



# National Wildlife Refuge Visitor Survey 2010/2011: Individual Refuge Results for Big Lake National Wildlife Refuge

By Natalie R. Sexton, Alia M. Dietsch, Andrew W. Don Carlos, Lynne Koontz, Adam N. Solomon and Holly M. Miller

*We like to go over and walk the trails with our grandkids and watch for wildlife. My husband loves this place. He would stay there 24/7 if possible in November, December, and January. It's in his blood.*—Survey comment from visitor to Big Lake National Wildlife Refuge.



Big Lake National Wildlife Refuge. Photo credit: U.S. Fish and Wildlife Service.

## Contents

|  |     |
|--|-----|
| Acknowledgments .....  | iv  |
| Introduction .....   | 1   |
| Organization of Results .....                                      | 1   |
| Methods .....  | 2   |
| Selecting Participating Refuges.....                               | 2   |
| Developing the Survey Instrument .....                             | 2   |
| Contacting Visitors .....  | 2   |
| Interpreting the Results .....                                     | 4   |
| Refuge Description.....  | 5   |
| Sampling at This Refuge .....                                      | 7   |
| Selected Survey Results .....                                      | 7   |
| Visitor and Trip Characteristics.....                              | 7   |
| Visitor Spending in Local Communities .....                        | 14  |
| Visitor Opinions about This Refuge .....                           | 15  |
| Visitor Opinions about National Wildlife Refuge System Topics..... | 20  |
| Conclusion .....   | 24  |
| References.....  | 24  |
| Appendix A: Survey Frequencies for This Refuge.....                | A-1 |
| Appendix B: Visitor Comments for This Refuge .....                 | B-1 |

## Figures

|     |  |    |
|-----|--|----|
| 1.  | Map of this refuge.....  | 6  |
| 2.  | How visitors first learned or heard about this refuge.....   | 8  |
| 3.  | Resources used by visitors to find their way to this refuge during this visit.....                               | 9  |
| 4.  | Number of visitors travelling to this refuge by residence.....   | 10 |
| 5.  | Modes of transportation used by visitors to this refuge during this visit. ....                                  | 11 |
| 6.  | Activities in which visitors participated during the past 12 months at this refuge. ....                         | 12 |
| 7.  | The primary activity in which visitors participated during this visit.....                                       | 13 |
| 8.  | Use of the visitor center at this refuge.. ....  | 13 |
| 9.  | Overall satisfaction with this refuge during this visit.....   | 15 |
| 10. | Importance-satisfaction ratings of services and facilities provided at this refuge.....                          | 17 |
| 11. | Importance-satisfaction ratings of recreational opportunities provided at this refuge.....                       | 18 |
| 12. | Importance-satisfaction ratings of transportation-related features at this refuge.....                           | 19 |
| 13. | Visitors' likelihood of using alternative transportation options at national wildlife refuges in the future..... | 21 |
| 14. | Visitors' personal involvement with climate change related to fish, wildlife and their habitats.....             | 22 |
| 15. | Visitors' beliefs about the effects of climate change on fish, wildlife and their habitats.....                  | 23 |

## Tables

|    |  |    |
|----|--|----|
| 1. | Participating refuges in the 2010/2011 national wildlife refuge visitor survey. ....                             | 3  |
| 2. | Sampling and response rate summary for this refuge. ....   | 7  |
| 3. | Influence of this refuge on visitors' decision to take this trip. ....   | 9  |
| 4. | Type and size of groups visiting this refuge.....  | 11 |
| 5. | Total visitor expenditures in local communities and at this refuge expressed in dollars per person per day. .... | 14 |

## Acknowledgments

This study was commissioned by the U.S. Fish and Wildlife Service Division of Visitor Services and Communications Headquarters Office, Arlington, Virginia. The study design and survey instrument were developed collaboratively with representatives from U.S. Fish and Wildlife Service and researchers from the PASA Branch, U.S. Geological Survey. For their support and input to the study, we would like to thank Kevin Kilcullen, Chief of Visitor Services; Steve Suder, National Transportation Coordinator; Regional Office Visitor Services Chiefs and Transportation Coordinators; and the staff and any volunteers at Big Lake NWR who assisted with the implementation of this surveying effort. The success of this effort is largely a result of their dedication to the refuge and its resources as well as to the people who come to explore these unique lands. We also would like to thank the following PASA team members for their hard work throughout the surveying effort, which has included (among *many* things) the arduous tasks of stuffing more than 20,000 envelopes, managing multiple databases, and preparing numerous reports: Shannon Conk, Halle Musfeldt, Phadrea Ponds, Gale Rastall, Margaret Swann, Emily Walenza, and Katie Walters.

## Introduction

The National Wildlife Refuge System (Refuge System), established in 1903 and managed by the U.S. Fish and Wildlife Service (Service), is the leading network of protected lands and waters in the world dedicated to the conservation of fish, wildlife and their habitats. There are 556 national wildlife refuges (NWRs) and 38 wetland management districts nationwide, including possessions and territories in the Pacific and Caribbean, encompassing more than 150 million acres. The mission of the Refuge System is to “administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” Part of achieving this mission is the goal “to foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use” (Clark, 2001). The Refuge System attracts more than 45 million visitors annually, including 25 million people per year to observe and photograph wildlife, over 9 million to hunt and fish, and more than 10 million to participate in educational and interpretation programs (Uniack, 1999; U.S. Fish and Wildlife Service, 2007). Understanding visitors and characterizing their experiences on national wildlife refuges are critical elements of managing these lands and meeting the goals of the Refuge System.

The Service contracted with the U.S. Geological Survey (USGS) to conduct a national survey of visitors regarding their experiences on national wildlife refuges. The survey was conducted to better understand visitor needs and experiences and to design programs and facilities that respond to those needs. The survey results will inform Service performance planning, budget, and communications goals. Results will also inform Comprehensive Conservation Plan (CCPs), Visitor Services, and Transportation Planning processes.

## Organization of Results

These results are for Big Lake NWR (this refuge) and are part of USGS Data Series 643 (Sexton and others, 2011). All refuges participating in the 2010/2011 surveying effort will receive individual refuge results specific to the visitors to that refuge. Each set of results is organized by the following categories:

- **Introduction:** An overview of the Refuge System and the goals of the national surveying effort.
- **Methods:** The procedures for the national surveying effort, including selecting refuges, developing the survey instrument, contacting visitors, and guidance for interpreting the results.
- **Refuge Description:** A brief description of the refuge location, acreage, purpose, recreational activities, and visitation statistics, including a map (where available) and refuge website link.
- **Sampling at This Refuge:** The sampling periods, locations, and response rate for this refuge.
- **Selected Survey Results:** Key findings for this refuge, including:
  - Visitor and Trip Characteristics
  - Visitor Spending in the Local Communities
  - Visitors Opinions about This Refuge
  - Visitor Opinions about National Wildlife Refuge System Topics
- **Conclusion**
- **References**
- **Survey Frequencies (Appendix A):** The survey instrument with the frequency results for this refuge.
- **Visitor Comments (Appendix B):** The verbatim responses to the open-ended survey questions for this refuge.

## **Methods**

### **Selecting Participating Refuges**

The national visitor survey was conducted from July 2010 – November 2011 on 53 refuges across the Refuge System (table 1). Based on the Refuge System’s 2008 Refuge Annual Performance Plan (RAPP; U.S. Fish and Wildlife Service, 2011, written comm.), 192 refuges with a minimum visitation of 25,000 were considered. This criterion was the median visitation across the Refuge System and the minimum visitation necessary to ensure that the surveying would be logistically feasible onsite. Visitors were sampled on 35 randomly selected refuges and 18 other refuges that were selected by Service Regional Offices to respond to priority refuge planning processes.

### **Developing the Survey Instrument**

USGS researchers developed the survey in consultation with the Service Headquarters Office, managers, planners, and visitor services professionals. The survey was peer-reviewed by academic and government researchers and was further pre-tested with eight Refuge System Friends Group representatives from each region to ensure readability and overall clarity. The survey and associated methodology were approved by the Office of Management and Budget (OMB control #: 1018-0145; expiration date: 6/30/2013).

### **Contacting Visitors**

Refuge staff identified two separate 15-day sampling periods and one or more locations that best reflected the diversity of use and specific visitation patterns of each participating refuge. Sampling periods and locations were identified by refuge staff and submitted to USGS via an internal website that included a customized mapping tool. A standardized sampling schedule was created for all refuges that included eight randomly selected sampling shifts during each of the two sampling periods. Sampling shifts were three- to five-hour randomly selected time bands that were stratified across AM and PM, as well as weekend and weekdays. Any necessary customizations were made, in coordination with refuge staff, to the standardized schedule to accommodate the identified sampling locations and to address specific spatial and temporal patterns of visitation.

Twenty visitors (18 years or older) per sampling shift were systematically selected, for a total of 320 willing participants per refuge—160 per sampling period—to ensure an adequate sample of completed surveys. When necessary, shifts were moved, added, or extended to alleviate logistical limitations (for example, weather or low visitation at a particular site) in an effort to reach target numbers.

**Table 1.** Participating refuges in the 2010/2011 national wildlife refuge visitor survey.

|   |  |
|---|--|
| <b>Pacific Region (R1)</b>                            |  |
| Kilauea Point National Wildlife Refuge (HI)           | William L. Finley National Wildlife Refuge (OR)  |
| Deer Flat National Wildlife Refuge (ID)               | McNary National Wildlife Refuge (WA)   |
| Cape Meares National Wildlife Refuge (OR)             | Turnbull National Wildlife Refuge (WA)   |
| Malheur National Wildlife Refuge (OR)                 |  |
| <b>Southwest Region (R2)</b>                          |  |
| Bitter Lake National Wildlife Refuge (NM)             | Aransas National Wildlife Refuge (TX)  |
| Bosque del Apache National Wildlife Refuge (NM)       | San Bernard/ Brazoria National Wildlife Refuge (TX)                                    |
| Wichita Mountains Wildlife Refuge (OK)                |  |
| <b>Great Lakes-Big Rivers Region (R3)</b>             |  |
| DeSoto National Wildlife Refuge (IA)                  | McGregor District, Upper Mississippi River National Wildlife and Fish Refuge – (IA/WI) |
| Neal Smith National Wildlife Refuge (IA)              |  |
| Muscatatuck National Wildlife Refuge (IN)             | Big Muddy National Fish and Wildlife Refuge (MO)                                       |
| Rice Lake National Wildlife Refuge (MN)               | Horicon National Wildlife Refuge (WI)  |
| Tamarac National Wildlife Refuge (MN)                 | Necedah National Wildlife Refuge (WI)  |
| <b>Southeast Region (R4)</b>                          |  |
| Wheeler National Wildlife Refuge (AL)                 | Banks Lake National Wildlife Refuge (GA)   |
| Big Lake National Wildlife Refuge (AR)                | Noxubee National Wildlife Refuge (MS)  |
| Pond Creek National Wildlife Refuge (AR)              | Cabo Rojo National Wildlife Refuge (Puerto Rico)                                       |
| Merritt Island National Wildlife Refuge (FL)          | Pea Island National Wildlife Refuge (NC)   |
| St. Marks National Wildlife Refuge (FL)               | Cape Romain National Wildlife Refuge (SC)  |
| Ten Thousand Islands National Wildlife Refuge (FL)    | Reelfoot National Wildlife Refuge (TN)   |
| <b>Northeast Region (R5)</b>                          |  |
| Stewart B. McKinney National Wildlife Refuge (CT)     | Moosehorn National Wildlife Refuge (ME)  |
| Bombay Hook National Wildlife Refuge (DE)             | Great Swamp National Wildlife Refuge (NJ)  |
| Monomoy National Wildlife Refuge (MA)                 | Montezuma National Wildlife Refuge (NY)  |
| Parker River National Wildlife Refuge (MA)            | Wertheim National Wildlife Refuge (NY)   |
| Patuxent Research Refuge (MD)                         | Occoquan Bay/ Elizabeth Hartwell Mason Neck National Wildlife Refuge (VA)              |
| <b>Mountain-Prairie Region (R6)</b>                   |  |
| Monte Vista National Wildlife Refuge (CO)             | Sand Lake National Wildlife Refuge (SD)  |
| Quivira National Wildlife Refuge (KS)                 | National Elk Refuge (WY)   |
| Charles M. Russell National Wildlife Refuge (MT)      |  |
| <b>Alaska Region (R7)</b>                             |  |
| Alaska Maritime National Wildlife Refuge (AK)         | Kenai National Wildlife Refuge (AK)  |
| <b>California and Nevada Region (R8)</b>              |  |
| Lower Klamath/Tule Lake National Wildlife Refuge (CA) | Ruby Lake National Wildlife Refuge (NV)  |
| Sonny Bono Salton Sea National Wildlife Refuge (CA)   |  |

Refuge staff and/or volunteers (survey recruiters) contacted visitors on-site following a protocol provided by USGS to ensure a diverse sample. Instructions included contacting visitors across the entire sampling shift (for example, every  $n^{\text{th}}$  visitor for dense visitation, as often as possible for sparse visitation), and only one person per group. Visitors were informed of the survey effort, given a token incentive (for example, a small magnet, temporary tattoo), and asked to participate. Willing participants provided their name, mailing address, and preference for language (English or Spanish) and survey mode (mail or online). Survey recruiters also were instructed to record any refusals and then proceed with the sampling protocol.

Visitors were mailed a postcard within 10 days of the initial on-site contact thanking them for agreeing to participate in the survey and inviting them to complete the survey online. Those visitors choosing not to complete the survey online were sent a paper copy a week later. Two additional contacts were made by mail during the next seven weeks following a modified Tailored Design Method (Dillman, 2007): 1) a reminder postcard one week after the first survey, and 2) a second paper survey two weeks after the reminder postcard. Each mailing included instructions for completing the survey online and a postage paid envelope for returning the paper version of the survey. Those visitors indicating a preference for Spanish were sent Spanish versions of all correspondence (including the survey). Finally, a short survey of six questions was sent to nonrespondents four weeks after the second survey mailing to determine any differences between respondents and nonrespondents at the national level. Online survey data were exported and paper survey data were entered using a standardized survey codebook and data entry procedure. All survey data were analyzed by using SPSS v.18 statistical analysis software.

## Interpreting the Results

The extent to which these results accurately represent the total population of visitors to this refuge is dependent on 1) an adequate sample size of those visitors and 2) the representativeness of that sample. The adequacy of the sample size for this refuge is quantified as the margin of error. The composition of the sample is dependent on the ability of the standardized sampling protocol for this study to account for the spatial and temporal patterns of visitor use specific to each refuge. Spatially, the geographical layout and public use infrastructure varies widely across refuges. Some refuges only can be accessed through a single entrance, while others have multiple unmonitored access points across large expanses of land and water. As a result, the degree to which sampling locations effectively captured spatial patterns of visitor use will likely vary from refuge to refuge. Temporally, the two 15-day sampling periods may not have effectively captured all of the predominant visitor uses/activities on some refuges during the course of a year. Therefore, certain survey measures such as visitors' self-reported "primary activity during their visit" may reflect a seasonality bias.

Herein, the sample of visitors who responded to the survey are referred to simply as "visitors." However, when interpreting the results for Big Lake NWR, any potential spatial and temporal sampling limitations specific to this refuge need to be considered when generalizing the results to the total population of visitors. For example, a refuge that sampled during a special event (for example, birding festival) held during the spring may have contacted a higher percentage of visitors who traveled greater than 50 miles to get to the refuge than the actual number of these people who would have visited throughout the calendar year (that is, oversampling of nonlocals). In contrast, another refuge may not have enough nonlocal visitors in the sample to adequately represent the beliefs and opinions of that group type. If the sample for a specific group type (for example, nonlocals, hunters, those visitors who paid a fee) is too low ( $n < 30$ ), a warning is included. Additionally, the term "*this* visit" is used to reference the visit on which people were contacted to participate in the survey, which may or may not have been their most recent refuge visit.

## Refuge Description for Big Lake National Wildlife Refuge

Once a free-flowing river system through Mississippi County, Arkansas, the habitat of Big Lake NWR now consists of wooded swamps and open water due to the New Madrid earthquakes of 1811 and 1812. The shallow lake is bordered by a virgin cypress-tupelo swamp with black willow and buttonbush. Smartweed, American lotus and water lily characterize the herbaceous wetland plants. Tree species on higher ground include cottonwood, green ash, hackberry, red maple, sycamore, river birch and a variety of oaks.

Big Lake National Wildlife Refuge was created to:

- Provide high quality, diverse habitats for migrating and wintering waterfowl, shorebirds, wading birds, other migratory birds, and other native species of fish and wildlife;
- Provide nesting and brood-rearing habitat for wood ducks;
- Protect habitat for endangered species; and
- Provide outdoor recreation and environmental education to the public.

