



National Wildlife Refuge Visitor Survey 2010/2011: Individual Refuge Results for Occoquan Bay and Elizabeth Hartwell Mason Neck National Wildlife Refuges

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The beauty of the bay, the birds and other critters I see, and the flowers and trees. Absolutely delightful. I love the place and it keeps on being improved every year.—Survey comment from visitor to Occoquan Bay National Wildlife Refuge.



Occoquan Bay National Wildlife Refuge. Photo credit: U.S. Fish and Wildlife Service.

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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 Occoquan Bay and Mason Neck NWRs (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.

Pacific Region (R1)	
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)	
Southwest Region (R2)	
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)	
Great Lakes-Big Rivers Region (R3)	
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)
Southeast Region (R4)	
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)
Northeast Region (R5)	
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)
Mountain-Prairie Region (R6)	
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)	
Alaska Region (R7)	
Alaska Maritime National Wildlife Refuge (AK)	Kenai National Wildlife Refuge (AK)
California and Nevada Region (R8)	
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^{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 Occoquan Bay and Mason Neck NWRs, 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 Occoquan Bay and Elizabeth Hartwell Mason Neck National Wildlife Refuges

Occoquan Bay and Elizabeth Hartwell Mason Neck (Mason Neck) NWRs lie adjacent to one another along the banks of the Potomac River, about twenty miles south of Washington, D.C. Occoquan Bay NWR is a former Army radio transmitting station that was closed in the 1990s prior to the 642-acre refuge being established in 1998 to protect habitat for upland nesting birds, migrating wildlife, habitat diversity and environmental education programs. Mason Neck NWR was established in 1969 with an initial purchase of 845 acres from the Nature Conservancy, to protect bald eagles from residential development. In fact, Mason Neck NWR was the first refuge specifically established for bald eagles. Mason Neck NWR has since grown to 2,277 acres with approximately 2,000 acres of mature hardwood forest.

Both Occoquan Bay and Mason Neck NWRs attract songbirds, raptors and waterfowl with their grasslands, hardwood forests and marshes. The forests and open waters provide food, nesting sites and resting places for a variety of native and migratory birds. Visitors share this feeling of respite as they hike trails and watch wildlife drawn to the oases outside of Washington, D.C.

Occoquan Bay and Mason Neck NWRs each attract nearly 33,000 visitors annually (based on 2008 RAPP database; U.S. Fish and Wildlife Service, 2011, written comm.). Occoquan Bay NWR's network of roads from its military past is the base of its trail system. Public use is rotated between the trails to allow for a variety of wildlife observations while limiting the stress on wildlife. Visitors also enjoy environmental education programs, a wildlife drive, wildlife observation and photography. Mason Neck NWR offers two trails for visitors to hike through the forests and along the marsh. Environmental education programs are also available for organized groups visiting Mason Neck NWR. Figure 1 displays a map of the Occoquan Bay NWR and Figure 2 displays a map of Mason Neck NWR. For more information on Occoquan Bay NWR, please visit <http://www.fws.gov/occoquanbay/index.html>, and for more information on Mason Neck NWR, please visit <http://www.fws.gov/masonneck/>.

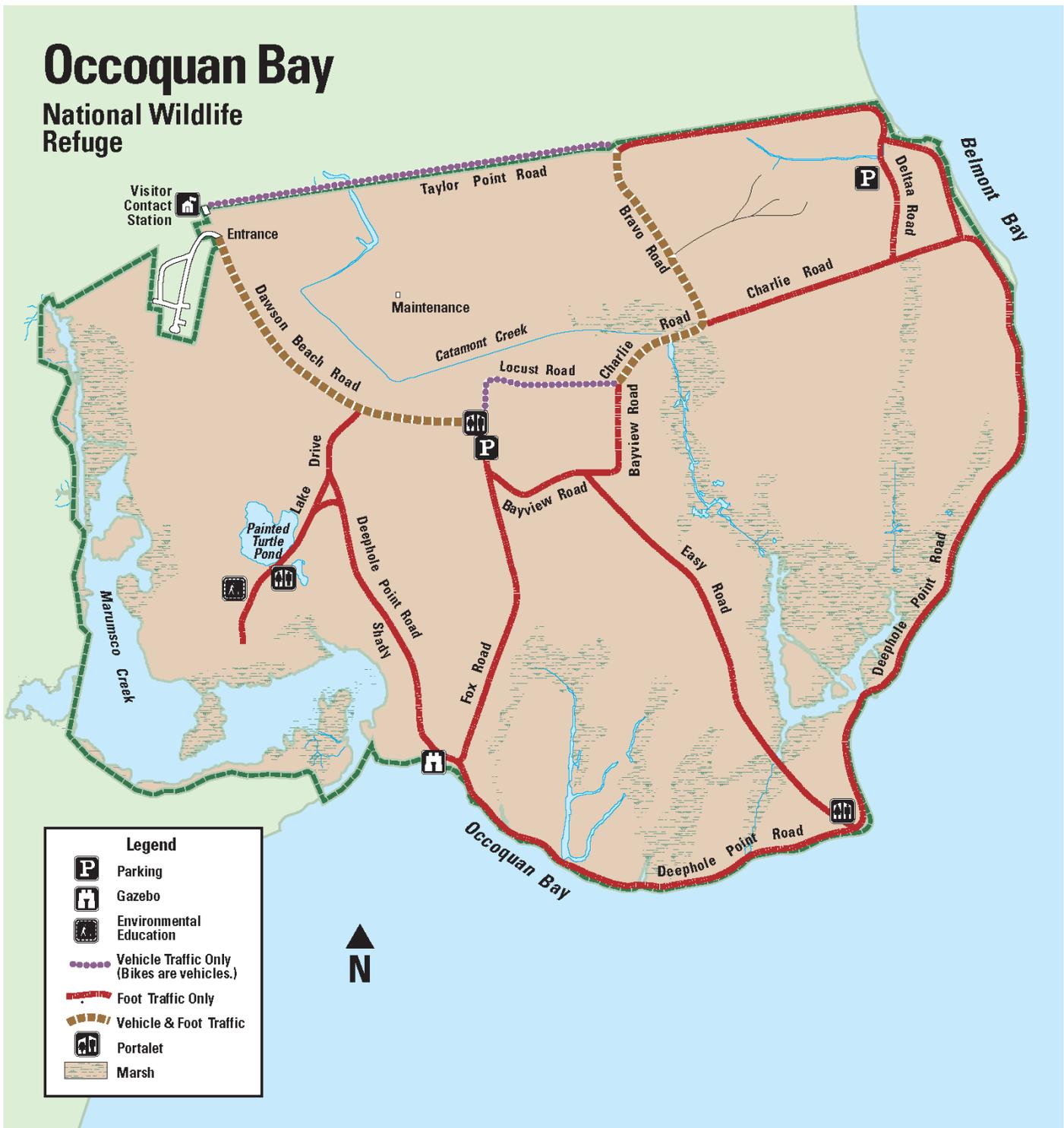


Figure 1. Map of Occoquan Bay NWR, courtesy of U.S. Fish and Wildlife Service.



Figure 2. Map of Elizabeth Hartwell Mason Neck NWR, courtesy of U.S. Fish and Wildlife Service.

Sampling at Occoquan Bay and Elizabeth Hartwell Mason Neck National Wildlife Refuge

A total of 180 visitors agreed to participate in the survey during the two sampling periods at the identified locations at Occoquan Bay and Mason Neck NWRs (table 2). In all, 132 visitors completed the survey for a 76% response rate and $\pm 7\%$ margin of error at the 95% confidence level.¹ These refuges were sampled as “one” unit and results are only generalizable to both refuges. It is not known from this survey the number of visitors who visited both refuges during the visit when they were contacted. However, the majority of the sampled visitors were contacted at Occoquan Bay NWR (86%, n = 114) and 18 visitors (14%, n = 18) were contacted at Mason Neck NWR.

Table 2. Sampling and response rate summary for Occoquan Bay and Mason Neck NWRs.

Sampling period	Dates	Locations	Total contacts	Undeliverable addresses	Completed surveys	Response rate
1	10/9/2010 to 10/23/2010	Visitor Contact Station (Occoquan)	108	2	82	77%
		Central Parking Lot (Occoquan)				
		Painted Turtle Pond (Occoquan)				
		Great Marsh Trail Parking Lot (Mason Neck)				
		Woodmarsh Trail Parking Lot (Mason Neck)				
2	5/7/2011 to 5/21/2011	Visitor Contact Station (Occoquan)	72	1	50	70%
		Central Parking Lot (Occoquan)				
		Painted Turtle Pond (Occoquan)				
		Great Marsh Trail Parking Lot (Mason Neck)				
		Woodmarsh Trail Parking Lot (Mason Neck)				
Total			180	3	132	76%

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 Occoquan Bay and Mason Neck NWRs reported that before participating in the survey, they were aware of the role of the U.S. Fish and Wildlife Service in managing

¹ 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).

national wildlife refuges (83%) and that the Refuge System has the mission of conserving, managing, and restoring fish, wildlife, plants and their habitat (90%). 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 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 (84%; 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. Most visitors to Occoquan Bay and Mason Neck NWRs had been to at least one other National Wildlife Refuge in the past year (70%), with an average of 7 visits to other refuges during the past 12 months.

Visiting This Refuge

Some surveyed visitors (17%) had only been to Occoquan Bay and Mason Neck NWRs once in the past 12 months, while most had been multiple times (83%). These repeat visitors went to the refuge an average of 26 times during that same 12-month period. Visitors used the refuge during only one season (29%), during multiple seasons (30%), and year-round (40%). Most visitors first learned about the refuge from friends/relatives (25%), signs on the highway (18%), or refuge website (15%; fig. 3). Key information sources used by visitors to find their way to this refuge include previous knowledge (64%), signs on highways (21%), or maps from internet (e.g., Google Maps) (13%; fig. 4).

Most visitors (96%) lived in the local area (within 50 miles of the refuge), whereas 4% were nonlocal visitors. For most local visitors, Occoquan Bay and Mason Neck NWRs was the primary purpose or sole destination of trip (91%; table 3). For most nonlocal visitors, these refuges were also the primary purpose or sole destination of trip (40%). Local visitors (n = 126) reported that they traveled an average of 12 miles to get to the refuge, while nonlocal visitors (n = 5) traveled an average of 205 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 5 shows the residence of visitors travelling to the refuge. About 95% of visitors travelling to Occoquan Bay and Mason Neck NWRs were from Virginia.

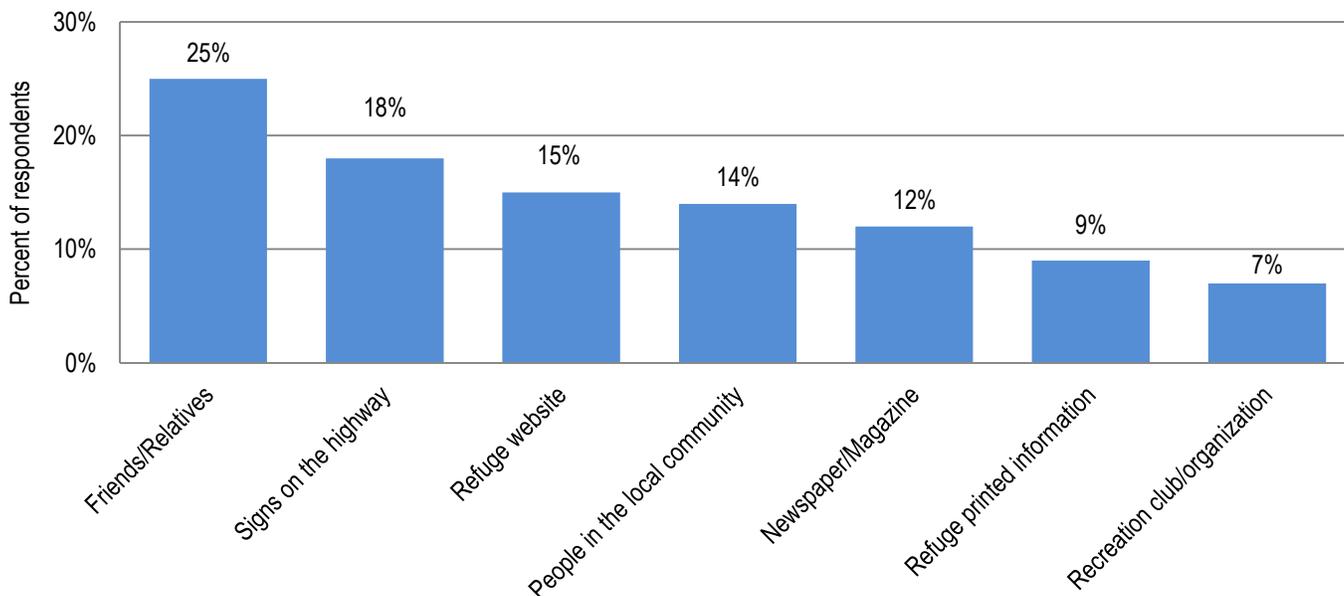


Figure 3. How visitors first learned or heard about Occoquan Bay and Mason Neck NWRs (n = 129).

