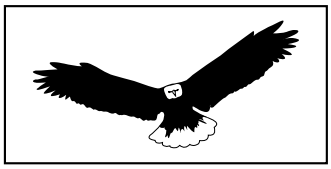
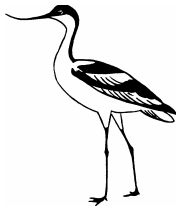
# Fish and Wildlife Management in North Dakota 2004 Public Opinion Survey

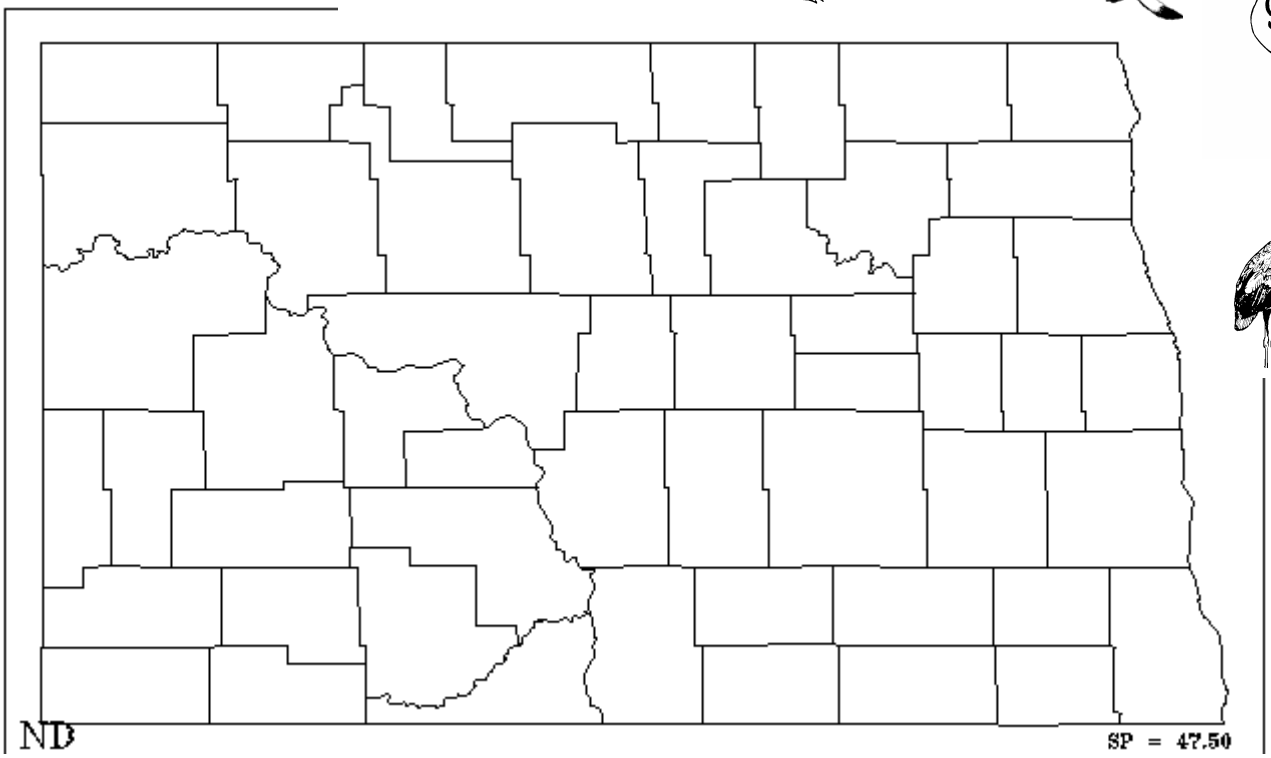
**[January 2006]**

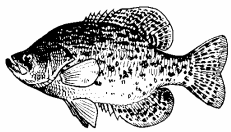

By
Larry Mark Gigliotti, Ph.D.
**Human Dimensions Consulting**
30286 S.D. Hwy 34
Pierre, South Dakota 57501

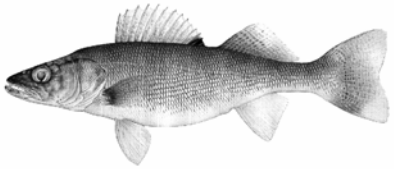


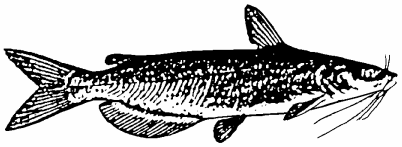






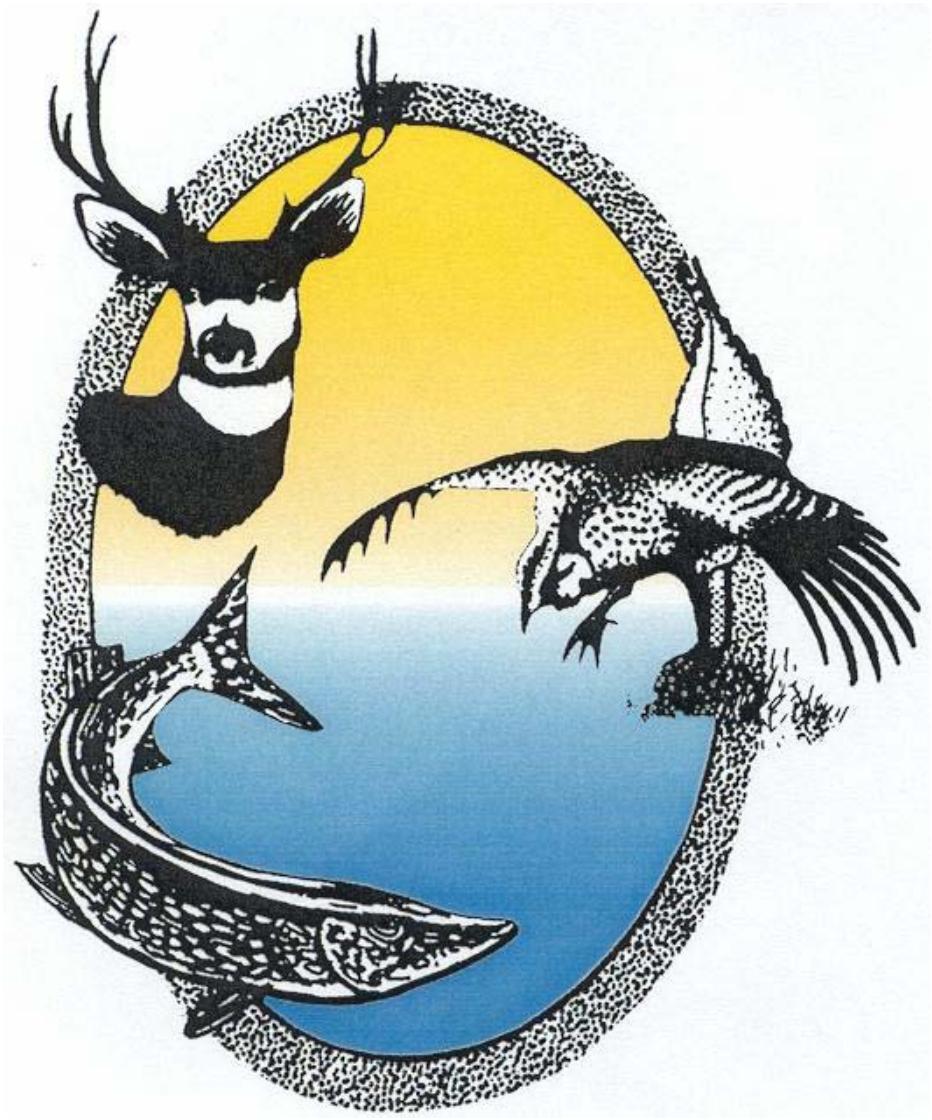







Results in this report are from the data collected for the following study:

Teel, T. L., Dayer, A. A., Manfredo, M. J., & Bright, A. D. (2005). Regional results from the research project entitled **"Wildlife Values in the West."** (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.



**A Product of the Wildlife Values in the West Project**

Teel, T. L., Dayer, A. A., Manfredo, M. J., & Bright, A. D. (2005). Regional results from the research project entitled **"Wildlife Values in the West."** (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.

**North Dakota State-Specific Report**

Gigliotti, L. M. (2006). Fish and wildlife management in North Dakota – 2004 public opinion survey. Report prepared for North Dakota Game and Fish Department. Human Dimensions Consulting, Pierre, SD.

# Executive Summary

## Fish and Wildlife Management in North Dakota
## 2004 Public Opinion Survey

*Larry Mark Gigliotti, Ph.D.*
**Human Dimensions Consulting**

This is a descriptive study of attitudes of North Dakota residents in relation to fish and wildlife management with three general perspectives: **water use decisions, nongame species management and chronic wasting disease**. This information has a number of valuable uses:

1. **Better management decisions**: This information provides a valuable understanding of the public's attitudes in relation to these three topics, which in turn can lead to better management decisions by the North Dakota Game and Fish Department.
2. **Improved ability to predict public responses to wildlife issues**: A better understanding of the public's attitudes on specific topics may also lead to an improved predictive ability on related topics.
3. **Improved public trust in the agency**: In addition, being able to demonstrate that NDG&F listens to and understands the public's attitudes, opinions, desires, needs, etc. can increase the public's trust in the agency.
4. **Public involvement tool**: Most wildlife issues are the result of conflicting values and attitudes. Often each side in such conflicts holds the view that their opinion is held by a significant majority of the public and/or they have a poor understanding of the other side's position. When sound scientific public attitude data is shared with the public it often tends to moderate the conflict and the groups tend to become more willing to accept compromise solutions.
5. **Measure trends and evaluate projects, programs or policy changes**: Human dimensions information is especially valuable in measuring trends and evaluating project or program effectiveness and impacts.

# Table of Contents

# Fish and Wildlife Management in North Dakota
# 2004 Public Opinion Survey

Larry Mark Gigliotti, Ph.D.
**Human Dimensions Consulting**

The purpose of this report is to gain a better understanding of North Dakota residents in relation to fish and wildlife management by the North Dakota Game and Fish Department (NDGFD). The report has three general perspectives–topics related to: 1) water use decisions, 2) management of nongame species, and 3) chronic wasting disease.

## METHODS

This study was conducted as part of a larger project (Wildlife Values in the West 2004) summarized below (Teel, et al., 2005). A complete description of project background and methods can be found in the Wildlife Values in the West 2004 report. This document only reports on the North Dakota state-specific section of the study. See Appendix A for a copy of the North Dakota state-specific question items used in this study.

## Project Overview - Wildlife

"Wildlife Values in the West 2004" is a project of the Western Association of Fish and Wildlife Agencies (WAFWA) Human Dimensions Committee in cooperation with Colorado State University. The survey instrument for this project was divided into two parts: 1) a regional section, and 2) a state-specific section.

The purpose of the regional section of the survey, which was the same across all states, was to measure public values and wildlife value orientations, sociodemographic characteristics, and participation in wildlife-related recreation activities among residents of each state. The regional section also contained questions addressing public reactions to key "regional" wildlife management issues deemed important across a majority of participating states. Issues were selected largely on the basis of their ability to provide information about how changes in public values could affect responses to management issues and decisions.

The state-specific section provided an opportunity to gather information about key, timely management issues affecting a particular state. The questions appearing in this part of the survey were developed by each participating state, with input and suggestions from Colorado State University and other members of the project work group.

The report is organized into five parts. Part one, *"Water Uses in North Dakota"*, explores how North Dakota residents feel water use decisions should be prioritized. The analysis identified seven types (groups of similar respondents) of priority profiles and provides a description of each type. The analysis also includes exploring the water use questions from a number of other perspectives–fishing, hunting, wildlife viewing participation, and wildlife value orientation.

Part two, *"Attitudes Related to Protecting All Types of Fish and Wildlife in North Dakota"*, explores attitudes related to nongame issues, such as self-reported knowledge about nongame, importance of managing nongame, an evaluation of NDG&F's nongame management efforts, and an evaluation of funding sources for nongame programs. This analysis identified a four-group typology based on the importance of managing for wildlife diversity in North Dakota. This analysis was also conducted from the perspective of fishing, hunting, and wildlife viewing participation, and wildlife value orientation.

Part three, *"Opinions, Attitudes and Behaviors Related to CWD in North Dakota"*, evaluated the quality of various types of information available on chronic wasting disease (CWD), some beliefs about CWD and trust in NDG&F to manage the CWD issue in North Dakota. This analysis was conducted from the perspective of hunting participation (non-hunters, inactive hunters and active hunters).

Part four, *"Demographic description of Fishing, Hunting and Wildlife Viewing participation in North Dakota – Who are our customers?"*" provides a demographic description of anglers, hunters and wildlife viewing participants. Part five, *"Demographic Description of North Dakota Residents from Two Perspectives – Who are our customers"*, provides a description of the wildlife diversity importance groups (low, medium low, medium high and high) and the four wildlife value orientations (pluralist, utilitarian, mutualist and distanced).

# RESULTS
## Part 1 – Water Uses in North Dakota

**Deciding How Water Should Be Used.** The survey question was worded, *"There are many competing uses for the water in North Dakota's rivers and lakes that must be considered when deciding how the water should be distributed. We are interested in how important you find the following water uses."* Water for local municipalities received the highest importance rating and water for healthy populations of water-dependent invertebrates received the lowest importance rating (Tables 1.1-A and 1.1-B and Figure 1.1).

However, looking at the population mean values may not be very descriptive of true public opinion if groups of people have significantly different attitudes related to water use decisions. A K-means cluster analysis was used to identify various groups of North Dakota residents based on their relative importance attributed to various water uses. A seven-group model was selected as the most complete and descriptive of North Dakota residents' opinions. Water-use group sizes ranged from 5% for water-use group 2 to 29% for water-use group 6 (Table 1.2 and Figure 1.2). Each water-use group will be described using the significantly importance variables in this study. The most basic description is how each water-use group rated the importance of the five water uses (Table 1.3 and Figure 1.3). Each water-use group has one or more distinct features that make it a unique group.

**Group 1** (16%) rated two of the five water uses as relatively important–local municipalities and industries (Figure 1.4). This suggests that group 1 has a focus on water use for the cities.

**Group 2** (5%) is the most unique of the seven water use groups (Figure 1.5). One unique feature is that this is the only group that did not rate local municipalities as their highest rated water use. A second unique feature was that group 2 had the highest rating for healthy populations of water-dependent invertebrates. This focus by group 2 suggests a strong environmental orientation.

**Group 3** (24%) is the second largest group and rated three of the five water uses as relatively important–local municipalities, industries and irrigation (Figure 1.6). This suggests that group 3 has a strong utilitarian focus on water use.

**Group 4** (10%) also rated three of the five water uses as relatively important–local municipalities, irrigation and game fish (Figure 1.7). This suggests that group 4 has an agricultural and recreational focus on water use.

**Group 5** (7%) also rated three of the five water uses as relatively important–local municipalities, game fish and water-dependent invertebrates (Figure 1.8). This suggests that group 5 has an environmental orientation and outdoor recreational focus.

**Group 6** (29%) is the largest group and they rated all five water uses as relatively important (Figure 1.9). I refer to this group as the balanced group because it seems that they can see the relative importance and connectivity of all five water uses.

**Group 7** (9%) is difficult to understand because they rated all five water uses relatively low in importance (Figure 1.10). It is likely that this result is due to the overall perspective that this group may have used to respond to this question, comparing water use decisions with other unnamed issues that they feel are more important.

These water-use groups will be further described using the following variables: wildlife values orientation, Missouri River system water use priorities and activities, wildlife related activities (fishing, hunting and wildlife viewing), gender, age, children in the household, education, income, length of residence in North Dakota, size of current residence and residence where raised, and ethnicity.

**The Wildlife Values Orientation.** The *Wildlife Values in the West* project identified the following value orientations for North Dakota residents (Teel et al. 2005):

> **Utilitarian Wildlife Value – 46.1%:** Believe that wildlife should be used and managed for human benefits.
>
> **Mutualist Wildlife Value – 15.6%:** Believe that humans and wildlife are meant to co-exist or live in harmony.
>
> **Pluralist Wildlife Value – 30.4%:** Hold aspects of both utilitarian and mutualist values.
>
> **Distanced Wildlife Value – 7.9%:** People that are not very interested in wildlife-related issues.

Each water-use group had a unique distribution of wildlife values orientations (Table 1.4 and Figures 1.11 and 1.11-A – 1.11-G). Note the very low percentage of utilitarians in water-use group 2. Water-use groups 5 and 6 have a relatively high proportion of

pluralists. Water-use groups 1, 3 and 4 have a relatively high proportion of utilitarians. Groups 2 and 4 had a relatively high proportion of mutualists.

**Missouri River System Water Use Priorities.** The survey question was worded, *"The Missouri River system includes Lake Sakakawea, Lake Oahe, and the free-flowing Missouri River. It provides benefits to many different groups of people. However, conflicts can occur when making decisions on how the Missouri River resources can be used. How strong of a focus should each of these 4 categories of uses be for managing the entire Missouri River system?"* Overall, home uses received the highest percent of points (32.8%), followed by 24.6% for agriculture and industry, 23.4% for recreation, and 19.3% for fish and wildlife (Figure 1.12). As expected, the opinions for Missouri River system water use priorities varied greatly according to water use group (Table 1.5 and Figures 1.13-A and 1.13-B). Particularly noteworthy is the very high value given to "fish and wildlife" by group 2 and the relatively high value given by group 5. Both of these groups were identified as seemingly having a high environmental orientation as suggested by their responses.

**Missouri River System Activities.** The survey question was worded , *"Which of the following water-based recreational activities have you participated in during the last 12 months on the Missouri River system (includes Lake Sakakawea and Oahe)?"* Almost two-thirds of North Dakota residents did not participate in any water-based recreational activities during the last 12 months on the Missouri River system (Table 1.6). The water-use groups were statistically similar in their average number of water-based recreational activities during the last 12 months on the Missouri River system (Table 1.7). However, group 2 had the overall highest percent of participation in one or more activities and group 3 the least (Table 1.8).

Parties, picnics, rest and relaxation along the Missouri River system was the overall highest use (28.7%) and water skiing the lowest use (4.7%) (Table 1.9). For all activities except parties/picnics/ rest and relaxation, the seven water use groups were statistically similar in participation in the activity (Table 1.10). Group 2 had the highest percent participation in parties/picnics/ rest and relaxation (48.6%) and group 3 the lowest percent participation (18.9%) (Table 1.10).

**Wildlife Related Activities (Fishing, Hunting and Viewing).** Fishing, hunting and wildlife viewing were measured by the following questions:

> Have you ever participated in recreational (non-commercial fishing?
> Did you participate in recreational (non-commercial) fishing during the past 12 months?
>
> Have you ever participated in recreational (non-commercial hunting?
> Did you participate in recreational (non-commercial) hunting during the past 12 months?
>
> Have you ever taken any recreational trips for which fish and wildlife viewing was the primary purpose of the trip?
> Did you take any recreational trips in the past 12 months for which fish and wildlife viewing was the primary purpose of the trip?

More than 80% have participated in fishing, slightly more than 50% in hunting and slightly less than 50% in wildlife viewing (Table 1.11). These wildlife-related activities were significantly related to the water-use groups (Table 1.12 and Figures 1.14 – 1.16). Groups 2 and 5 had the highest participation in fishing, hunting and wildlife viewing and groups 1 and 3 the lowest level of participation.

Wildlife participants (anglers, hunters and wildlife viewers) participated in more Missouri River system activities (Table 1.13). The higher participation in Missouri River system activities by active wildlife participants was true for all listed activities (Table 1.14).

Wildlife participants (anglers, hunters and wildlife viewers) gave higher Missouri River system water use priorities for fish and wildlife and recreation compared to the non-participants, especially the active participants (Table 1.15).

**Demographic Variables.** Gender was slightly related to the water-use groups (Table 1.16 and Figure 1.17). Groups 2 and 6 had higher than average composition of females and groups 4, 5 and 7 higher than average composition of males, especially group 5. Age was also related the water-use groups (Table 1.17). Groups 1 and 3 had the highest mean ages; groups 2 and 4 the lowest mean ages. Average years of residency in North Dakota were significantly related to water-use groups, however this relationship is more likely due to age because the same water-use groups had the highest and lowest average years of North Dakota residency as mean age (Table 1.18 and Figure 1.18).

The education category, *less than high school diploma*, was too small for chi-square analyses with the seven water-use groups so the category was combined with the

next highest level (Table 1.19). The seven water-use groups were relatively similar in education level with the exception of group 2 having overall higher education levels (Table 1.20 and Figure 1.19). The income category, *less than $10,000,* was too small for chi-square analyses with the seven water-use groups so the category was combined with the next highest level and the top four income categories were also combined due to small sample sizes (Table 1.21). Income level was not significantly related to water-use group (Table 1.22 and Figure 1.20).

About two-thirds of the North Dakota resident sample did not have children living at home (Table 1.23). Mean number of children living at home was not related to water use groups (ANOVA F=1.11; df=6/660; $p$=0.355). Also, a cross-tabs analysis between the dichotomous variable of children living at home verses no children living at home analyzed by water-use groups was not significant (Table 1.24 and Figure 1.21).

The distribution of size of current residence and size of residence where raised for the North Dakota resident sample show a substantial shift in population from more rural or less populated areas to more urban (populated areas) (Table 1.25). Current residence was not related to water-use groups (Chi-Square $X^2$=40.07; df=42; $p$=0.556), however residence where raised was significantly related to water-use groups (Table 1.26 and Figure 1.22). The largest difference was between group 1, with about 64% being raised in a rural area or small town (less than 5,000 people) and only about 9% coming from a city of more than 100,000 people compared to group 2, with only about 40% being raised in a rural area or small town (less than 5,000 people) and about 23% coming from a city of more than 100,000 people.

The race distribution for this North Dakota sample was dominated by whites (not of Hispanic origin) (97.1%) (Table 1.27). Although the sample size was too small for the non-white race categories (even when combined) for an accurate analysis, race was significantly related to the water-use groups (Table 1.28 and Figure 1.23). Group 7 had the highest percent of non-whites (6.5%).

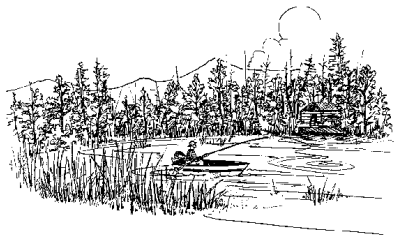


Table 1.1-A. Overall frequency distribution for North Dakota residents' rating of the importance of five uses of water for North Dakota's rivers and lakes.

| Importance (scale) | Local Municipalities | |
|---|---|---|
| | **Number** | **Percent** |
| **Not at All Important (1)** | 3 | 0.5% |
| **Slightly Important (2)** | 9 | 1.2% |
| **Moderately Important (3)** | 58 | 8.3% |
| **Quite Important (4)** | 193 | 27.6% |
| **Extremely Important (5)** | 435 | 62.3% |
| **Total** | 699 | 100% |

| Importance (scale) | Healthy Populations of Fish | |
|---|---|---|
| | **Number** | **Percent** |
| **Not at All Important (1)** | 5 | 0.7% |
| **Slightly Important (2)** | 35 | 5.1% |
| **Moderately Important (3)** | 163 | 23.4% |
| **Quite Important (4)** | 308 | 44.1% |
| **Extremely Important (5)** | 187 | 26.8% |
| **Total** | 698 | 100% |

| Importance (scale) | Local Industries | |
|---|---|---|
| | **Number** | **Percent** |
| **Not at All Important (1)** | 11 | 1.6% |
| **Slightly Important (2)** | 65 | 9.4% |
| **Moderately Important (3)** | 133 | 19.1% |
| **Quite Important (4)** | 293 | 41.9% |
| **Extremely Important (5)** | 195 | 28.0% |
| **Total** | 698 | 100% |

| Importance (scale) | Local Irrigation | |
|---|---|---|
| | **Number** | **Percent** |
| **Not at All Important (1)** | 17 | 2.4% |
| **Slightly Important (2)** | 69 | 10.0% |
| **Moderately Important (3)** | 171 | 24.6% |
| **Quite Important (4)** | 279 | 40.1% |
| **Extremely Important (5)** | 159 | 22.9% |
| **Total** | 695 | 100% |

| Importance (scale) | Healthy Populations of Water-Dependent Invertebrates | |
|---|---|---|
| | **Number** | **Percent** |
| **Not at All Important (1)** | 46 | 6.6% |
| **Slightly Important (2)** | 134 | 19.3% |
| **Moderately Important (3)** | 246 | 35.6% |
| **Quite Important (4)** | 189 | 27.3% |
| **Extremely Important (5)** | 77 | 11.2% |
| **Total** | 692 | 100% |

Table 1.1-B. Overall mean importance rating by North Dakota residents for five uses of water in North Dakota's rivers and lakes.

| Water Use | Mean Importance[1] | 95% Confidence Interval |
|---|---|---|
| **Local Municipalities** (water to cities for people to use) | 4.50 | 4.44 – 4.55 |
| **Healthy Populations of Fish** (e.g., walleye, sunfishes, minnows) | 3.91 | 3.85 – 3.98 |
| **Local Industries** (water for use in factories, power plants, manufacturing) | 3.85 | 3.78 – 3.93 |
| **Local Irrigation** (water for agricultural crops) | 3.71 | 3.64 – 3.79 |
| **Healthy Populations of Water-Dependent Invertebrates** (e.g., mussels, crayfish) | 3.17 | 3.09 – 3.25 |

[1]Improtance Scale: 1 = **Not** at all important, 2 = **Slightly** important, 3 = **Moderately** important, 4 = **Quite** important, 5 = **Extremely** important

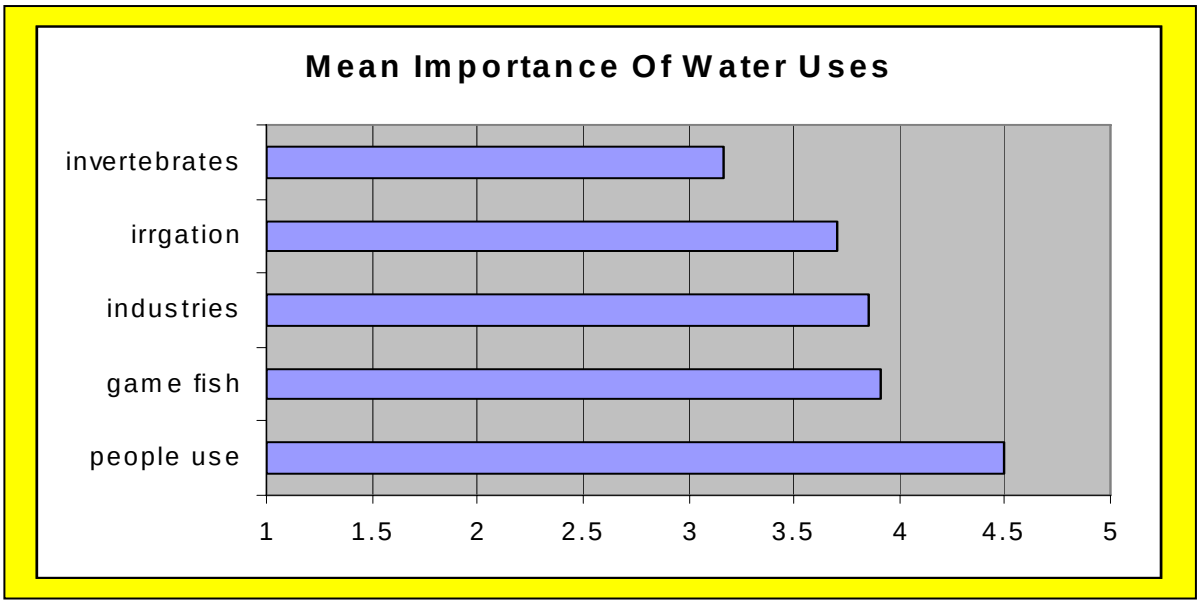



Figure 1.1. Overall mean importance rating for five uses of water in North Dakota's rivers and lakes (*data from Table 1.1*).

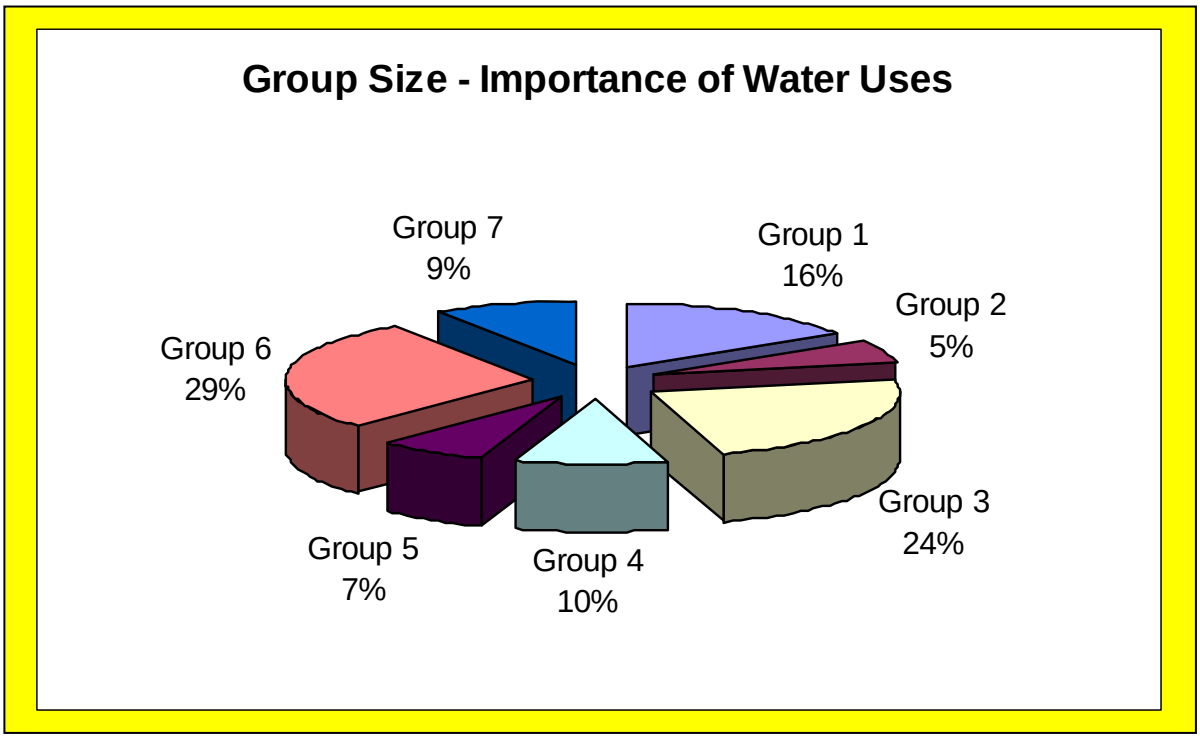



Figure 1.2. Group sizes of the seven water-use groups (*data from Table 1.2*).

Table 1.2. Water-use groups based on the importance rating for five uses of water in North Dakota's rivers and lakes.

| Water Use Group | Number in Sample | Percent |
|---|---|---|
| **Group 1** | 111 | 16.2% |
| **Group 2** | 38 | 5.5% |
| **Group 3** | 162 | 23.5% |
| **Group 4** | 70 | 10.2% |
| **Group 5** | 50 | 7.3% |
| **Group 6** | 192 | 28.0% |
| **Group 7** | 64 | 9.4% |
| **Total** | 688 | 100% |

Table 1.3. Mean importance rating for five uses of water in North Dakota's rivers and lakes for each of the seven water-use groups.

| Water Use | Water-Use Group | Mean Importance[1] | 95% Confidence Interval |
|---|---|---|---|
| **Local Irrigation** | **1** | 2.63 | 2.52 – 2.75 |
| | **2** | 3.40 | 3.10 – 3.69 |
| | **3** | 4.42 | 4.34 – 4.50 |
| | **4** | 4.10 | 3.95 – 4.25 |
| | **5** | 2.41 | 2.22 – 2.60 |
| | **6** | 4.33 | 4.25 – 4.40 |
| | **7** | 2.89 | 2.71 – 3.08 |
| **Healthy Populations of Fish** | **1** | 3.41 | 3.26 – 3.56 |
| | **2** | 4.59 | 4.43 – 4.76 |
| | **3** | 3.48 | 3.34 – 3.61 |
| | **4** | 4.15 | 4.03 – 4.28 |
| | **5** | 4.36 | 4.19 – 4.52 |
| | **6** | 4.51 | 4.44 – 4.59 |
| | **7** | 3.08 | 2.89 – 3.28 |
| **Healthy Populations of Water-Dependent Invertebrates** | **1** | 2.40 | 2.27 – 2.53 |
| | **2** | 4.29 | 4.13 – 4.45 |
| | **3** | 2.31 | 2.19 – 2.42 |
| | **4** | 3.05 | 2.87 – 3.24 |
| | **5** | 4.09 | 3.92 – 4.26 |
| | **6** | 4.12 | 4.03 – 4.21 |
| | **7** | 2.57 | 2.41 – 2.73 |
| **Local Municipalities** | **1** | 4.66 | 4.56 –4.75 |
| | **2** | 3.31 | 3.07 – 3.54 |
| | **3** | 4.75 | 4.68 – 4.82 |
| | **4** | 4.66 | 4.53 – 4.78 |
| | **5** | 4.53 | 4.39 – 4.68 |
| | **6** | 4.76 | 4.70 – 4.82 |
| | **7** | 3.25 | 3.02 – 3.47 |
| **Local Industries** | **1** | 4.21 | 4.10 – 4.32 |
| | **2** | 2.27 | 2.07 – 2.47 |
| | **3** | 4.38 | 4.29 – 4.47 |
| | **4** | 2.71 | 2.58 – 2.84 |
| | **5** | 3.66 | 3.45 – 3.86 |
| | **6** | 4.44 | 4.36 – 4.51 |
| | **7** | 2.44 | 2.28 – 2.60 |

[1]Improtance Scale: 1 = **Not** at all important, 2 = **Slightly** important, 3 = **Moderately** important, 4 = **Quite** important, 5 = **Extremely** important

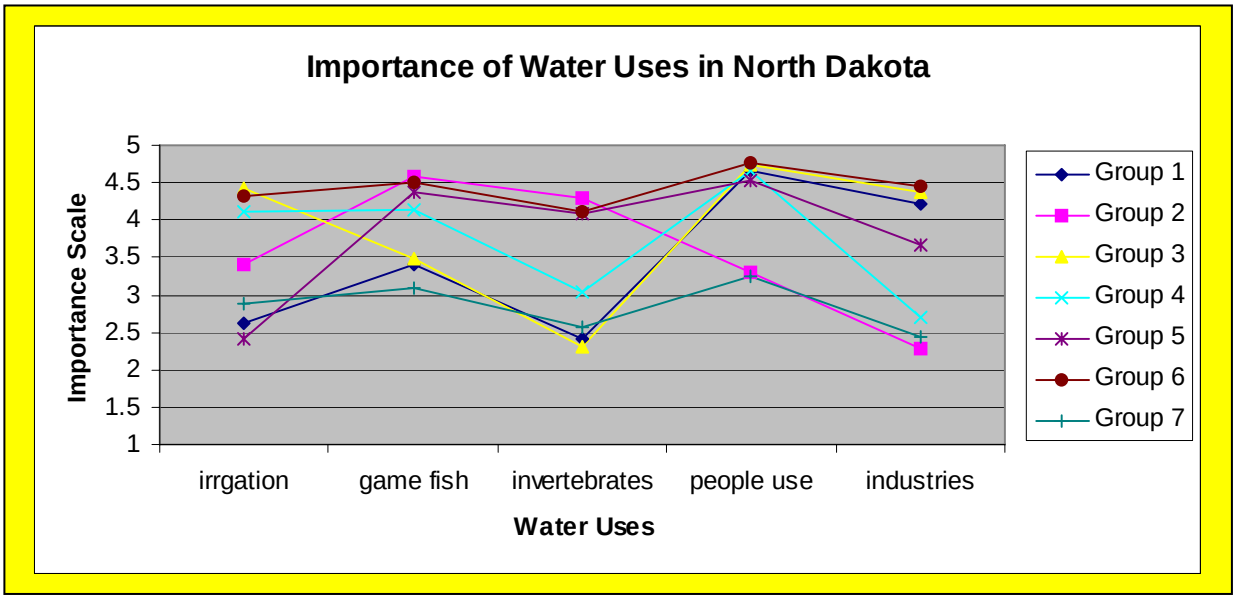



Figure 1.3. Comparison of the seven water-use groups' rating of the importance of the five water uses (*data from Table 1.3*).

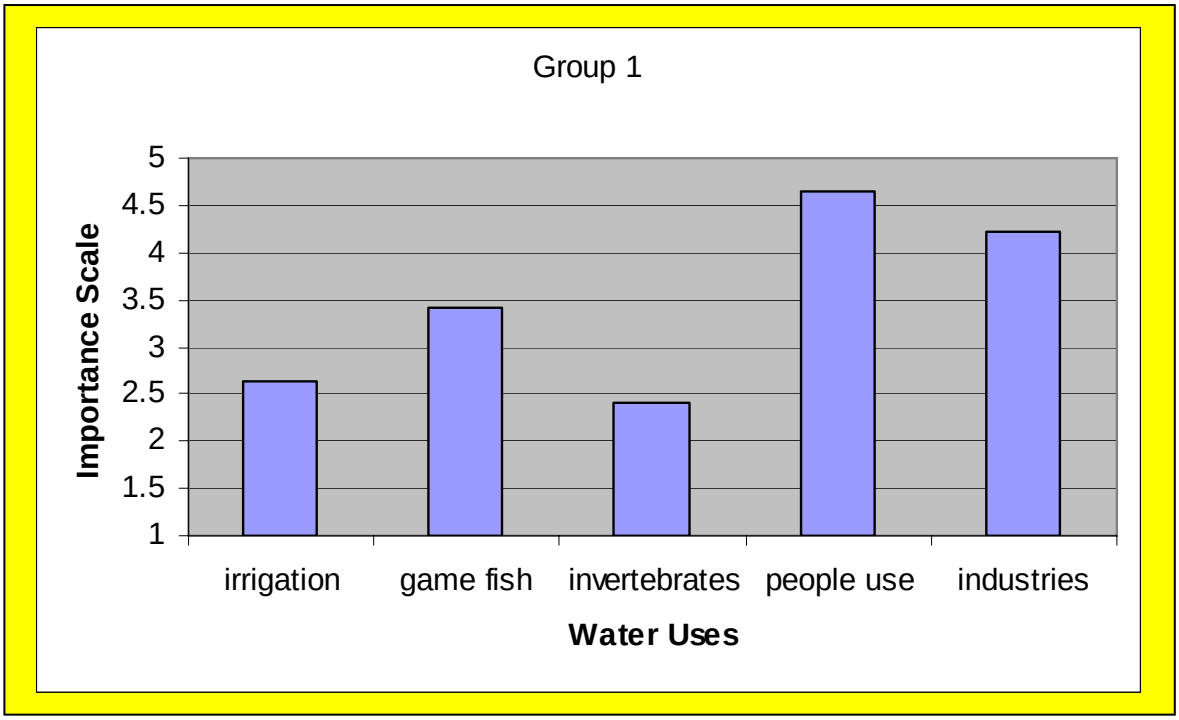



Figure 1.4. Importance of the five water uses rated by **Group 1** (*data from Table 1.3*).

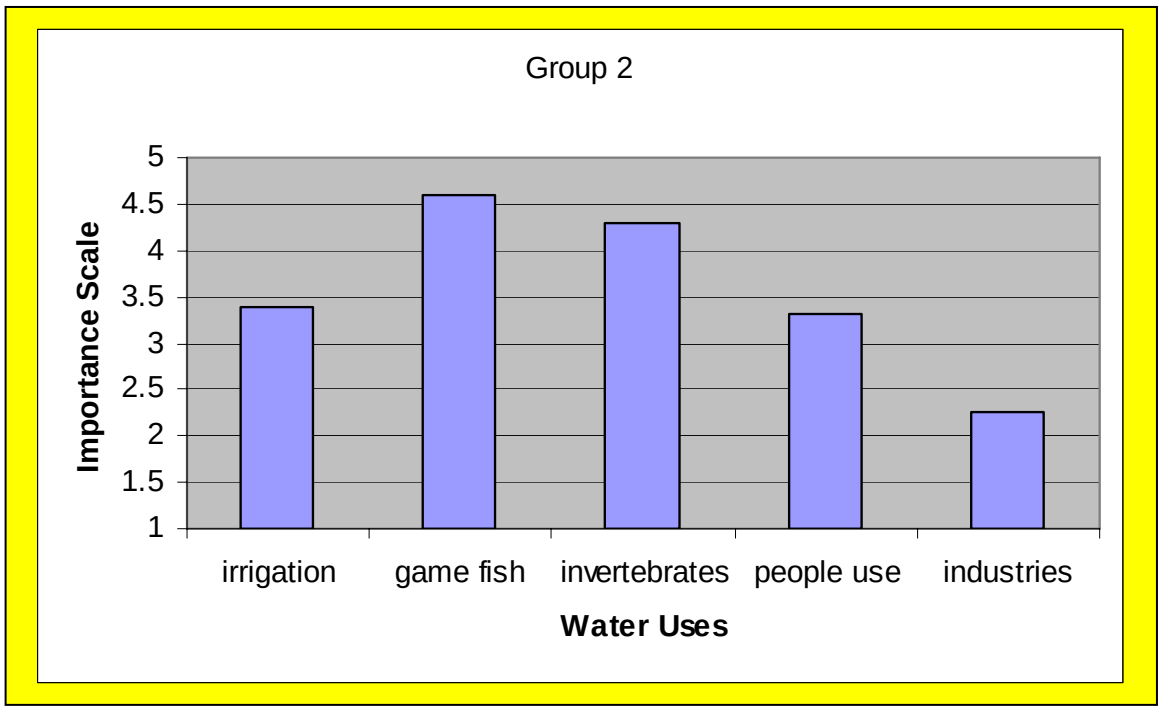



Figure 1.5. Importance of the five water uses rated by **Group 2** (*data from Table 1.3*).

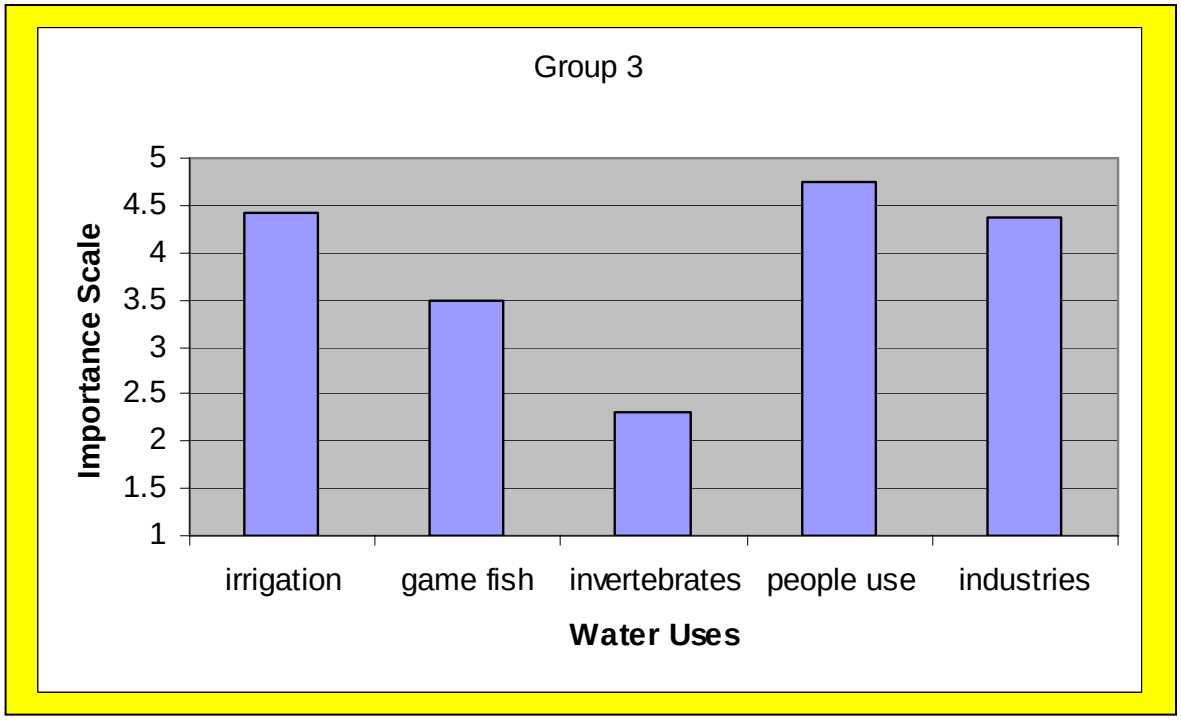



Figure 1.6. Importance of the five water uses rated by **Group 3** (*data from Table 1.3*).

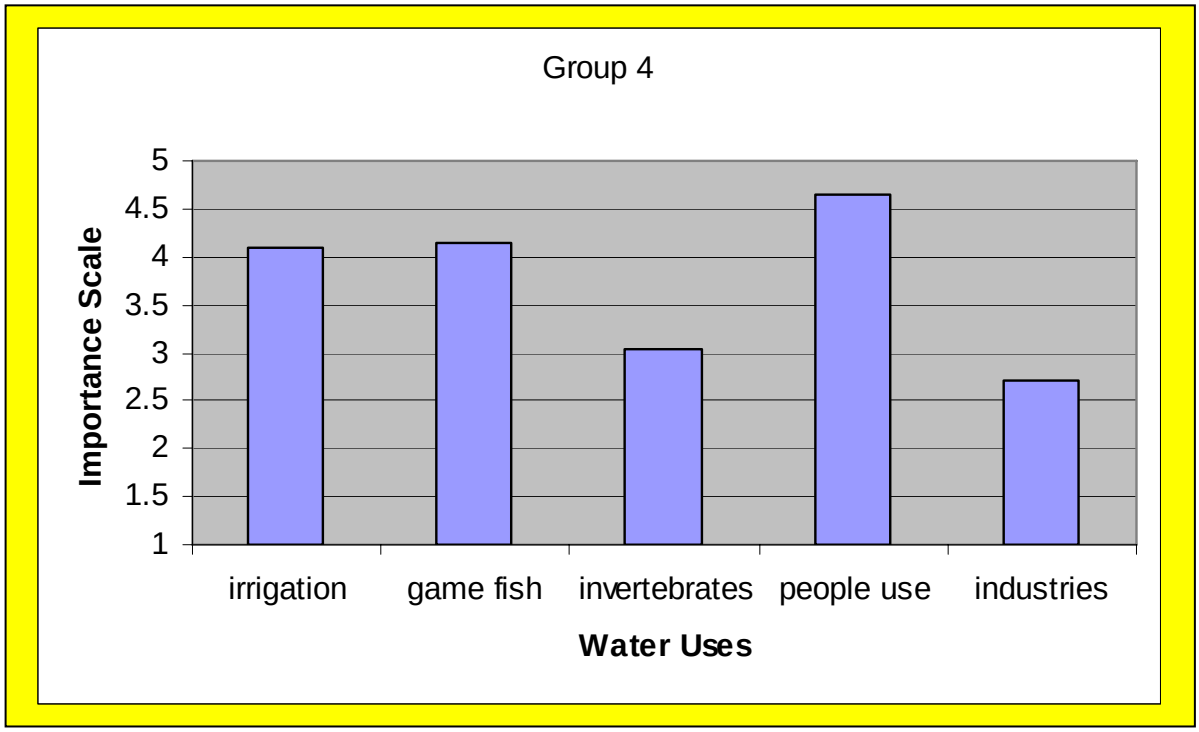



Figure 1.7. Importance of the five water uses rated by **Group 4** (*data from Table 1.3*).

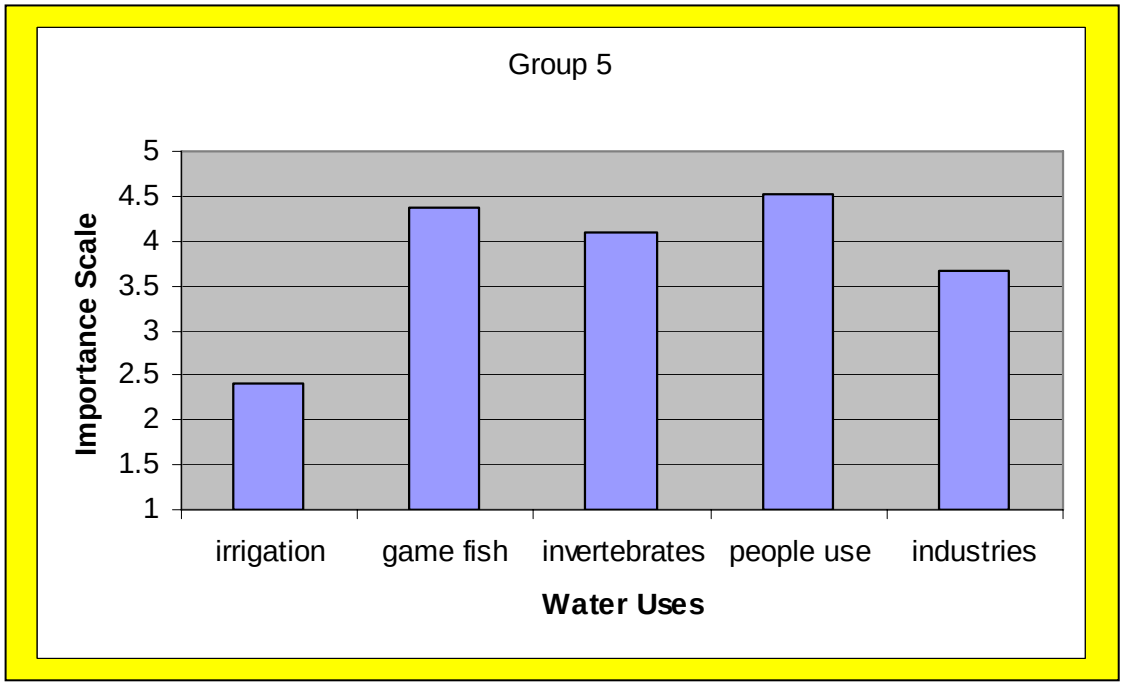



Figure 1.8. Importance of the five water uses rated by **Group 5** (*data from Table 1.3*).

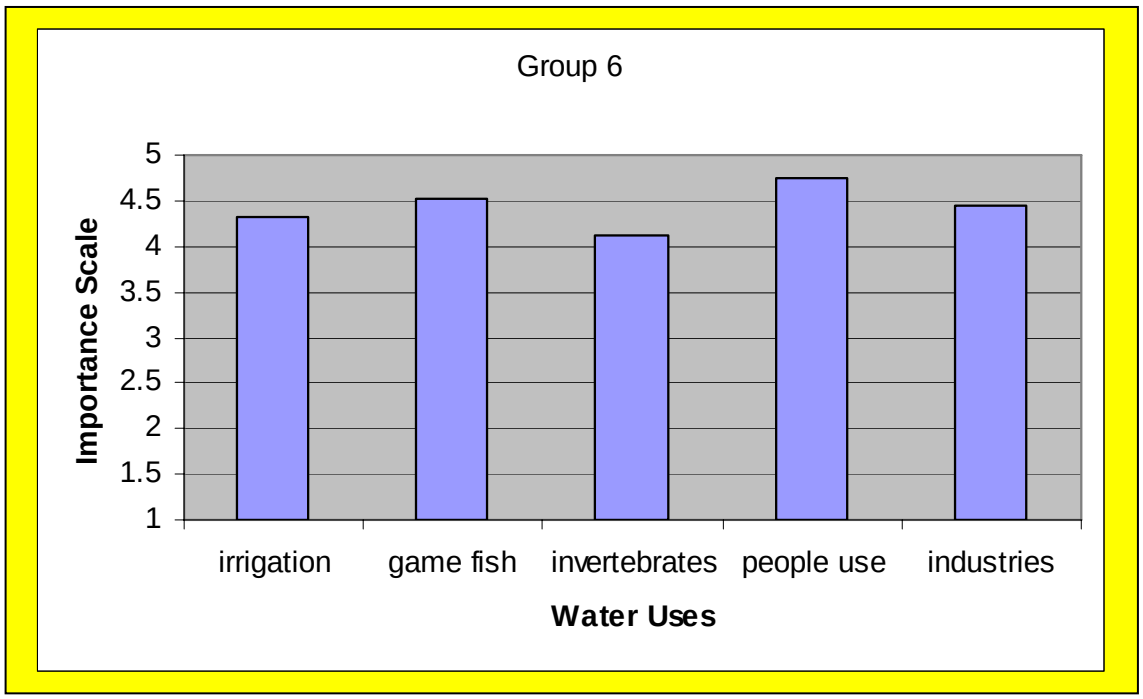



Figure 1.9. Importance of the five water uses rated by **Group 6** (*data from Table 1.3*).

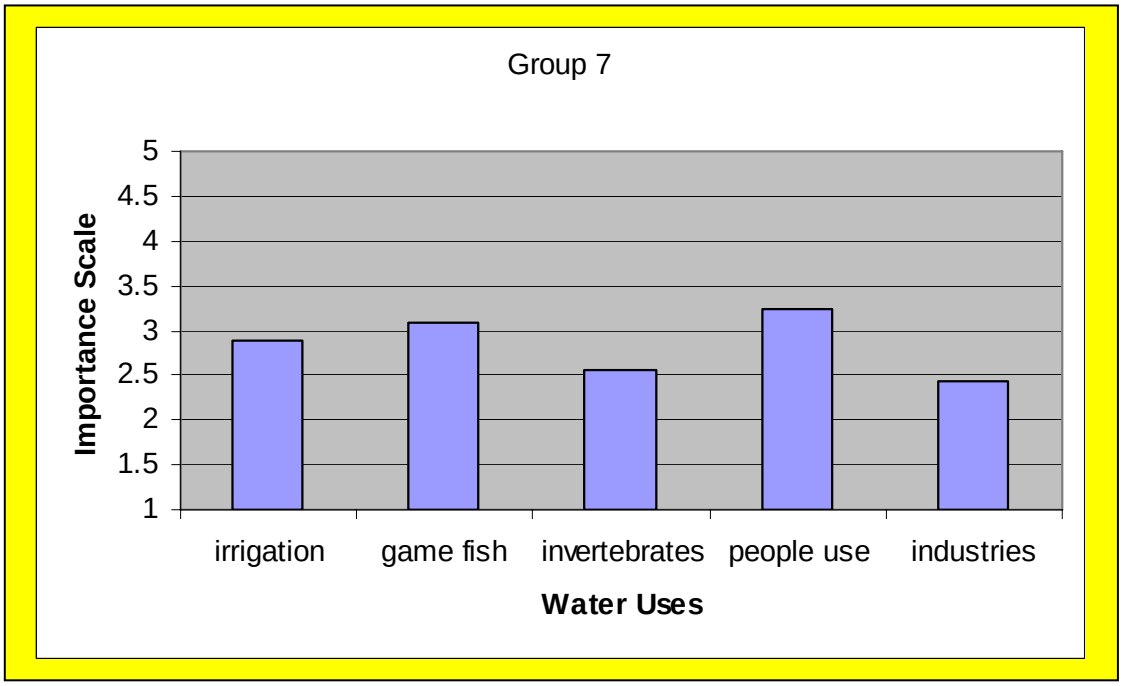



Figure 1.10. Importance of the five water uses rated by **Group 7** (*data from Table 1.3*).

Table 1.4. Wildlife value orientation composition for each water-use group.

| Water-Use Group | Wildlife Value Orientation Type | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **1** | 26.1% | 53.2% | 10.8% | 9.9% | 100% |
| **2** | 32.4% | 18.9% | 29.7% | 18.9% | 100% |
| **3** | 23.0% | 57.8% | 11.2% | 8.1% | 100% |
| **4** | 14.3% | 52.9% | 28.6% | 4.3% | 100% |
| **5** | 36.0% | 34.0% | 22.0% | 8.0% | 100% |
| **6** | 44.8% | 39.1% | 10.9% | 5.2% | 100% |
| **7** | 23.4% | 42.2% | 25.0% | 9.4% | 100% |
| **Average** | 30.2% | 46.0% | 15.9% | 7.9% | 100% |

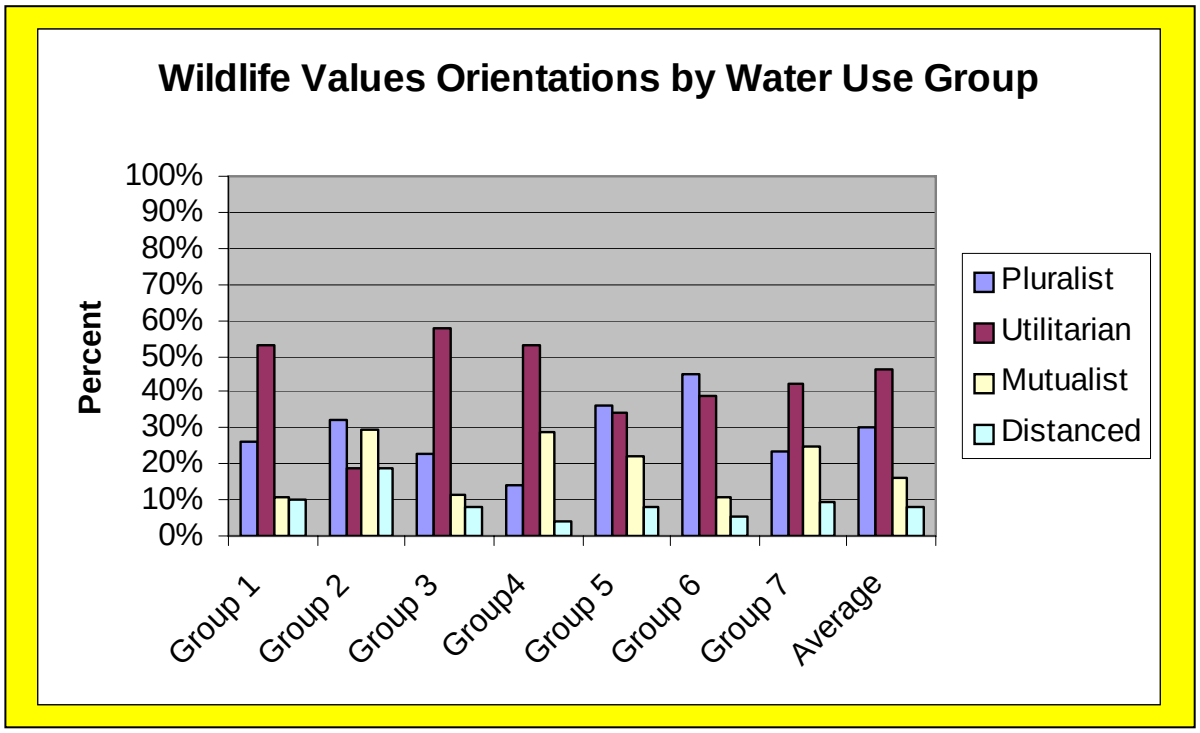



Figure 1.11. Wildlife values orientation composition for each water-use group (*data from Table 1.4*).

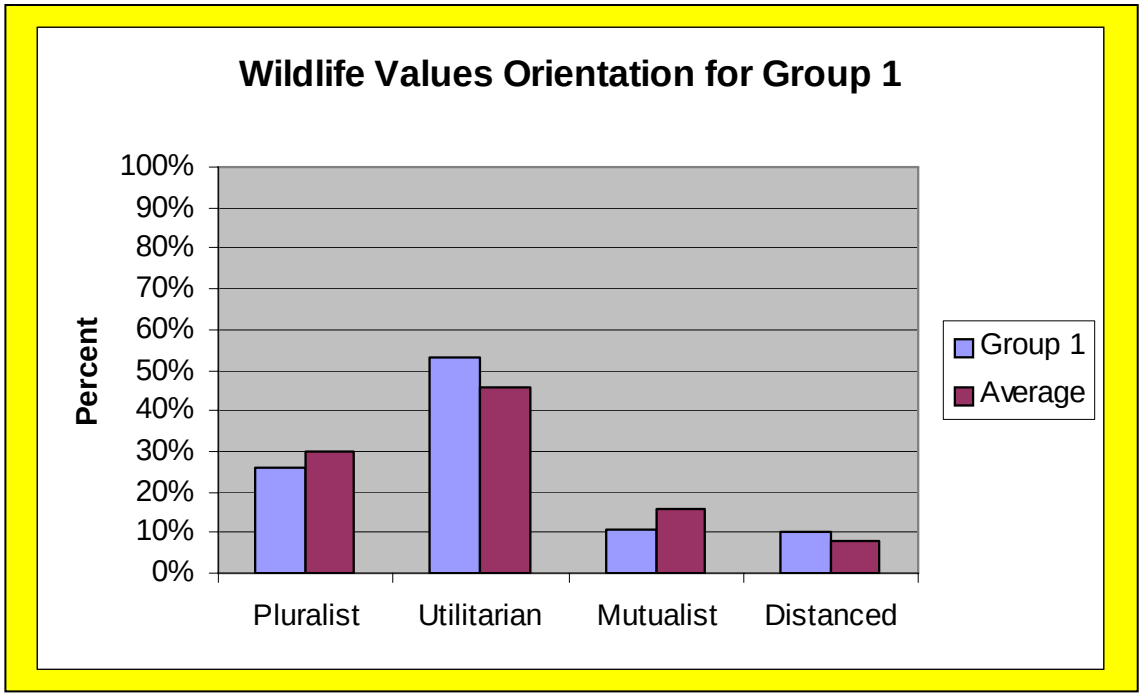



Figure 1.11-A. Wildlife values orientation composition for water-use **Group 1** (*data from Table 1.4*).