Established in 1915, this 11,000-acre refuge is recognized as an important link in the Mississippi migration corridor. Over 225 bird species have been observed on the refuge. Big Lake NWR was important in the recovery of the bald eagle from its endangered status. Eagles came back to nest on the refuge in 1989 and have annually raised young since 1993. Also, since most of the bottomland hardwood forests have disappeared, it has become more important to preserve and restore this habitat for the wide variety of wildlife it supports. Other wildlife that call the refuge home include beavers, otters, raccoons, wild turkeys, white-tailed deer, bobcats and the occasional armadillo. Due to the fact that Big Lake NWR is an oasis of bottomland hardwood in an agriculturally developed area, 6,400 acres are designated as a National Natural Landmark and 2,100 acres of the Natural Landmark are included in the Wilderness Preservation System.

With 40,000 visitors each year (based on 2008 RAPP database; U.S. Fish and Wildlife Service, 2011, written comm.), Big Lake NWR offers activities including big game hunting, fishing, use of the Visitor Center, hiking, biking, auto tour routes, motorized and nonmotorized boating, wildlife observation, photography, environmental education, and interpretation. Figure 1 below displays a map of the refuge. For more information please visit <http://www.fws.gov/biglake/>.

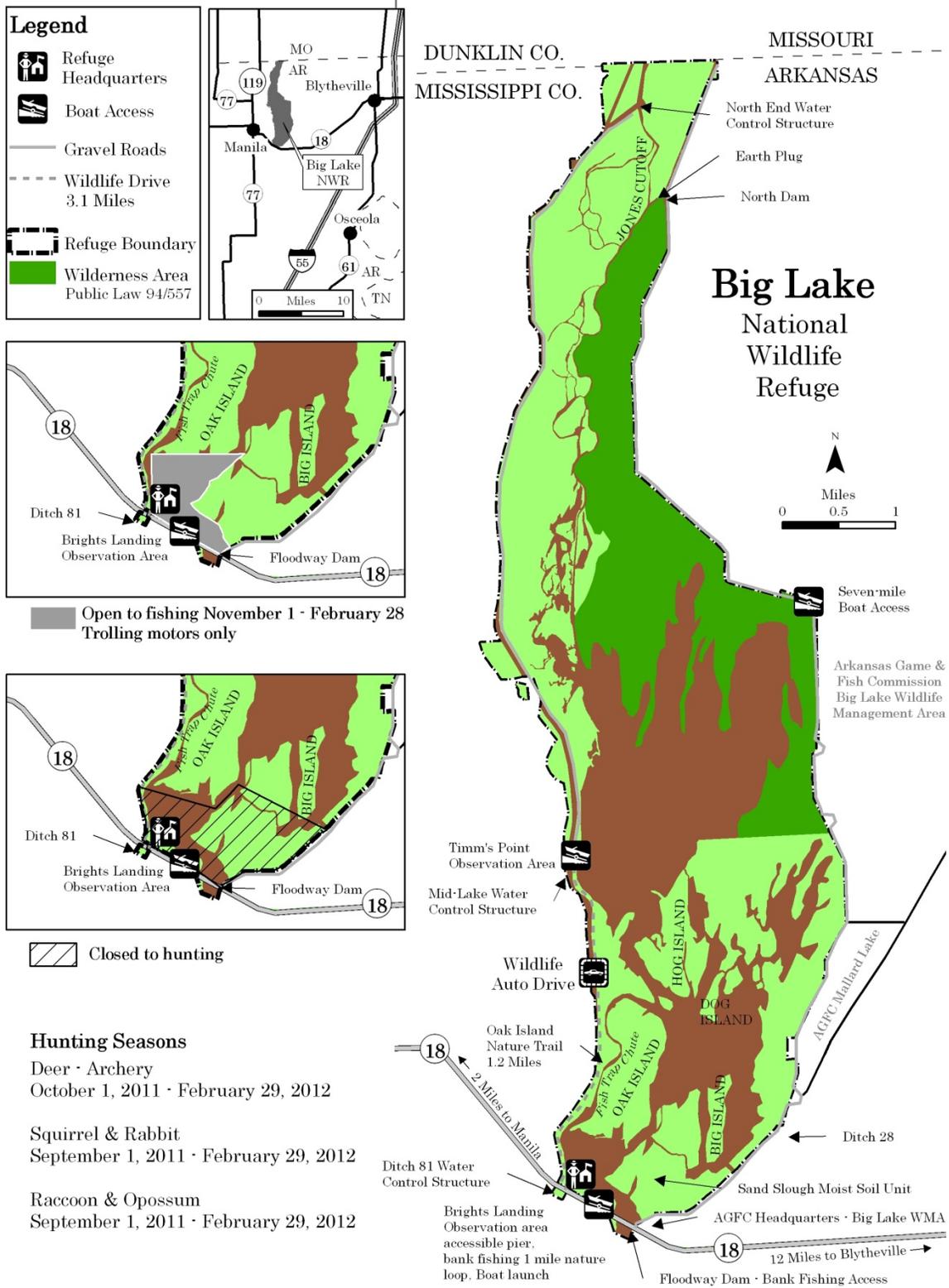


Figure 1. Map of Big Lake NWR, courtesy of U.S. Fish and Wildlife Service.

## Sampling at Big Lake National Wildlife Refuge

A total of 256 visitors agreed to participate in the survey during the two sampling periods at the identified locations at Big Lake NWR (table 2). In all, 118 visitors completed the survey for a 50% response rate and  $\pm 7\%$  margin of error at the 95% confidence level.<sup>1</sup> Additional sampling was done during the second sampling period to make up for a shortage in visitor contacts during the first sampling period.

**Table 2.** Sampling and response rate summary for Big Lake NWR.

| Sampling period | Dates                         | Locations   | Total contacts | Undeliverable addresses | Completed surveys | Response rate |
|-----------------|-------------------------------|---|----------------|-------------------------|-------------------|---------------|
| 1               | 11/1/2010<br>to<br>11/15/2010 | Refuge Headquarters and Hunter Check Station Area<br>7 Mile Boat Access and Wilderness Area Entry Point | 62             | 3                       | 43                | 73%           |
| 2               | 3/1/2011<br>to<br>3/19/2011   | Timms Point Boat Landing<br>Brights Landing Area<br>Refuge Headquarters                                 | 194            | 15                      | 75                | 42%           |
| <b>Total</b>    |                               |   | <b>256</b>     | <b>18</b>               | <b>118</b>        | <b>50%</b>    |

## Selected Survey Results

### Visitor and Trip Characteristics

*A solid understanding of refuge visitors and details about their trips to refuges can inform communication outreach efforts, inform visitor services and transportation planning, forecast use, and gauge demand for services and facilities.*

### Familiarity with the Refuge System

While we did not ask visitors to identify the mission of the National Wildlife Refuge System or the U.S. Fish and Wildlife Service, visitors to Big Lake NWR reported that before participating in the survey, they were aware of the role of the U.S. Fish and Wildlife Service in managing national wildlife refuges (97%) and that the Refuge System has the mission of conserving, managing, and restoring fish, wildlife, plants and their habitat (97%). Positive responses to these questions concerning the management and mission of the Refuge System do not indicate the degree to which these visitors understand the day-to-day

<sup>1</sup> The margin of error (or confidence interval) is the error associated with the results related to the sample and population size. A margin of error of  $\pm 5\%$ , for example, means if 55% of the sample answered a survey question in a certain way, then 50–60% of the entire population would have answered that way. The margin of error is calculated with an 80/20 response distribution, assuming that for any given dichotomous choice question, approximately 80% of respondents selected one choice and 20% selected the other (Salant and Dillman, 1994).

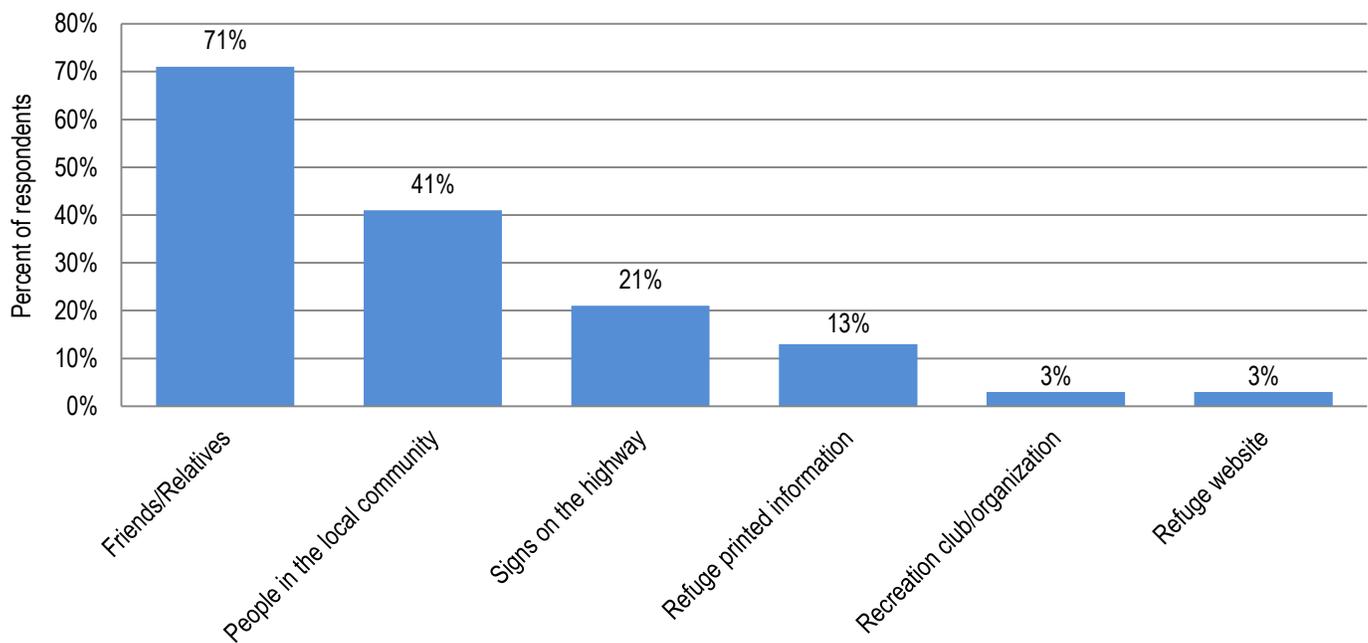
management practices of individual refuges, only that visitors feel they have a basic knowledge of who manages refuges and why. Compared to other public lands, many visitors feel that refuges provide a unique recreation experience (75%; see Appendix B for visitor comments on “What Makes National Wildlife Refuges Unique?”); however, reasons for why visitors find refuges unique are varied and may not directly correspond to their understanding of the mission of the Refuge System. About half of visitors to Big Lake NWR had been to at least one other National Wildlife Refuge in the past year (54%), with an average of 9 visits to other refuges during the past 12 months.

### Visiting This Refuge

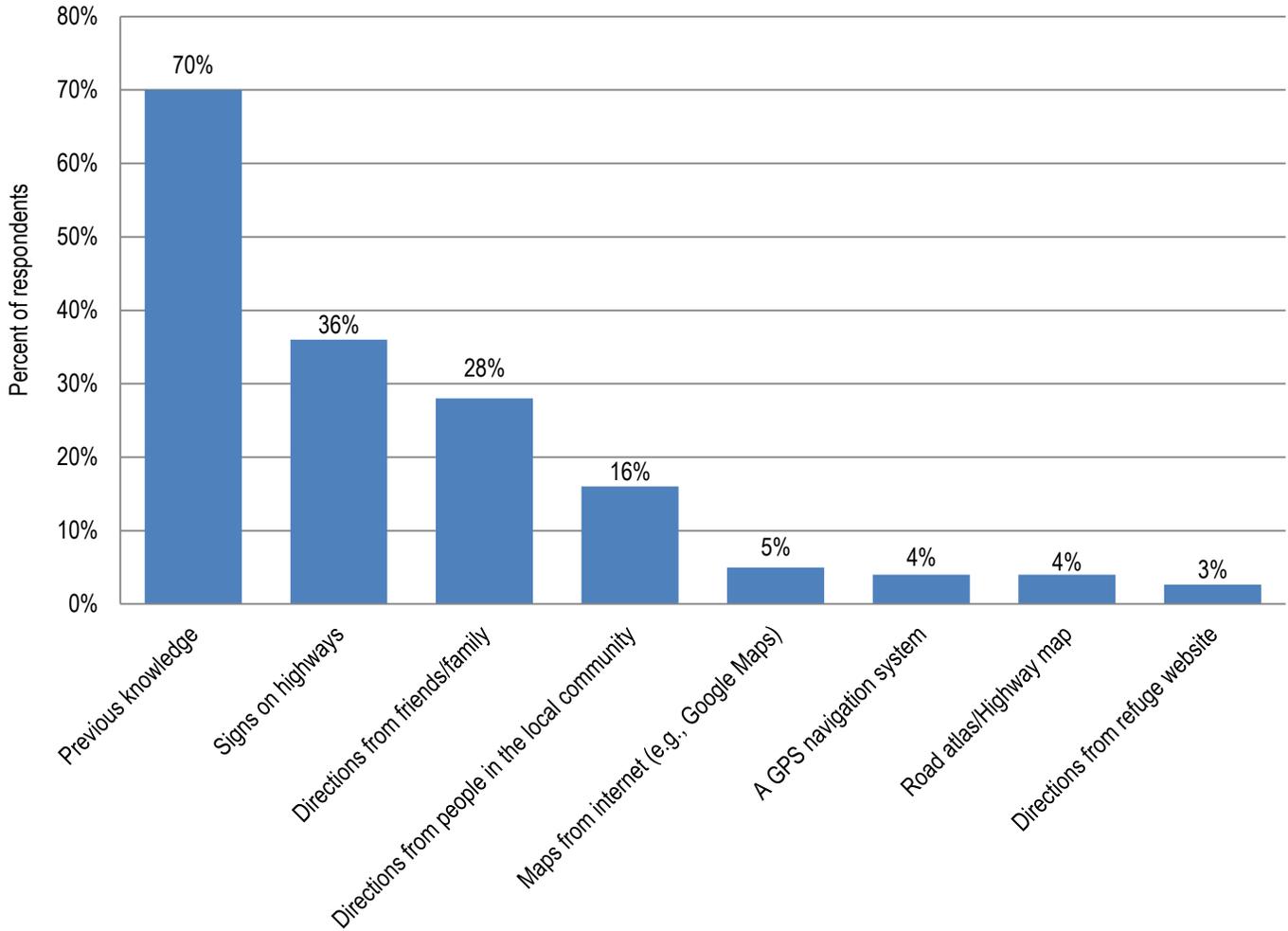
Few surveyed visitors (8%) had only been to Big Lake NWR once in the past 12 months, while most had been multiple times (92%). These repeat visitors went to the refuge an average of 25 times during that same 12-month period. Visitors used the refuge during only one season (23%), during multiple seasons (37%), and year-round (40%).

Most visitors first learned about the refuge from friends/relatives (71%), people in the local community (41%), or signs on the highway (21%; fig. 2). Key information sources used by visitors to find their way to this refuge include previous knowledge (70%), signs on highways (36%), or directions from friends/family (28%; fig. 3).

Most visitors (91%) lived in the local area (within 50 miles of the refuge), whereas 9% were nonlocal visitors. For most local visitors, Big Lake NWR was the primary purpose or sole destination of their trip (81%; table 3). For most nonlocal visitors, the refuge was also the primary purpose or sole destination of their trip (60%). Local visitors (n = 103) reported that they traveled an average of 16 miles to get to the refuge, while nonlocal visitors (n = 10) traveled an average of 221 miles. ***It is important to note that summary statistics based on a small sample size (n < 30) may not provide a reliable representation of the population.*** Figure 4 shows the residence of visitors travelling to the refuge. About 90% of visitors to Big Lake NWR were from Arkansas.



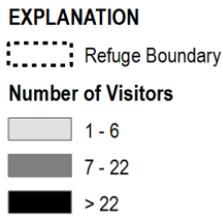
**Figure 2.** How visitors first learned or heard about Big Lake NWR (n = 97).