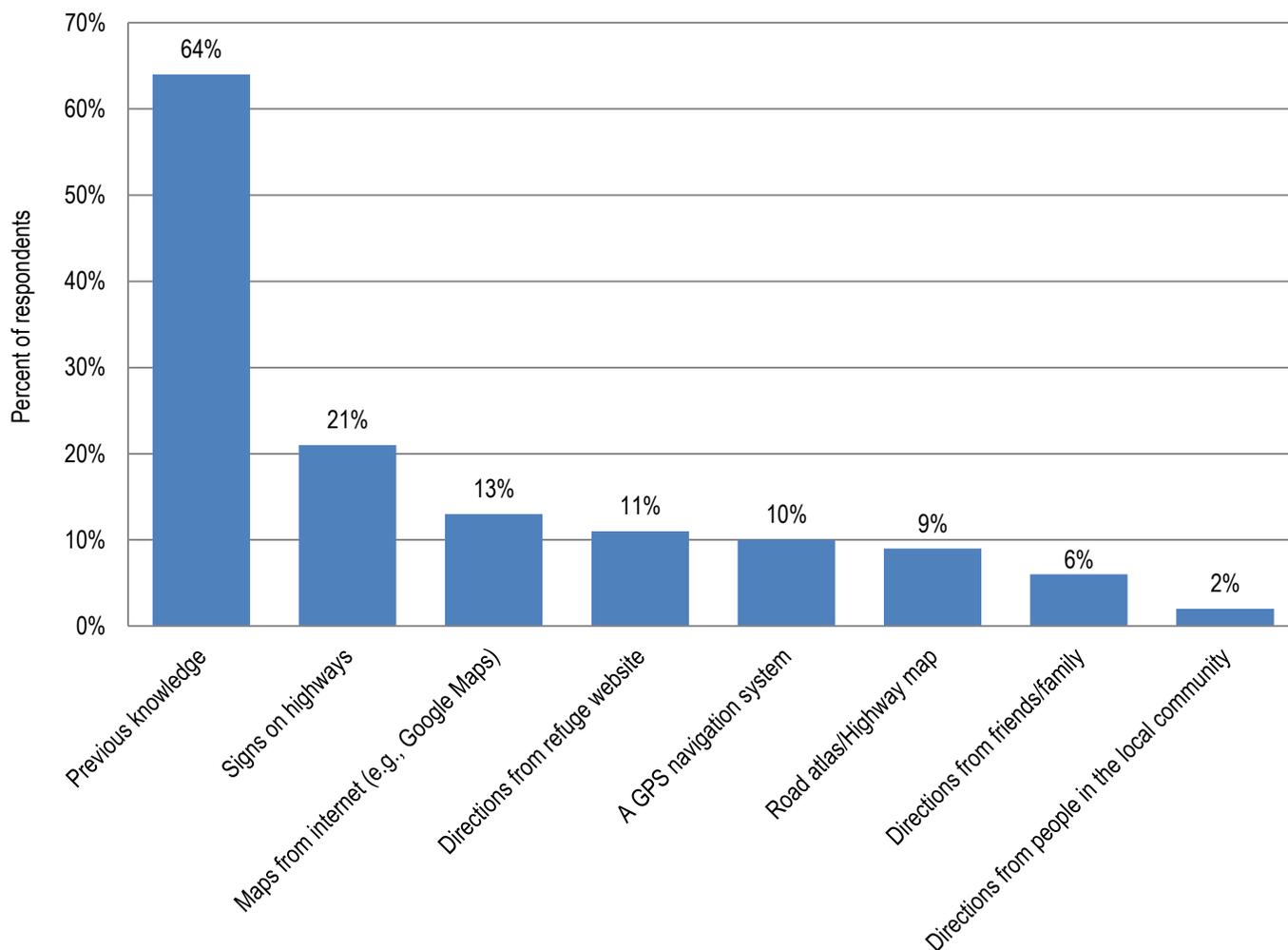


Figure 4. Resources used by visitors to find their way to Occoquan Bay and Mason Neck NWRs during *this* visit (n = 130).

Table 3. Influence of Occoquan Bay and Mason Neck NWRs 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	40%	20%	40%
Local	91%	6%	3%
Total	89%	6%	5%

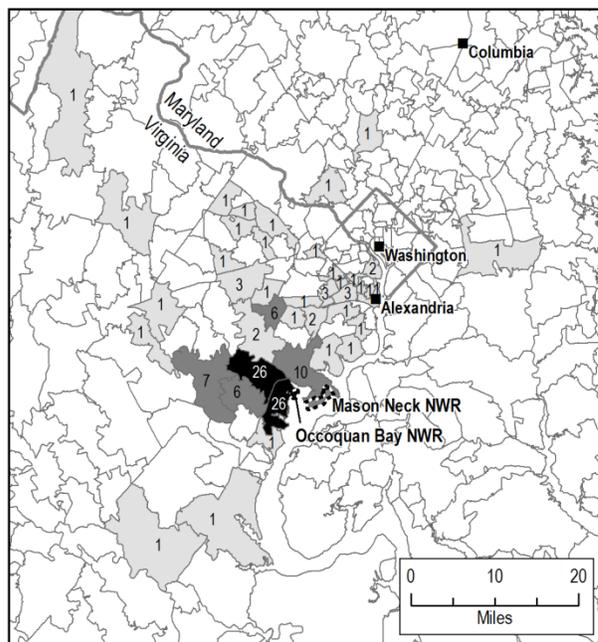


Figure 5. Number of visitors travelling to Occoquan Bay and Mason Neck NWRs by residence. Top map shows residence by state and bottom map shows residence by zip codes near these refuges (n = 131).

Surveyed visitors reported that they spent an average of 3 hours at Occoquan Bay and Mason Neck NWRs 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 2 hours (32%). The key modes of transportation used by visitors to travel around the refuge were private vehicle (86%), walking/hiking (42%), and bicycle (7%; fig. 5). Over half of visitors indicated they were part of a group on their visit to this refuge (57%), travelling primarily with family and friends (table 4).

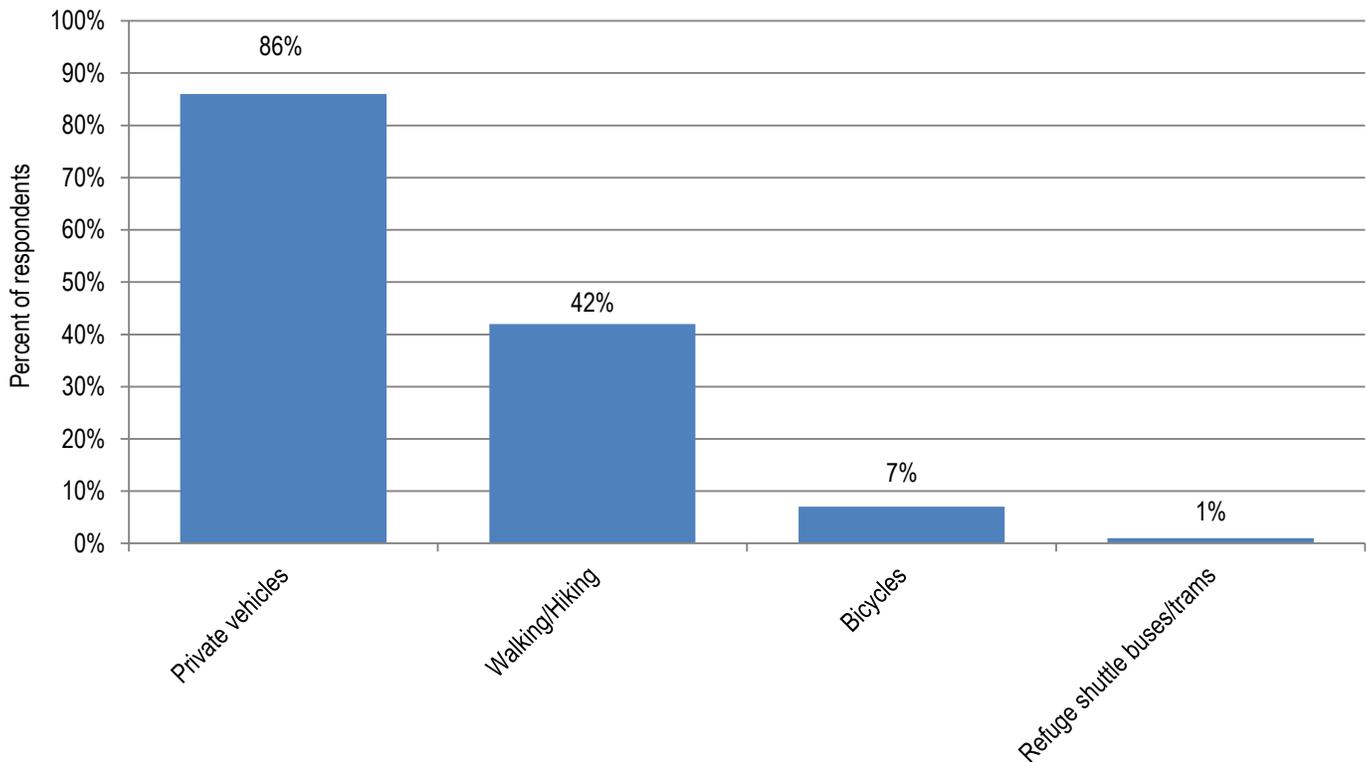


Figure 6. Modes of transportation used by visitors to Occoquan Bay and Mason Neck NWRs during *this* visit (n = 131).

Table 4. Type and size of groups visiting Occoquan Bay and Mason Neck NWRs (for those who indicated they were part of a group, n = 74).

Group type	Percent (of those traveling in a group)	Average group size		
		Number of adults	Number of children	Total group size
Family/Friends	80%	2	1	3
Commercial tour group	0%	0	0	0
Organized club/School group	13%	9	15	24
Other group type	7%	8	1	9

Surveyed visitors participated in a variety of refuge activities during the past 12 months (fig. 7); the top three activities reported were hiking (72%), wildlife observation (72%), and bird watching (65%). The primary reasons for their most recent visit included hiking (30%), bird watching (27%), and wildlife observation (10%; fig. 8). The visitor center was used by 24% of visitors, mostly to ask information of staff/volunteers (74%), view the exhibits (42%), and stop to use the facilities (for example, get water, use restroom; 29%; fig. 9). The visitor center for this refuge is open on weekends only and has few displays and no bookstore. It may be that visitors were referencing the State Park Visitor Center when they answered this question.