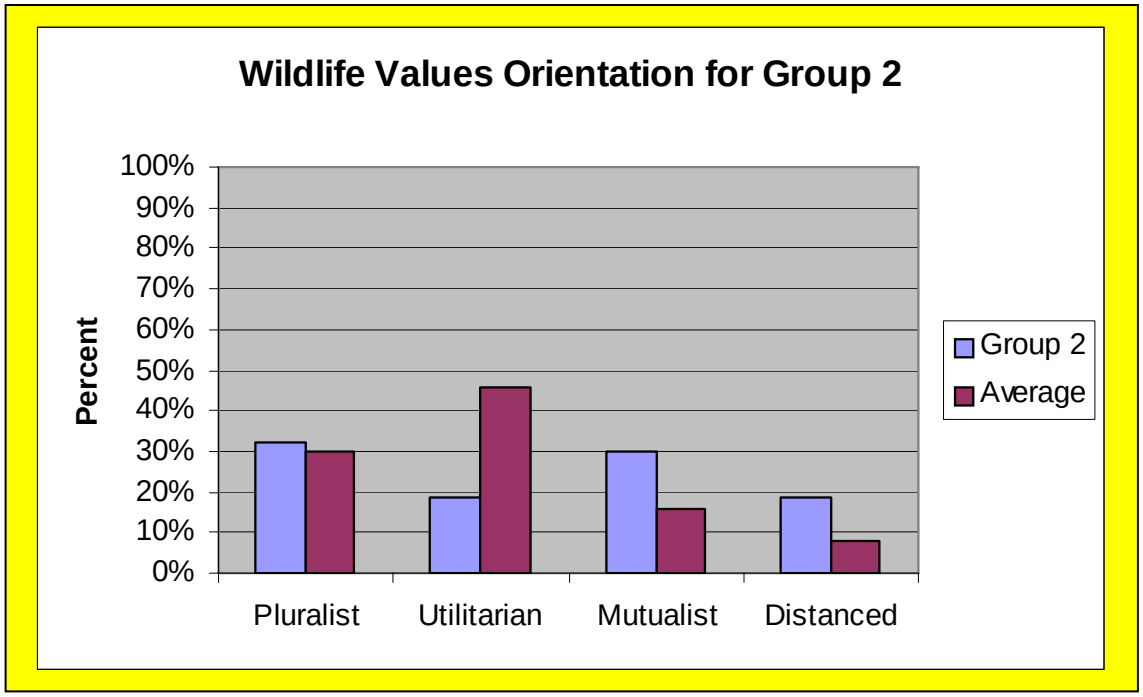



Figure 1.11-B. Wildlife values orientation composition for water-use **Group 2** (*data from Table 1.4*).

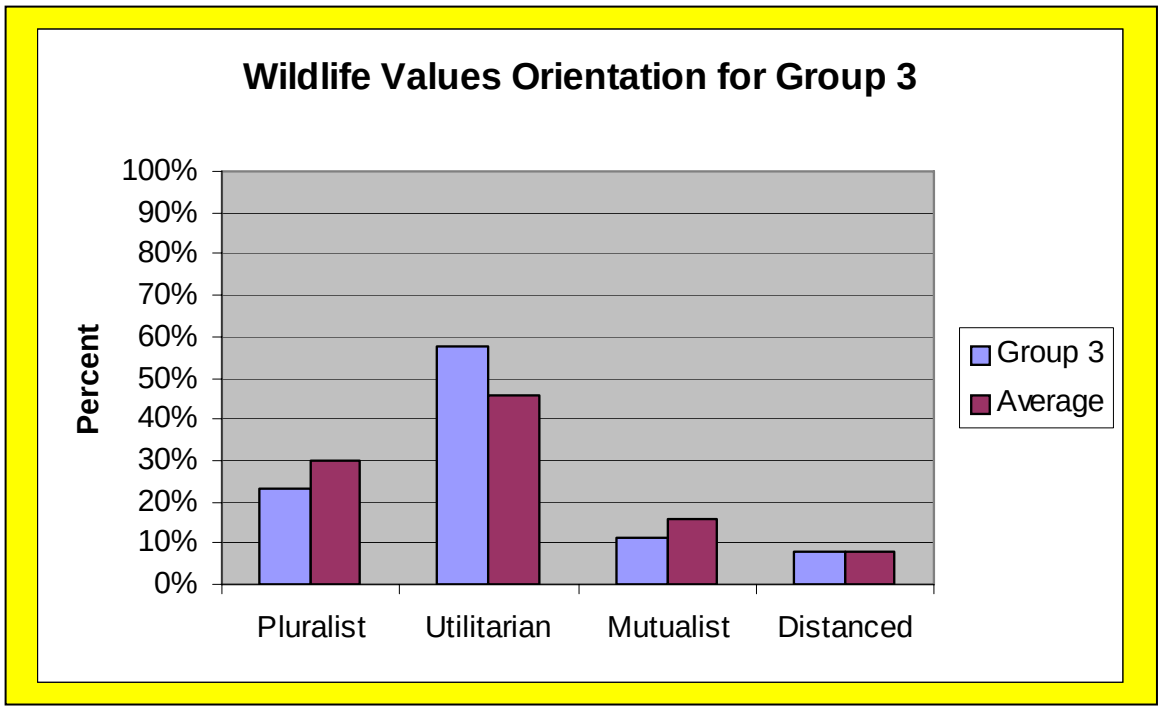



Figure 1.11-C. Wildlife values orientation composition for water-use **Group 3** (*data from Table 1.4*).

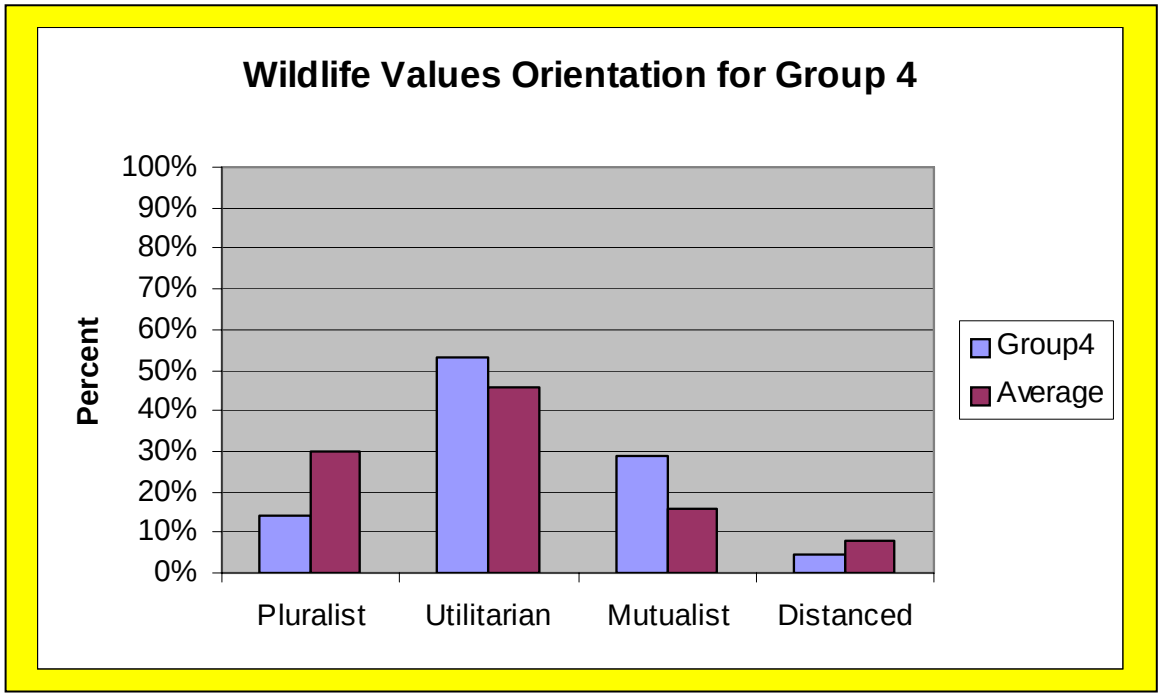



Figure 1.11-D. Wildlife values orientation composition for water-use **Group 4** (*data from Table 1.4*).

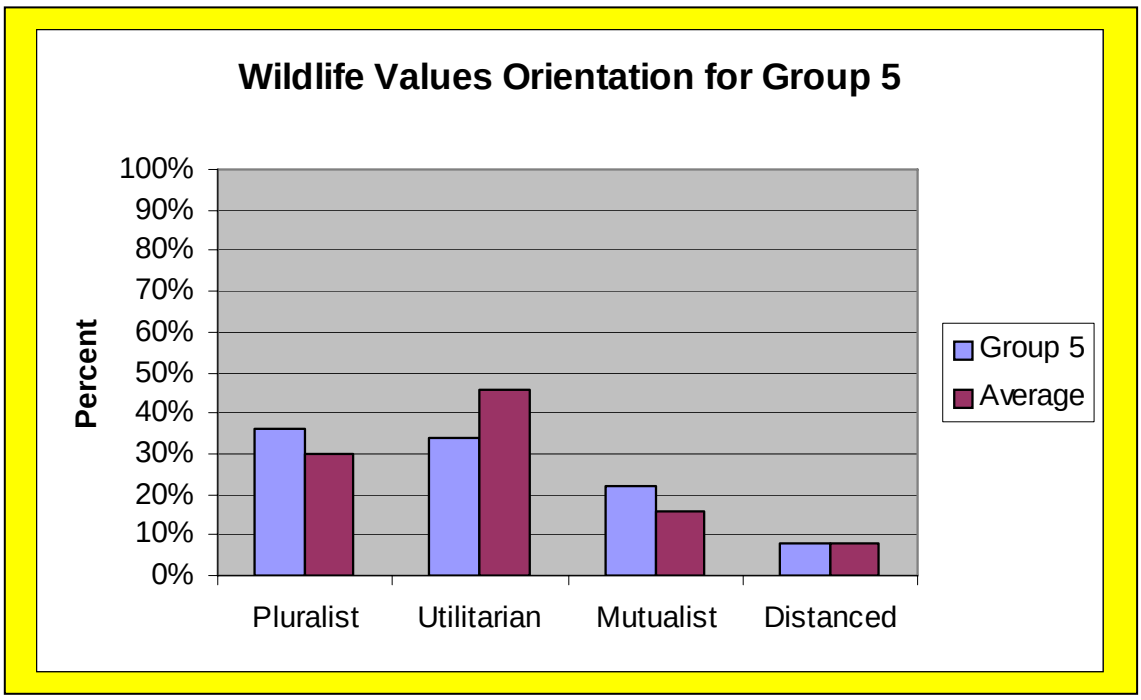



Figure 1.11-E. Wildlife values orientation composition for water-use **Group 5** (*data from Table 1.4*).

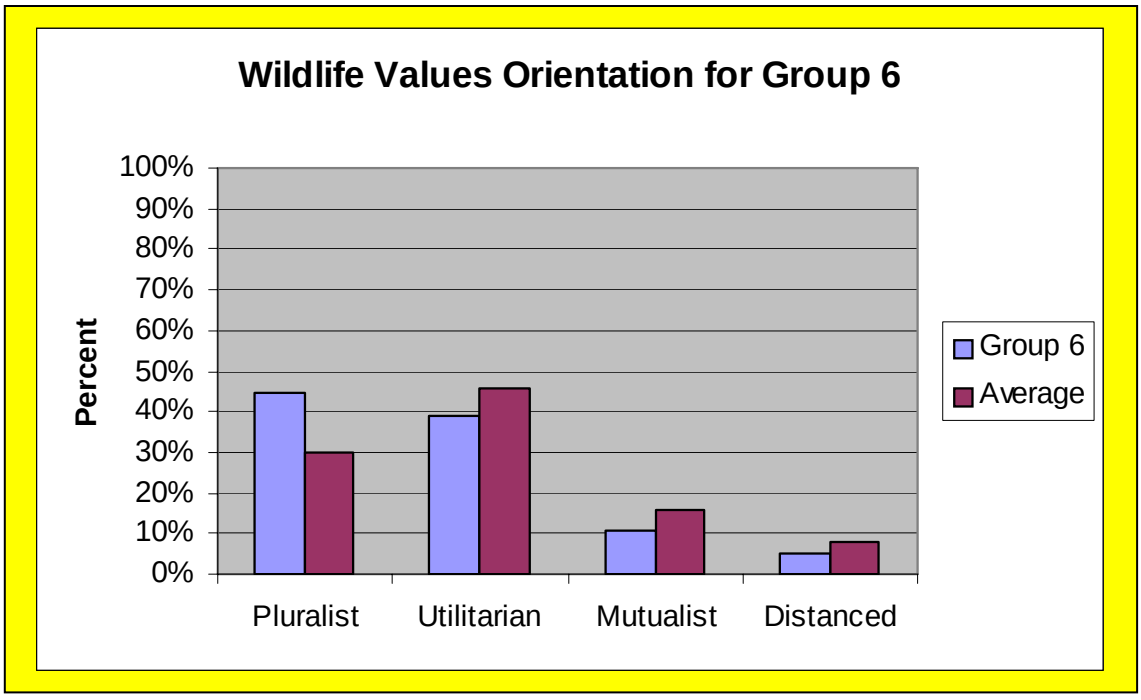



Figure 1.11-F. Wildlife values orientation composition for water-use **Group 6** (*data from Table 1.4*).

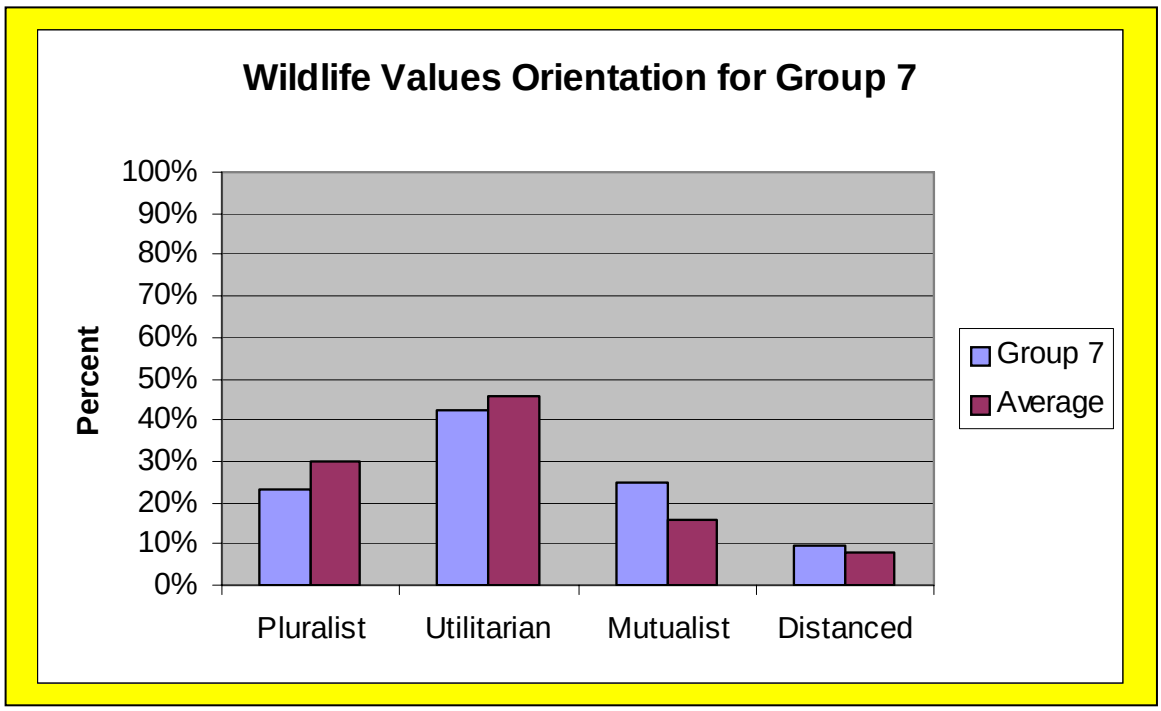



Figure 1.11-G. Wildlife values orientation composition for water-use **Group 7** (*data from Table 1.4*).

Table 1.5. Mean number of points out of 100 total points for four categories of Missouri River system water use for each of the seven water-use groups.

| Water Use | Water-Use Group | Percent of Total Points | 95% Confidence Interval |
|---|---|---|---|
| **Home Uses (for example, drinking water, cleaning)** | **1** | 33.6 | 30.8 – 36.3 |
| | **2** | 20.6 | 17.2 – 24.0 |
| | **3** | 34.7 | 32.5 – 36.9 |
| | **4** | 33.2 | 29.9 – 36.4 |
| | **5** | 33.0 | 29.4 – 36.6 |
| | **6** | 33.5 | 31.6 – 35.4 |
| | **7** | 29.3 | 26.2 – 32.4 |
| **Agriculture and Industry (for example, irrigation, power plants)** | **1** | 24.4 | 22.4 – 26.4 |
| | **2** | 18.4 | 15.2 – 21.7 |
| | **3** | 30.0 | 28.0 – 32.1 |
| | **4** | 22.0 | 19.9 – 24.1 |
| | **5** | 16.7 | 14.0 – 19.3 |
| | **6** | 24.7 | 23.6 – 25.9 |
| | **7** | 23.2 | 20.4 – 26.0 |
| **Fish and Wildlife** | **1** | 21.4 | 19.6 – 23.1 |
| | **2** | 38.8 | 33.7 – 43.9 |
| | **3** | 19.1 | 17.4 – 20.8 |
| | **4** | 22.3 | 20.3 – 24.2 |
| | **5** | 29.6 | 25.9 – 33.2 |
| | **6** | 23.4 | 22.1 – 24.8 |
| | **7** | 25.7 | 22.8 – 28.7 |
| **Recreation (for example, fishing, boating, other water-based recreation)** | **1** | 20.6 | 19.0 – 22.3 |
| | **2** | 22.2 | 18.1 – 26.2 |
| | **3** | 16.2 | 14.9 – 17.4 |
| | **4** | 22.6 | 19.5 – 25.7 |
| | **5** | 20.8 | 17.8 – 23.8 |
| | **6** | 18.3 | 17.1 – 19.5 |
| | **7** | 21.8 | 18.8 – 24.8 |

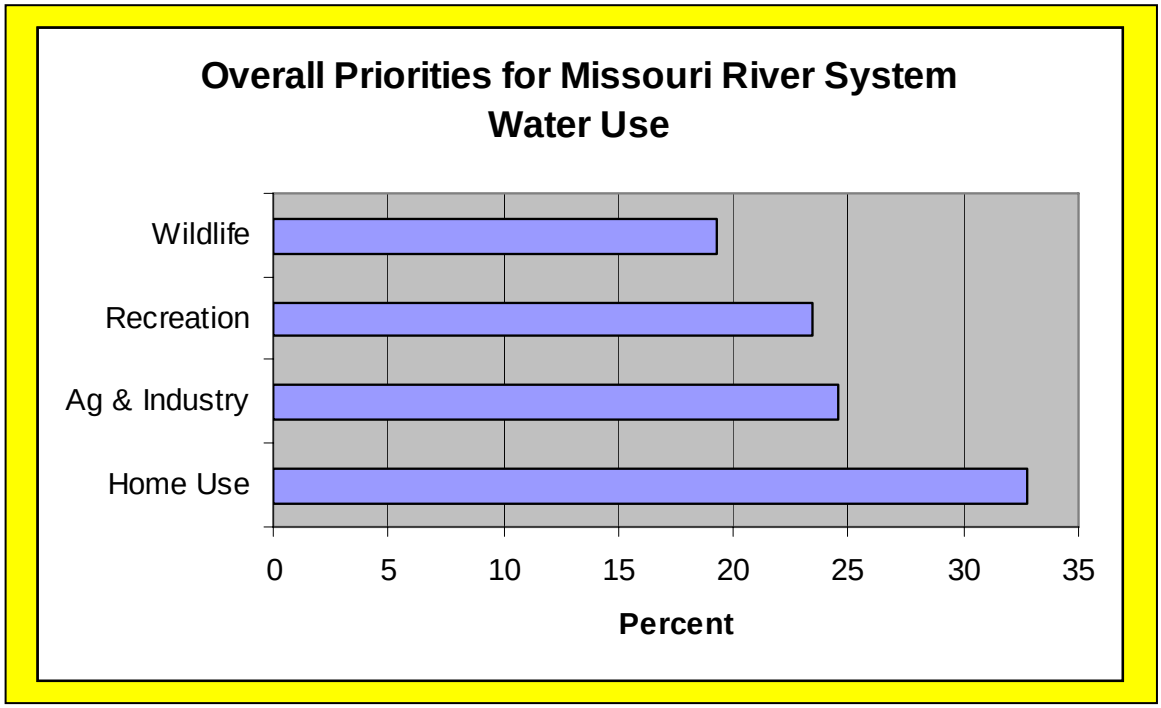



Figure 1.12. Overall mean number of points out of 100 total points for four categories of Missouri River system water use.

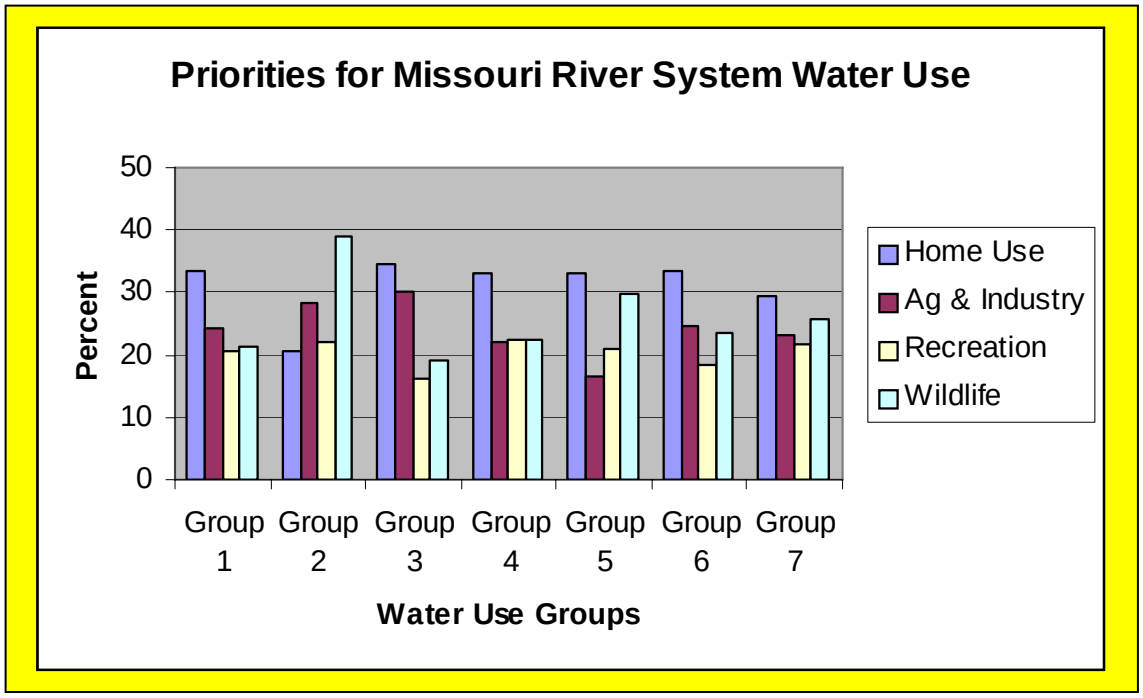



Figure 1.13-A. Priorities for Missouri River system water uses analyzed by water-use groups (*data from Table 1.5*).

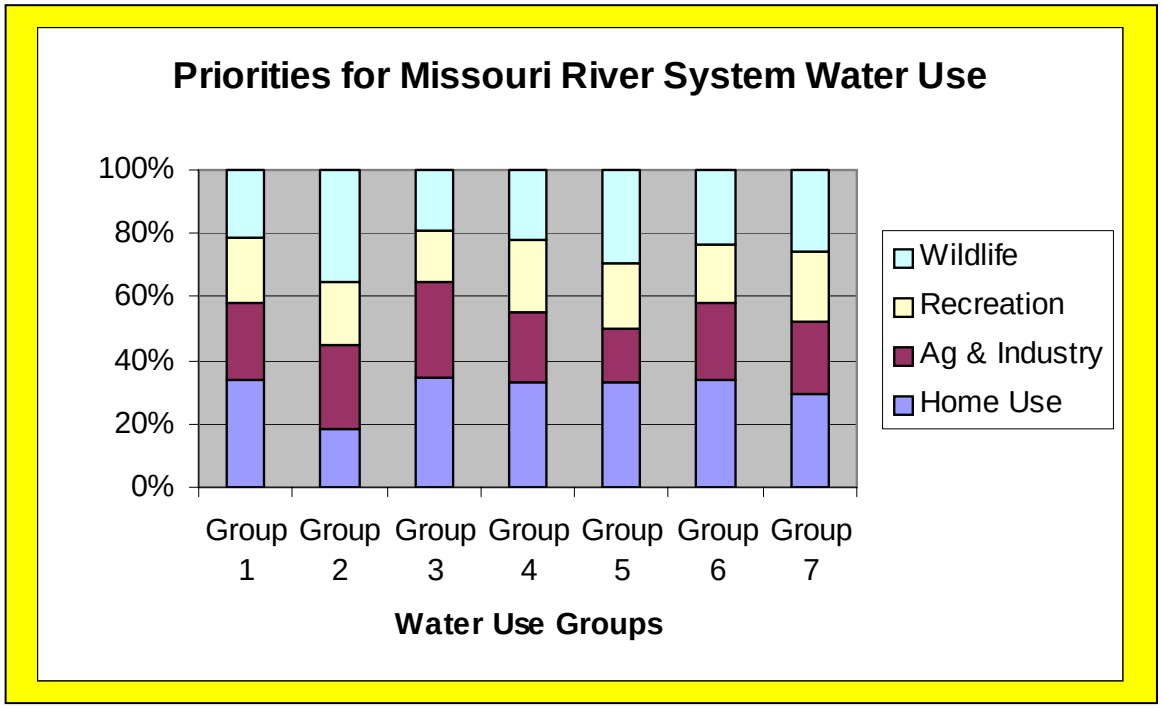



Figure 1.13-B. Priorities for Missouri River system water uses analyzed by water-use groups (*data from Table 1.5*).

Table 1.6. Number of water-based recreational activities during the last 12 months on the Missouri River system by North Dakota residents.

| Number of Activities | Number | Percent |
|---|---|---|
| **0** | 432 | 62.6% |
| **1** | 90 | 13.0% |
| **2** | 63 | 9.1% |
| **3** | 50 | 7.2% |
| **4** | 30 | 4.3% |
| **5** | 11 | 1.6% |
| **6** | 14 | 2.0% |
| **Total** | 689 | 100% |

Table 1.7. Mean number of water-based recreational activities during the last 12 months on the Missouri River system for each of the seven water-use groups.

| Water-Use Group | Mean Number of Activities | 95% Confidence Interval |
|---|---|---|
| **1** | 0.90 | 0.63 – 1.18 |
| **2** | 1.25 | 0.74 – 1.75 |
| **3** | 0.67 | 0.46 – 0.88 |
| **4** | 1.14 | 0.76 – 1.52 |
| **5** | 0.88 | 0.50 – 1.26 |
| **6** | 1.00 | 0.77 – 1.22 |
| **7** | 0.86 | 0.50 – 1.23 |
| **Average** | 0.91 | 0.80 – 1.02 |
| ANOVA: F=1.47; df=6 / 671; *p*=0.188 | | |

Table 1.8. Percent of North Dakota residents that did not participate in any water-based recreational activities during the last 12 months on the Missouri River system analyzed by water-use group.

| Water-Use Groups | Percent Not Participating in Water-Based Activities on Missouri River System |
|---|---|
| **1** | 60.6% |
| **2** | 48.6% |
| **3** | 73.6% |
| **4** | 54.3% |
| **5** | 58.0% |
| **6** | 60.2% |
| **7** | 66.1% |
| **Average** | 62.5% |
| Chi-Square: $X^2$=14.78; df=6; *p*=0.022 | |

Table 1.9. Overall types of water-based recreational activities during the last 12 months on the Missouri River system by North Dakota residents.

| Activity | Percent |
|---|---|
| **Parties, Picnics, Rest and Relaxation** | 28.7% |
| **Fishing** | 21.5% |
| **Recreational Boating** | 20.8% |
| **Sun Bathing, Sand Volleyball** | 10.2% |
| **Jet Skiing (personal water craft)** | 4.8% |
| **Water Skiing** | 4.7% |
| **Number of Cases** | 689 |

Table 1.10. Percent participation in water-based recreational activities during the last 12 months on the Missouri River system for each water-use group.

| Activity | Water-Use Groups | | | | | | |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **Parties, Picnics, etc** ***p*=0.002** | 31.2% | 48.6% | 18.9% | 38.0% | 20.0% | 31.4% | 27.4% |
| **Fishing** ***p*=0.103** | 16.5% | 21.6% | 17.0% | 27.1% | 34.0% | 23.7% | 17.7% |
| **Recreational Boating** ***p*=0.335** | 22.9% | 34.2% | 16.4% | 21.4% | 22.0% | 22.0% | 17.7% |
| **Sun Bathing, etc** ***p*=0.820** | 10.1% | 8.1% | 9.4% | 11.3% | 8.0% | 10.5% | 16.1% |
| **Jet Skiing** ***p*=0.224** | 4.6% | 10.8% | 3.1% | 7.0% | 2.0% | 6.8% | 1.6% |
| **Water Skiing** ***p*=0.123** | 4.6% | 2.6% | 1.9% | 10.0% | 2.0% | 5.2% | 8.1% |

Table 1.11. Percent of anglers, hunters and wildlife viewers in the North Dakota adult resident population.

| Wildlife Related Activity | Number | Percent |
|---|---|---|
| **Non-Anglers** | 121 | 17.5% |
| **Inactive Anglers** | 361 | 52.2% |
| **Active Anglers** | 209 | 30.2% |
| **Total** | 691 | 100% |
| | | |
| **Non-Hunters** | 330 | 47.6% |
| **Inactive Hunters** | 227 | 32.8% |
| **Active Hunters** | 136 | 19.6% |
| **Total** | 692 | 100% |
| | | |
| **Non-Wildlife Viewers** | 368 | 53.4% |
| **Inactive Wildlife Viewers** | 158 | 23.0% |
| **Active Wildlife Viewers** | 163 | 23.7% |
| **Total** | 690 | 100% |

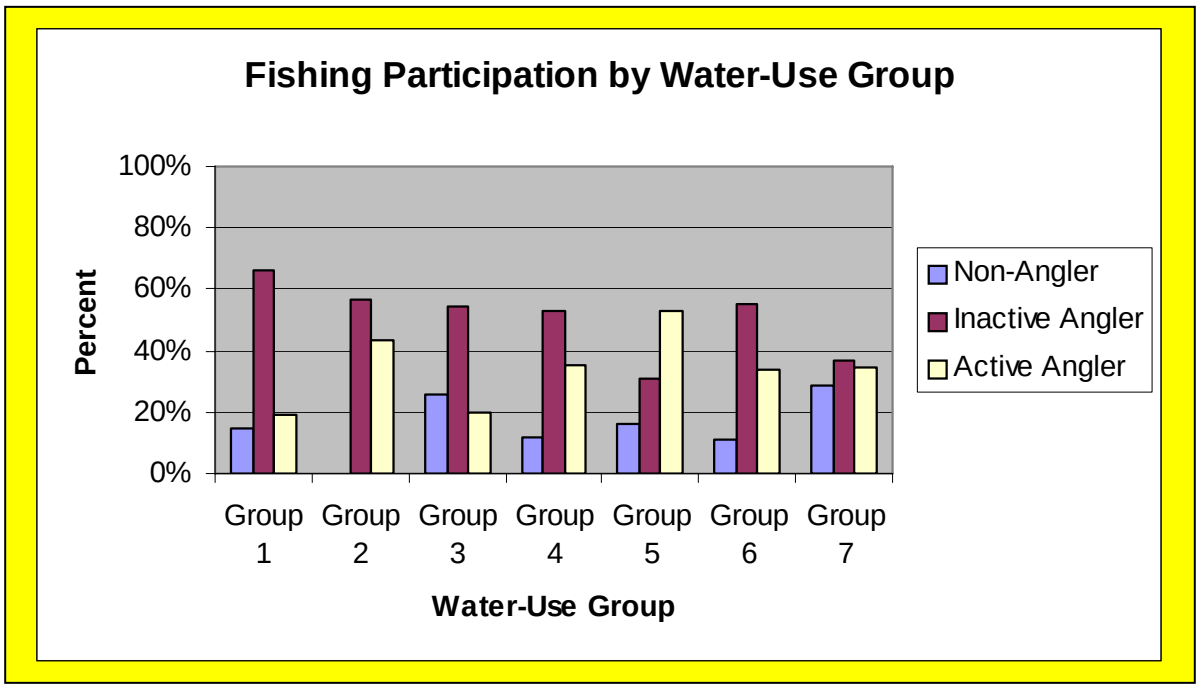



Figure 1.14. Fishing participation[1] for each water-use group (*data from Table 1.12*).

[1] In this report the heading of fishing, hunting and wildlife viewing participation includes the category of non-angler/hunter/viewer as a way of enhancing the description of the participants (inactive and active) by providing a comparison of participants with non-participants. The term "participation" is used in table and figure titles and headings because the main purpose was to provide a description of "participants".

Table 1.12. Relationship of fishing, hunting and wildlife viewing with the seven water-use groups.

| Water-Use Group | Number | Fishing | | |
|---|---|---|---|---|
| | | Non-Angler | Inactive Angler | Active Angler |
| **1** | 110 | 14.5% | 66.4% | 19.1% |
| **2** | 37 | 0.0% | 56.8% | 43.2% |
| **3** | 155 | 25.8% | 54.2% | 20.0% |
| **4** | 68 | 11.8% | 52.9% | 35.3% |
| **5** | 49 | 16.3% | 30.6% | 53.1% |
| **6** | 185 | 10.8% | 55.1% | 34.1% |
| **7** | 63 | 28.6% | 36.5% | 34.9% |
| **Average** | 667 | 16.5% | 53.1% | 30.4% |
| Chi-Square: $X^2$=58.66; df=12; $p$<0.001 | | | | |

| Water-Use Group | Number | Hunting | | |
|---|---|---|---|---|
| | | Non-Hunter | Inactive Hunter | Active Hunter |
| **1** | 109 | 45.9% | 40.4% | 13.8% |
| **2** | 37 | 43.2% | 29.7% | 27.0% |
| **3** | 156 | 53.2% | 29.5% | 17.3% |
| **4** | 69 | 42.0% | 37.7% | 20.3% |
| **5** | 49 | 30.6% | 30.6% | 38.8% |
| **6** | 186 | 47.3% | 33.9% | 18.8% |
| **7** | 63 | 50.8% | 27.0% | 22.2% |
| **Average** | 669 | 46.8% | 33.2% | 20.0% |
| Chi-Square: $X^2$=21.04; df=12; $p$=0.050 | | | | |

| Water-Use Group | Number | Wildlife Viewing | | |
|---|---|---|---|---|
| | | Non-Viewer | Inactive Viewer | Active Viewer |
| **1** | 110 | 64.5% | 21.8% | 13.6% |
| **2** | 36 | 27.8% | 13.9% | 58.3% |
| **3** | 155 | 60.6% | 21.9% | 17.4% |
| **4** | 68 | 51.5% | 26.5% | 22.1% |
| **5** | 48 | 41.7% | 25.0% | 33.3% |
| **6** | 186 | 49.5% | 25.8% | 24.7% |
| **7** | 63 | 50.8% | 20.6% | 28.6% |
| **Average** | 666 | 53.2% | 23.1% | 23.7% |
| Chi-Square: $X^2$=41.25; df=12; $p$<0.001 | | | | |

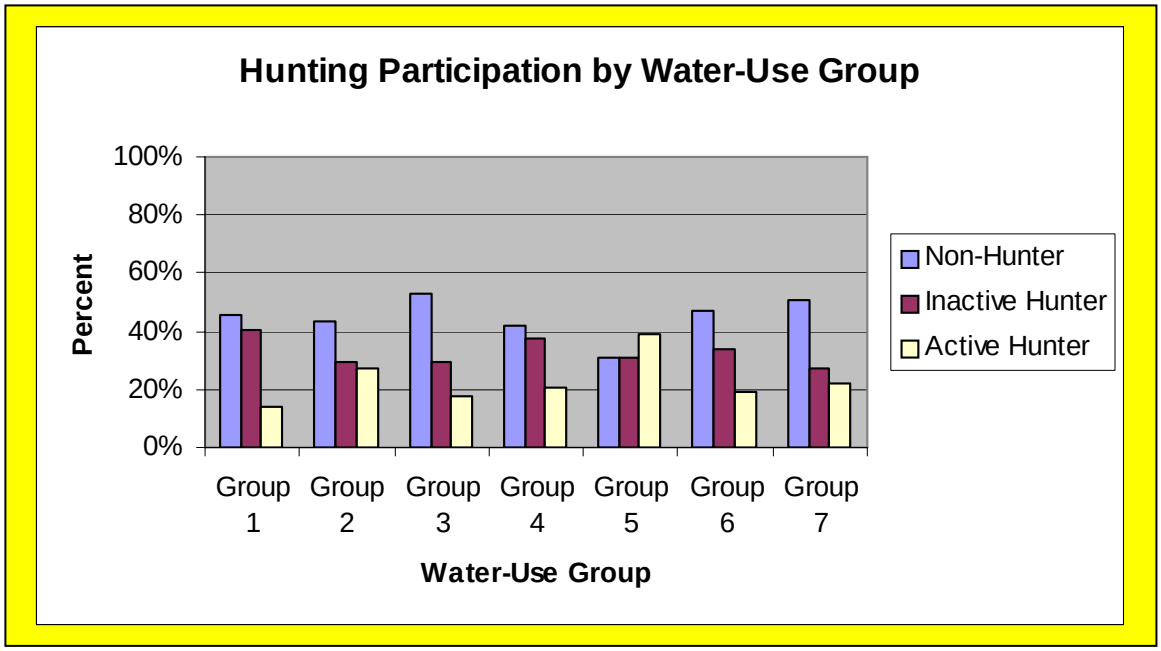



Figure 1.15. Hunting participation for each water-use group (*data from Table 1.12*).

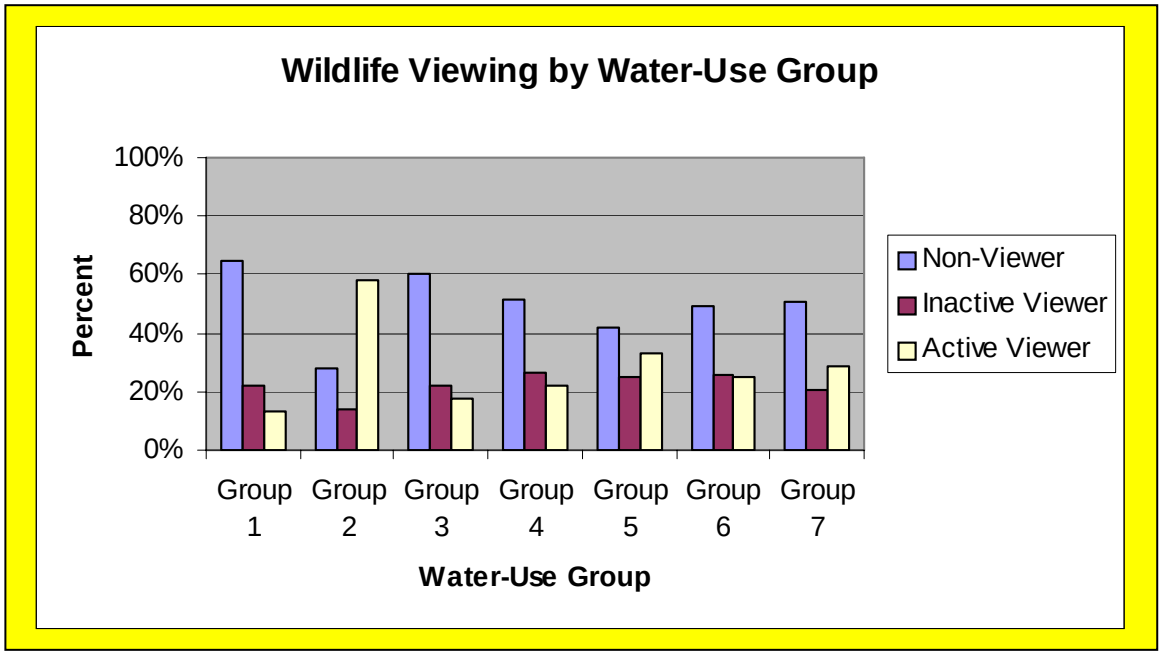



Figure 1.16. Wildlife viewing for each water-use group (*data from Table 1.12*).

Table 1.13. Mean number of water-based recreational activities during the last 12 months on the Missouri River system analyzed by anglers, hunters and wildlife viewers.

| Wildlife Related Activity | Mean Number of Activities | 95% Confidence Interval |
|---|---|---|
| **Non-Anglers** | 0.48 | 0.26 – 0.71 |
| **Inactive Anglers** | 0.59 | 0.48 – 0.71 |
| **Active Anglers** | 1.70 | 1.44 – 1.96 |
| **Average** | 0.91 | 0.80 – 1.02 |
| ANOVA: F=47.36; df=2 / 664; $p$<0.001 | | |
| | | |
| **Non-Hunters** | 0.72 | 0.58 – 0.86 |
| **Inactive Hunters** | 0.78 | 0.60 – 0.96 |
| **Active Hunters** | 1.55 | 1.23 – 1.88 |
| **Average** | 0.91 | 0.80 – 1.02 |
| ANOVA: F=16.80; df=2 / 665; $p$.001 | | |
| | | |
| **Non-Wildlife Viewers** | 0.75 | 0.62 – 0.88 |
| **Inactive Wildlife Viewers** | 0.86 | 0.62 – 1.10 |
| **Active Wildlife Viewers** | 1.31 | 1 03 – 1.59 |
| **Average** | 0.91 | 0.80 – 1.02 |
| ANOVA: F=8.01; df=2 / 665; $p$<0.001 | | |

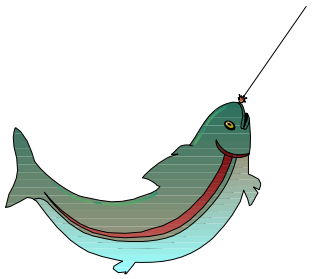


Table 1.14. Types of water-based recreational activities during the last 12 months on the Missouri River system analyzed by active anglers, active hunters and active wildlife viewers.

| Activity | Fishing / % Participating | | |
|---|---|---|---|
| | Non-Anglers & Inactive Anglers | Active Anglers | *p*-value |
| **Parties, Picnics, Rest and Relaxation** | 23.6% | 41.6% | <0.001 |
| **Fishing** | 6.9% | 53.5% | <0.001 |
| **Recreational Boating** | 13.3% | 38.6% | <0.001 |
| **Sun Bathing, Sand Volleyball** | 7.1% | 17.8% | <0.001 |
| **Jet Skiing (personal water craft)** | 3.2% | 8.4% | =0.004 |
| **Water Skiing** | 2.6% | 9.9% | <0.001 |

| Activity | Hunting / % Participating | | |
|---|---|---|---|
| | Non-Hunters & Inactive Hunters | Active Hunters | *p*-value |
| **Parties, Picnics, Rest and Relaxation** | 26.4% | 38.8% | =0.005 |
| **Fishing** | 15.7% | 41.8% | <0.001 |
| **Recreational Boating** | 17.2% | 35.8% | <0.001 |
| **Sun Bathing, Sand Volleyball** | 8.4% | 17.9% | =0.001 |
| **Jet Skiing (personal water craft)** | 3.6% | 10.4% | =0.001 |
| **Water Skiing** | 3.6% | 9.7% | =0.003 |

| Activity | Viewing / % Participating | | |
|---|---|---|---|
| | Non-Viewers & Inactive Viewers | Active Viewers | *p*-value |
| **Parties, Picnics, Rest and Relaxation** | 25.8% | 38.6% | =0.002 |
| **Fishing** | 18.3% | 28.9% | =0.004 |
| **Recreational Boating** | 17.7% | 30.3% | =0.001 |
| **Sun Bathing, Sand Volleyball** | 7.8% | 18.2% | <0.001 |
| **Jet Skiing (personal water craft)** | 4.4% | 6.1% | =0.379 |
| **Water Skiing** | 3.6% | 8.5% | =0.011 |

Table 1.15. Mean number of points out of 100 total points for four categories of Missouri River system water use analyzed by wildlife related activity (fishing, hunting and wildlife viewing).

| Water Use | Wildlife Related Activity | Percent of Total Points | 95% Confidence Interval |
|---|---|---|---|
| **Home Uses (for example, drinking water, cleaning)** | **Non-Angler** | 35.9 | 32.9 – 38.9 |
| | **Inactive Angler** | 33.7 | 32.3 – 35.2 |
| | **Active Angler** | 29.5 | 27.7 – 31.4 |
| | | | |
| **Agriculture and Industry ( irrigation, power plants)** | **Non-Angler** | 26.8 | 24.7 – 28.9 |
| | **Inactive Angler** | 25.5 | 24.4 – 26.7 |
| | **Active Angler** | 21.8 | 20.4 – 23.2 |
| | | | |
| **Fish and Wildlife** | **Non-Angler** | 19.5 | 17.6 – 21.5 |
| | **Inactive Angler** | 23.2 | 21.8 – 24.3 |
| | **Active Angler** | 26.0 | 24.5 – 27.6 |
| | | | |
| **Recreation (fishing, boating, other water-based recreation)** | **Non-Angler** | 17.8 | 16.1 – 19.6 |
| | **Inactive Angler** | 17.7 | 16.8 – 18.5 |
| | **Active Angler** | 22.6 | 21.0 – 24.3 |
| | | | |
| **Water Use** | **Wildlife Related Activity** | **Percent of Total Points** | **95% Confidence Interval** |
| **Home Uses (for example, drinking water, cleaning)** | **Non-Hunter** | 34.7 | 33.1 – 36.3 |
| | **Inactive Hunter** | 30.9 | 29.1 – 32.7 |
| | **Active Hunter** | 31.6 | 29.4 – 33.8 |
| | | | |
| **Agriculture and Industry ( irrigation, power plants)** | **Non-Hunter** | 25.4 | 24.1 – 26.8 |
| | **Inactive Hunter** | 24.4 | 23.2 – 25.7 |
| | **Active Hunter** | 23.0 | 21.2 – 24.8 |
| | | | |
| **Fish and Wildlife** | **Non-Hunter** | 22.3 | 20.9 – 23.6 |
| | **Inactive Hunter** | 24.6 | 23.1 – 26.1 |
| | **Active Hunter** | 23.9 | 22.0 – 25.7 |
| | | | |
| **Recreation (fishing, boating, other water-based recreation)** | **Non-Hunter** | 17.6 | 16.6 – 18.6 |
| | **Inactive Hunter** | 20.0 | 18.8 – 21.2 |
| | **Active Hunter** | 21.5 | 19.5 – 23.6 |
| | | | |

Table continued on next page.

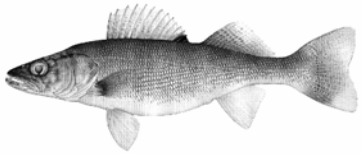
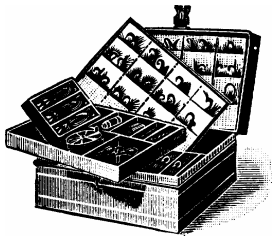


Table 1.15 – Continued.

| Water Use | Wildlife Related Activity | Percent of Total Points | 95% Confidence Interval |
|---|---|---|---|
| **Home Uses (for example, drinking water, cleaning)** | **Non-Viewer** | 34.3 | 32.7 – 35.8 |
| | **Inactive Viewer** | 33.3 | 31.2 – 35.4 |
| | **Active Viewer** | 29.2 | 27.3 – 31.1 |
| | | | |
| **Agriculture and Industry ( irrigation, power plants)** | **Non-Viewer** | 25.7 | 24.5 – 26.9 |
| | **Inactive Viewer** | 24.8 | 23.1 – 26.4 |
| | **Active Viewer** | 22.1 | 20.5 – 23.7 |
| | | | |
| **Fish and Wildlife** | **Non-Viewer** | 21.0 | 19.9 – 22.1 |
| | **Inactive Viewer** | 24.4 | 22.6 – 26.2 |
| | **Active Viewer** | 27.8 | 25.7 – 29.8 |
| | | | |
| **Recreation (fishing, boating, other water-based recreation)** | **Non-Viewer** | 19.1 | 18.1 – 20.1 |
| | **Inactive Viewer** | 17.5 | 16.1 – 18.9 |
| | **Active Viewer** | 20.9 | 19.1 – 22.7 |

Table 1.16. Water-Use groups analyzed by gender.

| Water-Use Group | Number | Gender | |
|---|---|---|---|
| | | Male | Female |
| **1** | 110 | 50.9% | 49.1% |
| **2** | 37 | 43.2% | 56.8% |
| **3** | 157 | 50.3% | 49.7% |
| **4** | 68 | 58.8% | 41.2% |
| **5** | 49 | 67.3% | 32.7% |
| **6** | 187 | 41.2% | 58.8% |
| **7** | 63 | 58.7% | 41.3% |
| **Average** | 671 | 50.4% | 49.6% |
| Chi-Square: $X^2$=16.44; df=6; $p$=0.012 | | | |



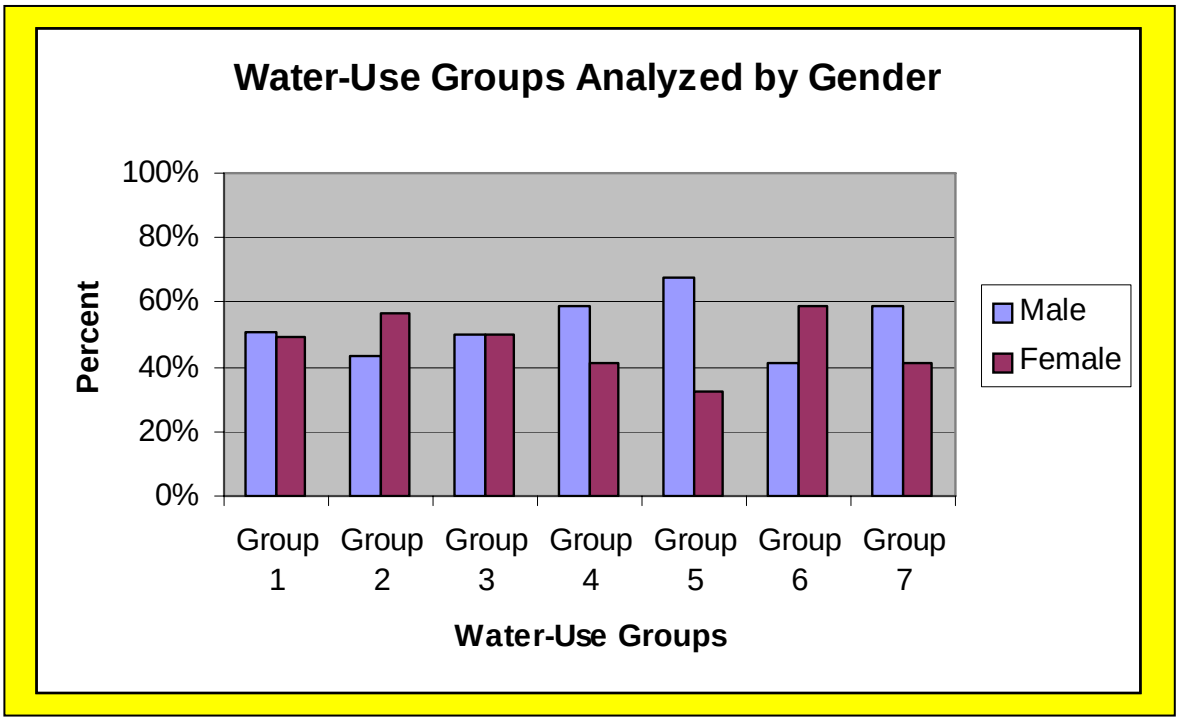



Figure 1.17. Water-use group analyzed by gender (*data from Table 1.16*).

Table 1.17. Mean age for each of the seven water-use groups.

| Water-Use Group | Mean Age (years) | 95% Confidence Interval |
|---|---|---|
| **1** | 50.9 | 47.3 – 54.4 |
| **2** | 39.2 | 34.1 – 44.3 |
| **3** | 49.7 | 46.7 – 52.7 |
| **4** | 41.7 | 38.1 – 45.2 |
| **5** | 47.7 | 43.0 – 52.4 |
| **6** | 46.5 | 44.0 – 49.0 |
| **7** | 43.2 | 39.1 – 47.3 |
| **Average** | 46.9 | 45.5 – 48.2 |
| ANOVA: F=4.41; df=6 / 659; $p$<0.001 | | |

Table 1.18. Mean years of residency in North Dakota for each of the seven water-use groups.

| Water-Use Group | Mean Residency (years) | 95% Confidence Interval |
|---|---|---|
| **1** | 39.2 | 34.7 – 43.7 |
| **2** | 27.3 | 21.1 – 33.5 |
| **3** | 38.6 | 34.9 – 42.3 |
| **4** | 28.2 | 23.4 – 33.1 |
| **5** | 33.7 | 27.9 – 39.6 |
| **6** | 34.9 | 31.7 – 38.1 |
| **7** | 32.0 | 26.9 – 37.2 |
| **Average** | 35.0 | 33.3 – 36.7 |
| ANOVA: F=3.32; df=6 / 610; *p*=0.003 | | |

Table 1.19. Education level of North Dakota resident sample.

| Education Level | Number | Percent |
|---|---|---|
| **Less than high school diploma** | 30 | 4.3% |
| **High school diploma or equivalent** | 199 | 28.8% |
| **2-year associates degree or trade school** | 168 | 24.4% |
| **4-year college degree** | 204 | 29.6% |
| **Advanced degree beyond 4-year college degree** | 89 | 12.9% |
| **Total** | 689 | 100% |

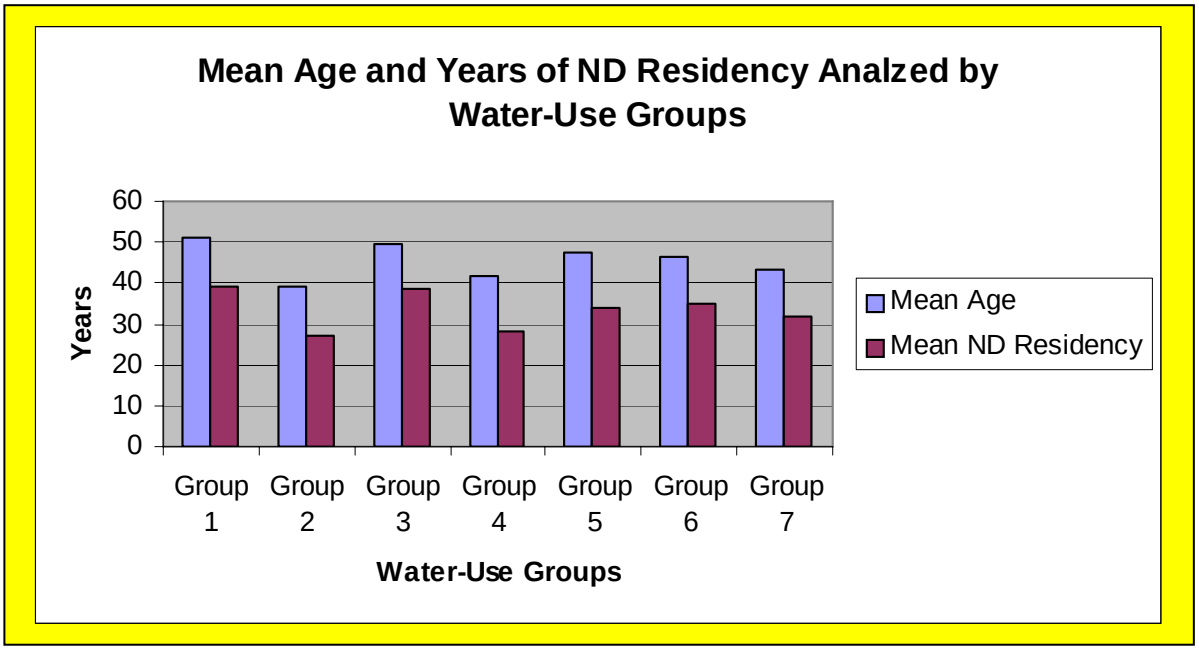



Figure 1.18. Mean age and mean years of North Dakota residency for each water-use group (*data from Tables 1.17 and 1.18*).

Table 1.20. Water-Use groups analyzed by education level.

| Water-Use Group | Number | Education Level | | | |
|---|---|---|---|---|---|
| | | HS or less | 2-year | 4-year | Advanced |
| **1** | 110 | 40.0% | 20.9% | 29.1% | 10.0% |
| **2** | 37 | 16.2% | 24.3% | 32.4% | 27.0% |
| **3** | 154 | 33.8% | 27.9% | 27.9% | 10.4% |
| **4** | 68 | 38.2% | 16.2% | 33.8% | 11.8% |
| **5** | 50 | 38.0% | 14.0% | 30.0% | 18.0% |
| **6** | 185 | 25.4% | 29.2% | 32.4% | 13.0% |
| **7** | 63 | 38.1% | 23.8% | 20.6% | 17.5% |
| **Average** | 667 | 32.7% | 24.3% | 29.7% | 13.3% |
| Chi-Square: $X^2$=28.53; df=18; $p$=0.055 | | | | | |

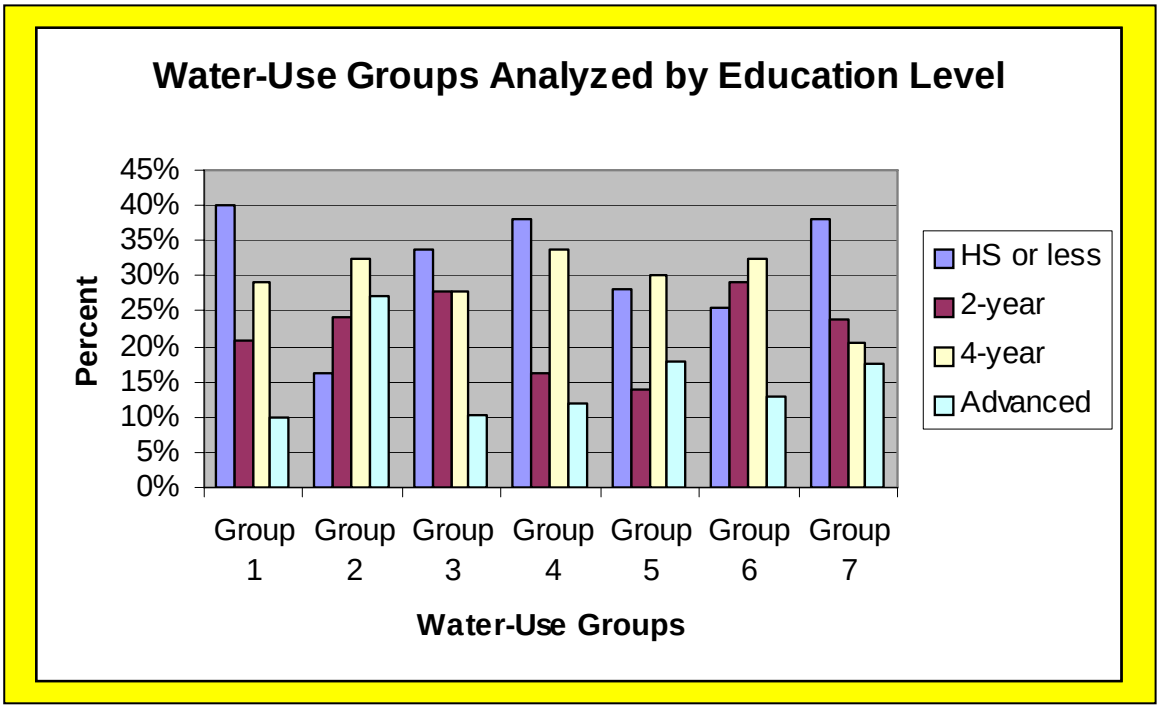


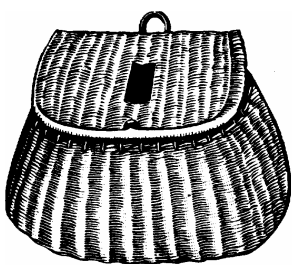

Figure 1.19. Water-use group analyzed by education level (*data from Table 1.20*).