**Figure 3.** Resources used by visitors to find their way to Big Lake NWR during *this* visit (n = 113).

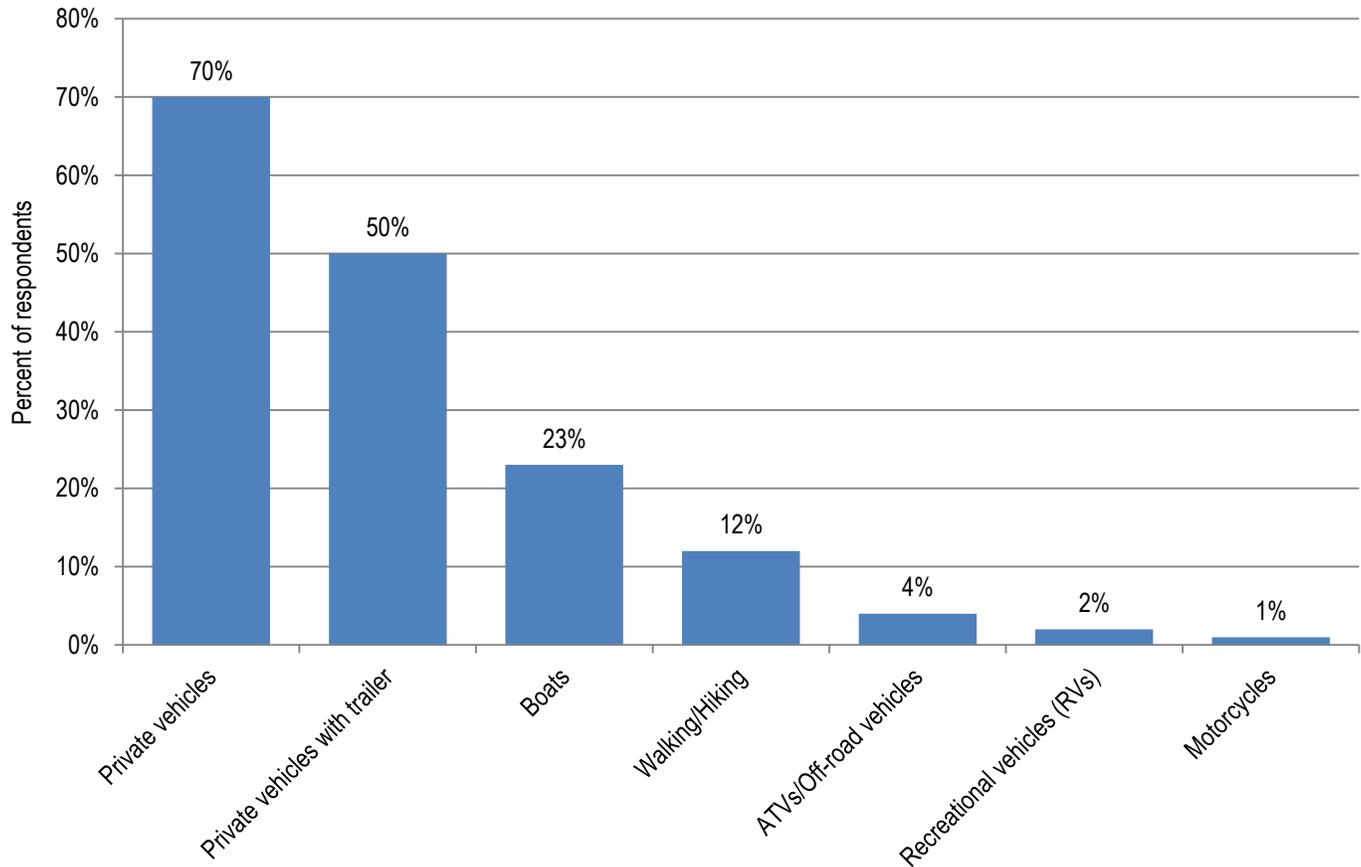
**Table 3.** Influence of Big Lake NWR on visitors' decision to take *this* trip.

| Visitors | Visiting this refuge was... |  |                    |
|----------|-----------------------------|--|--------------------|
|          | the primary reason for trip | one of many equally important reasons for trip | an incidental stop |
| Nonlocal | 60%                         | 10%  | 30%                |
| Local    | 81%                         | 12%  | 7%                 |
| Total    | 79%                         | 12%  | 9%                 |



**Figure 4.** Number of visitors travelling to Big Lake NWR by residence. Top map shows residence by state and bottom map shows residence by zip codes near the refuge (n = 114).

Surveyed visitors reported that they spent an average of 5 hours at Big Lake NWR during one day there (a day visit is assumed to be 8 hours). However, the most frequently reported length of visit during one day was actually 8 hours (37%). The key modes of transportation used by visitors to travel around the refuge were private vehicle (70%), private vehicle with trailer (50%), and boat (23%; fig. 5). Some visitors indicated they were part of a group on their visit to this refuge (44%), travelling primarily with family and friends (table 4).

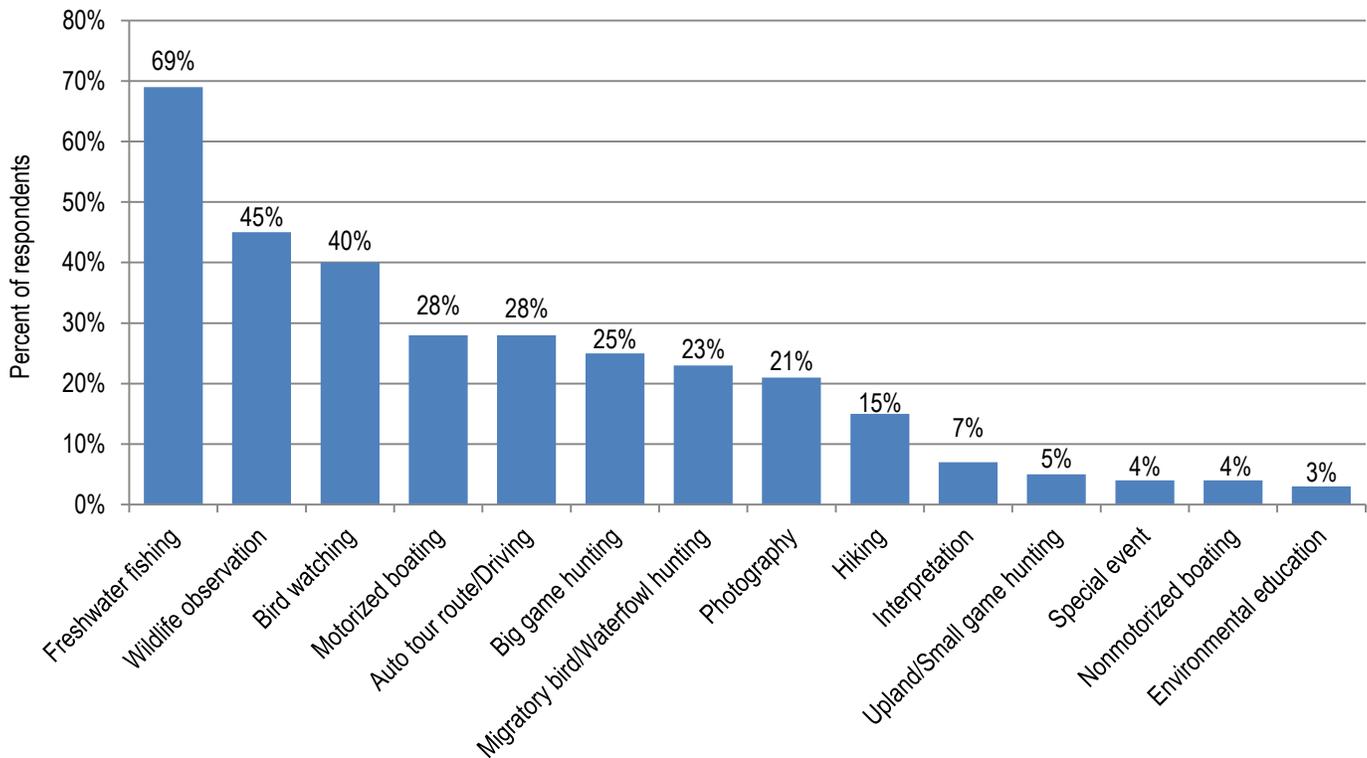


**Figure 5.** Modes of transportation used by visitors to Big Lake NWR during *this* visit (n = 114).

**Table 4.** Type and size of groups visiting Big Lake NWR (for those who indicated they were part of a group, n = 50).

| Group type                  | Percent<br>(of those traveling<br>in a group) | Average group size |                    |                  |
|-----------------------------|---|--------------------|--------------------|------------------|
|                             |   | Number of adults   | Number of children | Total group size |
| Family/Friends              | 92%   | 3                  | 1                  | 4                |
| Commercial tour group       | 0%  | 0                  | 0                  | 0                |
| Organized club/School group | 6%  | 10                 | 6                  | 16               |
| Other group type            | 2%  | 3                  | 0                  | 3                |

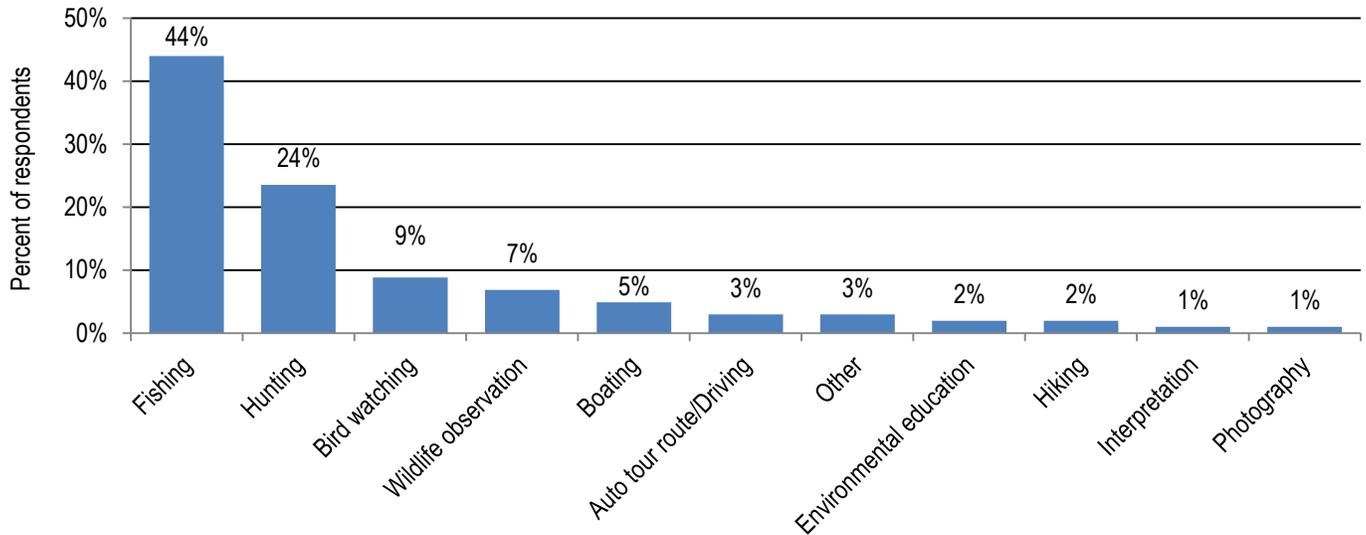
Surveyed visitors participated in a variety of refuge activities during the past 12 months (fig. 6); the top three activities reported were freshwater fishing (69%), wildlife observation (45%), and bird watching (40%). The primary reasons for their most recent visit included fishing (44%), hunting (24%), and bird watching (9%; fig. 7). Thirty percent of visitors indicated they used the visitor center, mostly to ask information of staff/volunteers (62%), view the exhibits (47%), and stop to use the facilities (for example, get water, use restroom; 21%; fig. 8). Big Lake NWR does not have a small contact station and that is likely what visitors were referencing when they answered this question.



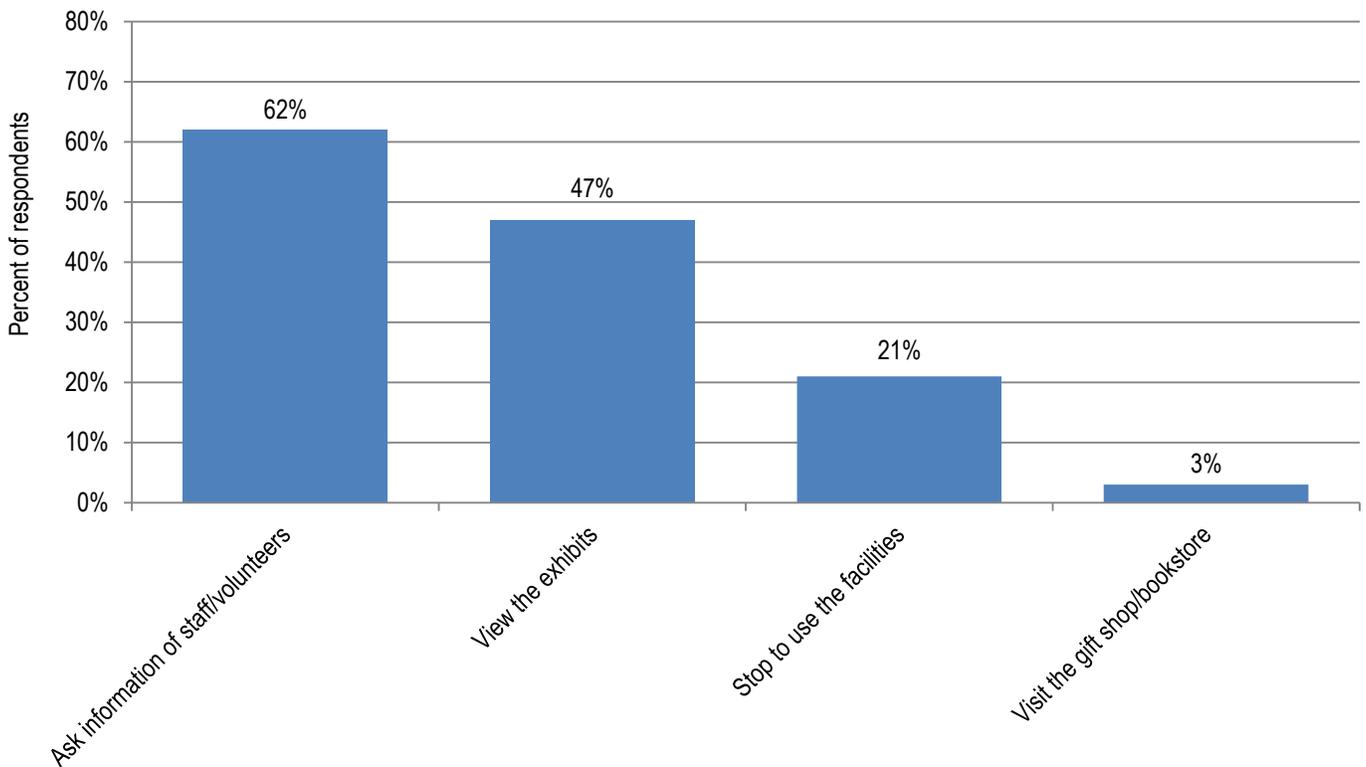
**Figure 6.** Activities in which visitors participated during the past 12 months at Big Lake NWR (n = 113). See Appendix B for a listing of “other” activities.

### Visitor Characteristics

All (100%) surveyed visitors to Big Lake NWR indicated that they were citizens or permanent residents of the United States. Only those visitors 18 years or older were sampled. Visitors were a mix of 89% male with an average age of 50 years and 11% female with an average age of 47 years. Visitors, on average, reported they had 13 years of formal education (college or technical school). The median level of income was \$50,000–\$74,999. See Appendix A for more demographic information. In comparison, the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation found that participants in wildlife watching and hunting on public land were 55% male and 45% female with an average age of 46 years, an average level of education of 14 years (associate degree or two years of college), and a median income of \$50,000–\$74,999 (Harris, 2011, personal communication). Compared to the U.S. population, these 2006 survey participants are more likely to be male, older, and have higher education and income levels (U.S. Department of the Interior and U.S. Department of Commerce, 2007).



**Figure 7.** The primary activity in which visitors participated during *this* visit to Big Lake NWR (n = 102). See Appendix B for a listing of “other” activities.



**Figure 8.** Use of the visitor center at Big Lake NWR (for those visitors who indicated they used the visitor center, n = 34).

## Visitor Spending in Local Communities

*Tourists usually buy a wide range of goods and services while visiting an area. Major expenditure categories include lodging, food, supplies, and gasoline. Spending associated with refuge visitation can generate considerable economic benefits for the local communities near a refuge. For example, more than 34.8 million visits were made to national wildlife refuges in fiscal year 2006; these visits generated \$1.7 billion in sales, almost 27,000 jobs, and \$542.8 million in employment income in regional economies (Carver and Caudill, 2007). Information on the amount and types of visitor expenditures can illustrate the economic importance of refuge visitor activities to local communities. Visitor expenditure information also can be used to analyze the economic impact of proposed refuge management alternatives.*

A region (and its economy) is typically defined as all counties within 50 miles of a travel destination (Stynes, 2008). Visitors that live within the local 50-mile area of a refuge typically have different spending patterns than those that travel from longer distances. During the two sampling periods, 91% of surveyed visitors to Big Lake NWR indicated that they live within the local area. Nonlocal visitors (9%) stayed in the local area, on average, for 4 days. Table 5 shows summary statistics for local and nonlocal visitor expenditures in the local communities and at the refuge, with expenditures reported on a per person per day basis. ***It is important to note that summary statistics based on a small sample size ( $n < 30$ ) may not provide a reliable representation of that population.*** During the two sampling periods, nonlocal visitors spent an average of \$54 per person per day and local visitors spent an average of \$35 per person per day in the local area. Several factors should be considered when estimating the economic importance of refuge visitor spending in the local communities. These include the amount of time spent at the refuge, influence of refuge on decision to take this trip, and the representativeness of primary activities of the sample of surveyed visitors compared to the general population. Controlling for these factors is beyond the scope of the summary statistics presented in this report. Detailed refuge-level visitor spending profiles which do consider these factors will be developed during the next phase of analysis.

