, rather than just those who took the time to directly contact the Division.

The survey was conducted in December 2007 to determine the opinion of resident hunters on the expansion of crossbow use for deer hunting in New Jersey. Currently, only people with disabilities are permitted to hunt with crossbows. A survey was mailed to 2,030 resident hunters who purchased licenses using the Division's automated licensing system. One thousand, forty-seven surveys were returned (51.6 %) indicating a very strong interest in this subject. A summary of results follows:

### PARTICIPATION IN DEER HUNTING IN NEW JERSEY

- ▶ Resident license buyers were asked which deer seasons they participate in. Only three percent of respondents were not deer hunters. User groups were defined by the seasons hunted, breaking down deer hunters into bow and gun hunters, gun-only hunters, and bow-only hunters. It was determined that 72% of participating deer hunters use both bow and guns; 23% hunt with guns only; and 5% hunt with bows only.

### SUPPORT FOR CROSSBOWS FOR DEER HUNTING

- ▶ Total support (strong support and moderate support) for the expansion of the use of crossbows for deer hunting was overwhelmingly in favor (73%) among all respondents.
- ▶ When broken down by user groups, total support was still in favor of crossbows: bow & gun hunters, 72%; gun-only hunters, 79%; bow-only hunters, 67%. The majority of non-deer hunters were also in favor of crossbows (56%).

► When broken down by affiliation (hunt club member, NJ Federation of Sportsmen’s Clubs member, member of both, or unaffiliated), support was still in favor of crossbows: hunt club, 74%; Federation, 74%; both, 63%; unaffiliated, 74%. Total opposition (strong opposition and moderate opposition) between affiliations: hunt club, 23%; Federation, 25%; both, 30%; unaffiliated, 21%.

#### PLACEMENT OF CROSSBOWS

► Supporters of crossbows were asked in which deer season(s) should crossbow use be allowed. The selection “all bow seasons” was preferred (54%) by all respondents. The second most popular choice of all respondents was “all deer seasons” (24%).

► When broken down by user group, the favored response was still “all bow seasons”: bow & gun hunters, 53%; gun-only hunters, 55%; bow-only hunters, 53%. The second most popular choice among user groups were as follows: bow & gun hunters, “all deer seasons” (25%); gun-only hunters, “all deer seasons” (21%); bow-only hunters, “all deer seasons”, “all gun seasons”, and “permit bow season”, all tied at 8%.

#### SUPPORT FOR CROSSBOWS TO CONTROL DEER POPULATIONS

► Participants were asked if they support the use of crossbows in areas where it is difficult to control deer. Total support among all respondents was 74%.

► When broken down by user group, total support in favor of using crossbows in areas where it is difficult to control deer was: bow & gun hunters, 73%; gun-only hunters, 81%; bow-only hunters, 70%.

#### LEGAL AGE FOR CROSSBOW USE

► Participants were asked what age group(s) should be legal for crossbow use. The majority of all respondents chose age “17 and older” (23%); the second favored response was “all ages” (17%).

## PARTICIPATION IN CROSSBOW HUNTING

- ▶ Respondents were asked how likely they were to hunt with a crossbow now, if legalized. The majority of all respondents (60%) will likely use a crossbow.
- ▶ When broken down by user group, the majority of hunters still agree they will use a crossbow now: bow & gun hunters, 62%; gun-only hunters, 59%; bow-only hunters, 54%.
- ▶ Respondents were also asked if they thought they might use a crossbow as they grow older. The majority of all respondents would use a crossbow as they age (64%). When broken down by user group, the majority of hunters think they will use a crossbow as they age: bow & gun hunters, 68%; gun-only hunters, 61%; bow-only hunters, 53%.

## SUPPORT FOR CROSSBOW USE BY WOMEN AND YOUTHS

- ▶ The majority of respondents supported the use of crossbows by women and youths that cannot draw back a regular bow (57%).

## AFFILIATION

- ▶ The majority of respondents were unaffiliated (55%); 29% belonged to a hunting club, 10% belonged to the NJ Federation of Sportsmen's Clubs, and 6% belonged to both a hunting club and the Federation.

## YEARS HUNTED IN NEW JERSEY

- ▶ Participants were asked how many years they have been hunting in New Jersey. The majority (39%) of respondents has been hunting between 21 and 40 years. However, this data is biased in that Youth hunters (those with a free youth license, ages 10 through 16) were not included in this survey.

## AGE AND GENDER

- ▶ The majority of participating hunters were 40 years old or older (76%); however, this data is biased toward older hunters as Youth hunters (those with a free youth license, ages 10 through 16) were not included in this survey.
- ▶ The overwhelming majority of respondents were male (99%).

## Introduction and Methodology

The study entailed a mail survey of resident hunting license holders to identify opinions regarding if, how, and when crossbow use should be expanded in New Jersey. The sample was obtained through the Electronic Licensing System (ELS), which has accumulated data on license holders since its implementation in 2006. Specific aspects of the methodology employed are discussed below.

Due to time constraints resulting from the Fish and Game Council's desire to vote on amendments to the 2009-10 Game Code by the end of January 2008, survey participants were drawn from the ELS database of all resident licenses sold from November 1, 2006 through October 31, 2007, rather than from the calendar year 2007 license sales.

The survey package consisted of an introductory letter from Director Chanda, a one-page survey, and a self-addressed, stamped envelope. Instructions were to return the survey no later than December 15, 2007. Data entry was cut off on December 19, 2007.

Previous mail surveys conducted in-house by the Division, as well as professional surveys done by contractors, resulted in a 20% return rate. In order to obtain a 95% confidence interval with a plus or minus 5% sampling error, the sample size of 406 returned and usable surveys was determined using the following formula and a New Jersey resident hunter population size of 85,957.

$$B = \left( \sqrt{\frac{\frac{N_p (.25)}{N_s} - .25}{N_p - 1}} \right) (1.96)$$

Where: B = maximum sampling error

$N_p$  = population size (total number that could be surveyed)

$N_s$  = sample size (total number of respondents surveyed)

(Derived from formula: p. 206 in Dillman, D.A. 2000. *Mail and Internet Surveys*. John Wiley & Sons, NY.)

Sampling error is the expected probable difference between a census (surveying all 85,957 resident hunters) versus a scientific sample drawn from the resident hunter population. Sampling error increases as the number responding to each question (n) decreases. Therefore, smaller subgroups of the total surveyed population are subject to more error than is the total surveyed population.

In order to obtain a completed survey size of 406, five times that amount, or 2,030 license holders names were pulled from the ELS database. Nine resident license type holder data were pooled. The percentage of each license type was calculated from the total resident license types. Those percentages were then applied to the total sample pull of 2,030 to determine how many of each license type were needed. The total of each license type was then divided by the desired sample needed for that license type to obtain the sampling interval. Calculations showed every 42.34335 license for each type should be pulled. This was rounded down to every 42<sup>nd</sup> license. Each license type was sorted by ascending CID number, and then every 42<sup>nd</sup> license was pulled (see Table 1).

Table 1.

| Privilege # | License type | number sold | % of total res sales | sample size | Number drawn |
|-------------|--------------|-------------|----------------------|-------------|--------------|
| 1           | AA           | 15501       | 0.180334             | 366         | 42.34335     |
| 203         | RB           | 15922       | 0.185232             | 376         | 42.34335     |
| 204         | Sr B         | 1798        | 0.020917             | 42          | 42.34335     |
| 206         | RF           | 44603       | 0.518899             | 1053        | 42.34335     |
| 207         | RF Sr        | 7289        | 0.084798             | 172         | 42.34335     |
| 216         | RB DV        | 63          | 0.000733             | 1           | 42.34335     |
| 217         | Sr RB DV     | 139         | 0.001617             | 3           | 42.34335     |
| 218         | RF DV        | 343         | 0.00399              | 8           | 42.34335     |
| 219         | RF Sr DV     | 299         | 0.003478             | 7           | 42.34335     |
| Total       |              | 85957       | 1                    | 2030        |              |