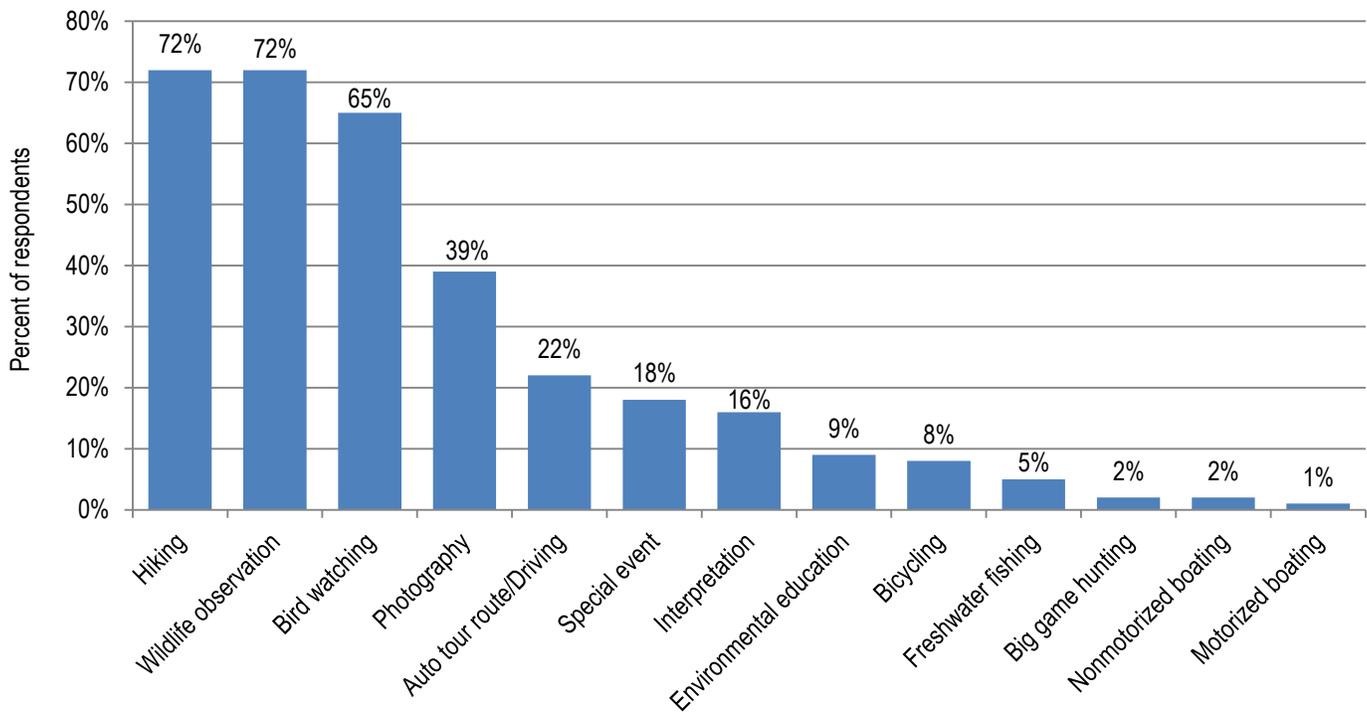


Figure 7. Activities in which visitors participated during the past 12 months at Occoquan Bay and Mason Neck NWRs (n = 130). See Appendix B for a listing of “other” activities.

Visitor Characteristics

Nearly all (99%) surveyed visitors to Occoquan Bay and Mason Neck NWRs 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 62% male with an average age of 57 years and 38% female with an average age of 50 years. Visitors, on average, reported they had 16 years of formal education (college or technical school). The median level of income was \$100,000–\$149,999. 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).

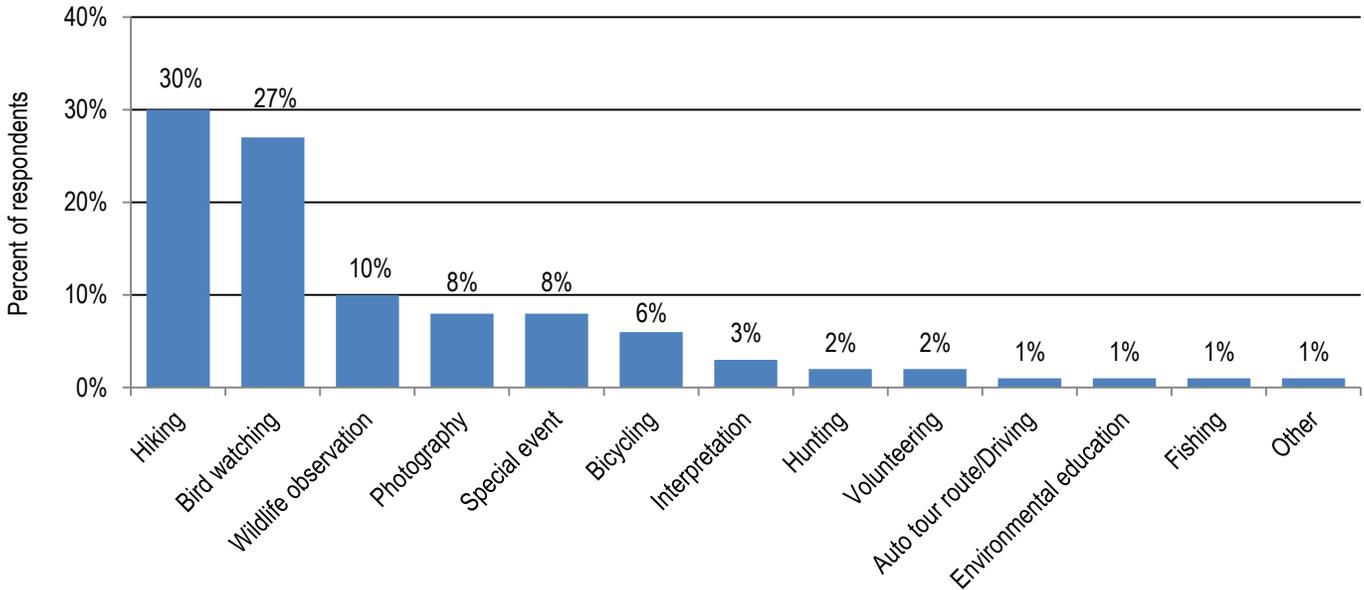


Figure 8. The primary activity in which visitors participated during *this* visit to Occoquan Bay and Mason Neck NWRs (n = 123). See Appendix B for a listing of “other” activities.

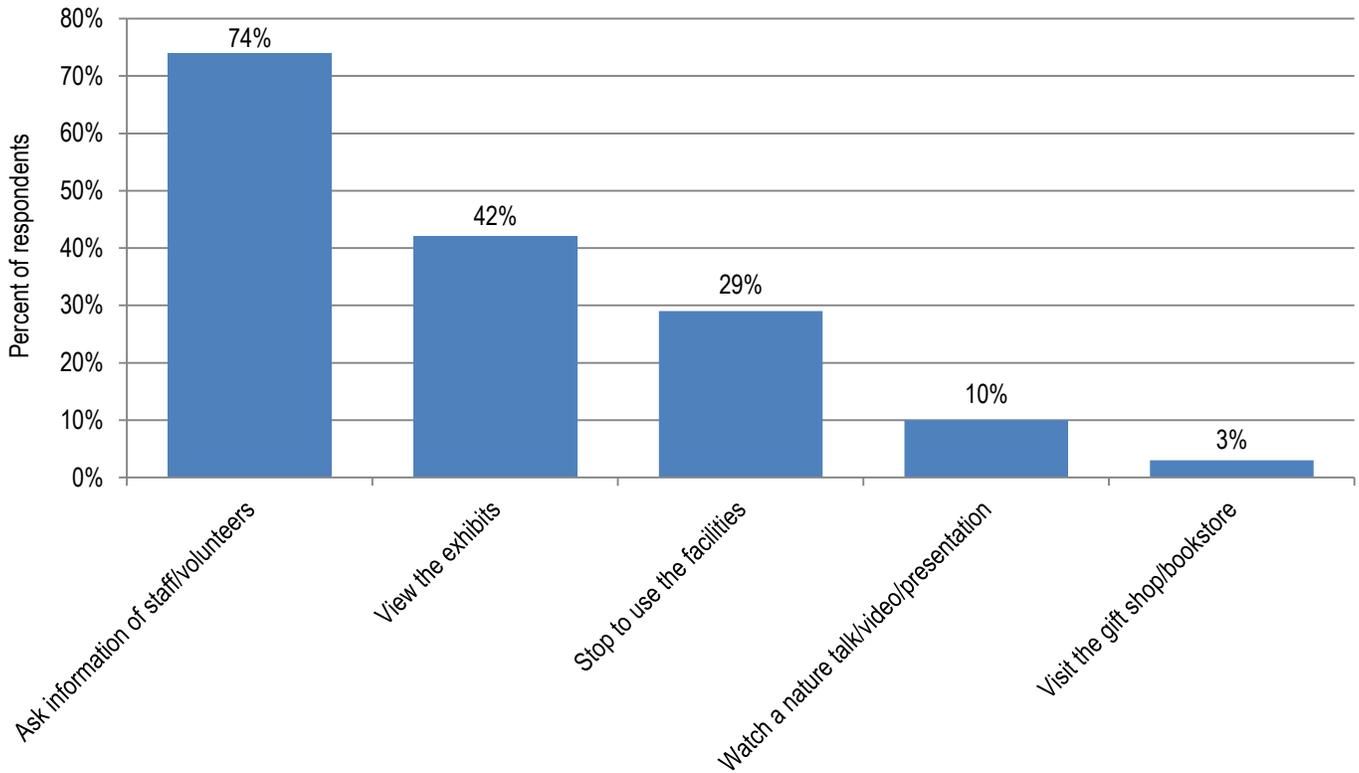


Figure 9. Use of the visitor center at Occoquan Bay and Mason Neck NWRs (for those visitors who indicated they used the visitor center, n = 31).

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, 96% of surveyed visitors to Occoquan Bay and Mason Neck NWRs indicated that they live within the local area. Nonlocal visitors (4%) stayed in the local area, on average, for 3 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 \$85 per person per day and local visitors spent an average of \$11 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 Occoquan Bay and Mason Neck NWRs expressed in dollars per person per day.

Visitors	n ¹	Median	Mean	Standard deviation	Minimum	Maximum
Nonlocal	4	\$75	\$85	\$75	\$5	\$185
Local	92	\$6	\$11	\$15	\$0	\$73

¹n = 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 Occoquan Bay and Mason Neck NWRs were as follows (fig. 10):

- 92% were satisfied with the recreational activities and opportunities,
- 85% were satisfied with the information and education about the refuge and its resources,
- 89% were satisfied with the services provided by employees or volunteers, and
- 90% were satisfied with the refuge's job of conserving fish, wildlife and their habitats.

Of the 70% of visitors who indicated that they paid a fee to enter these refuges, 92% agreed that the opportunities and services were at least equal to the fee they paid; 77% felt the fee was about right, whereas 23% felt that the fee was too low or too high (fig. 11).

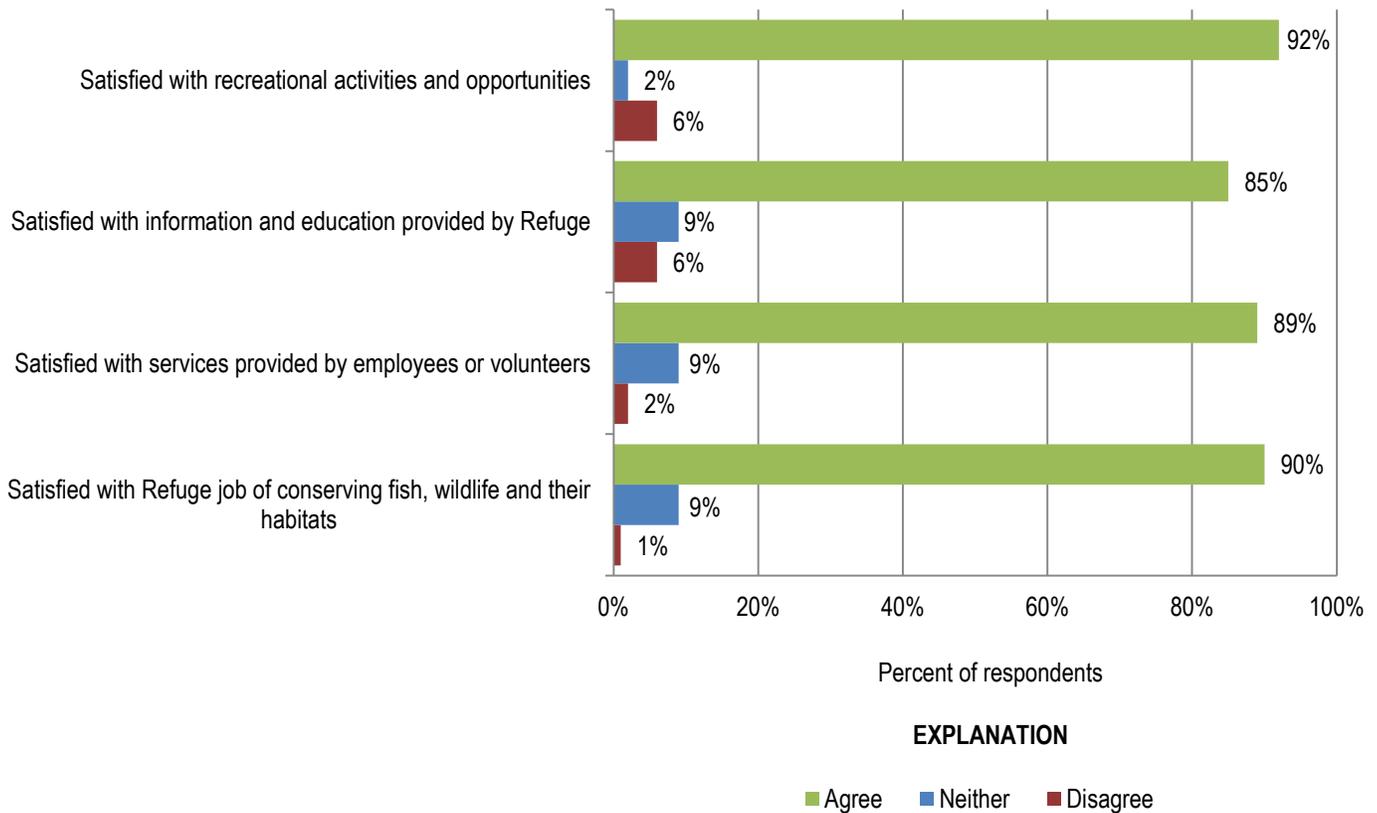


Figure 10. Overall satisfaction with Occoquan Bay and Mason Neck NWRs during this visit (n ≥ 119).