Table 1.21. Income level of North Dakota resident sample.

| Income Level | Number | Percent |
|---|---|---|
| **Less than $10,000** | 32 | 5.2% |
| **$10,000 – $29,000** | 122 | 19.6% |
| **$30,000 – $49,999** | 194 | 31.2% |
| **$50,000 – $69,999** | 127 | 20.4% |
| **$70,000 – $89,999** | 81 | 13.1% |
| **$90,000 – $109,999** | 30 | 4.9% |
| **$110,000 – $129,999** | 10 | 1.6% |
| **$130,000 – $149,999** | 9 | 1.4% |
| **$150,000 or More** | 17 | 2.7% |
| **Total** | 622 | 100% |

Table 1.22. Water-Use groups analyzed by income level.

| Water-Use Group | Number | Income Level | | | | |
|---|---|---|---|---|---|---|
| | | Less than $29,999 | $30,000 - $49,999 | $50,000 - $69.999 | $70,000 - $89,999 | $90,000 or More |
| **1** | 101 | 20.8% | 34.7% | 21.8% | 16.8% | 5.9% |
| **2** | 34 | 26.5% | 26.5% | 14.7% | 17.6% | 14.7% |
| **3** | 136 | 22.8% | 33.8% | 14.0% | 13.2% | 16.2% |
| **4** | 62 | 29.0% | 29.0% | 19.4% | 14.5% | 8.1% |
| **5** | 44 | 13.6% | 36.4% | 29.5% | 6.8% | 13.6% |
| **6** | 172 | 26.2% | 30.2% | 20.3% | 13.4% | 9.9% |
| **7** | 57 | 31.6% | 28.1% | 28.1% | 3.5% | 8.8% |
| **Average** | 606 | 24.4% | 31.7% | 20.1% | 12.9% | 10.9% |
| Chi-Square: $X^2$=27.81; df=24; $p$=0.268 | | | | | | |



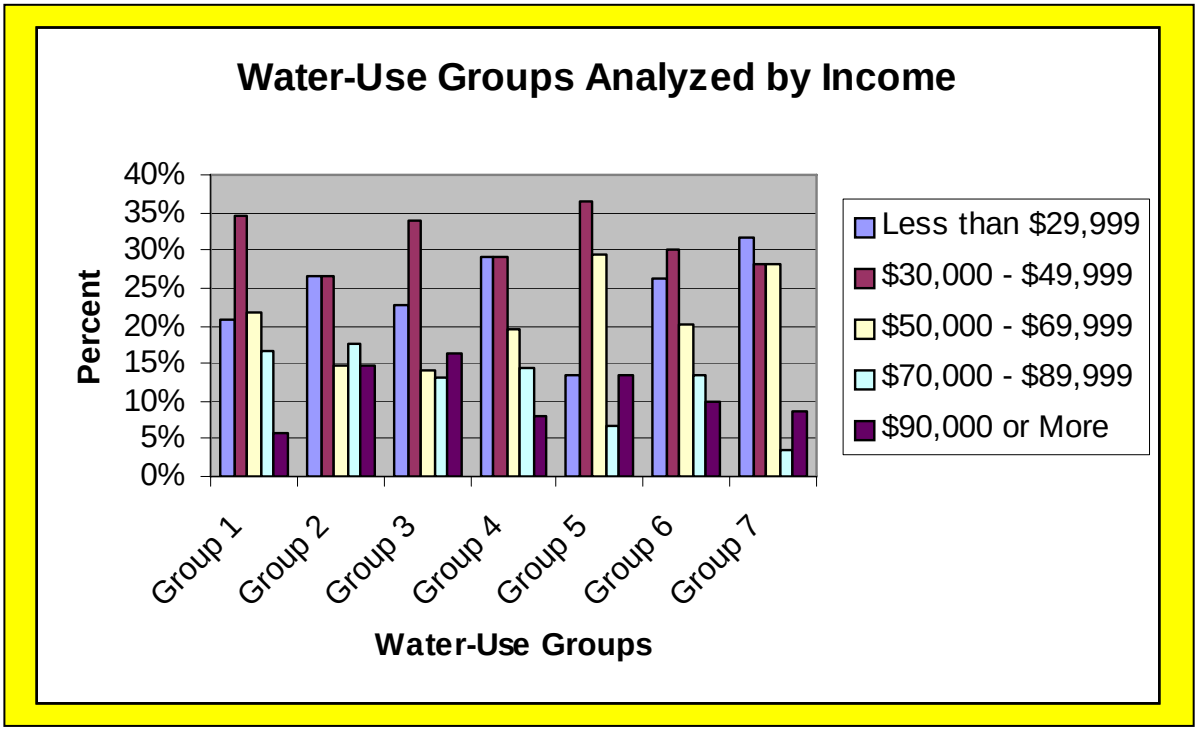



Figure 1.20. Water-use group analyzed by income level (*data from Table 1.22*).

Table 1.23. Number of people under 18 years of age living at home for the North Dakota resident sample.

| Number of children living at home | Number | Percent |
|---|---|---|
| **0** | 469 | 67.9% |
| **1** | 93 | 13.4% |
| **2** | 79 | 11.5% |
| **3** | 37 | 5.3% |
| **4** | 10 | 1.4% |
| **5** | 3 | 0.4% |
| **6** | 0 | 0.1% |
| **Total** | 691 | 100% |
| **Mean / 95% C.I.** | 0.60 | 0.53 – 0.68 |

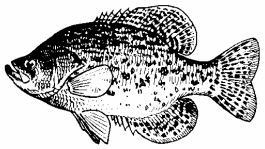


Table 1.24. Water-Use groups analyzed by children / no children living at home.

| Water-Use Group | Number | Children Living at Home | |
|---|---|---|---|
| | | 0 | 1 - 6 |
| **1** | 110 | 65.5% | 34.5% |
| **2** | 37 | 78.4% | 21.6% |
| **3** | 154 | 67.5% | 32.5% |
| **4** | 69 | 52.2% | 47.8% |
| **5** | 49 | 69.4% | 30.6% |
| **6** | 186 | 69.9% | 30.1% |
| **7** | 63 | 69.8% | 30.2% |
| **Average** | 668 | 67.2% | 32.8% |
| Chi-Square: $X^2$=10.25; df=6; $p$=0.115 | | | |

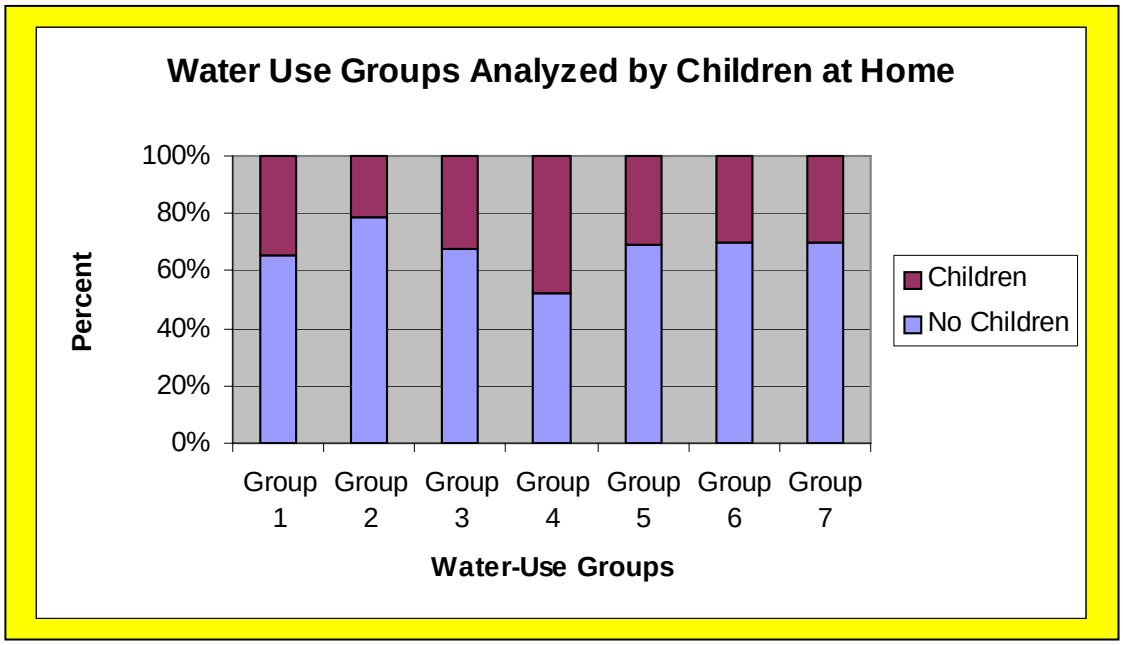



Figure 1.21. Water-use group analyzed by children at home (*data from Table 1.24*).

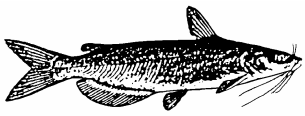


Table 1.25. Size of current residence and residence where raised for the North Dakota resident sample.

| Size of Current Residence | Number | Percent |
|---|---|---|
| **Large City with 250,000 or more people** | 13 | 2.0% |
| **City with 100,000 to 249,999 people** | 102 | 15.5% |
| **City with 50,000 to 99,999 people** | 168 | 25.5% |
| **City with 25,000 to 49,999 people** | 82 | 12.4% |
| **Town with 10,000 to 24,999 people** | 73 | 11.1% |
| **Town with 5,000 to 9,999 people** | 32 | 4.8% |
| **Small town / village with less than 5,000 people** | 96 | 14.6% |
| **A farm or rural area** | 93 | 14.1% |
| **Total** | 659 | 100% |
| | | |
| **Size of Residence Where Raised** | **Number** | **Percent** |
| **Large City with 250,000 or more people** | 29 | 4.5% |
| **City with 100,000 to 249,999 people** | 45 | 7.0% |
| **City with 50,000 to 99,999 people** | 76 | 11.7% |
| **City with 25,000 to 49,999 people** | 53 | 8.2% |
| **Town with 10,000 to 24,999 people** | 59 | 9.1% |
| **Town with 5,000 to 9,999 people** | 34 | 5.2% |
| **Small town / village with less than 5,000 people** | 156 | 23.9% |
| **A farm or rural area** | 198 | 30.4% |
| **Total** | 651 | 100% |

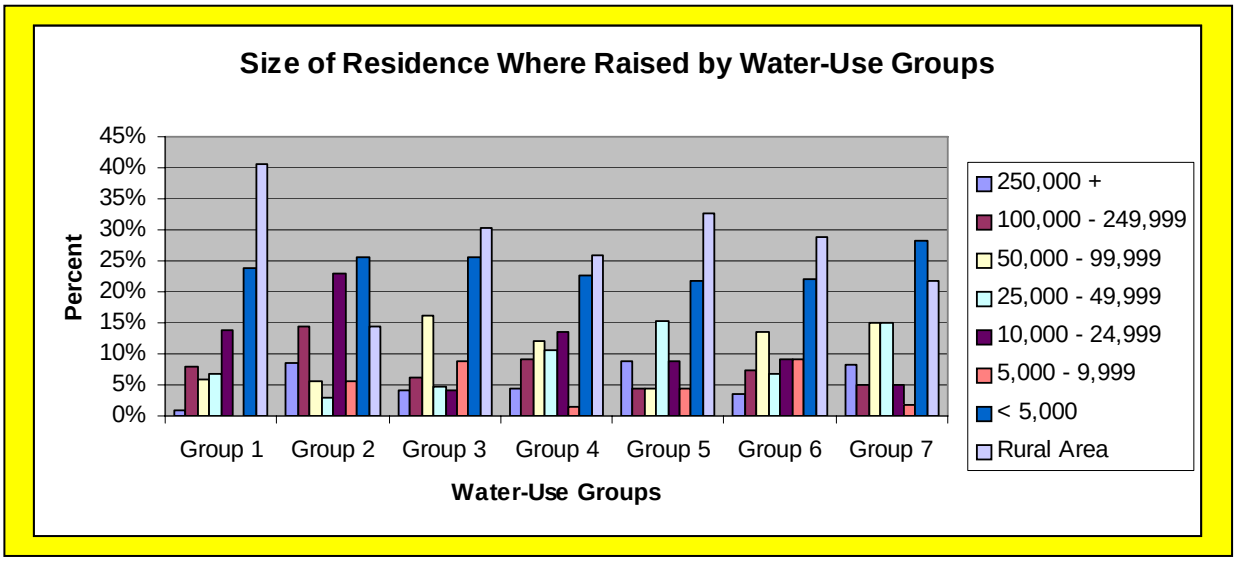



Figure 1.22. Water-use group analyzed by size of residence where raised (*data from Table 1.26*).

Table 1.26. Size of residence where raised analyzed by water-group.

| Residence Where Raised | Water-Use Groups | | | | | | |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **Large City w/ 250,000 +** | 1.0% | 8.6% | 4.1% | 4.5% | 8.7% | 3.4% | 8.3% |
| **City w/ 100,000 to 249,999** | 7.9% | 14.3% | 6.1% | 9.1% | 4.3% | 7.3% | 5.0% |
| **City w/ 50,000 to 99,999** | 5.9% | 5.7% | 16.2% | 12.1% | 4.3% | 13.6% | 15.0% |
| **City w/ 25,000 to 49,999** | 6.9% | 2.9% | 4.7% | 10.6% | 15.2% | 6.8% | 15.0% |
| **Town w/ 10,000 – 24,999** | 13.9% | 22.9% | 4.1% | 13.6% | 8.7% | 9.0% | 5.0% |
| **Town w/ 5,000 to 9,999** | 0.0% | 5.7% | 8.8% | 1.5% | 4.3% | 9.0% | 1.7% |
| **Small town w/ less than 5,000** | 23.8% | 25.7% | 25.7% | 22.7% | 21.7% | 22.0% | 28.3% |
| **A farm or rural area** | 40.6% | 14.3% | 30.4% | 25.8% | 32.6% | 28.8% | 21.7% |
| **Total** | 101 | 35 | 148 | 66 | 46 | 177 | 60 |
| Chi-Square: $X^2$=74.71; df=42; $p$=0.001 | | | | | | | |

Table 1.27. Race distribution for the North Dakota resident sample.

| Race | Number | Percent |
|---|---|---|
| **White, NOT of Hispanic origin** | 653 | 97.9% |
| **Black or African American, NOT of Hispanic origin** | 2 | 0.3% |
| **Spanish, Hispanic, or Latino** | 4 | 0.5% |
| **Native American or Alaska Native** | 7 | 1.1% |
| **Asian** | 1 | 0.2% |
| **Total** | 667 | 100% |

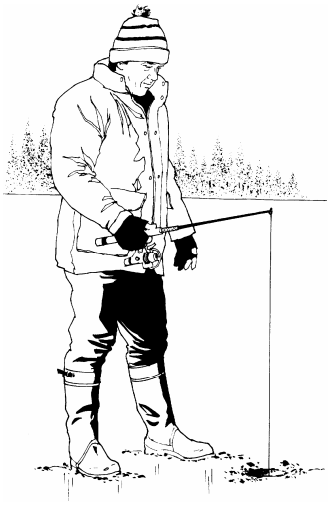


Table 1.28. Water-Use groups analyzed by race (white / non-white).

| Water-Use Group | Number | Race | |
|---|---|---|---|
| | | White | Non-White |
| **1** | 105 | 99.0% | 1.0% |
| **2** | 35 | 97.1% | 2.9% |
| **3** | 152 | 100.0% | 0.0% |
| **4** | 65 | 100.0% | 0.0% |
| **5** | 47 | 97.9% | 2.1% |
| **6** | 180 | 96.1% | 3.9% |
| **7** | 62 | 93.5% | 6.5% |
| **Average** | 646 | 97.8% | 2.2% |
| Chi-Square: $X^2$=13.50; df=6; $p$=0.036 | | | |

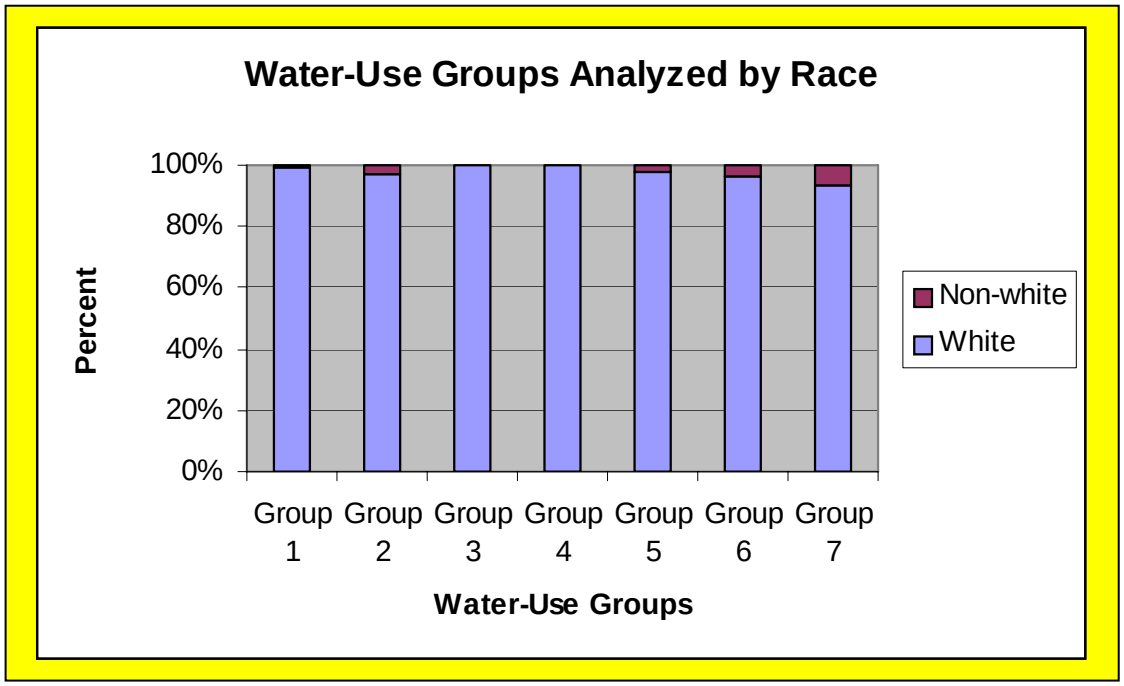



Figure 1.23. Water-use group analyzed by race (*data from Table 1.28*).

# Part 2 – Attitudes Related to Protecting All Types of Fish and Wildlife in North Dakota

## Section A: Analysis by Fishing, Hunting and Wildlife Viewing Participation

(Fishing, hunting and wildlife viewing participation in North Dakota is summarized in Table 1.11.)

**Self-Reported Knowledge of Fish and Wildlife in North Dakota.** Overall, North Dakota residents reported the highest level of knowledge about game, followed by NDG&F efforts to protect game and less knowledge about nongame and NDG&F efforts to protect nongame (Table 2.1 and Figure 2.1). Active anglers reported significantly higher knowledge levels than inactive anglers and non-anglers for all four categories (non-anglers and inactive anglers were statistically similar) (Table 2.2 and Figure 2.2). Active hunters reported significantly higher knowledge levels in all four categories than inactive hunters and inactive hunters reported significantly higher knowledge levels than non-hunters (Table 2.3 and Figure 2.3). Active wildlife viewer reported significantly higher knowledge levels than non-viewers, with inactive wildlife viewers reporting only slightly higher knowledge levels than non-viewers (Table 2.4 and Figure 2.4). Overall, active hunters reported the highest knowledge levels for all four categories compared to active anglers and active wildlife viewers. Active anglers reported higher knowledge levels than active wildlife viewers related to game but similar knowledge levels related to nongame.

**Importance of Protecting Nongame.** The importance of protecting nongame was measured by three survey questions: *It is important to me that…*

- *North Dakota protects as many types of fish and wildlife as possible* (Wildlife Diversity).
- *North Dakota keeps nongame from becoming rare, endangered or extinct* (Nongame Species).
- *North Dakota maintains levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals* (Aquatic Habitats for All Species).

North Dakota residents rated aquatic habitat for all species slightly higher than the other two categories (Table 2.5 and Figure 2.5).

Active anglers rated the importance of wildlife diversity and aquatic habitat for all species significantly higher than non-anglers and slightly higher than inactive anglers,

however fishing participation was not related to the importance of nongame species (Table 2.6 and Figure 2.6). Although some significant differences were found the overall differences in the three importance of nongame species variables and fishing participation were not very large, i.e., the relationship is not very important.

Inactive hunters and active hunters rated the importance of aquatic habitat for all species significantly higher than did non-hunters, however, hunting participation was not significantly related to the importance of protecting wildlife diversity or nongame species (Table 2.7 and Figure 2.7). Although some significant differences were found the overall differences in the three importance of nongame species variables and hunting participation were not very large, i.e., the relationship is not very important.

Inactive and active wildlife viewers rated the importance of wildlife diversity, nongame species and aquatic habitat for all species significantly higher than did non-viewers (Table 2.8 and Figure 2.8). Although some significant differences were found the overall differences in the three importance of nongame species variables and wildlife viewing participation were not very large, i.e., the relationship is not very important.

Calculating the average score for the three importance variables (protecting wildlife diversity, nongame species and aquatic habitats for all species) produced an overall importance of nongame species variable (Figure 2.9). Active participants (fishing, hunting and wildlife viewing) tended to have the highest importance score and non-participants the lowest score, although the overall differences were very small (Table 2.9 and Figure 2.10). This average importance scale was used to segment North Dakota residents into a continuum of four groups ranging from low importance to high importance (Table 2.10). This variable is useful for understanding attitudes related to wildlife diversity and nongame issues and will be further explored in Section C (Part 2) of this report.

**Evaluation of Efforts to Protect Nongame.** Only about 6% of the North Dakota residents felt that NDG&F efforts to protect nongame were **not** adequate; 40% did not have an opinion and about 54% agreed that NDG&F efforts to protect nongame were adequate (Table 2.11). Most people (71%) felt that projects designed to benefit nongame fish and wildlife will benefit game as well; only about 4% disagreed with the statement (Table 2.11).

Anglers and hunters (both inactive and active) had higher agreement compared to non-anglers and non-hunters that NDG&F efforts to protect nongame were adequate and that projects designed to benefit nongame also benefits game as well (Tables 2.12 and 2.13 and Figures 2.11 – 2.14). Hunting participation was more strongly related to these two variables (NDG&F efforts to protect nongame and the benefits of nongame projects) compared to fishing participation. Wildlife viewing participation was not related to these two variables (NDG&F efforts to protect nongame and the benefits of nongame projects) in any meaningful way (Table 2.14 and Figures 2.15 and 2.16).

**Sources of State Money for Nongame Programs.** The survey question was worded, *"North Dakota is required to match federal funds with state money to pay for protection of nongame fish and wildlife. Several possible sources for the state money to match federal funds for these programs have been suggested. There are differences of opinion about how these programs should be funded. We are interested in your opinions about funding. Is it unacceptable or acceptable to…"* (Table 2.15). Overall, using *"a portion of revenue presently being collected from taxes"* was the only "acceptable" source of state money to match federal funds for nongame programs. However, it was quite unacceptable to not spend money on nongame programs (to keep nongame form becoming rare, endangered or extinct).

Non-participants (anglers, hunters and wildlife viewers) were less accepting than participants of using current tax revenue to support nongame programs compared to inactive and active participants (active participants were most accepting of this source of matching state money) (Tables 2.16 – 2.21 and Figures 2.17 – 2.19). Also, non-participants rated using only money from people who hunt or fish as acceptable while participants (both inactive and active) rated this source of matching state money as less acceptable or unacceptable. Non-participants tended to rate using only money from voluntary contributions for the matching state money for nongame programs as neutral while participants rated this source of money as unacceptable. All participant groups were strongly opposed to new taxes or tax increases (no significant differences among the participant groups). All participant groups were very strongly opposed to **not** spending money to keep nongame from becoming rare, endangered or extinct, although

participants tended to be more strongly opposed than were non-participants (i.e., doing nothing for nongame was **not** an acceptable option).

Overall, a majority of the public (about 56%) most preferred using a portion of current taxes as matching state money for nongame programs, followed by using only money from hunters and anglers (24%), using only voluntary contributions (11%), and new taxes or tax increases (6%) (Tables 2.22 - 2.24). Only about 2% did not want to spend any money on nongame programs, regardless of the source of matching funds. Fishing participation was slightly related to most preferred source of matching state money for nongame programs (non-anglers were less interested in spending tax money on nongame programs compared to inactive and active anglers). However, hunting participation and wildlife viewing participation were not significantly related to most preferred source of matching state money for nongame programs.

Table 2.1. Overall frequency distribution and mean knowledge levels about fish and wildlife in North Dakota.

| Knowledge Level (scale value) | Knowledge Level of… | | | |
|---|---|---|---|---|
| | **Game** | **NDG&F Protecting Game** | **Nongame** | **NDG&F Protecting Nongame** |
| **Not at All Knowledgeable (1)** | 12.1% | 25.8% | 29.8% | 40.6% |
| **Slightly Knowledgeable (2)** | 30.7% | 32.6% | 37.0% | 32.0% |
| **Moderately Knowledgeable (3)** | 31.7% | 25.9% | 23.2% | 20.5% |
| **Quite Knowledgeable (4)** | 20.8% | 13.5% | 9.3% | 6.5% |
| **Extremely Knowledgeable (5)** | 4.6% | 2.1% | 0.7% | 0.5% |
| **Total** | 693 | 690 | 690 | 690 |
| **Mean** | 2.75 | 2.34 | 2.14 | 1.94 |
| **95% Confidence Interval** | 2.67 – 2.83 | 2.26 – 2.42 | 2.07 – 2.21 | 1.87 – 2.01 |

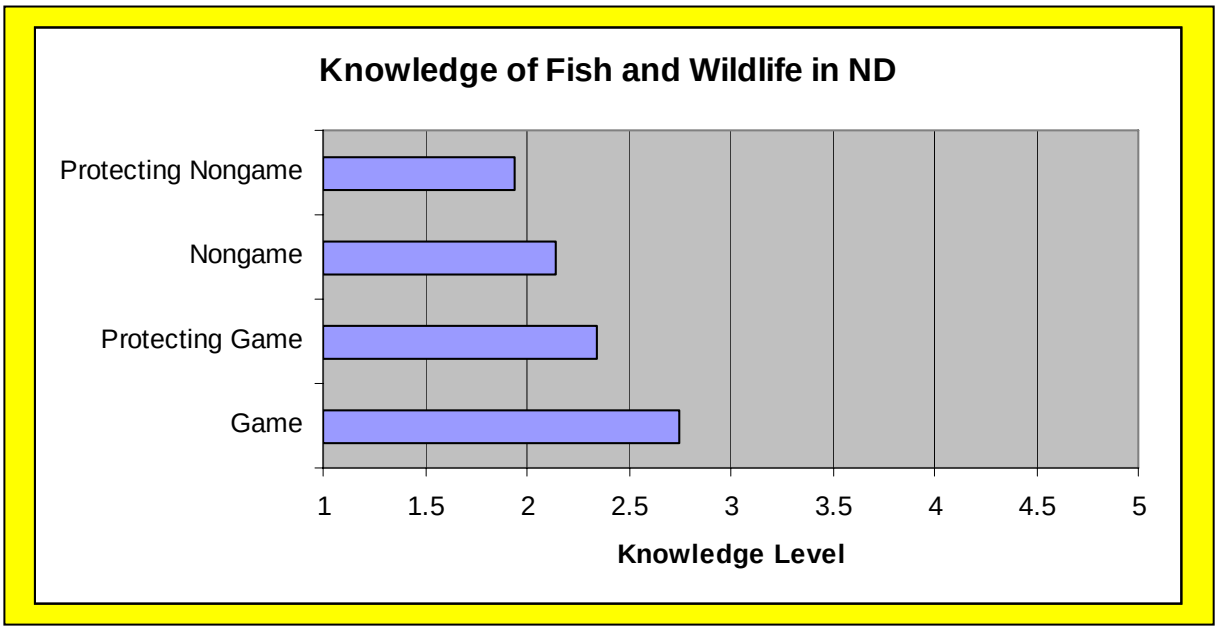



Figure 2.1. Overall mean knowledge level of North Dakota residents (*data from Table 2.1*).

Table 2.2. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by fishing participation.

| **Knowledge about Game** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Knowledgeable (1)** | 18.8% | 14.2% | 5.4% |
| **Slightly Knowledgeable (2)** | 40.2% | 33.5% | 22.2% |
| **Moderately Knowledgeable (3)** | 30.4% | 33.2% | 29.6% |
| **Quite Knowledgeable (4)** | 9.8% | 16.2% | 33.0% |
| **Extremely Knowledgeable (5)** | 0.9% | 2.8% | 9.9% |
| **Total** | 112 | 358 | 203 |
| Chi-Square: $X^2$=65.43; df=8; $p$<0.001 | | | |
| **Mean** | 2.35 | 2.60 | 3.20 |
| **95% Confidence Interval** | 2.18 – 2.53 | 2.49 – 2.70 | 3.06 – 3.35 |
| ANOVA: F=33.01; df=2 / 669; $p$<0.001 | | | |
| | | | |
| **Knowledge about NDG&F Efforts to Protect Game** | | | |
| **Knowledge Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Knowledgeable (1)** | 30.4% | 29.9% | 17.6% |
| **Slightly Knowledgeable (2)** | 38.4% | 32.5% | 30.7% |
| **Moderately Knowledgeable (3)** | 23.2% | 25.7% | 27.3% |
| **Quite Knowledgeable (4)** | 5.4% | 11.0% | 20.0% |
| **Extremely Knowledgeable (5)** | 2.7% | 0.8% | 4.4% |
| **Total** | 112 | 354 | 205 |
| Chi-Square: $X^2$=31.69; df=8; $p$<0.001 | | | |
| **Mean** | 2.13 | 2.21 | 2.63 |
| **95% Confidence Interval** | 1.94 – 2.31 | 2.10 – 2.31 | 2.47 – 2.78 |
| ANOVA: F=12.78; df=2 / 667; $p$<0.001 | | | |
| | | | |
| **Knowledge about Nongame** | | | |
| **Knowledge Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Knowledgeable (1)** | 38.4% | 32.9% | 20.1% |
| **Slightly Knowledgeable (2)** | 38.4% | 36.8% | 37.7% |
| **Moderately Knowledgeable (3)** | 17.0% | 23.6% | 24.5% |
| **Quite Knowledgeable (4)** | 6.3% | 6.7% | 15.2% |
| **Extremely Knowledgeable (5)** | 0.0% | 0.0% | 2.5% |
| **Total** | 112 | 356 | 204 |
| Chi-Square: $X^2$=35.21; df=8; $p$<0.001 | | | |
| **Mean** | 1.90 | 2.04 | 2.41 |
| **95% Confidence Interval** | 1.73 – 2.07 | 1.95 – 2.14 | 2.27 – 2.56 |
| ANOVA: F=13.70; df=2 / 666; $p$<0.001 | | | |
| | | | |

Table continued on next page.

Table 2.2 – Continued. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by fishing participation.

| **Knowledge about NDG&F Efforts to Protect Nongame** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Knowledgeable (1)** | 43.8% | 44.2% | 33.2% |
| **Slightly Knowledgeable (2)** | 30.4% | 30.7% | 36.6% |
| **Moderately Knowledgeable (3)** | 18.8% | 19.7% | 20.3% |
| **Quite Knowledgeable (4)** | 6.3% | 5.4% | 8.9% |
| **Extremely Knowledgeable (5)** | 0.9% | 0.0% | 1.0% |
| **Total** | 112 | 355 | 202 |
| Chi-Square: $X^2$=11.71; df=8; $p$=0.164 | | | |
| **Mean** | 1.91 | 1.86 | 2.08 |
| **95% Confidence Interval** | 1.73 – 2.10 | 1.77 – 1.96 | 1.94 – 2.22 |
| ANOVA: F=3.51; df=2 / 666; $p$=0.030 | | | |

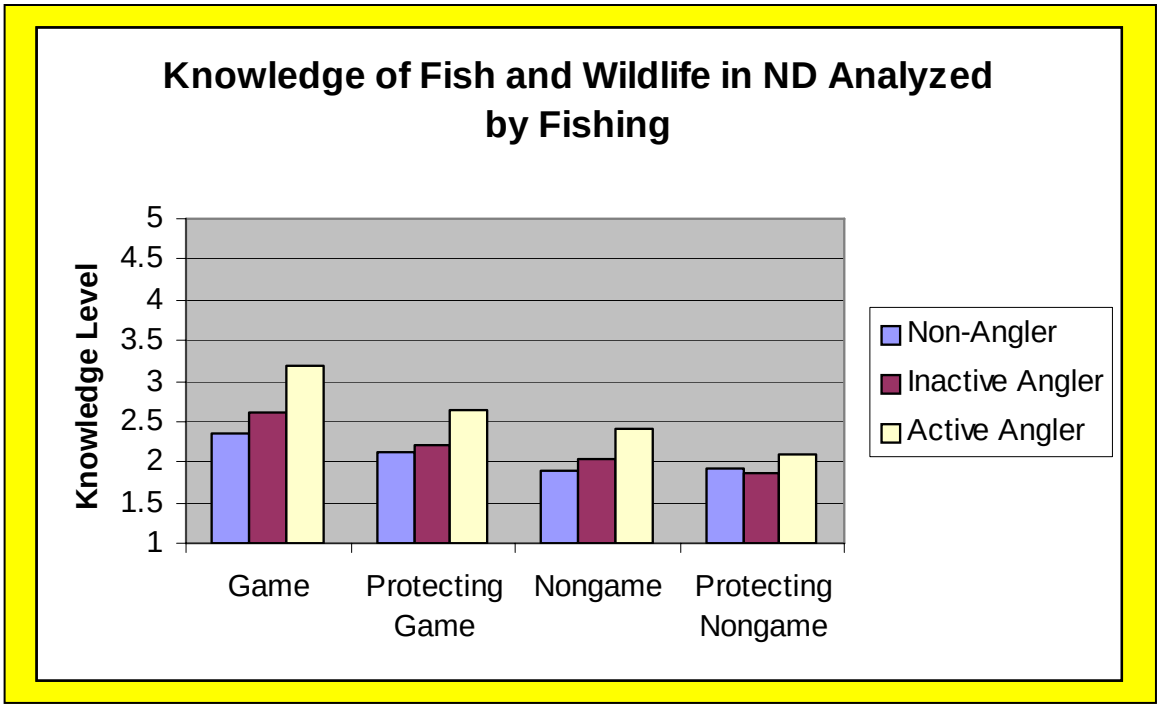



Figure 2.2. Mean knowledge levels about fish and wildlife in North Dakota analyzed by fishing participation (*data from Table 2.2*).

Table 2.3. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by hunting participation.

| **Knowledge about Game** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Knowledgeable (1)** | 20.1% | 7.6% | 1.5% |
| **Slightly Knowledgeable (2)** | 43.7% | 28.7% | 6.0% |
| **Moderately Knowledgeable (3)** | 25.5% | 39.0% | 33.6% |
| **Quite Knowledgeable (4)** | 9.7% | 21.1% | 43.3% |
| **Extremely Knowledgeable (5)** | 0.9% | 3.6% | 15.7% |
| **Total** | 318 | 223 | 134 |
| Chi-Square: $X^2$=180.86; df=8; $p$<0.001 | | | |
| **Mean** | 2.27 | 2.85 | 3.66 |
| **95% Confidence Interval** | 2.17 – 2.37 | 2.72 – 2.97 | 3.51 – 3.81 |
| ANOVA: F=108.96; df=2 / 670; $p$<0.001 | | | |
| | | | |
| **Knowledge about NDG&F Efforts to Protect Game** | | | |
| **Knowledge Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Knowledgeable (1)** | 39.3% | 20.5% | 4.5% |
| **Slightly Knowledgeable (2)** | 38.1% | 32.7% | 21.2% |
| **Moderately Knowledgeable (3)** | 17.6% | 30.9% | 36.4% |
| **Quite Knowledgeable (4)** | 3.8% | 15.0% | 31.1% |
| **Extremely Knowledgeable (5)** | 1.3% | 0.9% | 6.8% |
| **Total** | 318 | 220 | 132 |
| Chi-Square: $X^2$=142.21; df=8; $p$<0.001 | | | |
| **Mean** | 1.90 | 2.43 | 3.14 |
| **95% Confidence Interval** | 1.80 – 2.00 | 2.29 – 2.56 | 2.97 – 3.31 |
| ANOVA: F=82.17; df=2 / 668; $p$<0.001 | | | |
| | | | |
| **Knowledge about Nongame** | | | |
| **Knowledge Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Knowledgeable (1)** | 39.9% | 25.8% | 13.5% |
| **Slightly Knowledgeable (2)** | 38.6% | 38.0% | 34.6% |
| **Moderately Knowledgeable (3)** | 17.1% | 25.3% | 31.6% |
| **Quite Knowledgeable (4)** | 4.1% | 10.9% | 18.0% |
| **Extremely Knowledgeable (5)** | 0.3% | 0.0% | 2.3% |
| **Total** | 316 | 221 | 133 |
| Chi-Square: $X^2$=62.63; df=8; $p$<0.001 | | | |
| **Mean** | 1.87 | 2.21 | 2.61 |
| **95% Confidence Interval** | 1.77 – 1.96 | 2.09 – 2.34 | 2.44 – 2.79 |
| ANOVA: F=31.99; df=2 / 668; $p$<0.001 | | | |
| | | | |

Table continued on next page.

Table 2.3 – Continued. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by hunting participation.

| **Knowledge about NDG&F Efforts to Protect Nongame** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Knowledgeable (1)** | 53.3% | 34.8% | 21.1% |
| **Slightly Knowledgeable (2)** | 30.6% | 34.8% | 33.1% |
| **Moderately Knowledgeable (3)** | 14.2% | 20.8% | 30.8% |
| **Quite Knowledgeable (4)** | 1.6% | 9.5% | 13.5% |
| **Extremely Knowledgeable (5)** | 0.3% | 0.0% | 1.5% |
| **Total** | 317 | 221 | 133 |
| Chi-Square: $X^2$=70.12; df=8; $p$<0.001 | | | |
| **Mean** | 1.66 | 2.05 | 2.41 |
| **95% Confidence Interval** | 1.57 – 1.75 | 1.92 – 2.18 | 2.23 – 2.58 |
| ANOVA: F=34.71; df=2 / 668; $p$<0.001 | | | |

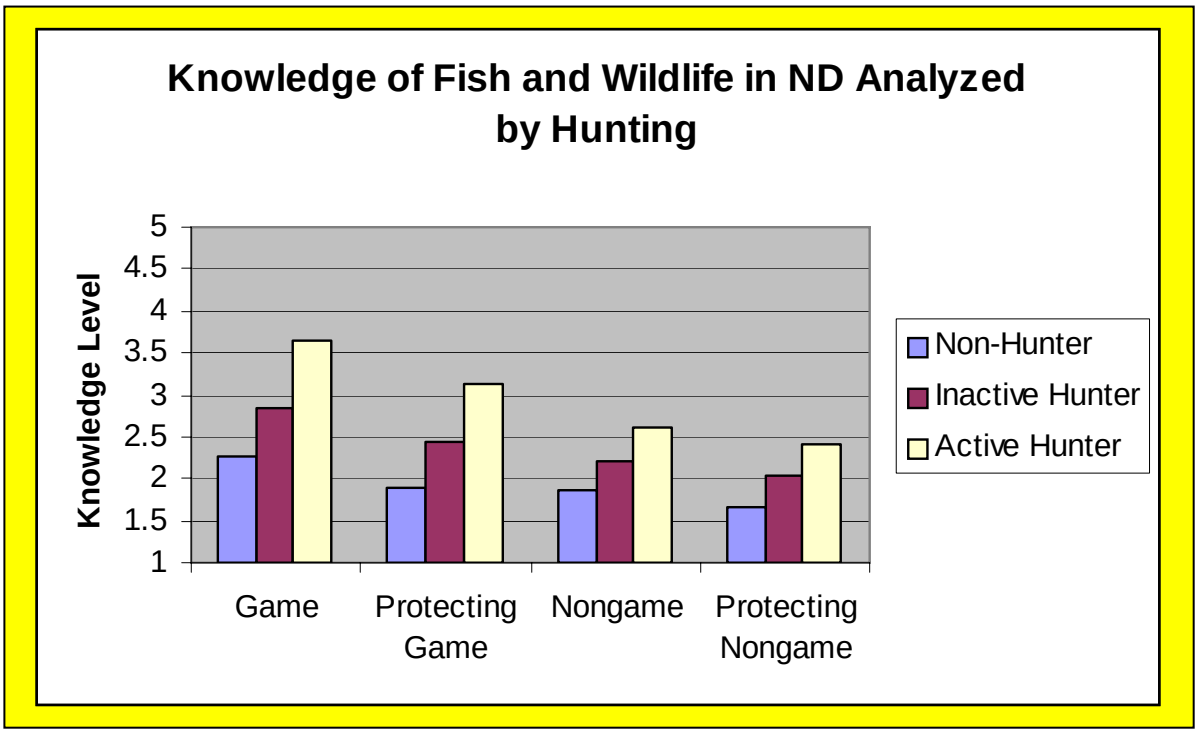



Figure 2.3. Mean knowledge levels about fish and wildlife in North Dakota analyzed by hunting participation (*data from Table 2.3*).

Table 2.4. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife viewing participation.

| **Knowledge about Game** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Knowledgeable (1)** | 14.0% | 14.2% | 6.3% |
| **Slightly Knowledgeable (2)** | 34.4% | 29.0% | 27.0% |
| **Moderately Knowledgeable (3)** | 31.0% | 32.3% | 32.1% |
| **Quite Knowledgeable (4)** | 17.6% | 20.0% | 26.4% |
| **Extremely Knowledgeable (5)** | 3.1% | 4.5% | 8.2% |
| **Total** | 358 | 155 | 159 |
| Chi-Square: $X^2$=18.74; df=8; $p$=0.016 | | | |
| **Mean** | 2.61 | 2.72 | 3.03 |
| **95% Confidence Interval** | 2.51 – 2.72 | 2.55 – 2.89 | 2.86 – 3.19 |
| ANOVA: F=8.73; df=2 / 670; $p$<0.001 | | | |
| | | | |
| **Knowledge about NDG&F Efforts to Protect Game** | | | |
| **Knowledge Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Knowledgeable (1)** | 28.9% | 29.0% | 17.7% |
| **Slightly Knowledgeable (2)** | 33.1% | 29.7% | 36.1% |
| **Moderately Knowledgeable (3)** | 26.9% | 25.8% | 22.8% |
| **Quite Knowledgeable (4)** | 9.7% | 12.9% | 19.6% |
| **Extremely Knowledgeable (5)** | 1.4% | 2.6% | 3.8% |
| **Total** | 360 | 155 | 158 |
| Chi-Square: $X^2$=18.88; df=8; $p$=0.016 | | | |
| **Mean** | 2.21 | 2.30 | 2.56 |
| **95% Confidence Interval** | 2.11 – 2.32 | 2.13 – 2.48 | 2.39 – 2.74 |
| ANOVA: F=6.10; df=2 / 668; $p$=0.002 | | | |
| | | | |
| **Knowledge about Nongame** | | | |
| **Knowledge Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Knowledgeable (1)** | 32.2% | 31.0% | 24.4% |
| **Slightly Knowledgeable (2)** | 41.5% | 39.4% | 26.9% |
| **Moderately Knowledgeable (3)** | 19.3% | 18.7% | 33.8% |
| **Quite Knowledgeable (4)** | 6.2% | 10.3% | 14.4% |
| **Extremely Knowledgeable (5)** | 0.8% | 0.6% | 0.6% |
| **Total** | 357 | 155 | 160 |
| Chi-Square: $X^2$=28.93; df=8; $p$<0.001 | | | |
| **Mean** | 2.02 | 2.10 | 2.40 |
| **95% Confidence Interval** | 1.92 – 2.11 | 1.95 – 2.26 | 2.24 – 2.56 |
| ANOVA: F=9.03; df=2 / 667; $p$<0.001 | | | |
| | | | |

Table continued on next page.

Table 2.4 – Continued. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife viewing participation.

| **Knowledge about NDG&F Efforts to Protect Nongame** | | | |
|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Knowledgeable (1)** | 44.4% | 40.4% | 33.5% |
| **Slightly Knowledgeable (2)** | 31.8% | 32.7% | 32.9% |
| **Moderately Knowledgeable (3)** | 17.3% | 20.5% | 24.1% |
| **Quite Knowledgeable (4)** | 5.9% | 5.8% | 8.9% |
| **Extremely Knowledgeable (5)** | 0.6% | 0.6% | 0.6% |
| **Total** | 358 | 156 | 158 |
| Chi-Square: $X^2$=7.54; df=8; $p$=0.479 | | | |
| **Mean** | 1.86 | 1.93 | 2.10 |
| **95% Confidence Interval** | 1.76 – 1.96 | 1.78 – 2.08 | 1.95 – 2.25 |
| ANOVA: F=3.52; df=2 / 667; $p$=0.030 | | | |

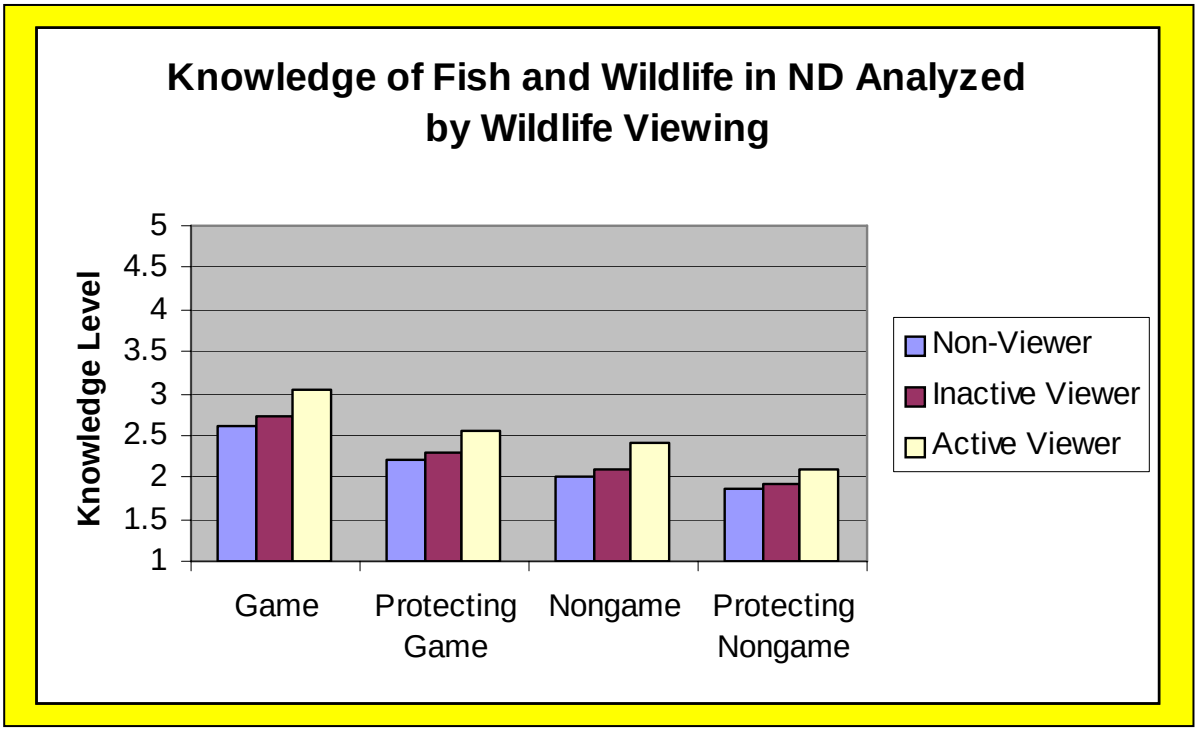



Figure 2.4. Mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife viewing participation (*data from Table 2.4*).

Table 2.5. Overall frequency distribution and mean importance of protecting nongame species and habitats in North Dakota.

| Importance Level (scale value) | Importance of protecting…[1] | | |
|---|---|---|---|
| | **Wildlife Diversity** | **Nongame Species** | **Aquatic Habitats for All Species** |
| **Not at All Important (1)** | 2.2% | 2.7% | 0.8% |
| **Slightly Important (2)** | 12.6% | 11.1% | 5.1% |
| **Moderately Important (3)** | 27.3% | 24.7% | 17.8% |
| **Quite Important (4)** | 39.0% | 37.0% | 39.8% |
| **Extremely Important (5)** | 18.9% | 24.5% | 36.5% |
| **Total** | 697 | 698 | 696 |
| **Mean** | 3.60 | 3.69 | 4.06 |
| **95% Confidence Interval** | 3.52 – 3.67 | 3.62 – 3.77 | 3.99 – 4.13 |

[1]See Appendix A for exact wording for these categories.

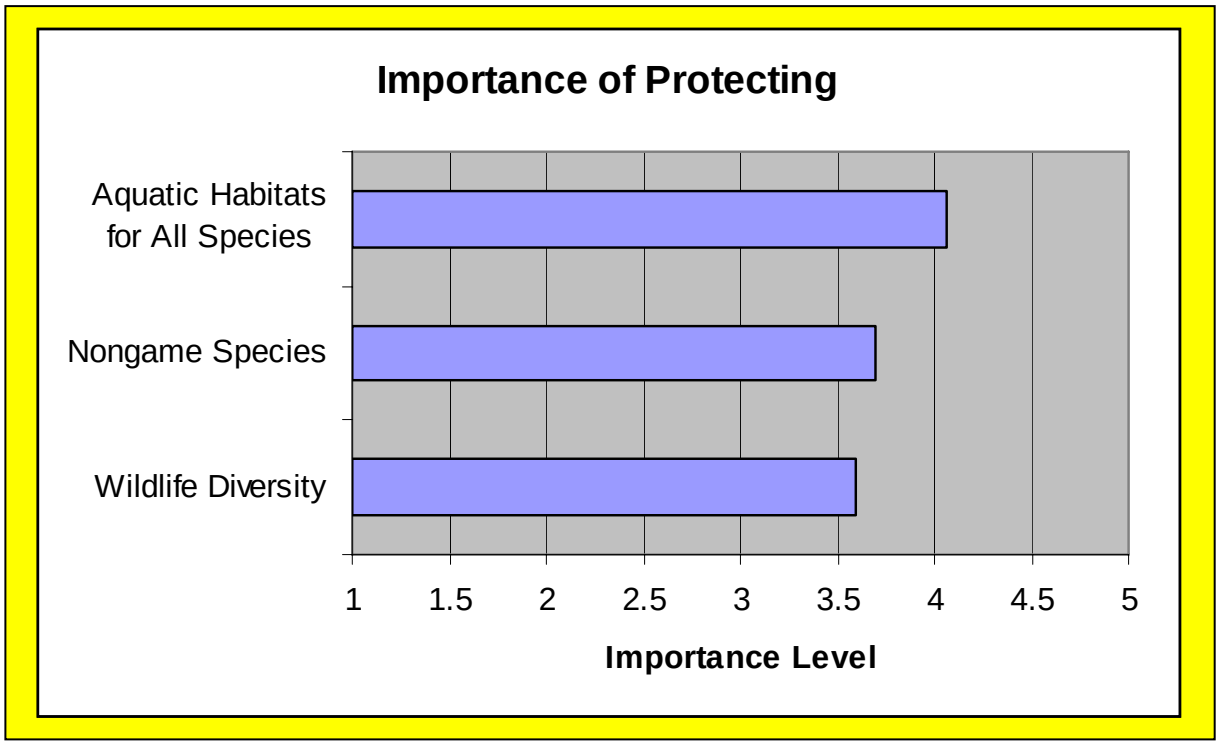



Figure 2.5. Overall mean importance level attributed by North Dakota residents (*data from Table 2.5*).

Table 2.6. Frequency distribution and mean importance of protecting nongame species and habitats in North Dakota analyzed by fishing participation.

| **Importance of protecting as many types of fish and wildlife as possible.** | | | |
|---|---|---|---|
| **Importance Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Important (1)** | 3.5% | 2.2% | 2.0% |
| **Slightly Important (2)** | 16.5% | 12.6% | 10.3% |
| **Moderately Important (3)** | 33.0% | 27.4% | 23.5% |
| **Quite Important (4)** | 31.3% | 41.1% | 40.2% |
| **Extremely Important (5)** | 15.7% | 16.8% | 24.0% |
| **Total** | 115 | 358 | 204 |
| Chi-Square: $X^2$=12.07; df=8; $p$=0.148 | | | |
| **Mean** | 3.40 | 3.58 | 3.74 |
| **95% Confidence Interval** | 3.20 – 3.59 | 3.48 – 3.68 | 3.61 – 3.88 |
| ANOVA: F=4.64; df=2 / 674; $p$=0.010 | | | |
| | | | |
| **Importance of keeping nongame from becoming rare, endangered or extinct.** | | | |
| **Importance Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Important (1)** | 6.8% | 2.2% | 1.0% |
| **Slightly Important (2)** | 14.5% | 10.3% | 10.8% |
| **Moderately Important (3)** | 25.6% | 22.9% | 27.0% |
| **Quite Important (4)** | 25.6% | 38.5% | 41.2% |
| **Extremely Important (5)** | 27.4% | 26.0% | 20.1% |
| **Total** | 117 | 358 | 204 |
| Chi-Square: $X^2$=20.06; df=8; $p$=0.010 | | | |
| **Mean** | 3.53 | 3.75 | 3.69 |
| **95% Confidence Interval** | 3.30 – 3.75 | 3.65 – 3.86 | 3.56 – 3.82 |
| ANOVA: F=2.10; df=2 / 675; $p$=0.123 | | | |
| | | | |
| **Importance of maintaining levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals.** | | | |
| **Importance Level (scale value)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at All Important (1)** | 1.7% | 0.8% | 1.0% |
| **Slightly Important (2)** | 12.2% | 5.3% | 1.0% |
| **Moderately Important (3)** | 13.9% | 21.3% | 14.8% |
| **Quite Important (4)** | 39.1% | 39.2% | 40.4% |
| **Extremely Important (5)** | 33.0% | 33.3% | 42.9% |
| **Total** | 115 | 357 | 203 |
| Chi-Square: $X^2$=26.47; df=8; $p$=0.001 | | | |
| **Mean** | 3.90 | 3.99 | 4.23 |
| **95% Confidence Interval** | 3.71 – 4.09 | 3.90 – 4.09 | 4.12 – 4.34 |
| ANOVA: F=6.56; df=2 / 673; $p$=0.002 | | | |

Table 2.7. Frequency distribution and mean importance of protecting nongame species and habitats in North Dakota analyzed by hunting participation.

| **Importance of protecting as many types of fish and wildlife as possible.** | | | |
|---|---|---|---|
| **Importance Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Important (1)** | 1.9% | 2.7% | 1.5% |
| **Slightly Important (2)** | 13.5% | 12.6% | 9.8% |
| **Moderately Important (3)** | 30.4% | 23.8% | 25.6% |
| **Quite Important (4)** | 38.6% | 40.4% | 39.8% |
| **Extremely Important (5)** | 15.7% | 20.6% | 23.3% |
| **Total** | 319 | 223 | 133 |
| Chi-Square: $X^2$=7.62; df=8; $p$=0.472 | | | |
| **Mean** | 3.52 | 3.63 | 3.73 |
| **95% Confidence Interval** | 3.41 – 3.63 | 3.49 – 3.77 | 3.56 – 3.90 |
| ANOVA: F=2.25; df=2 / 675; $p$=0.106 | | | |
| | | | |
| **Importance of keeping nongame from becoming rare, endangered or extinct.** | | | |
| **Importance Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Important (1)** | 4.3% | 1.3% | 0.8% |
| **Slightly Important (2)** | 12.1% | 8.9% | 12.1% |
| **Moderately Important (3)** | 25.2% | 21.9% | 28.0% |
| **Quite Important (4)** | 32.6% | 42.4% | 39.4% |
| **Extremely Important (5)** | 25.8% | 25.4% | 19.7% |
| **Total** | 322 | 224 | 132 |
| Chi-Square: $X^2$=14.62; df=8; $p$=0.067 | | | |
| **Mean** | 3.64 | 3.82 | 3.64 |
| **95% Confidence Interval** | 3.51 – 3.76 | 3.70 – 3.95 | 3.48 – 3.81 |
| ANOVA: F=2.35; df=2 / 676; $p$=0.096 | | | |
| | | | |
| **Importance of maintaining levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals.** | | | |
| **Importance Level (scale value)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at All Important (1)** | 0.9% | 0.4% | 0.8% |
| **Slightly Important (2)** | 8.7% | 1.3% | 3.8% |
| **Moderately Important (3)** | 22.4% | 14.7% | 12.9% |
| **Quite Important (4)** | 35.8% | 42.9% | 43.2% |
| **Extremely Important (5)** | 32.1% | 40.6% | 39.4% |
| **Total** | 321 | 224 | 132 |
| Chi-Square: $X^2$=26.67; df=8; $p$=0.001 | | | |
| **Mean** | 3.89 | 4.21 | 4.16 |
| **95% Confidence Interval** | 3.78 – 4.00 | 4.11 – 4.31 | 4.02 – 4.31 |
| ANOVA: F=9.44; df=2 / 674; $p$<0.001 | | | |

Table 2.8. Frequency distribution and mean importance of protecting nongame species and habitats in North Dakota analyzed by wildlife viewing participation.

| **Importance of protecting as many types of fish and wildlife as possible.** | | | |
|---|---|---|---|
| **Importance Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Important (1)** | 2.8% | 0.6% | 2.5% |
| **Slightly Important (2)** | 13.2% | 13.5% | 9.4% |
| **Moderately Important (3)** | 32.8% | 20.6% | 21.3% |
| **Quite Important (4)** | 36.9% | 39.4% | 44.4% |
| **Extremely Important (5)** | 14.3% | 25.8% | 22.5% |
| **Total** | 363 | 155 | 160 |
| Chi-Square: $X^2$=23.08; df=8; $p$=0.003 | | | |
| **Mean** | 3.47 | 3.76 | 3.74 |
| **95% Confidence Interval** | 3.37 – 3.57 | 3.60 – 3.92 | 3.59 – 3.90 |
| ANOVA: F=6.92; df=2 / 674; $p$=0.001 | | | |
| | | | |
| **Importance of keeping nongame from becoming rare, endangered or extinct.** | | | |
| **Importance Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Important (1)** | 3.6% | 1.3% | 1.9% |
| **Slightly Important (2)** | 12.9% | 9.6% | 7.6% |
| **Moderately Important (3)** | 26.4% | 21.8% | 23.4% |
| **Quite Important (4)** | 36.9% | 35.3% | 39.9% |
| **Extremely Important (5)** | 20.1% | 32.1% | 27.2% |
| **Total** | 363 | 156 | 158 |
| Chi-Square: $X^2$=14.34; df=8; $p$=0.073 | | | |
| **Mean** | 3.57 | 3.88 | 3.82 |
| **95% Confidence Interval** | 3.46 – 3.68 | 3.72 – 4.04 | 3.66 – 3.97 |
| ANOVA: F=6.30; df=2 / 676; $p$=0.002 | | | |
| | | | |
| **Importance of maintaining levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals.** | | | |
| **Importance Level (scale value)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at All Important (1)** | 0.8% | 0.6% | 0.6% |
| **Slightly Important (2)** | 6.9% | 0.6% | 6.3% |
| **Moderately Important (3)** | 19.6% | 21.4% | 11.9% |
| **Quite Important (4)** | 40.5% | 40.3% | 36.3% |
| **Extremely Important (5)** | 32.2% | 37.0% | 45.0% |
| **Total** | 363 | 154 | 160 |
| Chi-Square: $X^2$=18.66; df=8; $p$=0.017 | | | |
| **Mean** | 3.96 | 4.11 | 4.19 |
| **95% Confidence Interval** | 3.87 – 4.06 | 3.98 – 4.25 | 4.05 – 4.33 |
| ANOVA: F=3.96; df=2 / 674; $p$=0.019 | | | |

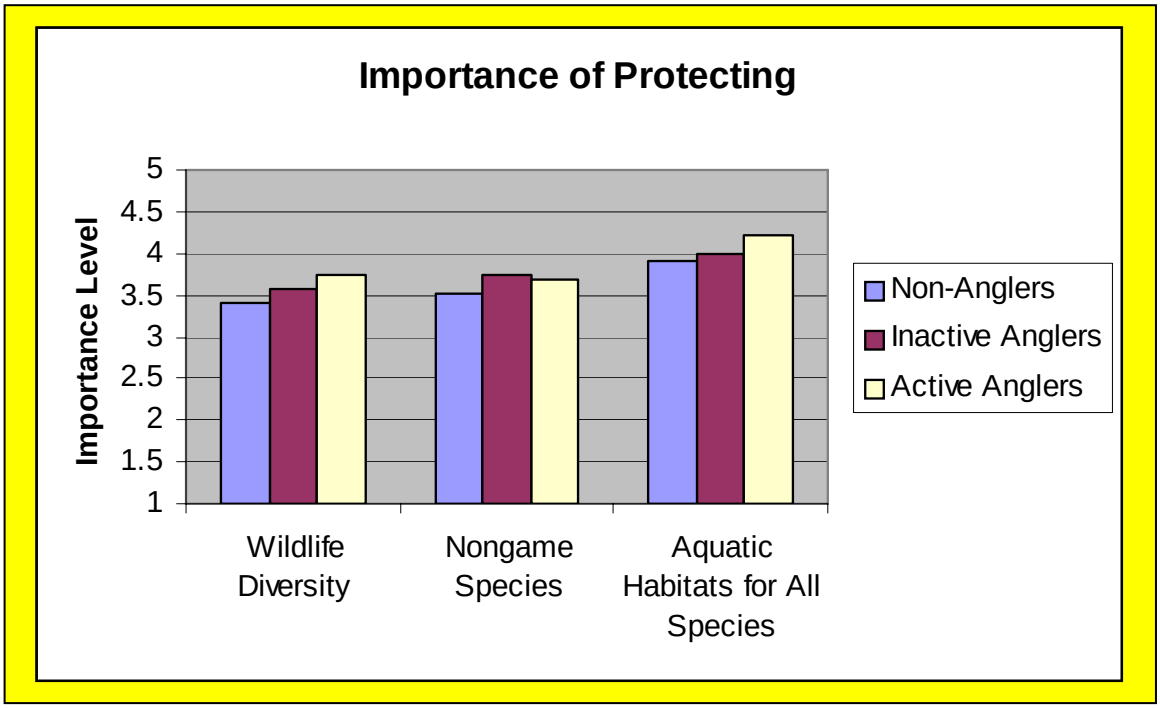



Figure 2.6. Mean importance level attributed by North Dakota residents analyzed by fishing participation (*data from Table 2.6*).