**Table 5.** Total visitor expenditures in local communities and at Big Lake NWR expressed in dollars per person per day.

| Visitors | n <sup>1</sup> | Median | Mean | Standard deviation | Minimum | Maximum |
|----------|----------------|--------|------|--------------------|---------|---------|
| Nonlocal | 8              | \$60   | \$54 | \$35               | \$4     | \$117   |
| Local    | 68             | \$23   | \$35 | \$39               | \$0     | \$175   |

<sup>1</sup>n = number of visitors who answered both locality *and* expenditure questions.

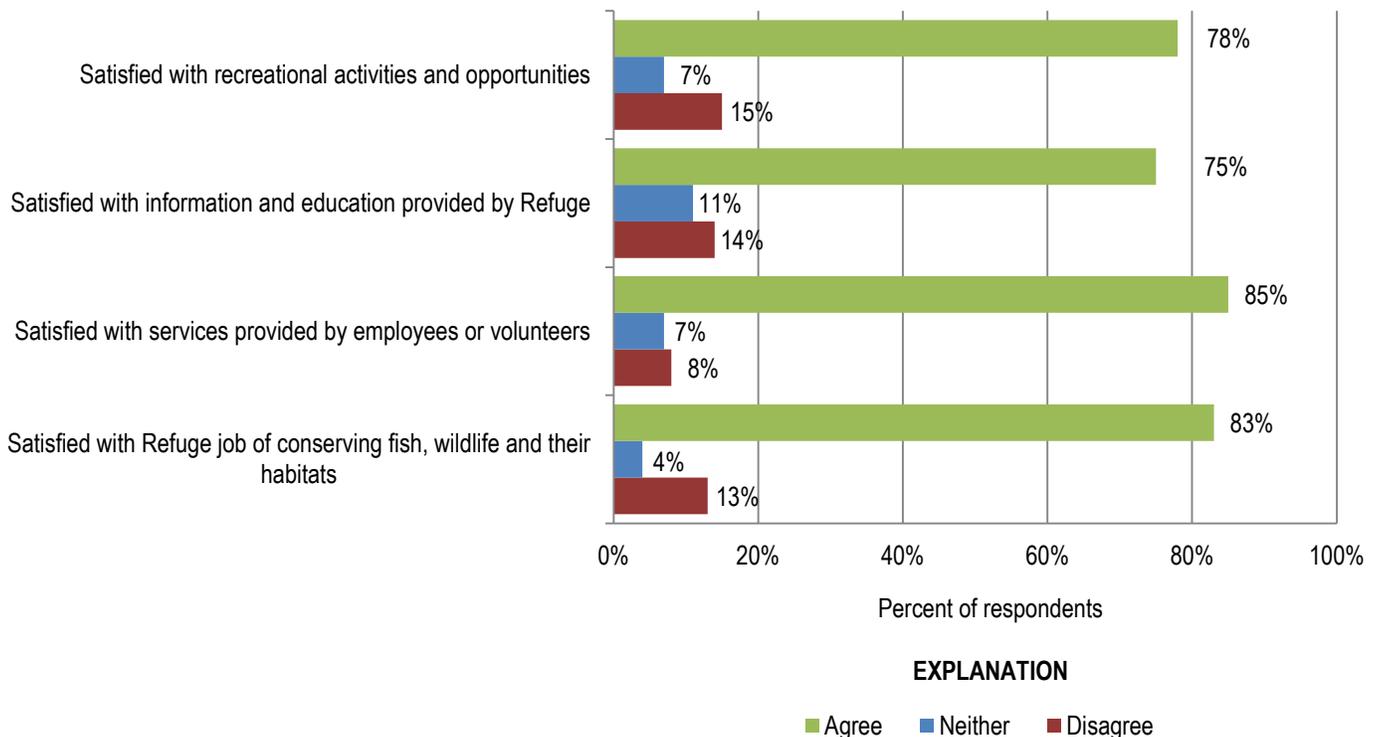
Note: For each respondent, reported expenditures were divided by the number of persons in their group that shared expenses in order to determine the spending per person per trip. This was then divided by the number of days spent in the local area to determine the spending per person per day for each respondent. For respondents who reported spending less than one full day, trip length was set equal to one day. These visitor spending estimates are appropriate for the sampling periods selected by refuge staff (see table 2 for sampling period dates and figure 7 for the primary visitor activities). They may not be representative of the total population of visitors to this refuge.

## Visitor Opinions about This Refuge

National wildlife refuges provide visitors with a variety of services, facilities, and wildlife-dependent recreational opportunities. Understanding visitors' perceptions of their refuge experience is a key component of the Refuge System mission as it pertains to providing high-quality wildlife-dependent recreational opportunities. Having a baseline understanding of visitor experience can inform management decisions to better balance visitors' expectations with the Refuge System mission. Recent studies in outdoor recreation have included an emphasis on declining participation in traditional activities such as hunting and an increasing need to connect the next generation to nature and wildlife. These factors highlight the importance of current refuge visitors as a key constituency in wildlife conservation. A better understanding is increasingly needed to better manage the visitor experience and to address the challenges of the future.

Surveyed visitors' overall satisfaction with the services, facilities, and recreational opportunities provided at Big Lake NWR were as follows (fig. 9):

- 78% were satisfied with the recreational activities and opportunities,
- 75% were satisfied with the information and education about the refuge and its resources,
- 85% were satisfied with the services provided by employees or volunteers, and
- 83% were satisfied with the refuge's job of conserving fish, wildlife and their habitats.



**Figure 9.** Overall satisfaction with Big Lake NWR during *this* visit (n ≥ 104).

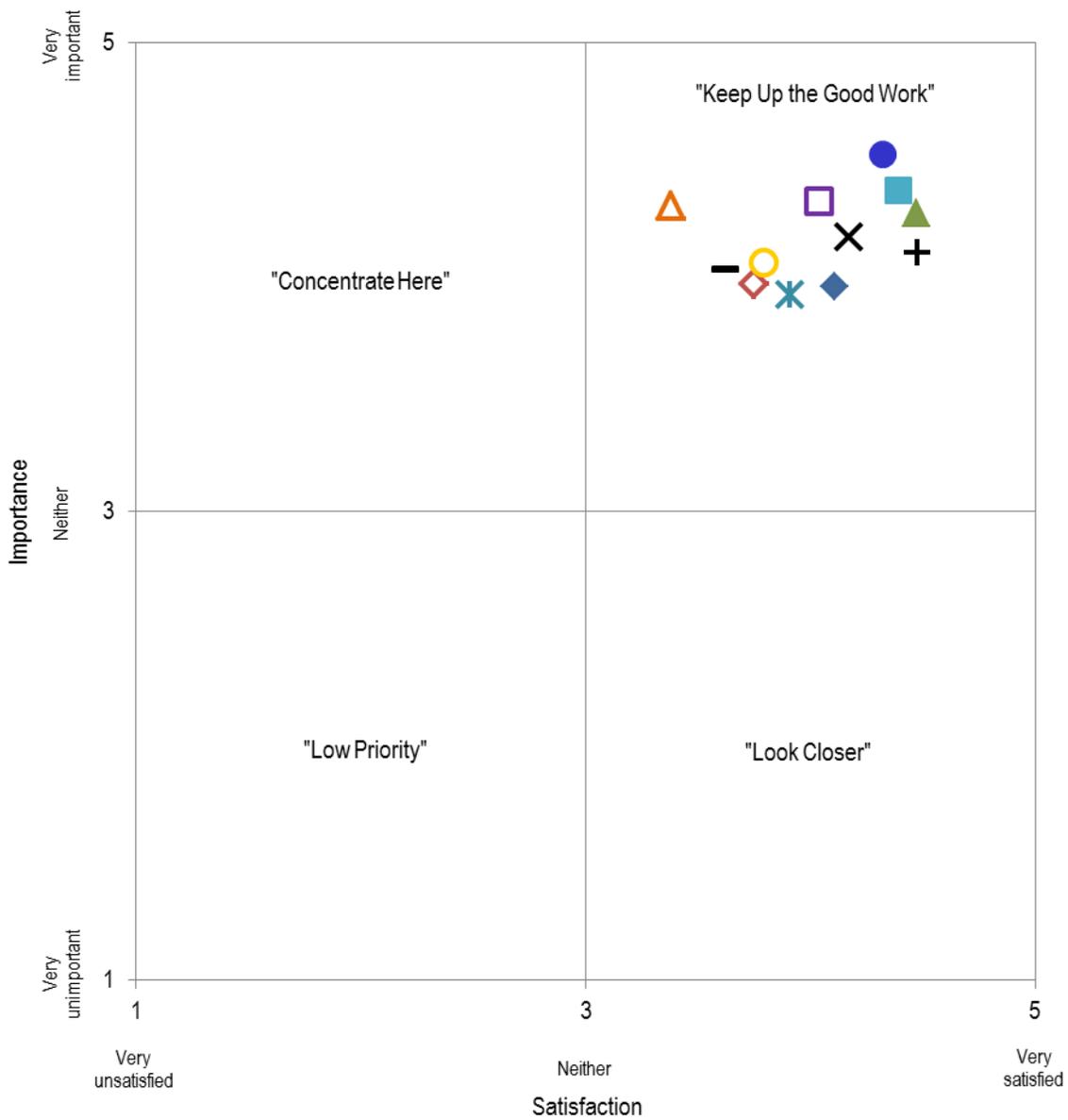
## Importance/Satisfaction Ratings

*Comparing the importance and satisfaction ratings for visitor services provided by refuges can help to identify how well the services are meeting visitor expectations. The importance-performance framework presented in this section is a tool that includes the importance of an attribute to visitors in relation to their satisfaction with that attribute. Drawn from marketing research, this tool has been applied to outdoor recreation and visitation settings (Martilla and James, 1977; Tarrant and Smith, 2002). Results for the attributes of interest are segmented into one of four quadrants (modified for this national study):*

- Keep Up the Good Work = high importance/high satisfaction;
- Concentrate Here = high importance/low satisfaction;
- Low Priority = low importance/low satisfaction; and
- Look Closer = low importance/high satisfaction.

*Graphically plotting visitors' importance and satisfaction ratings for different services, facilities, and recreational opportunities provides a simple and intuitive visualization of these survey measures. However, this tool is not without its drawbacks. One is the potential for variation among visitors regarding their expectations and levels of importance (Vaske et al., 1996; Bruyere et al., 2002; Wade and Eagles, 2003), and certain services or recreational opportunities may be more or less important for different segments of the visitor population. For example, hunters may place more importance on hunting opportunities and amenities such as blinds, while school group leaders may place more importance on educational/informational displays than would other visitors. This potential for highly varied importance ratings needs to be considered when viewing the average results of this analysis of visitors to Big Lake NWR. This consideration is especially important when reviewing the attributes that fall into the "Look Closer" quadrant. In some cases, these attributes may represent specialized recreational activities in which a small subset of visitors participate (for example, hunting, kayaking) or facilities and services that only some visitors experience (for example, exhibits about the refuge). For these visitors, the average importance of (and potentially the satisfaction with) the attribute may be much higher than it would be for the overall population of visitors.*

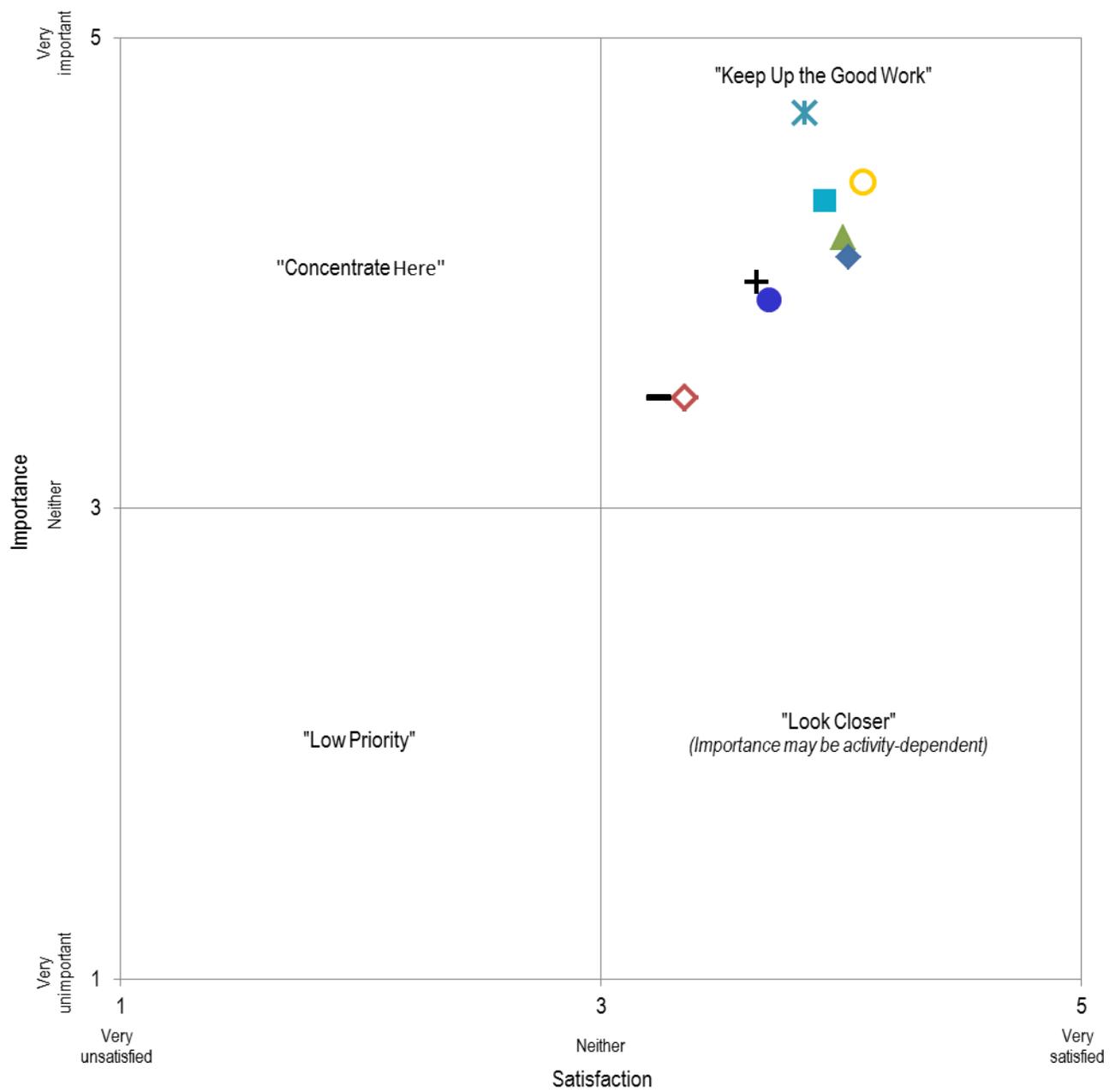
Figures 10-12 depict surveyed visitors' importance-satisfaction results for refuge services and facilities, recreational opportunities, and transportation-related features at Big Lake NWR, respectively. All refuge services and facilities fell in the "Keep Up the Good Work" quadrant (fig. 10). All refuge recreational opportunities fell in the "Keep Up the Good Work" quadrant (fig. 11). All transportation-related features fell in the "Keep Up the Good Work" quadrant (fig. 12).