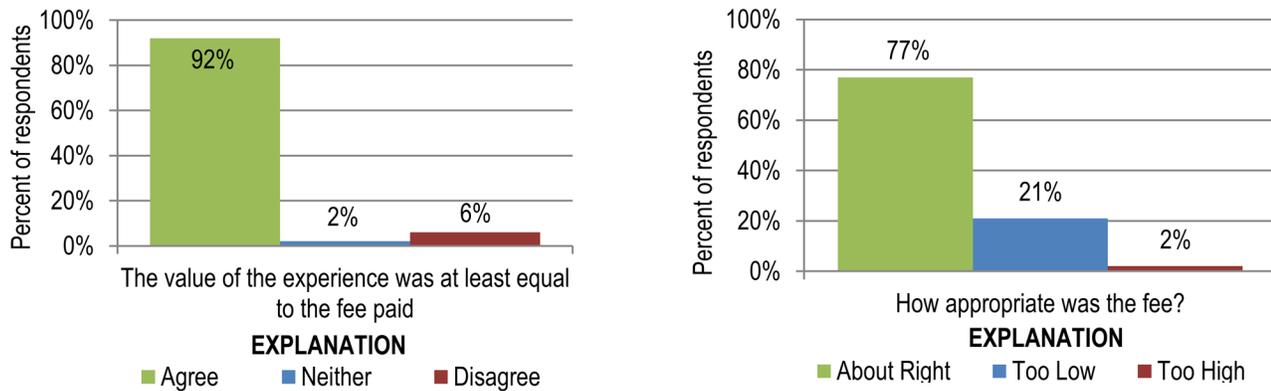


Figure 11. Opinions about fees at Occoquan Bay and Mason Neck NWRs (for those visitors who indicated they paid a fee, n = 90).

Importance/Satisfaction Ratings

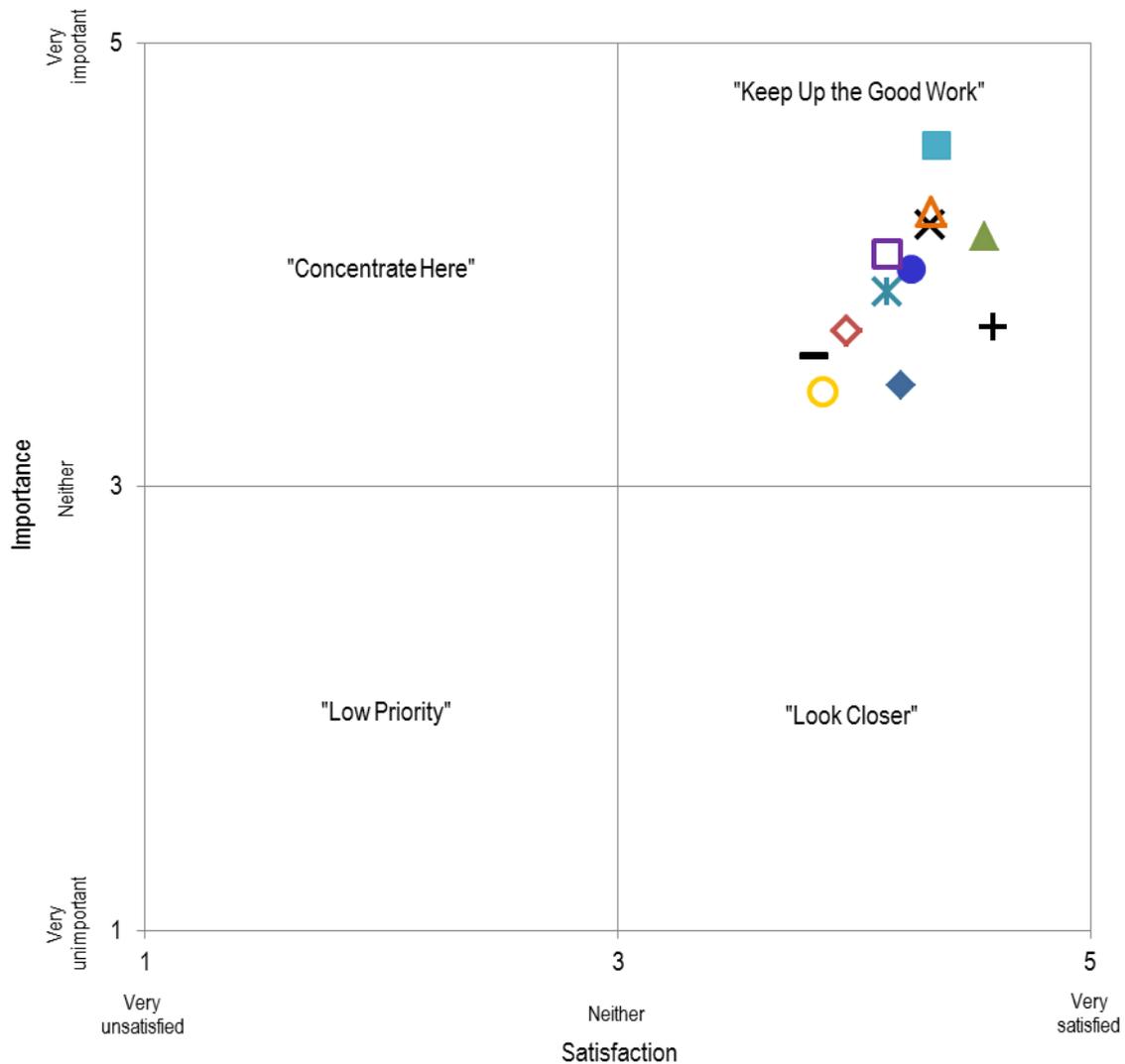
Comparing the importance and satisfaction ratings for visitor services provided by refuges can help to identify how well the services are meeting visitor expectations. The importance-performance framework presented in this section is a tool that includes the importance of an attribute to visitors in 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 Occoquan Bay 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 12-14 depict surveyed visitors' importance-satisfaction results for refuge services and facilities, recreational opportunities, and transportation-related features at Occoquan Bay and Mason Neck NWRs, respectively. All refuge services and facilities fell in the "Keep Up the Good Work" quadrant (fig.

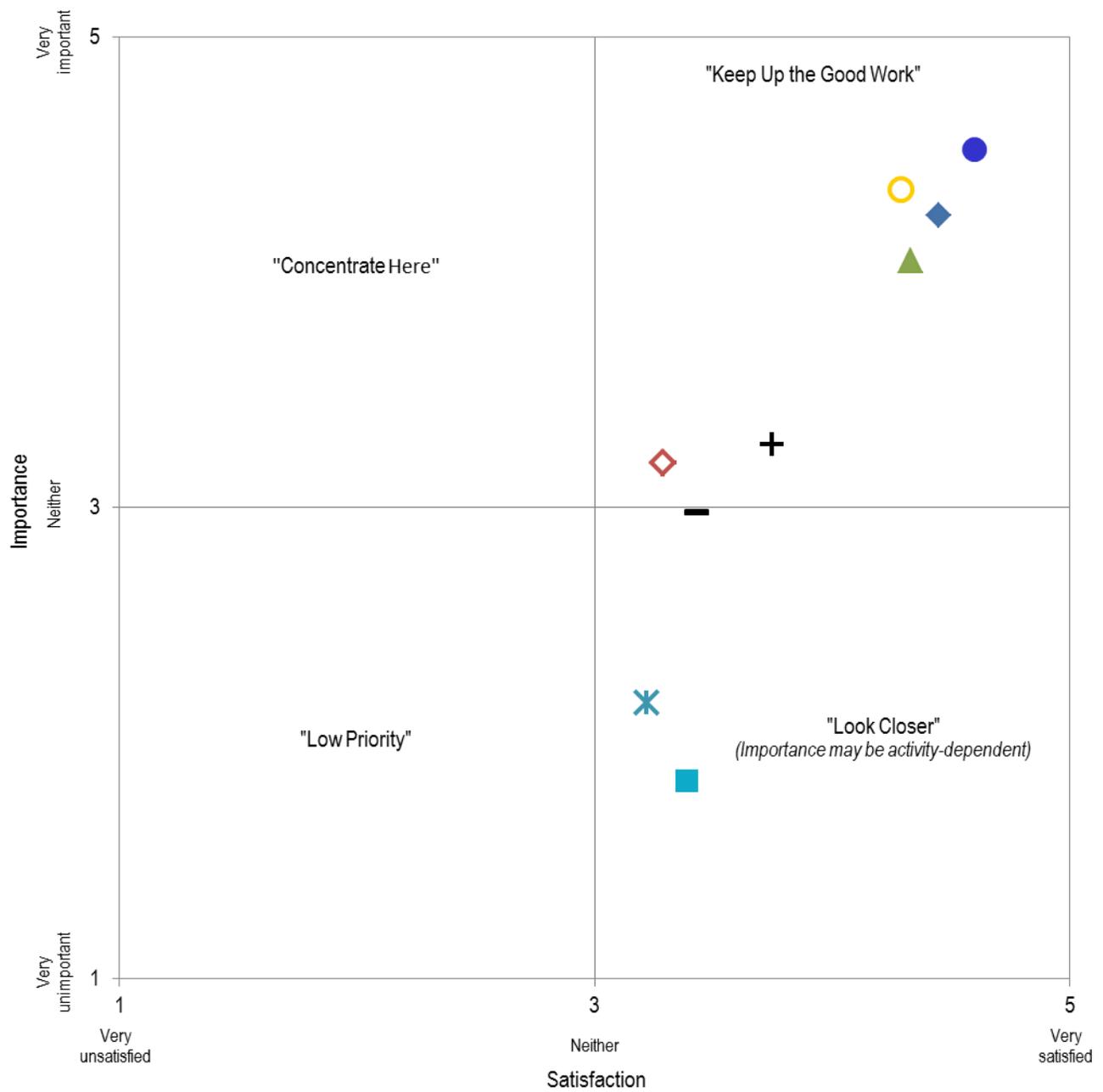
12). Nearly all refuge recreational opportunities fell in the “Keep Up the Good Work” quadrant except fishing opportunities, hunting opportunities, and bicycling opportunities, which fell into the “Look Closer” quadrant (fig. 13). The average importance of fishing, hunting, and bicycling in the “Look Closer” quadrant may be higher among visitors who have participated in these activities during the past 12 months; however, there were not enough individuals in the sample to evaluate the responses of such participants. All transportation-related features fell in the “Keep Up the Good Work” quadrant (fig. 14).