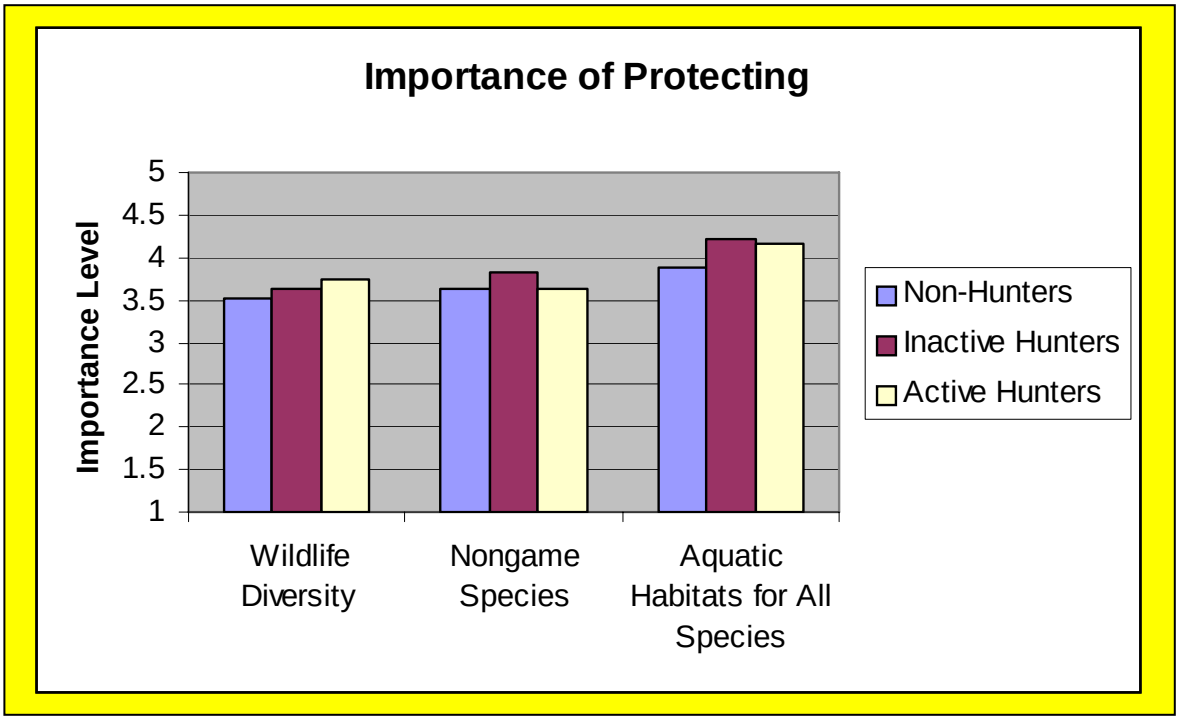



Figure 2.7. Mean importance level attributed by North Dakota residents analyzed by hunting participation (*data from Table 2.7*).

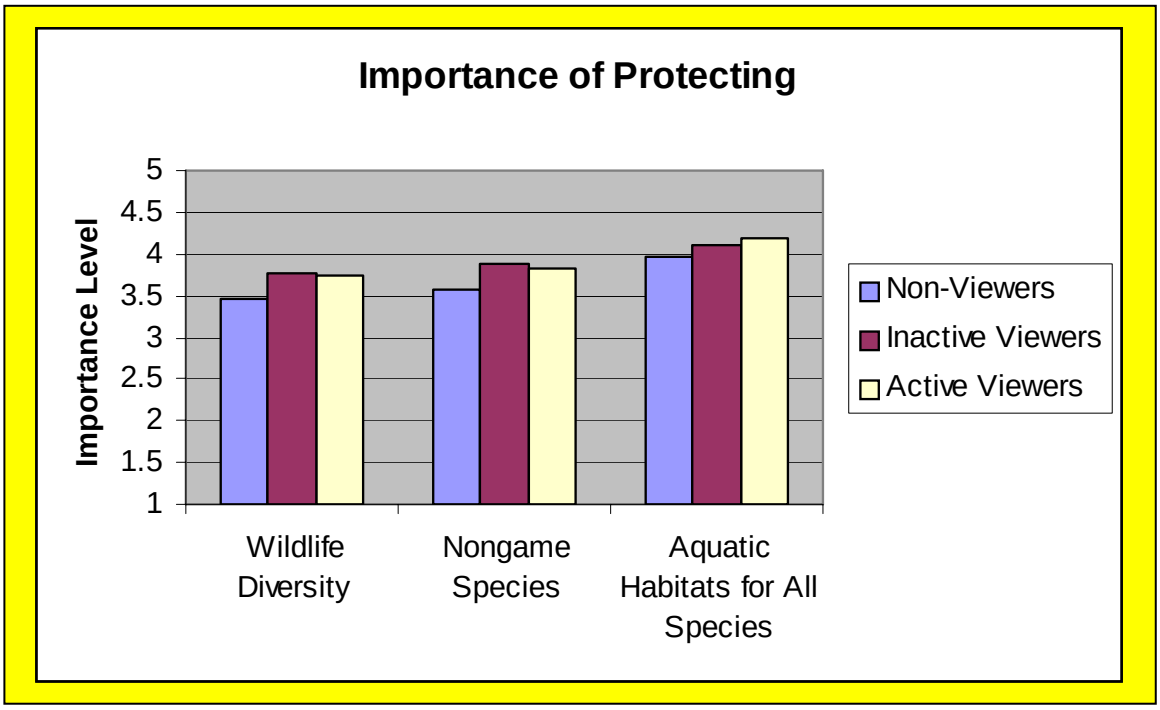



Figure 2.8. Mean importance level attributed by North Dakota residents analyzed by wildlife viewing participation (*data from Table 2.8*).

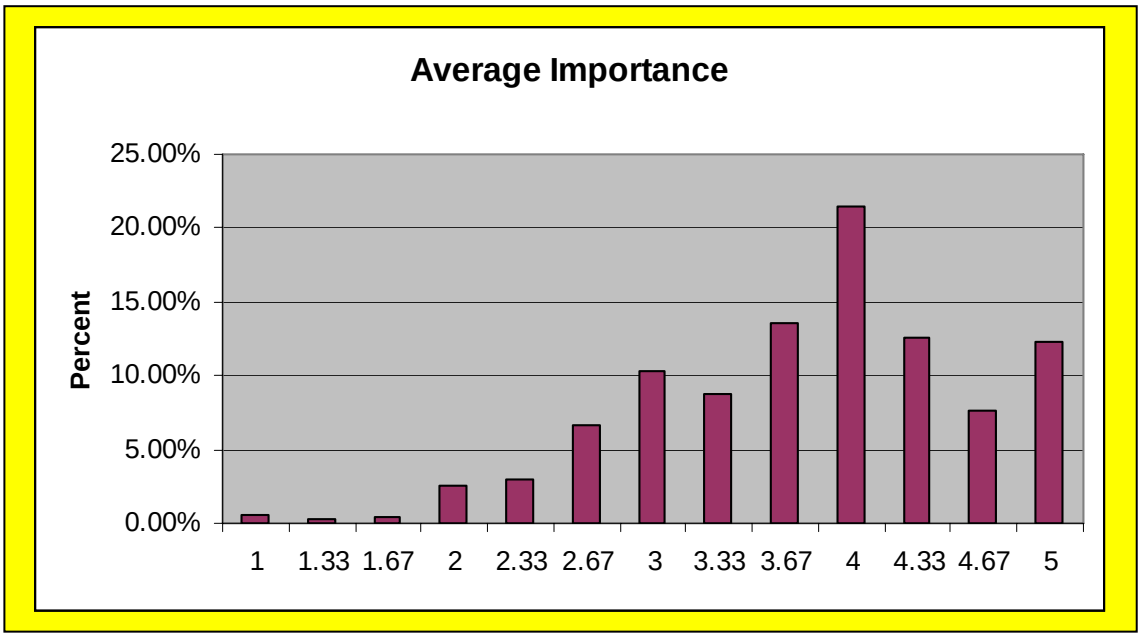



Figure 2.9. Frequency distribution for North Dakota residents' average importance for protecting wildlife diversity, nongame species and aquatic habitats for all species.

Table 2.9. Average importance (calculated by combining the three responses for protecting wildlife diversity, nongame species and aquatic habitats for all species)[1] analyzed by fishing, hunting and wildlife viewing participation.

| **Average Importance (3.78)** | **Fishing Participation** | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Mean** | 3.61 | 3.77 | 3.89 |
| **95% C.I.** | 3.45 – 3.78 | 3.69 – 3.86 | 3.78 – 3.99 |
| ANOVA: F=4.13; df=2 / 672; *p*=0.016 | | | |
| | | | |
| **Average Importance (3.78)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Mean** | 3.69 | 3.89 | 3.84 |
| **95% C.I.** | 3.59 – 3.78 | 3.78 – 3.99 | 3.71 – 3.98 |
| ANOVA: F=4.36; df=2 / 673; *p*=0.013 | | | |
| | | | |
| | | | |
| **Average Importance (3.78)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Mean** | 3.67 | 3.92 | 3.92 |
| **95% C.I.** | 3.58 – 3.75 | 3.79 – 4.04 | 3.79 – 4.05 |
| ANOVA: F=7.70; df=2 / 672; *p*<0.001 | | | |

[1]See Appendix A for exact wording for these categories.

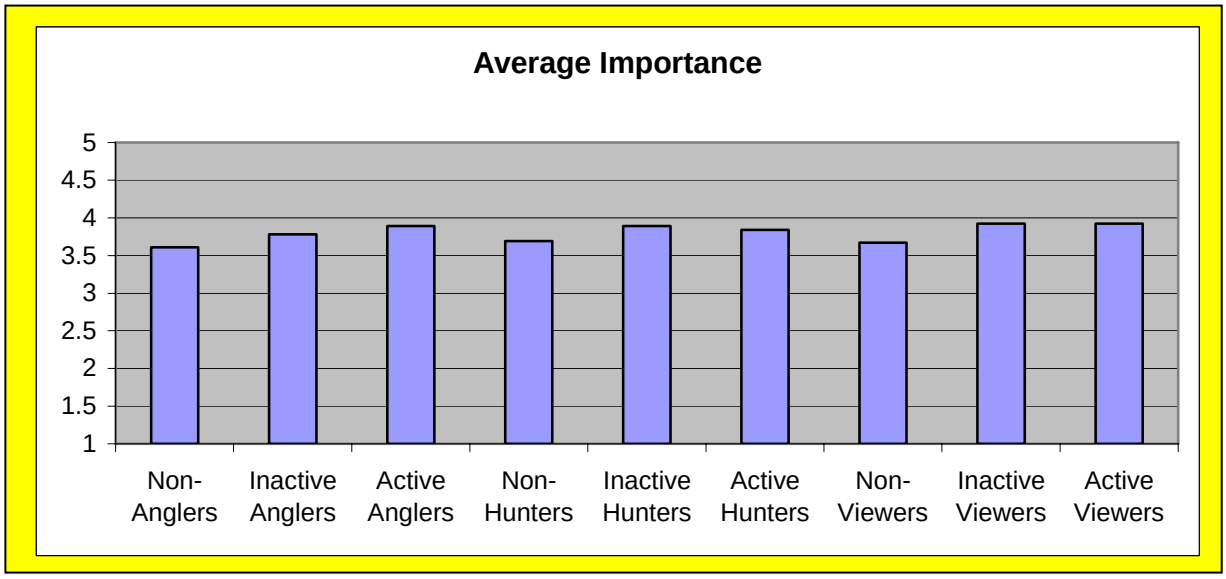



Figure 2.10. Average importance (for protecting wildlife diversity, nongame species and aquatic habitats for all species) analyzed by participation (*data from Table 2.9*).

Table 2.10. Classifying North Dakota residents based on their average importance (for protecting wildlife diversity, nongame species and aquatic habitats for all species) score.

| Average Importance Group (scale) | Number | Percent |
|---|---|---|
| **Low Importance (1 *to* <3)** | 93 | 13.4% |
| **Medium Low Importance (3 *to* <4)** | 227 | 32.7% |
| **Medium High Importance (4 *to* <5)** | 289 | 41.6% |
| **High Importance (5)** | 85 | 12.3% |
| **Total** | 695 | 100% |

Table 2.11. Overall frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management.

| Attitude (scale) | The NDG&F efforts to protect nongame fish and wildlife are adequate. | | Projects designed to benefit nongame fish and wildlife will benefit game as well. | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| **Strongly Disagree (-3)** | 5 | 0.7% | 3 | 0.4% |
| **Moderately Disagree (-2)** | 7 | 1.0% | 7 | 1.0% |
| **Slightly Disagree (-1)** | 29 | 4.2% | 15 | 2.2% |
| **Neither (0)** | 277 | 40.2% | 175 | 25.3% |
| **Slightly Agree (+1)** | 158 | 22.9% | 171 | 24.8% |
| **Moderately Agree (+2)** | 187 | 27.1% | 225 | 32.6% |
| **Strongly Agree (+3)** | 28 | 4.0% | 96 | 13.8% |
| **Total** | 691 | 100% | 692 | 100% |
| **Mean** | 0.81 | | 1.26 | |
| **95% Confidence Interval** | 0.73 – 0.89 | | 1.18 – 1.35 | |

Table 2.12. Frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management analyzed by fishing participation.

| **The NDG&F efforts to protect nongame fish and wildlife are adequate.** | | | |
|---|---|---|---|
| **Attitude (scale)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Strongly Disagree (-3)** | 0.9% | 0.0% | 2.0% |
| **Moderately Disagree (-2)** | 3.6% | 0.0% | 1.5% |
| **Slightly Disagree (-1)** | 8.0% | 3.7% | 2.9% |
| **Neither (0)** | 42.9% | 45.1% | 32.4% |
| **Slightly Agree (+1)** | 19.6% | 22.0% | 25.5% |
| **Moderately Agree (+2)** | 22.3% | 25.9% | 29.4% |
| **Strongly Agree (+3)** | 2.7% | 3.4% | 6.4% |
| **Total** | 112 | 355 | 204 |
| Chi-Square: $X^2$=34.07; df=12; $p$=0.001 | | | |
| **Mean** | 0.53 | 0.80 | 0.92 |
| **95% Confidence Interval** | 0.32 – 0.75 | 0.70 – 0.91 | 0.76 – 1.09 |
| ANOVA: F=4.76; df=2 / 668; $p$=0.009 | | | |

| **Projects designed to benefit nongame fish and wildlife will benefit game as well.** | | | |
|---|---|---|---|
| **Attitude (scale)** | **Fishing Participation** | | |
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Strongly Disagree (-3)** | 0.0% | 0.0% | 1.5% |
| **Moderately Disagree (-2)** | 2.7% | 0.8% | 1.0% |
| **Slightly Disagree (-1)** | 3.5% | 2.0% | 2.0% |
| **Neither (0)** | 23.9% | 28.9% | 20.1% |
| **Slightly Agree (+1)** | 30.1% | 23.5% | 23.5% |
| **Moderately Agree (+2)** | 35.4% | 30.8% | 33.8% |
| **Strongly Agree (+3)** | 4.4% | 14.0% | 18.1% |
| **Total** | 113 | 357 | 204 |
| Chi-Square: $X^2$=26.94; df=12; $p$=0.008 | | | |
| **Mean** | 1.06 | 1.23 | 1.39 |
| **95% Confidence Interval** | 0.86 – 1.26 | 1.12 – 1.35 | 1.22 – 1.56 |
| ANOVA: F=3.18; df=2 / 669; $p$=0.042 | | | |

Table 2.13. Frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management analyzed by hunting participation.

| **The NDG&F efforts to protect nongame fish and wildlife are adequate.** | | | |
|---|---|---|---|
| **Attitude (scale)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Strongly Disagree (-3)** | 0.9% | 0.4% | 0.8% |
| **Moderately Disagree (-2)** | 1.6% | 0.4% | 0.8% |
| **Slightly Disagree (-1)** | 5.0% | 3.1% | 3.8% |
| **Neither (0)** | 49.8% | 35.7% | 27.1% |
| **Slightly Agree (+1)** | 21.8% | 21.4% | 27.1% |
| **Moderately Agree (+2)** | 18.9% | 33.9% | 32.3% |
| **Strongly Agree (+3)** | 1.9% | 4.9% | 8.3% |
| **Total** | 317 | 224 | 133 |
| Chi-Square: $X^2$=41.62; df=12; $p$<0.001 | | | |
| **Mean** | 0.55 | 0.99 | 1.07 |
| **95% Confidence Interval** | 0.43 – 0.66 | 0.85 – 1.13 | 0.88 – 1.27 |
| ANOVA: F=17.03; df=2 / 669; $p$<0.001 | | | |
| | | | |
| **Projects designed to benefit nongame fish and wildlife will benefit game as well.** | | | |
| **Attitude (scale)** | **Hunting Participation** | | |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Strongly Disagree (-3)** | 0.6% | 0.0% | 0.8% |
| **Moderately Disagree (-2)** | 1.9% | 0.0% | 0.8% |
| **Slightly Disagree (-1)** | 3.5% | 0.4% | 2.3% |
| **Neither (0)** | 35.8% | 18.8% | 13.5% |
| **Slightly Agree (+1)** | 25.5% | 24.7% | 21.8% |
| **Moderately Agree (+2)** | 25.5% | 37.7% | 40.6% |
| **Strongly Agree (+3)** | 7.2% | 18.4% | 20.3% |
| **Total** | 318 | 223 | 133 |
| Chi-Square: $X^2$=63.48; df=12; $p$<0.001 | | | |
| **Mean** | 0.90 | 1.55 | 1.58 |
| **95% Confidence Interval** | 0.78 – 1.03 | 1.42 – 1.68 | 1.38 – 1.78 |
| ANOVA: F=30.47; df=2 / 671; $p$<0.001 | | | |

Table 2.14. Frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management analyzed by wildlife viewing participation.

| **The NDG&F efforts to protect nongame fish and wildlife are adequate.** | | | |
|---|---|---|---|
| **Attitude (scale)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Strongly Disagree (-3)** | 0.6% | 1.3% | 0.6% |
| **Moderately Disagree (-2)** | 1.4% | 0.0% | 1.3% |
| **Slightly Disagree (-1)** | 4.2% | 3.2% | 5.0% |
| **Neither (0)** | 43.1% | 36.5% | 40.3% |
| **Slightly Agree (+1)** | 22.7% | 19.2% | 25.8% |
| **Moderately Agree (+2)** | 24.1% | 33.3% | 24.5% |
| **Strongly Agree (+3)** | 3.9% | 6.4% | 2.5% |
| **Total** | 357 | 156 | 159 |
| Chi-Square: $X^2$=13.00; df=12; $p$=0.369 | | | |
| **Mean** | 0.74 | 0.98 | 0.74 |
| **95% Confidence Interval** | 0.63 – 0.85 | 0.80 – 1.16 | 0.58 – 0.90 |
| ANOVA: F=3.04; df=2 / 669; $p$=0.048 | | | |
| | | | |
| **Projects designed to benefit nongame fish and wildlife will benefit game as well.** | | | |
| **Attitude (scale)** | **Wildlife Viewing Participation** | | |
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Strongly Disagree (-3)** | 0.6% | 0.0% | 0.0% |
| **Moderately Disagree (-2)** | 1.1% | 0.0% | 1.9% |
| **Slightly Disagree (-1)** | 2.5% | 3.2% | 0.6% |
| **Neither (0)** | 27.7% | 27.6% | 19.5% |
| **Slightly Agree (+1)** | 25.4% | 16.0% | 30.8% |
| **Moderately Agree (+2)** | 32.1% | 34.0% | 32.1% |
| **Strongly Agree (+3)** | 10.6% | 19.2% | 15.1% |
| **Total** | 358 | 156 | 159 |
| Chi-Square: $X^2$=23.86; df=12; $p$=0.021 | | | |
| **Mean** | 1.15 | 1.39 | 1.34 |
| **95% Confidence Interval** | 1.03 – 1.26 | 1.21 – 1.58 | 1.17 – 1.52 |
| ANOVA: F=3.20; df=2 / 670; $p$=0.041 | | | |

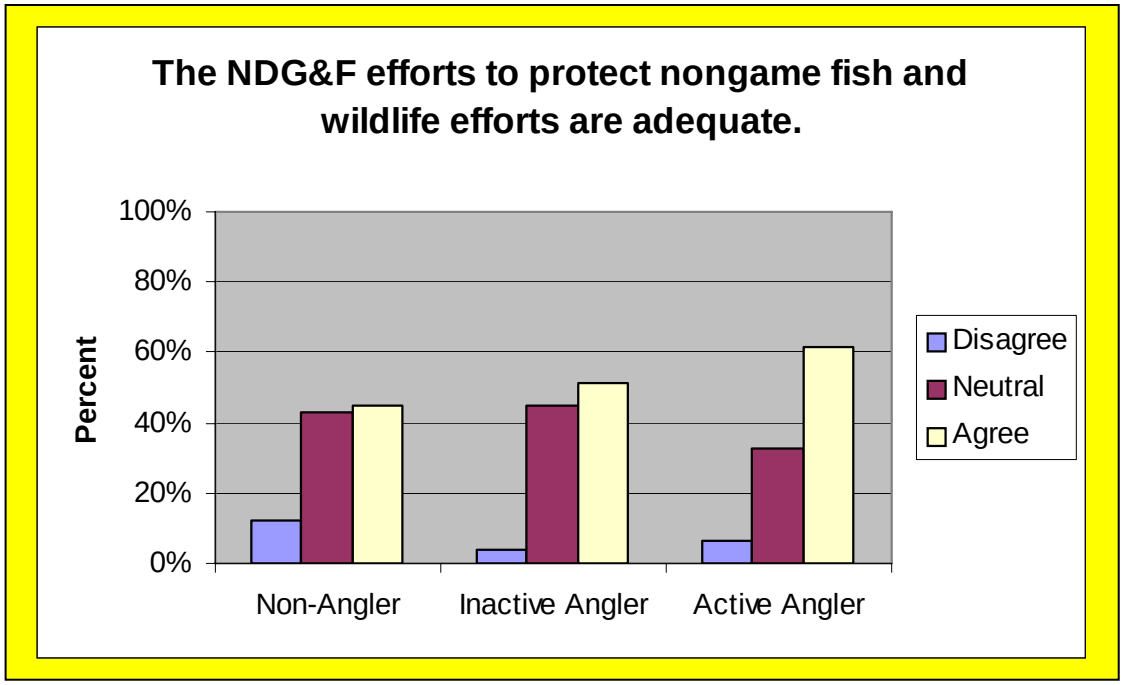



Figure 2.11. Summarized attitude, "*The NDG&F efforts to protect nongame fish and wildlife are adequate,*" analyzed by fishing participation (Chi-square $X^2$=20.73; df=4; $p$<0.001).

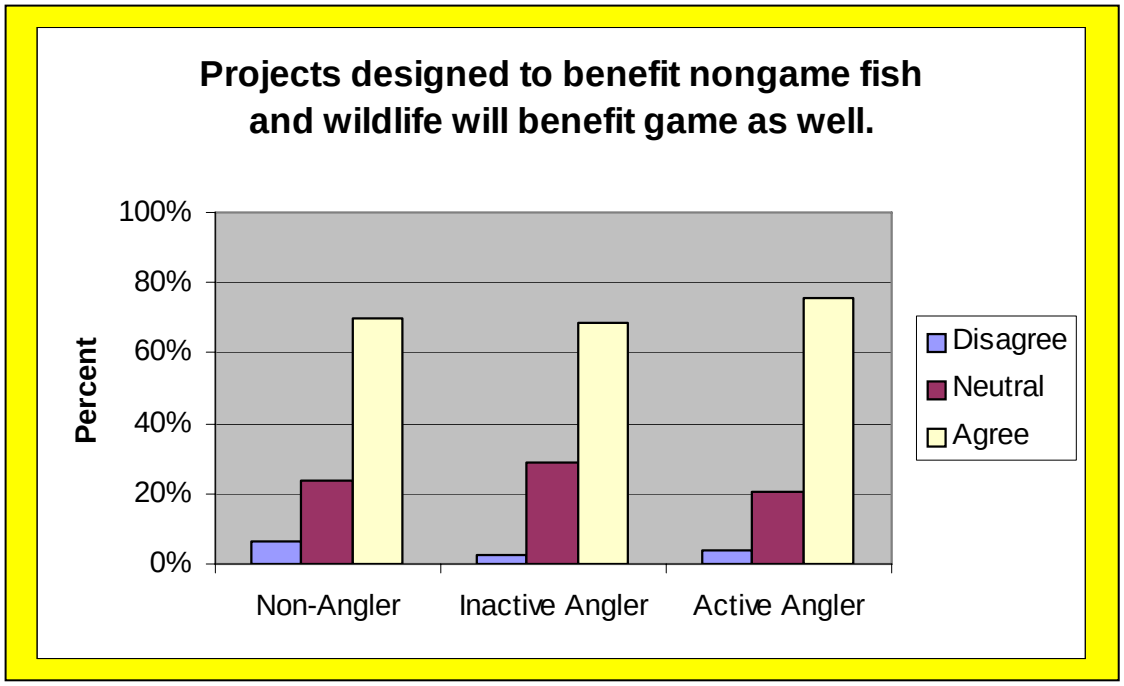



Figure 2.12. Summarized attitude, "*Projects designed to benefit nongame fish and wildlife will benefit game as well,*" analyzed by fishing participation (Chi-square $X^2$=7.76; df=4; $p$=0.101).

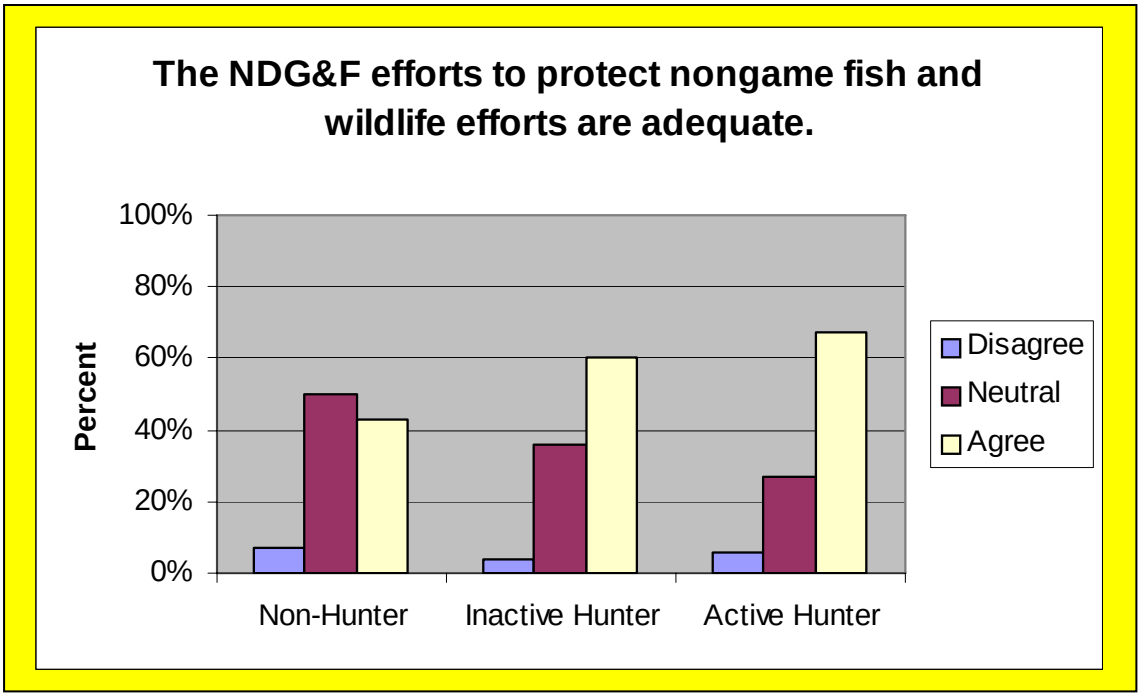



Figure 2.13. Summarized attitude, "*The NDG&F efforts to protect nongame fish and wildlife are adequate,*" analyzed by hunting participation (Chi-square $X^2$=30.98; df=4; $p$<0.001).

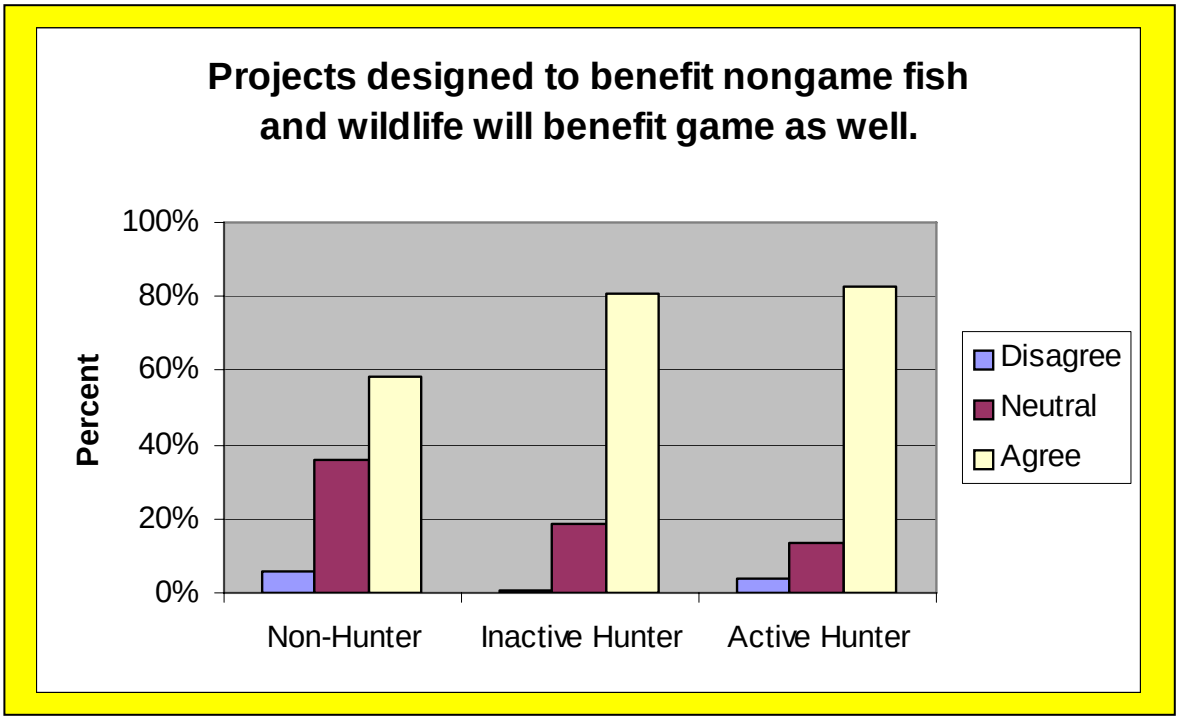



Figure 2.14. Summarized attitude, "*Projects designed to benefit nongame fish and wildlife will benefit game as well,*" analyzed by hunting participation (Chi-square $X^2$=47.00; df=4; $p$<0.001).

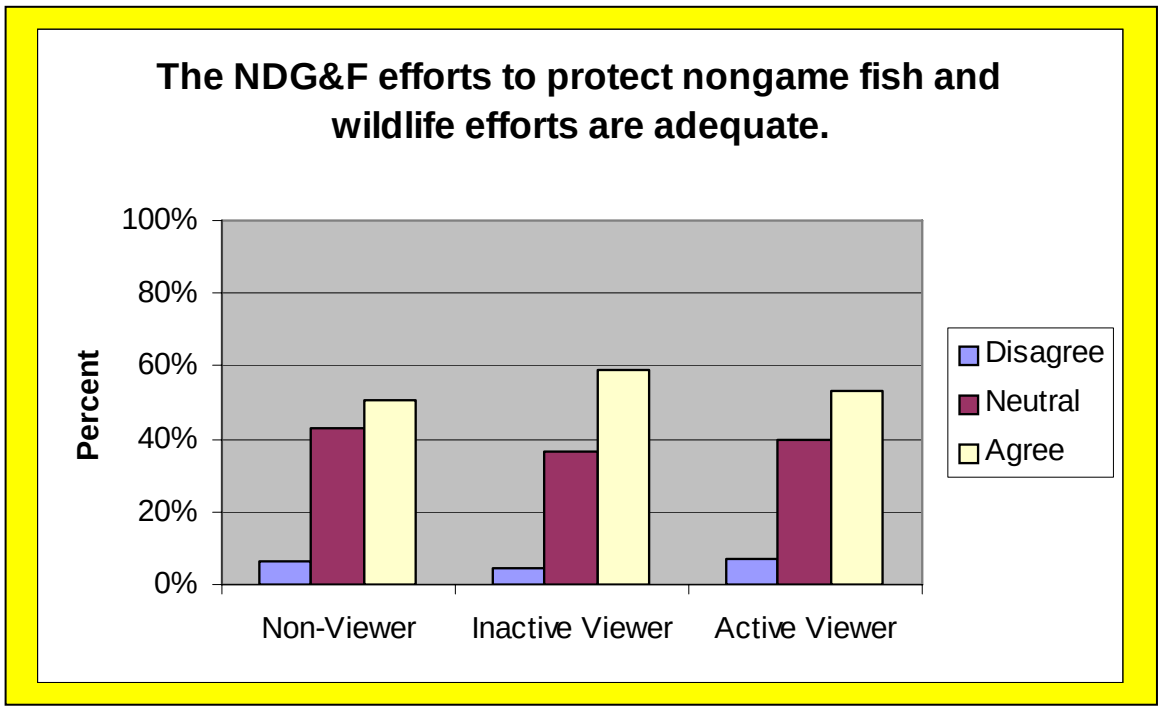



Figure 2.15. Summarized attitude, "*The NDG&F efforts to protect nongame fish and wildlife are adequate,*" analyzed by wildlife viewing participation (Chi-square $X^2$=3.41; df=4; $p$=0.491).

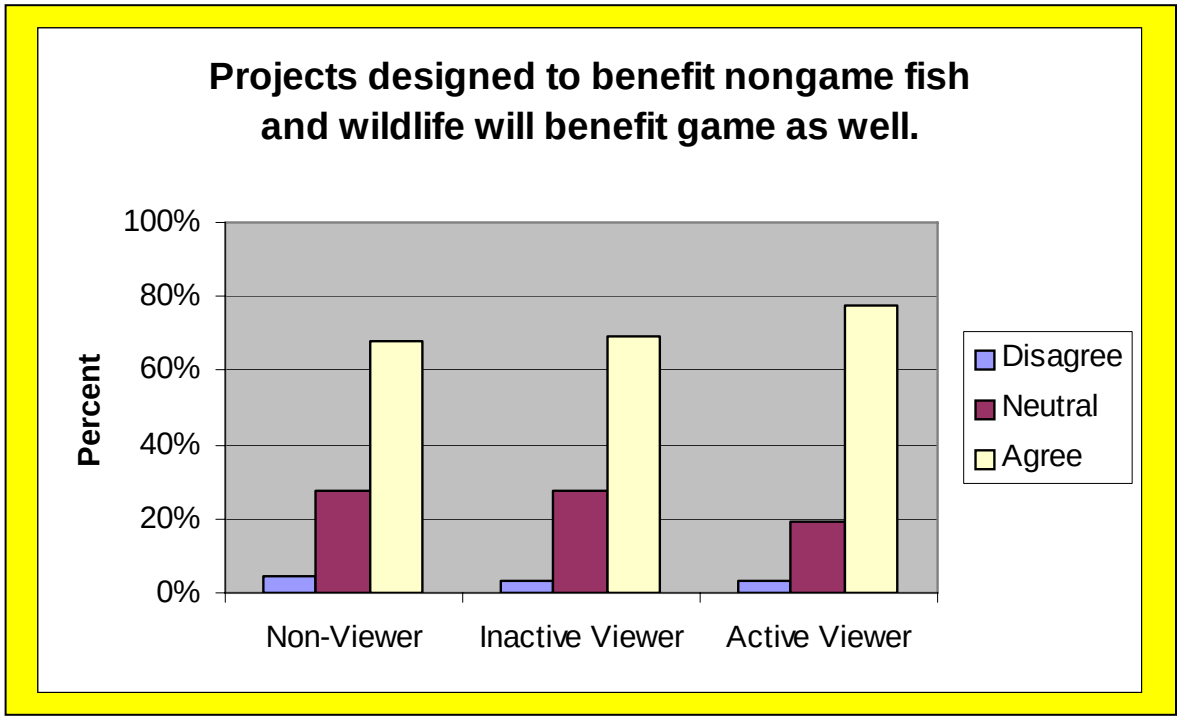



Figure 2.16. Summarized attitude, "*Projects designed to benefit nongame fish and wildlife will benefit game as well,*" analyzed by wildlife viewing participation (Chi-square $X^2$=5.14; df=4; $p$=0.274).

Table 2.15. North Dakota is required to match federal funds with state money to pay for protection of nongame fish and wildlife. What is your opinion on each of these suggested sources of state money to match federal funds for these nongame programs?

| **Sources of State Money to Match Federal Funds for Nongame Programs: Is it unacceptable or acceptable to…** | **Mean Attitude[1]** | **95% Confidence Interval** |
|---|---|---|
| …use a portion of revenue presently being collected from taxes | 0.80 | 0.69 – 0.91 |
| …use only money from people who hunt or fish | -0.07 | -0.22 – 0.08 |
| …use only money from voluntary contributions | -0.25 | -0.39 – -0.11 |
| …use new taxes or an increase in existing taxes | -0.98 | -1.11 – -0.86 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -1.92 | -2.03 – -1.81 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

Table 2.16. Opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation.

| **Sources of State Money to Match Federal Funds for Nongame Programs** | **Fishing Participation (Mean / 95% C.I.)[1]** | | | ***P*-value** |
|---|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** | |
| …use a portion of revenue presently being collected from taxes | 0.45<br>0.16 – 0.74 | 0.81<br>0.65 – 0.96 | 1.00<br>0.82 – 1.18 | =0.006 |
| …use only money from people who hunt or fish | 0.27<br>-0.10 – 0.65 | 0.12<br>-0.08 – 0.33 | -0.58<br>-0.86 – -0.30 | <0.001 |
| …use only money from voluntary contributions | -0.03<br>-0.36 – 0.30 | -0.18<br>-0.38 – 0.03 | -0.54<br>-0.80 – -0.29 | =0.031 |
| …use new taxes or an increase in existing taxes | -1.14<br>-1.45 – -0.83 | -0.97<br>-1.14 – -0.79 | -0.89<br>-1.12 – -0.67 | =0.448 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -1.43<br>-1.78 – -1.07 | -2.02<br>-2.17 – -1.88 | -2.02<br>-2.20 – -1.84 | <0.001 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

Table 2.17. Opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation.

| **Sources of State Money to Match Federal Funds for Nongame Programs** | **Hunting Participation (Mean / 95% C.I.)[1]** | | | ***P*-value** |
|---|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| …use a portion of revenue presently being collected from taxes | 0.67<br>0.51 – 0.83 | 0.86<br>0.67 – 1.06 | 1.02<br>0.76 – 1.28 | =0.054 |
| …use only money from people who hunt or fish | 0.26<br>0.04 – 0.47 | -0.07<br>-0.33 – 0.20 | -0.84<br>-1.18 – -0.50 | <0.001 |
| …use only money from voluntary contributions | -0.03<br>-0.24 – 0.17 | -0.40<br>-0.64 – -0.15 | -0.56<br>-0.89 – -0.22 | =0.012 |
| …use new taxes or an increase in existing taxes | -1.01<br>-1.19 – -0.83 | -0.92<br>-1.15 – -0.70 | -0.94<br>-1.23 – -0.65 | =0.830 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -1.83<br>-2.00 – -1.66 | -2.13<br>-2.30 – -1.96 | -1.81<br>-2.08 – -1.54 | =0.038 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

Table 2.18. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation.

| **Sources of State Money to Match Federal Funds for Nongame Programs** | **Viewing Participation (Mean / 95% C.I.)[1]** | | | ***P*-value** |
|---|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** | |
| …use a portion of revenue presently being collected from taxes | 0.70<br>0.55 – 0.85 | 0.82<br>0.57 – 1.06 | 1.02<br>0.80 – 1.24 | =0.072 |
| …use only money from people who hunt or fish | 0.08<br>-0.13 – 0.28 | -0.10<br>-0.42 – 0.21 | -0.35<br>-0.68 – -0.02 | =0.081 |
| …use only money from voluntary contributions | -0.06<br>-0.25 – 0.14 | -0.55<br>-0.85 – -0.25 | -0.42<br>-0.73 – -0.12 | =0.012 |
| …use new taxes or an increase in existing taxes | -1.06<br>-1.23 – -0.89 | -0.93<br>-1.21 – -0.66 | -0.80<br>-1.07 – -0.52 | =0.244 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -1.70<br>-1.87 – -1.51 | -2.25<br>-2.43 – -2.08 | -2.11<br>-2.32 – -1.90 | <0.001 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

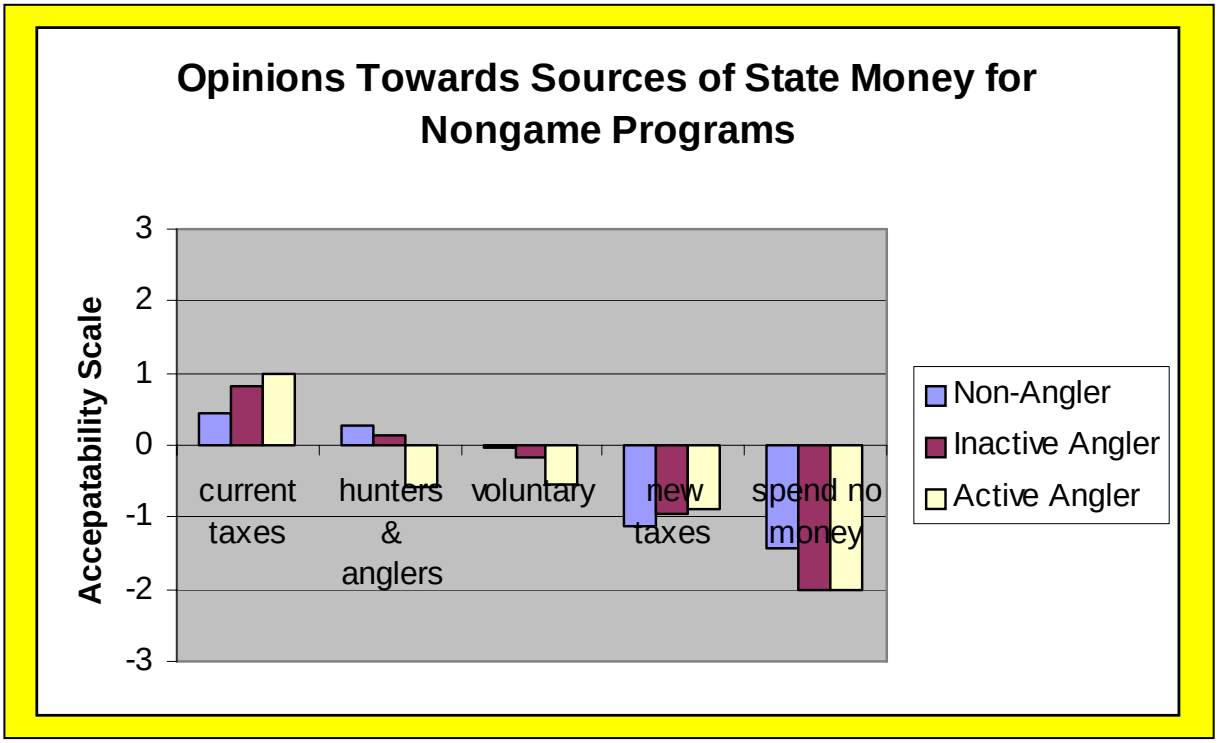



Figure 2.17. Opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation (*data from Table 2.16*).

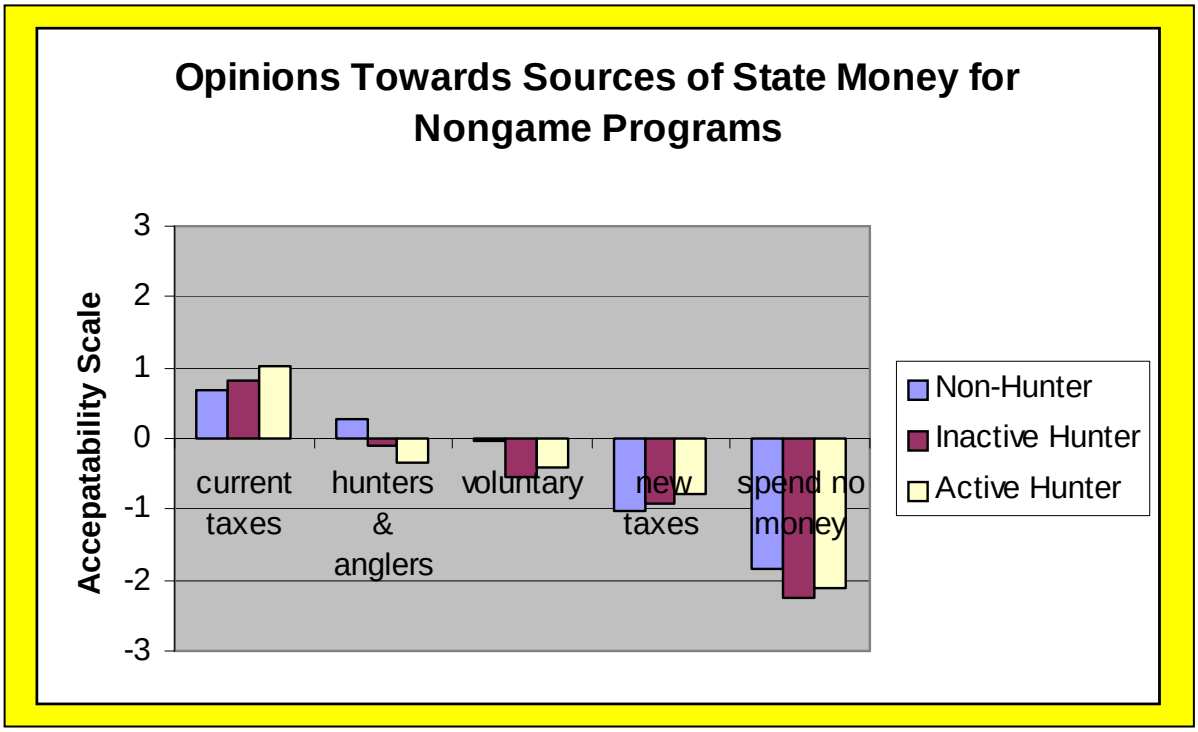



Figure 2.18. Opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation (*data from Table 2.17*).

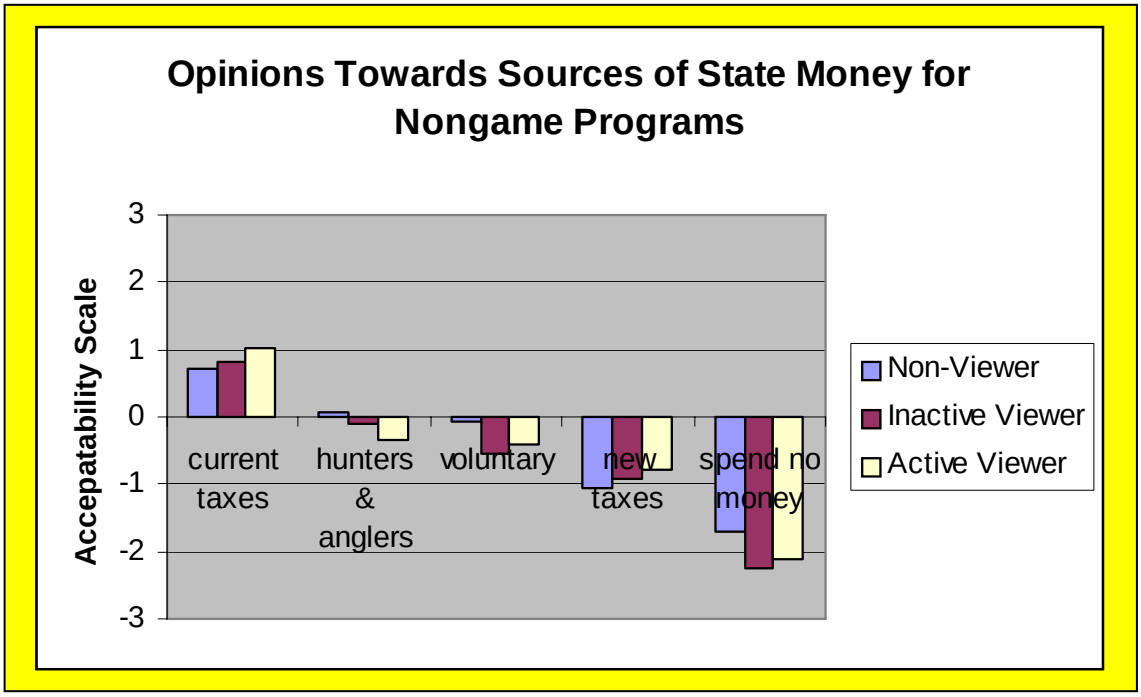



Figure 2.19. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation (*data from Table 2.18*).

Table 2.19-A. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation – **use a portion of revenue presently being collected from taxes.**

| Attitude Response | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| **Highly Unacceptable** | 6.2% | 4.8% | 3.0% | 4.5% |
| **Moderately Unacceptable** | 8.0% | 5.6% | 3.0% | 5.2% |
| **Slightly Unacceptable** | 12.4% | 10.7% | 8.9% | 10.4% |
| **Neither** | 12.4% | 4.2% | 5.4% | 6.0% |
| **Slightly Acceptable** | 31.9% | 40.2% | 45.3% | 40.3% |
| **Moderately Acceptable** | 26.5% | 27.0% | 25.6% | 26.5% |
| **Highly Acceptable** | 2.7% | 7.6% | 8.9% | 7.1% |
| **Total** | 113 | 356 | 203 | 672 |
| Chi-Square: $X^2$=23.78; df=12; $p$=0.022 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 26.8% | 21.1% | 14.7% | 20.1% |
| **NEITHER** | 12.5% | 4.2% | 5.4% | 6.0% |
| **ACCEPTABLE** | 60.7% | 74.6% | 79.9% | 73.9% |
| Chi-Square: $X^2$=19.22; df=4; $p$=0.001 | | | | |

Table 2.19-B. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation – **use only money from people who hunt or fish.**

| Attitude Response | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| **Highly Unacceptable** | 9.7% | 12.6% | 21.3% | 14.8% |
| **Moderately Unacceptable** | 16.8% | 12.1% | 19.8% | 15.2% |
| **Slightly Unacceptable** | 10.6% | 19.1% | 19.3% | 17.7% |
| **Neither** | 10.6% | 7.0% | 5.0% | 7.0% |
| **Slightly Acceptable** | 19.5% | 18.3% | 12.9% | 16.8% |
| **Moderately Acceptable** | 15.0% | 18.0% | 13.4% | 16.1% |
| **Highly Acceptable** | 17.7% | 12.9% | 8.4% | 12.4% |
| **Total** | 113 | 356 | 202 | 671 |
| Chi-Square: $X^2$=31.16; df=12; $p$=0.002 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 37.5% | 43.7% | 60.4% | 47.7% |
| **NEITHER** | 10.7% | 7.0% | 5.0% | 7.0% |
| **ACCEPTABLE** | 51.8% | 49.3% | 34.7% | 45.3% |
| Chi-Square: $X^2$=21.24; df=4; $p$<0.001 | | | | |

Table 2.19-C. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation – **use only money from voluntary contributions.**

| Attitude Response | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| **Highly Unacceptable** | 9.9% | 15.1% | 16.3% | 14.6% |
| **Moderately Unacceptable** | 17.1% | 15.6% | 20.2% | 17.3% |
| **Slightly Unacceptable** | 13.5% | 15.6% | 20.7% | 16.8% |
| **Neither** | 14.4% | 14.5% | 10.3% | 13.2% |
| **Slightly Acceptable** | 20.7% | 15.6% | 16.3% | 16.7% |
| **Moderately Acceptable** | 18.9% | 11.5% | 9.4% | 12.1% |
| **Highly Acceptable** | 5.4% | 12.0% | 6.9% | 9.4% |
| **Total** | 111 | 358 | 203 | 672 |
| Chi-Square: $X^2$=21.20; df=12; $p$=0.047 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 40.5% | 46.4% | 57.1% | 48.7% |
| **NEITHER** | 14.4% | 14.5% | 10.3% | 13.2% |
| **ACCEPTABLE** | 45.0% | 39.1% | 32.5% | 38.1% |
| Chi-Square: $X^2$=9.90; df=4; $p$=0.042 | | | | |

Table 2.19-D. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation – **use new taxes or an increase in existing taxes.**

| Attitude Response | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| **Highly Unacceptable** | 33.6% | 25.1% | 21.6% | 25.4% |
| **Moderately Unacceptable** | 15.5% | 20.7% | 19.6% | 19.5% |
| **Slightly Unacceptable** | 5.5% | 15.6% | 17.2% | 14.4% |
| **Neither** | 25.5% | 12.8% | 15.7% | 15.8% |
| **Slightly Acceptable** | 17.3% | 17.9% | 21.6% | 18.9% |
| **Moderately Acceptable** | 2.7% | 5.6% | 2.5% | 4.2% |
| **Highly Acceptable** | 0.0% | 2.2% | 2.0% | 1.8% |
| **Total** | 110 | 358 | 204 | 672 |
| Chi-Square: $X^2$=28.57; df=12; $p$=0.005 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 54.5% | 61.5% | 58.3% | 59.4% |
| **NEITHER** | 25.5% | 12.8% | 15.7% | 15.8% |
| **ACCEPTABLE** | 20.0% | 25.7% | 26.0% | 24.9% |
| Chi-Square: $X^2$=10.46; df=4; $p$=0.033 | | | | |

Table 2.19-E. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by fishing participation – **spend no money to keep nongame from becoming rare, endangered or extinct.**

| Attitude Response | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| **Highly Unacceptable** | 47.3% | 54.6% | 49.5% | 51.9% |
| **Moderately Unacceptable** | 11.6% | 17.3% | 23.0% | 18.1% |
| **Slightly Unacceptable** | 11.6% | 14.2% | 16.2% | 14.4% |
| **Neither** | 13.4% | 7.8% | 6.4% | 8.3% |
| **Slightly Acceptable** | 4.5% | 2.5% | 2.0% | 2.7% |
| **Moderately Acceptable** | 6.3% | 1.7% | 2.0% | 2.5% |
| **Highly Acceptable** | 5.4% | 1.9% | 1.0% | 2.2% |
| **Total** | 112 | 359 | 204 | 675 |
| Chi-Square: $X^2$=28.00; df=12; $p$=0.006 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 70.5% | 86.3% | 88.7% | 84.4% |
| **NEITHER** | 13.4% | 7.8% | 6.4% | 8.3% |
| **ACCEPTABLE** | 16.1% | 5.9% | 4.9% | 7.3% |
| Chi-Square: $X^2$=22.14; df=4; $p$<0.001 | | | | |

Table 2.20-A. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation – **use a portion of revenue presently being collected from taxes.**

| Attitude Response | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| **Highly Unacceptable** | 3.8% | 4.9% | 4.5% | 4.3% |
| **Moderately Unacceptable** | 5.4% | 5.4% | 4.5% | 5.2% |
| **Slightly Unacceptable** | 13.6% | 8.1% | 6.8% | 10.4% |
| **Neither** | 7.3% | 4.9% | 5.3% | 6.1% |
| **Slightly Acceptable** | 41.8% | 39.9% | 37.9% | 40.4% |
| **Moderately Acceptable** | 22.8% | 30.0% | 28.8% | 26.4% |
| **Highly Acceptable** | 5.4% | 6.7% | 12.1% | 7.2% |
| **Total** | 316 | 223 | 132 | 671 |
| Chi-Square: $X^2$=17.14; df=12; $p$=0.144 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 22.8% | 18.4% | 15.9% | 20.0% |
| **NEITHER** | 7.3% | 4.9% | 5.3% | 6.1% |
| **ACCEPTABLE** | 69.9% | 76.7% | 78.8% | 73.9% |
| Chi-Square: $X^2$=5.31; df=4; $p$=0.257 | | | | |

Table 2.20-B. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation – **use only money from people who hunt or fish.**

| Attitude Response | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| **Highly Unacceptable** | 9.5% | 15.6% | 25.4% | 14.7% |
| **Moderately Unacceptable** | 12.6% | 14.3% | 23.1% | 15.3% |
| **Slightly Unacceptable** | 18.6% | 17.9% | 15.7% | 17.8% |
| **Neither** | 8.2% | 7.1% | 4.5% | 7.1% |
| **Slightly Acceptable** | 19.6% | 14.7% | 13.4% | 16.7% |
| **Moderately Acceptable** | 16.1% | 19.2% | 11.2% | 16.1% |
| **Highly Acceptable** | 15.5% | 11.2% | 6.7% | 12.3% |
| **Total** | 317 | 224 | 134 | 675 |
| Chi-Square: $X^2$=38.24; df=12; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 40.7% | 47.7% | 64.2% | 47.7% |
| **NEITHER** | 8.2% | 7.2% | 4.5% | 7.1% |
| **ACCEPTABLE** | 51.1% | 45.0% | 31.3% | 45.2% |
| Chi-Square: $X^2$=20.87; df=4; $p$<0.001 | | | | |

Table 2.20-C. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation – **use only money from voluntary contributions.**

| Attitude Response | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| **Highly Unacceptable** | 10.1% | 17.4% | 20.5% | 14.6% |
| **Moderately Unacceptable** | 18.0% | 15.2% | 18.2% | 17.1% |
| **Slightly Unacceptable** | 16.1% | 17.9% | 16.7% | 16.8% |
| **Neither** | 14.2% | 12.5% | 12.9% | 13.4% |
| **Slightly Acceptable** | 15.8% | 19.2% | 13.6% | 16.5% |
| **Moderately Acceptable** | 13.9% | 12.1% | 8.3% | 12.2% |
| **Highly Acceptable** | 11.7% | 5.8% | 9.8% | 9.4% |
| **Total** | 316 | 224 | 132 | 672 |
| Chi-Square: $X^2$=18.98; df=12; $p$=0.089 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 44.3% | 50.7% | 55.3% | 48.6% |
| **NEITHER** | 14.2% | 12.4% | 12.9% | 13.4% |
| **ACCEPTABLE** | 41.5% | 36.9% | 31.8% | 38.0% |
| Chi-Square: $X^2$=5.36; df=4; $p$=0.253 | | | | |

Table 2.20-D. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation – **use new taxes or an increase in existing taxes.**

| Attitude Response | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| **Highly Unacceptable** | 23.9% | 27.2% | 25.8% | 25.4% |
| **Moderately Unacceptable** | 23.3% | 16.1% | 15.9% | 19.4% |
| **Slightly Unacceptable** | 12.9% | 14.7% | 17.4% | 14.4% |
| **Neither** | 15.4% | 16.1% | 16.7% | 15.9% |
| **Slightly Acceptable** | 19.5% | 18.8% | 16.7% | 18.7% |
| **Moderately Acceptable** | 3.8% | 4.9% | 5.3% | 4.5% |
| **Highly Acceptable** | 1.3% | 2.2% | 2.3% | 1.8% |
| **Total** | 318 | 224 | 132 | 674 |
| Chi-Square: $X^2$=8.57; df=12; $p$=0.739 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 60.1% | 57.8% | 59.4% | 59.2% |
| **NEITHER** | 15.5% | 16.0% | 16.5% | 15.9% |
| **ACCEPTABLE** | 24.4% | 26.2% | 24.1% | 24.9% |
| Chi-Square: $X^2$=0.42; df=4; $p$=0.981 | | | | |

Table 2.20-E. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by hunting participation – **spend no money to keep nongame from becoming rare, endangered or extinct.**

| Attitude Response | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| **Highly Unacceptable** | 49.8% | 58.2% | 46.6% | 52.0% |
| **Moderately Unacceptable** | 17.9% | 16.0% | 21.8% | 18.0% |
| **Slightly Unacceptable** | 14.1% | 14.2% | 15.0% | 14.3% |
| **Neither** | 8.8% | 7.6% | 8.3% | 8.3% |
| **Slightly Acceptable** | 4.1% | 0.9% | 2.3% | 2.7% |
| **Moderately Acceptable** | 3.4% | 1.8% | 2.3% | 2.7% |
| **Highly Acceptable** | 1.9% | 1.3% | 3.8% | 2.1% |
| **Total** | 319 | 225 | 133 | 677 |
| Chi-Square: $X^2$=13.68; df=12; $p$=0.322 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 82.0% | 88.4% | 83.6% | 84.4% |
| **NEITHER** | 8.8% | 7.6% | 8.2% | 8.3% |
| **ACCEPTABLE** | 9.1% | 4.0% | 8.2% | 7.3% |
| Chi-Square: $X^2$=5.86; df=4; $p$=0.210 | | | | |

Table 2.21-A. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation – **use a portion of revenue presently being collected from taxes.**

| Attitude Response | Wildlife Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| **Highly Unacceptable** | 3.9% | 6.5% | 3.8% | 4.5% |
| **Moderately Unacceptable** | 6.1% | 5.2% | 3.1% | 5.2% |
| **Slightly Unacceptable** | 12.3% | 7.7% | 8.8% | 10.4% |
| **Neither** | 7.0% | 5.8% | 5.0% | 6.2% |
| **Slightly Acceptable** | 39.1% | 40.0% | 43.1% | 40.3% |
| **Moderately Acceptable** | 26.8% | 27.1% | 24.4% | 26.3% |
| **Highly Acceptable** | 4.7% | 7.7% | 11.9% | 7.1% |
| **Total** | 358 | 155 | 160 | 673 |
| Chi-Square: $X^2$=15.93; df=12; $p$=0.195 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 22.3% | 19.4% | 15.1% | 19.9% |
| **NEITHER** | 7.0% | 5.8% | 5.0% | 6.3% |
| **ACCEPTABLE** | 70.7% | 74.8% | 79.9% | 73.8% |
| Chi-Square: $X^2$=4.97; df=4; $p$=0.291 | | | | |

Table 2.21-B. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation – **use only money from people who hunt or fish.**

| Attitude Response | Wildlife Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| **Highly Unacceptable** | 12.5% | 11.8% | 22.3% | 14.6% |
| **Moderately Unacceptable** | 15.5% | 15.8% | 14.6% | 15.4% |
| **Slightly Unacceptable** | 14.7% | 26.3% | 15.9% | 17.6% |
| **Neither** | 7.8% | 5.9% | 7.0% | 7.2% |
| **Slightly Acceptable** | 21.1% | 9.2% | 14.6% | 16.9% |
| **Moderately Acceptable** | 15.5% | 19.1% | 14.6% | 16.1% |
| **Highly Acceptable** | 13.0% | 11.8% | 10.8% | 12.2% |
| **Total** | 361 | 152 | 157 | 670 |
| Chi-Square: $X^2$=28.47; df=12; $p$=0.005 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 42.8% | 53.9% | 53.2% | 47.8% |
| **NEITHER** | 7.7% | 5.8% | 7.0% | 7.1% |
| **ACCEPTABLE** | 49.4% | 40.3% | 39.9% | 45.1% |
| Chi-Square: $X^2$=7.85; df=4; $p$=0.097 | | | | |

Table 2.21-C. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation – **use only money from voluntary contributions.**

| Attitude Response | Wildlife Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| **Highly Unacceptable** | 11.2% | 19.2% | 17.6% | 14.6% |
| **Moderately Unacceptable** | 16.2% | 19.9% | 17.0% | 17.2% |
| **Slightly Unacceptable** | 16.5% | 14.7% | 19.5% | 16.8% |
| **Neither** | 14.2% | 14.1% | 10.1% | 13.2% |
| **Slightly Acceptable** | 17.6% | 15.4% | 15.7% | 16.6% |
| **Moderately Acceptable** | 14.0% | 9.0% | 11.3% | 12.2% |
| **Highly Acceptable** | 10.3% | 7.7% | 8.8% | 9.4% |
| **Total** | 358 | 156 | 159 | 673 |
| Chi-Square: $X^2$=13.36; df=12; $p$=0.343 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 43.9% | 53.5% | 54.4% | 48.6% |
| **NEITHER** | 14.2% | 14.2% | 10.0% | 13.2% |
| **ACCEPTABLE** | 41.9% | 32.3% | 35.6% | 38.2% |
| Chi-Square: $X^2$=8.18; df=4; $p$=0.085 | | | | |

Table 2.21-D. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation – **use new taxes or an increase in existing taxes.**

| Attitude Response | Wildlife Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| **Highly Unacceptable** | 27.6% | 23.9% | 22.0% | 25.4% |
| **Moderately Unacceptable** | 17.3% | 22.6% | 21.4% | 19.5% |
| **Slightly Unacceptable** | 16.4% | 12.3% | 12.6% | 14.6% |
| **Neither** | 15.0% | 18.1% | 14.5% | 15.6% |
| **Slightly Acceptable** | 20.3% | 14.2% | 20.1% | 18.9% |
| **Moderately Acceptable** | 2.5% | 5.8% | 6.9% | 4.3% |
| **Highly Acceptable** | 0.8% | 3.2% | 2.5% | 1.8% |
| **Total** | 359 | 155 | 159 | 673 |
| Chi-Square: $X^2$=18.61; df=12; $p$=0.098 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 61.3% | 58.4% | 56.0% | 59.4% |
| **NEITHER** | 15.0% | 18.2% | 14.5% | 15.6% |
| **ACCEPTABLE** | 23.7% | 23.4% | 29.6% | 25.0% |
| Chi-Square: $X^2$=3.15; df=4; $p$=0.533 | | | | |

Table 2.21-E. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife viewing participation – **spend no money to keep nongame from becoming rare, endangered or extinct.**

| Attitude Response | Wildlife Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| **Highly Unacceptable** | 45.8% | 61.9% | 56.3% | 52.0% |
| **Moderately Unacceptable** | 18.9% | 14.8% | 19.4% | 18.1% |
| **Slightly Unacceptable** | 15.8% | 12.9% | 12.5% | 14.4% |
| **Neither** | 8.3% | 9.7% | 6.9% | 8.3% |
| **Slightly Acceptable** | 4.2% | 0.0% | 1.9% | 2.7% |
| **Moderately Acceptable** | 3.9% | 0.6% | 1.3% | 2.5% |
| **Highly Acceptable** | 3.1% | 0.0% | 1.9% | 2.1% |
| **Total** | 360 | 155 | 160 | 675 |
| Chi-Square: $X^2$=27.55; df=12; $p$=0.006 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **UNACCEPTABLE** | 80.6% | 89.7% | 88.1% | 84.4% |
| **NEITHER** | 8.3% | 9.7% | 6.9% | 8.3% |
| **ACCEPTABLE** | 11.1% | 0.6% | 5.0% | 7.3% |
| Chi-Square: $X^2$=19.97; df=4; $p$=0.001 | | | | |

Table 2.22. Most preferred source of state money to match federal funds for nongame programs analyzed by fishing participation.

| Sources of State Money to Match Federal Funds for Nongame Programs | Fishing Participation | | | Total |
|---|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler | |
| …use a portion of revenue presently being collected from taxes | 44.4% | 59.5% | 58.1% | 56.7% |
| …use only money from people who hunt or fish | 25.9% | 25.2% | 20.0% | 23.7% |
| …use only money from voluntary contributions | 16.0% | 9.9% | 11.3% | 11.3% |
| …use new taxes or an increase in existing taxes | 6.2% | 3.6% | 10.0% | 6.0% |
| …spend no money to keep nongame from becoming rare, endangered or extinct | 7.4% | 1.8% | 0.6% | 2.3% |
| Total Number | 81 | 274 | 160 | 515 |
| Chi-Square: $X^2$=24.09; df=8; $p$=0.002 | | | | |

Table 2.23. Most preferred source of state money to match federal funds for nongame programs analyzed by hunting participation.

| Sources of State Money to Match Federal Funds for Nongame Programs | Hunting Participation | | | Total |
|---|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter | |
| …use a portion of revenue presently being collected from taxes | 51.8% | 59.1% | 62.9% | 56.4% |
| …use only money from people who hunt or fish | 28.5% | 23.8% | 13.3% | 23.9% |
| …use only money from voluntary contributions | 11.6% | 9.1% | 15.2% | 11.6% |
| …use new taxes or an increase in existing taxes | 5.2% | 5.5% | 7.6% | 5.8% |
| …spend no money to keep nongame from becoming rare, endangered or extinct | 2.8% | 2.4% | 1.0% | 2.3% |
| Total Number | 249 | 164 | 105 | 518 |
| Chi-Square: $X^2$=12.98; df=8; $p$=0.112 | | | | |

Table 2.24. Most preferred source of state money to match federal funds for nongame programs analyzed by wildlife viewing participation.

| Sources of State Money to Match Federal Funds for Nongame Programs | Viewing Participation | | | Total |
|---|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer | |
| …use a portion of revenue presently being collected from taxes | 55.8% | 55.4% | 59.0% | 56.4% |
| …use only money from people who hunt or fish | 24.1% | 25.6% | 21.4% | 23.8% |
| …use only money from voluntary contributions | 13.3% | 9.9% | 8.5% | 11.4% |
| …use new taxes or an increase in existing taxes | 3.6% | 6.6% | 10.3% | 5.8% |
| …spend no money to keep nongame from becoming rare, endangered or extinct | 3.2% | 2.5% | 0.9% | 2.5% |
| Total Number | 278 | 121 | 117 | 516 |
| Chi-Square: $X^2$=10.91; df=8; $p$=0.207 | | | | |

# Part 2 – Attitudes Related to Protecting All Types of Fish and Wildlife in North Dakota

**Section B: Analysis by Wildlife Value Orientation** (… is described on page 4)

**Self-Reported Knowledge of Fish and Wildlife in North Dakota.** Pluralists and utilitarians had the highest self-reported knowledge levels about game and NDG&F efforts to protect game, followed by mutualists with distanced having the lowest self-reported knowledge levels (Table 2.25 and Figure 2.20). However, pluralists had the highest self-reported levels of knowledge about nongame and NDG&F efforts to protect nongame and distanced the lowest self-reported knowledge levels with utilitarian and mutualists in-between these two groups.