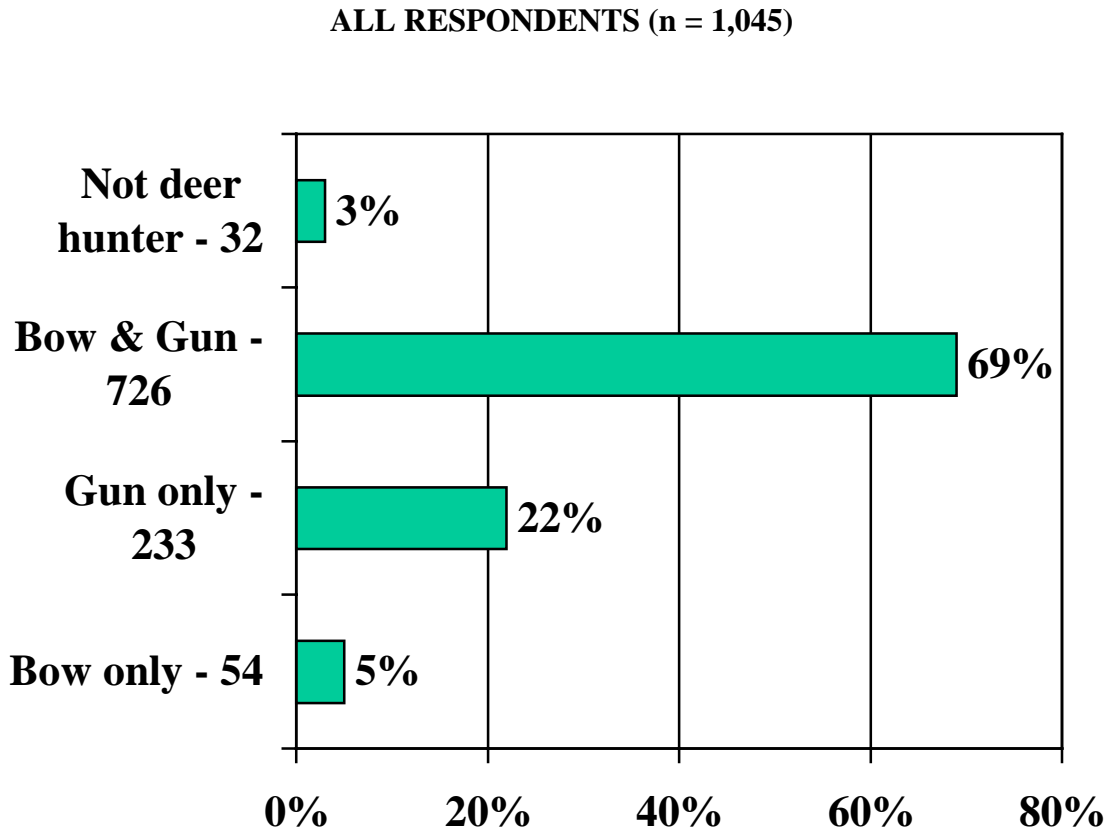
Fifty surveys were returned as non-deliverable. The response rate of usable surveys received before the data entry cut-off was 51.6% instead of the anticipated 20% response rate. Total number of respondents used was 1,047, instead of the anticipated 406. Therefore, sampling error is plus or minus 3.0 percentage points when all respondents answered the question. Chi square statistical analysis was performed on responses between user groups to determine significance. An alpha level of .05 was used to determine significance among responses to questions by various user groups.

Note that user groups were determined by respondents' answer to Question 1, rather than by hunting license type. Some results may not sum exactly to 100% because of rounding.

**Q1. What deer season(s) do you participate in?**

Although participants were asked specifically what deer seasons they hunted in, the response was too complex to graph, as it totaled 50 permutations. Therefore, answers were lumped into bow users, gun users, both bow and gun users, and non-deer hunters.

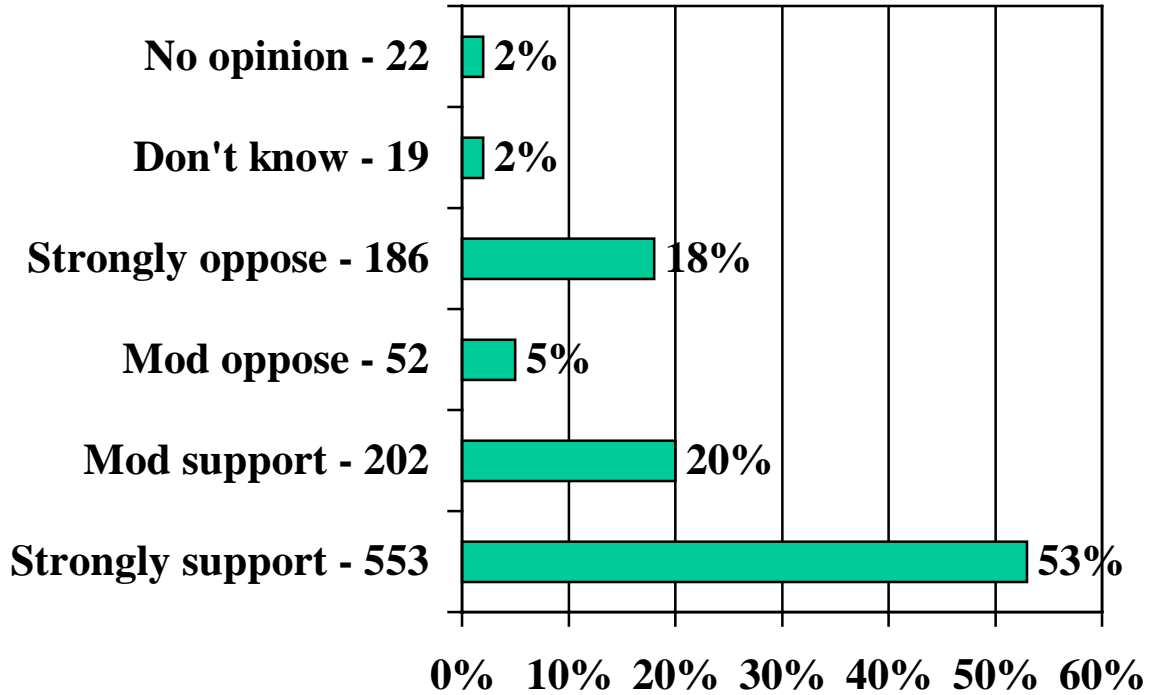
Ninety-seven percent of New Jersey resident hunting license holders who participated are deer hunters. Of the 1,013 deer hunters, 72% hunt with both guns and bows, 23% hunt with guns only, and 5.3% hunt with bows only.



Sampling error: +/-3%

**Q2. Would you support the introduction of crossbows for deer hunting in NJ?**

**ALL RESPONDENTS (n=1,034)**

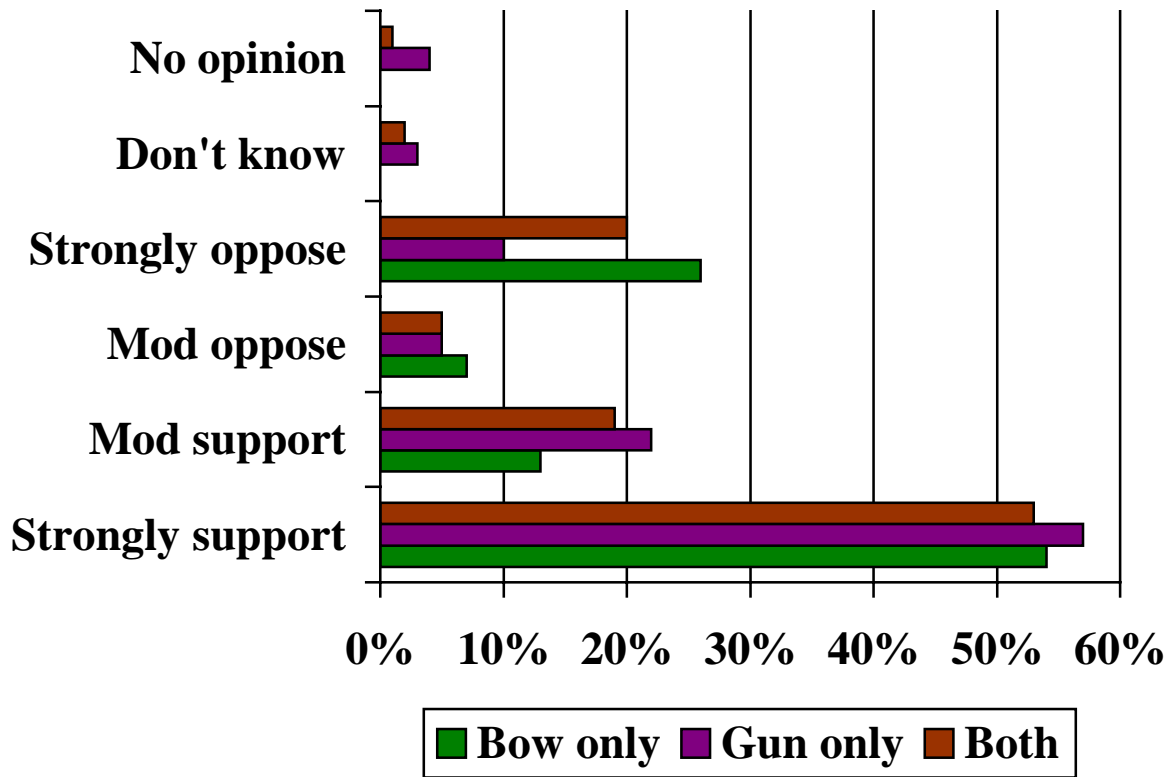


**Sampling error +/-3%**

**Total support: 73%**  
**Total opposition: 23%**



**Q2. Would you support the introduction of crossbows for deer hunting in NJ?  
BY USER GROUP**



No significant difference between user groups on support; significant difference on opposition.