**EXPLANATION**

- ◆ Availability of employees/volunteers
- ▲ Knowledgeable employees/volunteers
- ⊠ Informational kiosks/displays about this Refuge
- ◇ Exhibits about this Refuge
- Visitor Center
- △ Well-maintained restrooms
- ⊕ Courteous/welcoming employees/volunteers
- ⊗ Printed information about this Refuge
- Signs with rules/regulations
- Environmental education programs/activities
- Convenient hours/days of operation
- Wildlife observation structures

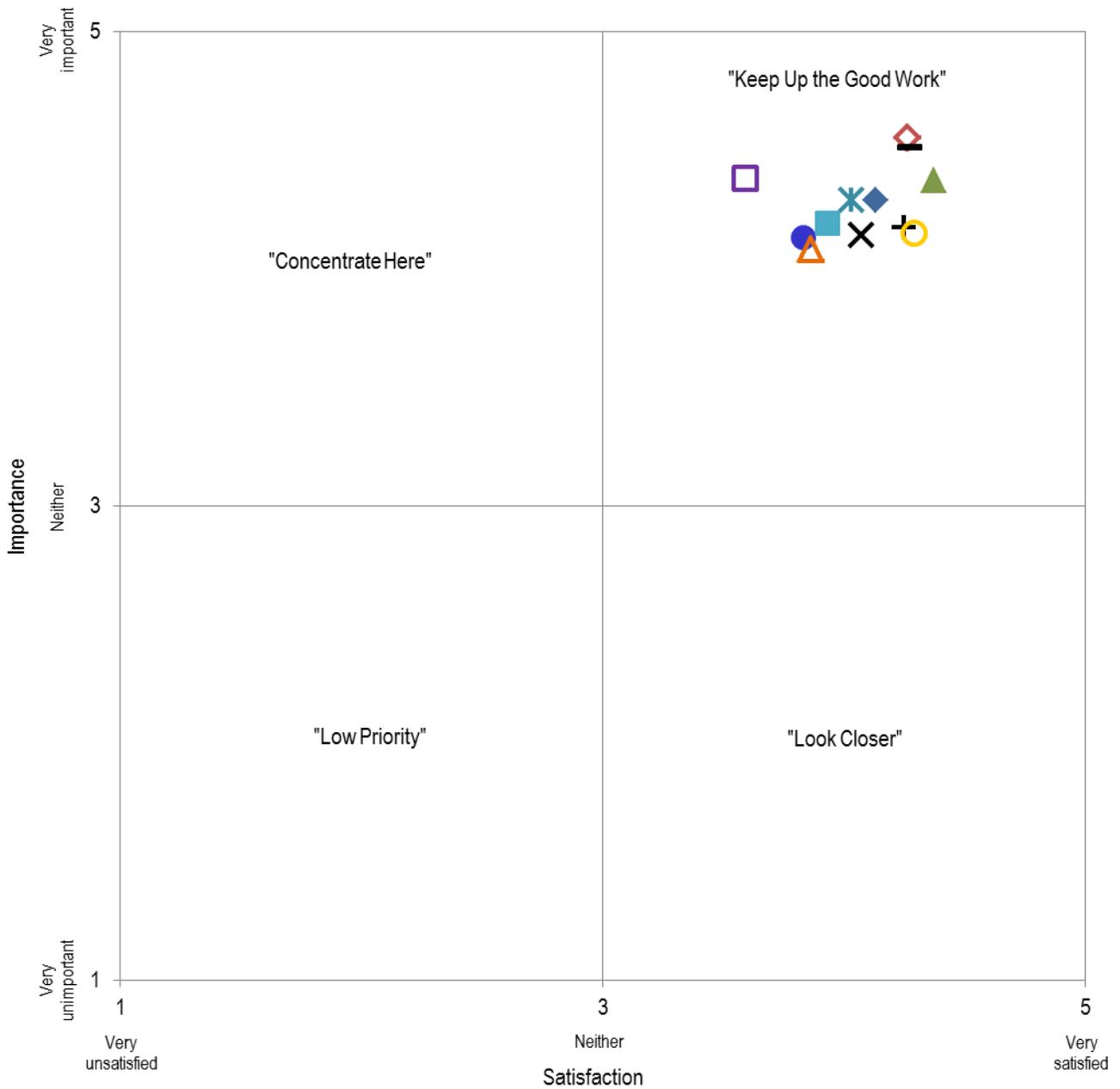
**Figure 10.** Importance-satisfaction ratings of services and facilities provided at Big Lake NWR.



**EXPLANATION**

- Wildlife viewing opportunities
- Hunting opportunities
- ◇ Kayak/Canoe opportunities
- ▲ Photography opportunities
- ✕ Fishing opportunities
- Bicycling opportunities
- ◆ Bird watching opportunities
- Hiking opportunities
- ⊕ Volunteer opportunities

**Figure 11.** Importance-satisfaction ratings of recreational opportunities provided at Big Lake NWR.



**EXPLANATION**

- |                                 |                               |                                |                                  |
|---------------------------------|-------------------------------|--------------------------------|----------------------------------|
| ◆ Condition of roads            | + Condition of parking areas  | ▲ Condition of bridges         | ✕ Condition of trails/boardwalks |
| ✖ Number of parking places      | ● Number of pullovers         | ◇ Safety of driving conditions | — Safety of Refuge entrances     |
| ○ Directional signs on highways | ■ Directional signs on Refuge | △ Directional signs on trails  | □ Disabled access                |

**Figure 12.** Importance-satisfaction ratings of transportation-related features at Big Lake NWR.

## Visitor Opinions about National Wildlife Refuge System Topics

*One goal of this national visitor survey was to identify visitor trends across the Refuge System to more effectively manage refuges and provide visitor services. Two important issues to the Refuge System are transportation on refuges and communicating with visitors about climate change. The results to these questions will be most meaningful when they are evaluated in aggregate (data from all participating refuges together). However, basic results for Big Lake NWR are reported here.*

### Alternative Transportation and the National Wildlife Refuge System

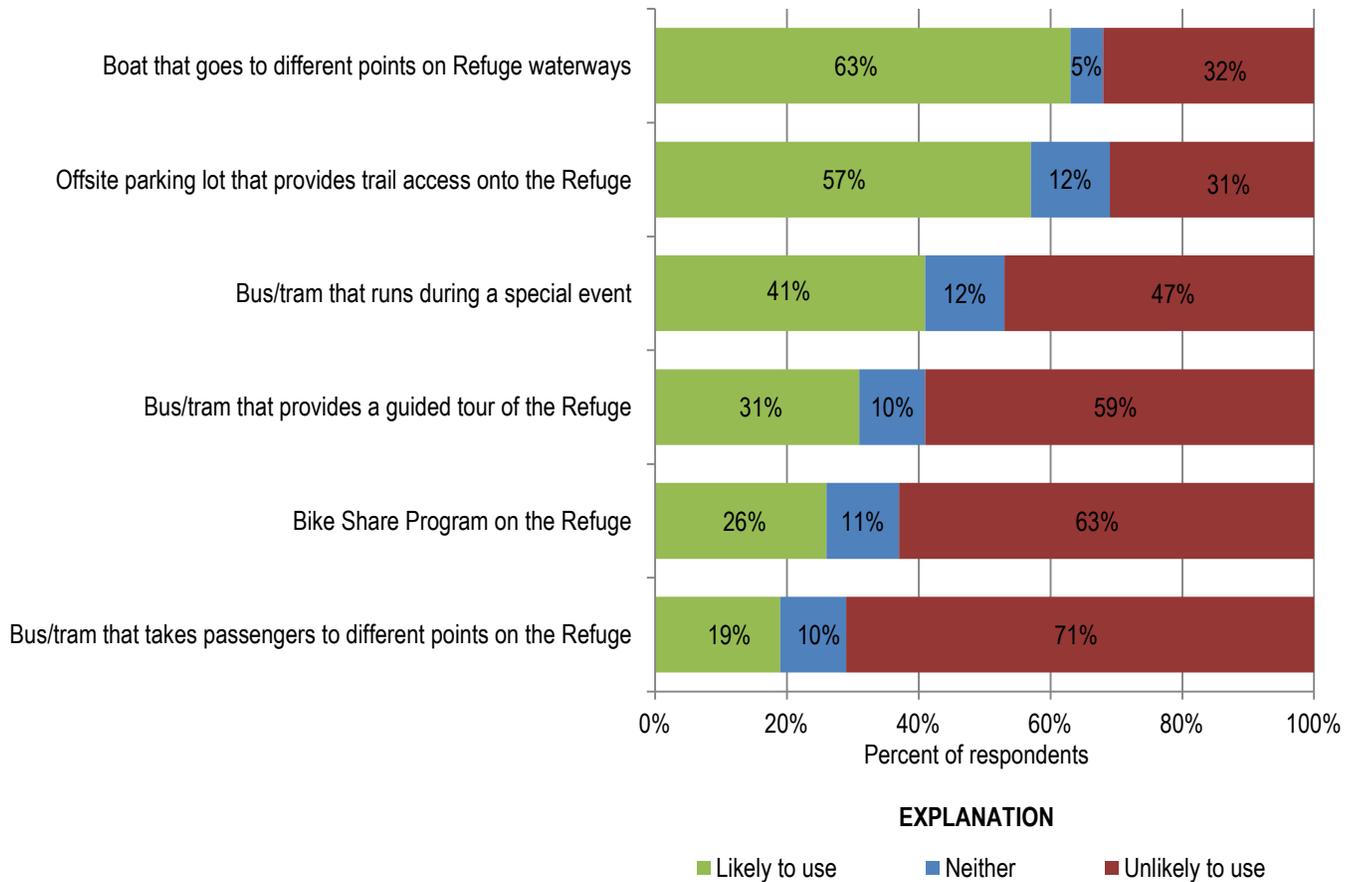
*Visitors use a variety of transportation means to access and enjoy national wildlife refuges. While many visitors arrive at the refuge in a private vehicle, alternatives such as buses, trams, watercraft, and bicycles are increasingly becoming a part of the visitor experience. Previous research has identified a growing need for transportation alternatives within the Refuge System (Krechmer et al., 2001); however, less is known about how visitors perceive and use these new transportation options. An understanding of visitors' likelihood of using certain alternative transportation options can help in future planning efforts. Visitors were asked their likelihood of using alternative transportation options at national wildlife refuges in the future.*

Of the six Refuge System-wide alternative transportation options listed on the survey, the majority of Big Lake NWR visitors who were surveyed were likely to use the following options at national wildlife refuges in the future (fig. 13):

- an offsite parking lot that provides trail access; and
- a boat that goes to different points on refuge waterways.

The majority of visitors were *not* likely to use a bus/tram that takes passengers to different points, a bike share program, or a bus/tram that provides a guided tour on national wildlife refuges in the future (fig. 13).

When asked about using alternative transportation at Big Lake NWR specifically, 40% of visitors indicated they were unsure whether it would enhance their experience; however, some visitors thought alternative transportation would enhance their experience (38%) and others thought it would not (22%).



**Figure 13.** Visitors' likelihood of using alternative transportation options at national wildlife refuges in the future (n ≥ 104).

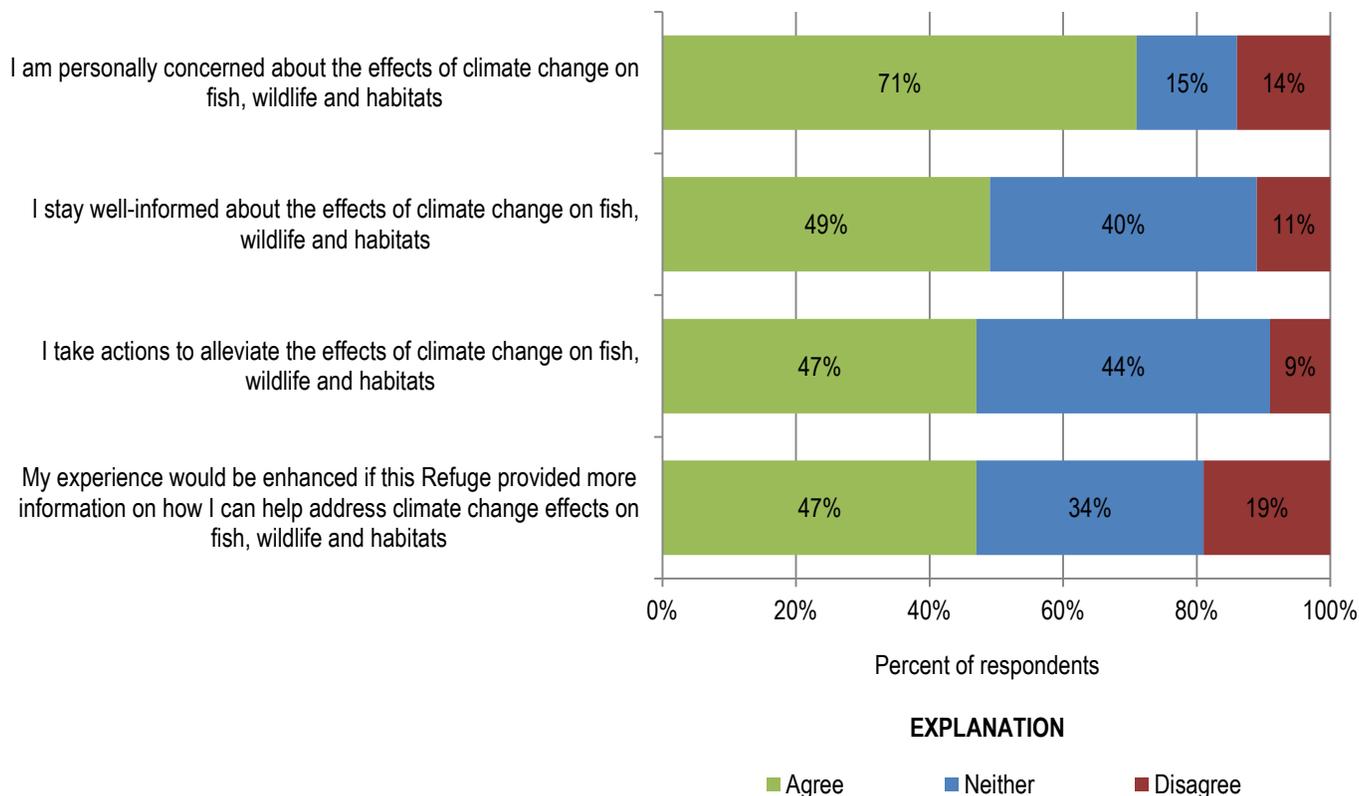
### Climate Change and the National Wildlife Refuge System

*Climate change represents a growing concern for the management of national wildlife refuges. The Service's climate change strategy, titled "Rising to the Urgent Challenge," establishes a basic framework for the agency to work within a larger conservation community to help ensure wildlife, plant, and habitat sustainability (U.S. Fish and Wildlife Service, 2010). To support the guiding principles of the strategy, refuges will be exploring options for more effective engagement with visitors on this topic. The national visitor survey collected information about visitors' level of personal involvement in climate change related to fish, wildlife and their habitats and visitors' beliefs regarding this topic. Items draw from the "Six Americas" framework for understanding public sentiment toward climate change (Leiserowitz, Maibach, and Roser-Renouf, 2008) and from literature on climate change message frames (for example, Nisbet, 2009). Such information provides a baseline for understanding visitor perceptions of climate change in the context of fish and wildlife conservation that can further inform related communication and outreach strategies.*

Factors that influence how individuals think about climate change include their basic beliefs, levels of involvement, policy preferences, and behaviors related to this topic. Results presented below provide baseline information on visitors' levels of involvement with the topic of climate change related to fish,

wildlife and their habitats. The majority of surveyed visitors to Big Lake NWR agreed with the following statements (fig. 14):

- “I am personally concerned about the effects of climate change on fish, wildlife and habitats.”



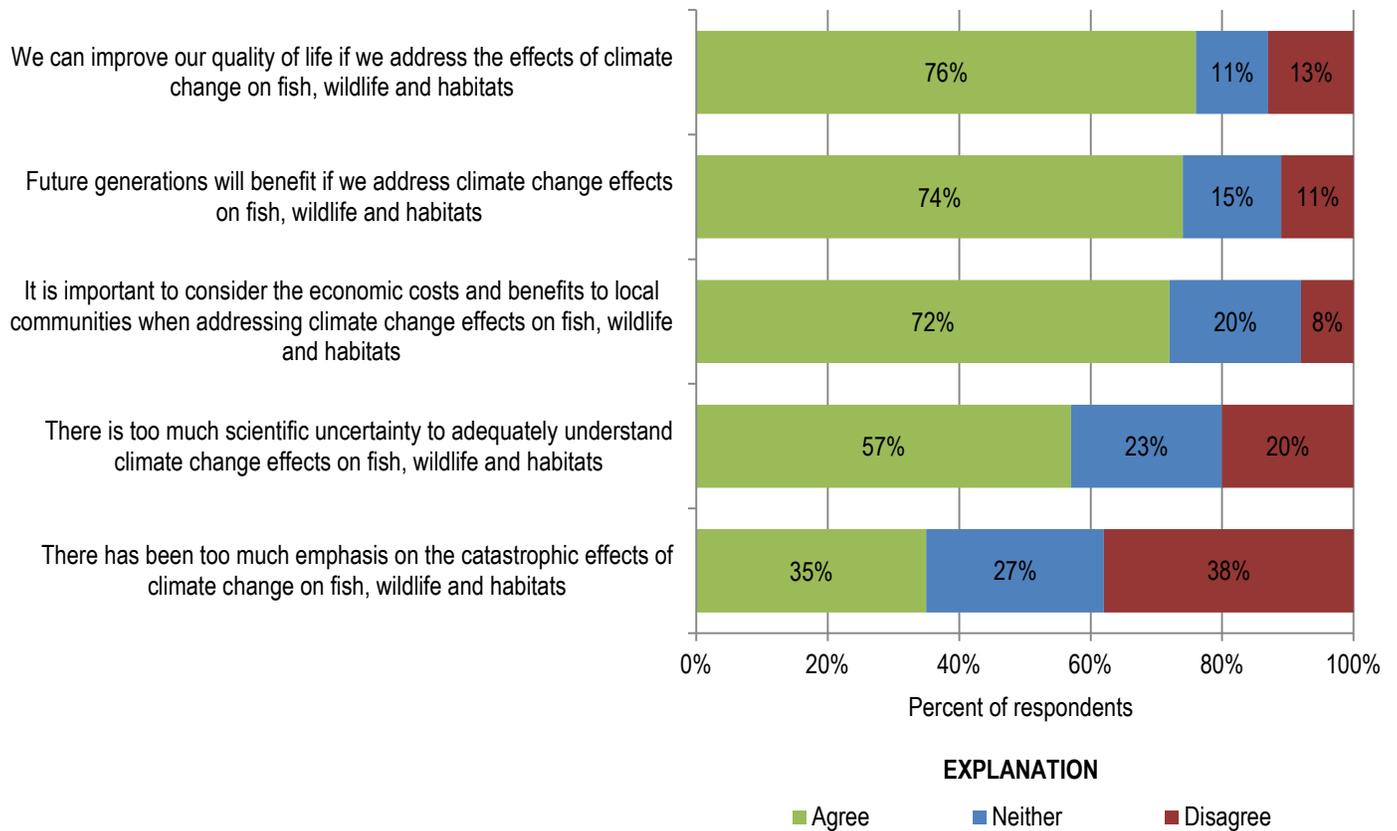
**Figure 14.** Visitors’ personal involvement with climate change related to fish, wildlife and their habitats (n ≥ 105).