EXPLANATION

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

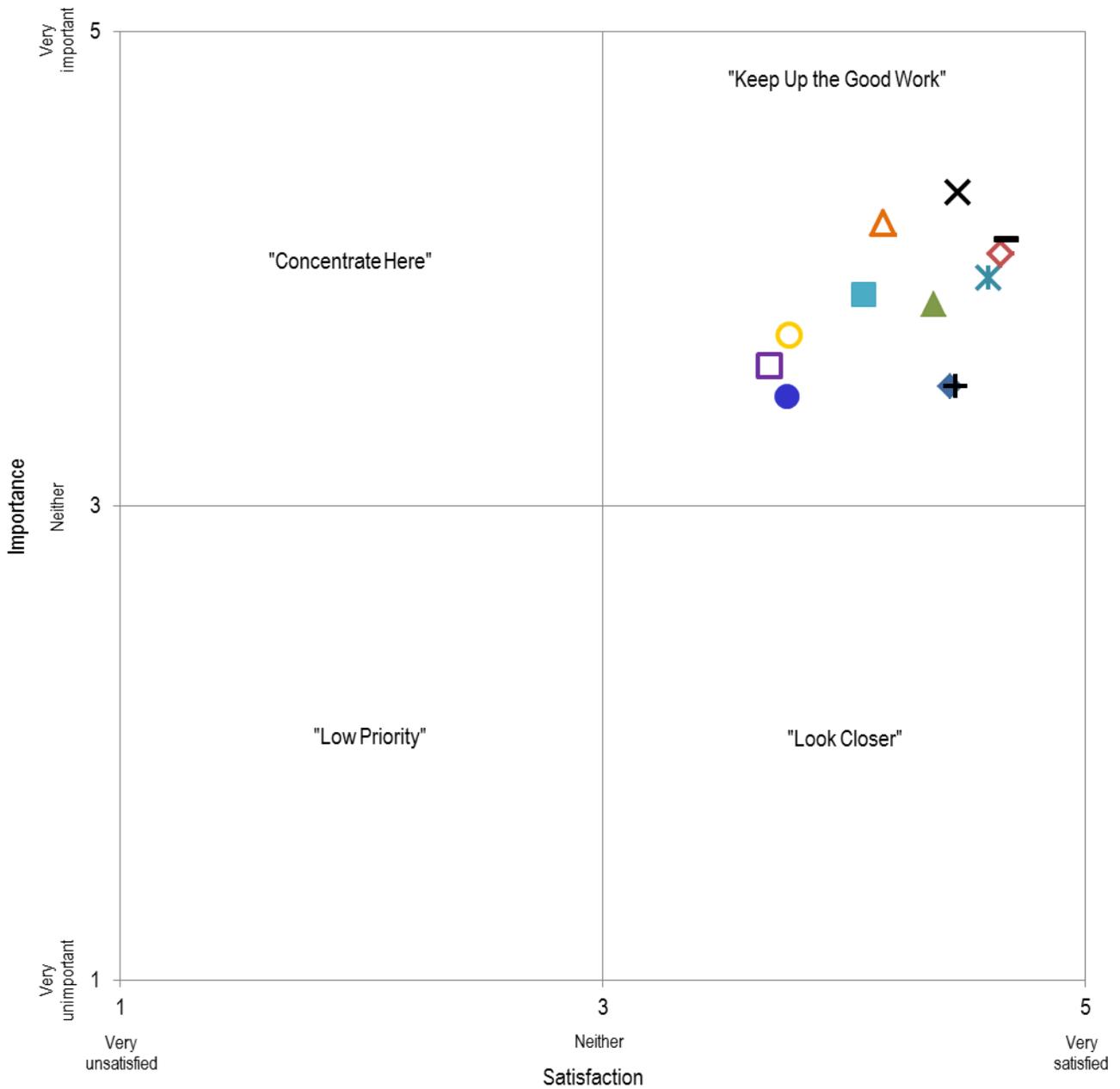
Figure 12. Importance-satisfaction ratings of services and facilities provided at Occoquan Bay and Mason Neck NWRs.



EXPLANATION

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

Figure 13. Importance-satisfaction ratings of recreational opportunities provided at Occoquan Bay and Mason Neck NWRs.



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 14. Importance-satisfaction ratings of transportation-related features at Occoquan Bay and Mason Neck NWRs.

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 Occoquan Bay 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 Occoquan Bay and Mason Neck NWRs visitors who were surveyed were likely to use the following options at national wildlife refuges in the future (fig. 15):

- an offsite parking lot that provides trail access;
- a boat that goes to different points on Refuge waterways;
- a bus/tram that runs during a special event; and
- a bike share program.

The majority of visitors were *not* likely to use a bus/tram that takes passengers to different points or a bus/tram that provides a guided tour on national wildlife refuges in the future (fig. 15).

When asked about using alternative transportation at Occoquan Bay and Mason Neck NWRs specifically, 34% of visitors indicated they were unsure whether it would enhance their experience; however, some visitors thought alternative transportation would enhance their experience (14%) and others thought it would not (52%).

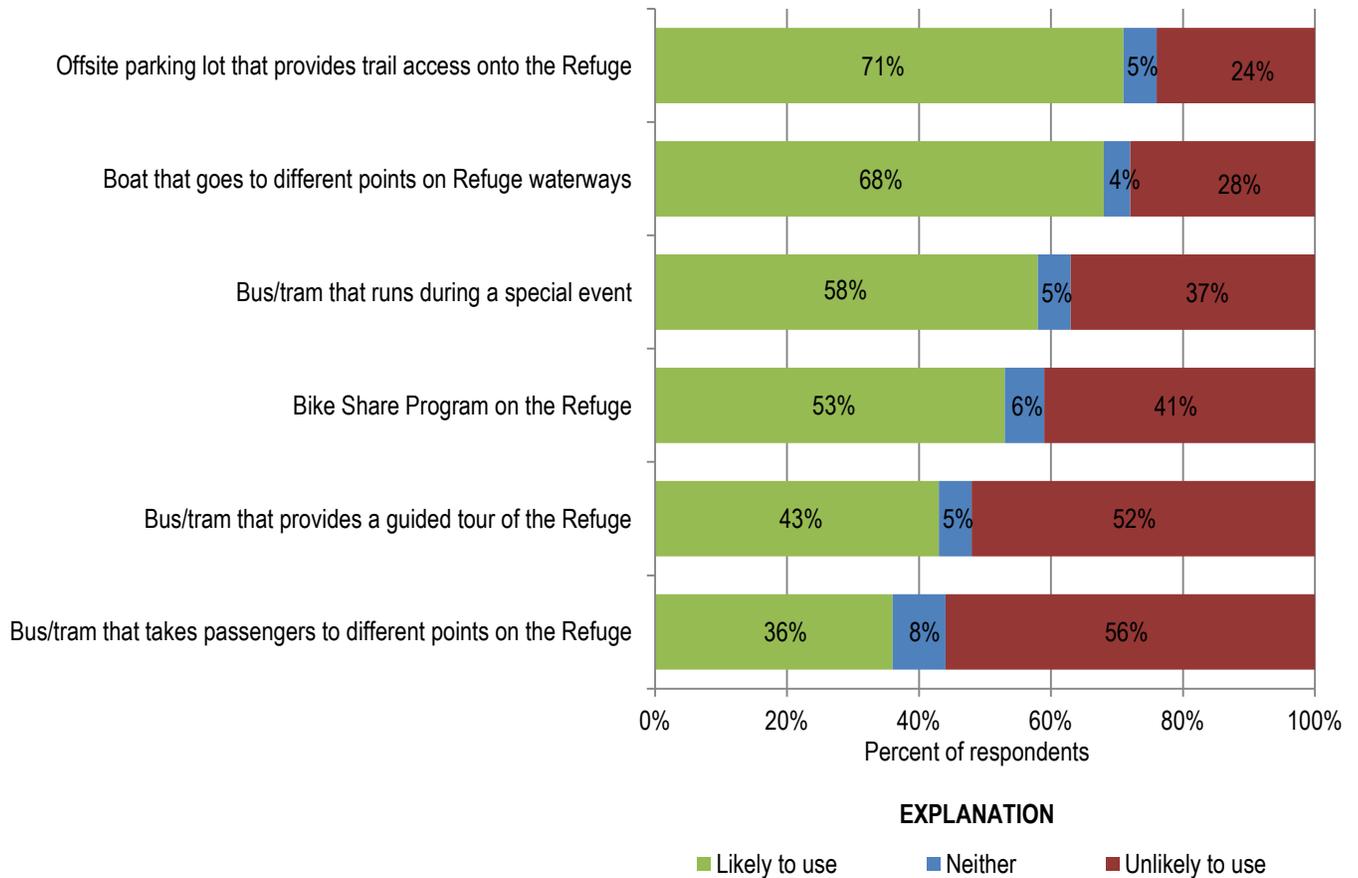


Figure 15. Visitors’ likelihood of using alternative transportation options at national wildlife refuges in the future (n ≥ 127).

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 Occoquan Bay and Mason Neck NWRs agreed with the following statements (fig. 16):

- “I am personally concerned about the effects of climate change on fish, wildlife and habitats;”
- “I stay well-informed about the effects of climate change;” and
- “I take actions to alleviate the effects of climate change.”

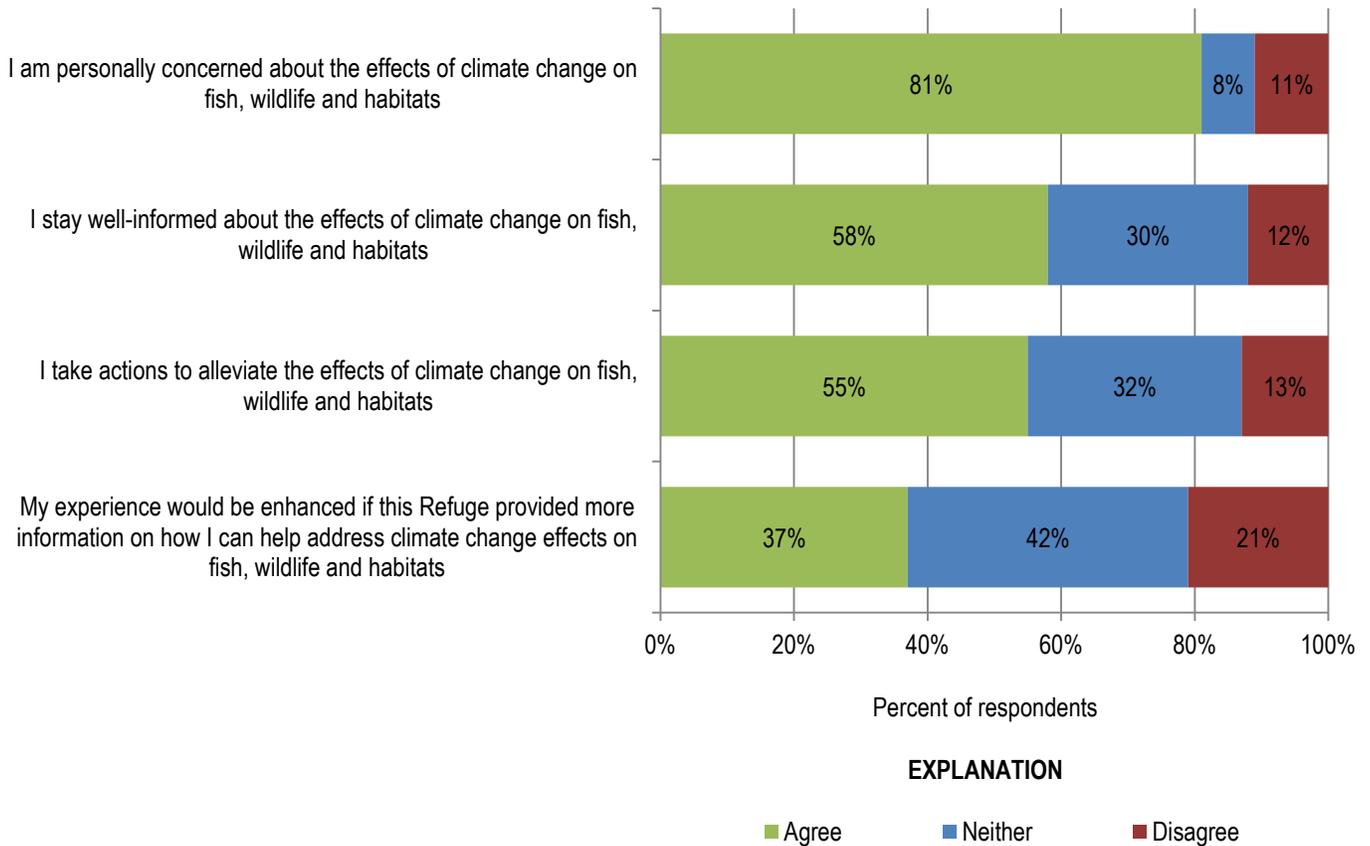


Figure 16. Visitors’ personal involvement with climate change related to fish, wildlife and their habitats (n ≥ 125).