**BOW ONLY HUNTERS**

**Total support: 67%**  
**Total opposition: 33%**  
**(n=54) Sampling error +/-13%**

**GUN HUNTERS ONLY**

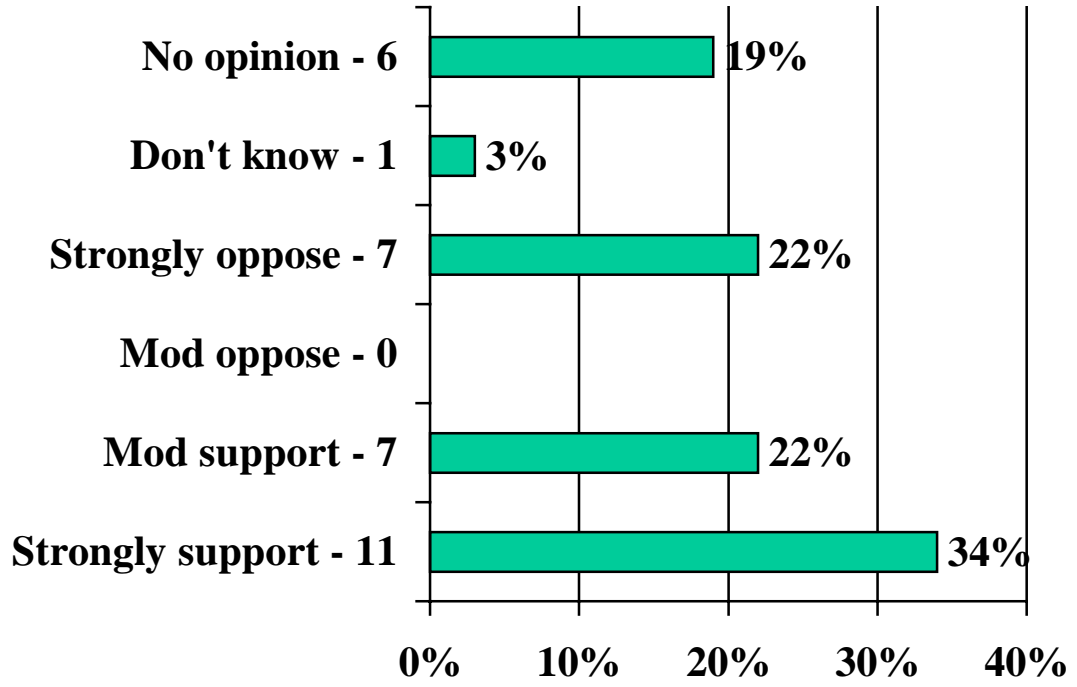
**Total support: 79%**  
**Total opposition: 14%**  
**(n=231) Sampling error +/-6%**

**BOTH BOW & GUN**

**Total support: 72%**  
**Total opposition: 25%**  
**(n=717) Sampling error +/-4%**

**Q2. Would you support the introduction of crossbows for deer hunting in NJ?**

**NOT DEER HUNTERS (n=32)**



**Sampling error +/-17%**

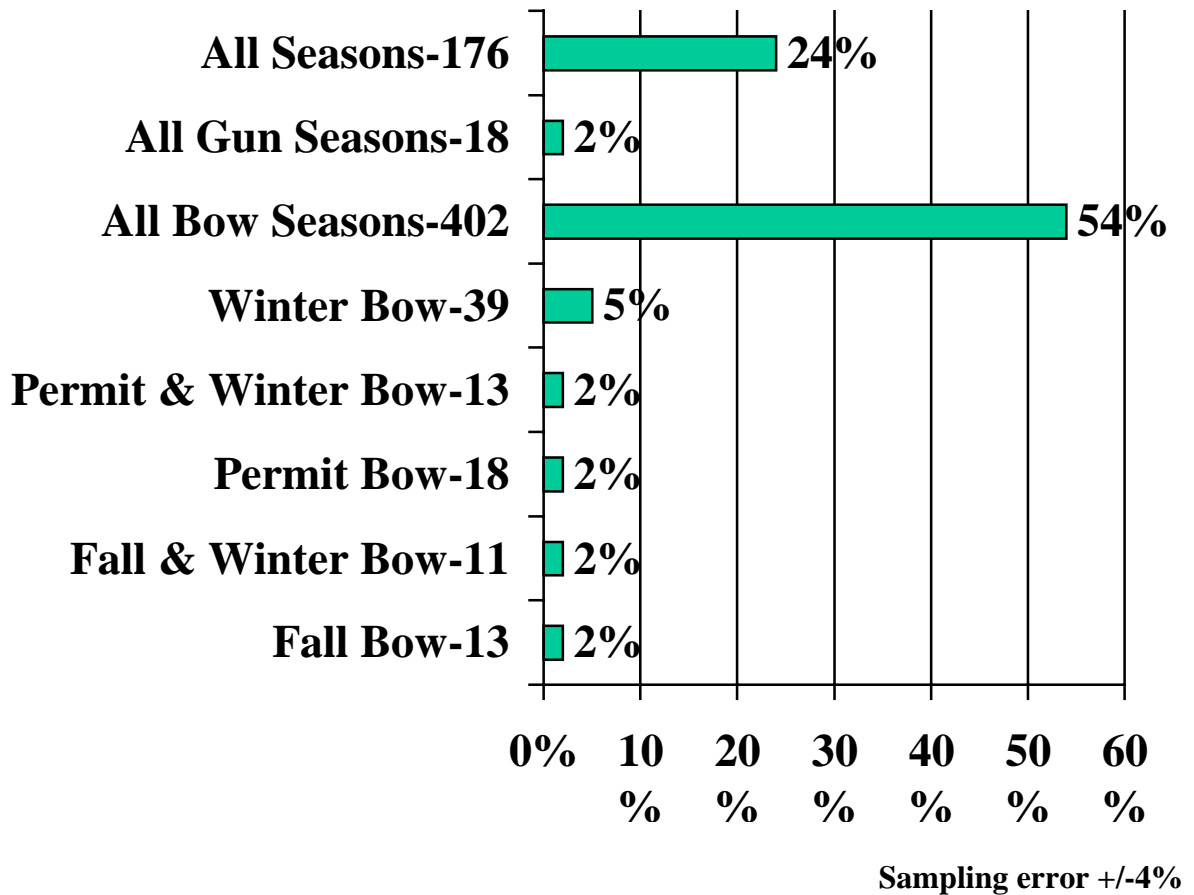
**Total support: 56%**

**Total opposition: 22%**

**Q3. If you support the introduction of crossbows, during which deer season(s) should they be allowed?**

Participants were asked specifically which seasons they wanted; 30 permutations resulted.  
Only responses  $\geq 1.0\%$  are graphed.