These results are most useful when coupled with responses to belief statements about the effects of climate change on fish, wildlife and their habitats, because such beliefs may be used to develop message frames (or ways to communicate) about climate change with a broad coalition of visitors. Framing science-based findings will not alter the overall message, but rather place the issue in a context in which different audience groupings can relate. The need to mitigate impacts of climate change on Refuges could be framed as a quality-of-life issue (for example, preserving the ability to enjoy fish, wildlife, plants, and their habitat) or an economic issue (for example, maintaining tourist revenues, supporting economic growth through new jobs/technology).

For Big Lake NWR, the majority of visitors believed the following regarding climate change related to fish, wildlife and their habitats (fig. 15):

- “We can improve our quality of life if we address the effects of climate change;”
- “Future generations will benefit if we address climate change effects;”
- “It is important to consider the economic costs and benefits to local communities when addressing climate change effects;” and
- “There is too much scientific uncertainty to adequately understand climate change effects.”

Such information suggests that certain beliefs resonate with a greater number of visitors than other beliefs do. This information is important to note because some visitors (47%) indicated that their experience would be enhanced if Big Lake NWR provided information about how they could help address the effects of climate change on fish, wildlife, and their habitats (fig. 14), and framing the information in a way that resonates most with visitors may result in a more engaged public who support strategies aimed at alleviating climate change pressures. Data will be analyzed further at the aggregate, or national level, to inform the development of a comprehensive communication strategy about climate change.



**Figure 15.** Visitors' beliefs about the effects of climate change on fish, wildlife and their habitats (n ≥ 104).

## Conclusion

These individual refuge results provide a summary of trip characteristics and experiences of a sample of visitors to Big Lake NWR during 2010–2011. These data can be used to inform decision-making efforts related to the refuge, such as Comprehensive Conservation Plan implementation, visitor services management, and transportation planning and management. For example, when modifying (either minimizing or enhancing) visitor facilities, services, or recreational opportunities, a solid understanding of visitors' trip and activity characteristics, their satisfaction with existing offerings, and opinions regarding refuge fees is helpful. This information can help to gauge demand for refuge opportunities and inform both implementation and communication strategies. Similarly, an awareness of visitors' satisfaction ratings with refuge offerings can help determine if any potential areas of concern need to be investigated further. As another example of the utility of these results, community relations may be improved or bolstered through an understanding of the value of the refuge to visitors, whether that value is attributed to an appreciation of the refuge's uniqueness, enjoyment of its recreational opportunities, or spending contributions of nonlocal visitors to the local economy. Such data about visitors and their experiences, in conjunction with an understanding of biophysical data on the refuge, can ensure that management decisions are consistent with the Refuge System mission while fostering a continued public interest in these special places.

Individual refuge results are available for downloading at <http://pubs.usgs.gov/ds/643/> as part of USGS Data Series 643 (Sexton and others, 2011). For additional information about this project, contact the USGS researchers at [national\\_visitor\\_survey@usgs.gov](mailto:national_visitor_survey@usgs.gov) or 970.226.9205.

## References

- Bruyere, B.L., Rodriguez, D.A., and Vaske, J.J., 2002, Enhancing importance-performance analysis through segmentation: *Journal of Travel and Tourism Marketing*, v. 12, no. 1, p. 81-95.
- Carver, E., and Caudill, J., 2007, Banking on nature 2006: The economic benefits to local communities of National Wildlife Refuge visitation: U.S. Fish and Wildlife Service, Division of Economics, Washington, D.C., 372 p., accessed September 30, 2011, at [http://www.fws.gov/refuges/about/msWord/BankingonNature\\_2006\\_11-23.doc](http://www.fws.gov/refuges/about/msWord/BankingonNature_2006_11-23.doc).
- Clark, J.R., 2001, Mission and Goals (National Fish and Wildlife Service Director's Order #132–601 FW1), accessed November 18, 2011 at [http://www.fws.gov/refuges/policiesandbudget/HR1420\\_missionGoals.html](http://www.fws.gov/refuges/policiesandbudget/HR1420_missionGoals.html).
- Dillman, D.A., 2007, Mail and Internet surveys: The tailored design method. (2nd ed.): Hoboken, N.J., John Wiley and Sons, Inc., 523 p.
- Krechmer, D., Grimm, L., Hodge, D., Mendes, D., and Goetzke, F., 2001, Federal lands alternative transportation systems study – Volume 3 – Summary of national ATS needs: prepared for Federal Highway Administration, and Federal Transit Administration in association with National Park Service, Bureau of Land Management, and U.S. Fish and Wildlife Service, 80 p. (Also available at [http://www.fta.dot.gov/documents/3039\\_study.pdf](http://www.fta.dot.gov/documents/3039_study.pdf).)
- Leiserowitz, A, Maibach, E., and Roser-Renouf, C., 2008, Global warming's six Americas: An audience segmentation: New Haven, Conn., Yale University.
- Martilla, J.A., and James, J.C., 1977, Importance-performance analysis: *Journal of Marketing*, v. 41, p. 77–79.
- Nisbet, M.C., 2009, Communicating climate change: Why frames matter for public engagement: *Environment*, v. 51, p. 12-23.
- Salant, P., and Dillman, D.A., 1994, How to conduct your own study: New York, N.Y., John Wiley and Sons, Inc.

- Sexton, N.R., Dietsch, A.M., Don Carlos, A.W., Koontz, L., Solomon, A. and Miller, H., 2011, National wildlife refuge visitor survey 2010/2011: Individual refuge results: U.S. Geological Survey Data Series 643.
- Stynes, D.J., 2008, National Park visitor spending and payroll impacts, 2007: East Lansing, Mich., Michigan State University, Department of Community, Agriculture, Recreation and Resource Studies.
- Tarrant, M.A., and Smith, E.K., 2002, The use of a modified importance-performance framework to examine visitor satisfaction with attributes of outdoor recreation settings: *Managing Leisure*, v. 7, no. 2, p. 69–82.
- Uniack, T., 1999, The citizen's wildlife refuge planning handbook: Charting the future of conservation on the National Wildlife Refuge near you: Defenders of Wildlife, Washington, D.C., accessed April 2010 at [http://www.defenders.org/resources/publications/programs\\_and\\_policy/habitat\\_conservation/federal\\_lands/citizen's\\_wildlife\\_refuge\\_planning\\_handbook.pdf](http://www.defenders.org/resources/publications/programs_and_policy/habitat_conservation/federal_lands/citizen's_wildlife_refuge_planning_handbook.pdf).
- U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau, 2007, 2006 National survey of fishing, hunting, and wildlife-associated recreation: U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C., 168 p.
- U.S. Fish and Wildlife Service, 2007, America's national wildlife refuges, Fact Sheet, last updated July 31, 2007.
- U.S. Fish and Wildlife Service, 2010, Rising to the urgent challenge: Strategic plan for responding to accelerating climate change: U.S. Fish and Wildlife Service, Division of Refuges, Washington, D.C., 32 p., accessed April 2011 at <http://www.fws.gov/home/climatechange/pdf/CCStrategicPlan.pdf>.
- Vaske, J.J., Beaman, J., Stanley R., and Grenier, M., 1996, Importance-performance and segmentation: Where do we go from here?: *in* Fesenmaier, D.R., O'Leary, J.T., and Uysal, M., eds., *Recent advances in tourism marketing research*: New York, The Haworth Press, Inc., p. 225-240.
- Wade, D.J. and Eagles, P.F.J., 2003, The use of importance-performance analysis and market segmentation for tourism management in parks and protected areas: An application to Tanzania's National Parks: *Journal of Ecotourism*, v. 2, no. 3, p. 196-212.

This page left intentionally blank.

# National Wildlife Refuge Visitor Survey



**PLEASE READ THIS FIRST:**

Thank you for visiting a National Wildlife Refuge and for agreeing to participate in this study! We hope that you had an enjoyable experience. The U.S. Fish and Wildlife Service and the U.S. Geological Survey would like to learn more about National Wildlife Refuge visitors in order to improve the management of the area and enhance visitor opportunities.

**If you have recently visited more than one National Wildlife Refuge or made more than one visit to the same Refuge, please respond regarding only the Refuge and the visit when you were asked to participate in this survey. Any question that uses the phrase “this Refuge” refers to the Refuge and visit when you were contacted.**

---

**SECTION 1. Your visit to this Refuge**

---

1. Including your most recent visit, which activities have you participated in during the past 12 months at this Refuge?  
(Please mark **all that apply.**)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> 25% Big game hunting                 | <input type="checkbox"/> 15% Hiking  | <input type="checkbox"/> 3% Environmental education (for example, classrooms or labs, tours) |
| <input type="checkbox"/> 5% Upland/Small-game hunting         | <input type="checkbox"/> 0% Bicycling  |  |
| <input type="checkbox"/> 23% Migratory bird/Waterfowl hunting | <input type="checkbox"/> 28% Auto tour route/Driving                               | <input type="checkbox"/> 4% Special event ( <i>please specify</i> )<br><u>See Appendix B</u> |
| <input type="checkbox"/> 45% Wildlife observation             | <input type="checkbox"/> 28% Motorized boating                                     |  |
| <input type="checkbox"/> 40% Bird watching                    | <input type="checkbox"/> 4% Nonmotorized boating (including canoes/kayaks)         | <input type="checkbox"/> 4% Other ( <i>please specify</i> )<br><u>See Appendix B</u>         |
| <input type="checkbox"/> 69% Freshwater fishing               |  |  |
| <input type="checkbox"/> 0% Saltwater fishing                 | <input type="checkbox"/> 7% Interpretation (for example, exhibits, kiosks, videos) | <input type="checkbox"/> 1% Other ( <i>please specify</i> )<br><u>See Appendix B</u>         |
| <input type="checkbox"/> 21% Photography                      |  |  |

2. Which of the activities above was the ***primary*** purpose of your visit to this Refuge?  
(Please write **only one activity** on the line.) See report for categorized results; see Appendix B for miscellaneous responses

3. Did you go to a Visitor Center at this Refuge?

- 70% No
- 30% Yes → If yes, what did you do there? (Please mark **all that apply.**)
- |  |   |
|--|---|
| <input type="checkbox"/> 3% Visit the gift shop or bookstore     | <input type="checkbox"/> 0% Watch a nature talk/video/presentation                                |
| <input type="checkbox"/> 47% View the exhibits                   | <input type="checkbox"/> 21% Stopped to use the facilities (for example, get water, use restroom) |
| <input type="checkbox"/> 62% Ask information of staff/volunteers | <input type="checkbox"/> 24% Other ( <i>please specify</i> ) <u>See Appendix B</u>                |

4. Which of the following best describes your visit to this Refuge? (*Please mark **only one.***)

| Nonlocal | Local | Total |   |
|----------|-------|-------|---|
| 60%      | 81%   | 79%   | It was the primary purpose or sole destination of my trip.  |
| 10%      | 12%   | 12%   | It was one of many equally important reasons or destinations for my trip.   |
| 30%      | 7%    | 9%    | It was just an incidental or spur-of-the-moment stop on a trip taken for other purposes or to other destinations. |

5. Approximately how many **miles** did you travel to get to this Refuge?

**Nonlocal**   221   number of miles

**Local**   16   number of miles

6. How much time did you spend at this Refuge on your visit?

See Report for Results

7. Were you part of a group on your visit to this Refuge?

56% No (*skip to question #9*)

44% Yes → What **type of group** were you with on your visit? (*Please mark **only one.***)

92% Family and/or friends

6% Organized club or school group

0% Commercial tour group

2% Other (*please specify*) See Appendix B

8. How many people were in your group, including yourself? (*Please answer each category.*)

  3   number 18 years and over

  1   number 17 years and under

9. How did you **first learn or hear about** this Refuge? (*Please mark **all that apply.***)

71% Friends or relatives

3% Refuge website

21% Signs on highway

1% Other website (*please specify*) See Appendix B

3% Recreation club or organization

0% Television or radio

41% People in the local community

0% Newspaper or magazine

13% Refuge printed information (brochure, map)

7% Other (*please specify*) See Appendix B

10. During which seasons have you visited this Refuge in the last 12 months? (*Please mark **all that apply.***)

80% Spring  
(March-May)

60% Summer  
(June-August)

71% Fall  
(September-November)

64% Winter  
(December-February)

11. How many times have you visited...

...this Refuge (including this visit) in the last 12 months?   23   number of visits

...other National Wildlife Refuges in the last 12 months?   5   number of visits

**SECTION 2. Transportation and access at this Refuge**

1. What **forms of transportation** did you use on your visit to this Refuge? (*Please mark **all that apply.***)

- |                              |   |                              |                                  |                              |                                       |
|------------------------------|---|------------------------------|----------------------------------|------------------------------|---------------------------------------|
| <input type="checkbox"/> 70% | Private vehicle without a trailer                             | <input type="checkbox"/> 0%  | Refuge shuttle bus or tram       | <input type="checkbox"/> 0%  | Bicycle                               |
| <input type="checkbox"/> 50% | Private vehicle with a trailer<br>(for boat, camper or other) | <input type="checkbox"/> 1%  | Motorcycle                       | <input type="checkbox"/> 12% | Walk/Hike                             |
| <input type="checkbox"/> 0%  | Commercial tour bus   | <input type="checkbox"/> 4%  | ATV or off-road vehicle          | <input type="checkbox"/> 3%  | Other ( <i>please specify below</i> ) |
| <input type="checkbox"/> 2%  | Recreational vehicle (RV)                                     | <input type="checkbox"/> 23% | Boat                             | <u>See Appendix B</u>        |                                       |
|                              |   | <input type="checkbox"/> 0%  | Wheelchair or other mobility aid |                              |                                       |

2. Which of the following did you use to find your way to this Refuge? (*Please mark **all that apply.***)

- |                              |  |                              |   |
|------------------------------|--|------------------------------|---|
| <input type="checkbox"/> 36% | Signs on highways  | <input type="checkbox"/> 3%  | Directions from Refuge website                        |
| <input type="checkbox"/> 4%  | A GPS navigation system  | <input type="checkbox"/> 16% | Directions from people in community near this Refuge  |
| <input type="checkbox"/> 4%  | A road atlas or highway map                                      | <input type="checkbox"/> 28% | Directions from friends or family                     |
| <input type="checkbox"/> 5%  | Maps from the Internet (for example,<br>MapQuest or Google Maps) | <input type="checkbox"/> 70% | Previous knowledge/I have been to this Refuge before  |
|                              |  | <input type="checkbox"/> 3%  | Other ( <i>please specify</i> ) <u>See Appendix B</u> |

3. Below are different alternative transportation options that could be offered at some National Wildlife Refuges in the future. Considering the different Refuges you may have visited, please tell us **how likely you would be to use each transportation option.** (*Please circle one number for each statement.*)

| How likely would you be to use...   | Very Unlikely                | Somewhat Unlikely            | Neither                      | Somewhat Likely              | Very Likely                  |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| ...a bus or tram that takes passengers to different points on the Refuge (such as the Visitor Center)?          | <input type="checkbox"/> 60% | <input type="checkbox"/> 11% | <input type="checkbox"/> 10% | <input type="checkbox"/> 13% | <input type="checkbox"/> 6%  |
| ...a bike that was offered through a Bike Share Program for use while on the Refuge?                            | <input type="checkbox"/> 54% | <input type="checkbox"/> 9%  | <input type="checkbox"/> 12% | <input type="checkbox"/> 18% | <input type="checkbox"/> 8%  |
| ...a bus or tram that provides a guided tour of the Refuge with information about the Refuge and its resources? | <input type="checkbox"/> 48% | <input type="checkbox"/> 11% | <input type="checkbox"/> 11% | <input type="checkbox"/> 17% | <input type="checkbox"/> 13% |
| ...a boat that goes to different points on Refuge waterways?  | <input type="checkbox"/> 23% | <input type="checkbox"/> 8%  | <input type="checkbox"/> 6%  | <input type="checkbox"/> 26% | <input type="checkbox"/> 37% |
| ...a bus or tram that runs during a special event (such as an evening tour of wildlife or weekend festival)?    | <input type="checkbox"/> 40% | <input type="checkbox"/> 7%  | <input type="checkbox"/> 12% | <input type="checkbox"/> 26% | <input type="checkbox"/> 15% |
| ...an offsite parking lot that provides trail access for walking/hiking onto the Refuge?                        | <input type="checkbox"/> 23% | <input type="checkbox"/> 7%  | <input type="checkbox"/> 12% | <input type="checkbox"/> 27% | <input type="checkbox"/> 30% |
| ...some other alternative transportation option?<br>( <i>please specify</i> ) <u>See Appendix B</u>             | <input type="checkbox"/> 0%  | <input type="checkbox"/> 0%  | <input type="checkbox"/> 0%  | <input type="checkbox"/> 33% | <input type="checkbox"/> 67% |