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 Occoquan Bay and Mason Neck NWRs, the majority of visitors believed the following regarding climate change related to fish, wildlife and their habitats (fig. 17):

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

The majority of visitors did *not* believe:

- “There has been too much emphasis on the catastrophic effects of climate change.”

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 (37%) indicated that their experience would be enhanced if Occoquan Bay and Mason Neck NWRs provided information about how they could help address the effects of climate change on fish, wildlife, and their habitats (fig. 16), 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.

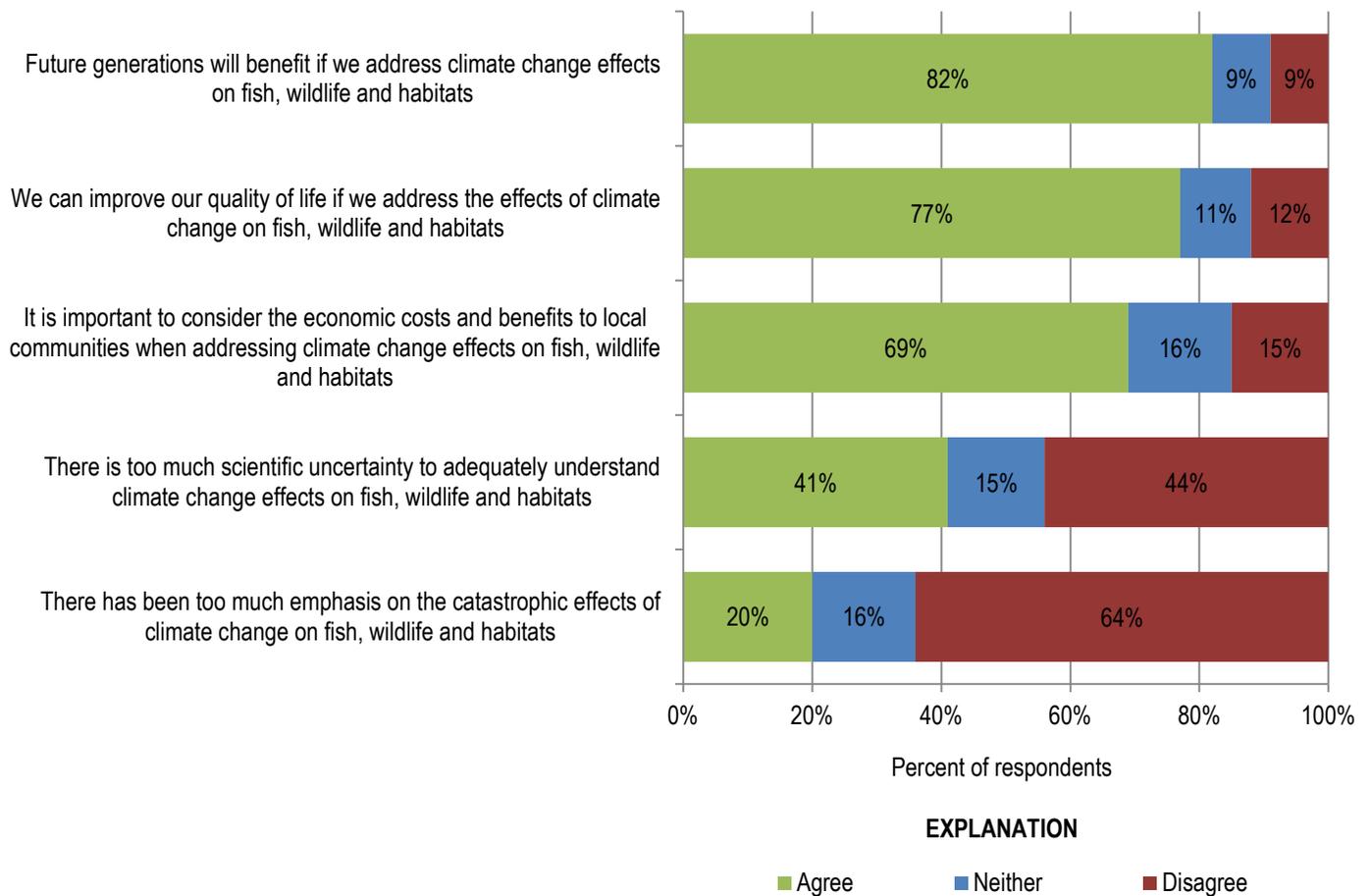


Figure 17. Visitors’ beliefs about the effects of climate change on fish, wildlife and their habitats (n ≥ 127).

Conclusion

These individual refuge results provide a summary of trip characteristics and experiences of a sample of visitors to Occoquan Bay and Mason Neck NWRs 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 or 970.226.9205.

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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"/> 2% Big game hunting | <input type="checkbox"/> 72% Hiking | <input type="checkbox"/> 9% Environmental education (for example, classrooms or labs, tours) |
| <input type="checkbox"/> 0% Upland/Small-game hunting | <input type="checkbox"/> 8% Bicycling | |
| <input type="checkbox"/> 0% Migratory bird/Waterfowl hunting | <input type="checkbox"/> 22% Auto tour route/Driving | <input type="checkbox"/> 18% Special event (<i>please specify</i>)
<u>See Appendix B</u> |
| <input type="checkbox"/> 72% Wildlife observation | <input type="checkbox"/> 1% Motorized boating | |
| <input type="checkbox"/> 65% Bird watching | <input type="checkbox"/> 2% Nonmotorized boating (including canoes/kayaks) | <input type="checkbox"/> 8% Other (<i>please specify</i>)
<u>See Appendix B</u> |
| <input type="checkbox"/> 5% Freshwater fishing | | |
| <input type="checkbox"/> 0% Saltwater fishing | <input type="checkbox"/> 16% Interpretation (for example, exhibits, kiosks, videos) | <input type="checkbox"/> 0% Other (<i>please specify</i>)
<u>See Appendix B</u> |
| <input type="checkbox"/> 39% 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?

- 76% No
- 24% 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"/> 10% Watch a nature talk/video/presentation |
| <input type="checkbox"/> 42% View the exhibits | <input type="checkbox"/> 29% Stopped to use the facilities (for example, get water, use restroom) |
| <input type="checkbox"/> 74% Ask information of staff/volunteers | <input type="checkbox"/> 6% 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	
40%	91%	89%	It was the primary purpose or sole destination of my trip.
20%	6%	6%	It was one of many equally important reasons or destinations for my trip.
40%	3%	5%	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 205 number of miles

Local 12 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?

43% No (*skip to question #9*)

57% Yes → What **type of group** were you with on your visit? (*Please mark **only one.***)

80% Family and/or friends

14% Organized club or school group

0% Commercial tour group

7% 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

2 number 17 years and under

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

25% Friends or relatives

15% Refuge website

18% Signs on highway

10% Other website (*please specify*) See Appendix B

7% Recreation club or organization

0% Television or radio

14% People in the local community

12% Newspaper or magazine

9% Refuge printed information (brochure, map)

14% 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.***)

72% Spring
(March-May)

59% Summer
(June-August)

82% Fall
(September-November)

51% Winter
(December-February)

11. How many times have you visited...

...this Refuge (including this visit) in the last 12 months? 21 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"/> 86% | Private vehicle without a trailer | <input type="checkbox"/> 1% | Refuge shuttle bus or tram | <input type="checkbox"/> 7% | Bicycle |
| <input type="checkbox"/> 0% | Private vehicle with a trailer
(for boat, camper or other) | <input type="checkbox"/> 0% | Motorcycle | <input type="checkbox"/> 42% | Walk/Hike |
| <input type="checkbox"/> 0% | Commercial tour bus | <input type="checkbox"/> 0% | ATV or off-road vehicle | <input type="checkbox"/> 2% | Other (<i>please specify below</i>) |
| <input type="checkbox"/> 0% | Recreational vehicle (RV) | <input type="checkbox"/> 0% | 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"/> 21% | Signs on highways | <input type="checkbox"/> 11% | Directions from Refuge website |
| <input type="checkbox"/> 10% | A GPS navigation system | <input type="checkbox"/> 2% | Directions from people in community near this Refuge |
| <input type="checkbox"/> 9% | A road atlas or highway map | <input type="checkbox"/> 6% | Directions from friends or family |
| <input type="checkbox"/> 13% | Maps from the Internet (for example,
MapQuest or Google Maps) | <input type="checkbox"/> 64% | Previous knowledge/I have been to this Refuge before |
| | | <input type="checkbox"/> 2% | 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"/> 43%	<input type="checkbox"/> 12%	<input type="checkbox"/> 8%	<input type="checkbox"/> 19%	<input type="checkbox"/> 17%
...a bike that was offered through a Bike Share Program for use while on the Refuge?	<input type="checkbox"/> 28%	<input type="checkbox"/> 13%	<input type="checkbox"/> 5%	<input type="checkbox"/> 39%	<input type="checkbox"/> 14%
...a bus or tram that provides a guided tour of the Refuge with information about the Refuge and its resources?	<input type="checkbox"/> 40%	<input type="checkbox"/> 12%	<input type="checkbox"/> 5%	<input type="checkbox"/> 22%	<input type="checkbox"/> 21%
...a boat that goes to different points on Refuge waterways?	<input type="checkbox"/> 22%	<input type="checkbox"/> 6%	<input type="checkbox"/> 4%	<input type="checkbox"/> 39%	<input type="checkbox"/> 29%
...a bus or tram that runs during a special event (such as an evening tour of wildlife or weekend festival)?	<input type="checkbox"/> 32%	<input type="checkbox"/> 5%	<input type="checkbox"/> 5%	<input type="checkbox"/> 34%	<input type="checkbox"/> 24%
...an offsite parking lot that provides trail access for walking/hiking onto the Refuge?	<input type="checkbox"/> 16%	<input type="checkbox"/> 8%	<input type="checkbox"/> 6%	<input type="checkbox"/> 32%	<input type="checkbox"/> 39%
...some other alternative transportation option? (<i>please specify</i>) <u>See Appendix B</u>	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 10%	<input type="checkbox"/> 30%	<input type="checkbox"/> 60%

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

- 14% Yes 52% No 34% 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%	19%	15%	50%	13%	Surface conditions of roads	6%	2%	2%	21%	69%	NA
5%	18%	12%	52%	13%	Surface conditions of parking areas	6%	3%	2%	15%	73%	NA
6%	8%	16%	37%	34%	Condition of bridges	6%	0%	13%	13%	69%	NA
5%	2%	5%	35%	54%	Condition of trails and boardwalks	6%	2%	2%	19%	71%	NA
5%	9%	7%	46%	34%	Number of places for parking	4%	2%	5%	10%	80%	NA
10%	10%	20%	48%	13%	Number of places to pull over along Refuge roads	8%	9%	20%	25%	38%	NA
3%	7%	8%	45%	38%	Safety of driving conditions on Refuge roads	2%	1%	6%	14%	78%	NA
2%	5%	9%	47%	37%	Safety of Refuge road entrances/exits	3%	0%	3%	14%	79%	NA
9%	10%	14%	35%	32%	Signs on highways directing you to the Refuge	7%	9%	20%	28%	36%	NA
7%	6%	9%	48%	30%	Signs directing you around the Refuge roads	4%	8%	11%	29%	48%	NA
5%	4%	7%	36%	48%	Signs directing you on trails	4%	7%	8%	30%	50%	NA
5%	6%	35%	31%	22%	Access for people with physical disabilities or who have difficulty walking	4%	7%	37%	21%	31%	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)?

96% Yes

4% No → How much time did you spend **in local communities** on this trip?