**Importance of Protecting Nongame.** The mutualists and pluralists reported significantly higher levels of importance in protecting nongame than did the utilitarians (Tables 2.26 and 2.27 and Figure 2.21).

**Evaluation of Efforts to Protect Nongame.** Pluralists had the highest agreement that NDG&F efforts to protect nongame were adequate and with the statement that projects designed to benefit nongame also benefit game (Table 2.28 and Figures 2.22 and 2.23). Utilitarians had the second highest level of agreement with these two statements and mutualists and distanced the lowest level of agreement.

**Sources of State Money for Nongame Programs.** Distanced people had the highest acceptance of using current taxes for nongame programs and utilitarians the lowest level of acceptance, although the overall differences were minor (Tables 2.29 and 2.30 and Figure 2.24). All four wildlife value orientation groups were equally neutral towards using only money from hunters and anglers to fund nongame programs. The utilitarians were somewhat neutral towards using only voluntary contributions for funding nongame programs while the other three groups found this funding strategy unacceptable. All four groups were opposed to new taxes or increased taxes to fund nongame programs, however the utilitarians were significantly more opposed to this funding source than the other three groups. All four groups felt that it was very unacceptable to **not** spend any money to keep nongame from becoming rare, endangered, or extinct, however the utilitarians were significantly less opposed to not spending any money compared to the other three groups.

There were only small differences among the four wildlife value orientation groups when it came to selecting their most preferred funding source of state money to match federal funds for nongame programs (Table 2.31). Utilitarians were more likely than the other three groups to prefer using only voluntary contributions. The mutualists had higher support for using new or increased taxes compared to the other three groups.

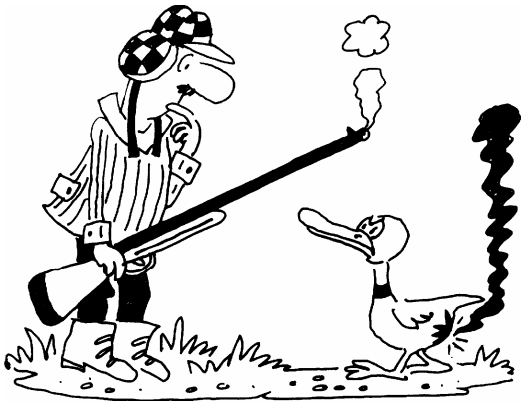


Table 2.25. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife value orientation.

| **Knowledge about Game** | | | | |
|---|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Knowledgeable (1)** | 9.9% | 10.2% | 13.0% | 29.6% |
| **Slightly Knowledgeable (2)** | 27.8% | 25.4% | 44.4% | 42.6% |
| **Moderately Knowledgeable (3)** | 33.0% | 35.6% | 25.0% | 20.4% |
| **Quite Knowledgeable (4)** | 23.1% | 23.5% | 15.7% | 7.4% |
| **Extremely Knowledgeable (5)** | 6.1% | 5.4% | 1.9% | 0.0% |
| **Total** | 212 | 315 | 108 | 54 |
| Chi-Square: $X^2$=46.91; df=12; $p$<0.001 | | | | |
| **Mean** | 2.88 | 2.88 | 2.49 | 2.05 |
| **95% Confidence Interval** | 2.74 – 3.03 | 2.77 – 3.00 | 2.30 – 2.67 | 1.81 – 2.30 |
| ANOVA: F=13.58; df=3 / 686; $p$<0.001 | | | | |
| | | | | |
| **Knowledge about NDG&F Efforts to Protect Game** | | | | |
| **Knowledge Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Knowledgeable (1)** | 20.4% | 23.9% | 32.7% | 45.5% |
| **Slightly Knowledgeable (2)** | 31.8% | 29.9% | 40.2% | 32.7% |
| **Moderately Knowledgeable (3)** | 28.0% | 29.0% | 18.7% | 16.4% |
| **Quite Knowledgeable (4)** | 18.0% | 15.0% | 5.6% | 3.6% |
| **Extremely Knowledgeable (5)** | 1.9% | 2.2% | 2.8% | 1.8% |
| **Total** | 211 | 314 | 107 | 55 |
| Chi-Square: $X^2$=34.02; df=12; $p$=0.001 | | | | |
| **Mean** | 2.49 | 2.42 | 2.05 | 1.81 |
| **95% Confidence Interval** | 2.34 – 2.63 | 2.30 – 2.54 | 1.86 – 2.24 | 1.56 – 2.07 |
| ANOVA: F=9.34; df=3 / 683; $p$<0.001 | | | | |
| | | | | |
| **Knowledge about Nongame** | | | | |
| **Knowledge Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Knowledgeable (1)** | 23.1% | 30.8% | 28.4% | 50.9% |
| **Slightly Knowledgeable (2)** | 37.5% | 37.8% | 36.7% | 30.9% |
| **Moderately Knowledgeable (3)** | 26.9% | 21.0% | 27.5% | 14.5% |
| **Quite Knowledgeable (4)** | 10.6% | 10.2% | 7.3% | 3.6% |
| **Extremely Knowledgeable (5)** | 1.9% | 0.3% | 0.0% | 0.0% |
| **Total** | 208 | 315 | 109 | 55 |
| Chi-Square: $X^2$=25.73; df=12; $p$=0.012 | | | | |
| **Mean** | 2.31 | 2.11 | 2.14 | 1.71 |
| **95% Confidence Interval** | 2.17 – 2.45 | 2.00 – 2.21 | 1.97 – 2.31 | 1.47 – 1.94 |
| ANOVA: F=6.05; df=3 / 682; $p$<0.001 | | | | |
| | | | | |

Table continued on next page.

Table 2.25 – Continued. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife value orientation.

| **Knowledge about NDG&F Efforts to Protect Nongame** | | | | |
|---|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Knowledgeable (1)** | 29.7% | 41.7% | 45.8% | 65.5% |
| **Slightly Knowledgeable (2)** | 34.4% | 31.2% | 33.6% | 21.8% |
| **Moderately Knowledgeable (3)** | 25.9% | 20.1% | 15.9% | 10.9% |
| **Quite Knowledgeable (4)** | 9.4% | 6.4% | 4.7% | 1.8% |
| **Extremely Knowledgeable (5)** | 0.5% | 0.6% | 0.0% | 0.0% |
| **Total** | 212 | 314 | 107 | 55 |
| Chi-Square: $X^2$=30.43; df=12; $p$=0.002 | | | | |
| **Mean** | 2.17 | 1.93 | 1.79 | 1.50 |
| **95% Confidence Interval** | 2.03 – 2.30 | 1.81 – 2.03 | 1.63 – 1.96 | 1.29 – 1.70 |
| ANOVA: F=9.03; df=3 / 683; $p$<0.001 | | | | |

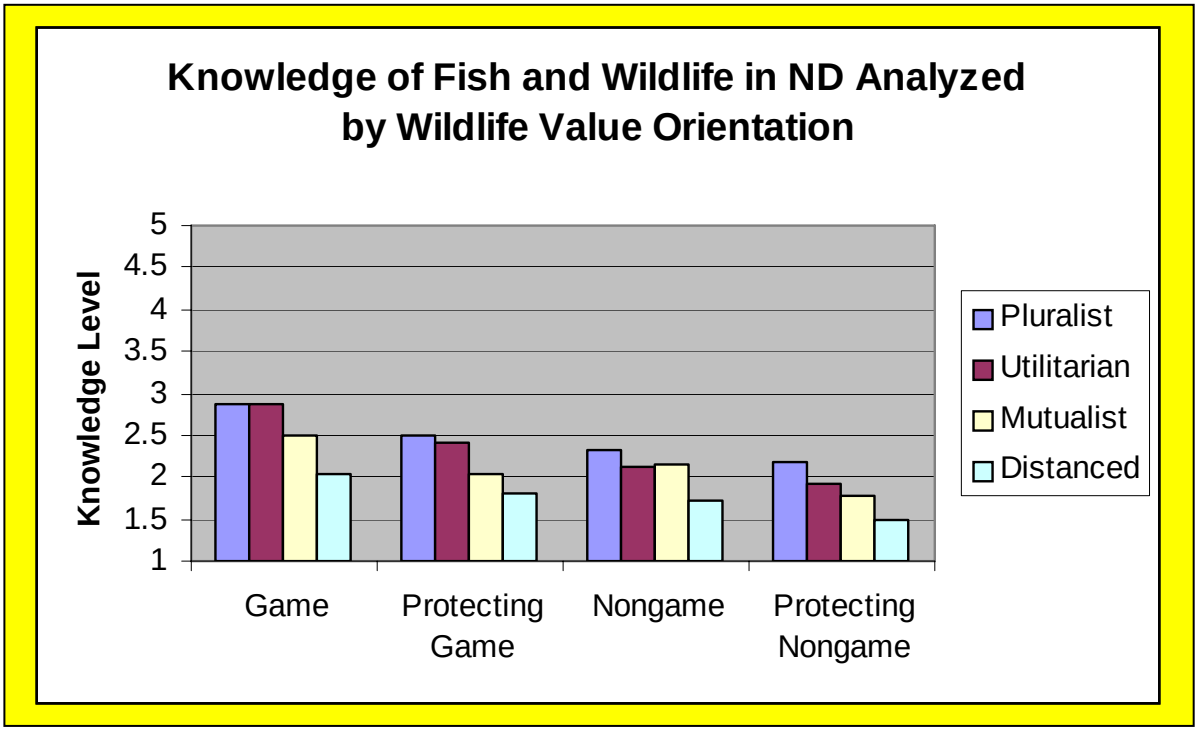



Figure 2.20. Mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife value orientation (*data from Table 2.25*).

Table 2.26. Frequency distribution and mean importance of protecting nongame species and habitats in North Dakota analyzed by wildlife value orientation.

| **Importance of protecting as many types of fish and wildlife as possible.** | | | | |
|---|---|---|---|---|
| **Importance Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Important (1)** | 0.9% | 3.8% | 0.9% | 0.0% |
| **Slightly Important (2)** | 8.5% | 18.4% | 5.5% | 9.1% |
| **Moderately Important (3)** | 17.5% | 33.1% | 23.9% | 36.4% |
| **Quite Important (4)** | 46.9% | 32.2% | 39.4% | 47.3% |
| **Extremely Important (5)** | 26.1% | 12.5% | 30.3% | 7.3% |
| **Total** | 211 | 320 | 109 | 55 |
| Chi-Square: $X^2$=69.04; df=12; $p$<0.001 | | | | |
| **Mean** | 3.89 | 3.31 | 3.93 | 3.50 |
| **95% Confidence Interval** | 3.76 4.01 | 3.20 3.43 | 3.76 4.11 | 3.29 3.71 |
| ANOVA: F=20.40; df=3 / 690; $p$<0.001 | | | | |
| | | | | |
| **Importance of keeping nongame from becoming rare, endangered or extinct.** | | | | |
| **Importance Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Important (1)** | 0.5% | 5.3% | 0.9% | 0.0% |
| **Slightly Important (2)** | 6.6% | 17.9% | 2.8% | 7.3% |
| **Moderately Important (3)** | 17.5% | 30.4% | 15.6% | 36.4% |
| **Quite Important (4)** | 44.3% | 32.0% | 41.3% | 30.9% |
| **Extremely Important (5)** | 31.1% | 14.4% | 39.4% | 25.5% |
| **Total** | 212 | 319 | 109 | 55 |
| Chi-Square: $X^2$=87.95; df=12; $p$<0.001 | | | | |
| **Mean** | 3.99 | 3.33 | 4.16 | 3.74 |
| **95% Confidence Interval** | 3.87 – 4.11 | 3.21 – 3.45 | 4.00 – 4.32 | 3.49 – 3.99 |
| ANOVA: F=29.38; df=3 / 691; $p$<0.001 | | | | |
| | | | | |
| **Importance of maintaining levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals.** | | | | |
| **Importance Level (scale value)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Not at All Important (1)** | 0.0% | 0.9% | 1.8% | 0.0% |
| **Slightly Important (2)** | 1.9% | 7.8% | 3.7% | 5.5% |
| **Moderately Important (3)** | 10.9% | 22.6% | 15.6% | 23.6% |
| **Quite Important (4)** | 38.4% | 41.1% | 35.8% | 47.3% |
| **Extremely Important (5)** | 48.8% | 27.6% | 43.1% | 23.6% |
| **Total** | 211 | 319 | 109 | 55 |
| Chi-Square: $X^2$=45.26 df=12; $p$<0.001 | | | | |
| **Mean** | 4.34 | 3.86 | 4.15 | 3.89 |
| **95% Confidence Interval** | 4.24 – 4.44 | 3.76 – 3.97 | 3.97 – 4.33 | 3.66 – 4.12 |
| ANOVA: F=13.60; df=3 / 689; $p$<0.001 | | | | |

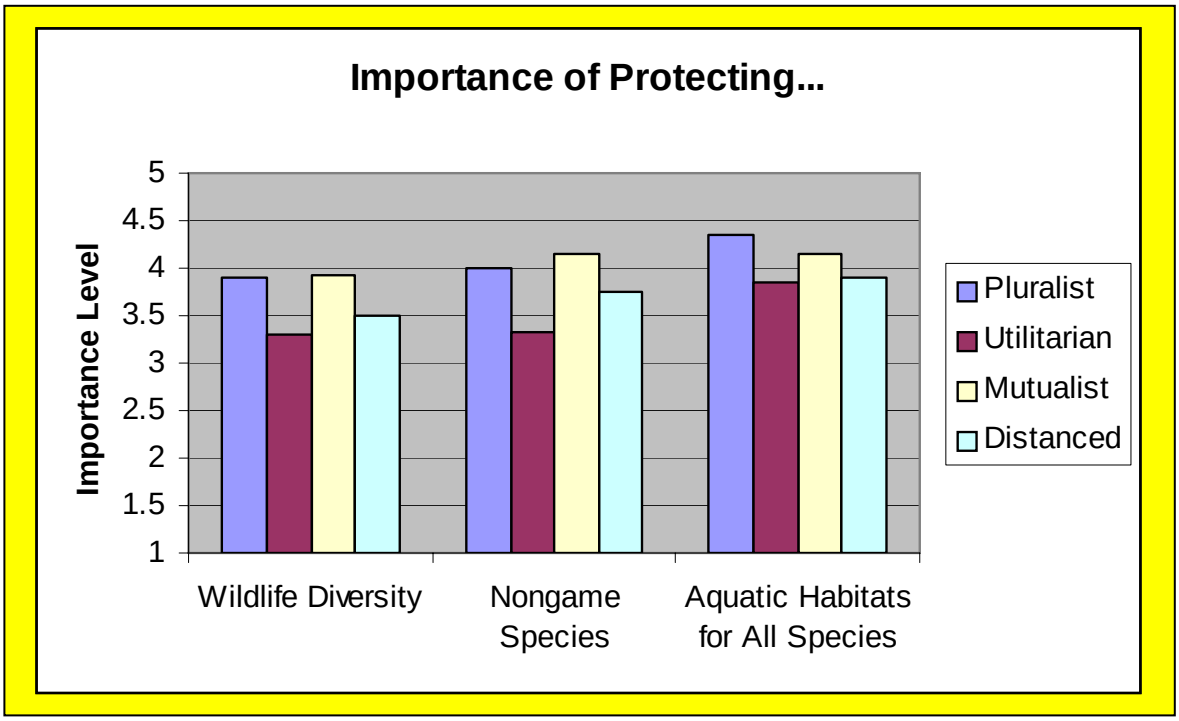



Figure 2.21. Mean importance level attributed by North Dakota residents analyzed by wildlife value orientation (*data from Table 2.26*).

Table 2.27. Average importance (calculated by combining the three responses for protecting wildlife diversity, nongame species and aquatic habitats for all species)[1] analyzed by wildlife value orientation.

| **Average Importance (3.78)** | **Wildlife Value Orientation** | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Mean** | 4.08 | 3.50 | 4.08 | 3.71 |
| **95% C.I.** | 3.99 – 4.17 | 3.41 – 3.59 | 3.94 – 4.22 | 3.51 – 3.91 |
| ANOVA: F=29.69; df=3 / 688; $p<0.001$ | | | | |

[1]See Appendix A for exact wording for these categories.

Table 2.28. Frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management analyzed by wildlife value orientation.

| **The NDG&F efforts to protect nongame fish and wildlife are adequate.** | | | | |
|---|---|---|---|---|
| **Attitude (scale)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Strongly Disagree (-3)** | 0.9% | 1.0% | 0.9% | 0.0% |
| **Moderately Disagree (-2)** | 0.5% | 1.0% | 0.9% | 1.9% |
| **Slightly Disagree (-1)** | 2.3% | 3.2% | 11.0% | 1.9% |
| **Neither (0)** | 28.5% | 42.0% | 47.7% | 59.3% |
| **Slightly Agree (+1)** | 29.4% | 19.2% | 22.9% | 18.5% |
| **Moderately Agree (+2)** | 33.2% | 28.5% | 14.7% | 18.5% |
| **Strongly Agree (+3)** | 5.1% | 5.1% | 1.8% | 0.0% |
| **Total** | 214 | 312 | 109 | 54 |
| Chi-Square: $X^2$=53.19; df=18; $p$<0.001 | | | | |
| **Mean** | 1.07 | 0.84 | 0.42 | 0.49 |
| **95% Confidence Interval** | 0.93 – 1.21 | 0.71 – 0.96 | 0.23 – 0.61 | 0.26 –0.73 |
| ANOVA: F=10.81; df=3 / 684; $p$<0.001 | | | | |
| | | | | |
| **Projects designed to benefit nongame fish and wildlife will benefit game as well.** | | | | |
| **Attitude (scale)** | **Wildlife Value Orientation** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Strongly Disagree (-3)** | 0.0% | 0.3% | 0.9% | 0.0% |
| **Moderately Disagree (-2)** | 1.4% | 1.0% | 0.0% | 0.0% |
| **Slightly Disagree (-1)** | 2.8% | 1.6% | 2.8% | 1.9% |
| **Neither (0)** | 16.0% | 27.2% | 31.2% | 40.7% |
| **Slightly Agree (+1)** | 22.5% | 24.0% | 33.9% | 20.4% |
| **Moderately Agree (+2)** | 38.5% | 32.6% | 20.2% | 35.2% |
| **Strongly Agree (+3)** | 18.8% | 13.4% | 11.0% | 1.9% |
| **Total** | 213 | 313 | 109 | 54 |
| Chi-Square: $X^2$=42.01; df=18; $p$=0.001 | | | | |
| **Mean** | 1.50 | 1.25 | 1.02 | 0.94 |
| **95% Confidence Interval** | 1.35 – 1.66 | 1.12 – 1.37 | 0.81 – 1.23 | 0.68 – 1.21 |
| ANOVA: F=6.38; df=3 / 685; $p$<0.001 | | | | |

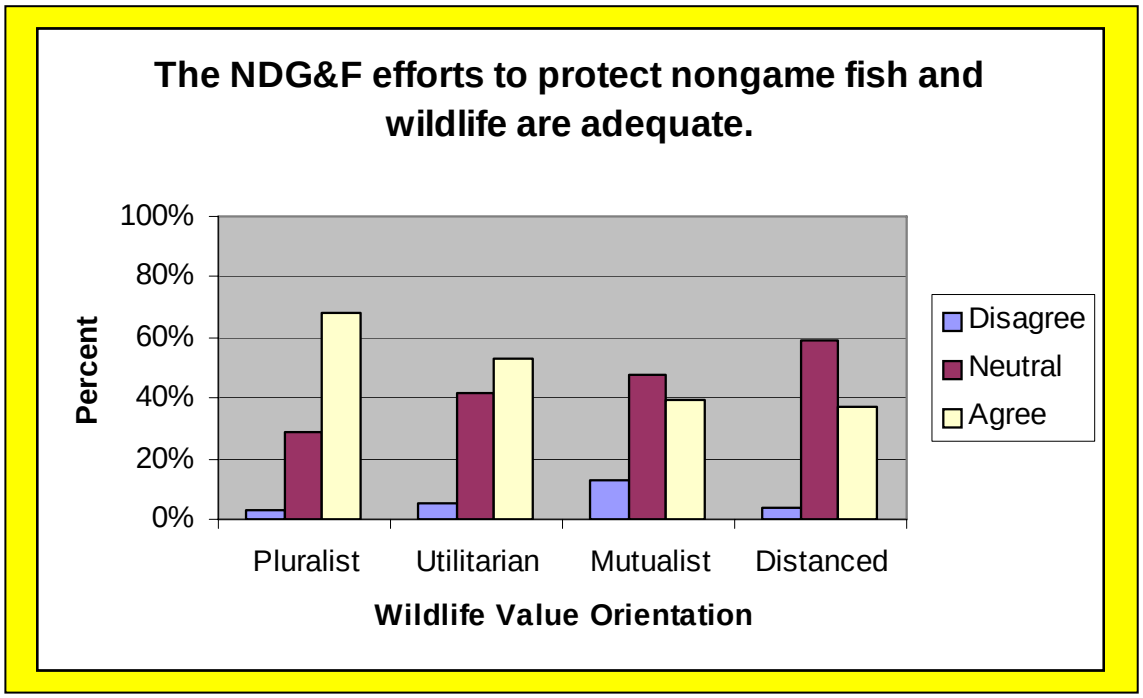



Figure 2.22. Summarized attitude, "*The NDG&F efforts to protect nongame fish and wildlife are adequate,*" analyzed by wildlife value orientation (Chi-square $X^2$=41.30; df=6; $p$<0.001).

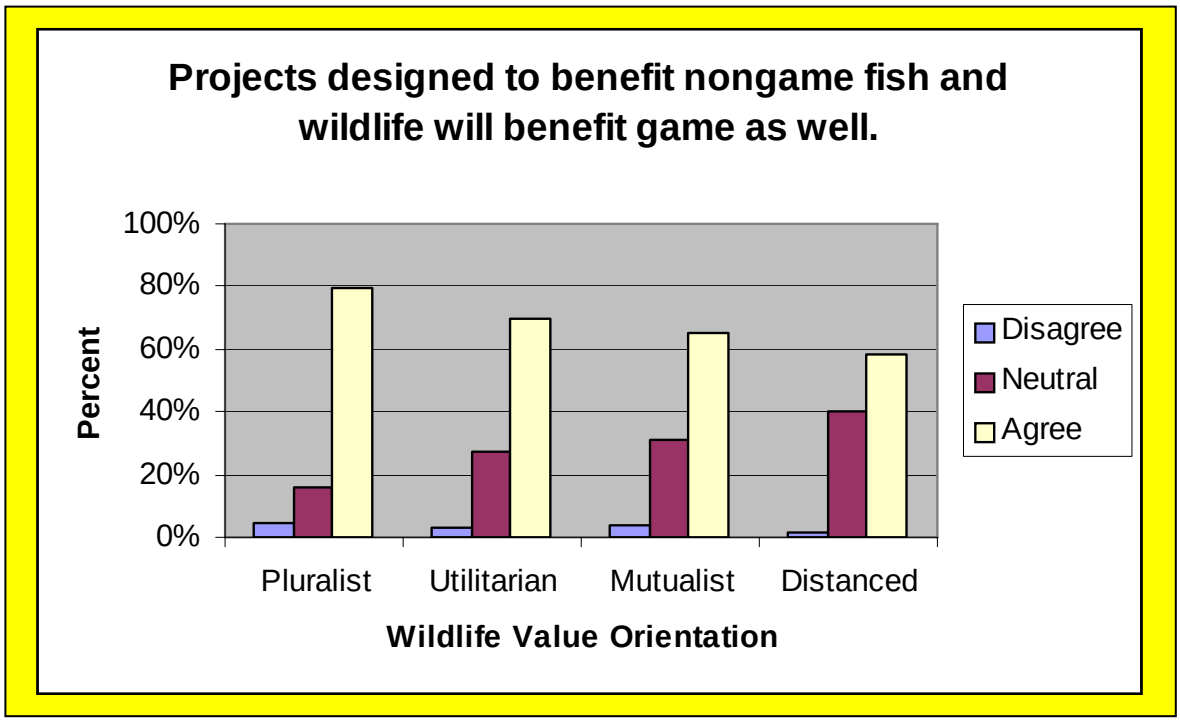



Figure 2.23. Summarized attitude, "*Projects designed to benefit nongame fish and wildlife will benefit game as well*," analyzed by wildlife value orientation (Chi-square $X^2$=18.99; df=6; $p$=0.004).

Table 2.29. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation.

| Sources of State Money to Match Federal Funds for Nongame Programs | Wildlife Value Orientation (Mean / 95% C.I.)[1] | | | | *P*-value |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| …use a portion of revenue presently being collected from taxes | 0.87<br>0.68 – 1.07 | 0.65<br>0.47 – 0.82 | 0.92<br>0.67 – 1.16 | 1.19<br>0.89 – 1.49 | =0.037 |
| …use only money from people who hunt or fish | -0.03<br>-0.30 – 0.25 | -0.04<br>-0.26 – 0.19 | -0.19<br>-0.59 – 0.20 | -0.07<br>-0.54 – 0.41 | =0.902 |
| …use only money from voluntary contributions | -0.44<br>-0.70 – -0.19 | 0.07<br>-0.14 – 0.28 | -0.68<br>-1.03 – -0.33 | -0.59<br>-1.09 – -0.09 | <0.001 |
| …use new taxes or an increase in existing taxes | -0.76<br>-0.97 – -0.55 | -1.37<br>-1.55 – -1.19 | -0.61<br>-0.95 – -0.27 | -0.33<br>-0.78 – 0.11 | <0.001 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -2.19<br>-2.37 – -2.01 | -1.64<br>-1.81 – -1.47 | -2.24<br>-2.49 – -1.98 | -2.02<br>-2.37 – -1.66 | <0.001 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

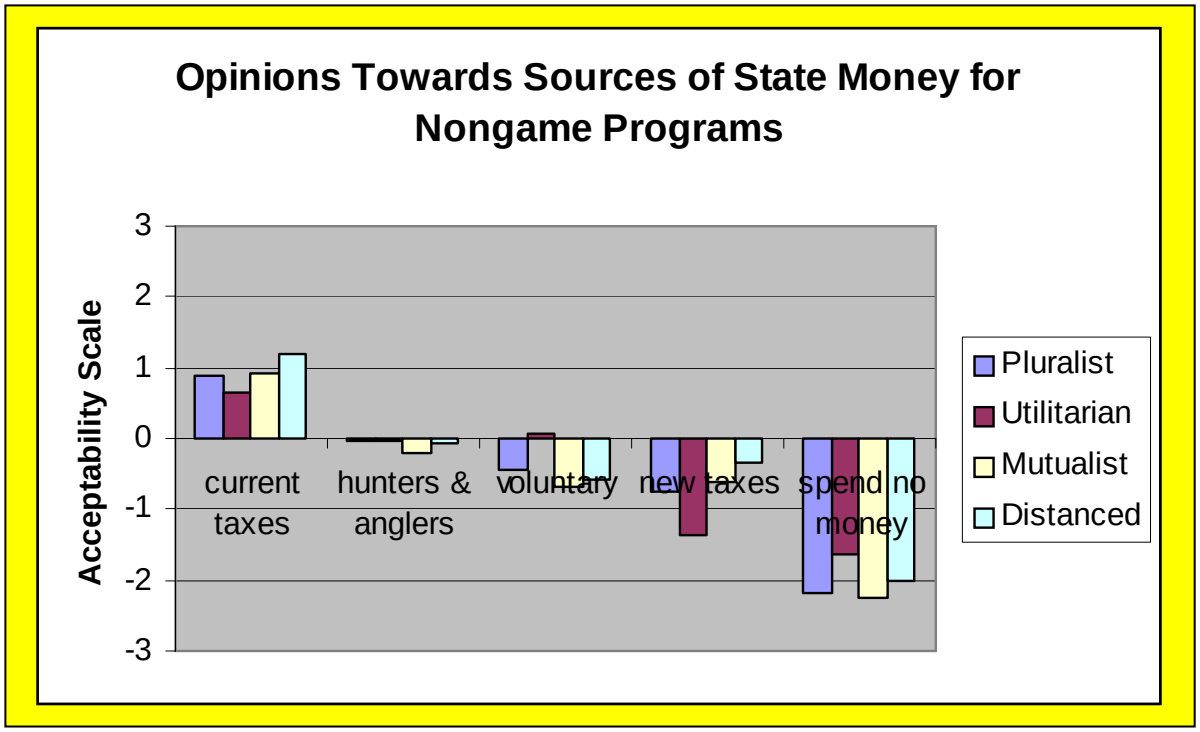



Figure 2.24. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation (*data from Table 2.29*).

Table 2.30-A. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation – **use a portion of revenue presently being collected from taxes.**

| Attitude Response | Wildlife Value Orientation | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **Highly Unacceptable** | 5.2% | 5.4% | 1.9% | 0.0% | 4.3% |
| **Moderately Unacceptable** | 2.8% | 8.6% | 2.8% | 0.0% | 5.2% |
| **Slightly Unacceptable** | 9.0% | 10.5% | 13.9% | 9.1% | 10.4% |
| **Neither** | 5.7% | 6.0% | 6.5% | 7.3% | 6.1% |
| **Slightly Acceptable** | 44.3% | 36.5% | 40.7% | 49.1% | 40.6% |
| **Moderately Acceptable** | 25.0% | 27.0% | 28.7% | 23.6% | 26.4% |
| **Highly Acceptable** | 8.0% | 6.0% | 5.6% | 10.9% | 7.0% |
| **Total** | 212 | 315 | 108 | 55 | 690 |
| Chi-Square: $X^2$=26.13; df=18; $p$=0.097 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 17.4% | 24.5% | 17.6% | 9.1% | 20.0% |
| **NEITHER** | 5.6% | 6.1% | 6.5% | 7.3% | 6.1% |
| **ACCEPTABLE** | 77.0% | 69.4% | 75.9% | 83.6% | 73.9% |
| Chi-Square: $X^2$=9.65; df=6; $p$=0.140 | | | | | |

Table 2.30-B. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation – **use only money from people who hunt or fish.**

| Attitude Response | Wildlife Value Orientation | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **Highly Unacceptable** | 16.0% | 15.6% | 14.8% | 5.7% | 14.8% |
| **Moderately Unacceptable** | 14.1% | 14.6% | 18.5% | 13.2% | 15.0% |
| **Slightly Unacceptable** | 16.0% | 16.6% | 18.5% | 30.2% | 17.7% |
| **Neither** | 7.0% | 6.4% | 8.3% | 9.4% | 7.1% |
| **Slightly Acceptable** | 17.4% | 15.6% | 12.0% | 26.4% | 16.4% |
| **Moderately Acceptable** | 16.4% | 19.7% | 13.9% | 0.0% | 16.3% |
| **Highly Acceptable** | 13.1% | 11.5% | 13.9% | 15.1% | 12.6% |
| **Total** | 213 | 314 | 108 | 53 | 688 |
| Chi-Square: $X^2$=27.47; df=18; $p$=0.071 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 45.8% | 47.0% | 51.9% | 50.0% | 47.6% |
| **NEITHER** | 7.1% | 6.3% | 8.3% | 9.3% | 7.1% |
| **ACCEPTABLE** | 47.2% | 46.7% | 39.8% | 40.7% | 45.3% |
| Chi-Square: $X^2$=2.75; df=6; $p$=0.840 | | | | | |

Table 2.30-C. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation – **use only money from voluntary contributions.**

| Attitude Response | Wildlife Value Orientation | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **Highly Unacceptable** | 15.2% | 12.6% | 17.8% | 18.5% | 14.7% |
| **Moderately Unacceptable** | 20.4% | 12.3% | 25.2% | 16.7% | 17.1% |
| **Slightly Unacceptable** | 21.3% | 14.5% | 12.1% | 22.2% | 16.8% |
| **Neither** | 8.5% | 14.8% | 15.9% | 14.8% | 13.1% |
| **Slightly Acceptable** | 14.7% | 19.2% | 15.0% | 11.1% | 16.5% |
| **Moderately Acceptable** | 11.8% | 14.8% | 8.4% | 9.3% | 12.5% |
| **Highly Acceptable** | 8.1% | 11.7% | 5.6% | 7.4% | 9.3% |
| **Total** | 211 | 317 | 107 | 54 | 689 |
| Chi-Square: $X^2$=32.98; df=18; $p$=0.017 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 56.9% | 39.4% | 55.1% | 57.4% | 48.6% |
| **NEITHER** | 8.5% | 14.8% | 15.9% | 14.8% | 13.1% |
| **ACCEPTABLE** | 34.6% | 45.7% | 29.0% | 27.8% | 38.3% |
| Chi-Square: $X^2$=24.43; df=6; $p$<0.001 | | | | | |

Table 2.30-D. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation – **use new taxes or an increase in existing taxes.**

| Attitude Response | Wildlife Value Orientation | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **Highly Unacceptable** | 17.5% | 35.0% | 21.3% | 14.0% | 25.8% |
| **Moderately Unacceptable** | 20.3% | 20.4% | 17.6% | 14.0% | 19.4% |
| **Slightly Unacceptable** | 17.5% | 14.3% | 10.2% | 12.3% | 14.5% |
| **Neither** | 17.5% | 15.0% | 11.1% | 24.6% | 15.9% |
| **Slightly Acceptable** | 22.6% | 10.8% | 30.6% | 21.1% | 18.4% |
| **Moderately Acceptable** | 3.8% | 2.2% | 6.5% | 14.0% | 4.3% |
| **Highly Acceptable** | 0.9% | 2.2% | 2.8% | 0.0% | 1.7% |
| **Total** | 212 | 314 | 108 | 57 | 691 |
| Chi-Square: $X^2$=69.41; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 55.2% | 69.5% | 49.5% | 40.0% | 59.6% |
| **NEITHER** | 17.5% | 14.9% | 11.0% | 25.5% | 15.9% |
| **ACCEPTABLE** | 27.4% | 15.6% | 39.4% | 34.5% | 24.5% |
| Chi-Square: $X^2$=39.83; df=6; $p$<0.001 | | | | | |

Table 2.30-E. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife value orientation – **spend no money to keep nongame from becoming rare, endangered or extinct.**

| Attitude Response | Wildlife Value Orientation | | | | Total |
|---|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced | |
| **Highly Unacceptable** | 63.8% | 40.2% | 63.3% | 55.6% | 52.2% |
| **Moderately Unacceptable** | 14.8% | 21.2% | 18.3% | 13.0% | 18.1% |
| **Slightly Unacceptable** | 9.0% | 19.3% | 6.4% | 18.5% | 14.1% |
| **Neither** | 7.1% | 9.8% | 7.3% | 7.4% | 8.4% |
| **Slightly Acceptable** | 2.4% | 3.2% | 0.9% | 3.7% | 2.6% |
| **Moderately Acceptable** | 2.4% | 3.5% | 0.9% | 1.9% | 2.6% |
| **Highly Acceptable** | 0.5% | 2.8% | 2.8% | 0.0% | 1.9% |
| **Total** | 210 | 316 | 109 | 54 | 689 |
| Chi-Square: $X^2$=46.48; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 87.2% | 80.7% | 88.1% | 87.3% | 84.4% |
| **NEITHER** | 7.1% | 9.8% | 7.3% | 7.3% | 8.4% |
| **ACCEPTABLE** | 5.7% | 9.5% | 4.6% | 5.5% | 7.2% |
| Chi-Square: $X^2$=6.56; df=6; $p$=0.364 | | | | | |

Table 2.31. Most preferred source of state money to match federal funds for nongame programs analyzed by wildlife value orientation.

| Sources of State Money to Match Federal Funds for Nongame Programs | Wildlife Value Orientation | | | |
|---|---|---|---|---|
| | Pluralist | Utilitarian | Mutualist | Distanced |
| …use a portion of revenue presently being collected from taxes | 63.9% | 49.6% | 52.9% | 76.9% |
| …use only money from people who hunt or fish | 18.7% | 26.4% | 26.4% | 15.4% |
| …use only money from voluntary contributions | 10.3% | 15.4% | 8.0% | 5.1% |
| …use new taxes or an increase in existing taxes | 5.2% | 4.5% | 11.5% | 2.6% |
| …spend no money to keep nongame from becoming rare, endangered or extinct | 1.9% | 4.1% | 1.1% | 0.0% |
| Total Number | 155 | 246 | 87 | 39 |
| Chi-Square: $X^2$=26.45; df=12; $p$=0.009 | | | | |

# Part 2 – Attitudes Related to Protecting All Types of Fish and Wildlife in North Dakota

**Section C: Analysis by Wildlife Diversity Importance Groups** (… is described on page 43 and in Table 2.10)

**Self-Reported Knowledge of Fish and Wildlife in North Dakota.** The wildlife diversity importance groups form a continuum from people that place a low importance on protecting nongame to people that place a high value on protecting nongame (Table 2.10 and Table 2.32). Self-reported knowledge about game, nongame and about NDG&F efforts to protect game and nongame increased along the continuum from the low wildlife diversity importance group to the high wildlife diversity importance group (Table 2.33 and Figure 2.25). In other words, increased knowledge and increased importance for protecting nongame were strongly related.

**Evaluation of Efforts to Protect Nongame.** Agreement with the statement that NDG&F efforts to protect nongame are adequate and the statement that projects designed to benefit nongame also benefit game increased along the continuum from the low wildlife diversity importance group to the high wildlife diversity importance group (Table 2.34 and Figures 2.26 and 2.27). The increase in agreement was mainly due to a decrease in the neither (no opinion) category rather than a decrease in disagreement with the statements. This would indicate, as found above, increasing knowledge along the continuum rather than a real shift in attitude.

**Sources of State Money for Nongame Programs.** There were very significant differences along the continuum from low to high wildlife diversity importance groups in acceptability of sources of state money to match federal funds for nongame programs (Tables 2.35 and 2.36 and Figure 2.28). The low wildlife diversity importance group found using only money from hunters and anglers and only using voluntary contributions as acceptable, while the medium groups found these sources unacceptable and the high wildlife diversity importance group considered these sources very unacceptable. The low group was somewhat neutral towards using current taxes while at the other end the high group was very positive towards this source of money for funding nongame programs. While all groups considered new or increased taxes as unacceptable, the level of unacceptability decreased along the continuum from low to high wildlife diversity

importance groups. Also, the unacceptability of **not** spending any money to keep nongame from becoming rare, endangered or extinct increased greatly along the continuum from low to high wildlife diversity importance groups.

The low wildlife diversity importance group had the highest percent of the four groups selecting "use only money from people who hunt or fish" (38%) for their most preferred funding option and also had a relatively high percent selecting "spend no money to keep nongame from becoming rare, endangered or extinct" (11%) (Table 2.37). The high wildlife diversity importance group had the highest preference for using taxes (current taxes - 67%; new taxes 12%) to match federal funds for nongame programs compared to the other wildlife diversity importance groups.

Table 2.32. Average importance (calculated by combining the three responses for protecting wildlife diversity, nongame species and aquatic habitats for all species)[1] analyzed by wildlife diversity importance groups.

| **Average Importance (3.78)** | **Wildlife Diversity Importance Groups** | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Mean** | 2.33 | 3.37 | 4.22 | 5.00 |
| **95% C.I.** | 2.24 – 2.42 | 3.33 – 3.40 | 4.19 – 4.25 | 5.00 |
| **Number (N=694)** | 93 | 227 | 289 | 85 |
| **Percent** | 13.4% | 32.7% | 41.6% | 12.3% |
| ANOVA: F=4.13; df=2 / 672; *p*=0.016 | | | | |

[1]See Appendix A for exact wording for these categories.

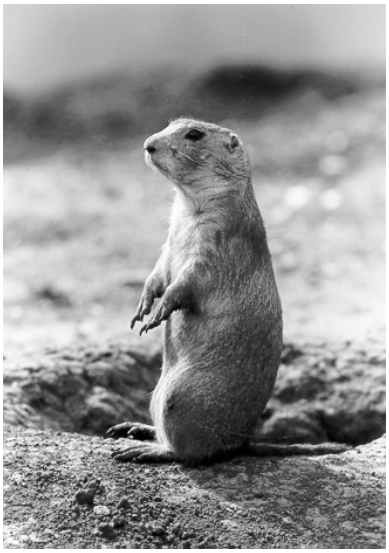


Table 2.33. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife diversity importance groups.

| **Knowledge about Game** | | | | |
|---|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Not at All Knowledgeable (1)** | 22.0% | 12.4% | 9.7% | 8.4% |
| **Slightly Knowledgeable (2)** | 38.5% | 36.9% | 26.3% | 21.7% |
| **Moderately Knowledgeable (3)** | 27.5% | 29.8% | 36.0% | 26.5% |
| **Quite Knowledgeable (4)** | 9.9% | 18.7% | 22.5% | 32.5% |
| **Extremely Knowledgeable (5)** | 2.2% | 2.2% | 5.5% | 10.8% |
| **Total** | 91 | 225 | 289 | 83 |
| Chi-Square: $X^2$=44.39; df=12; $p$<0.001 | | | | |
| **Mean** | 2.32 | 2.61 | 2.87 | 3.15 |
| **95% Confidence Interval** | 2.11 – 2.53 | 2.48 – 2.74 | 2.75 – 2.99 | 2.90 – 3.40 |
| ANOVA: F=12.19; df=3 / 686; $p$<0.001 | | | | |
| | | | | |
| **Knowledge about NDG&F Efforts to Protect Game** | | | | |
| **Knowledge Level (scale value)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Not at All Knowledgeable (1)** | 44.0% | 23.6% | 22.6% | 23.8% |
| **Slightly Knowledgeable (2)** | 33.0% | 39.6% | 29.2% | 26.2% |
| **Moderately Knowledgeable (3)** | 18.7% | 24.4% | 31.3% | 19.0% |
| **Quite Knowledgeable (4)** | 3.3% | 10.2% | 16.0% | 25.0% |
| **Extremely Knowledgeable (5)** | 1.1% | 2.2% | 1.0% | 6.0% |
| **Total** | 91 | 225 | 288 | 84 |
| Chi-Square: $X^2$=51.95; df=12; $p$<0.001 | | | | |
| **Mean** | 1.86 | 2.28 | 2.44 | 2.61 |
| **95% Confidence Interval** | 1.67 – 2.06 | 2.15 – 2.41 | 2.32 – 2.56 | 2.34 – 2.88 |
| ANOVA: F=9.31; df=3 / 684; $p$<0.001 | | | | |
| | | | | |

Table continued on next page

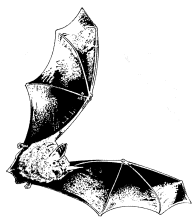
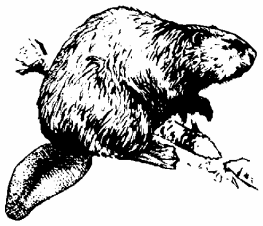


Table 2.33 – Continued. Frequency distribution and mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife diversity importance groups.

| **Knowledge about Nongame** | | | | |
|---|---|---|---|---|
| **Knowledge Level (scale value)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Not at All Knowledgeable (1)** | 48.9% | 29.8% | 28.8% | 12.2% |
| **Slightly Knowledgeable (2)** | 34.8% | 46.2% | 30.9% | 35.4% |
| **Moderately Knowledgeable (3)** | 12.0% | 16.9% | 30.6% | 26.8% |
| **Quite Knowledgeable (4)** | 3.3% | 7.1% | 9.4% | 22.0% |
| **Extremely Knowledgeable (5)** | 1.1% | 0.0% | 0.3% | 3.7% |
| **Total** | 92 | 225 | 288 | 82 |
| Chi-Square: $X^2$=75.12; df=12; $p$<0.001 | | | | |
| **Mean** | 1.71 | 2.01 | 2.22 | 2.69 |
| **95% Confidence Interval** | 1.54 – 1.89 | 1.90 – 2.13 | 2.10 – 2.33 | 2.46 – 2.93 |
| ANOVA: F=18.08; df=3 / 683; $p$<0.001 | | | | |
| | | | | |
| **Knowledge about NDG&F Efforts to Protect Nongame** | | | | |
| **Knowledge Level (scale value)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Not at All Knowledgeable (1)** | 69.2% | 40.0% | 35.5% | 28.2% |
| **Slightly Knowledgeable (2)** | 18.7% | 41.3% | 29.3% | 31.8% |
| **Moderately Knowledgeable (3)** | 12.1% | 13.8% | 27.9% | 21.2% |
| **Quite Knowledgeable (4)** | 0.0% | 4.0% | 7.3% | 16.5% |
| **Extremely Knowledgeable (5)** | 0.0% | 0.9% | 0.0% | 2.4% |
| **Total** | 91 | 225 | 287 | 85 |
| Chi-Square: $X^2$=79.93; df=12; $p$<0.001 | | | | |
| **Mean** | 1.45 | 1.84 | 2.07 | 2.33 |
| **95% Confidence Interval** | 1.30 – 1.60 | 1.73 – 1.95 | 1.96 – 2.18 | 2.09 – 2.57 |
| ANOVA: F=16.45; df=3 / 683; $p$<0.001 | | | | |



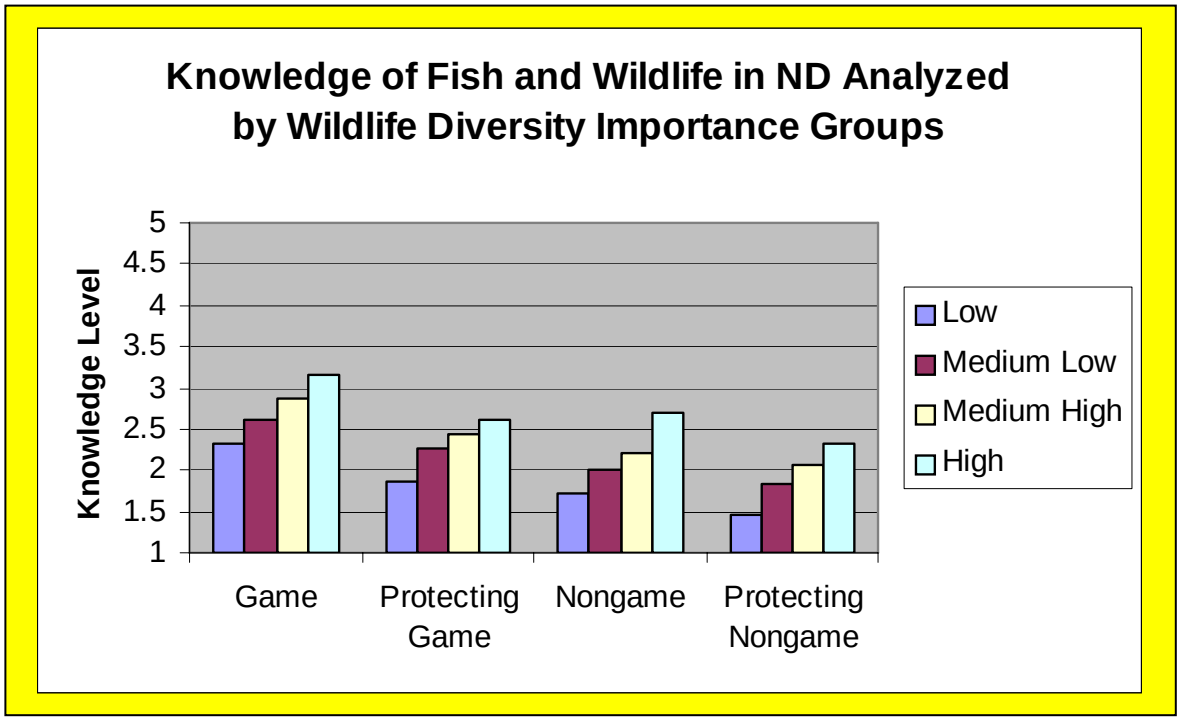
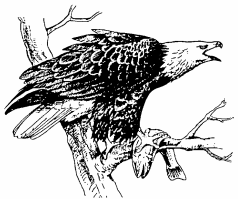



Figure 2.25. Mean knowledge levels about fish and wildlife in North Dakota analyzed by wildlife diversity importance groups (*data from Table 2.33*).

Table 2.34. Frequency distribution and mean attitude for the public's evaluation of NDG&F efforts to protect nongame and belief related to the relationship between benefits associated with nongame and game management analyzed by wildlife diversity importance groups.

| **The NDG&F efforts to protect nongame fish and wildlife are adequate.** | | | | |
|---|---|---|---|---|
| **Attitude (scale)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Strongly Disagree (-3)** | 2.2% | 0.0% | 0.7% | 1.2% |
| **Moderately Disagree (-2)** | 0.0% | 1.3% | 0.7% | 2.4% |
| **Slightly Disagree (-1)** | 2.2% | 4.9% | 4.2% | 3.6% |
| **Neither (0)** | 60.0% | 44.0% | 34.4% | 29.8% |
| **Slightly Agree (+1)** | 16.7% | 29.8% | 21.5% | 14.3% |
| **Moderately Agree (+2)** | 15.6% | 18.7% | 33.3% | 41.7% |
| **Strongly Agree (+3)** | 3.3% | 1.3% | 5.2% | 7.1% |
| **Total** | 90 | 225 | 288 | 84 |
| Chi-Square: $X^2$=60.53; df=18; $p$<0.001 | | | | |
| **Mean** | 0.47 | 0.63 | 0.97 | 1.10 |
| **95% Confidence Interval** | 0.25 – 0.69 | 0.51 – 0.76 | 0.84 – 1.10 | 0.83 – 1.36 |
| ANOVA: F=9.36; df=3 / 683; $p$<0.001 | | | | |

| **Projects designed to benefit nongame fish and wildlife will benefit game as well.** | | | | |
|---|---|---|---|---|
| **Attitude (scale)** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Strongly Disagree (-3)** | 2.2% | 0.0% | 0.0% | 0.0% |
| **Moderately Disagree (-2)** | 0.0% | 1.3% | 1.4% | 0.0% |
| **Slightly Disagree (-1)** | 1.1% | 4.0% | 1.7% | 0.0% |
| **Neither (0)** | 48.9% | 26.5% | 20.0% | 14.5% |
| **Slightly Agree (+1)** | 31.1% | 30.5% | 21.4% | 15.7% |
| **Moderately Agree (+2)** | 15.6% | 30.0% | 38.6% | 36.1% |
| **Strongly Agree (+3)** | 1.1% | 7.6% | 16.9% | 33.7% |
| **Total** | 90 | 223 | 290 | 83 |
| Chi-Square: $X^2$=111.69; df=18; $p$<0.001 | | | | |
| **Mean** | 0.58 | 1.06 | 1.45 | 1.89 |
| **95% Confidence Interval** | 0.37 – 0.78 | 0.91 – 1.20 | 1.32 – 1.58 | 1.66 – 2.11 |
| ANOVA: F=27.08; df=3 / 684; $p$<0.001 | | | | |



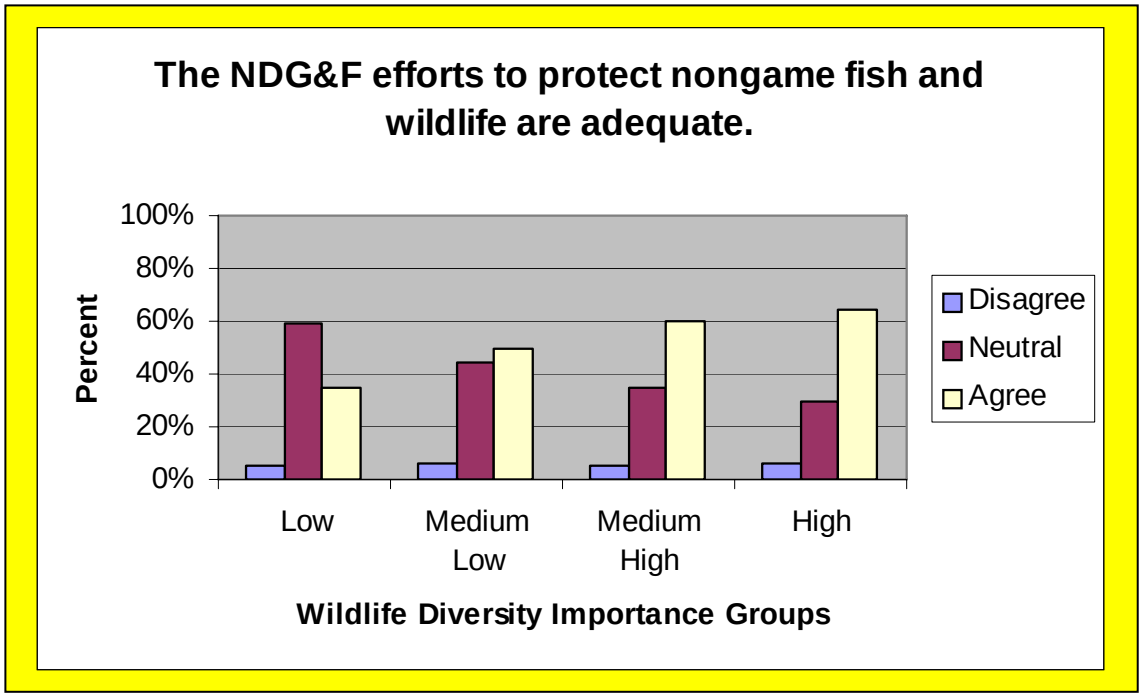



Figure 2.26. Summarized attitude, "*The NDG&F efforts to protect nongame fish and wildlife are adequate*," analyzed by wildlife diversity importance groups (Chi-square $X^2$=24.25; df=6; $p$<0.001).