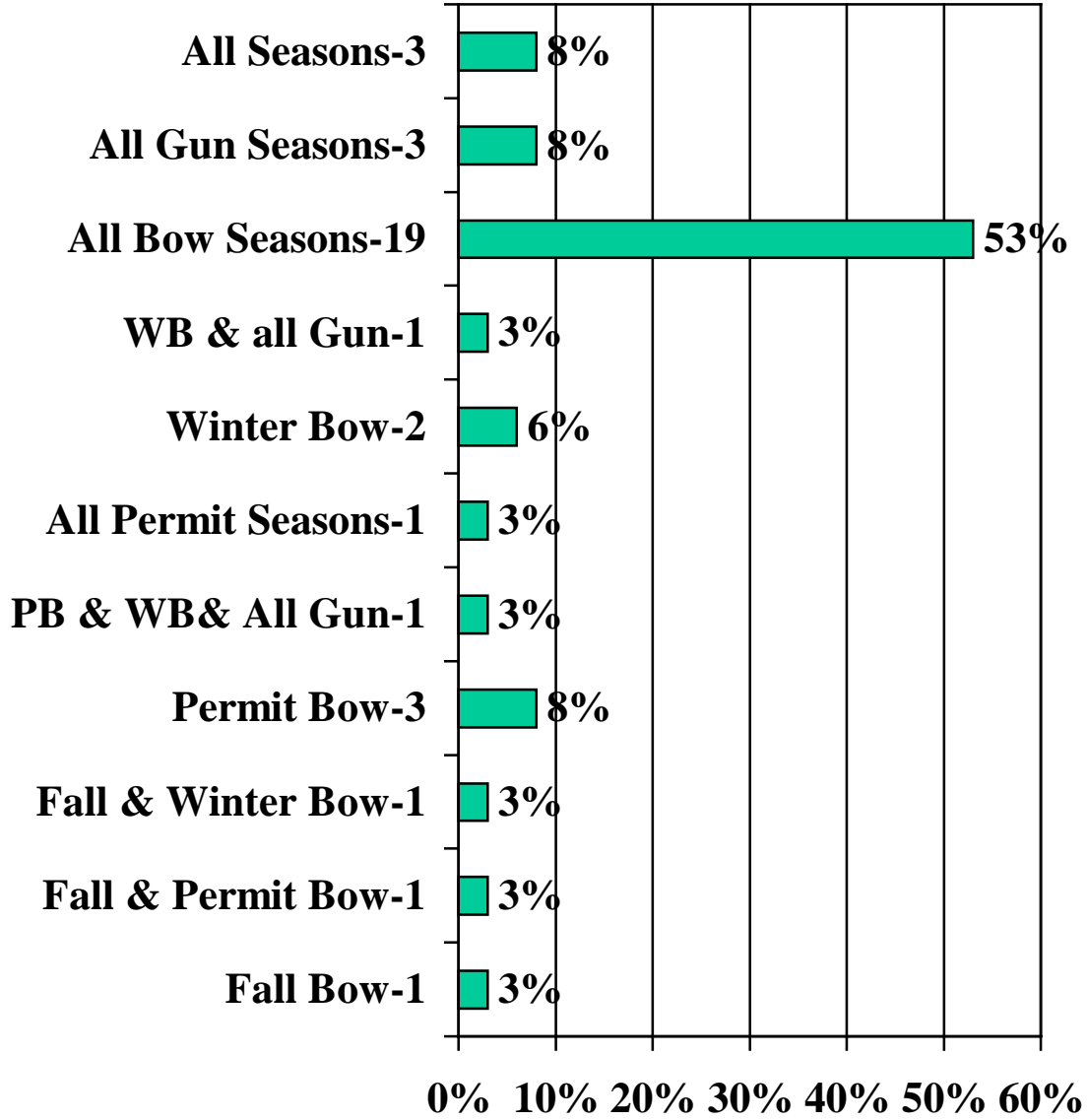
**ALL RESPONDENTS (n=747)**



No significant difference between user groups for the selection of “All bow seasons”.

**Q3. If you support the introduction of crossbows, during which deer season(s) should they be allowed?**

**BOW ONLY (n=36)**

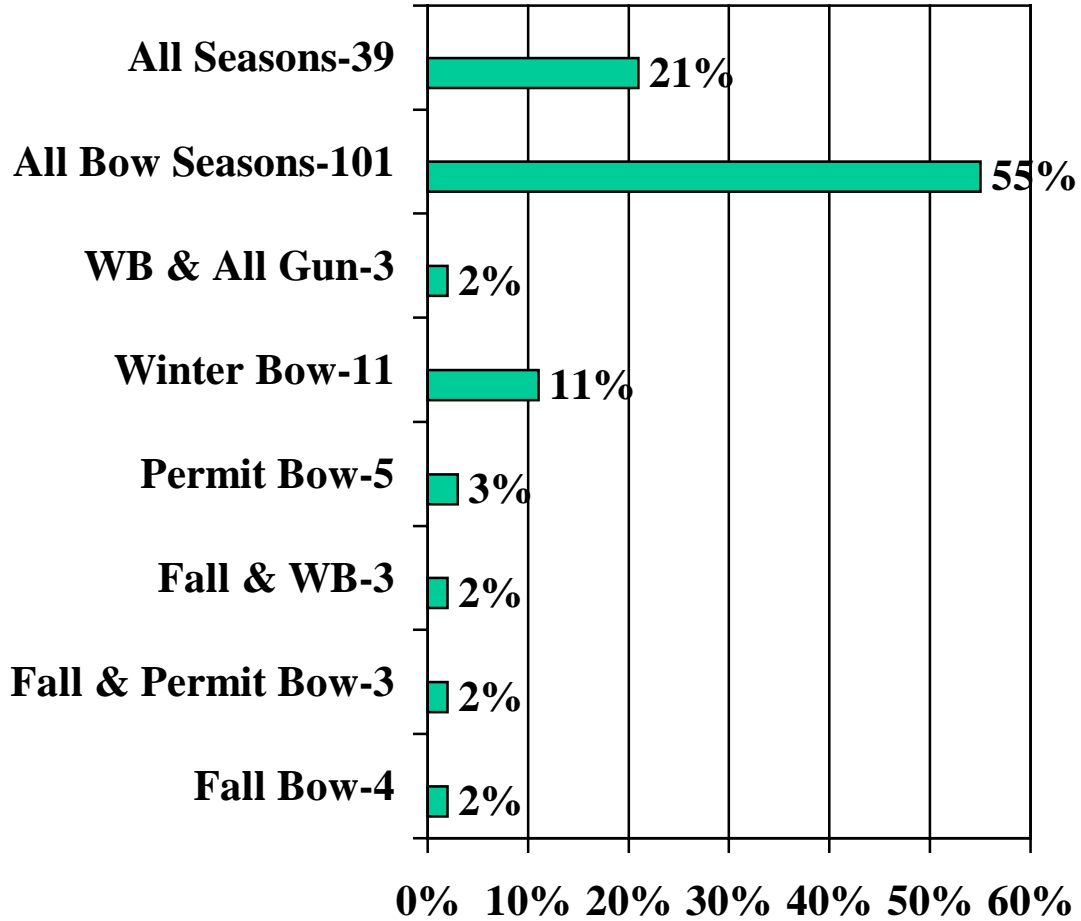


**Sampling error +/-17%**

**Q3. If you support the introduction of crossbows, during which deer season(s) should they be allowed?**

Participants were asked specifically which seasons they wanted; 17 permutations resulted. Only responses >1.0% are graphed.

**GUN ONLY (n=182)**

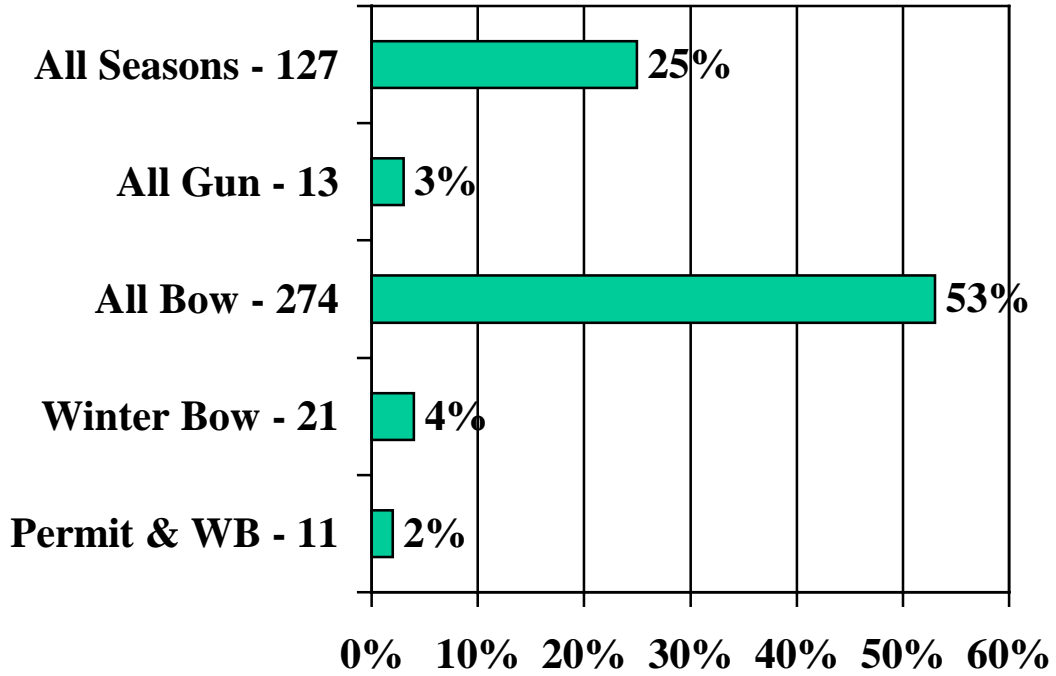


**Sampling error +/-7%**

**Q3. If you support the introduction of crossbows, during which deer season(s) should they be allowed?**

Participants were asked specifically which seasons they wanted; 26 permutations resulted. Only responses >1.0% are graphed.