4. If alternative transportation were offered at *this* Refuge, would it enhance your experience?

- 38% Yes       22% No       40% Not Sure

5. For each of the following transportation-related features, first, **rate how important** each feature is to you when visiting this Refuge; then **rate how satisfied** you are with the way this Refuge is managing each feature. *If this Refuge does not offer a specific transportation-related feature, please rate how important it is to you and then circle NA "Not Applicable" under the Satisfaction column.*

| Importance                |                      |         |                    |                | Satisfaction              |                      |         |                    |                |                |
|---------------------------|----------------------|---------|--------------------|----------------|---------------------------|----------------------|---------|--------------------|----------------|----------------|
| Circle one for each item. |                      |         |                    |                | Circle one for each item. |                      |         |                    |                |                |
| Very Unimportant          | Somewhat Unimportant | Neither | Somewhat Important | Very Important | Very Unsatisfied          | Somewhat Unsatisfied | Neither | Somewhat Satisfied | Very Satisfied | Not Applicable |
| 4%                        | 6%                   | 6%      | 25%                | 59%            | 4%                        | 9%                   | 7%      | 32%                | 49%            | NA             |
| 3%                        | 6%                   | 12%     | 31%                | 48%            | 2%                        | 6%                   | 11%     | 28%                | 53%            | NA             |
| 5%                        | 2%                   | 10%     | 16%                | 66%            | 1%                        | 3%                   | 11%     | 25%                | 59%            | NA             |
| 5%                        | 4%                   | 11%     | 34%                | 47%            | 5%                        | 3%                   | 16%     | 29%                | 46%            | NA             |
| 3%                        | 6%                   | 7%      | 26%                | 57%            | 3%                        | 12%                  | 11%     | 30%                | 45%            | NA             |
| 6%                        | 4%                   | 10%     | 31%                | 49%            | 7%                        | 12%                  | 11%     | 31%                | 39%            | NA             |
| 4%                        | 1%                   | 5%      | 16%                | 74%            | 6%                        | 3%                   | 6%      | 31%                | 54%            | NA             |
| 4%                        | 3%                   | 5%      | 17%                | 72%            | 3%                        | 4%                   | 9%      | 32%                | 52%            | NA             |
| 6%                        | 5%                   | 10%     | 26%                | 53%            | 1%                        | 6%                   | 13%     | 24%                | 56%            | NA             |
| 5%                        | 7%                   | 8%      | 24%                | 56%            | 5%                        | 12%                  | 12%     | 27%                | 44%            | NA             |
| 6%                        | 6%                   | 11%     | 30%                | 48%            | 3%                        | 10%                  | 21%     | 30%                | 36%            | NA             |
| 5%                        | 2%                   | 9%      | 20%                | 64%            | 11%                       | 13%                  | 18%     | 22%                | 36%            | NA             |

6. If you have any comments about transportation-related items at this Refuge, please write them on the lines below.

See Appendix B

---



---



---



---

**SECTION 3. Your expenses related to your Refuge visit**

1. Do you live in the local area (within approximately 50 miles of this Refuge)?

91% Yes

9% No → How much time did you spend **in local communities** on this trip?  
2 number of hours OR 5 number of days

2. Please record the amount that **you and other members of your group** with whom you shared expenses (for example, other family members, traveling companions) spent in the local 50-mile area during **your most recent visit** to this Refuge. (Please enter the amount spent to the nearest dollar in each category below. Enter 0 (zero) if you did not spend any money in a particular category.)

| Categories   | Amount Spent in<br>Local Communities & at this Refuge<br><i>(within 50 miles of this Refuge)</i> |
|--|--|
| Motel, bed & breakfast, cabin, etc.                              |  |
| Camping  |  |
| Restaurants & bars   |  |
| Groceries  |  |
| Gasoline and oil   |  |
| Local transportation (bus, shuttle, rental car, etc.)            |  |
| Refuge entrance fee  |  |
| Recreation guide fees (hunting, fishing, wildlife viewing, etc.) |  |
| Equipment rental (canoe, bicycle, kayak, etc.)                   |  |
| Sporting good purchases  |  |
| Souvenirs/clothing and other retail                              |  |
| Other (please specify) _____                                     |  |

See Report for Results

3. Including yourself, how many people in your group shared these trip expenses?

2 number of people sharing expenses

4. As you know, some of the costs of travel such as gasoline, hotels, and airline tickets often increase. If your total trip costs were to increase, what is the maximum extra amount you would pay and still visit this Refuge? (*Please circle the highest dollar amount.*)

|     |      |      |      |      |      |       |       |       |       |       |
|-----|------|------|------|------|------|-------|-------|-------|-------|-------|
| \$0 | \$10 | \$20 | \$35 | \$50 | \$75 | \$100 | \$125 | \$150 | \$200 | \$250 |
| 11% | 18%  | 26%  | 7%   | 15%  | 2%   | 11%   | 1%    | 2%    | 2%    | 6%    |

5. If you or a member of your group paid a fee or used a pass to enter this Refuge, how appropriate was the fee? (*Please mark **only one.***)

|     |             |    |         |     |             |    |          |    |              |     |  |
|-----|-------------|----|---------|-----|-------------|----|----------|----|--------------|-----|--|
| 14% | Far too low | 0% | Too low | 86% | About right | 0% | Too high | 0% | Far too high | 94% | Did not pay a fee<br>(skip to Section 4) |
|-----|-------------|----|---------|-----|-------------|----|----------|----|--------------|-----|--|

6. Please indicate whether you disagree or agree with the following statement. (*Please mark **only one.***)

**The value of the recreation opportunities and services I experienced at this Refuge was at least equal to the fee I paid.**

|    |                   |    |          |     |                           |     |       |     |                |
|----|-------------------|----|----------|-----|---------------------------|-----|-------|-----|----------------|
| 0% | Strongly disagree | 0% | Disagree | 43% | Neither agree or disagree | 29% | Agree | 29% | Strongly agree |
|----|-------------------|----|----------|-----|---------------------------|-----|-------|-----|----------------|

---

#### SECTION 4. Your experience at this Refuge

---

1. Considering your visit to this Refuge, please indicate the extent to which you disagree or agree with each statement. (*Please circle one number for each statement.*)

|   | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree | Not Applicable |
|---|-------------------|----------|---------|-------|----------------|----------------|
| Overall, I am satisfied with the recreational activities and opportunities provided by this Refuge.     | 5%                | 10%      | 7%      | 45%   | 33%            | NA             |
| Overall, I am satisfied with the information and education provided by this Refuge about its resources. | 5%                | 10%      | 11%     | 38%   | 38%            | NA             |
| Overall, I am satisfied with the services provided by employees or volunteers at this Refuge.           | 4%                | 5%       | 7%      | 33%   | 52%            | NA             |
| This Refuge does a good job of conserving fish, wildlife and their habitats.                            | 8%                | 5%       | 5%      | 30%   | 53%            | NA             |

2. For each of the following services, facilities, and activities, first, **rate how important** each item is to you when visiting this Refuge; then, **rate how satisfied** you are with the way this Refuge is managing each item.  
*If this Refuge does not offer a specific service, facility, or activity, please rate how important it is to you and then circle NA “Not Applicable” under the Satisfaction column.*

| Importance                |                      |         |                    |                | Refuge Services, Facilities, and Activities   | Satisfaction              |                      |         |                    |                |                |
|---------------------------|----------------------|---------|--------------------|----------------|---|---------------------------|----------------------|---------|--------------------|----------------|----------------|
| Circle one for each item. |                      |         |                    |                |   | Circle one for each item. |                      |         |                    |                |                |
| Very Unimportant          | Somewhat Unimportant | Neither | Somewhat Important | Very Important |   | Very Unsatisfied          | Somewhat Unsatisfied | Neither | Somewhat Satisfied | Very Satisfied | Not Applicable |
| 5%                        | 7%                   | 11%     | 40%                | 36%            | Availability of employees or volunteers   | 5%                        | 7%                   | 13%     | 21%                | 54%            | NA             |
| 5%                        | 5%                   | 12%     | 34%                | 45%            | Courteous and welcoming employees or volunteers   | 0%                        | 3%                   | 15%     | 13%                | 69%            | NA             |
| 5%                        | 4%                   | 9%      | 24%                | 59%            | Knowledgeable employees or volunteers   | 0%                        | 3%                   | 15%     | 14%                | 68%            | NA             |
| 4%                        | 6%                   | 10%     | 31%                | 50%            | Printed information about this Refuge and its resources (for example, maps and brochures) | 0%                        | 9%                   | 12%     | 32%                | 47%            | NA             |
| 5%                        | 5%                   | 17%     | 39%                | 34%            | Informational kiosks/displays about this Refuge and its resources                         | 2%                        | 10%                  | 16%     | 38%                | 34%            | NA             |
| 2%                        | 2%                   | 4%      | 27%                | 65%            | Signs with rules/regulations for this Refuge  | 1%                        | 7%                   | 5%      | 34%                | 53%            | NA             |
| 6%                        | 4%                   | 14%     | 39%                | 37%            | Exhibits about this Refuge and its resources  | 7%                        | 10%                  | 18%     | 31%                | 34%            | NA             |
| 3%                        | 5%                   | 20%     | 30%                | 42%            | Environmental education programs or activities  | 11%                       | 8%                   | 22%     | 26%                | 33%            | NA             |
| 7%                        | 4%                   | 10%     | 32%                | 46%            | Visitor Center  | 10%                       | 8%                   | 16%     | 26%                | 40%            | NA             |
| 2%                        | 3%                   | 9%      | 29%                | 57%            | Convenient hours and days of operation  | 2%                        | 1%                   | 11%     | 27%                | 59%            | NA             |
| 4%                        | 2%                   | 15%     | 17%                | 62%            | Well-maintained restrooms   | 19%                       | 5%                   | 27%     | 16%                | 32%            | NA             |
| 2%                        | 4%                   | 8%      | 34%                | 53%            | Wildlife observation structures (decks, blinds)   | 3%                        | 10%                  | 12%     | 30%                | 45%            | NA             |
| 5%                        | 7%                   | 10%     | 33%                | 46%            | Bird-watching opportunities   | 2%                        | 9%                   | 16%     | 30%                | 43%            | NA             |
| 3%                        | 2%                   | 10%     | 24%                | 61%            | Opportunities to observe wildlife other than birds  | 4%                        | 6%                   | 11%     | 34%                | 44%            | NA             |
| 4%                        | 5%                   | 12%     | 30%                | 49%            | Opportunities to photograph wildlife and scenery  | 1%                        | 10%                  | 16%     | 33%                | 40%            | NA             |
| 7%                        | 3%                   | 9%      | 15%                | 66%            | Hunting opportunities   | 8%                        | 5%                   | 15%     | 29%                | 43%            | NA             |
| 2%                        | 2%                   | 3%      | 14%                | 80%            | Fishing opportunities   | 12%                       | 9%                   | 7%      | 27%                | 46%            | NA             |
| 9%                        | 2%                   | 20%     | 30%                | 39%            | Trail hiking opportunities  | 8%                        | 11%                  | 19%     | 29%                | 33%            | NA             |
| 12%                       | 4%                   | 34%     | 26%                | 24%            | Water trail opportunities for canoeing or kayaking  | 9%                        | 8%                   | 41%     | 24%                | 18%            | NA             |
| 8%                        | 7%                   | 35%     | 30%                | 20%            | Bicycling opportunities   | 13%                       | 6%                   | 41%     | 23%                | 17%            | NA             |
| 6%                        | 1%                   | 25%     | 26%                | 41%            | Volunteer opportunities   | 5%                        | 12%                  | 28%     | 26%                | 30%            | NA             |

3. If you have any comments about the services, facilities, and activities at this Refuge, please write them on the lines below.

See Appendix B

---

---

---

---

**SECTION 5. Your opinions regarding National Wildlife Refuges and the resources they conserve**

---

1. Before you were contacted to participate in this survey, were you aware that National Wildlife Refuges...

...are managed by the U. S. Fish and Wildlife Service?

97% Yes

3% No

...have the primary mission of conserving, managing, and restoring fish, wildlife, plants and their habitat?

97% Yes

3% No

2. Compared to other public lands you have visited, do you think Refuges provide a unique recreation experience?

75% Yes

25% No

3. If you answered "Yes" to Question 2, please briefly describe what makes Refuges unique. \_\_\_\_\_

See Appendix B

---

---

---

---

4. There has been a lot of talk about climate change recently. We would like to know what you think about climate change as it relates to fish, wildlife and their habitats. To what extent do you disagree or agree with each statement below? (Please circle one number for each statement.)

| Statements about climate change  | Strongly Disagree | Disagree | Neither | Agree | Strongly Agree |
|--|-------------------|----------|---------|-------|----------------|
| I am personally concerned about the effects of climate change on fish, wildlife and their habitats.  | 8%                | 6%       | 15%     | 42%   | 29%            |
| We can improve our quality of life if we address the effects of climate change on fish, wildlife and their habitats.   | 8%                | 5%       | 11%     | 44%   | 32%            |
| There is too much scientific uncertainty to adequately understand how climate change will impact fish, wildlife and their habitats.  | 3%                | 17%      | 23%     | 41%   | 15%            |
| I stay well-informed about the effects of climate change on fish, wildlife and their habitats.   | 2%                | 9%       | 40%     | 34%   | 15%            |
| It is important to consider the economic costs and benefits to local communities when addressing the effects of climate change on fish, wildlife and their habitats.                     | 2%                | 6%       | 20%     | 47%   | 26%            |
| I take actions to alleviate the effects of climate change on fish, wildlife and their habitats.  | 4%                | 6%       | 43%     | 37%   | 10%            |
| There has been too much emphasis on the catastrophic effects of climate change on fish, wildlife and their habitats.   | 13%               | 24%      | 28%     | 24%   | 11%            |
| Future generations will benefit if we address the effects of climate change on fish, wildlife and their habitats.  | 7%                | 5%       | 15%     | 38%   | 36%            |
| My experience at this Refuge would be enhanced if this Refuge provided more information about how I can help address the effects of climate change on fish, wildlife and their habitats. | 7%                | 12%      | 34%     | 25%   | 22%            |

## SECTION 6. A Little about You

**\*\* Please tell us a little bit about yourself. Your answers to these questions will help further characterize visitors to National Wildlife Refuges. Answers are not linked to any individual taking this survey. \*\***

1. Are you a citizen or permanent resident of the United States?

100% Yes  0% No → If not, what is your home country? See Figure 4 in Report

2. Are you?  89% Male  11% Female

3. In what year were you born? 1961 (YYYY)

4. What is your highest year of formal schooling? *(Please circle one number.)*

|              |   |   |   |   |                                |   |   |               |    |    |    |                               |    |    |    |                                   |    |    |     |
|--------------|---|---|---|---|--------------------------------|---|---|---------------|----|----|----|-------------------------------|----|----|----|-----------------------------------|----|----|-----|
| 1            | 2 | 3 | 4 | 5 | 6                              | 7 | 8 | 9             | 10 | 11 | 12 | 13                            | 14 | 15 | 16 | 17                                | 18 | 19 | 20+ |
| (elementary) |   |   |   |   | (junior high or middle school) |   |   | (high school) |    |    |    | (college or technical school) |    |    |    | (graduate or professional school) |    |    |     |
|              |   |   |   |   | 6%                             |   |   | 39%           |    |    |    | 47%                           |    |    |    | 8%                                |    |    |     |

5. What ethnicity do you consider yourself?  2% Hispanic or Latino  98% Not Hispanic or Latino

6. From what racial origin(s) do you consider yourself? *(Please mark **all that apply.**)*

- 5% American Indian or Alaska Native  3% Black or African American  96% White  
 0% Asian  0% Native Hawaiian or Pacific Islander

7. How many members of your household contribute to paying the household expenses? 2 persons

8. Including these members, what was your approximate household income from all sources (before taxes) last year?

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> 6% Less than \$10,000   | <input type="checkbox"/> 8% \$35,000 - \$49,999  | <input type="checkbox"/> 16% \$100,000 - \$149,999 |
| <input type="checkbox"/> 17% \$10,000 - \$24,999 | <input type="checkbox"/> 18% \$50,000 - \$74,999 | <input type="checkbox"/> 4% \$150,000 - \$199,999  |
| <input type="checkbox"/> 16% \$25,000 - \$34,999 | <input type="checkbox"/> 13% \$75,000 - \$99,999 | <input type="checkbox"/> 4% \$200,000 or more      |

9. How many outdoor recreation trips did you take in the last 12 months (for activities such as hunting, fishing, wildlife viewing, etc.)?