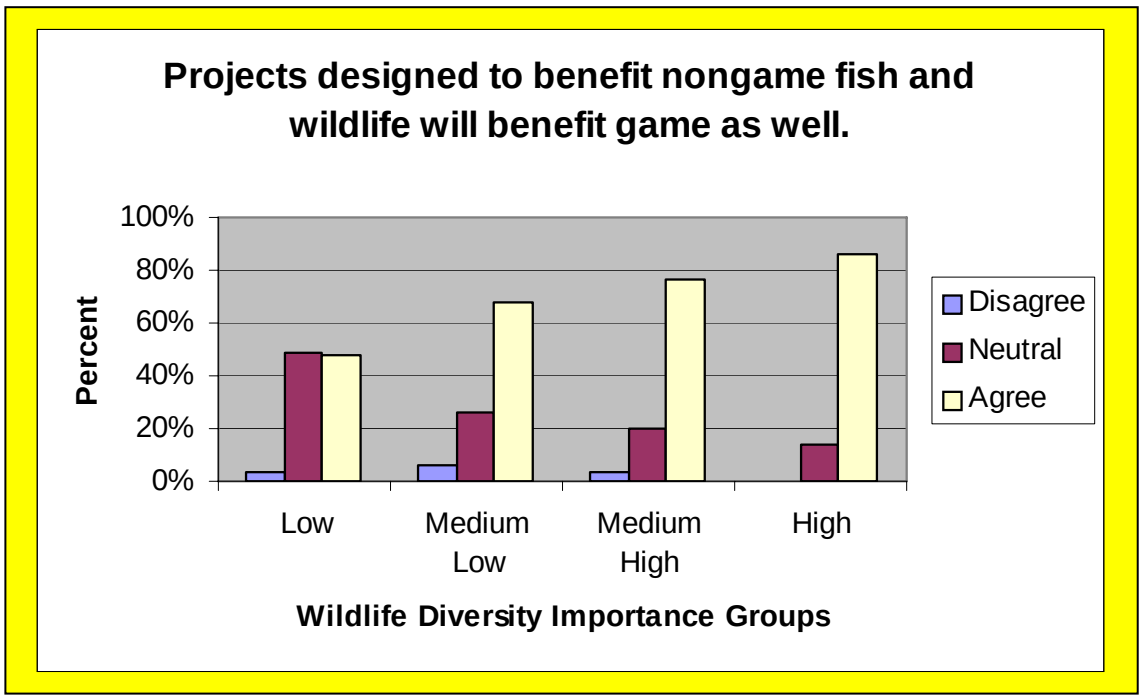



Figure 2.27. Summarized attitude, "*Projects designed to benefit nongame fish and wildlife will benefit game as well*," analyzed by wildlife diversity importance groups (Chi-square $X^2$=44.52; df=6; $p$<0.001).

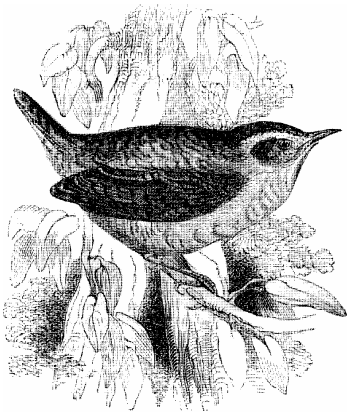


Table 2.35. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups.

| Sources of State Money to Match Federal Funds for Nongame Programs | Wildlife Diversity Importance Groups | | | | *P*-value |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| …use a portion of revenue presently being collected from taxes | -0.07<br>-0.39 – 0.25 | 0.83<br>0.66 – 0.99 | 0.86<br>0.69 – 1.04 | 1.46<br>1.14 – 1.78 | <0.001 |
| …use only money from people who hunt or fish | 0.45<br>0.07 – 0.85 | -0.04<br>-0.29 – 0.21 | -0.20<br>-0.44 – 0.04 | -0.30<br>-0.79 – 0.19 | =0.039 |
| …use only money from voluntary contributions | 0.63<br>0.30 – 0.96 | -0.29<br>-0.52 – -0.06 | -0.35<br>-0.58 – -0.12 | -0.88<br>-1.32 – -0.44 | <0.001 |
| …use new taxes or an increase in existing taxes | -1.61<br>-1.92 – -1.31 | -1.20<br>-1.40 – -1.00 | -0.82<br>-1.00 – -0.62 | -0.36<br>-0.80 – 0.07 | <0.001 |
| …spend no money to keep nongame from becoming rare, endangered or extinct | -0.84<br>-1.13 – -0.55 | -1.73<br>-1.93 – -1.54 | -2.25<br>-2.40 – -2.09 | -2.57<br>-2.81 – -2.34 | <0.001 |

[1]Attitude scale: -3 = highly unacceptable, -2 = moderately unacceptable, -1 = slightly unacceptable, 0 = neither; +1 = slightly acceptable, +2 = moderately acceptable, +3 = highly acceptable

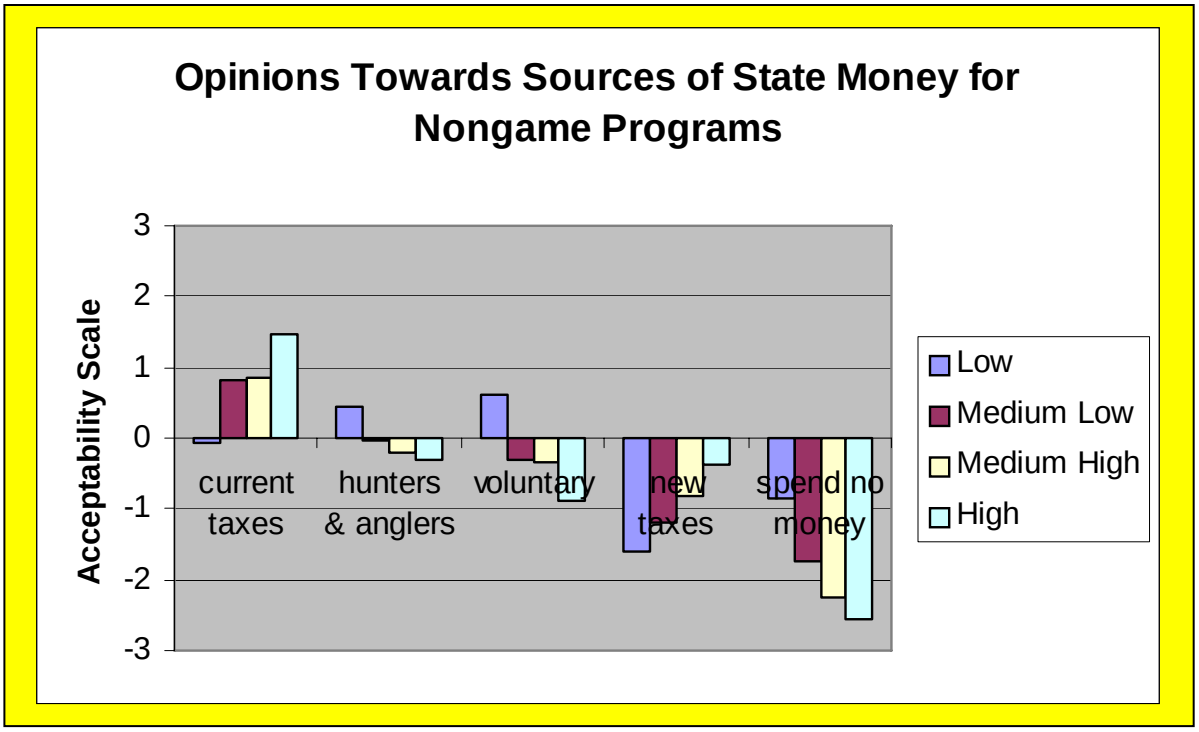



Figure 2.28. Opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups (*data from Table 2.35*).

Table 2.36-A. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups – **use a portion of revenue presently being collected from taxes.**

| Attitude Response | Wildlife Diversity Importance Groups | | | | Total |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| **Highly Unacceptable** | 8.7% | 1.8% | 5.6% | 3.6% | 4.5% |
| **Moderately Unacceptable** | 9.8% | 5.3% | 5.2% | 1.2% | 5.4% |
| **Slightly Unacceptable** | 23.9% | 9.8% | 6.6% | 8.4% | 10.2% |
| **Neither** | 10.9% | 6.2% | 5.6% | 2.4% | 6.1% |
| **Slightly Acceptable** | 32.6% | 48.9% | 40.1% | 27.7% | 40.5% |
| **Moderately Acceptable** | 13.0% | 24.9% | 30.7% | 30.1% | 26.3% |
| **Highly Acceptable** | 1.1% | 3.1% | 6.3% | 26.5% | 7.0% |
| **Total** | 92 | 225 | 287 | 83 | 687 |
| Chi-Square: $X^2$=112.89; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 42.4% | 16.9% | 17.7% | 13.3% | 20.2% |
| **NEITHER** | 10.9% | 6.2% | 5.6% | 2.4% | 6.1% |
| **ACCEPTABLE** | 46.7% | 76.9% | 76.7% | 84.3% | 73.7% |
| Chi-Square: $X^2$=42.96; df=6; $p$<0.001 | | | | | |

Table 2.36-B. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups – **use only money from people who hunt or fish.**

| Attitude Response | Wildlife Diversity Importance Groups | | | | Total |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| **Highly Unacceptable** | 5.4% | 10.3% | 18.2% | 27.9% | 15.1% |
| **Moderately Unacceptable** | 14.1% | 17.0% | 15.4% | 10.5% | 15.1% |
| **Slightly Unacceptable** | 16.3% | 20.6% | 17.1% | 12.8% | 17.6% |
| **Neither** | 4.3% | 7.6% | 6.6% | 8.1% | 6.8% |
| **Slightly Acceptable** | 28.3% | 17.9% | 13.6% | 10.5% | 16.6% |
| **Moderately Acceptable** | 18.5% | 15.2% | 17.1% | 14.0% | 16.3% |
| **Highly Acceptable** | 13.0% | 11.2% | 11.9% | 16.3% | 12.4% |
| **Total** | 92 | 223 | 286 | 86 | 687 |
| Chi-Square: $X^2$=39.15; df=18; $p$=0.003 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 35.9% | 48.0% | 50.9% | 51.2% | 48.0% |
| **NEITHER** | 4.3% | 7.6% | 6.6% | 8.1% | 6.8% |
| **ACCEPTABLE** | 59.8% | 44.4% | 42.5% | 40.7% | 45.2% |
| Chi-Square: $X^2$=9.97; df=6; $p$=0.126 | | | | | |

Table 2.36-C. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups – **use only money from voluntary contributions.**

| Attitude Response | Wildlife Diversity Importance Groups | | | | Total |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| **Highly Unacceptable** | 4.3% | 10.7% | 16.7% | 31.3% | 14.8% |
| **Moderately Unacceptable** | 6.5% | 18.2% | 19.4% | 18.1% | 17.1% |
| **Slightly Unacceptable** | 14.0% | 22.7% | 14.9% | 12.0% | 17.0% |
| **Neither** | 18.3% | 12.4% | 13.2% | 8.4% | 13.1% |
| **Slightly Acceptable** | 26.9% | 18.2% | 11.8% | 14.5% | 16.3% |
| **Moderately Acceptable** | 16.1% | 10.2% | 14.6% | 8.4% | 12.6% |
| **Highly Acceptable** | 14.0% | 7.6% | 9.4% | 7.2% | 9.1% |
| **Total** | 93 | 225 | 288 | 83 | 689 |
| Chi-Square: $X^2$=60.83; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 24.5% | 51.3% | 51.0% | 61.4% | 48.8% |
| **NEITHER** | 18.1% | 12.5% | 13.2% | 8.4% | 13.1% |
| **ACCEPTABLE** | 57.4% | 36.2% | 35.8% | 30.1% | 38.2% |
| Chi-Square: $X^2$=29.20; df=6; $p$<0.001 | | | | | |

Table 2.36-D. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups – **use new taxes or an increase in existing taxes.**

| Attitude Response | Wildlife Diversity Importance Groups | | | | Total |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| **Highly Unacceptable** | 39.4% | 27.6% | 21.1% | 21.4% | 25.7% |
| **Moderately Unacceptable** | 21.3% | 22.2% | 18.2% | 15.5% | 19.6% |
| **Slightly Unacceptable** | 11.7% | 14.7% | 17.2% | 9.5% | 14.7% |
| **Neither** | 19.1% | 16.0% | 16.1% | 9.5% | 15.7% |
| **Slightly Acceptable** | 6.4% | 17.8% | 20.7% | 23.8% | 18.2% |
| **Moderately Acceptable** | 1.1% | 1.3% | 5.3% | 13.1% | 4.4% |
| **Highly Acceptable** | 1.1% | 0.4% | 1.4% | 7.1% | 1.7% |
| **Total** | 94 | 225 | 285 | 84 | 688 |
| Chi-Square: $X^2$=66.78; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 72.3% | 64.4% | 56.5% | 47.0% | 60.1% |
| **NEITHER** | 19.1% | 16.0% | 16.1% | 9.6% | 15.7% |
| **ACCEPTABLE** | 8.5% | 19.6% | 27.4% | 43.4% | 24.2% |
| Chi-Square: $X^2$=34.14; df=6; $p$<0.001 | | | | | |

Table 2.36-E. Frequency distribution of opinions towards sources of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups – **spend no money to keep nongame from becoming rare, endangered or extinct.**

| Attitude Response | Wildlife Diversity Importance Groups | | | | Total |
|---|---|---|---|---|---|
| | Low | Medium Low | Medium High | High | |
| **Highly Unacceptable** | 14.0% | 40.8% | 64.7% | 83.3% | 52.4% |
| **Moderately Unacceptable** | 14.0% | 25.6% | 18.3% | 2.4% | 18.1% |
| **Slightly Unacceptable** | 37.6% | 16.6% | 7.3% | 6.0% | 14.2% |
| **Neither** | 22.6% | 9.0% | 3.8% | 4.8% | 8.1% |
| **Slightly Acceptable** | 3.2% | 3.6% | 1.7% | 2.4% | 2.6% |
| **Moderately Acceptable** | 6.5% | 2.7% | 1.7% | 0.0% | 2.5% |
| **Highly Acceptable** | 2.2% | 1.8% | 2.4% | 1.2% | 2.0% |
| **Total** | 93 | 223 | 289 | 84 | 689 |
| Chi-Square: $X^2$=168.41; df=18; $p$<0.001 | | | | | |
| **SUMMARIZED RESULTS** | | | | | |
| **UNACCEPTABLE** | 65.6% | 82.6% | 90.3% | 92.8% | 84.7% |
| **NEITHER** | 22.6% | 8.9% | 3.8% | 4.8% | 8.1% |
| **ACCEPTABLE** | 11.8% | 8.5% | 5.9% | 2.4% | 7.1% |
| Chi-Square: $X^2$=44.21; df=6; $p$<0.001 | | | | | |

Table 2.37. Most preferred source of state money to match federal funds for nongame programs analyzed by wildlife diversity importance groups.

| Sources of State Money to Match Federal Funds for Nongame Programs | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | Low | Medium Low | Medium High | High |
| …use a portion of revenue presently being collected from taxes | 31.0% | 53.8% | 64.6% | 66.7% |
| …use only money from people who hunt or fish | 38.0% | 25.5% | 18.9% | 14.0% |
| …use only money from voluntary contributions | 15.5% | 14.7% | 9.9% | 7.0% |
| …use new taxes or an increase in existing taxes | 4.2% | 5.4% | 4.7% | 12.3% |
| …spend no money to keep nongame from becoming rare, endangered or extinct | 11.3% | 0.5% | 1.9% | 0.0% |
| Total Number | 71 | 184 | 212 | 57 |
| Chi-Square: $X^2$=58.16; df=12; $p$<0.001 | | | | |

## Part 3 – Opinions, Attitudes and Behaviors Related to CWD in ND

**Opinions Related to Information Available about CWD.** Significantly more active hunters felt that they had enough information about what states have deer with CWD and what type(s) of wildlife species have CWD compared with non-hunters and inactive hunters (Tables 3.1-A and 3.1-B and Figures 3.1-A and 3.1-B). Even so, about one-third of the active hunters felt that they did not have enough information about these two topics related to CWD.

Compared to non-hunters and inactive hunters, more active hunters felt that they had enough information about what causes CWD in wildlife, possible livestock health and human safety risks associated with CWD, precautions that hunters should take because of CWD and what NDG&F is doing about CWD in North Dakota (Tables 3.1-C – 3.1-G and Figures 3.1-C – 3.1-G). Even so, between 42% and 52% of the active hunters felt that they did not have enough information about these five topics related to CWD.

**Opinions, Attitudes and Behaviors Related to CWD.** Only about 10% to 13% of the non-hunters and inactive hunters, respectively, felt that the threat of CWD has been exaggerated compared to about 24% of the active hunters (Table 3.2-A and Figure 3.2-A). About 17% of the non-hunters and 25% of the hunters (inactive and active) agreed with the statement that CWD poses a risk to deer, but not to humans (around half of each of these three groups disagreed with this statement) (Table 3.2-B and Figure 3.2-B).

About half of the non-hunters and hunters (inactive and active) agreed with the statement that CWD may pose a risk to humans, but not enough is currently known to be sure (about 23% disagreed) (Table 3.2-C and Figure 3.2-C). Also, about half of the non-hunters and hunters (inactive and active) believe that CWD may cause disease in humans if they eat meat from animals infected with CWD (about 10% to 23% disagreed) (Table 3.2-D and Figure 3.2-D).

Active hunters had a very significantly different response than non-hunters and inactive hunters to the two questions related to concern about eating deer meat because of CWD (Tables 3.2-E and 3.2-F and Figures 3.2-E and 3.2-F). Active hunters were far less concerned about eating deer meat because of CWD compared to non-hunters and inactive

hunters. However, about one-third of the active hunters were concerned about eating deer meat because of CWD.

**Trust in NDG&F Related to CWD Issues.** Most (ranging from 75% to 89%) of the non-hunters and hunters (inactive and active) alike trusted the NDG&F to provide the following information regarding CWD issues: the best available information; enough information to make personal decisions about actions to take; truthful information about human safety; timely information; and to make good deer management decisions regarding CWD issues and overall to properly address CWD in North Dakota (Tables 3.3-A – 3.3-F and Figures 3.3-A – 3.3-F).

**Parallel CWD Study of North Dakota Deer Hunters.** After the 2003 season North Dakota deer hunters were asked similar questions on CWD information availability (see study below). Results for active hunters in Tables 3.1-A – 3.1-G from this study compare favorably.

Needham, M. D., Vaske, J. J., & Manfredo, M. J. (2005). *Hunters' responses to chronic wasting disease: Regional and state-specific results* (Project Rep. No. 56). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins: Colorado State University, Human Dimensions in Natural Resources Unit.

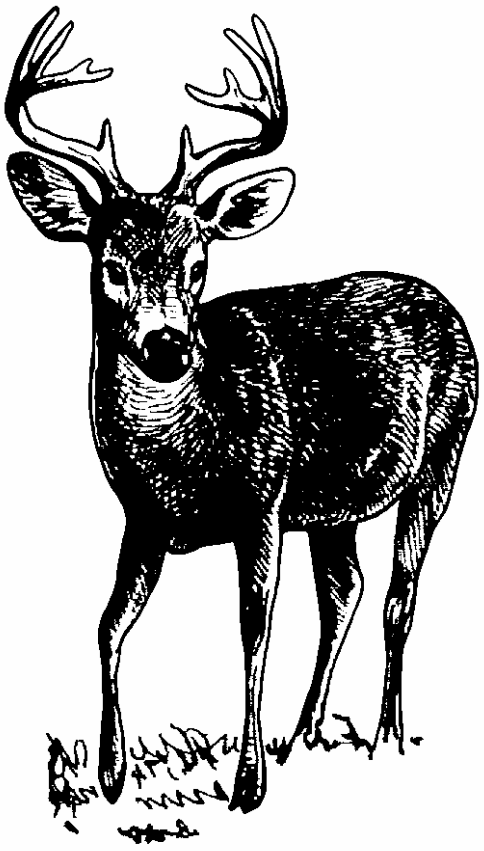


Table 3.1-A. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **what states have deer with CWD?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 27.7% | 24.3% | 9.6% | 22.9% |
| **Moderately Disagree (-2)** | 16.1% | 13.7% | 11.1% | 14.3% |
| **Slightly Disagree (-1)** | 14.8% | 12.4% | 14.8% | 14.0% |
| **Neither (0)** | 12.5% | 15.0% | 6.7% | 12.2% |
| **Slightly Agree (+1)** | 16.4% | 18.1% | 22.2% | 18.2% |
| **Moderately Agree (+2)** | 9.6% | 12.4% | 25.9% | 13.8% |
| **Strongly Agree (+3)** | 2.9% | 4.0% | 9.6% | 4.6% |
| **Total Number** | 311 | 226 | 135 | 672 |
| Chi-Square: $X^2$=50.74; df=12; $p$<0.001 | | | | |
| **Mean** | -0.85 | -0.57 | 0.39 | -0.51 |
| **95% C.I.** | -1.05 – -0.64 | -0.82 – -0.33 | 0.07 – 0.70 | -0.65 – -0.36 |
| ANOVA: F=20.91; df=2 / 670; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 58.5% | 50.4% | 34.8% | 51.0% |
| **NEITHER** | 12.5% | 15.0% | 6.7% | 12.2% |
| **AGREE** | 28.9% | 34.5% | 58.5%* | 36.8% |
| Chi-Square: $X^2$=38.18; df=4; $p$<0.001 | | | | |

*CWD study reports 57%

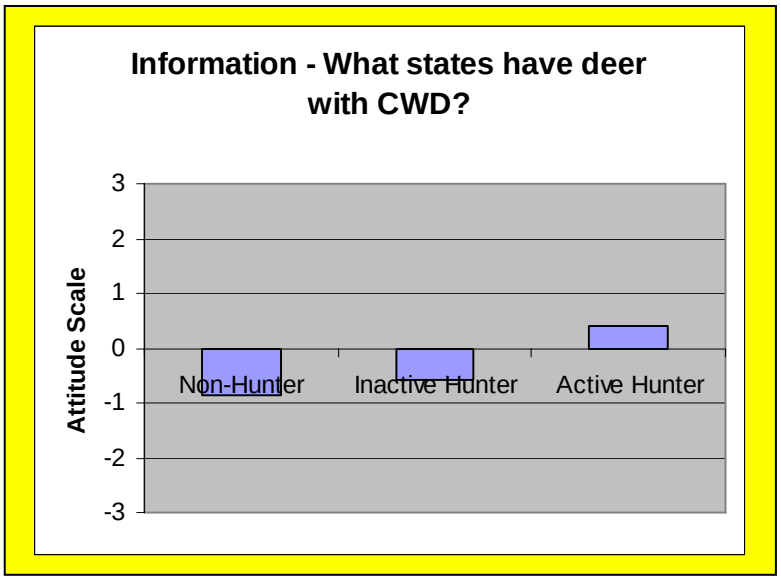



Figure 3.1-A. Mean attitude analyzed by hunting participation - I feel that I had enough information about **what states have deer with CWD.**

Table 3.1-B. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **what type(s) of wildlife species have CWD?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 28.3% | 18.1% | 11.1% | 21.4% |
| **Moderately Disagree (-2)** | 13.7% | 14.2% | 9.6% | 13.0% |
| **Slightly Disagree (-1)** | 13.7% | 16.8% | 15.6% | 15.1% |
| **Neither (0)** | 14.0% | 11.9% | 5.2% | 11.5% |
| **Slightly Agree (+1)** | 17.3% | 19.9% | 25.9% | 19.9% |
| **Moderately Agree (+2)** | 10.7% | 14.2% | 23.7% | 14.5% |
| **Strongly Agree (+3)** | 2.3% | 4.9% | 8.9% | 4.5% |
| **Total Number** | 307 | 226 | 135 | 668 |
| Chi-Square: $X^2$=47.10; df=12; $p$<0.001 | | | | |
| **Mean** | -0.81 | -0.37 | 0.31 | -0.43 |
| **95% C.I.** | -1.01 – -0.60 | -0.61 – -0.12 | 0.00 – 0.63 | -0.57 – -0.29 |
| ANOVA: F=17.29; df=2 / 665; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 55.7% | 49.1% | 36.3% | 49.6% |
| **NEITHER** | 14.0% | 11.9% | 5.2% | 11.5% |
| **AGREE** | 30.3% | 38.9% | 58.5%* | 38.9% |
| Chi-Square: $X^2$=32.71; df=4; $p$<0.001 | | | | |

*CWD study reports 56%

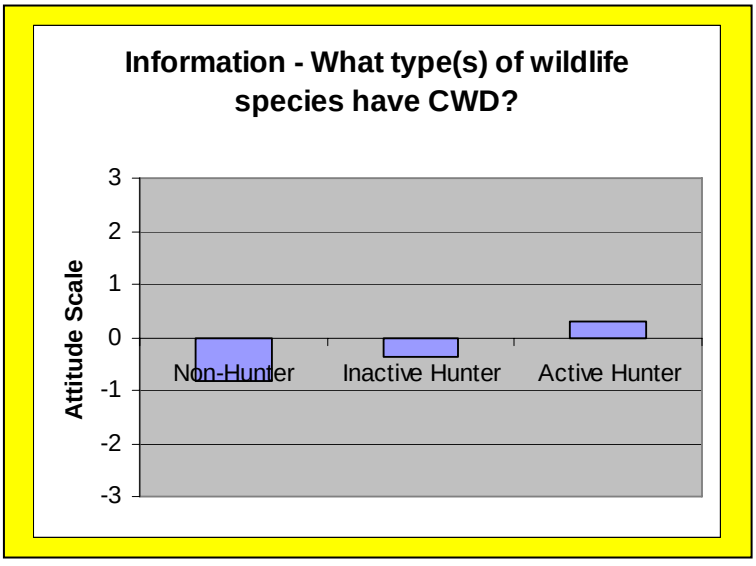



Figure 3.1-B. Mean attitude analyzed by hunting participation - I feel that I had enough information about **what type(s) of wildlife species have CWD.**

Table 3.1-C. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **what causes CWD in wildlife?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 30.9% | 28.0% | 14.1% | 26.5% |
| **Moderately Disagree (-2)** | 13.0% | 12.4% | 14.8% | 13.2% |
| **Slightly Disagree (-1)** | 17.9% | 19.1% | 23.7% | 19.5% |
| **Neither (0)** | 15.6% | 16.4% | 11.1% | 15.0% |
| **Slightly Agree (+1)** | 13.0% | 13.8% | 16.3% | 13.9% |
| **Moderately Agree (+2)** | 7.5% | 3.6% | 15.6% | 7.8% |
| **Strongly Agree (+3)** | 2.0% | 6.7% | 4.4% | 4.0% |
| **Total Number** | 307 | 225 | 135 | 667 |
| Chi-Square: $X^2$=37.66; df=12; $p$<0.001 | | | | |
| **Mean** | -1.04 | -0.89 | -0.34 | -0.84 |
| **95% C.I.** | -1.23 – -0.84 | -1.13 – -0.65 | -0.64 – -0.03 | -0.98 – -0.71 |
| ANOVA: F=7.36; df=2 / 663; $p$=0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 61.9% | 59.8% | 52.2% | 59.2% |
| **NEITHER** | 15.6% | 16.5% | 11.0% | 15.0% |
| **AGREE** | 22.5% | 23.7% | 36.8%* | 25.8% |
| Chi-Square: $X^2$=11.42; df=4; $p$=0.022 | | | | |

*CWD study reports 37%

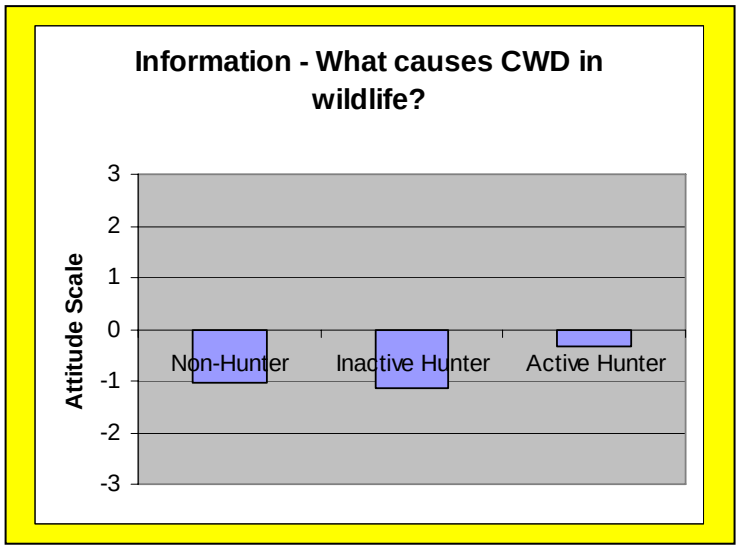



Figure 3.1-C. Mean attitude analyzed by hunting participation - I feel that I had enough information about **what causes CWD in wildlife.**

Table 3.1-D. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **possible livestock health risks associated with CWD?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 30.5% | 25.4% | 12.5% | 25.1% |
| **Moderately Disagree (-2)** | 17.4% | 16.5% | 15.4% | 16.7% |
| **Slightly Disagree (-1)** | 17.7% | 16.1% | 20.6% | 17.7% |
| **Neither (0)** | 12.5% | 10.3% | 8.8% | 11.0% |
| **Slightly Agree (+1)** | 12.1% | 18.3% | 22.1% | 16.2% |
| **Moderately Agree (+2)** | 6.9% | 8.5% | 14.0% | 8.9% |
| **Strongly Agree (+3)** | 3.0% | 4.9% | 6.6% | 4.4% |
| **Total Number** | 305 | 224 | 136 | 665 |
| Chi-Square: $X^2$=29.73; df=12; $p$=0.003 | | | | |
| **Mean** | -1.10 | -0.75 | -0.19 | -0.80 |
| **95% C.I.** | -1.30 – -0.90 | -1.00 – -0.51 | -0.50 – 0.12 | -0.94 – -0.66 |
| ANOVA: F=11.88; df=2 / 661; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 65.6% | 58.0% | 48.5% | 59.6% |
| **NEITHER** | 12.5% | 10.3% | 9.0% | 11.0% |
| **AGREE** | 22.0% | 31.7% | 42.5%* | 29.4% |
| Chi-Square: $X^2$=19.89; df=4; $p$=0.001 | | | | |

*CWD study reports 38%

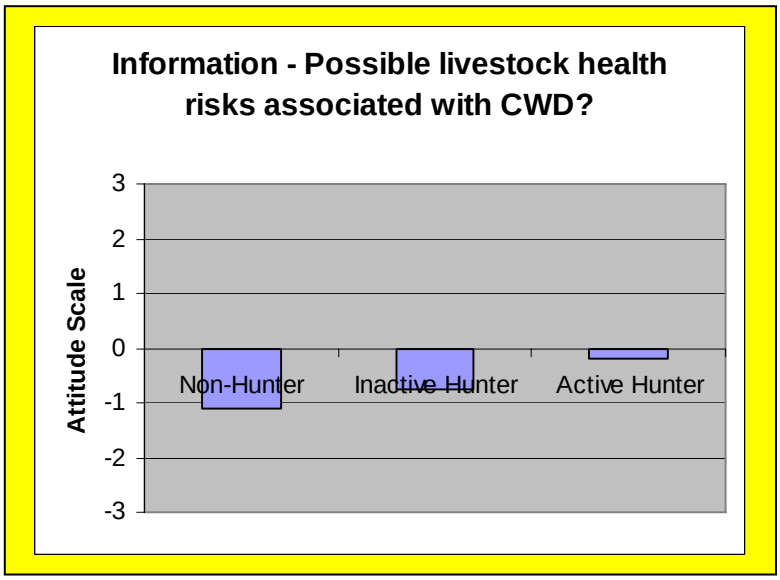



Figure 3.1-D. Mean attitude analyzed by hunting participation - I feel that I had enough information about **possible livestock health risks associated with CWD.**

Table 3.1-E. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **possible human safety risks associated with CWD?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 30.6% | 28.9% | 14.1% | 26.7% |
| **Moderately Disagree (-2)** | 14.3% | 12.4% | 16.3% | 14.1% |
| **Slightly Disagree (-1)** | 20.2% | 17.3% | 17.8% | 18.7% |
| **Neither (0)** | 14.0% | 12.0% | 6.7% | 11.8% |
| **Slightly Agree (+1)** | 8.8% | 13.8% | 22.2% | 13.2% |
| **Moderately Agree (+2)** | 7.8% | 10.7% | 14.8% | 10.2% |
| **Strongly Agree (+3)** | 4.2% | 4.9% | 8.1% | 5.2% |
| **Total Number** | 307 | 225 | 135 | 667 |
| Chi-Square: $X^2$=36.37; df=12; $p$<0.001 | | | | |
| **Mean** | -1.03 | -0.79 | -0.14 | -0.77 |
| **95% C.I.** | -1.23 – -0.83 | -1.04 – -0.54 | -0.47 – 0.18 | -0.91 – -0.63 |
| ANOVA: F=10.66; df=2 / 664; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 64.9% | 58.7% | 47.4% | 59.3% |
| **NEITHER** | 14.0% | 12.0% | 6.7% | 11.8% |
| **AGREE** | 21.1% | 29.3% | 45.9%* | 28.9% |
| Chi-Square: $X^2$=29.16; df=4; $p$<0.001 | | | | |

*CWD study reports 43%

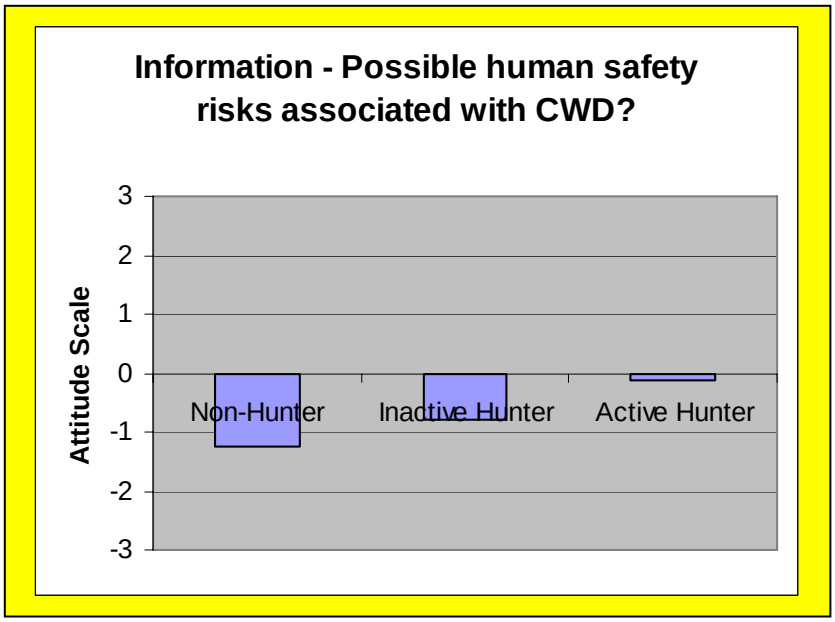



Figure 3.1-E. Mean attitude analyzed by hunting participation - I feel that I had enough information about **possible human safety risks associated with CWD.**

Table 3.1-F. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **precautions that hunters should take because of CWD?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 30.3% | 24.8% | 14.2% | 25.2% |
| **Moderately Disagree (-2)** | 16.0% | 13.7% | 11.2% | 14.2% |
| **Slightly Disagree (-1)** | 15.3% | 16.4% | 17.2% | 16.0% |
| **Neither (0)** | 13.4% | 13.7% | 6.0% | 12.0% |
| **Slightly Agree (+1)** | 9.4% | 15.5% | 19.4% | 13.5% |
| **Moderately Agree (+2)** | 10.4% | 8.0% | 20.1% | 11.5% |
| **Strongly Agree (+3)** | 5.2% | 8.0% | 11.9% | 7.5% |
| **Total Number** | 307 | 226 | 134 | 667 |
| Chi-Square: $X^2$=41.54; df=12; $p$<0.001 | | | | |
| **Mean** | -0.92 | -0.63 | 0.14 | -0.61 |
| **95% C.I.** | -1.14 – -0.71 | -0.89 – -0.38 | -0.20 – 0.48 | -0.76 –-0.46 |
| ANOVA: F=14.05; df=2 / 665; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 61.7% | 54.9% | 42.2% | 55.5% |
| **NEITHER** | 13.3% | 13.7% | 5.9% | 12.0% |
| **AGREE** | 25.0% | 31.4% | 51.9%* | 32.6% |
| Chi-Square: $X^2$=32.51; df=4; $p$<0.001 | | | | |

*CWD study reports 49%

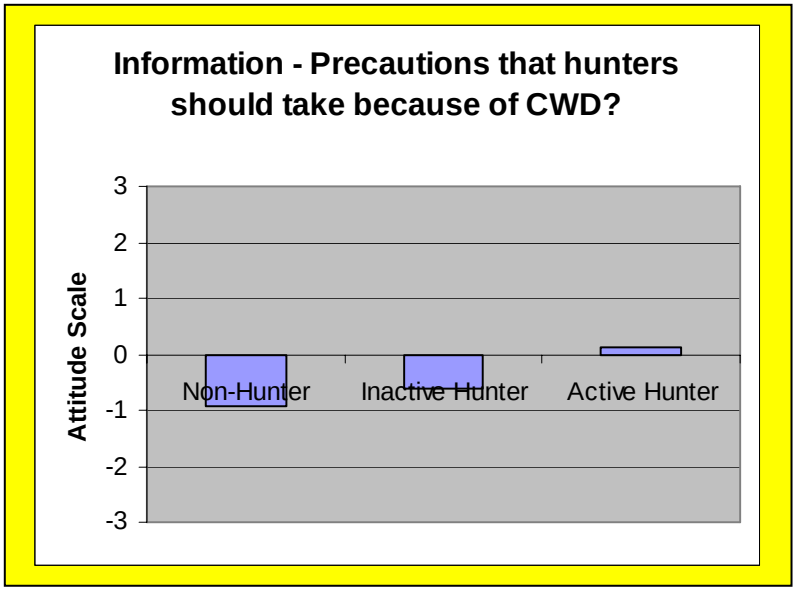



Figure 3.1-F. Mean attitude analyzed by hunting participation - I feel that I had enough information about **precautions that hunters should take because of CWD.**

Table 3.1-G. Prior to receiving this survey to what extent do you disagree or agree that you had enough information about… analyzed by hunting participation.

| I feel that I had enough information about… **what the NDG&F is doing about CWD in North Dakota?** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 29.8% | 22.9% | 13.4% | 24.2% |
| **Moderately Disagree (-2)** | 13.3% | 16.3% | 11.2% | 13.9% |
| **Slightly Disagree (-1)** | 15.9% | 14.5% | 18.7% | 16.0% |
| **Neither (0)** | 19.4% | 15.0% | 9.0% | 15.8% |
| **Slightly Agree (+1)** | 8.1% | 17.2% | 18.7% | 13.3% |
| **Moderately Agree (+2)** | 9.7% | 7.9% | 17.2% | 10.6% |
| **Strongly Agree (+3)** | 3.9% | 6.2% | 11.9% | 6.3% |
| **Total Number** | 309 | 227 | 134 | 670 |
| Chi-Square: $X^2$=48.48; df=12; $p$<0.001 | | | | |
| **Mean** | -0.93 | -0.64 | 0.07 | -0.63 |
| **95% C.I.** | -1.14 – -0.73 | -0.89 – -0.40 | -0.27 – 0.40 | -0.78 – -0.49 |
| ANOVA: F=13.47; df=2 / 667; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 59.2% | 53.5% | 43.3% | 54.1% |
| **NEITHER** | 19.4% | 15.0% | 9.0% | 15.8% |
| **AGREE** | 21.4% | 31.4% | 47.8%* | 30.0% |
| Chi-Square: $X^2$=32.90; df=4; $p$<0.001 | | | | |

*CWD study reports 49%

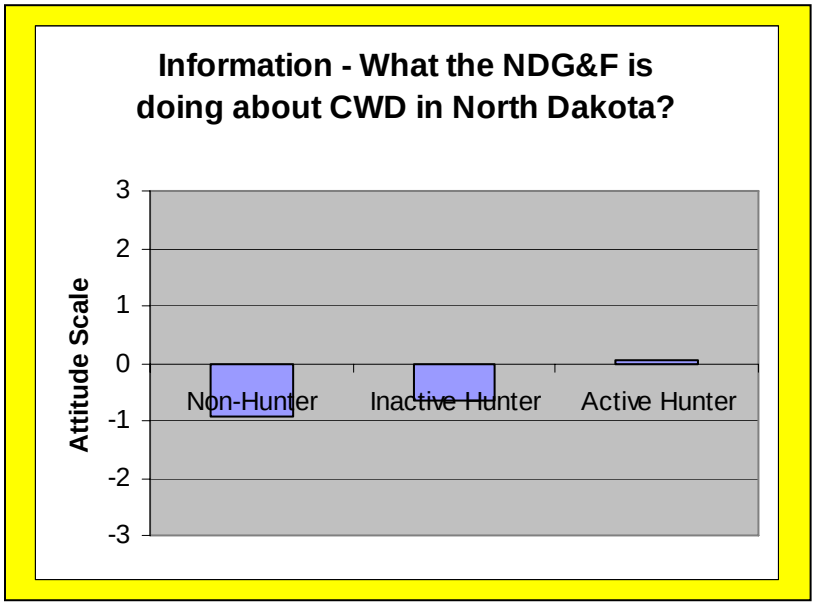



Figure 3.1-G. Mean attitude analyzed by hunting participation - I feel that I had enough information about **what the NDG&F is doing about CWD in North Dakota.**

Table 3.2-A. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…The threat of CWD has been exaggerated.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 12.6% | 14.3% | 12.7% | 13.2% |
| **Moderately Disagree (-2)** | 18.1% | 20.1% | 16.4% | 18.4% |
| **Slightly Disagree (-1)** | 18.1% | 22.8% | 25.4% | 21.1% |
| **Neither (0)** | 41.3% | 29.9% | 21.6% | 33.5% |
| **Slightly Agree (+1)** | 6.8% | 8.9% | 14.9% | 9.1% |
| **Moderately Agree (+2)** | 1.9% | 3.1% | 6.0% | 3.1% |
| **Strongly Agree (+3)** | 1.3% | 0.9% | 3.0% | 1.5% |
| **Total Number** | 310 | 224 | 134 | 668 |
| Chi-Square: $X^2$=30.15; df=12; $p$=0.003 | | | | |
| **Mean** | -0.77 | -0.88 | -0.60 | -0.77 |
| **95% C.I.** | -0.92 – -0.62 | -1.06 – -0.70 | -0.87 – -0.34 | -0.88 – -0.67 |
| ANOVA: F=1.67; df=2 / 667; $p$=0.188 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 48.7% | 57.3% | 54.8% | 52.8% |
| **NEITHER** | 41.3% | 29.8% | 21.5% | 33.4% |
| **AGREE** | 10.0% | 12.9% | 23.7% | 13.7% |
| Chi-Square: $X^2$=27.39; df=4; $p$<0.001 | | | | |

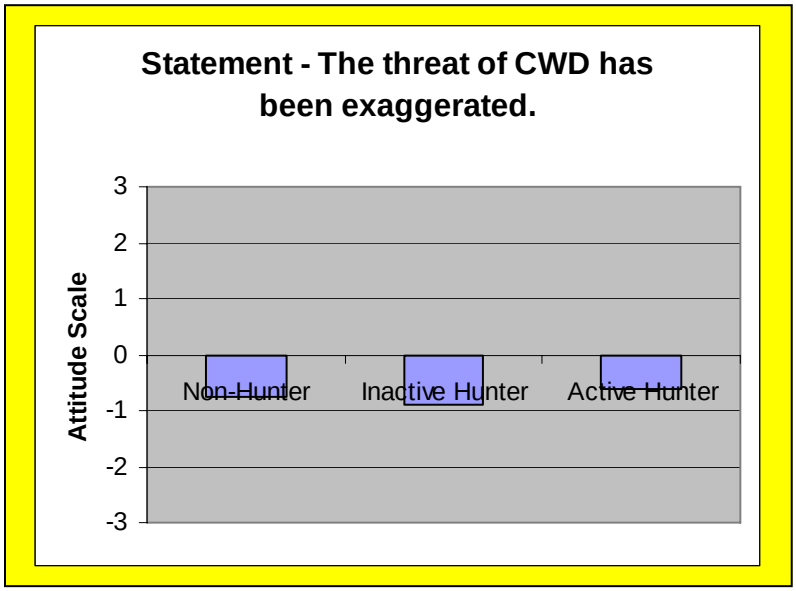



Figure 3.2-A. Mean attitude analyzed by hunting participation - **The threat of CWD has been exaggerated.**

Table 3.2-B. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…CWD poses a risk to deer, but not to humans.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 11.6% | 13.5% | 11.9% | 12.3% |
| **Moderately Disagree (-2)** | 15.8% | 17.0% | 17.2% | 16.5% |
| **Slightly Disagree (-1)** | 17.7% | 16.1% | 23.1% | 18.3% |
| **Neither (0)** | 38.4% | 28.7% | 23.1% | 32.1% |
| **Slightly Agree (+1)** | 11.6% | 15.7% | 14.2% | 13.5% |
| **Moderately Agree (+2)** | 4.5% | 7.2% | 6.7% | 5.8% |
| **Strongly Agree (+3)** | 0.3% | 1.8% | 3.7% | 1.5% |
| **Total Number** | 310 | 223 | 134 | 667 |
| Chi-Square: $X^2$=21.74; df=12; $p$=0.041 | | | | |
| **Mean** | -0.62 | -0.55 | -0.54 | -0.58 |
| **95% C.I.** | -0.77 – -0.47 | -0.75 – -0.35 | -0.81 – -0.27 | -0.69 – -0.47 |
| ANOVA: F=0.24; df=2 / 663; $p$=0.791 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 45.2% | 46.6% | 52.5% | 47.1% |
| **NEITHER** | 38.4% | 28.7% | 23.1% | 32.1% |
| **AGREE** | 16.5% | 24.7% | 24.6% | 20.8% |
| Chi-Square: $X^2$=14.34; df=4; $p$=0.006 | | | | |

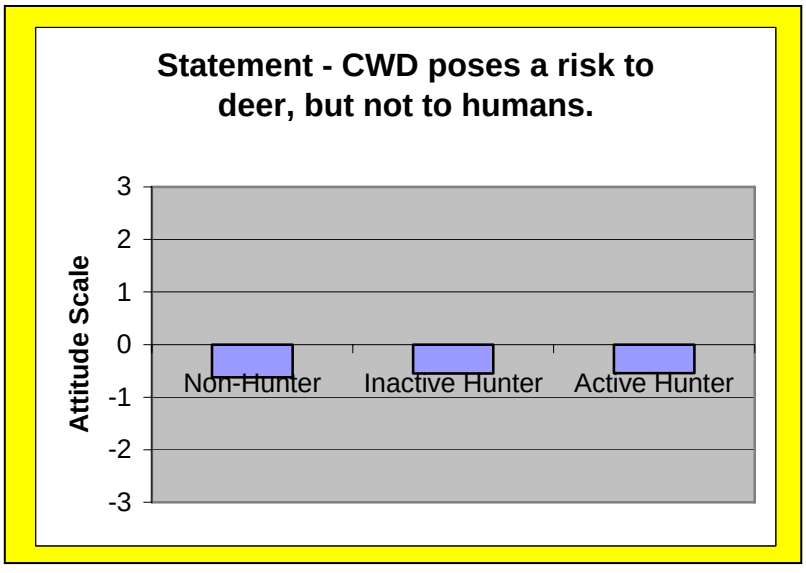



Figure 3.2-B. Mean attitude analyzed by hunting participation - **CWD poses a risk to deer, but not to humans.**

Table 3.2-C. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…CWD may pose a risk to humans, but not enough is currently known to be sure.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 5.5% | 2.2% | 6.0% | 4.5% |
| **Moderately Disagree (-2)** | 7.8% | 11.7% | 8.2% | 9.2% |
| **Slightly Disagree (-1)** | 9.8% | 9.9% | 9.7% | 9.8% |
| **Neither (0)** | 32.9% | 28.3% | 22.4% | 29.2% |
| **Slightly Agree (+1)** | 26.7% | 23.3% | 31.3% | 26.5% |
| **Moderately Agree (+2)** | 12.7% | 13.5% | 14.9% | 13.4% |
| **Strongly Agree (+3)** | 4.6% | 11.2% | 7.5% | 7.4% |
| **Total Number** | 307 | 223 | 134 | 664 |
| Chi-Square: $X^2$=19.91; df=12; $p$=0.069 | | | | |
| **Mean** | 0.25 | 0.45 | 0.40 | 0.35 |
| **95% C.I.** | 0.09 – 0.41 | 0.25 – 0.65 | 0.14 – 0.66 | 0.23 – 0.46 |
| ANOVA: F=1.31; df=2 / 659; $p$=0.270 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 22.9% | 23.3% | 23.7% | 23.2% |
| **NEITHER** | 33.0% | 28.3% | 22.2% | 29.2% |
| **AGREE** | 44.1% | 48.4% | 54.1% | 47.6% |
| Chi-Square: $X^2$=5.87; df=4; $p$=0.209 | | | | |

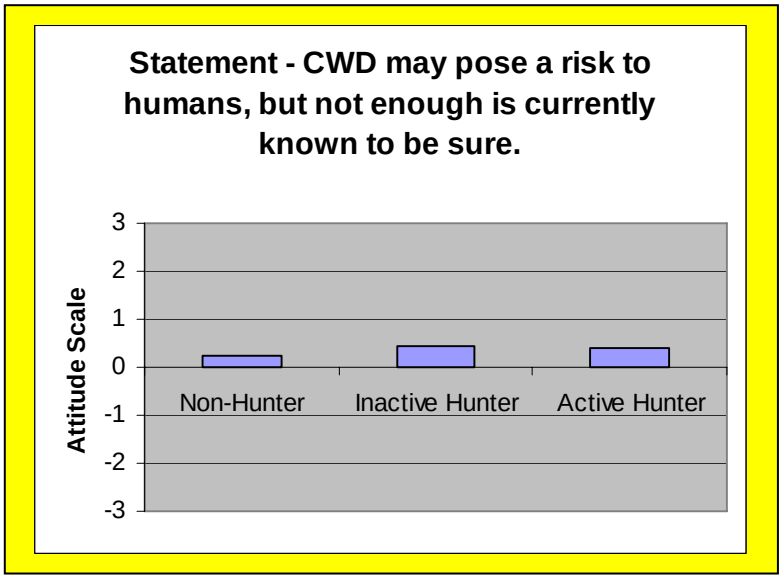



Figure 3.2-C. Mean attitude analyzed by hunting participation - **CWD may pose a risk to humans, but not enough is currently known to be sure.**

Table 3.2-D. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…CWD may cause disease in humans if they eat meat from animals infected with CWD.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.3% | 2.3% | 5.9% | 2.6% |
| **Moderately Disagree (-2)** | 3.3% | 5.9% | 8.1% | 5.2% |
| **Slightly Disagree (-1)** | 5.0% | 7.2% | 8.8% | 6.5% |
| **Neither (0)** | 41.1% | 36.5% | 32.4% | 37.7% |
| **Slightly Agree (+1)** | 28.1% | 19.8% | 25.0% | 24.7% |
| **Moderately Agree (+2)** | 14.7% | 15.8% | 12.5% | 14.6% |
| **Strongly Agree (+3)** | 6.4% | 12.6% | 7.4% | 8.7% |
| **Total Number** | 299 | 222 | 136 | 657 |
| Chi-Square: $X^2$=26.58; df=12; $p$=0.009 | | | | |
| **Mean** | 0.60 | 0.64 | 0.29 | 0.55 |
| **95% C.I.** | 0.47 – 0.73 | 0.45 – 0.83 | 0.03 – 0.54 | 0.45 – 0.65 |
| ANOVA: F=3.28; df=2 / 654; $p$=0.038 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 10.0% | 15.3% | 22.8% | 14.4% |
| **NEITHER** | 41.0% | 36.5% | 32.4% | 37.7% |
| **AGREE** | 49.0% | 48.2% | 44.9% | 47.9% |
| Chi-Square: $X^2$=13.12; df=4; $p$=0.011 | | | | |

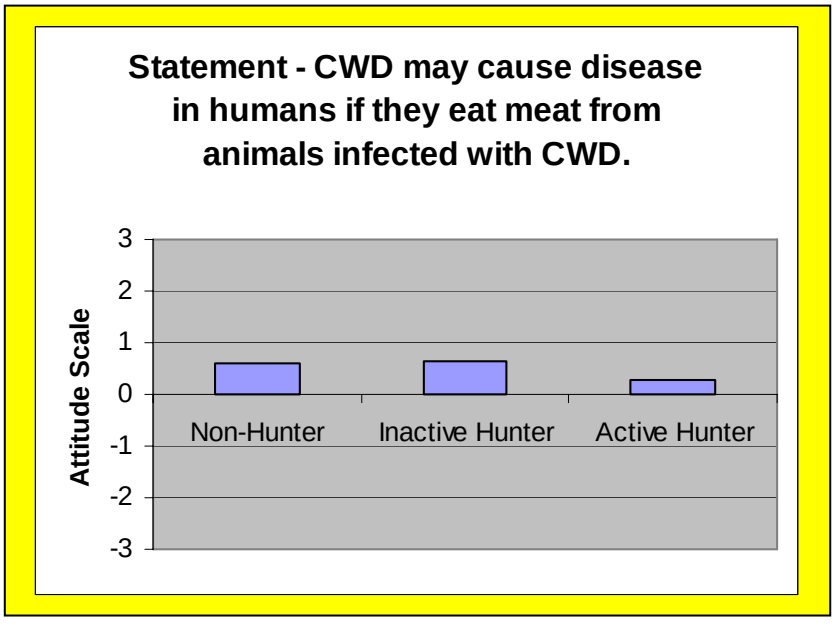



Figure 3.2-D. Mean attitude analyzed by hunting participation - **CWD may cause disease in humans if they eat meat from animals infected with CWD.**

Table 3.2-E. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…Because of CWD, I have concerns about eating deer meat.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 5.1% | 8.0% | 18.5% | 8.8% |
| **Moderately Disagree (-2)** | 6.4% | 8.9% | 19.3% | 9.9% |
| **Slightly Disagree (-1)** | 9.4% | 14.3% | 14.1% | 12.0% |
| **Neither (0)** | 26.9% | 19.2% | 12.6% | 21.3% |
| **Slightly Agree (+1)** | 18.5% | 16.1% | 21.5% | 18.3% |
| **Moderately Agree (+2)** | 9.4% | 9.8% | 6.7% | 9.0% |
| **Strongly Agree (+3)** | 12.1% | 14.3% | 5.2% | 11.4% |
| **NA (missing)[1]** | 12.1% | 9.4% | 2.2% | 9.1% |
| **Total Number** | 297 | 224 | 135 | 656 |
| Chi-Square: $X^2$=66.58 df=14; $p$<0.001 | | | | |
| **Mean** | 0.41 | 0.25 | -0.61 | 0.13 |
| **95% C.I.** | 0.22 – 0.61 | -0.01 – 0.50 | -0.92 – -0.30 | -0.01 – 0.27 |
| ANOVA: F=15.96; df=2 / 592; $p$<0.001 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 20.8% | 31.4% | 51.9% | 30.8% |
| **NEITHER** | 26.8% | 19.3% | 12.6% | 21.3% |
| **AGREE** | 40.3% | 39.9% | 33.3% | 38.7% |
| **NA[1]** | 12.1% | 9.4% | 2.2% | 9.1% |
| Chi-Square: $X^2$=49.82; df=6; $p$<0.001 | | | | |

NA = not applicable.

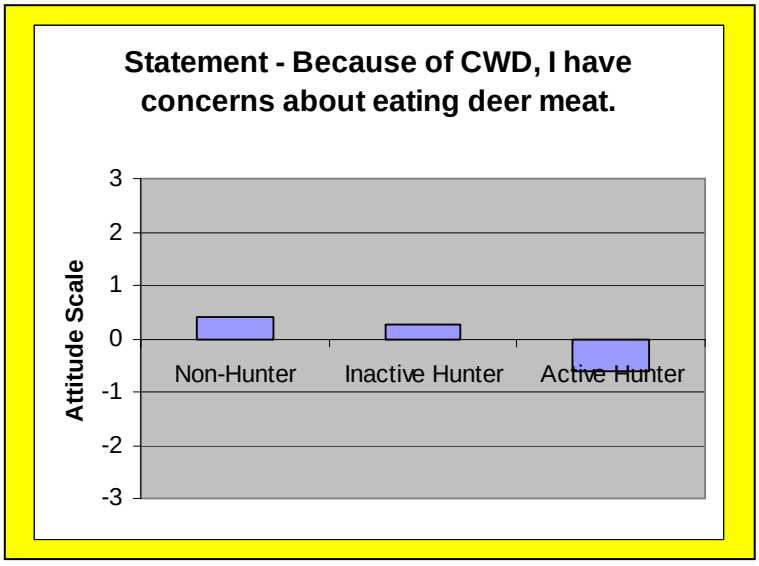



Figure 3.2-E. Mean attitude analyzed by hunting participation - **Because of CWD, I have concerns about eating deer meat.**

Table 3.2-F. To what extent do you disagree or agree with each statement related to CWD… analyzed by hunting participation.

| statement: **…Because of CWD, members of my family (for example: spouse, children) have concerns about eating deer meat.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 5.0% | 7.6% | 17.0% | 8.4% |
| **Moderately Disagree (-2)** | 6.4% | 11.6% | 17.8% | 10.5% |
| **Slightly Disagree (-1)** | 10.1% | 8.5% | 11.1% | 9.7% |
| **Neither (0)** | 32.6% | 28.6% | 15.6% | 27.7% |
| **Slightly Agree (+1)** | 12.8% | 9.8% | 15.6% | 12.3% |
| **Moderately Agree (+2)** | 6.4% | 8.5% | 10.4% | 7.9% |
| **Strongly Agree (+3)** | 9.1% | 10.3% | 6.7% | 9.0% |
| **NA (missing)**[1] | 17.8% | 15.2% | 5.9% | 14.5% |
| **Total Number** | 298 | 224 | 135 | 657 |
| Chi-Square: $X^2$=53.29; df=14; $p$<0.001 | | | | |
| **Mean** | 0.18 | 0.04 | -0.45 | -0.01 |
| **95% C.I.** | -0.01 – 0.38 | -0.21 – 0.29 | -0.78 – -0.12 | -0.15 – 0.14 |
| ANOVA: F=5.87; df=2 / 557; $p$=0.003 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 21.5% | 27.5% | 45.9% | 28.5% |
| **NEITHER** | 32.6% | 28.8% | 15.6% | 27.8% |
| **AGREE** | 28.2% | 28.4% | 32.6% | 29.2% |
| **NA (missing)**[1] | 17.8% | 15.3% | 5.9% | 14.5% |
| Chi-Square: $X^2$=39.23; df=6; $p$<0.001 | | | | |

NA = not applicable.