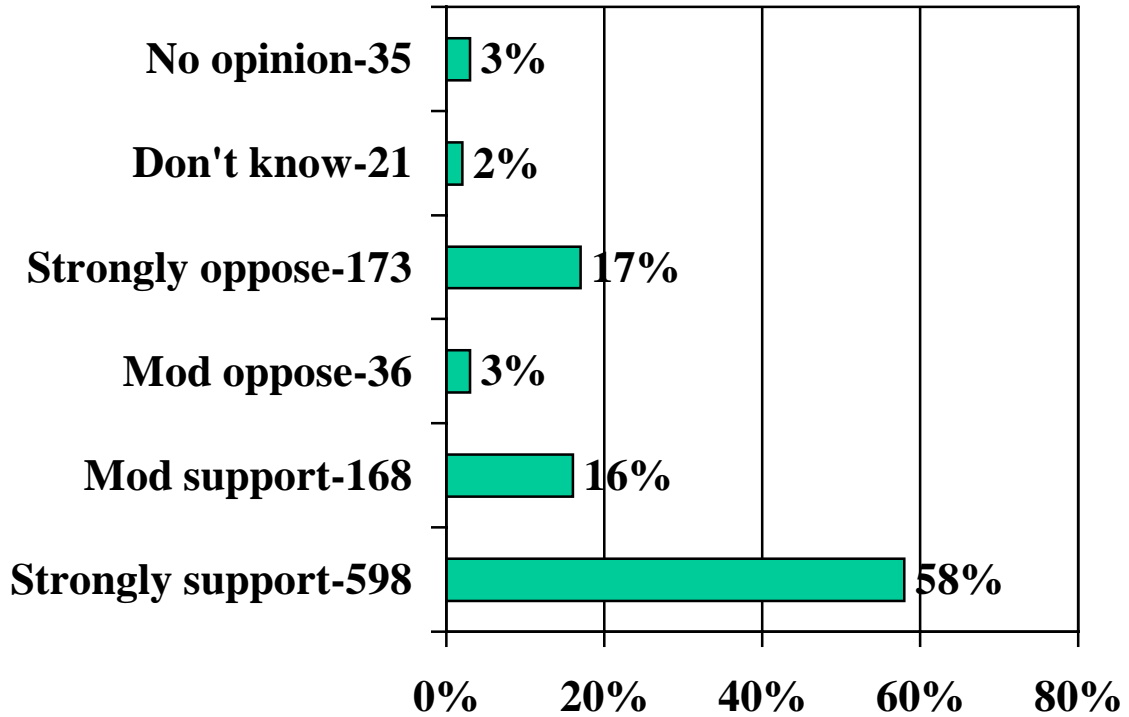
**BOTH BOW & GUN HUNTERS (n=514)**



Sampling error +/-4%

**Q4. Would you support the use of crossbows in areas where it is difficult to control deer populations?**

**ALL RESPONDENTS (n = 1035)**

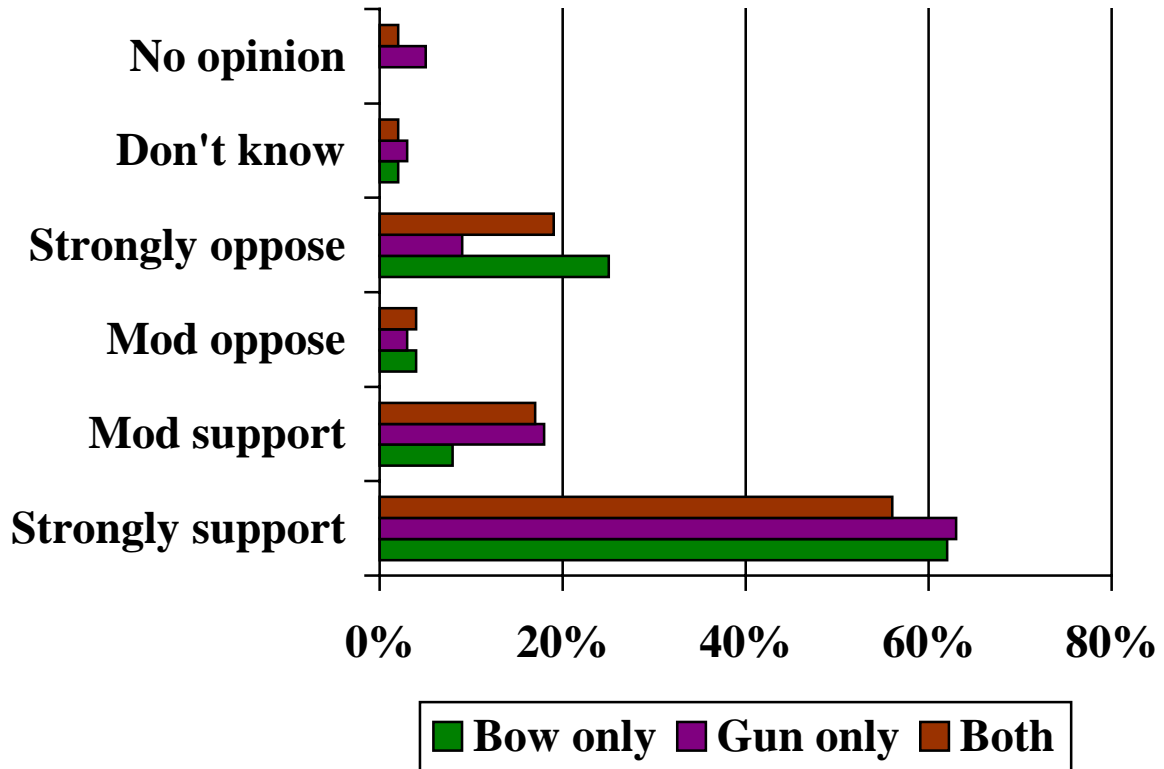


Sampling error +/-3%

**Total support: 74%**  
**Total opposition: 20%**

**Q4. Would you support the use of crossbows in areas where it is difficult to control deer populations?**

BY USER GROUP



No significant difference between user groups on support; significant difference on opposition.

**BOW ONLY**

**Total support: 70%**

**Total opposition: 28%**

**(n=53) Sampling error +/-13%**

**GUN ONLY**

**Total support: 81%**

**Total opposition: 12%**

**(n = 232) Sampling error +/-6%**

**BOTH GUN & BOW**

**Total support: 73%**

**Total opposition: 23%**

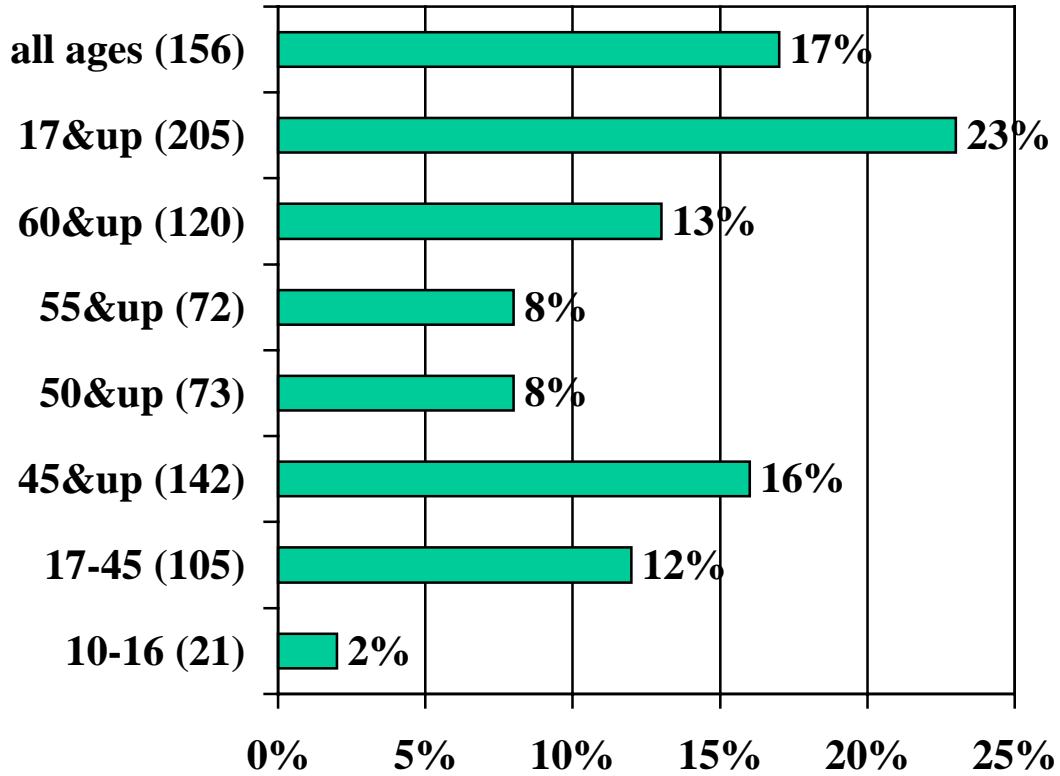
**(n = 711) Sampling error +/-4%**



**Q5. Would you support crossbows for hunters of a certain age; what age(s) should be legal?**

Participants were given a choice of six age groups and told to circle all that pertain, which resulted in 14 permutations; only those amounting to >1% are graphed.