 1 number of hours OR 4 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	<u>Amount Spent in Local Communities & at this Refuge</u> <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 <i>(please specify)</i> _____	

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
21%	43%	20%	5%	6%	0%	2%	0%	0%	0%	2%

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**.)*

6%	Far too low	16%	Too low	77%	About right	2%	Too high	0%	Far too high	30%	Did not pay a fee <i>(skip to Section 4)</i>
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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.

3%	Strongly disagree	2%	Disagree	2%	Neither agree or disagree	29%	Agree	63%	Strongly agree
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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.	1%	5%	2%	29%	63%	NA
Overall, I am satisfied with the information and education provided by this Refuge about its resources.	1%	6%	9%	33%	52%	NA
Overall, I am satisfied with the services provided by employees or volunteers at this Refuge.	0%	2%	9%	29%	61%	NA
This Refuge does a good job of conserving fish, wildlife and their habitats.	0%	1%	10%	26%	64%	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
9%	13%	17%	46%	15%	Availability of employees or volunteers	3%	10%	7%	21%	58%	NA
9%	6%	16%	43%	27%	Courteous and welcoming employees or volunteers	2%	1%	11%	10%	77%	NA
6%	4%	9%	36%	46%	Knowledgeable employees or volunteers	2%	0%	13%	11%	74%	NA
5%	4%	6%	39%	46%	Printed information about this Refuge and its resources (for example, maps and brochures)	2%	4%	7%	32%	54%	NA
4%	6%	11%	57%	22%	Informational kiosks/displays about this Refuge and its resources	2%	5%	16%	31%	46%	NA
5%	5%	11%	44%	35%	Signs with rules/regulations for this Refuge	2%	6%	12%	30%	51%	NA
2%	11%	18%	51%	17%	Exhibits about this Refuge and its resources	3%	5%	21%	31%	39%	NA
5%	11%	23%	43%	19%	Environmental education programs or activities	2%	9%	30%	22%	37%	NA
11%	12%	20%	37%	20%	Visitor Center	3%	9%	26%	21%	41%	NA
2%	1%	2%	29%	66%	Convenient hours and days of operation	2%	8%	4%	26%	60%	NA
3%	5%	7%	35%	50%	Well-maintained restrooms	2%	2%	9%	36%	51%	NA
1%	9%	9%	48%	34%	Wildlife observation structures (decks, blinds)	1%	8%	12%	34%	45%	NA
2%	7%	10%	26%	55%	Bird-watching opportunities	0%	3%	10%	28%	60%	NA
0%	3%	7%	42%	48%	Opportunities to observe wildlife other than birds	1%	3%	10%	39%	48%	NA
6%	6%	14%	28%	46%	Opportunities to photograph wildlife and scenery	1%	1%	18%	25%	55%	NA
62%	7%	17%	10%	3%	Hunting opportunities	4%	1%	67%	7%	21%	NA
48%	14%	16%	15%	7%	Fishing opportunities	4%	9%	63%	8%	16%	NA
2%	3%	3%	25%	67%	Trail hiking opportunities	1%	1%	6%	23%	70%	NA
16%	11%	25%	32%	15%	Water trail opportunities for canoeing or kayaking	2%	15%	50%	17%	16%	NA
24%	11%	23%	25%	16%	Bicycling opportunities	3%	13%	44%	17%	23%	NA
13%	10%	31%	31%	16%	Volunteer opportunities	1%	4%	48%	14%	33%	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?

83%

Yes

17%

No

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

90%

Yes

10%

No

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

84%

Yes

16%

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.	7%	4%	9%	39%	41%
We can improve our quality of life if we address the effects of climate change on fish, wildlife and their habitats.	9%	3%	12%	33%	44%
There is too much scientific uncertainty to adequately understand how climate change will impact fish, wildlife and their habitats.	17%	27%	15%	28%	13%
I stay well-informed about the effects of climate change on fish, wildlife and their habitats.	2%	10%	30%	42%	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.	5%	10%	17%	53%	16%
I take actions to alleviate the effects of climate change on fish, wildlife and their habitats.	5%	8%	32%	39%	17%
There has been too much emphasis on the catastrophic effects of climate change on fish, wildlife and their habitats.	32%	32%	16%	13%	6%
Future generations will benefit if we address the effects of climate change on fish, wildlife and their habitats.	5%	4%	9%	33%	49%
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.	10%	10%	43%	25%	12%

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?

99% Yes 1% No → If not, what is your home country? See Figure 4 in Report

2. Are you? 62% Male 38% Female

3. In what year were you born? 1957 (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)			
					1%			6%				41%				52%			

5. What ethnicity do you consider yourself? 4% Hispanic or Latino 96% Not Hispanic or Latino

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

- 3% American Indian or Alaska Native 3% Black or African American 91% White
4% 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?

- | | | |
|------------------------|-------------------------|---------------------------|
| 1% Less than \$10,000 | 4% \$35,000 - \$49,999 | 35% \$100,000 - \$149,999 |
| 2% \$10,000 - \$24,999 | 13% \$50,000 - \$74,999 | 15% \$150,000 - \$199,999 |
| 2% \$25,000 - \$34,999 | 20% \$75,000 - \$99,999 | 9% \$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.)?

37 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

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Appendix B: Visitor Comments to Open-Ended Survey Questions for Occoquan Bay and Elizabeth Hartwell Mason Neck National Wildlife Refuges

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
Annual show	1
Autumn Festival	4
Bird Count	1
Bird walk sponsored by Northern VA Bird Club	1
Fall Event	1
Fall Wildlife Festival	6
Formal Bird & Butterfly Surveys	1
Kids Fishing Day	3
National Wildlife Refuge Week event	1
Occoquan Festival	1
Shoreline Clean Up	1
Youth fishing catch and release	1
Total	22

Other Activity	Frequency
Butterfly watching	1
FOPRR dinner/hike, observing migratory bird banding	1
Help paint benches	1
Nature enjoyment	1

Observing migratory bird banding	2
Participated in a cleanup day on the river.	1
Pilot survey of nocturnal animals, wild flowering	1
Use of compass or hand held GPS	1
Volunteer with youth	1
Volunteered with ranger and helped manage habitat	1
Total	11

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
Exercise	1
Total	1

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

Other Visitor Center Activity	Frequency
Pick up map	1
Renew Annual Pass	1
Total	2

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
Autumn Festival	1
Birding team	1
Jim Weggener birding survey	1
Virginia DGIF	1
Total	4

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

Other Website	Frequency
Friends of the Occoquan River	1
Google	1
Google maps	3
http://www.dcr.virginia.gov/state_parks/mas.shtml	1
I saw it on Google Earth.	1
National Park website	1
National Wildlife Refuges	1
Viewing wildlife in Virginia website	1
Virginia Birding	1
Virginia bird watching list serve	2
Total	13

Other Ways Heard about This Refuge	Frequency
Brochure and the hotel	1
Child's teacher	1
ExxonMobil cleanup day	1
George Mason University	1
I used to work at this location when it belonged to the Army.	1
I used to work there (HDL).	1
I was part of the group that wanted to establish this Refuge.	1
Local map	1
Participated in data collection that led to this refuge's creation.	1
Prince William County schools professional development	1
Refuge employees	1
Road map	1
Saw it on a map.	1
Virginia Bird List	1
Virginia Fish & Wildlife notified me of the Refuge.	1
Visit during graduate class field trip.	1
Wildlife study (American Woodcock) on this property.	1
Work	1
Total	18

Survey Section 2

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

Other Forms of Transportation	Frequency
John Deer tractor	1
School bus	2
Total	3

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

Other Ways Found This Refuge	Frequency
Newspaper article	1
Refuge pamphlet	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
Any	1
Battery operated golf carts or horses	1
Bicycle	1
Caballos (Horses)	1
Handicap scooter	1
Hiking	1
Hiking from home	1
Horses	2

Not sure, but willing to consider almost anything	1
Private vehicle	1
Total	11

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 = 21)

Don't "improve" the refuge so much that the ospreys go away.

Entrance/Exit gates are operated by sensing the presence of a motor vehicle. If you are on the refuge and on foot after the "closing" time, one must climb the gate to exit the refuge! Perhaps a push button could be installed inside the gate for someone to open the gate when it is closed.

Everything is excellent. I take all these items for granted.

I did not tour the entire refuge and cannot give objective feedback on access to trails for handicap/physically disabled persons.

I found the signs about entering the refuge confusing.

It is a small refuge with a short road. The road was fine. The parking lot was adequate in condition and enough for the amount of visitors. The only alternate transportation that would work here would be a bike or a tractor ride, such as we took with our kids at the exhibits. Very nice. I like it without a lot of buildings, etc. I prefer to hike/walk, especially at this one, but I think alternate transportation would be good at others. It would encourage visitation and cut down on private vehicle traffic.

Larger signs would help keep bikers and joggers off the closed trails.

Most of the road network at this refuge is off-limits to auto travel. We would like to see more of the road network opened up. It would provide easier access to various parts of the refuge. There are existing parking areas that could be used.

Signage outside the refuge from interstate 95 leading in is lacking or poor. Signage from Rt 1 is also not prominent enough. It was difficult to find on the first visit.

The portable stop sign placed in the middle of the entrance road can be a hazard and doesn't leave much room to safely get by, especially in a larger vehicle.

The trails are gravel and do not lend themselves to easy use for people in wheelchairs, etc. I do not know how important access is to the handicapped for this refuge.

The trails need to be marked with the names. The signs do not tell you which trail you are on, and the maps along the way are arranged with north "up," but the trails are all going south, so I found it difficult both times I was there to figure out which trail I was on.

There are no signs on I-95, but that's ok. There is only a generic wildlife and birding area sign on Rt. 1, then no signs until you go a mile through residential/industrial to the entrance. It keeps traffic down, as only folks looking for it continue. Better signage will increase traffic and hopefully not upset the quiet. I really love how running dogs, picnics, etc. are not welcome. Wildlife refuge it is!

There is only one parking lot, but the refuge map shows two. Once you start driving down the one-way road, you have to exit via a side road. I didn't understand that from the map.

There was no place to park and observe the refuge while driving through it!

This is a new refuge and still a work in progress.

This is a small refuge and further road development, in my opinion, would be unwarranted.

This is a very small refuge; only one vehicle access road through it (which is sufficient) restricts trails, as it is so small. The little map is sufficient to absolutely not get lost.

This park has paved trails for people with disabilities and I am very impressed with their good condition.

To get to the bird banding site, you have to park far away and then hike in. It would be more convenient to have parking near the site. Also, for Youth Fishing Day, there is no pavement parking at all.

Wildlife loop should have pull-offs for viewing. Perimeter fence should have open spaces (and not be vine covered) for observation.

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 = 47)

Additional observation decks at key locations and on boardwalks into wetlands are needed.

Better advertising of activities in local newspapers, etc.

Eliminate hunting. Have blinds available for wildlife and bird observing. Right now, the hunters have the best blinds. I thought it was a REFUGE for wildlife, not a game park.

Enchanted by chance encounter at bird banding station on first visit in April. Love the way you're keeping the diverse habitats in square miles - deciduous, marsh, fields, and shore. Saw a coyote last week!

Great staff teamwork and courteous service.

Having activities and volunteer opportunities posted at main parking lot would be nice. Also, resources for other nearby refuges.

Hope the refuge will eventually get a Visitor Center.

I am a volunteer at this refuge. I appreciated the staff's attitude and the fact that it seems to be clean and well maintained. As an amateur naturalist, I feel this refuge is an important place to keep for wildlife.

I am very grateful for the clean and available restrooms!

I heard there is a new Visitor Center planned for this refuge, I don't support spending money on this, as it is a very small (1 square mile) space to begin with; this center will take away land, and the disruption of a beautiful area, and cause disturbance of the landscape by building of additional roadways and parking. I think more important than having a building with information is to get on the trail and get 'informed' by that actual experience of a little sanctuary. I also would like to see protection of the waterways (Occoquan River and Bay, Potomac River) surrounding the refuge from hunting. This is an important migratory rest spot for waterfowl and the free (and commercial) hunting opposes the whole idea of this being a refuge. There is nothing wrong with shooting a duck here and there for the dinner table, but there is something very wrong with taking whole flocks for commercial profit.

I spent some time talking with staff. I found them knowledgeable about birds, plants and their own long-term preservation plans, including complicated issues of plant succession. They were very courteous, too. I was very impressed.