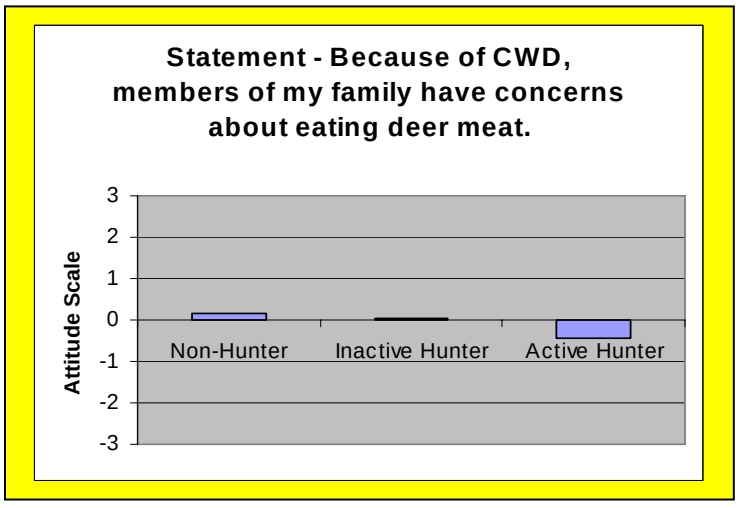



Figure 3.2-F. Mean attitude analyzed by hunting participation - **Because of CWD, members of my family (for example: spouse, children) have concerns about eating deer meat.**

Table 3.3-A. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **provide the best available information on CWD issues.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.3% | 1.3% | 1.5% | 1.3% |
| **Moderately Disagree (-2)** | 2.2% | 2.2% | 2.2% | 2.2% |
| **Slightly Disagree (-1)** | 6.1% | 4.9% | 5.9% | 5.6% |
| **Neither (0)** | 11.9% | 13.3% | 3.7% | 10.7% |
| **Slightly Agree (+1)** | 29.5% | 28.3% | 25.2% | 28.2% |
| **Moderately Agree (+2)** | 32.1% | 31.0% | 37.0% | 32.7% |
| **Strongly Agree (+3)** | 17.0% | 19.0% | 24.4% | 19.2% |
| **Total Number** | 312 | 226 | 135 | 673 |
| Chi-Square: $X^2$=12.75; df=12; $p$=0.388 | | | | |
| **Mean** | 1.31 | 1.35 | 1.58 | 1.38 |
| **95% C.I.** | 1.17 – 1.46 | 1.18 – 1.52 | 1.36 – 1.80 | 1.28 – 1.48 |
| ANOVA: F=2.12; df=2 / 669; $p$=0.121 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 9.3% | 8.4% | 9.6% | 9.1% |
| **NEITHER** | 11.9% | 13.3% | 3.7% | 10.7% |
| **AGREE** | 78.8% | 78.3% | 86.8% | 80.3% |
| Chi-Square: $X^2$=9.14; df=4; $p$=0.058 | | | | |

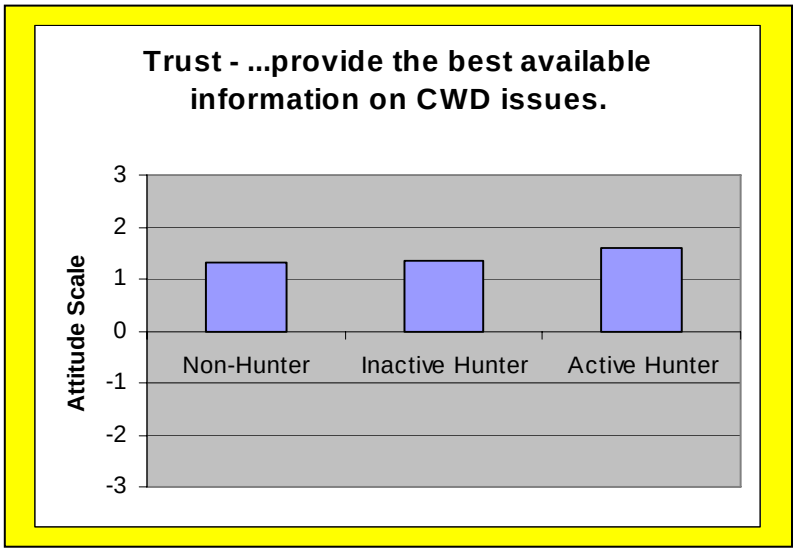



Figure 3.3-A. Mean attitude analyzed by hunting participation - I trust NDG&F to **provide the best available information on CWD issues.**

Table 3.3-B. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **provide me with enough information to decide what actions I should take regarding CWD.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.3% | 2.2% | 0.8% | 1.5% |
| **Moderately Disagree (-2)** | 2.9% | 3.6% | 2.3% | 3.0% |
| **Slightly Disagree (-1)** | 5.8% | 3.6% | 5.3% | 4.9% |
| **Neither (0)** | 13.5% | 12.9% | 6.0% | 11.8% |
| **Slightly Agree (+1)** | 27.6% | 29.3% | 26.3% | 27.9% |
| **Moderately Agree (+2)** | 32.4% | 29.3% | 36.8% | 32.2% |
| **Strongly Agree (+3)** | 16.7% | 19.1% | 22.6% | 18.7% |
| **Total Number** | 312 | 225 | 133 | 670 |
| Chi-Square: $X^2$=11.48; df=12; $p$=0.488 | | | | |
| **Mean** | 1.26 | 1.28 | 1.53 | 1.32 |
| **95% C.I.** | 1.11 – 1.41 | 1.10 – 1.46 | 1.31 – 1.75 | 1.22 – 1.42 |
| ANOVA: F=2.03; df=2 / 670; $p$=0.133 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 9.9% | 9.3% | 8.9% | 9.5% |
| **NEITHER** | 13.5% | 12.8% | 5.9% | 11.7% |
| **AGREE** | 76.6% | 77.9% | 85.2% | 78.8% |
| Chi-Square: $X^2$=5.95; df=4; $p$=0.203 | | | | |

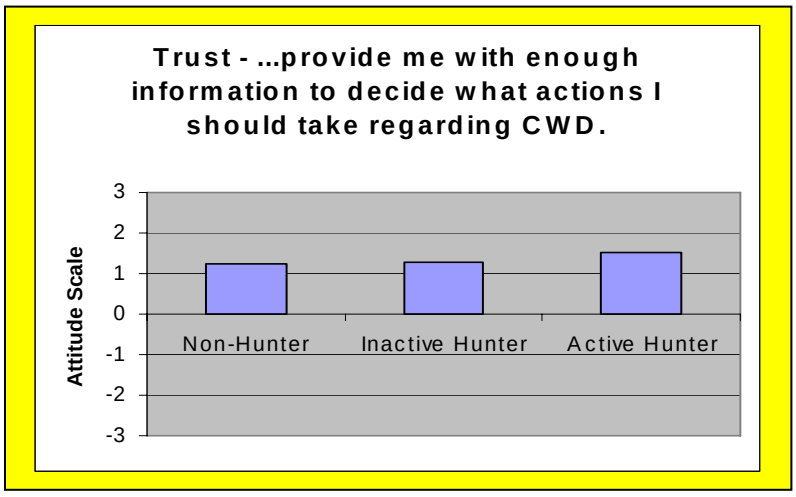



Figure 3.3-B. Mean attitude analyzed by hunting participation - I trust NDG&F to **provide me with enough information to decide what actions I should take regarding CWD.**

Table 3.3-C. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **provide truthful information about human safety issues related to CWD.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.3% | 0.4% | 0.7% | 0.9% |
| **Moderately Disagree (-2)** | 1.6% | 3.1% | 2.2% | 2.,2% |
| **Slightly Disagree (-1)** | 3.5% | 3.5% | 4.4% | 3.7% |
| **Neither (0)** | 12.9% | 12.4% | 4.4% | 11.0% |
| **Slightly Agree (+1)** | 27.1% | 24.8% | 24.1% | 25.7% |
| **Moderately Agree (+2)** | 30.3% | 31.0% | 35.8% | 31.6% |
| **Strongly Agree (+3)** | 23.2% | 24.8% | 28.5% | 24.8% |
| **Total Number** | 310 | 226 | 137 | 673 |
| Chi-Square: $X^2$=11.92; df=12; $p$=0.452 | | | | |
| **Mean** | 1.46 | 1.50 | 1.73 | 1.53 |
| **95% C.I.** | 1.31 – 1.60 | 1.33 – 1.67 | 1.52 – 1.93 | 1.43 – 1.62 |
| ANOVA: F=2.16; df=2 / 670; $p$=0.116 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 6.7% | 7.1% | 6.6% | 6.8% |
| **NEITHER** | 12.8% | 12.4% | 4.4% | 11.0% |
| **AGREE** | 80.4% | 80.5% | 89.0% | 82.2% |
| Chi-Square: $X^2$=7.70; df=4; $p$=0.103 | | | | |

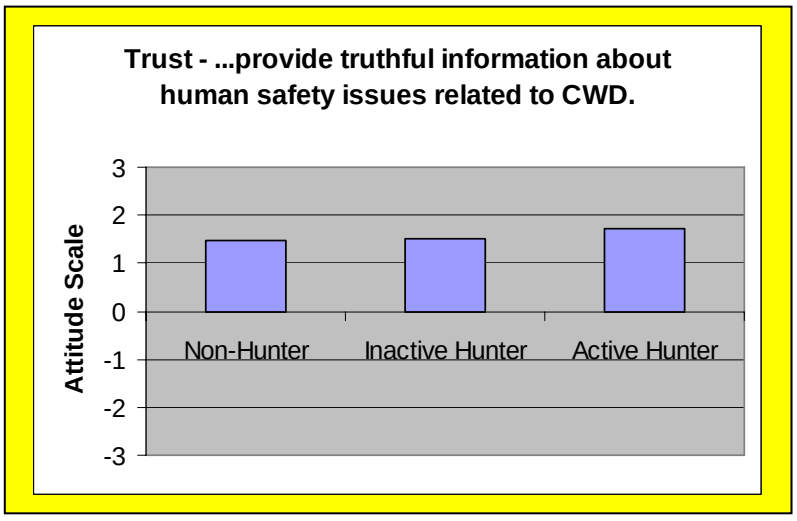



Figure 3.3-C. Mean attitude analyzed by hunting participation - I trust NDG&F to **provide truthful information about human safety issues related to CWD.**

Table 3.3-D. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **provide timely information regarding CWD issues.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.6% | 1.3% | 1.5% | 1.5% |
| **Moderately Disagree (-2)** | 1.0% | 4.8% | 2.9% | 2.7% |
| **Slightly Disagree (-1)** | 4.5% | 4.4% | 5.1% | 4.6% |
| **Neither (0)** | 13.6% | 14.1% | 5.9% | 12.2% |
| **Slightly Agree (+1)** | 31.2% | 22.0% | 25.7% | 27.0% |
| **Moderately Agree (+2)** | 28.6% | 33.9% | 36.0% | 31.9% |
| **Strongly Agree (+3)** | 19.5% | 19.4% | 22.8% | 20.1% |
| **Total Number** | 308 | 227 | 136 | 671 |
| Chi-Square: $X^2$=20.01; df=12; $p$=0.067 | | | | |
| **Mean** | 1.35 | 1.31 | 1.50 | 1.36 |
| **95% C.I.** | 1.21 – 1.49 | 1.12 – 1.49 | 1.27 – 1.73 | 1.26 – 1.47 |
| ANOVA: F=0.95; df=2 / 666; $p$=0.387 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 7.1% | 10.6% | 9.6% | 8.8% |
| **NEITHER** | 13.6% | 14.2% | 5.9% | 12.2% |
| **AGREE** | 79.2% | 75.2% | 84.6% | 79.0% |
| Chi-Square: $X^2$=8.50; df=4; $p$=0.075 | | | | |

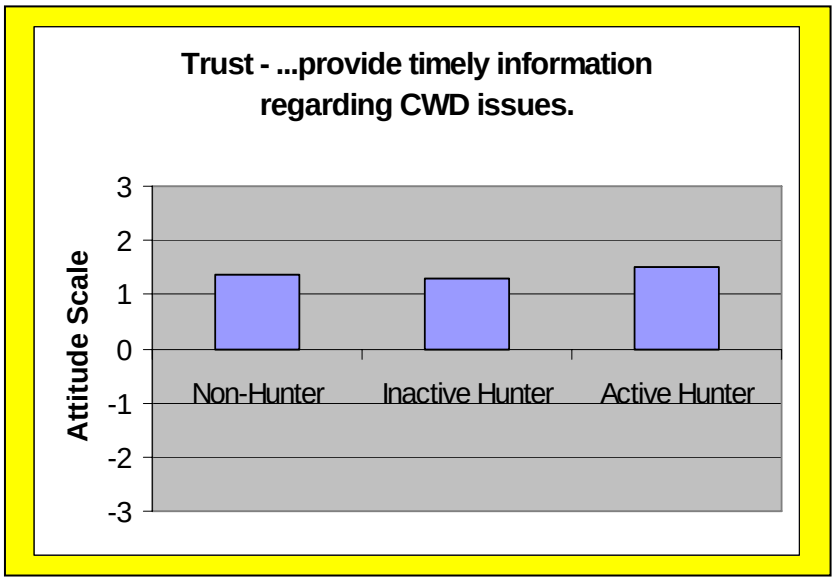



Figure 3.3-D. Mean attitude analyzed by hunting participation - I trust NDG&F to **provide timely information regarding CWD issues.**

Table 3.3-E. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **make good deer management decisions regarding CWD issues.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 1.9% | 0.0% | 2.2% | 1.3% |
| **Moderately Disagree (-2)** | 1.0% | 1.3% | 3.7% | 1.6% |
| **Slightly Disagree (-1)** | 5.5% | 4.4% | 2.2% | 4.5% |
| **Neither (0)** | 12.9% | 11.5% | 4.4% | 10.7% |
| **Slightly Agree (+1)** | 26.5% | 22.9% | 21.3% | 24.3% |
| **Moderately Agree (+2)** | 30.7% | 37.9% | 40.4% | 35.1% |
| **Strongly Agree (+3)** | 21.4% | 22.0% | 25.7% | 22.5% |
| **Total Number** | 309 | 227 | 136 | 672 |
| Chi-Square: $X^2$=23.39; df=12; $p$=0.025 | | | | |
| **Mean** | 1.39 | 1.59 | 1.64 | 1.51 |
| **95% C.I.** | 1.25 – 1.54 | 1.44 – 1.74 | 1.41 – 1.87 | 1.41 – 1.61 |
| ANOVA: F=2.41; df=2 / 667; $p$=0.090 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 8.1% | 5.3% | 8.1% | 7.2% |
| **NEITHER** | 12.9% | 11.5% | 4.4% | 10.7% |
| **AGREE** | 79.0% | 83.2% | 87.4% | 82.1% |
| Chi-Square: $X^2$=9.00; df=4; $p$=0.061 | | | | |

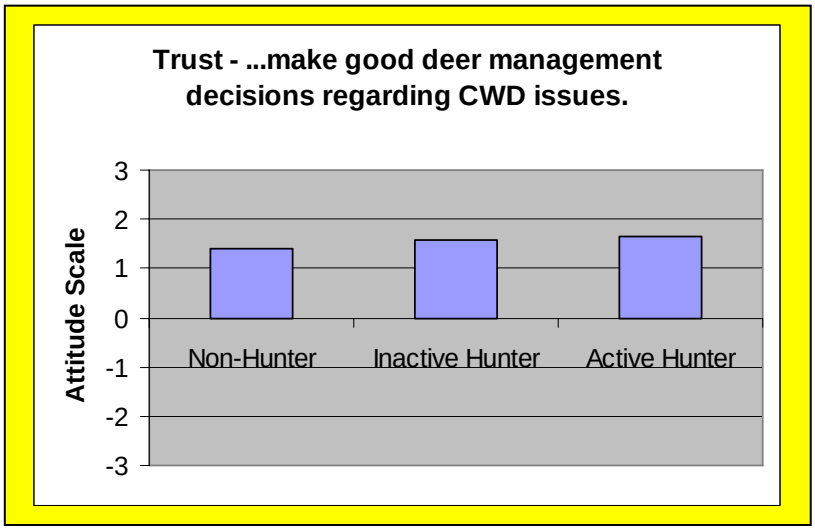



Figure 3.3-E. Mean attitude analyzed by hunting participation - I trust NDG&F to **make good deer management decisions regarding CWD issues.**

Table 3.3-F. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD… analyzed by hunting participation.

| I trust NDG&F to… **properly address CWD in North Dakota.** | | | | |
|---|---|---|---|---|
| **Opinion (scale)** | **Hunting Participation** | | | **Total** |
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** | |
| **Strongly Disagree (-3)** | 2.2% | 0.0% | 2.9% | 1.6% |
| **Moderately Disagree (-2)** | 1.6% | 1.8% | 3.7% | 2.1% |
| **Slightly Disagree (-1)** | 4.5% | 3.1% | 2.2% | 3.6% |
| **Neither (0)** | 13.1% | 12.8% | 4.4% | 11.3% |
| **Slightly Agree (+1)** | 26.0% | 23.3% | 20.6% | 24.0% |
| **Moderately Agree (+2)** | 29.5% | 33.5% | 40.4% | 33.0% |
| **Strongly Agree (+3)** | 23.1% | 25.6% | 25.7% | 24.4% |
| **Total Number** | 312 | 227 | 136 | 675 |
| Chi-Square: $X^2$=21.80; df=12; $p$=0.040 | | | | |
| **Mean** | 1.39 | 1.61 | 1.62 | 1.51 |
| **95% C.I.** | 1.23 – 1.54 | 1.45 – 1.76 | 1.38 – 1.86 | 1.41 – 1.61 |
| ANOVA: F=2.41; df=2 / 670; $p$=0.091 | | | | |
| **SUMMARIZED RESULTS** | | | | |
| **DISAGREE** | 8.7% | 4.9% | 8.1% | 7.3% |
| **NEITHER** | 13.1% | 12.8% | 4.4% | 11.3% |
| **AGREE** | 78.2% | 82.3% | 87.4% | 81.4% |
| Chi-Square: $X^2$=10.79; df=4; $p$=0.029 | | | | |

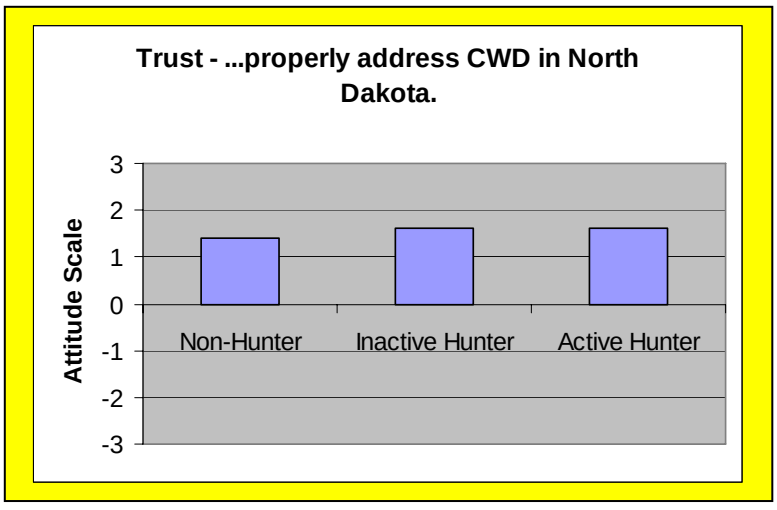



Figure 3.3-F. Mean attitude analyzed by hunting participation - I trust NDG&F to **properly address CWD in North Dakota.**

# Part 4 – Demographic description of Fishing, Hunting and Wildlife Viewing Participants in North Dakota – Who are our customers?

## Section A: Description of Fishing Participants (Non-Anglers, Inactive Anglers and Active Anglers)

**Fishing Participation and Interest.** About 30% of the adult North Dakota residents reported fishing in the past year and 52% reported having fished in the past, but not in the recent year (Table 4.1). Non-anglers have very little interest in fishing in the future, representing only 3.7% of the adult population with any level of interest in fishing (most of which were only slightly interested). About 56% of the inactive anglers had some level of interest in fishing in the future, representing about 29% of the adult population. Most (92%) of the active anglers are interested in fishing in the future (most of which were strongly interested), representing about 28% of the adult population. Overall, about 39% of the adult population have no interest in fishing.

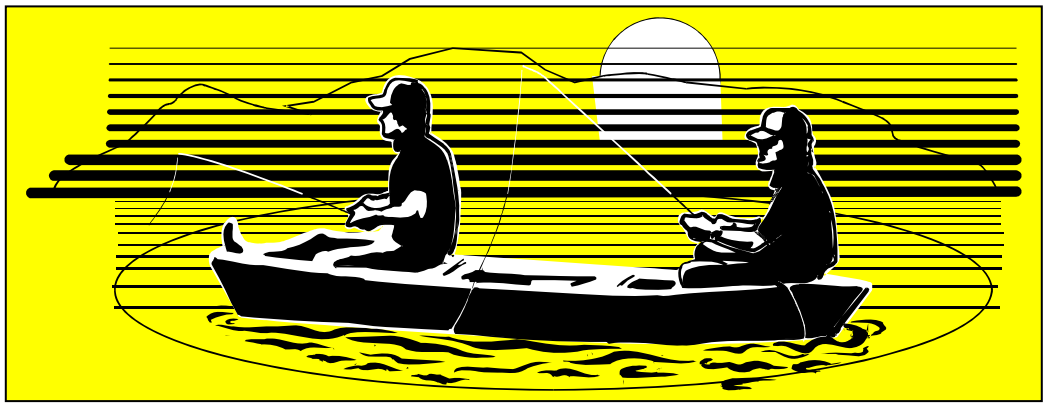
Fishing participation is strongly related to hunting and wildlife viewing participation (Table 4.2). About 44% of the active anglers were active hunters and 42% were active wildlife viewing participants.

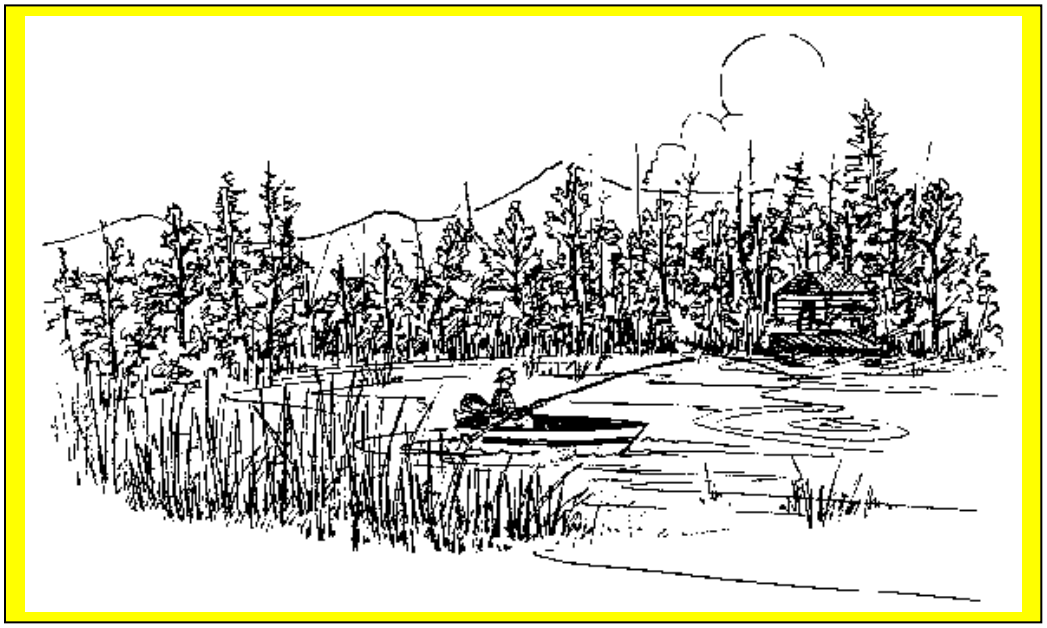
**Describing the Angler.** Although slightly significant, the wildlife value orientations of the non-anglers, inactive anglers and active anglers were relatively similar (Table 4.3). Overall, anglers had slightly higher levels of interest in protecting nongame species (Table 4.4).

Active anglers were more likely to be male (64%) compared to non-anglers (43% male) and inactive anglers (45% male) (Table 4.5). Active anglers were younger and lived fewer years in North Dakota (which is most likely mainly related to the age variable) compared to non-anglers and inactive anglers (Table 4.6). A higher percent of active anglers had children living at home compared to non-anglers and inactive anglers (this may also be somewhat related to the age variable) (Table 4.7). Non-anglers had a slightly higher percentage of non-whites, but the number of non-white in the sample was too small for an accurate assessment of the relationship between fishing participation and race (Table 4.8).

Anglers (inactive and active) had a higher proportion of participants with degrees compared to non-anglers (Table 4.9). Non-anglers had a higher proportion of people

with income less than $10,000 compared to inactive and active anglers (Table 4.10). Fishing participation was not significantly related to size of current residence or size of residence where raised (Tables 4.11 and 4.12).





## Fishing Participation and Interest:

Table 4.1. Fishing participation and interest in fishing in the future by adult, North Dakota residents.

| **Type of Fishing Participation** | **Number** | **Percent** |
|---|---|---|
| **Non-Angler** – Never fished | 121 | 17.5% |
| **Inactive Angler** – Fished in the past but not recently (past year) | 361 | 52.2% |
| **Active Angler** – Fished recently (past 1 year) | 209 | 30.2% |
| **Total** | 691 | 100% |

| **Interest in Fishing (scale score)** | **Type of Fishing Participation** | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Not at all Interested (0)** | 79.0% | 44.2% | 8.1% |
| **Slightly Interested (1)** | 13.4% | 30.3% | 16.3% |
| **Moderately Interested (2)** | 4.2% | 16.9% | 25.4% |
| **Strongly Interested (3)** | 3.4% | 8.6% | 50.2% |
| **Total Number → (688)** | 119 | 360 | 209 |
| **Mean → (1.18)** | 0.32 | 0.90 | 2.18 |
| **95% C.I. → (1.10 – 1.27)** | 0.19 – 0.45 | 0.80 – 1.00 | 2.05 – 2.32 |

Table 4.2. Hunting and wildlife viewing participation analyzed by fishing participation.

| **Type of Hunting Participation** | **Type of Fishing Participation** | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Non-Hunter** | 83.6% | 46.1% | 28.8% |
| **Inactive Hunter** | 12.3% | 43.1% | 26.9% |
| **Active Hunter** | 4.1% | 10.8% | 44.2% |
| **Total Number** | 122 | 362 | 208 |
| Chi-Square: $X^2$=171.81; df=4; $p$<0.001 | | | |

| **Type of Wildlife Viewing Participation** | **Type of Fishing Participation** | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Non-Viewer** | 80.8% | 54.2% | 36.1% |
| **Inactive Viewer** | 8.3% | 28.3% | 22.1% |
| **Active Viewer** | 10.8% | 17.5% | 41.8% |
| **Total Number** | 120 | 360 | 208 |
| Chi-Square: $X^2$=87.54; df=4; $p$<0.001 | | | |

**Describing the Angler:**

Table 4.3. Fishing participation analyzed by wildlife value orientation.

| Wildlife Value Orientation | Type of Fishing Participation | | |
|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler |
| **Pluralist** | 29.4% | 31.3% | 29.3% |
| **Utilitarian** | 50.4% | 40.2% | 52.9% |
| **Mutualist** | 15.1% | 17.2% | 14.4% |
| **Distanced** | 5.0% | 11.4% | 3.4% |
| **Total Number** | 119 | 361 | 208 |
| Chi-Square: $X^2$=18.43; df=6; *p*=0.005 | | | |

Table 4.4. Fishing participation analyzed by wildlife importance groups.

| Wildlife Diversity Importance Groups | Type of Fishing Participation | | |
|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler |
| **Low** | 23.9% | 13.4% | 8.3% |
| **Medium Low** | 25.7% | 32.8% | 35.3% |
| **Medium High** | 41.6% | 41.2% | 43.1% |
| **High** | 8.8% | 12.6% | 13.2% |
| **Total Number** | 113 | 357 | 204 |
| Chi-Square: $X^2$=16.44; df=6; *p*=0.012 | | | |

Table 4.5. Fishing participation analyzed by gender.

| Gender | Type of Fishing Participation | | |
|---|---|---|---|
| | Non-Angler | Inactive Angler | Active Angler |
| **Male** | 43.0% | 44.9% | 64.1% |
| **Female** | 57.0% | 55.1% | 35.9% |
| **Total Number** | 121 | 361 | 209 |
| Chi-Square: $X^2$=22.80; df=2; *p*<0.001 | | | |

Table 4.6. Fishing participation analyzed by age & years of residence in North Dakota.

| Type of Fishing Participation | Age | Years of Residence in ND |
|---|---|---|
| | Mean (95% C.I.) | Mean (95% C.I.) |
| **Non-Angler** | 55.7 (52.1 – 59.3) | 43.7 (38.9 – 48.5) |
| **Inactive Angler** | 47.4 (45.6 – 49.3) | 35.2 (32.9 – 37.5) |
| **Active Angler** | 41.8 (39.8 – 43.8) | 31.2 (28.4 – 34.1) |
| **Average (95% C.I.)** | 47.1 (45.8 – 48.5) | 35.4 (33.7 – 37.1) |
| **ANOVA** | F=24.54; df=2/683; *p*<0.001 | F=11.33; df=2/630; *p*<0.001 |

Table 4.7. Fishing participation analyzed by children (18 years old or less) living at home.

| Children Living at Home | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **No Children at Home** | 76.3% | 73.7% | 53.4% |
| **Children at Home** | 23.7% | 26.3% | 46.6% |
| **Total Number** | 118 | 361 | 208 |
| Chi-Square: $X^2$=29.53; df=2; $p$<0.001 | | | |

Table 4.8. Fishing participation analyzed by ethnicity.

| Race | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **White** | 94.6% | 99.7% | 96.4% |
| **Non-White** | 5.4% | 0.3% | 3.6% |
| **Total Number** | 112 | 341 | 194 |
| Chi-Square: $X^2$=12.94; df=2; $p$=0.002 | | | |

Table 4.8-A. Ethnicity - description of sample.

| Ethnicity | Number | Percent |
|---|---|---|
| **White** | 653 | 97.9% |
| **American Indian** | 7 | 1.1% |
| **Hispanic** | 4 | 0.5% |
| **Black** | 2 | 0.3% |
| **Asian** | 1 | 0.2% |
| **Total** | 667 | 100% |

Table 4.9. Fishing participation analyzed by education level.

| Highest Level of Education | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Less than High School** | 13.7% | 2.5% | 2.4% |
| **High School or GED** | 40.2% | 27.4% | 25.4% |
| **2-Year Degree / Trade School** | 16.2% | 25.8% | 25.8% |
| **4-Year College Degree** | 21.4% | 29.9% | 34.0% |
| **College + (Advanced Degree)** | 8.5% | 14.4% | 12.4% |
| **Total Number** | 117 | 361 | 209 |
| Chi-Square: $X^2$=44.38; df=8; $p$<0.001 | | | |
| | | | |
| **Mean Education Level** | 2.71 | 3.26 | 3.30 |
| **95% Confidence Interval** | 2.49 – 2.93 | 3.15 – 3.38 | 3.16 – 3.44 |
| ANOVA: F=13.00; df=2/683; $p$<0.001 | | | |

Table 4.10. Fishing participation analyzed by income level.

| Highest Income Level (Level) | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Less than $10,000 (1)** | 13.7% | 3.1% | 3.8% |
| **$10,000 – $29,999 (2)** | 19.6% | 21.3% | 16.3% |
| **$30,000 – $49,999 (3)** | 30.4% | 31.9% | 29.9% |
| **$50,000 – $69,999 (4)** | 13.7% | 20.9% | 23.4% |
| **$70,000 – $89,999 (5)** | 12.7% | 11.6% | 15.2% |
| **$90,000 – $109,999 (6)** | 2.9% | 5.3% | 6.0% |
| **$110,000 – $149,999 (7 & 8)** | 2.9% | 3.4% | 3.3% |
| **$150,000 or more (9)** | 3.9% | 2.5% | 2.2% |
| **Total Number** | 102 | 320 | 184 |
| Chi-Square: $X^2$=25.89; df=14; $p$=0.027 | | | |
| | | | |
| **Mean Income Level** | 3.38 | 3.63 | 3.75 |
| **95% Confidence Interval** | 3.01 – 3.75 | 3.44 – 3.81 | 3.52 – 3.98 |
| ANOVA: F=1.58; df=2/601; $p$=0.206 | | | |

Table 4.11. Fishing participation analyzed by size of current residence.

| Size of Current Residence (level) | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Large City – 250,000 or more (1)** | 0.9% | 2.3% | 1.6% |
| **City w/ 100,000 – 249,999 (2)** | 12.8% | 17.3% | 13.6% |
| **City w/ 50,000 – 99,999 (3)** | 22.9% | 27.0% | 25.7% |
| **Small City w/ 25,000 – 49,999 (4)** | 12.8% | 11.4% | 14.7% |
| **Town w/ 10,000 – 24,999 (5)** | 6.4% | 11.4% | 13.1% |
| **Town w/ 5,000 – 9,999 (6)** | 5.5% | 4.7% | 4.7% |
| **Small town w/ less than 5,000 (7)** | 17.4% | 13.2% | 14.7% |
| **Farm or Rural Area (8)** | 21.1% | 12.6% | 12.0% |
| **Total Number** | 109 | 341 | 191 |
| Chi-Square: $X^2$=13.22; df=14; *p*=0.509 | | | |
| **Mean Residence Level** | 5.04 | 4.42 | 4.57 |
| **95% Confidence Interval** | 4.61 – 5.47 | 4.19 – 4.64 | 4.27 – 4.86 |
| ANOVA: F=3.55; df=2/636; *p*=0.029 | | | |

Table 4.12. Fishing participation analyzed by size of residence where raised.

| Size of Residence Where Raised (level) | Type of Fishing Participation | | |
|---|---|---|---|
| | **Non-Angler** | **Inactive Angler** | **Active Angler** |
| **Large City – 250,000 or more (1)** | 3.7% | 4.5% | 5.3% |
| **City w/ 100,000 – 249,999 (2)** | 4.6% | 7.8% | 6.8% |
| **City w/ 50,000 – 99,999 (3)** | 11.0% | 12.0% | 11.1% |
| **Small City w/ 25,000 – 49,999 (4)** | 4.6% | 7.8% | 11.1% |
| **Town w/ 10,000 – 24,999 (5)** | 5.5% | 9.6% | 10.0% |
| **Town w/ 5,000 – 9,999 (6)** | 6.4% | 4.5% | 5.8% |
| **Small town w/ less than 5,000 (7)** | 28.4% | 24.3% | 23.2% |
| **Farm or Rural Area (8)** | 35.8% | 29.6% | 26.8% |
| **Total Number** | 109 | 334 | 190 |
| Chi-Square: $X^2$=10.68; df=14; *p*=0.711 | | | |
| **Mean Residence Level** | 6.13 | 5.69 | 5.58 |
| **95% Confidence Interval** | 5.72 – 6.54 | 5.44 – 5.93 | 5.25 – 5.90 |
| ANOVA: F=2.22; df=2/630; *p*=0.109 | | | |

## Section B: Description of Hunting Participants (Non-Hunters, Inactive Hunters and Active Hunters)

**Hunting Participation and Interest.** About 20% of the adult North Dakota residents reported hunting in the past year and 33% reported having hunted in the past, but not in the recent year (Table 4.13). Non-hunters have very little interest in hunting in the future, representing only 7.4% of the adult population with any level of interest in hunting (most of which were only slightly interested). About 49% of the inactive hunters had some level of interest in hunting in the future, representing about 16% of the adult population. Most (96%) of the active hunters are interested in hunting in the future (most of which were strongly interested), representing about 19% of the adult population. Overall, about 58% of the adult population have no interest in hunting.

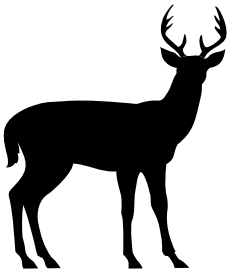
Hunting participation is strongly related to fishing and wildlife viewing participation (Table 4.14). About 68% of the active hunters were active anglers and 42% were active wildlife viewing participants.

**Describing the Hunter.** The wildlife value orientation variable was strongly related to hunting participation (Table 4.15). Active hunters had a high proportion of utilitarians and non-hunters had a high proportion of mutualists. Hunting participation was not significantly related to the wildlife diversity importance groups (Table 4.16).

Active hunters were more likely to be male (74%) compared to inactive hunters (63%) and non-hunters (32%) (Table 4.17). Active hunters were younger and lived fewer years in North Dakota (which is most likely mainly related to the age variable) (Table 4.18). A higher percent of active hunters had children living at home compared to non-hunters and inactive hunters (this may also be somewhat related to the age variable) (Table 4.19). Non-hunters had a slightly higher percentage of non-whites, but the number of non-whites in the sample was too small for an accurate assessment of the relationship between hunting participation and race (Table 4.20).

Non-hunters had a higher proportion of participants with less than a high school compared to hunters (inactive and active) and non-hunters and inactive hunters had a higher proportion of advanced degrees compared to active hunters (Table 4.21). However, mean education level was not related to hunting participation. Overall, active

hunters had a higher mean income level compared to non-hunters with inactive hunters in between in mean income level (Table 4.22). A higher percent of active hunters currently lived in a rural area compared to non-hunters and inactive hunters (Table 4.23) and non-hunters tended to have been raised in a more urban residence compared to both inactive and active hunters (Table 4.24).



## Hunting Participation and Interest:

Table 4.13. Hunting participation and interest in hunting in the future by adult, North Dakota residents.

| **Type of Hunting Participation** | **Number** | **Percent** |
|---|---|---|
| **Non-Hunter** – Never Hunted | 330 | 47.6% |
| **Inactive Hunter** – Hunted in the past but not recently (past year) | 227 | 32.8% |
| **Active Hunter** – Hunted recently (past 1 year) | 136 | 19.6% |
| **Total** | 692 | 100% |

| **Interest in Hunting (scale score)** | **Type of Hunting Participation** | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Not at all Interested (0)** | 84.5% | 50.7% | 4.4% |
| **Slightly Interested (1)** | 9.5% | 20.7% | 15.4% |
| **Moderately Interested (2)** | 5.8% | 17.6% | 21.3% |
| **Strongly Interested (3)** | 0.3% | 11.0% | 58.8% |
| **Total Number → (691)** | 328 | 227 | 136 |
| **Mean → (0.86)** | 0.22 | 0.89 | 2.35 |
| **95% C.I. → (0.78 – 0.95)** | 0.16 – 0.29 | 0.75 – 1.03 | 2.20 – 2.50 |

Table 4.14. Fishing and wildlife viewing participation analyzed by hunting participation.

| **Type of Fishing Participation** | **Type of Hunting Participation** | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Non-Angler** | 31.0% | 6.6% | 3.7% |
| **Inactive Angler** | 50.8% | 68.7% | 28.7% |
| **Active Angler** | 18.2% | 24.7% | 67.6% |
| **Total Number** | 329 | 227 | 136 |
| Chi-Square: $X^2$=171.81; df=4; $p$<0.001 | | | |

| **Type of Wildlife Viewing Participation** | **Type of Hunting Participation** | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Non-Viewer** | 61.5% | 50.7% | 38.5% |
| **Inactive Viewer** | 20.2% | 28.6% | 20.0% |
| **Active Viewer** | 18.3% | 20.7% | 41.5% |
| **Total Number** | 327 | 227 | 135 |
| Chi-Square: $X^2$=37.57; df=4; $p$<0.001 | | | |

## Describing the Hunter:

Table 4.15. Hunting participation analyzed by wildlife value orientation.

| Wildlife Value Orientation | Type of Hunting Participation | | |
|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter |
| **Pluralist** | 28.7% | 31.0% | 34.1% |
| **Utilitarian** | 38.2% | 49.1% | 58.5% |
| **Mutualist** | 22.3% | 13.3% | 4.4% |
| **Distanced** | 10.7% | 6.6% | 3.0% |
| **Total Number** | 327 | 226 | 135 |
| Chi-Square: $X^2$=38.93; df=6; $p$<0.001 | | | |

Table 4.16. Hunting participation analyzed by wildlife diversity importance groups.

| Wildlife Diversity Importance Groups | Type of Hunting Participation | | |
|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter |
| **Low** | 16.3% | 12.4% | 9.8% |
| **Medium Low** | 33.8% | 27.6% | 36.8% |
| **Medium High** | 39.1% | 46.2% | 40.6% |
| **High** | 10.9% | 13.8% | 12.8% |
| **Total Number** | 320 | 225 | 133 |
| Chi-Square: $X^2$=8.48; df=6; $p$=0.205 | | | |

Table 4.17. Hunting participation analyzed by gender.

| Gender | Type of Hunting Participation | | |
|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter |
| **Male** | 31.9% | 63.0% | 73.5% |
| **Female** | 68.1% | 37.0% | 26.5% |
| **Total Number** | 329 | 227 | 136 |
| Chi-Square: $X^2$=88.48; df=2; $p$<0.001 | | | |

Table 4.18. Hunting participation analyzed by age & years of residence in North Dakota.

| Type of Hunting Participation | Age | Years of Residence in ND |
|---|---|---|
| | Mean (95% C.I.) | Mean (95% C.I.) |
| **Non-Hunter** | 46.8 (44.7 – 48.9) | 34.1 (31.5 – 36.7) |
| **Inactive Hunter** | 50.7 ( 48.5 – 53.0) | 38.7 (35.6 – 41.9) |
| **Active Hunter** | 42.3 ( 39.9 – 44.7) | 33.9 (30.7 – 37.0) |
| **Average (95% C.I.)** | 47.2 ( 45.9 – 48.5) | 35.5 (33.8 – 37.2) |
| **ANOVA** | F=9.79; df=2/684; $p$<0.001 | F=3.13; df=2/631; $p$=0.044 |

Table 4.19. Hunting participation analyzed by children (18 years old or less) living at home.

| Children Living at Home | Type of Hunting Participation | | |
|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter |
| **No Children at Home** | 69.4% | 73.9% | 54.4% |
| **Children at Home** | 30.6% | 26.1% | 45.6% |
| **Total Number** | 327 | 226 | 136 |
| Chi-Square: $X^2$=15.43; df=2; $p$<0.001 | | | |

Table 4.20. Hunting participation analyzed by ethnicity.

| Race | Type of Hunting Participation | | |
|---|---|---|---|
| | Non-Hunter | Inactive Hunter | Active Hunter |
| **White** | 96.5% | 99.5% | 98.4% |
| **Non-White** | 3.5% | 0.5% | 1.6% |
| **Total Number** | 317 | 206 | 125 |
| Chi-Square: $X^2$=5.49; df=2; $p$=0.064 | | | |

Table 4.20-A. Ethnicity - description of sample.

| Ethnicity | Number | Percent |
|---|---|---|
| **White** | 653 | 97.9% |
| **American Indian** | 7 | 1.1% |
| **Hispanic** | 4 | 0.5% |
| **Black** | 2 | 0.3% |
| **Asian** | 1 | 0.2% |
| **Total** | 667 | 100% |

Table 4.21. Hunting participation analyzed by education level.

| Highest Level of Education | Type of Hunting Participation | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Less than High School** | 7.1% | 1.8% | 1.5% |
| **High School or GED** | 25.2% | 34.5% | 28.1% |
| **2-Year Degree / Trade School** | 18.7% | 27.4% | 32.6% |
| **4-Year College Degree** | 34.4% | 22.6% | 30.4% |
| **College + (Advanced Degree)** | 14.7% | 13.7% | 7.4% |
| **Total Number** | 326 | 226 | 135 |
| Chi-Square: $X^2$=35.19; df=8; $p$<0.001 | | | |
| | | | |
| **Mean Education Level** | 3.24 | 3.12 | 3.14 |
| **95% Confidence Interval** | 3.11 – 3.37 | 2.98 – 3.26 | 2.97 – 3.31 |
| ANOVA: F=0.94; df=2/684; $p$=0.393 | | | |

Table 4.22. Hunting participation analyzed by income level.

| Highest Income Level (Level) | Type of Hunting Participation | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Less than $10,000 (1)** | 6.4% | 5.8% | 1.6% |
| **$10,000 – $29,999 (2)** | 23.1% | 17.4% | 14.6% |
| **$30,000 – $49,999 (3)** | 34.5% | 30.0% | 24.4% |
| **$50,000 – $69,999 (4)** | 16.9% | 22.1% | 26.0% |
| **$70,000 – $89,999 (5)** | 10.2% | 13.2% | 19.5% |
| **$90,000 – $109,999 (6)** | 4.4% | 5.8% | 5.7% |
| **$110,000 – $149,999 (7 & 8)** | 1.7% | 3.2% | 6.5% |
| **$150,000 or more (9)** | 3.1% | 2.6% | 1.6% |
| **Total Number** | 295 | 190 | 123 |
| Chi-Square: $X^2$=27.96; df=14; $p$=0.014 | | | |
| | | | |
| **Mean Income Level** | 3.41 | 3.68 | 4.01 |
| **95% Confidence Interval** | 3.22 – 3.60 | 3.44 – 3.92 | 3.72 – 4.29 |
| ANOVA: F=5.73; df=2/603; $p$=0.003 | | | |

Table 4.23. Hunting participation analyzed by size of current residence.

| Size of Current Residence (level) | Type of Hunting Participation | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Large City – 250,000 or more (1)** | 2.6% | 0.5% | 2.4% |
| **City w/ 100,000 – 249,999 (2)** | 19.2% | 11.7% | 12.8% |
| **City w/ 50,000 – 99,999 (3)** | 27.3% | 26.2% | 22.4% |
| **Small City w/ 25,000 – 49,999 (4)** | 12.7% | 12.6% | 12.0% |
| **Town w/ 10,000 – 24,999 (5)** | 10.4% | 13.6% | 8.0% |
| **Town w/ 5,000 – 9,999 (6)** | 4.9% | 4.4% | 5.6% |
| **Small town w/ less than 5,000 (7)** | 12.3% | 17.5% | 15.2% |
| **Farm or Rural Area (8)** | 10.7% | 13.6% | 21.6% |
| **Total Number** | 308 | 206 | 125 |
| Chi-Square: $X^2$=21.81; df=14; *p*=0.083 | | | |
| **Mean Residence Level** | 4.27 | 4.78 | 4.98 |
| **95% Confidence Interval** | 4.03 – 4.50 | 4.50 – 5.06 | 4.58 – 5.39 |
| ANOVA: F=6.59; df=2/637; *p*=0.001 | | | |

Table 4.24. Hunting participation analyzed by size of residence where raised.

| Size of Residence Where Raised (level) | Type of Hunting Participation | | |
|---|---|---|---|
| | **Non-Hunter** | **Inactive Hunter** | **Active Hunter** |
| **Large City – 250,000 or more (1)** | 5.9% | 2.9% | 4.0% |
| **City w/ 100,000 – 249,999 (2)** | 9.4% | 5.9% | 3.2% |
| **City w/ 50,000 – 99,999 (3)** | 14.0% | 8.8% | 10.5% |
| **Small City w/ 25,000 – 49,999 (4)** | 8.1% | 7.4% | 9.7% |
| **Town w/ 10,000 – 24,999 (5)** | 9.1% | 10.3% | 6.5% |
| **Town w/ 5,000 – 9,999 (6)** | 4.2% | 6.4% | 5.6% |
| **Small town w/ less than 5,000 (7)** | 20.2% | 30.4% | 24.2% |
| **Farm or Rural Area (8)** | 29.0% | 27.9% | 36.3% |
| **Total Number** | 307 | 204 | 124 |
| Chi-Square: $X^2$=21.04; df=14; *p*=0.101 | | | |
| **Mean Residence Level** | 5.44 | 5.98 | 6.09 |
| **95% Confidence Interval** | 5.17 – 5.70 | 5.69 – 6.26 | 5.71 – 6.47 |
| ANOVA: F=5.47; df=2/631; *p*=0.004 | | | |

## Section C: Description of Wildlife Viewing Participants (Non-Viewers, Inactive Viewers and Active Viewers)

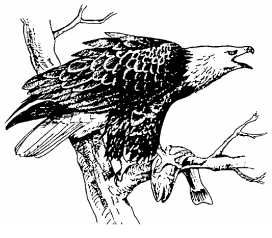
**Wildlife Viewing Participation and Interest.** About 24% of the adult North Dakota residents reported taking a recreational trip in the past year for the primary purpose of wildlife viewing and another 23% reported taking a trip for wildlife viewing in the past, but not in the recent year (Table 4.25). About 52% of the non-viewers reported having some interest in wildlife viewing in the future, representing about 28% of the adult population. Most of the inactive (88%) and active wildlife viewers (96%) had some level of interest in wildlife viewing in the future. Overall, about only 29% of the adult population have no interest in wildlife viewing.

Wildlife viewing was strongly related to fishing and hunting participation (Table 4.26). About 53% of the active viewers were active anglers and 34% were active hunters.

**Describing the Wildlife Viewer.** Higher proportions of wildlife viewers (both inactive and active) were mutualists and non-viewers had a higher proportion of utilitarian and distanced wildlife value orientations (Table 4.27). Overall, wildlife viewers had higher levels of interest in protecting nongame species (Table 4.28).

Gender was not related to wildlife viewing participation (Table 4.29). Non-viewers were older and lived more years in North Dakota compared to wildlife viewers (inactive and active) (Table 4.30). The children living at home variable was not related to wildlife viewing participation (Table 4.31). Wildlife viewers had slightly higher percentages of non-whites compared to whites, however, the number of non-whites in the sample was too small for an accurate assessment of the relationship between wildlife viewing participation and race (Table 4.32).

Active wildlife viewers had both higher education and income levels compared to non-viewers and inactive viewers (Tables 4.33 and 4.34). Non-viewers had a higher proportion of folks living in a rural area compared to viewers, but overall, size of current residence was not related to wildlife viewing participation in any meaningful manner (Table 4.35). Overall, active wildlife viewers tended to have been raised in a more urban setting compared to non-viewers (Table 4.36).



## Wildlife Viewing Participation and Interest:

Table 4.25. Wildlife viewing participation and interest in wildlife viewing in the future by adult, North Dakota residents.

| **Type of Viewing Participation** | **Number** | **Percent** |
|---|---|---|
| **Non-Viewer** – Never viewed wildlife | 368 | 53.4% |
| **Inactive Viewer** – Viewed in the past but not recently (past year) | 158 | 23.0% |
| **Active Viewer** – Viewed wildlife recently (past 1 year) | 163 | 23.7% |
| **Total** | 690 | 100% |

| **Interest in Viewing (scale score)** | **Type of Viewing Participation** | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Not at all Interested (0)** | 48.2% | 12.0% | 4.3% |
| **Slightly Interested (1)** | 30.0% | 27.8% | 15.4% |
| **Moderately Interested (2)** | 19.1% | 38.6% | 25.9% |
| **Strongly Interested (3)** | 2.7% | 21.5% | 54.3% |
| **Total Number → (690)** | 367 | 158 | 162 |
| **Mean → (1.34)** | 0.76 | 1.70 | 2.30 |
| **95% C.I. → (1.26 – 1.42)** | 0.67 – 0.85 | 1.55 – 1.85 | 2.16 – 2.44 |

Table 4.26. Fishing and hunting participation analyzed by wildlife viewing participation.

| **Type of Fishing Participation** | **Type of Viewing Participation** | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Non-Angler** | 26.4% | 6.3% | 8.0% |
| **Inactive Angler** | 53.1% | 64.6% | 38.7% |
| **Active Angler** | 20.4% | 29.1% | 53.4% |
| **Total Number** | 367 | 158 | 163 |
| Chi-Square: $X^2$=87.54; df=4; $p$<0.001 | | | |

| **Type of Hunting Participation** | **Type of Viewing Participation** | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Non-Hunter** | 54.6% | 41.8% | 36.8% |
| **Inactive Hunter** | 31.3% | 41.1% | 28.8% |
| **Active Hunter** | 14.1% | 17.1% | 34.4% |
| **Total Number** | 368 | 158 | 163 |
| Chi-Square: $X^2$=37.57; df=4; $p$<0.001 | | | |

## Describing the Wildlife Viewer:

Table 4.27. Viewing participation analyzed by wildlife value orientation.

| Wildlife Value Orientation | Type of Viewing Participation | | |
|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer |
| **Pluralist** | 28.5% | 32.3% | 33.5% |
| **Utilitarian** | 48.5% | 45.6% | 38.4% |
| **Mutualist** | 11.8% | 19.0% | 22.6% |
| **Distanced** | 11.2% | 3.2% | 5.5% |
| **Total Number** | 365 | 158 | 164 |
| Chi-Square: $X^2$=23.69; df=6; *p*=0.001 | | | |

Table 4.28. Viewing participation analyzed by wildlife importance groups.

| Wildlife Diversity Importance Groups | Type of Viewing Participation | | |
|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer |
| **Low** | 16.9% | 9.7% | 10.7% |
| **Medium Low** | 34.8% | 29.7% | 28.9% |
| **Medium High** | 39.5% | 43.9% | 45.3% |
| **High** | 8.8% | 16.8% | 15.1% |
| **Total Number** | 362 | 155 | 159 |
| Chi-Square: $X^2$=15.29; df=6; *p*=0.018 | | | |

Table 4.29. Viewing participation analyzed by gender.

| Gender | Type of Viewing Participation | | |
|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer |
| **Male** | 48.6% | 56.6% | 47.2% |
| **Female** | 51.4% | 43.4% | 52.8% |
| **Total Number** | 368 | 159 | 163 |
| Chi-Square: $X^2$=3.54; df=2; *p*=0.171 | | | |

Table 4.30. Viewing participation analyzed by age & years of residence in North Dakota.

| Type of Wildlife Viewing Participation | Age | Years of Residence in ND |
|---|---|---|
| | Mean (95% C.I.) | Mean (95% C.I.) |
| **Non-Viewer** | 49.9 (48.0 – 51.8) | 39.3 (36.9 – 41.7) |
| **Inactive Viewer** | 45.0 (42.2 – 47.7) | 32.9 (29.4 – 36.5) |
| **Active Viewer** | 43.8 (41.4 – 46.2) | 30.4 (27.1 – 33.6) |
| **Average (95% C.I.)** | 47.3 (46.0 – 48.6) | 35.7 (33.9 – 37.4) |
| **ANOVA** | F=8.58; df=2/681; *p*<0.001 | F=10.38; df=2/628; *p*<0.001 |

Table 4.31. Viewing participation analyzed by children (18 years old or less) living at home.

| Children Living at Home | Type of Viewing Participation | | |
|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer |
| **No Children at Home** | 70.1% | 66.5% | 63.8% |
| **Children at Home** | 29.9% | 33.5% | 36.2% |
| **Total Number** | 365 | 158 | 163 |
| Chi-Square: $X^2$=2.24; df=2; *p*=0.327 | | | |

Table 4.32. Viewing participation analyzed by ethnicity.

| Race | Type of Viewing Participation | | |
|---|---|---|---|
| | Non-Viewer | Inactive Viewer | Active Viewer |
| **White** | 99.1% | 95.9% | 96.8% |
| **Non-White** | 0.9% | 4.1% | 3.2% |
| **Total Number** | 342 | 148 | 157 |
| Chi-Square: $X^2$=5.95; df=2; *p*=0.051 | | | |

Table 4.32-A. Ethnicity - description of sample.

| Ethnicity | Number | Percent |
|---|---|---|
| **White** | 653 | 97.9% |
| **American Indian** | 7 | 1.1% |
| **Hispanic** | 4 | 0.5% |
| **Black** | 2 | 0.3% |
| **Asian** | 1 | 0.2% |
| **Total** | 667 | 100% |

Table 4.33. Viewing participation analyzed by education level.

| Highest Level of Education | Type of Viewing Participation | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Less than High School** | 6.0% | 3.1% | 1.2% |
| **High School or GED** | 32.1% | 32.7% | 18.4% |
| **2-Year Degree / Trade School** | 21.4% | 28.3% | 27.0% |
| **4-Year College Degree** | 31.0% | 25.8% | 29.4% |
| **College + (Advanced Degree)** | 9.3% | 10.1% | 23.9% |
| **Total Number** | 364 | 159 | 163 |
| Chi-Square: $X^2$=38.67; df=8; $p$<0.001 | | | |
| | | | |
| **Mean Education Level** | 3.06 | 3.07 | 3.56 |
| **95% Confidence Interval** | 2.94 – 3.17 | 2.90 – 3.23 | 3.39 – 3.73 |
| ANOVA: F=13.02; df=2/681; $p$<0.001 | | | |

Table 4.34. Viewing participation analyzed by income level.

| Highest Income Level (Level) | Type of Viewing Participation | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Less than $10,000 (1)** | 7.2% | 3.0% | 4.0% |
| **$10,000 – $29,999 (2)** | 21.9% | 21.5% | 11.9% |
| **$30,000 – $49,999 (3)** | 32.6% | 31.9% | 27.2% |
| **$50,000 – $69,999 (4)** | 15.7% | 25.2% | 25.2% |
| **$70,000 – $89,999 (5)** | 11.6% | 11.9% | 17.2% |
| **$90,000 – $109,999 (6)** | 5.3% | 3.7% | 5.3% |
| **$110,000 – $149,999 (7 & 8)** | 2.8% | 2.2% | 4.6% |
| **$150,000 or more (9)** | 2.8% | 0.7% | 4.6% |
| **Total Number** | 319 | 135 | 151 |
| Chi-Square: $X^2$=26.06; df=14; $p$=0.025 | | | |
| | | | |
| **Mean Income Level** | 3.48 | 3.47 | 4.04 |
| **95% Confidence Interval** | 3.29 – 3.67 | 3.24 – 3.70 | 3.75 – 4.33 |
| ANOVA: F=6.50; df=2/600; $p$=0.002 | | | |

Table 4.35. Viewing participation analyzed by size of current residence.

| Size of Current Residence (level) | Type of Viewing Participation | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Large City – 250,000 or more (1)** | 2.9% | 0.7% | 0.7% |
| **City w/ 100,000 – 249,999 (2)** | 17.4% | 9.7% | 17.1% |
| **City w/ 50,000 – 99,999 (3)** | 23.8% | 32.4% | 23.7% |
| **Small City w/ 25,000 – 49,999 (4)** | 11.8% | 15.2% | 11.2% |
| **Town w/ 10,000 – 24,999 (5)** | 11.8% | 9.0% | 11.2% |
| **Town w/ 5,000 – 9,999 (6)** | 4.4% | 4.1% | 6.6% |
| **Small town w/ less than 5,000 (7)** | 10.3% | 22.1% | 17.1% |
| **Farm or Rural Area (8)** | 17.6% | 6.9% | 12.5% |
| **Total Number** | 340 | 145 | 152 |
| Chi-Square: $X^2$=34.13; df=14; *p*=0.002 | | | |
| **Mean Residence Level** | 4.55 | 4.56 | 4.65 |
| **95% Confidence Interval** | 4.31 – 4.78 | 4.24 – 4.88 | 4.31 – 4.99 |
| ANOVA: F=0.13; df=2/634; *p*=0.875 | | | |

Table 4.36. Viewing participation analyzed by size of residence where raised.

| Size of Residence Where Raised (level) | Type of Viewing Participation | | |
|---|---|---|---|
| | **Non-Viewer** | **Inactive Viewer** | **Active Viewer** |
| **Large City – 250,000 or more (1)** | 1.8% | 4.9% | 10.5% |
| **City w/ 100,000 – 249,999 (2)** | 6.8% | 7.0% | 7.2% |
| **City w/ 50,000 – 99,999 (3)** | 10.1% | 16.9% | 9.8% |
| **Small City w/ 25,000 – 49,999 (4)** | 8.3% | 7.0% | 9.2% |
| **Town w/ 10,000 – 24,999 (5)** | 9.5% | 4.9% | 12.4% |
| **Town w/ 5,000 – 9,999 (6)** | 4.1% | 5.6% | 7.2% |
| **Small town w/ less than 5,000 (7)** | 25.1% | 28.9% | 19.0% |
| **Farm or Rural Area (8)** | 34.3% | 24.6% | 24.8% |
| **Total Number** | 338 | 142 | 153 |
| Chi-Square: $X^2$=36.83; df=14; *p*=0.001 | | | |
| **Mean Residence Level** | 6.01 | 5.56 | 5.27 |
| **95% Confidence Interval** | 5.78 – 6.24 | 5.18 – 5.95 | 4.89 – 5.66 |
| ANOVA: F=6.20; df=2/629; *p*=0.002 | | | |

## Summary:

Overall, fishing, hunting and wildlife viewing participation were related to most of the demographic variables measured in this survey (Table 4.37). Overall, about 54% of the adult population in North Dakota did not participate in fishing, hunting or taking a recreational trip with wildlife viewing as the primary reason in the past year (Table 4.38). Only about 7% participated in all three activities in the past year. Interest in participating in these three activities in the future was significantly correlated (Table 4.39). Interest in participating in fishing and hunting and fishing and wildlife viewing were strongly correlated.

Size of current residence and size of residence where raised can have an influence on wildlife related attitudes and behaviors (i.e., the urban-rural influence). The change in residential can also be part of that influence. About one-third of the adult North Dakota residents are currently living in the same residential status as where they were raised, however most (51%) currently live in a more urban residence than where raised (Table 4.40). The degree of change may also play an important role (Figure 4.1).

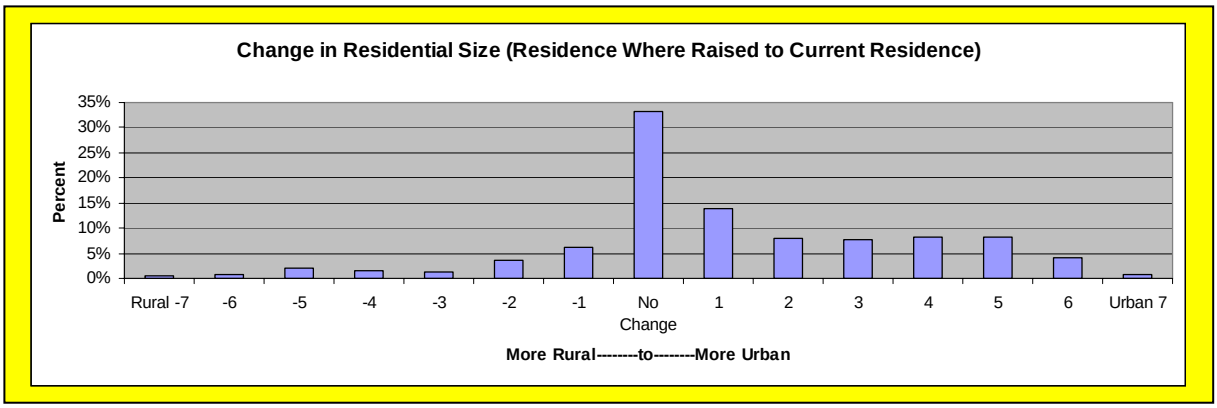



Figure 4.1. The degree of change in size of residential status from where raised to current residence.