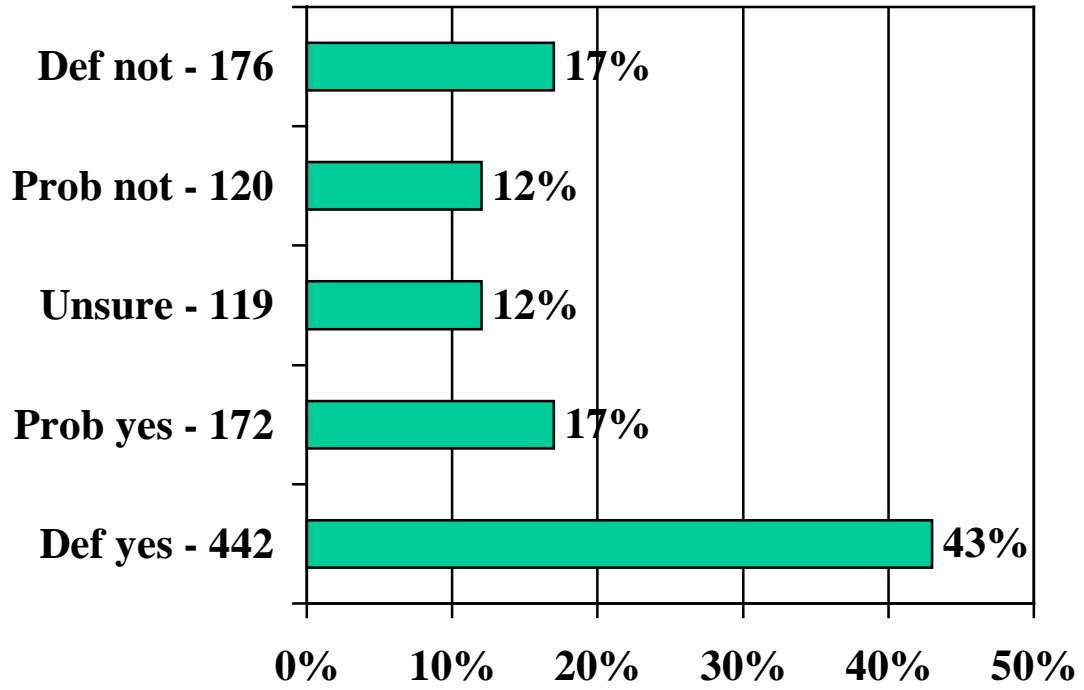
**ALL RESPONDENTS (n = 911)**



Sampling error +/-3%

**Q6. Would you hunt with a crossbow if legalized?**

**ALL RESPONDENTS (n = 1029)**

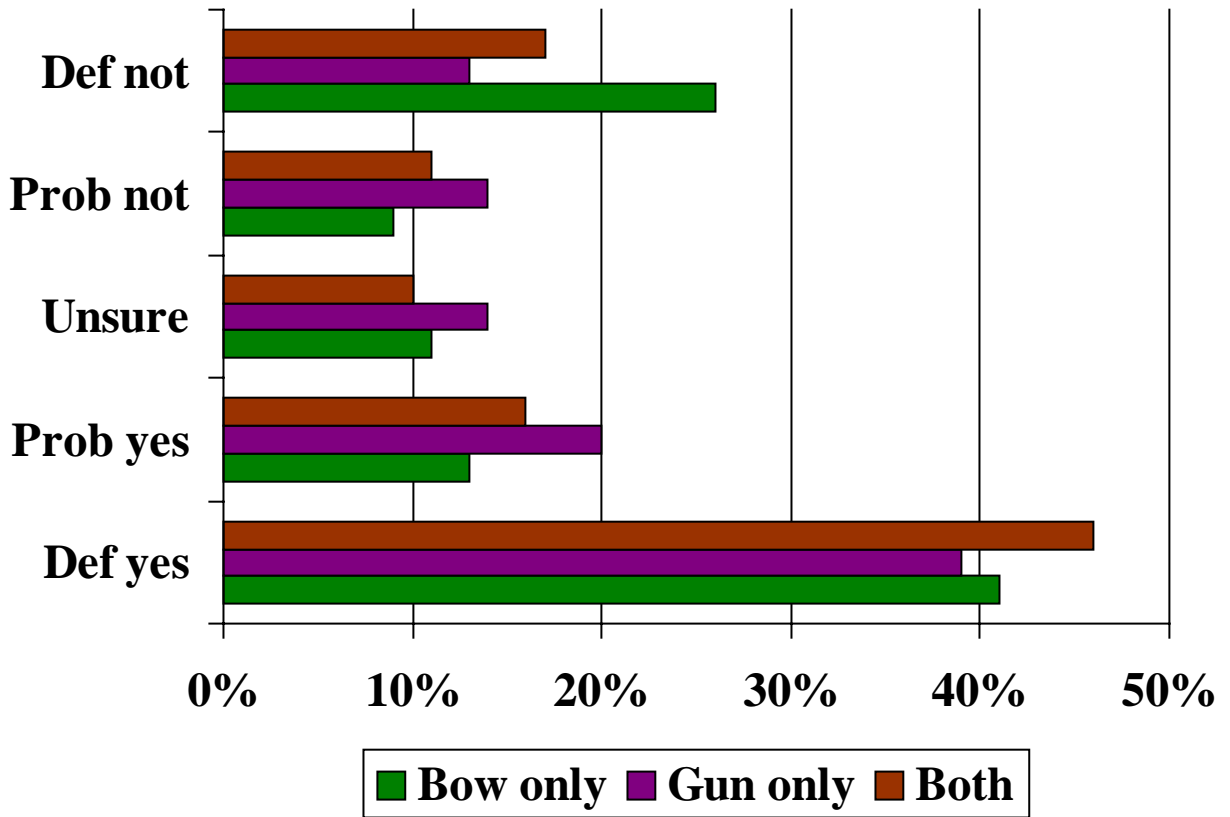


**Sampling error +/-3%**

**Will use crossbows: 60%**  
**Won't use crossbows: 29%**

**Q6. Would you hunt with a crossbow if legalized?**

BY USER GROUP



Significant difference of opinion between user groups.