29 number of trips

**Thank you for completing the survey.**

**There is space on the next page for any additional comments you may have regarding your visit to this Refuge.**

See Appendix B for Comments

This page left intentionally blank.

## Appendix B: Visitor Comments to Open-Ended Survey Questions for Big Lake National Wildlife Refuge

### Survey Section 1

Question 1: "Including your most recent visit, which activities have you participated in during the past 12 months at this Refuge?"

| Special Event        | Frequency |
|----------------------|-----------|
| Air Boat Ride        | 1         |
| Christmas Bird Count | 2         |
| Mallard Duck banding | 1         |
| Waterfowl Survey     | 1         |
| Total                | 5         |

| Other Activity  | Frequency |
|---|-----------|
| Bow Hunting Deer                                      | 1         |
| Camping   | 1         |
| Eagle Project Boy Scouts                              | 1         |
| My kids love to throw rocks at one of the boat ramps. | 1         |
| Wild Hogs   | 1         |
| Total   | 5         |

| 2 <sup>nd</sup> Other Activity                         | Frequency |
|--|-----------|
| My husband works with our lab on his water retrieving. | 1         |

Question 2: "Which of the activities above was the primary purpose of your visit to this Refuge?"  
*Primary activities are categorized in the main report; the table below lists the "other" miscellaneous primary activities listed by survey respondents.*

| Other Miscellaneous Primary Activities | Frequency |
|--|-----------|
| Eagles                                 | 1         |
| Kids throwing rocks.                   | 1         |
| Waterfowl survey                       | 1         |
| Wild hogs                              | 1         |
| <b>Total</b>                           | <b>4</b>  |

Question 3: "Did you go to a Visitor Center at this Refuge?"; If Yes, "What did you do there?"

| Other Visitor Center Activity      | Frequency |
|------------------------------------|-----------|
| Checked logbook                    | 1         |
| Converse with the Refuge Director. | 1         |
| Fishing, hiking, photography       | 1         |
| Friends of Game Warden             | 1         |
| Refuge Hunting Permit              | 1         |
| Signed-in to hunt                  | 1         |
| Telescope                          | 1         |
| Visit Employees                    | 1         |
| <b>Total</b>                       | <b>8</b>  |

Question 7: "Were you part of a group on your visit to this Refuge?; If Yes, "What type of group were you with on your visit?"

| Other Group Type                  | Frequency |
|-----------------------------------|-----------|
| Volunteer Wildlife Refuge Interns | 1         |

Question 9: "How did you first learn or hear about this Refuge?"

| Other Website | Frequency |
|---------------|-----------|
| Arkansas DNR  | 1         |

| Other Ways Heard about This Refuge           | Frequency |
|--|-----------|
| AAA  | 1         |
| Arkansas State University                    | 1         |
| Current Director                             | 1         |
| Just trying to look for a good fishing spot! | 1         |
| Other Wildlife Refuge Staff                  | 1         |
| Professor                                    | 1         |
| Professor at Arkansas State University       | 1         |
| Total  | 7         |

## Survey Section 2

Question 1: "What forms of transportation did you use on your visit to this Refuge?"

| Other Forms of Transportation | Frequency |
|-------------------------------|-----------|
| Air boat                      | 1         |
| Kayak                         | 1         |

|                  |   |
|------------------|---|
| Personal vehicle | 1 |
| Total            | 3 |

Question 2: "Which of the following did you use to find your way to this Refuge?"

| Other Ways Found This Refuge                     | Frequency |
|--|-----------|
| Directions from a previous visitor of the Refuge | 1         |
| Passing by going to Jonesboro                    | 1         |
| Total  | 2         |

Question 5: "Below are different alternative transportation options that could be offered at some National Wildlife Refuges in the future...please tell us how likely you would be to use each transportation option."

| Other Transportation Option Likely to Use | Frequency |
|---|-----------|
| ATV                                       | 4         |
| Boat                                      | 1         |
| Fan boat rides                            | 1         |
| Four-wheeler                              | 1         |
| Motorcycle                                | 1         |
| One road in the same out.                 | 1         |
| Paddle boats                              | 1         |
| Personal vehicle                          | 1         |
| Pick-up truck                             | 1         |
| Truck                                     | 1         |
| Total                                     | 13        |

Question 6: "If you have any comments about transportation-related items at this Refuge, please write them on the lines below."

---

Comments on Transportation-related Items at This Refuge (n = 16)

---

Boat rentals.

Can you make Big Lake deeper?

It was great to see a handicap zone for people.

Need ATV trails.

Need more physical disability access so they can fish more than one spot.

People need to slow down around Mallard Lake. It's not a NASCAR Track.

Please be sure signs are visible from both directions, coming and going. We always pass them and have to turn around!

Roads and parking areas are kept clean and roads are kept graded.

Roads are terrible. Hiking trails are overgrown.

Roads are unsafe and small, and speeding is rampant!

Some refuge areas need handicap trails or roads.

There is no transportation on the refuge except personal.

There is really only one access road on the west levee. More trails off the road would be helpful, as it is all tupelo swamp. I would also like to be able to pull off the road along that levee, which is now impossible without a 4 wheel drive vehicle.

This refuge does not have access in some of the dry areas. It is flooded for waterfowl in fall and winter. Some type of hiking, biking, and handicap access would be great.

We recently had major flooding at the Big Lake. There is no access to either the north or south side of Mallard Lake due to washouts. I would like to see them repaired in a timely manner.

We would like to see summer boat rides (limited) to the public!

---

## Survey Section 4

Question 6: "If you have any comments about services, facilities, and activities at this Refuge, please write them on the lines below."

---

### Comments on Services, Facilities, and Activities at This Refuge (n = 39)

---

Better hiking trails, better Visitor Center.

Big Lake National Wildlife Refuge needs more access for handicapped persons.

I believe the new shop and Visitor Center is going to be a great addition to the refuge.

I believe this place is very nice. It's quiet and people are nice to you. I feel safe fishing at Big Lake.

I feel that more access is needed to certain parts of the refuge.

I only go to fish in my boat. I don't really know about anything but the fishing. This fishing is great!

I think they do a fairly good job. I would like to see bathrooms because some folks can't stay very long for that reason.

I think this refuge is mostly for ducks! I fish and hunt, and motoring for ducks in my opinion causes trouble for the hunts!

I was very pleased with all but one thing: no restrooms. They had them at Woodstock over fifty years ago, why not here!?

I wish there were trails rather than a road to bike.

I wish they had a 3-point rule on deer. Will be glad when we get a Visitor Center.

I would like to see more improvements on fishing. More people would fish on the refuge if the water level was improved.

It needs public restrooms. You can go fishing or hunting or just ride there and see deer, turkey, and all sorts of birds and enjoy the beauty of them.

It would be great to have restrooms and more activities (paddle boats, more trails, better fishing, etc.).

It's a great place to hunt and they will point you in the right direction.

Jeremy Bennett made my trip wonderful. Lots of information about the wildlife that I didn't know! Great tour!

Just seems like there is not enough fish to go around. I mainly fish.

More off-road bike trails!

Necesitamos mas centros recreativos para los niños, baños publicos, lugares donde acampar. (We need more recreation centers for children, public bathrooms, and places to camp.)

---

---

Need bathroom facilities. Would like to see biking trails and more hiking trails. Would like to see a better Visitor Center with more history and wildlife education. Would like to see an observation deck for bird observation.

Need public bathrooms and boat rentals.

Need restrooms for women.

No facilities on Mallard Lake (need them badly).

Other than fishing and hunting, this refuge is treated like a step child!

Please fix the fishing!

Porta potties would be a big plus for Mallard.

Should allow duck hunting on certain days to change the patterns of waterfowl.

Some information on fishing sites (on land) would be nice with a structure near the back for family fishing.

Thank you, I can't wait until your new Visitor Center is finished.

The bathrooms are awful, but I think new ones are under construction. Biking is impossible with gravel roads, but would be a nice opportunity if available.

The Big Lake National Wildlife Refuge is greatly appreciated by the Director/Manager Jeremy Bennett. I am very appreciative of his personality, his activity, and his professional quality.

The lake was drained down to the channels, which killed most of the fish. This was to hold waterfowl longer to keep them away from the oil spill in the Gulf. It could house waterfowl without draining it all the way down; it ruined the fishing for several years.

The Refuge Manager is a very nice, helpful, courteous person and is well liked by most everyone in the community.

The refuge needs handicap access to roads and trails.

There are very few services on this refuge. There is too much conflict between Federal and State Officials.

They have done a very bad job with trying to maintain fishing here. Most of the lake is no more than 6" deep. They drained the lake this year to plant feed for migrating birds, which has resulted in excellent bird watching opportunities, but has drastically affected the duck hunting here. The worst I've ever seen. After refilling the lake, they have not restocked the fish, so I imagine that fishing here will be useless over the next several years.

This is a Wildlife Refuge for fish, birds, and all animals. They drained Big Lake for the ducks and killed all the fish. They say fish were unharmed, but as I drove by every day there was no water, so how did they survive?

This refuge is well maintained and has knowledgeable and courteous staff. It is an important and irreplaceable area for this part of the area.

This refuge seems to be under-staffed. Not much opportunity to talk with refuge employees.

---

## Survey Section 5

Question 3: "If you answered "Yes" to Question 2, please briefly describe what makes Refuges unique."

---

### Comments on What Makes Refuges Unique? (n = 59)

A good place to hunt.

All of the different things you can do in one area: fish, hunt, boat, bird watch, trail hiking, wildlife scenery, exhibits, and the refuge resources.

All people need a place to go, whether to fish, hunt, bird watch, or camp!

All the trails and sights.

As I said previously, I give the credit to the quality of the Manger/Director Jeremy Bennett.

Big deer and hogs.

Bird migration, water and land environment conditions.

Clean and keep-up makes things better.

Conservation of wilderness areas, especially in the area I live, where most woodland has been cleared.

Conservation of wildlife.

Each one is different and each one is important to us all. If you need nature in your life, you need these refuges.

Everything.

Fishing, boat riding, and sightseeing.

Fishing.

Gives me a place to hunt and fish.

Great opportunity to see wildlife, fish, and spend time with family and friends on weekends.

Hunting and fishing.

I believe it sets an area apart to allow people to actually see wildlife at its best without having to take the pain of trekking through deep wilderness to find it.

I didn't realize how beautiful the Big Lake Refuge was until I saw it!

I have a chance to catch limits of fish and to harvest a decent deer!

I think what makes Refuges unique is the beautiful wildlife.

---

---

In certain times of the year, the area is ideal for duck hunting. There are also eagles in the area. During spring, summer, and fall, largemouth bass fishing is great.

It has a wide range of fish, waterfowl, deer, eagles, and other wildlife for people to enjoy.

It is a very good place to go.

It is close to where I live, and the fishing is very good.

It is wonderful for us to have this service close to home.

It preserves the land and habitat needed for so many species to live; species that lose so much habitat to a growing America! They deserve a place that is their home just as a human does.

It's a controlled environment; people respect each other.

It's a natural environment for wildlife.

It's an oasis for wildlife and their habitat.

It's close to home, well maintained, and the duck hunting.

It's in my home town. There might not be a lot of deer, but there are a lot of nice sights, flora and fauna alike. I spend a lot of time out here.

Its unique recreation opportunities are directly related to the lake itself and how it is affected by the floodways that flow into it.

Less people.

Limited hunting seasons.

Natural.

Our history. The duck hunting in the area has a long history. I would like to see more to do with that.

Preservation of environment for animals, birds, etc.

Rest stops for waterfowl, eagles, birds of prey, deer, and turkey.

Some of the best waterfowl hunting in the state, and they are one of the few places you can still have duck blinds.

The bird watching, the scenery, photography of wildlife, and hunting and fishing experiences.

The effort put into protecting the resources: game and habitat. National Wildlife Refuges do a good job for the people.

The employees work to provide a good environment and friendliness and protect our resources. I am very satisfied with the staff of this refuge.

---

---

The hours they are open.

The natural state of wildlife is maintained.

The opportunity to hunt, fish, and enjoy the outdoors.

There are lots of different animals and birds at most refuges.

They are maintained as much as possible in their original or natural state. They are reminders of what our parents and grandparents grew up with and the history of our area of the country.

They are preserving important ecosystems, wintering habitat, and animal "refuges" for the lack of a better term. We can look to these refuges to see how the land "was" before we interjected ourselves into the scene.

They do provide unique experiences, but I don't think they are as well maintained as they should be. Some areas need improvement.

They give refuge for wildlife.

They offer hunting, fishing, watching birds, trails to walk, boating, camping, a Sunday afternoon ride, or just a way to get away from the farm land.

They provide natural habitat and cover for the many types of wildlife. They also provide recreation for visitors.

This refuge has fishing, hunting, and boating. It's just a nice place to be.

Trails for hiking, water for fishing, and good land for animals all made it very good for photographing wildlife.

Usually well maintained.

Well maintained.

Wildlife existing in the natural state. Fewer visitors than at zoos/aquariums. Interesting history, usually.

Without the refuges, the public wouldn't have the opportunity.

---

#### Additional Comments (n = 23)

Area fishing has decreased in the past few years in Northern Arkansas. Big Lake provides a lot of fishing opportunities to kids and families to enjoy. If there are no places to restock Big Lake, it will take several years to come back; that is, if it ever does. The silt problems are not being addressed and it is taking away fishing territory every year. This should be addressed as soon as possible or fishing will be hurt for years to come.

As a professional outdoor photographer, I travel to refuges and parks a lot more than the average person.

Been hunting and fishing at this refuge for 30 years. I'm very satisfied.

Big Lake National Wildlife Refuge has a lot to offer sportsmen of Mississippi County. The employees are top notch. It

---

---

does need more access.

Big Lake Refuge is beautiful. I didn't know much about wildlife until I met Jeremy Bennett and Julie Bennett. He is an awesome and informative Refuge Manager. I'm so excited to see the new Visitors Center when it is finished.

Boat rentals and public bathrooms would greatly enhance the fishing and Big Lake.

Could be cleaned up around the woods a little more and could use more places to bank fish!

Go team go!

I am a big duck hunter, and I understand the thought that draining Big Lake would help save the ducks from heading south before oil cleanup was complete in the South, but I also know harsh winters will drive ducks regardless of the food source. Draining the lake did nothing more than hurt the duck season by not allowing the water needed to flood the state side come through and to hurt the fishing tremendously. Water was diverted from the state woods on the Big Lake WMT to the Big Lake NWR to refill Big Lake after planting the Japanese Millet. Where we normally have water to hunt by early November, it was almost mid-December before I could reach my hole. I also took into consideration the drought, but the water could have been split half and half. My concern is recent rumors of the draining of Mallard Lake for the same reasons. I hope this isn't true because there are state record bass in there, not to mention the actual state record came from there. Thank you for your time. (signature)

I am very thankful for all of the National Wildlife Refuges that are still maintained in the US.

I don't believe in global warming.

I would be careful when planning to introduce new fish to help control algae and to provide food for other fish. Carp may keep algae at bay, but they tend to muddy the water. Tilapia die easily and rarely bite lures. When the lakes are drained, it takes years for fish to get back to normal, thus taking your favorite fishing hole and ruining it. Also, I believe there should always be an accurate map of where hunting and fishing is allowed and any regulations different from that of state's normal regulations should be clearly explained. Example: (drew picture of example map).

I'd like to thank everyone at this refuge, very nice group of people that will help you in any way they can. I'd like to thank Jeremy Bennett for everything he does. He does a good job there. Thanks a lot. (Wife writing) I'm the wife of the writer of this letter. We like to go over and walk the trails with our grandkids, watch the birds, deer, raccoons, opossums, beavers, ducks, owls, eagles, rabbits, squirrels, porcupines, turkeys, skunks, bobcats, and armadillos. My favorite are deer, armadillos, skunks, beavers, raccoons, and opossums. We just love them all. I especially like the armadillos. They're different. My husband loves this place. He would stay there 24/7 if possible in November, December, and January. It's in his blood.

More duck blinds, better buck to doe ratio.

Need women restrooms. Overall cleanliness and trash pickup would be enhanced if containers were provided. Fish restocking program should be implemented.

On a bad day, I may go and just visit for a good change.

Please fix the fishing at Mallard Lake. It's a great location for me (with a disability) and my young grandsons to go. We just don't catch many fish. It used to be the best fishing in these parts. Thank you (signature)

The Federal Refuge is adjacent to the State Refuge and the state legal hunting area. I am confident that collaboration between local, state, and federal agencies will be of great value to us.

---

The staff at Big Lake National Wildlife Refuge is very nice, professional, and helpful!

The staff at Big Lake Refuge was very helpful. The office and facility are under construction and will benefit all visitors when completed. Some foot tunnel access into the refuge would be great for viewing wildlife. Jeremy Bennett and Seth Fisher were very helpful.

There needs to be a better stocking program for crappie and bream in Mallard.

This refuge is mainly for hunting and fishing.

This wildlife refuge is for duck hunters first, then if they have time to think about anything else like fishing! (signature and phone number)