Table 4.37. Summary of variables tested for relationship with fishing, hunting and wildlife viewing participation.

| Variable | Participation | | |
|---|---|---|---|
| | **Fishing** | **Hunting** | **Wildlife Viewing** |
| **Fishing** | | ***Significant*** | ***Significant*** |
| **Hunting** | ***Significant*** | | ***Significant*** |
| **Wildlife Viewing** | ***Significant*** | ***Significant*** | |
| **Wildlife Value Orientation** | ***Significant*** | ***Significant*** | ***Significant*** |
| **Wildlife Diversity Importance** | ***Significant*** | **NOT** | ***Significant*** |
| **Gender** | ***Significant*** | ***Significant*** | **NOT** |
| **Age** | ***Significant*** | ***Significant*** | ***Significant*** |
| **Years of Residence in ND** | ***Significant*** | ***Significant*** | ***Significant*** |
| **Children Living at Home** | ***Significant*** | ***Significant*** | **NOT** |
| **Race** | ***Significant*** | **NOT** | ***Significant*** |
| **Education** | ***Significant*** | ***Significant*** | ***Significant*** |
| **Income** | ***Significant*** | ***Significant*** | ***Significant*** |
| **Current Residence** | **NOT** | ***Significant*** | ***Significant*** |
| **Residence Where Raised** | **NOT** | ***Significant*** | ***Significant*** |

Table 4.38. Summary of participation based on active participation of North Dakota adult residents – 2004.

| Participation Type | Number | Percent |
|---|---|---|
| **Non-participant** | 371 | 54.3% |
| **Hunter Only** | 30 | 4.4% |
| **Angler Only** | 72 | 10.5% |
| **Viewer Only** | 64 | 9.4% |
| **Hunter & Angler** | 46 | 6.7% |
| **Hunter & Viewer** | 12 | 1.8% |
| **Angler & Viewer** | 43 | 6.3% |
| **Hunter-Angler-Viewer** | 45 | 6.6% |
| **Total** | 683 | 100% |

Table 4.39. Relationship (Pearson correlation) among interest in future participation in fishing, hunting and wildlife watching.

| Interest in…[1,2] | Interest in…[1,2] | | |
|---|---|---|---|
| | **Fishing** | **Hunting** | **Wildlife Watching** |
| **Fishing** | 1.000 | 0.615 | 0.505 |
| **Hunting** | 0.615 | 1.000 | 0.297 |
| **Wildlife Watching** | 0.505 | 0.297 | 1.000 |

[1]Interest coded as: 0 = Not at all Interested, 1 = Slightly Interested, 2 = Moderately Interested, 3 = Strongly Interested

[2]All correlation significant: $p<0.001$

Table 4.40. Type of residence where raised compared with current residence.

| Current Residence (Level) | Type of Residence Where Raised | | | | | | | | Total Number |
|---|---|---|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 | Level 7 | Level 8 | |
| 250,000 or more (1) | 0.2% | 0.3% | 0.2% | 0.0% | 0.0% | 0.2% | 0.3% | 0.8% | 12 |
| 100,000 – 249,999 (2) | 0.9% | 2.8% | 2.6% | 1.2% | 1.1% | 0.5% | 2.6% | 3.7% | 100 |
| 50,000 – 99,999 (3) | 1.7% | 1.6% | 7.0% | 1.2% | 2.3% | 1.6% | 4.8% | 5.6% | 166 |
| 25,000 – 49,999 (4) | 0.3% | 0.5% | 0.3% | 3.9% | 1.1% | 0.6% | 2.8% | 2.8% | 79 |
| 10,000 – 24,999 (5) | 0.5% | 0.2% | 0.3% | 0.8% | 3.9% | 1.2% | 2.3% | 2.2% | 73 |
| 5,000 – 9,999 (6) | 0.2% | 0.0% | 0.2% | 0.2% | 0.2% | 0.8% | 1.7% | 1.4% | 29 |
| less than 5,000 (7) | 0.3% | 0.9% | 0.3% | 0.3% | 0.5% | 0.0% | 6.7% | 5.7% | 95 |
| Farm–Rural Area (8) | 0.3% | 0.5% | 0.9% | 0.6% | 0.5% | 0.6% | 2.5% | 8.1% | 90 |
| Total Number | 28 | 43 | 76 | 53 | 61 | 35 | 153 | 195 | 644 |

| Residence Change Status | Percent |
|---|---|
| Remained the Same | 33.2% |
| Became more Urban | 50.9% |
| Became more Rural | 15.8% |

| Current Residence (Level) | Type of Residence Where Raised | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Level 6 | Level 7 | Level 8 |
| 250,000 or more (1) | 3.6% | 4.7% | 1.3% | 0.0% | 0.0% | 2.9% | 1.3% | 2.6% |
| 100,000 – 249,999 (2) | 21.4% | 41.9% | 22.4% | 15.1% | 11.5% | 8.6% | 11.1% | 12.3% |
| 50,000 – 99,999 (3) | 39.3% | 23.3% | 59.2% | 15.1% | 24.6% | 28.6% | 20.3% | 18.5% |
| 25,000 – 49,999 (4) | 7.1% | 7.0% | 2.6% | 47.2% | 11.5% | 11.4% | 11.8% | 9.2% |
| 10,000 – 24,999 (5) | 10.7% | 2.3% | 2.6% | 9.4% | 41.0% | 22.9% | 9.8% | 7.2% |
| 5,000 – 9,999 (6) | 3.6% | 0.0% | 1.3% | 1.9% | 1.6% | 14.3% | 7.2% | 4.6% |
| less than 5,000 (7) | 7.1% | 14.0% | 2.6% | 3.8% | 4.9% | 0.0% | 28.1% | 19.0% |
| Farm–Rural Area (8) | 7.1% | 7.0% | 7.9% | 7.5% | 4.9% | 11.4% | 10.5% | 26.7% |
| Total Number | 28 | 43 | 76 | 53 | 61 | 35 | 153 | 195 |

# Part 5 – Demographic Description of North Dakota Residents from Two Perspectives – Who are our customers?

## Section A: Description of Wildlife Diversity Importance Groups (Low, Medium Low, Medium High and High)

The "low" wildlife diversity importance group had a higher percent of non-anglers and lower percent of active anglers compared to the three higher wildlife diversity importance groups (Table 5.1). Hunting participation was not related to the wildlife diversity importance groups. On the other hand, wildlife viewing was linearly related to the wildlife diversity importance groups. The "low" wildlife diversity group had the highest percent of non-viewers and the lowest percent of active viewers ranging linearly to the "high" wildlife diversity group, which had the lowest percent of non-viewers and the highest percent of active viewers.

The wildlife diversity importance groups were very strongly related to the wildlife value orientation groups (Table 5.2). The "low" wildlife diversity importance group was comprised mainly of utilitarians (79%), while the "high" wildlife diversity importance group contained the highest percentage of both pluralists (42%) and mutualists (29%) compared to the lower three wildlife diversity importance groups and the lowest percent of utilitarians (26%).

Gender, years living in North Dakota, children living at home, race, education, and income were not significantly related to the wildlife diversity importance groups (Tables 5.3 – 5.8). Age was only weakly related to wildlife diversity importance groups– the "high" wildlife diversity importance group had the highest mean age, but the difference was not very large (Table 5.4). The "low" wildlife diversity importance group had the highest percent currently living in a rural area and having been raised in a rural area compared to the higher three wildlife diversity importance groups (Tables 5.9 and 5.10). Also, the "high" wildlife diversity importance group had the highest percent having been raised in a large city compared to the lower three wildlife diversity importance groups.

Table 5.1. Wildlife diversity importance groups analyzed by fishing, hunting and wildlife viewing participation.

| **Type of Fishing Participation** | **Wildlife Diversity Importance Groups** | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Non-Angler** | 29.3% | 13.3% | 16.7% | 12.2% |
| **Inactive Angler** | 52.2% | 53.7% | 52.1% | 54.9% |
| **Active Angler** | 18.5% | 33.0% | 31.2% | 32.9% |
| **Total Number** | 92 | 218 | 282 | 82 |
| Chi-Square: $X^2$=16.44; df=6; $p$=0.012 | | | | |
| | | | | |
| **Type of Hunting Participation** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Non-Hunter** | 55.9% | 49.3% | 44.2% | 42.2% |
| **Inactive Hunter** | 30.1% | 28.3% | 36.7% | 37.3% |
| **Active Hunter** | 14.0% | 22.4% | 19.1% | 20.5% |
| **Total Number** | 93 | 219 | 283 | 83 |
| Chi-Square: $X^2$=8.48; df=6; $p$=0.205 | | | | |
| | | | | |
| **Type of Wildlife Viewing Participation** | **Wildlife Diversity Importance Groups** | | | |
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Non-Viewer** | 65.6% | 57.8% | 50.5% | 39.0% |
| **Inactive Viewer** | 16.1% | 21.1% | 24.0% | 31.7% |
| **Active Viewer** | 18.3% | 21.1% | 25.4% | 29.3% |
| **Total Number** | 93 | 218 | 283 | 82 |
| Chi-Square: $X^2$=15.29; df=6; $p$=0.018 | | | | |

Table 5.2. Wildlife diversity importance groups analyzed by wildlife value orientation.

| **Wildlife Value Orientation** | **Wildlife Diversity Importance Groups** | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Pluralist** | 14.0% | 18.7% | 41.2% | 42.4% |
| **Utilitarian** | 78.5% | 54.7% | 34.9% | 25.9% |
| **Mutualist** | 3.2% | 15.6% | 15.6% | 29.4% |
| **Distanced** | 4.3% | 11.1% | 8.3% | 2.4% |
| **Total Number** | 93 | 225 | 289 | 85 |
| Chi-Square: $X^2$=100.92; df=9; $p$<0.001 | | | | |

Table 5.3. Wildlife diversity importance groups analyzed by gender.

| Gender | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Male** | 51.1% | 50.7% | 50.0% | 48.8% |
| **Female** | 48.9% | 49.3% | 50.0% | 51.2% |
| **Total Number** | 92 | 221 | 284 | 82 |
| Chi-Square: $X^2$=0.12; df=3; *p*=0.989 | | | | |

Table 5.4. Wildlife diversity importance groups analyzed by age & years of residence in North Dakota.

| Wildlife Diversity Importance Groups | Age | Years of Residence in ND |
|---|---|---|
| | **Mean (95% C.I.)** | **Mean (95% C.I.)** |
| **Low** | 47.4 (43.8 – 50.9) | 36.0 (31.5 – 40.4) |
| **Medium Low** | 45.9 (43.6 – 48.2) | 34.0 (31.0 – 37.0) |
| **Medium High** | 46.7 (44.6 – 48.8) | 36.1 (33.6 – 38.6) |
| **High** | 52.5 (48.3 – 56.8) | 37.6 (31.1 – 44.0) |
| **Average (95% C.I.)** | 47.2 (45.9 – 48.6) | 35.6 (33.9 – 37.3) |
| **ANOVA** | F=2.95; df=3/669; *p*=0.032 | F=0.60; df=3/620; *p*=0.616 |

Table 5.5. Wildlife diversity importance groups analyzed by children (18 years old or less) living at home.

| Children Living at Home | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **No Children at Home** | 60.9% | 64.3% | 69.3% | 77.1% |
| **Children at Home** | 39.1% | 35.7% | 30.7% | 22.9% |
| **Total Number** | 92 | 221 | 280 | 83 |
| Chi-Square: $X^2$=6.80; df=3; *p*=0.079 | | | | |

Table 5.6. Wildlife diversity importance groups analyzed by ethnicity.

| Race | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **White** | 97.7% | 98.6% | 97.1% | 97.4% |
| **Non-White** | 2.3% | 1.4% | 2.9% | 2.6% |
| **Total Number** | 88 | 214 | 274 | 76 |
| Chi-Square: $X^2$=1.27; df=3; *p*=0.735 | | | | |

Table 5.7. Wildlife diversity importance groups analyzed by education level.

| Highest Level of Education | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Less than High School** | 5.4% | 5.0% | 3.2% | 6.1% |
| **High School or GED** | 22.6% | 27.9% | 31.8% | 29.3% |
| **2-Year Degree / Trade School** | 23.7% | 24.2% | 23.9% | 28.0% |
| **4-Year College Degree** | 36.6% | 33.8% | 25.0% | 22.0% |
| **College + (Advanced Degree)** | 11.8% | 9.1% | 16.1% | 14.6% |
| **Total Number** | 93 | 219 | 280 | 82 |
| Chi-Square: $X^2$=15.76; df=12; *p*=0.202 | | | | |
| | | | | |
| **Mean Education Level** | 3.26 | 3.13 | 3.19 | 3.11 |
| **95% Confidence Interval** | 3.03 – 3.49 | 2.99 – 3.28 | 3.05 – 3.32 | 2.85 – 3.36 |
| ANOVA: F=0.39; df=3/669; *p*=0.759 | | | | |

Table 5.8. Wildlife diversity importance groups analyzed by income level.

| Highest Income Level (Level) | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Less than $10,000 (1)** | 0.0% | 6.7% | 5.8% | 5.4% |
| **$10,000 – $29,999 (2)** | 19.8% | 16.9% | 21.4% | 21.6% |
| **$30,000 – $49,999 (3)** | 32.1% | 31.8% | 31.5% | 29.7% |
| **$50,000 – $69,999 (4)** | 19.8% | 21.5% | 18.3% | 20.3% |
| **$70,000 – $89,999 (5)** | 16.0% | 12.3% | 12.5% | 14.9% |
| **$90,000 – $109,999 (6)** | 6.2% | 4.6% | 4.3% | 5.4% |
| **$110,000 – $149,999 (7 & 8)** | 6.2% | 3.1% | 2.7% | 1.4% |
| **$150,000 or more (9)** | 0.0% | 3.1% | 3.5% | 1.4% |
| **Total Number** | 81 | 195 | 257 | 74 |
| Chi-Square: $X^2$=15.28; df=21; *p*=0.808 | | | | |
| | | | | |
| **Mean Income Level** | 3.77 | 3.64 | 3.56 | 3.48 |
| **95% Confidence Interval** | 3.44 – 4.10 | 3.40 – 3.89 | 3.35 – 3.77 | 3.13 – 3.83 |
| ANOVA: F=0.50; df=3/606; *p*=0.684 | | | | |

Table 5.9. Wildlife diversity importance groups analyzed by size of current residence.

| Size of Current Residence (level) | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Large City – 250,000 or more (1)** | 1.1% | 2.3% | 3.0% | 0.0% |
| **City w/ 100,000 – 249,999 (2)** | 19.5% | 12.6% | 19.4% | 5.3% |
| **City w/ 50,000 – 99,999 (3)** | 19.5% | 27.9% | 25.7% | 26.3% |
| **Small City w/ 25,000 – 49,999 (4)** | 9.2% | 9.8% | 11.9% | 19.7% |
| **Town w/ 10,000 – 24,999 (5)** | 11.5% | 13.5% | 7.5% | 14.5% |
| **Town w/ 5,000 – 9,999 (6)** | 9.2% | 6.0% | 2.2% | 6.6% |
| **Small town w/ less than 5,000 (7)** | 6.9% | 13.5% | 19.0% | 13.2% |
| **Farm or Rural Area (8)** | 23.0% | 14.4% | 11.2% | 14.5% |
| **Total Number** | 87 | 215 | 268 | 76 |
| Chi-Square: $X^2$=46.79; df=21; *p*=0.001 | | | | |
| **Mean Residence Level** | 4.78 | 4.65 | 4.41 | 4.88 |
| **95% Confidence Interval** | 4.29 – 5.27 | 4.36 – 4.93 | 4.15 – 4.68 | 4.45 – 5.32 |
| ANOVA: F=1.37; df=3/642; *p*=0.253 | | | | |

Table 5.10. Wildlife diversity importance groups analyzed by size of residence where raised.

| Size of Residence Where Raised (level) | Wildlife Diversity Importance Groups | | | |
|---|---|---|---|---|
| | **Low** | **Medium Low** | **Medium High** | **High** |
| **Large City – 250,000 or more (1)** | 3.6% | 5.2% | 2.3% | 11.7% |
| **City w/ 100,000 – 249,999 (2)** | 13.1% | 8.5% | 4.2% | 6.5% |
| **City w/ 50,000 – 99,999 (3)** | 11.9% | 10.4% | 15.6% | 3.9% |
| **Small City w/ 25,000 – 49,999 (4)** | 4.8% | 9.4% | 6.5% | 14.3% |
| **Town w/ 10,000 – 24,999 (5)** | 4.8% | 9.4% | 10.6% | 9.1% |
| **Town w/ 5,000 – 9,999 (6)** | 6.0% | 7.5% | 3.8% | 3.9% |
| **Small town w/ less than 5,000 (7)** | 20.2% | 20.3% | 28.1% | 24.7% |
| **Farm or Rural Area (8)** | 35.7% | 29.2% | 28.9% | 26.0% |
| **Total Number** | 84 | 212 | 263 | 77 |
| Chi-Square: $X^2$=44.48; df=21; *p*=0.002 | | | | |
| **Mean Residence Level** | 5.76 | 5.59 | 5.87 | 5.45 |
| **95% Confidence Interval** | 5.24 – 6.28 | 5.27 – 5.90 | 5.61 – 6.12 | 4.89 – 6.02 |
| ANOVA: F=0.97; df=3/632; *p*=0.407 | | | | |

## Section B: Description of Wildlife Value Orientation Groups (Pluralist, Utilitarian, Mutualist, and Distanced)

The wildlife value orientation groups were significantly related to fishing, hunting and wildlife viewing participation (Table 5.11). The pluralists tended to be similar to the mutualists in fishing participation, similar to the utilitarians in hunting participation and somewhat in-between the mutualists and utilitarians in wildlife viewing (Table 5.11). The utilitarians had the highest percent of active anglers and hunters while the mutualists had the highest percent of active wildlife viewers. The distanced group was comprised mainly of inactive anglers, non-hunters and non-viewers.

The wildlife value orientation groups were very strongly related to the wildlife diversity importance groups (Table 5.12). The utilitarians had the highest percent of the "low" wildlife diversity importance group compared to the other three wildlife value orientation groups. The mutualists had the highest percent of the "high" wildlife diversity importance group compared to the other three wildlife value orientation groups.

Gender was significantly related to the wildlife value orientation groups (Table 5.13). Mutualists were comprised of 68% female and distanced had 59% female compared to the utilitarians being about 61% male. Age was not related significantly to the wildlife value orientation groups (Table 5.14). However, mutualists lived significantly fewer years in North Dakota, especially compared to the utilitarians.

Children living at home and race were not significantly related to the wildlife value orientation groups (Tables 5.15 and 5.16). Education and income were not significantly related to the wildlife value orientation groups however, the mutualists tended to have a higher percentage of people with advanced degrees (Tables 5.17 and 5.18).

Mutualists and distanced wildlife value orientation groups tended to currently live in more urban residences and the mutualists were more likely to have been raised in urban settings compared to the other three wildlife value orientation groups (Tables 5.19 and 5.20)

Table 5.11. Wildlife value orientation groups analyzed by fishing, hunting and wildlife viewing participation.

| **Type of Fishing Participation** | **Wildlife Value Orientation Groups** | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Non-Angler** | 16.7% | 19.0% | 16.4% | 11.1% |
| **Inactive Angler** | 54.1% | 46.0% | 56.4% | 75.9% |
| **Active Angler** | 29.2% | 34.9% | 27.3% | 13.0% |
| **Total Number** | 209 | 315 | 110 | 54 |
| Chi-Square: $X^2$=18.43; df=6; $p$=0.005 | | | | |
| | | | | |
| **Type of Hunting Participation** | **Wildlife Value Orientation Groups** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Non-Hunter** | 44.8% | 39.7% | 67.0% | 64.8% |
| **Inactive Hunter** | 33.3% | 35.2% | 27.5% | 27.8% |
| **Active Hunter** | 21.9% | 25.1% | 5.5% | 7.4% |
| **Total Number** | 210 | 315 | 109 | 54 |
| Chi-Square: $X^2$=38.93; df=6; $p$<0.001 | | | | |
| | | | | |
| **Type of Wildlife Viewing Participation** | **Wildlife Value Orientation Groups** | | | |
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Non-Viewer** | 49.5% | 56.7% | 39.1% | 74.5% |
| **Inactive Viewer** | 24.3% | 23.1% | 27.3% | 9.1% |
| **Active Viewer** | 26.2% | 20.2% | 33.6% | 16.4% |
| **Total Number** | 210 | 312 | 110 | 55 |
| Chi-Square: $X^2$=23.69; df=6; $p$=0.001 | | | | |

Table 5.12. Wildlife value orientation groups analyzed by wildlife value orientation.

| **Wildlife Diversity Importance Groups** | **Wildlife Value Orientation Groups** | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Low** | 6.2% | 22.9% | 2.8% | 7.3% |
| **Medium Low** | 20.0% | 38.6% | 32.4% | 45.5% |
| **Medium High** | 56.7% | 31.7% | 41.7% | 43.6% |
| **High** | 17.1% | 6.9% | 23.1% | 3.6% |
| **Total Number** | 210 | 319 | 108 | 55 |
| Chi-Square: $X^2$=100.92; df=9; $p$<0.001 | | | | |

Table 5.13. Wildlife value orientation groups analyzed by gender.

| Gender | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Male** | 47.1% | 60.6% | 31.8% | 41.1% |
| **Female** | 52.9% | 39.4% | 68.2% | 58.9% |
| **Total Number** | 210 | 317 | 110 | 56 |
| Chi-Square: $X^2$=31.14; df=3; $p$<0.001 | | | | |

Table 5.14. Wildlife value orientation groups analyzed by age & years of residence in North Dakota.

| Wildlife Value Orientation Groups | Age | Years of Residence in ND |
|---|---|---|
| | **Mean (95% C.I.)** | **Mean (95% C.I.)** |
| **Pluralist** | 47.9 (45.4 – 50.4) | 35.2 (32.1 – 38.3) |
| **Utilitarian** | 48.2 (46.3 – 50.2) | 38.3 (35.6 – 40.9) |
| **Mutualist** | 43.8 (40.4 – 47.3) | 29.7 (25.6 – 33.7) |
| **Distanced** | 45.5 (41.0 – 50.0) | 34.0 (28.5 – 39.5) |
| **Average (95% C.I.)** | 47.2 (45.9 – 48.6) | 35.6 (33.9 – 37.3) |
| **ANOVA** | F=1.93; df=3/683; $p$=0.124 | F=4.02; df=3/632; $p$=0.007 |

Table 5.15. Wildlife value orientation groups analyzed by children (18 years old or less) living at home.

| Children Living at Home | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **No Children at Home** | 68.4% | 65.1% | 67.3% | 80.4% |
| **Children at Home** | 31.6% | 34.9% | 32.7% | 19.6% |
| **Total Number** | 209 | 315 | 110 | 56 |
| Chi-Square: $X^2$=5.15; df=3; $p$=0.161 | | | | |

Table 5.16. Wildlife value orientation groups analyzed by ethnicity.

| Race | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **White** | 95.5% | 98.7% | 98.1% | 100% |
| **Non-White** | 4.5% | 1.3% | 1.9% | 0% |
| **Total Number** | 200 | 308 | 106 | 53 |
| Chi-Square: $X^2$=7.16; df=3; $p$=0.067 | | | | |

Table 5.17. Wildlife value orientation groups analyzed by education level.

| Highest Level of Education | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Less than High School** | 4.3% | 4.8% | 2.8% | 1.8% |
| **High School or GED** | 28.4% | 29.7% | 29.4% | 23.2% |
| **2-Year Degree / Trade School** | 28.8% | 25.6% | 15.6% | 17.9% |
| **4-Year College Degree** | 25.5% | 29.4% | 32.1% | 42.9% |
| **College + (Advanced Degree)** | 13.0% | 10.5% | 20.2% | 14.3% |
| **Total Number** | 208 | 313 | 109 | 56 |
| Chi-Square: $X^2$=19.17; df=12; *p*=0.085 | | | | |
| | | | | |
| **Mean Education Level** | 3.14 | 3.11 | 3.36 | 3.43 |
| **95% Confidence Interval** | 2.99 – 3.29 | 2.99 – 3.23 | 3.13 – 3.58 | 3.15 – 3.71 |
| ANOVA: F=2.38; df=3/682; *p*=0.069 | | | | |

Table 5.18. Wildlife value orientation groups analyzed by income level.

| Highest Income Level (Level) | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Less than $10,000 (1)** | 5.0% | 4.5% | 5.8% | 6.0% |
| **$10,000 – $29,999 (2)** | 26.0% | 17.8% | 14.6% | 18.0% |
| **$30,000 – $49,999 (3)** | 30.9% | 30.3% | 32.0% | 36.0% |
| **$50,000 – $69,999 (4)** | 18.8% | 20.9% | 23.3% | 18.0% |
| **$70,000 – $89,999 (5)** | 10.5% | 15.3% | 14.6% | 6.0% |
| **$90,000 – $109,999 (6)** | 5.0% | 5.6% | 1.9% | 6.0% |
| **$110,000 – $149,999 (7 & 8)** | 2.2% | 3.1% | 4.9% | 2.0% |
| **$150,000 or more (9)** | 1.7% | 2.4% | 2.9% | 8.0% |
| **Total Number** | 181 | 287 | 103 | 50 |
| Chi-Square: $X^2$=21.31; df=21; *p*=0.440 | | | | |
| | | | | |
| **Mean Income Level** | 3.40 | 3.70 | 3.70 | 3.75 |
| **95% Confidence Interval** | 3.17 – 3.63 | 3.51 – 3.89 | 3.36 – 4.03 | 3.17 – 4.32 |
| ANOVA: F=1.45; df=3/616; *p*=0.228 | | | | |

Table 5.19. Wildlife value orientation groups analyzed by size of current residence.

| Size of Current Residence (level) | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Large City – 250,000 or more (1)** | 2.5% | 0.7% | 3.8% | 3.8% |
| **City w/ 100,000 – 249,999 (2)** | 10.7% | 14.5% | 20.0% | 28.8% |
| **City w/ 50,000 – 99,999 (3)** | 25.4% | 23.4% | 30.5% | 26.9% |
| **Small City w/ 25,000 – 49,999 (4)** | 13.7% | 12.5% | 9.5% | 11.5% |
| **Town w/ 10,000 – 24,999 (5)** | 9.6% | 12.9% | 10.5% | 9.6% |
| **Town w/ 5,000 – 9,999 (6)** | 5.1% | 5.9% | 3.8% | 0.0% |
| **Small town w/ less than 5,000 (7)** | 18.3% | 13.5% | 11.4% | 11.5% |
| **Farm or Rural Area (8)** | 14.7% | 16.5% | 10.5% | 7.7% |
| **Total Number** | 197 | 303 | 105 | 52 |
| Chi-Square: $X^2$=30.54; df=21; $p$=0.082 | | | | |
| **Mean Residence Level** | 4.78 | 4.76 | 4.09 | 3.74 |
| **95% Confidence Interval** | 4.48 – 5.08 | 4.52 – 5.00 | 3.69 – 4.50 | 3.18 – 4.30 |
| ANOVA: F=5.91, df=3/653; $p$=0.001 | | | | |

Table 5.20. Wildlife value orientation groups analyzed by size of residence where raised.

| Size of Residence Where Raised (level) | Wildlife Value Orientation Groups | | | |
|---|---|---|---|---|
| | **Pluralist** | **Utilitarian** | **Mutualist** | **Distanced** |
| **Large City – 250,000 or more (1)** | 3.1% | 2.7% | 14.6% | 0.0% |
| **City w/ 100,000 – 249,999 (2)** | 6.7% | 4.7% | 10.7% | 11.3% |
| **City w/ 50,000 – 99,999 (3)** | 15.5% | 9.7% | 11.7% | 9.4% |
| **Small City w/ 25,000 – 49,999 (4)** | 6.2% | 8.7% | 10.7% | 7.5% |
| **Town w/ 10,000 – 24,999 (5)** | 8.8% | 8.4% | 8.7% | 15.1% |
| **Town w/ 5,000 – 9,999 (6)** | 4.1% | 6.7% | 2.9% | 5.7% |
| **Small town w/ less than 5,000 (7)** | 25.9% | 25.2% | 20.4% | 17.0% |
| **Farm or Rural Area (8)** | 29.5% | 33.9% | 20.4% | 34.0% |
| **Total Number** | 193 | 298 | 103 | 53 |
| Chi-Square: $X^2$=51.97; df=21; $p$<0.001 | | | | |
| **Mean Residence Level** | 5.74 | 6.06 | 4.80 | 5.79 |
| **95% Confidence Interval** | 5.42 – 6.06 | 5.82 – 6.29 | 4.31 – 5.30 | 5.19 – 6.39 |
| ANOVA: F=8.22; df=3/645; $p$<0.000 | | | | |

## DISCUSSION

**Value and Use of this Information.** This is a descriptive study of attitudes of North Dakota residents in relation to fish and wildlife management with three general perspectives: water use decisions, nongame species management and chronic wasting disease. This information provides a valuable understanding of the public's attitudes in relation to these three topics, which in turn can lead to better management decisions by the North Dakota Game and Fish Department. A better understanding of the public's attitudes on specific topics may also lead to an improved predictive ability on related topics. In addition, being able to demonstrate that NDG&F listens to and understands the public's attitudes, opinions, desires, needs, etc. can increase the public's trust in the agency.

This information is also a very good public involvement tool. Most wildlife issues are the result of conflicting values and attitudes. Often each side in such conflicts holds the view that their opinion is held by a significant majority of the public and/or they have a poor understanding of the other side's position. When sound scientific public attitude data is shared with the public it often tends to moderate the conflict and the groups tend to become more willing to accept compromise solutions.

Another valuable use of this information is as baseline data that can be used to evaluate trends to measure the impact of projects, programs or changes in policy. For example, this study measured the current amount of knowledge related to CWD in North Dakota, which was based on a certain level of information output and expenditures by the Department. How much of an increase in knowledge can be achieved by adding a new information project or increasing expenditures by X-amount? This study measured the current amount of interest in nongame species management. Is interest in nongame species management a trend that is increasing and if so, at what rate? Human dimensions information is especially valuable in measuring trends and evaluating project or program effectiveness and impacts.

**Water Uses in North Dakota.** This section identified seven distinct groups based on the priorities that they assigned for water use decisions (and thus identifying their underlying value system). When dealing with water use decisions it would be very helpful to publicly recognize the diversity of values held by the public and to show how

attempts were made to fairly address this diversity in the decision-making process used and the decisions reached.

Opinions for Missouri River system water use priorities varied greatly according to water use group, but overall home uses received the highest percent of points (32.8%), followed by 24.6% for agriculture and industry, 23.4% for recreation, and 19.3% for fish and wildlife. Wildlife participants (especially active anglers, hunters and wildlife viewers) gave higher Missouri River system water use priorities for fish and wildlife and recreation compared to the non-participants.

A third of North Dakota residents (37%) participated in one or more water-based recreational activities during the last 12 months on the Missouri River system.

**Attitudes Related to Protecting All Types of Fish and Wildlife in North Dakota.** With the development of Wildlife Action Plans by every state and the increase in national attention on nongame species management, nongame issues will likely increase. One important aspect of this issue for wildlife agencies will be the public's understanding of and support for nongame species management. This is especially important, as each state will need to identify 50% matching funds to receive federal funding for their nongame management projects.

Overall, the majority of North Dakota residents had a medium level of support for nongame species management; however, this summary overlooks a lot of the diversity of opinions on this topic. This study provided an analysis of this topic from five perspectives: fishing, hunting, and wildlife viewing participation, wildlife value orientation and from a typology based on the importance attributed to wildlife diversity. Many of the differences among recreational participation levels related to nongame species management were not very large, i.e., non-anglers and anglers, non-hunters and hunters and non-viewers and viewers were relatively similar on many of the variables related to nongame species management measured in this section. One notable difference was that active participants tended to dislike the funding option of only using money from people who hunt or fish to fund nongame programs.

Overall, using a portion of revenue presently being collected from taxes had by far the highest acceptable rating. Creating new taxes for nongame programs had very

low support. On the other hand, not spending any money to keep nongame from becoming rare, endangered or extinct had almost no support.

Pluralists and mutualists did rate nongame issues higher in importance compared to utilitarians and distanced wildlife value orientations, however there was considerable variation within each group. For this reason, the wildlife diversity importance typology that identifies four groups according to increasing level of importance attributed to nongame species management provides a better description of North Dakota residents related to this topic. The "low" group was about 13% and the "high" about 12% with the majority of the population in the two middle groups (medium low = 33% and medium high = 42%). This typology was very strongly related to all the variables measured under this topic.

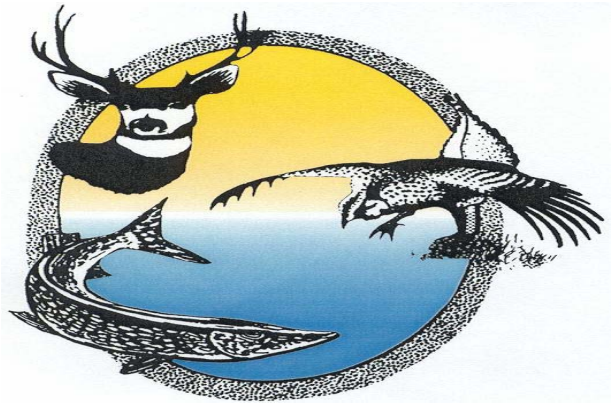
**Opinions, Attitudes and Behaviors Related to CWD in North Dakota.** Active hunters were significantly more likely to have received enough information about CWD compared to the level of information received by inactive hunters and non-hunters. This would be expected given that the nature of the topic affects mainly active hunters. Most non-hunters and inactive hunters probably feel that they have little need to search out information on CWD. On one hand many active hunters feel that they are being informed about CWD, however, from one-third to one-half of the hunters felt that they did not have enough information on the various topics related to CWD. Thus, some hunters and the public in general are not finding the information about CWD. This suggests that additional places and methods need to be incorporated into disseminating the messages about CWD to the public.

Overall, the hunters and the public in general do not seem to be overly alarmed about CWD and hunters seem to have a healthy concern about CWD, which should help in keeping them informed about the disease. On the positive side, the hunters and public in general have considerable trust in the NDG&F to provide good information on CWD and make good decisions regarding deer management and CWD in North Dakota.

North Dakota deer hunters were asked similar questions after the 2003 season in a different survey. Opinions related to information available about CWD for active hunters in this study compare favorably.

**Description of Fishing, Hunting and Wildlife Viewing Participation in North Dakota – Who are our customers?** This section provides a demographic description of three major classifications of customers, namely, anglers, hunters and wildlife watchers. Overall, most of the demographic variables measured in this study were significantly related to fishing, hunting and wildlife viewing participation. This information is useful when planning projects or programs for the various constituents, especially when the target groups have significantly different demographic profiles from the general public. One particular note is the relatively strong relationship among these three recreational groups, i.e., a significant number of people tend to have an interest in more than just one of the activities.

**Demographic Description of North Dakota Residents from Two Perspectives – Who are our customers?** This section provides a demographic description of North Dakota residents from the perspective of nongame species management, referred to as the wildlife diversity importance groups, and from the perspective of the wildlife value orientations. The wildlife diversity importance groups were found to be very useful in understanding the public related to the topic of nongame species management, however, not many of the demographic variables were related to this typology. This suggests that projects and programs, such as educational messages about nongame species management, needs to be directed at all demographic markets equally. The wildlife value orientation groups were found to be very useful for providing an overall understanding of the public's attitudes and behaviors related to wildlife issues (Teel, et al., 2005), but it also was not strongly related to many of the demographic variables. However, the wildlife diversity importance groups and the wildlife value orientations were strongly related, i.e., strongly predictive of each other.



# APPENDIX A

## Complete questionnaire used in the Wildlife Values in the West Survey for North Dakota – 2004

# Management of Fish and Wildlife in the West

**A study conducted cooperatively by:**

Colorado State University

*Knowledge to Go Places*


WESTERN ASSOCIATION OF
FISH AND WILDLIFE AGENCIES

**This survey is for <u>all</u> citizens of your state!**
**Even if you know little about wildlife,**
**your opinions are needed!**

**Fall 2004**

**PLEASE READ BEFORE COMPLETING THIS SURVEY:**

**This survey is being sent to people residing in states throughout the West. Please note that, while some of the questions in this survey may not be relevant to your state specifically, we are still interested in your opinions because they are relevant to other states in the western region.**

## Section I.

**We begin this survey by asking you about the goals for our country. Below are 3 groups of goals that people might prioritize differently. *For each group, rank the 4 goals in order of importance to you*. That is:**

**1 = the goal most important to YOU**
**2 = the 2nd most important goal**
**3 = the 3rd most important goal**
**4 = the least important goal**

**Group 1. Rank these 4 goals from most important (1) to least important (4). Please no ties (meaning, DO NOT GIVE ANY OF THESE ITEMS THE SAME RANK).** Group 1 Rank

- Maintain a high level of economic growth. _____
- See that people have more to say about how things are done at their jobs and in their communities. _____
- Make sure this country has strong defense forces. _____
- Try to make our cities and countryside more beautiful. _____

**Group 2. Repeat now for this next set of goals (1=most important, 4=least important). Please no ties (meaning, DO NOT GIVE ANY OF THESE ITEMS THE SAME RANK).** Group 2 Rank

- Maintain order in the nation. _____
- Give people more to say in important government decisions. _____
- Fight rising prices. _____
- Protect freedom of speech. _____

**Group 3. Repeat again for this final set of goals (1=most important, 4=least important). Please no ties (meaning, DO NOT GIVE ANY OF THESE ITEMS THE SAME RANK).** Group 3 Rank

- Maintain a stable economy. _____
- Progress toward a less impersonal and more humane society. _____
- Fight crime. _____
- Progress toward a society in which ideas count more than money. _____

**Below are statements that represent a variety of ways people feel about fish and wildlife and the natural environment. Please indicate the extent to which you disagree or agree with each statement.** ***Circle one number for each statement.***

| | | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neither | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|---|
| 1. | Humans should manage fish and wildlife populations so that humans benefit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | We should strive for a world where humans and fish and wildlife can live side by side without fear. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | The needs of humans should take priority over fish and wildlife protection. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | I view all living things as part of one big family. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Animals should have rights similar to the rights of humans. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Wildlife are like my family and I want to protect them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | People should never be allowed to use any fish or wildlife for any reason. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neither | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 9. It is acceptable for people to kill wildlife if they think it poses a threat to their life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. It is acceptable for people to kill wildlife if they think it poses a threat to their property. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. If I had to walk in the outdoors, I would be worried about encountering a wild animal. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. It is acceptable to use fish and wildlife in research even if it may harm or kill some animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Fish and wildlife are on earth primarily for people to use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. If I were around wildlife in the outdoors I would be uncomfortable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Hunting is cruel and inhumane to the animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. I have concerns about being around wildlife because they may carry a disease. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I am not interested in knowing anything more about fish and wildlife. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. It would be more rewarding to me to help animals rather than people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I have concerns about being around wildlife because they may hurt me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. I am really not that interested in fish and wildlife. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Advances in technology will eventually provide a solution to our environmental problems. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I care about animals as much as I do other people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. People who want to hunt should be provided the opportunity to do so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. I take great comfort in the relationships I have with animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. I value the sense of companionship I receive from animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. The natural environment should be protected for its own sake rather than simply to meet our needs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. Hunting does not respect the lives of animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. I feel a strong emotional bond with animals. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. We should strive for a society that emphasizes environmental protection over economic growth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. Science can provide answers to any problems that we encounter in nature. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. Protecting the natural environment should be this country's top priority. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. We can find solutions to environmental problems through science and technology. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## Section II.

**This section asks your opinion about key regional issues that are important in one or more western states. Some of these issues may not be present in your state specifically. However, your opinion is still important to us.** ***For each set of questions, please follow the directions that are provided.***

**State fish and wildlife agencies hear from many different groups of people about their interests, making decisions and priorities difficult. Below is a series of hypothetical approaches that describe how priorities *could* be directed.** ***Please read about each approach. Then tell us how you think things are now and how they should be in your state based on these approaches by answering the 2 questions that follow.***

**APPROACH 1**
- State agencies develop programs that meet the needs primarily of those who hunt and/or fish.
- Fish and wildlife management is **almost entirely funded by hunting and fishing license dollars**.

**APPROACH 2**
- State agencies develop programs that meet the needs primarily of those who hunt and/or fish.
- Fish and wildlife management is **substantially funded by both hunting and fishing license dollars *and* public taxes**.

**APPROACH 3**
- State agencies develop programs that meet the needs of all members of the public regardless of their level of interest in wildlife.
- Fish and wildlife management is **almost entirely funded by hunting and fishing license dollars**.

**APPROACH 4**
- State agencies develop programs that meet the needs of all members of the public regardless of their level of interest in wildlife.
- Fish and wildlife management is **substantially funded by both hunting and fishing license dollars *and* public taxes**.

1. Of the above approaches, which approach do you think best resembles how things are now in your state? *Check only one (☑).*

❒ **Approach 1** ❒ **Approach 2** ❒ **Approach 3** ❒ **Approach 4**

2. Which approach best represents your opinion of how things should be in your state? *Check only one (☑).*

❒ **Approach 1** ❒ **Approach 2** ❒ **Approach 3** ❒ **Approach 4**

**We would like to know how you feel about the extent to which your state fish and wildlife agency listens to and considers your opinions in fish and wildlife decision-making. Please indicate how strongly you disagree or agree with each of the following statements.** ***Circle one number for each statement.***

| | Strongly Disagree | Moderately Disagree | Slightly Disagree | Neither | Slightly Agree | Moderately Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. I feel that my opinions are heard by fish and wildlife decision-makers in my state. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I feel that my interests are adequately taken into account by fish and wildlife decision-makers in my state. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I feel that if I provide input, it will make a difference in fish and wildlife decisions in my state. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I feel that my state fish and wildlife agency makes a good effort to obtain input from the public as a whole. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I don't have an interest in providing input to fish and wildlife decisions in my state. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I trust my state fish and wildlife agency to make good decisions without my input. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please respond to the following questions about the extent to which you trust certain forms of government.** ***Circle one number for each statement.***

| **Overall, to what extent do you trust…** | **Almost Never** | **Only Some of the Time** | **Most of the Time** | **Almost Always** |
|---|---|---|---|---|
| 1. …your federal government to do what is right for your country? | 1 | 2 | 3 | 4 |
| 2. …your state government to do what is right for your state? | 1 | 2 | 3 | 4 |
| 3. …your state fish and wildlife agency to do what is right for fish and wildlife management in your state? | 1 | 2 | 3 | 4 |

**Fish and wildlife agencies want to know how the public thinks the agencies should respond to human-wildlife conflict situations. Below are two IMAGINARY situations involving black bears. We would like to know how you feel about certain management actions that could be directed at bear populations to address these situations.** ***Even though it may seem unlikely that these things could occur where you live, we are still interested in your opinions.***

***(PLEASE TELL US HOW YOU FEEL ABOUT THE ACTIONS LISTED BELOW FOR EACH SITUATION)***

| **ACTIONS:** | **SITUATION 1** Bears are wandering into areas where humans live in search of food. Bears are getting into trash and pet food containers. | | **SITUATION 2** Bears are wandering into areas where humans live in search of food. Human deaths from bear attacks have occurred. | |
|---|---|---|---|---|
| **Is it unacceptable or acceptable to….** | **Unacceptable** | **Acceptable** | **Unacceptable** | **Acceptable** |
| 1. ...do nothing to control bear populations? | ❒ | ❒ | ❒ | ❒ |
| 2. …provide more recreational opportunities to hunt bears? | ❒ | ❒ | ❒ | ❒ |
| 3. …conduct controlled hunts using trained agency staff? | ❒ | ❒ | ❒ | ❒ |

**Below are two IMAGINARY situations involving deer. We would like to know how you feel about certain management actions that could be directed at deer populations to address these situations.** ***Even though it may seem unlikely that these things could occur where you live, we are still interested in your opinions.***

***(PLEASE TELL US HOW YOU FEEL ABOUT THE ACTIONS LISTED BELOW FOR EACH SITUATION)***

| **ACTIONS:** | **SITUATION 1** Deer numbers are increasing. There are complaints about deer entering people's yards and eating shrubs and garden plants. | | **SITUATION 2** Deer numbers are increasing. Authorities are concerned because deer are carrying a disease that is transmissible to some domestic animals and livestock. | |
|---|---|---|---|---|
| **Is it unacceptable or acceptable to….** | **Unacceptable** | **Acceptable** | **Unacceptable** | **Acceptable** |
| 1. ...do nothing to control deer populations? | ❒ | ❒ | ❒ | ❒ |
| 2. …provide more recreational opportunities to hunt deer? | ❒ | ❒ | ❒ | ❒ |
| 3. …conduct controlled hunts using trained agency staff? | ❒ | ❒ | ❒ | ❒ |
| 4. …distribute pellets containing contraceptives, causing deer to be unable to produce offspring permanently? | ❒ | ❒ | ❒ | ❒ |
| 5. …distribute pellets containing contraceptives, causing deer to be unable to produce offspring for only a few breeding seasons? | ❒ | ❒ | ❒ | ❒ |

**A fish and wildlife agency manager of a particular area may have limited funds to spend on conservation programs for fish and wildlife. As a result, difficult choices must be made about what type of fish or wildlife deserves the greatest priority. This often involves evaluating different combinations of characteristics of the fish or wildlife. Below is a series of hypothetical comparisons that illustrate the kinds of choices that might be made for an area.** ***For each comparison please select the choice with the characteristics you think the manager should spend funds on to maintain or enhance the fish or wildlife population.***

***These are hypothetical comparisons.*** *Even though some of these fish or wildlife may not be present where you live, we are still interested in your opinions.*

**1. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ *OR* | ❒ CHOICE B |
|---|---|---|
| ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Common in the area, and numbers are stable.<br>➢ Not a hunted/fished species.<br>**Example: Spottail Shiner**<br>  | | ➢ This species naturally occurs in the area.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Hunted/fished species.<br>**Example: Paddlefish**<br>  |

---

**2. Which should the manager spend funds on?** *(Check one ☑.)*

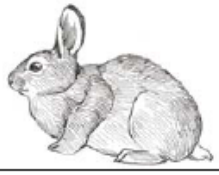
| ❒ CHOICE A | ⇔ *OR* | ❒ CHOICE B |
|---|---|---|
| ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Even though it did exist here at one time, it is no longer present in the area under consideration.<br>➢ Hunted/fished species.<br>**Example: Sichuan Pheasant**<br>  | | ➢ This species naturally occurs in the area.<br>➢ Common in the area, and numbers are stable.<br>➢ Not a hunted/fished species.<br>**Example: American Robin**<br>  |

**3. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ *OR* | ❒ CHOICE B |
|---|---|---|
| ➢ This species naturally occurs in the area.<br>➢ Even though it did exist here at one time, it is no longer present in the area under consideration.<br>➢ Not a hunted/fished species.<br>**Example: Mountain Plover**<br>  | | ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Common in the area, and numbers are stable.<br>➢ Hunted/fished species.<br>**Example: Hungarian Partridge**<br>  |

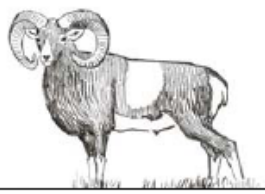
---

**4. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ *OR* | ❒ CHOICE B |
|---|---|---|
| ➢ This species naturally occurs in the area.<br>➢ Common in the area and numbers are stable.<br>➢ Hunted/fished species.<br>**Example: Cottontail Rabbit**<br>  | | ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Not a hunted/fished species.<br>**Example: Eurasian Collared Dove**<br>  |

---

**5. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ *OR* | ❒ CHOICE B |
|---|---|---|
| ➢ This species naturally occurs in the area.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Hunted/fished species.<br>**Example: Canvasback**<br>  | | ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Even though it did exist here at one time, it is no longer present in the area under consideration.<br>➢ Not a hunted/fished species.<br>**Example: Mouflon Sheep**<br>  |

**6. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ OR | ❒ CHOICE B |
|---|---|---|
| ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Not a hunted/fished species.<br>**Example: Mosquitofish**<br>  | | ➢ This species naturally occurs in the area.<br>➢ Even though it did exist here at one time, it is no longer present in the area under consideration.<br>➢ Hunted/fished species.<br>**Example: Blue Catfish**<br>  |

---

**7. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ OR | ❒ CHOICE B |
|---|---|---|
| ➢ This species naturally occurs in the area.<br>➢ Common in the area and numbers are stable.<br>➢ Not a hunted/fished species.<br>**Example: Least Chipmunk**<br>  | | ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Hunted/fished species.<br>**Example: Black Crappie**<br>  |

---

**8. Which should the manager spend funds on?** *(Check one ☑.)*

| ❒ CHOICE A | ⇔ OR | ❒ CHOICE B |
|---|---|---|
| ➢ This species does not naturally occur in the area. It was introduced by humans.<br>➢ Common in the area and numbers are stable.<br>➢ Hunted/fished species.<br>**Example: Ring-necked Pheasant**<br>  | | ➢ This species naturally occurs in the area.<br>➢ Numbers are low, which means you don't see this species very often anymore.<br>➢ Not a hunted/fished species.<br>**Example: Mountain Bluebird**<br>  |

## Section III.

**Next, we would like your input on fish and wildlife management in North Dakota. The information you provide will help the North Dakota Game and Fish Department (NDG&F) understand how North Dakotans feel about these issues and improve their ability to manage fish and wildlife populations and habitats in North Dakota.** ***Please respond to each of the following questions according to the directions provided.***

1. There are many competing uses for the water in North Dakota's rivers and lakes that must be considered when deciding how the water should be distributed. We are interested in how important you find the following water uses. *Circle one number for each statement.*

| When making water distribution decisions, it is important to consider … | Not at All Important | Slightly Important | Moderately Important | Quite Important | Extremely Important |
|---|---|---|---|---|---|
| …local irrigation (water for agricultural crops). | 1 | 2 | 3 | 4 | 5 |
| …healthy populations of fish (for example, walleyes, sunfish, minnows). | 1 | 2 | 3 | 4 | 5 |
| …healthy populations of water-dependent invertebrates (for example, mussels, crayfish). | 1 | 2 | 3 | 4 | 5 |
| …local municipalities (water to cities for people to use). | 1 | 2 | 3 | 4 | 5 |
| …local industries (water for use in factories, power plants, manufacturing). | 1 | 2 | 3 | 4 | 5 |

2. The Missouri River system includes Lake Sakakawea, Lake Oahe, and the free-flowing Missouri River. It provides benefits to many different groups of people. However, conflicts can occur when making decisions on how the Missouri River resources can be used. How strong of a focus should each of these 4 categories of uses be for managing the entire Missouri River system? *Please distribute 100 points among these 4 categories to show how much focus you feel each category should receive in management of the Missouri River.*

| | Points |
|---|---|
| Agriculture and Industry (for example, irrigation, power plants) | |
| Home Uses (for example, drinking water, cleaning) | |
| Recreation (for example, fishing, boating, other water-based recreation) | |
| Fish and Wildlife | |
| | **100 Points Total** |

3. Which of the following water-based recreational activities have you participated in during the last 12 months on the Missouri River system (includes Lakes Sakakawea and Oahe)? *Check (☑) ALL activities that apply.*

| Recreational Boating (includes canoes, pontoons) | Jet Skiing (personal water craft) | Water Skiing | Fishing | Sun Bathing, Sand Volleyball | Parties, Picnics, Rest and Relaxation | I didn't participate in ANY water-based recreation on the Missouri River system |
|---|---|---|---|---|---|---|
| ❒ | ❒ | ❒ | ❒ | ❒ | ❒ | ❒ |

The NDG&F is responsible for protecting **all** types of fish and wildlife. This includes fish and wildlife which are considered **game** (those that are hunted or fished, such as pheasants, deer, walleye) and **nongame** (those that are not hunted or fished, such as meadowlark, frogs, bats). We are interested in learning what you know and how you feel about these various types of fish and wildlife.

4. How would you categorize your knowledge of fish and wildlife in North Dakota? *Circle one number for each statement.*

| **I'd categorize my knowledge about …** | **Not at All Knowledgeable** | **Slightly Knowledgeable** | **Moderately Knowledgeable** | **Quite Knowledgeable** | **Extremely Knowledgeable** |
|---|---|---|---|---|---|
| …game (those that are hunted or fished). | 1 | 2 | 3 | 4 | 5 |
| …NDG&F efforts to protect game. | 1 | 2 | 3 | 4 | 5 |
| …nongame (those that are not hunted or fished). | 1 | 2 | 3 | 4 | 5 |
| …NDG&F efforts to protect nongame. | 1 | 2 | 3 | 4 | 5 |

5. Please indicate the importance of the following statements to you. *Circle one number for each statement.*

| **It is important to me that …** | **Not at All Important** | **Slightly Important** | **Moderately Important** | **Quite Important** | **Extremely Important** |
|---|---|---|---|---|---|
| …North Dakota protects as many types of fish and wildlife as possible. | 1 | 2 | 3 | 4 | 5 |
| …North Dakota keeps nongame from becoming rare, endangered or extinct. | 1 | 2 | 3 | 4 | 5 |
| …North Dakota maintains levels of water in rivers, streams, and lakes that are sufficient for the protection of fish and other water-dependent animals. | 1 | 2 | 3 | 4 | 5 |

6. NDG&F has various management projects to protect game and nongame. Please indicate your level of agreement with the following statements about these projects. *Circle one number for each statement.*

| **Do you disagree or agree that…** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neither** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| The NDG&F efforts to protect nongame fish and wildlife are adequate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Projects designed to benefit nongame fish and wildlife will benefit game as well. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

7. North Dakota is required to match federal funds with state money to pay for protection of nongame fish and wildlife. Several possible sources for the state money to match federal funds for these programs have been suggested. There are differences of opinion about how these programs should be funded. We are interested in your opinions about funding. *Circle one number for each statement.*

| **Is it unacceptable or acceptable to….** | **Highly Unacceptable** | **Moderately Unacceptable** | **Slightly Unacceptable** | **Neither** | **Slightly Acceptable** | **Moderately Acceptable** | **Highly Acceptable** |
|---|---|---|---|---|---|---|---|
| A)…use only money from people who hunt or fish? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| B)…use a portion of revenue presently being collected from taxes? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| C)…use new taxes or an increase in existing taxes? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| D) …use only money from voluntary contributions? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| E) …spend no money to keep nongame from becoming rare, endangered or extinct? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**8. Of the options listed in #7 above (A to E), which source of money do you prefer be used to pay for projects to keep nongame (those not hunted or fished) from becoming rare, endangered or extinct?**

***List ONLY one letter (A, B, C, D, or E) from #7 above*** ⇨ ____

Chronic Wasting Disease (CWD) is a brain disease found in deer. It is believed to be caused by an abnormal protein called a prion. In the early stages of the disease, infected animals may appear healthy. In later stages, infected animals may display one or more symptoms such as weight loss, lack of energy, "droopy" appearance, and excessive salivation. Infected animals always die. The origin and transmission of CWD are not well understood. The following questions ask about your opinions regarding CWD. **CWD has not yet been detected in North Dakota. However, the disease has been detected in bordering states and provinces.**

9. To what extent do you disagree or agree that you had enough information about each of the following CWD related topics *prior to receiving this survey*? *Circle one number for each statement.*

| **I feel that I had enough information about…** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neither** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| …what states have deer with CWD? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …what type(s) of wildlife species can have CWD? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …what causes CWD in wildlife? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …possible livestock health risks associated with CWD? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …possible human safety risks associated with CWD? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …precautions that hunters should take because of CWD? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …what the NDG&F is doing about CWD in North Dakota? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

10. To what extent do you disagree or agree with each of the following statements related to CWD? *Circle one number or "NA" for each statement. NA = not applicable.*

| **Do you disagree or agree that…** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neither** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** | |
|---|---|---|---|---|---|---|---|---|
| The threat of CWD has been exaggerated. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| CWD poses a risk to deer, but not to humans. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| CWD may pose a risk to humans, but not enough is currently known to be sure. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| CWD may cause disease in humans if they eat meat from animals infected with CWD. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| Because of CWD, I have concerns about eating deer meat. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | NA |
| Because of CWD, members of my family (for example: spouse, children) have concerns about eating deer meat. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | NA |

11. NDG&F is responsible for managing North Dakota's free ranging wildlife resources. To what extent do you disagree or agree with the following statements regarding your trust in the NDG&F when it comes to CWD? *Circle one number for each statement.*

| **I trust NDG&F to …** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Neither** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| …provide the best available information on CWD issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …provide me with enough information to decide what actions I should take regarding CWD. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …provide truthful information about human safety issues related to CWD. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …provide timely information regarding CWD issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …make good deer management decisions regarding CWD issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| …properly address CWD in North Dakota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**INFORMATIONAL NOTE:** There is **NO** evidence that CWD affects humans according to both the World Health Organization and U.S. Centers for Disease Control. Public health officials do recommend, however, that human exposure to CWD-affected deer and elk be avoided as research continues. After reading this informational note please **DO NOT** go back and change any of your previous responses, as the purpose of this section was to find out your current opinions and knowledge of CWD.

## Section IV.

**We would like to learn about your fish- and wildlife-related recreation activities.** *Please check your response (☑).*

| | | | |
|---|---|---|---|
| 1. | Have you ever participated in recreational (non-commercial) fishing? | ❒ Yes | ❒ No |
| 2. | Did you participate in recreational (non-commercial) fishing during the past 12 months (1 year)? | ❒ Yes | ❒ No |
| 3. | Have you ever participated in recreational (non-commercial) hunting? | ❒ Yes | ❒ No |
| 4. | Did you participate in recreational (non-commercial) hunting during the past 12 months (1 year)? | ❒ Yes | ❒ No |
| 5. | Have you ever taken any recreational trips for which fish or wildlife viewing was the primary purpose of the trip? | ❒ Yes | ❒ No |
| 6. | Did you take any recreational trips in the past 12 months (1 year) for which fish or wildlife viewing was the primary purpose of the trip? | ❒ Yes | ❒ No |

**Please respond to the following 3 questions about your interest in participating in fish- and wildlife-related recreation in the future.** *Circle one number for each statement.*

| | | Not at all Interested | Slightly Interested | Moderately Interested | Strongly Interested |
|---|---|---|---|---|---|
| 1. | How interested are you in taking recreational fishing trips in the future? | 1 | 2 | 3 | 4 |
| 2. | How interested are you in taking recreational hunting trips in the future? | 1 | 2 | 3 | 4 |
| 3. | How interested are you in taking recreational trips in the future for which fish or wildlife viewing is the primary purpose of the trip? | 1 | 2 | 3 | 4 |

**Now we would like to know more about your interest in taking specific trips to view wildlife.**

**How likely is it that you would consider taking one of the following trips in the future?** *Circle one number for each statement.*

| | | Not at all Likely | Slightly Likely | Moderately Likely | Extremely Likely |
|---|---|---|---|---|---|
| 1. | …a trip to Africa to go on a safari to view wildlife? | 1 | 2 | 3 | 4 |
| 2. | …a trip to a remote area of Alaska to view wildlife? | 1 | 2 | 3 | 4 |

**The following demographic information will be used to help make general conclusions about the residents of this state. Your responses will remain completely confidential.**

1. Are you…? ❒ Male ❒ Female

2. What is your age? (*Write response.*) _____ Years

3. How many people under 18 years of age are currently living in your household? (*Write response.*) _____ Person(s)

4. What is the highest level of education that you have achieved? (*Check only one ☑.*)
   - ❒ Less than high school diploma
   - ❒ High school diploma or equivalent (for example, GED)
   - ❒ 2-year associates degree or trade school
   - ❒ 4-year college degree
   - ❒ Advanced degree beyond 4-year college degree

5. What is your approximate annual household income before taxes? (*Check one ☑.*)

- ❒ Less than $10,000
- ❒ $10,000 - $29,999
- ❒ $30,000 - $49,999
- ❒ $50,000 - $69,999
- ❒ $70,000 - $89,999
- ❒ $90,000 - $109,999
- ❒ $110,000 - $129,999
- ❒ $130,000 - $149,999
- ❒ $150,000 or more

6. About how long have you lived in North Dakota? (*Write response or check box ☑ indicating less than one year.*)

_____ Years, OR ❒ Less than one year.

7. How would you describe your current residence or community? (*Check one ☑.*)

- ❒ Large city with 250,000 or more people
- ❒ City with 100,000 to 249,999 people
- ❒ City with 50,000 to 99,999 people
- ❒ Small city with 25,000 to 49,999 people
- ❒ Town with 10,000 to 24,999 people
- ❒ Town with 5,000 to 9,999 people
- ❒ Small town / village with less than 5,000 people
- ❒ A farm or rural area

8. Would you consider your current residence a **suburb** of a larger city or metropolitan area? (*Check one ☑.*) ❒ Yes ❒ No

9. How would you describe the community in which you were raised? (*Check one ☑.*) If more than one area, check the place where you lived the longest.

- ❒ Large city with 250,000 or more people
- ❒ City with 100,000 to 249,999 people
- ❒ City with 50,000 to 99,999 people
- ❒ Small city with 25,000 to 49,999 people
- ❒ Town with 10,000 to 24,999 people
- ❒ Town with 5,000 to 9,999 people
- ❒ Small town / village with less than 5,000 people
- ❒ A farm or rural area

10. Would you consider the community in which you were raised a **suburb** of a larger city or metropolitan area? (*Check one ☑.*) ❒ Yes ❒ No

11. Are you…? (*Check one or more categories to indicate what you consider yourself to be.*)

- ❒ White, NOT of Hispanic origin
- ❒ Black or African American, NOT of Hispanic origin
- ❒ Spanish, Hispanic, or Latino
- ❒ Native American or Alaska Native
- ❒ Asian
- ❒ Native Hawaiian
- ❒ Other Pacific Islander
- ❒ Other (*Please print on line below.*)

_____

12. While many people in America view themselves as "Americans", we are interested in finding out more about how you would define your ethnic background. What is **the primary ethnic origin with which you identify yourself**? (*for example, Italian, Jamaican, Norwegian, Dominican, Korean, Mexican, Taiwanese, Ukrainian, and so on*)

(*Please write your ethnic origin.*) _____

**Thank you for participating in this study. Your input is very important!**

**Please return the completed survey as soon as possible in the enclosed addressed and postage-paid envelope.**