**BOW ONLY**

Will use crossbows: 54%

Won't use crossbows: 35%

(n = 54) Sampling error +/-13%

**GUN ONLY**

Will use crossbows: 59%

Won't use crossbows: 27%

(n = 230) Sampling error +/-6%

**BOTH GUN & BOW**

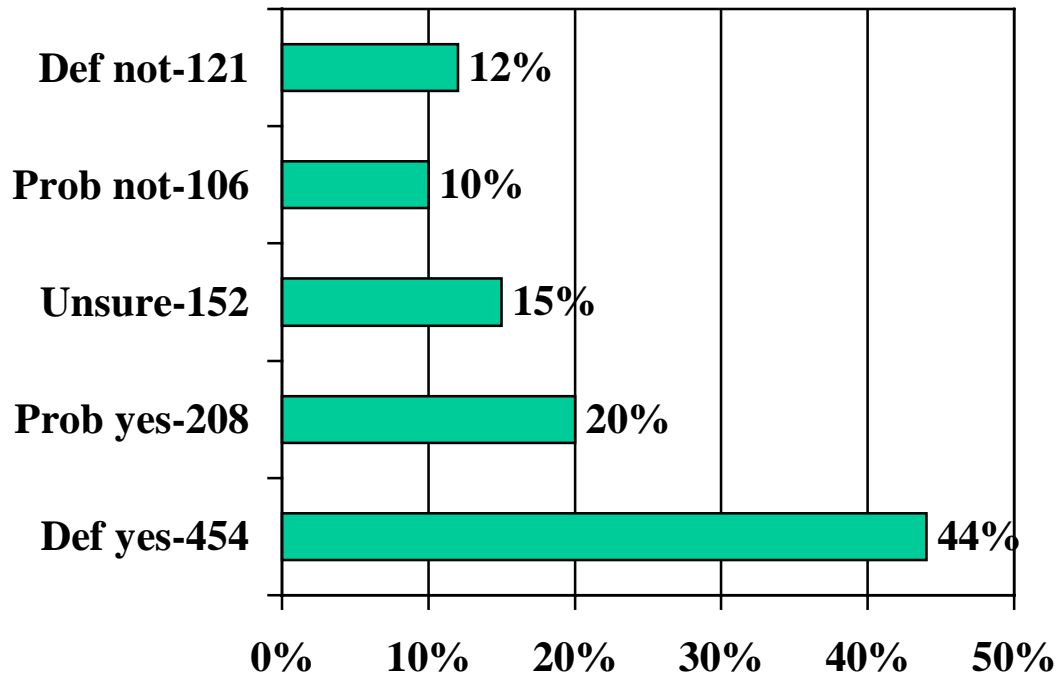
Will use crossbows: 62%

Won't use crossbows: 28%

(n = 709) Sampling error +/-4%

**Q7. Do you think that you will use a crossbow as you advance in years?**

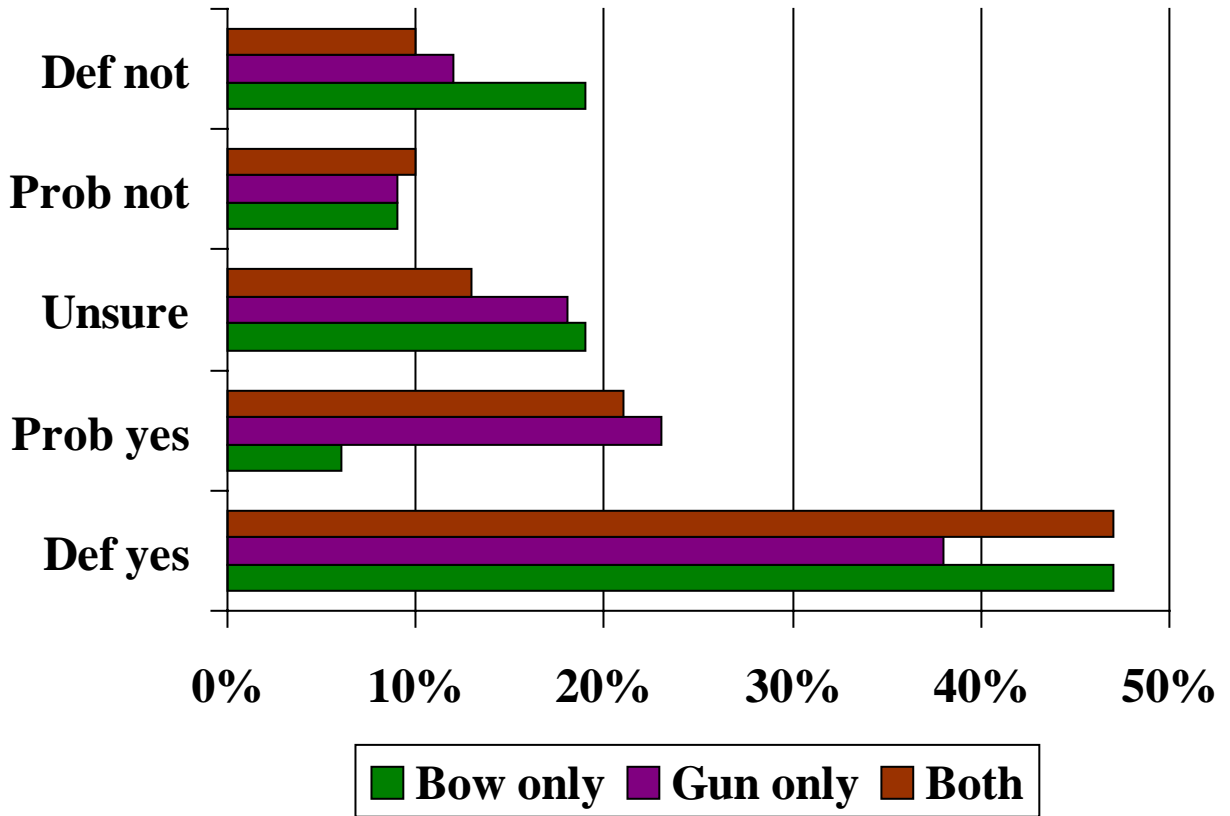
**ALL RESPONDENTS (n = 1041)**



**Sampling error +/-3%**

**Will use crossbows: 64%**  
**Won't use crossbows: 22%**

**Q7. Do you think that you will use a crossbow as you advance in years?**



**BOW ONLY**

Will use crossbows: 53%  
 Won't use crossbows: 28%  
 (n = 53) Sampling error +/-13%

**GUN ONLY**

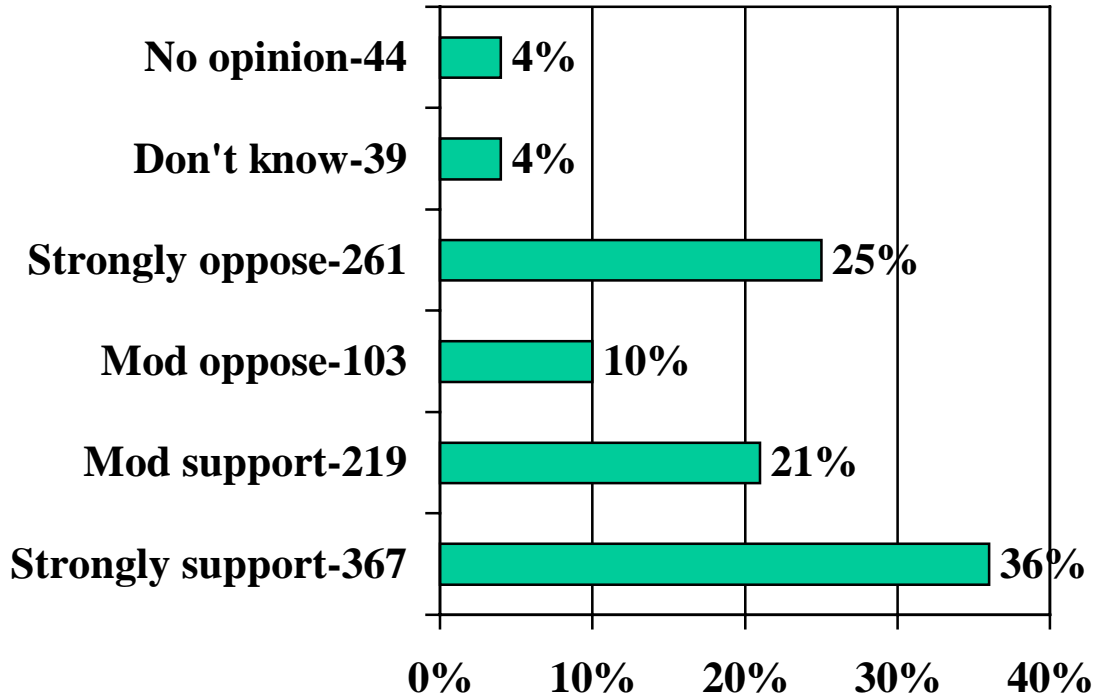
Will use crossbows: 61%  
 Won't use crossbows: 21%  
 (n = 233) Sampling error +/-6%

**BOTH GUN & BOW**

Will use crossbows: 68%  
 Won't use crossbows: 20%  
 (n = 715) Sampling error +/-4%

**Q8. Would you support allowing the use of crossbows by women & youths who cannot draw a regular bow?**

**ALL RESPONDENTS (n = 1033)**



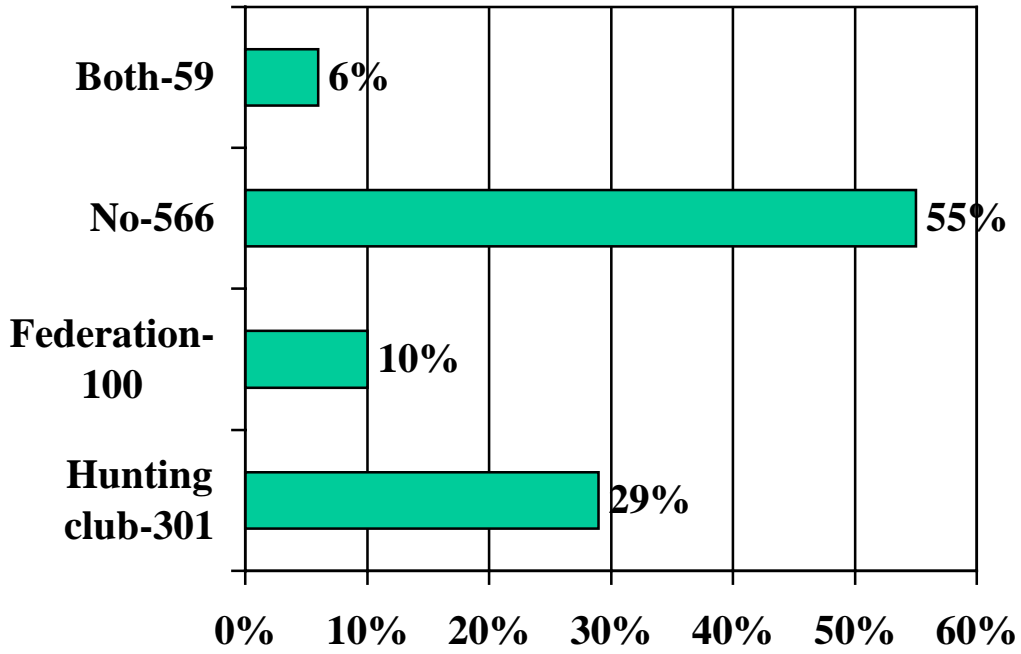
Sampling error +/-3%

**Total support for crossbow use for women & children: 57%**

**Total opposition for crossbow use for women & children: 35%**

**Q9. Are you a member of a hunting club or the NJ Federation of Sportsmen's Clubs?**

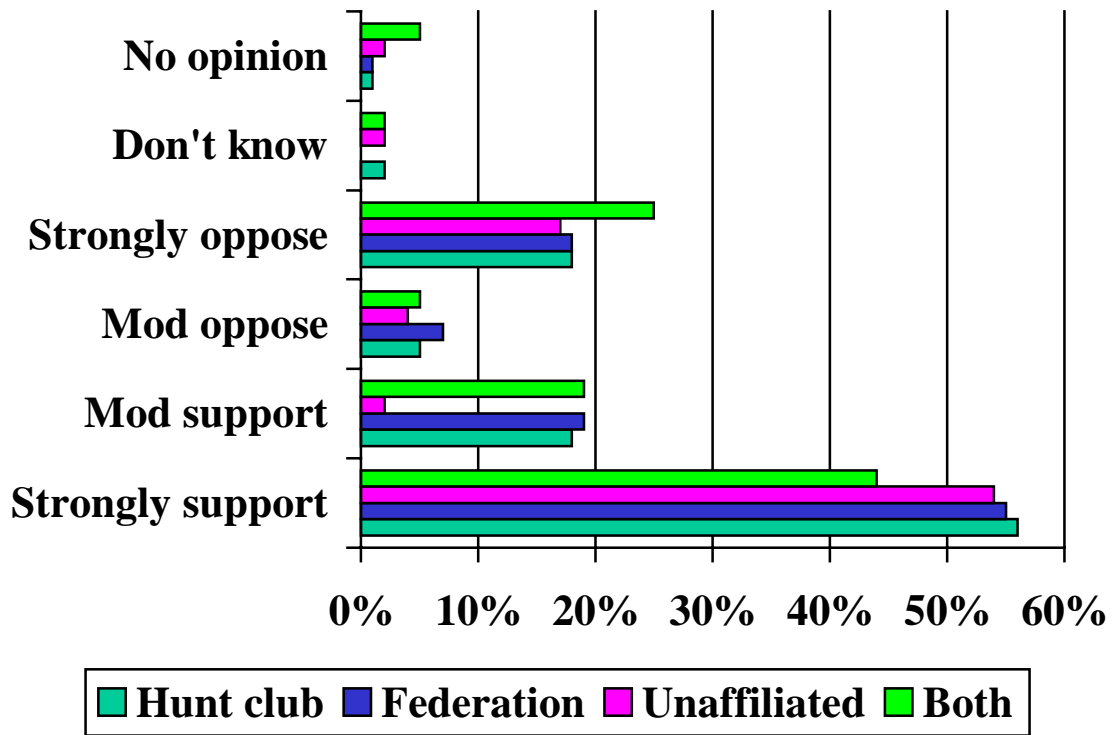
**ALL RESPONDENTS (n = 1026)**



**Sampling error +/-3%**

**Affiliated hunters: 45%**

Support of crossbows by affiliation (n = 1033)



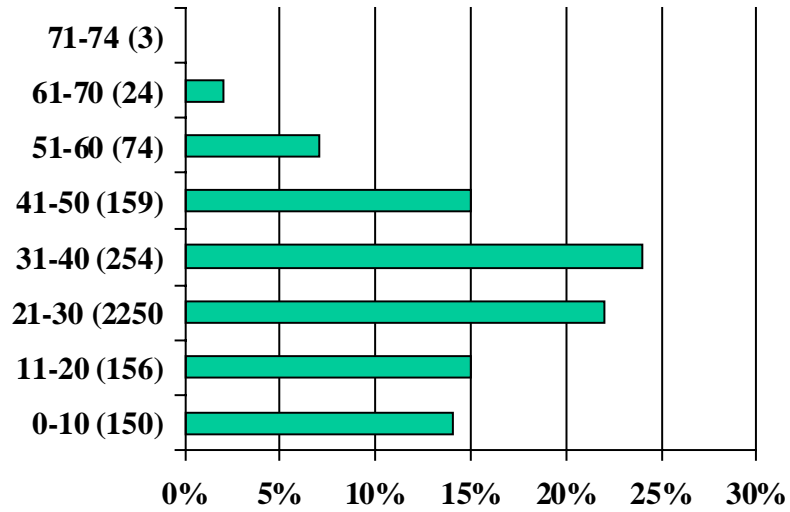
Sampling error +/- 3%

Significant difference between affiliations on support and opposition.



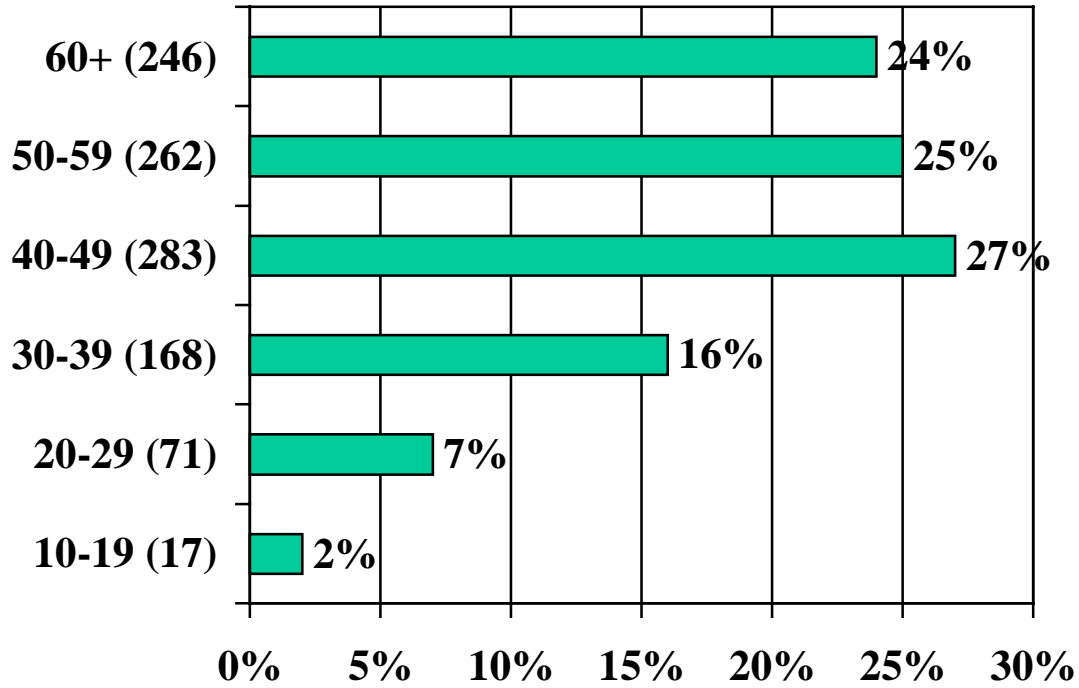
**Q10. How many years have you hunted in NJ?**

**ALL RESPONDENTS**



**Q11. What age group are you in?**

**ALL RESPONDENTS (n = 1047)**



**Sampling error +/-3%**

**Q12. What is your gender?**

|               |             |            |
|---------------|-------------|------------|
| <b>Male</b>   | <b>1032</b> | <b>99%</b> |
| <b>Female</b> | <b>11</b>   | <b>1%</b>  |

n=1043 Sampling error +/- 3%