I would like to see the refuge open at sunrise in the spring and summer (6 am).

I would like to see the refuge open from dawn to dusk all year. The refuge opens too late and closes too early. Consequently, you miss some of the best times to see and photograph wildlife.

I would love it if they stayed open until sundown instead of just 5 PM. It would be no cost to do so - they have automatic gates.

It is an excellent place to walk and enjoy nature in each season. I go for exercise and get a lot more from nature.

It is very well run and the people are always helpful and knowledgeable.

It was a beautiful and scenic walk. Needed trail markers.

It would be good if the contact center with FWS staff was open longer hours on the weekends.

It would be nice to have another restroom along the paved trail.

Jogging is not permitted on the refuge. I hope that changes in the future.

Occoquan has minimal facilities, which is fine. It has what is needed for a good bird watching experience. More development might spoil it.

Occoquan is a small refuge and obviously does not have the resources or human power to do more programs and outreach to the local community. I would urge the DOI and FWS to invest more in this very important, if small, site.

Other than biking on the car road, I wish there were biking trails.

Paving part of a trail would be a good idea, so wheelchair bound people can enjoy the refuge, too.

Plans are to build a Visitor Center in an untouched area rather than using the existing parking lot and infrastructure. I hope the Fish and Wildlife Service reconsiders this plan.

Publicize it more.

Ranger McCleavey has been a courteous and outstanding resource to our 4-H group, as we seek to develop our youth.

Refuge is open until 7 in the summer and 5 in the spring, fall and winter. Hours that more closely matched daylight would greatly enhance the viewing opportunities (e.g. 6:00 in spring and fall, 8:00 in summer).

The contact with rangers with the group I led was very negative, demonstrating a lack of personal relations and need for training of staff.

The employee who convinced me to answer this questionnaire was friendly and knowledgeable.

The nature of the refuge is not suitable for boating activities. No significant, navigable bodies of water lie within the refuge.

The staff personnel are great!

There really haven't been any services, other than the well-maintained portable toilets.

There was no publicity about the event I went to -- the Youth Fishing Day. Every year, I have to remember about what time of year it is and then call and hunt down the information. It is not on any website or public information that I come across. I feel that this refuge is a hidden gem that is not interested in publicity. The fishing day was fantastic - the employees are warm and wonderful and put together a GREAT event, but there is no information about it. I have no idea about what other things they do at the refuge and would love to attend other events.

There were so many rules at this park - they were everywhere, but too hard to keep up with. People violated them all day, because they were all over the place, not consolidated, and only in English - non English speakers were mostly the violators, because they could not read the rules or there were so many it was hard to get them all. No dogs? That is just crazy. People are a far more invasive species than dogs.

This is one of my favorite local birding sites. The refuge is very important to me and I feel it does a great job protecting wildlife, providing migration stop over points. It also provides excellent educational opportunities to the public on conservation. A very important location.

This refuge does not have a Visitor Center and needs one. I see other refuges getting recently remodeled Visitor Centers over and over again, and this refuge cannot even get a Visitor Center. Case in point: Blackwater NWR.

This refuge does not have a Visitor Center and probably doesn't need one. We aren't hunters, nor do we fish, so that is very unimportant to us. This is a big refuge, and it would be nice to open the road network for bicycling.

This refuge is a diamond in the rough that could be enhanced with a Visitor Center and an increase in staffing. Guided nature hikes would also improve the experience.

This refuge is small and there are few workers/volunteers. It is mostly a place to hike and watch wildlife. You really don't need many people there to help you, as it would be hard to get lost. One worker took us on a tractor ride and talked about it. Wonderful. I love the place.

Trail access to the eagle nesting area has been restricted in the last several years. Less rewarding experience to visit the refuge now.

Use the trails on most days for an exercise/walking regimen. Usually walk 4-5 miles per day.

Very nice annual event (first time). Place is usually empty.

We are very impressed by the park rangers at our refuge. They are always interested in answering questions, very hard working, and make the refuge a pleasure to visit. We are not pleased to have the refuge open to the public while hunting is occurring! We believe there could be a safety issue for the hunters; people may be shot by accident. If deer herds must be culled, let professionals do it, and give proceeds to the hungry!

We came primarily for the Fall Festival, and didn't explore much beyond that, so I can't really rate the general services of the refuge very specifically.

When the days are longer, it would be nice to be able to stay through sunset, but the refuge closes beforehand.

Would like more volunteer opportunities.

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 = 93)

A quiet, low-tech, oasis where one can observe wildlife and flora in a natural setting.

A real glimpse at raw, untouched lands that are often not far from developed areas. This is an experience much more valuable than visiting your average area "park."

Active focus on wildlife itself, and not just the lands/scenery.

Allowing the area to be mostly natural, and to have a way to see the natural area.

Better emphasis on wildlife.

Better quality of preservation. Alaska has enough oil for us for 2,000 years.

Combination of open fields, woods and water.

Convenient location, ease of use, beautiful scenery, and diverse wildlife.

Easy access to local community; great for me as a handicap person to get outdoors, enjoy wildlife and get exercise.

Easy! Refuges are real. Nature in the wild. Human recreation and tourism are secondary to the preservation of the habitat and fauna.

Far more rules, far more restrictive.

For this refuge, it is that it sees few visitors. I don't feel overwhelmed by other visitors.

Great to see wildlife conservation in action.

Higher level of protection and professional management than on most public lands.

Hiking, bird watching, and programs for adults and children.

Hiking, walking, and educational events.

Human population and activities are more controlled.

I am always grateful for being able to walk in the woods on land that I am not able to own, enjoying nature especially in a busy city area.

I think refuges protect wildlife and allow people to experience natural habitats of wildlife.

It is protected land, not subject to development, and a sanctuary not only for wildlife, but for us humans as well!

It is the best place in the area to hike and bird watch!

It's truly a natural setting as opposed to a zoo or some parks.

Its location on the Occoquan River and proximity to the Potomac and Chesapeake make it a unique location for observing local wildlife.

Just to view nature and enjoy the outdoors.

Less people.

Location.

Mason Neck National Wildlife Refuge has bald eagles, nice trails, and beautiful views of the Belmont Bay.

More or less untouched environment in which to observe wild/native plants and animals.

Most refuges in Virginia and in other states give visitors a chance to see what the land looked like before there were roads, bridges, towns, etc. The opportunity to view animals and birds in their natural habitat can be rare. Sometimes it's a neat thing to see wildlife that's been preserved in a specific region and compare it to your own.

Multi-use of land allows for many experiences not available in State or National Park lands.

Natural settings for wildlife.

Opportunities to experience nature in a natural setting.

Opportunity to observe protected and undisturbed wildlife and birds.

Opportunity to visit wildland with low visitor density and high probability of seeing song birds, raptors, waterfowl and mammals, even with noise from surrounding area. The feeling of open space is amazing.

Peaceful and beautiful trail through the woods ends at a preserved undisturbed marsh.

Protected places for wildlife, and in a variety of settings - remote or, like Occoquan, easily accessible by city dwellers. I always check the FWS website for refuge information when I am planning a trip.

Protection and conservation of endemic flora and fauna. Availability to visit these areas for recreational activities.

Protection.

Reclaimed land on a bay in driving distance from work, lots of wildlife, kept in a perpetual state of ecologic succession by annual mowing, fresh air, and great trails. I visit, on average, 4 times a week during the 9 or 10 months the ticks don't run me out.

Refuges are more natural and wild than most other parks and locations. Provides an opportunity to observe nature and wildlife with little human intrusion.

Refuges are unique, because NWRs are focused not on recreation, but on conservation. I prefer to visit public lands that limit recreational use, so that the land may be as natural and blessed with wildlife as possible - places where rare habitats are preserved for declining species of plants and animals.

Refuges give us the opportunity to protect portions of our country for the expressed purpose of protecting habitat for wildlife. They remind us of our stewardship responsibilities as human beings.

Refuges provide a quiet, unmotorized visit or speed limits at 5-10 mph, so as not to disturb wildlife.

Refuges usually have more wildlife, and are more quiet and peaceful than other parks and outdoor recreation areas.

Refuges, unlike the National Park System, have a very light human footprint.

Rustic, underdeveloped land is the appeal to me. Wildlife is more directly observable.

Seeing wildlife in natural habitat.

Since refuges are managed to conserve wildlife and habitat, they provide an opportunity to learn about and observe habitat and the wildlife it supports.

Small enclaves of natural habitat and wildlife in often otherwise over-developed urban/suburban areas provide visitors an opportunity to experience nature at its best. Their operation and management are key to preserving and promoting the native environment.

The "natural" (or "wild", or untouched) environmental setting. Encountering numerous types of wildlife and nature scenes up-close in their natural setting. Watching the changes in these things as the seasons change and, to a degree, as the day changes.

The ability to see wildlife naturally with no pets or bicycles.

The beauty of the bay, the birds and other critters I see, and the flowers and trees. Absolutely delightful, I love the place and it keeps on being improved every year.

The critical primary mission leads to excellent wildlife observation opportunities and no interference from dog walkers, joggers, bicyclists and active recreationists.

The effort that goes into game management. Specifically, hunting opportunities for wildlife management.

The fact that refuges are established for wildlife/ecological management makes them unique among the public lands programs - including the National Park/Seashore systems.

The focus is less on recreation, at least my kind. Generally better than National Parks for wildlife and bird watching. More for nature than for people, which is a good thing. We need more of them.

The focus of refuges is exclusively on wildlife. Federal/state/local parks are almost always multipurpose and more crowded.

The FWS' specific interest is wildlife conservation. I also enjoy the NPS, but with the NPS, the focus is shared between both natural and human treasures, which are an absolute necessity, but the FWS has a more laser like focus on wildlife, which is vital.

The lands are preserved, "untouched" by society. Other parks have areas for people to socialize. This refuge appears to remain untouched by people and it is VERY nice.

The many events for young adults and children to share the importance of nature.

The opportunity to experience wildlife in its natural environment. The refuges I have visited are often the best and only place to view specific wildlife and attract and protect birds on their migratory journeys, or provide habitat for their residence.

The park is set up for animals to have a good habitat and not as much for people.

The people who are assigned there make the experience very rewarding and fun.

The people who use this refuge tend to value wildlife and nature. Unlike it would be if it was just a public park.

The primary focus is on the wildlife, not the human use of the facility.

The primary mission makes them unique. Also, refuges are usually designed to make wildlife observation easier.

The refuge I visited is very natural - the facilities are basic and the emphasis is on enjoying nature and learning more about it.

The refuge remains mostly natural with few man-made additions to take away from the habitat reserved for native fauna and flora.

The refuge restricts recreational activities (running, biking, dog walking) so that this is truly a refuge for wildlife. The refuge is on a bird migratory path and monarch path so there is a lot of great wildlife to see. Volunteers run a bird banding station. The county school system had a one year grant to run weekend wildlife education programs which were great.

The refuges are unique in that Mother Nature has planned and designed these wonderful outdoor spaces and man helps her maintain and promote these marvelous sanctuaries. During this time of technological wizardry, we need a place where we can commune with nature and the refuges provide just such a place.

The refuges we have visited generally have fewer visitors than, for example, the National Parks, which allows for a more intimate and solitary experience with nature.

The refuges, especially the small ones, do not have massive crowds and it is easy to find refuge yourself.

The scenery.

The wildlife comes first!

The wildlife refuge was more focused on natural habitat and conservation, while other parks I have been to have had other points of focus (e.g., tourism or recreational activities).

There are limits on recreational activities that would disturb wildlife and plants, which make them a great place to observe nature.

There wasn't much to see, I didn't see much wildlife, but I did see rare waterfowl in the river that was very interesting. I learned a lot from the signs posted that talk about the refuge and the wildlife. I liked the places you could just sit down and listen to it all.

They are less cluttered and visited than parks. There are fewer buildings and you get to commune with nature more. I really love refuges - I've only been to a handful because I don't know much about where they are. I believe some advertising would help attract people. A reasonable fee would help pay for management. Too big a fee would discourage people. I would pay \$10 per person or \$25 per car.

They are protected and managed.

They are typically much larger than local parks.

They are usually more rustic where people have to get out of their vehicles and get close to nature. The emphasis is on a refuge for the fish, etc., which is important. People are a secondary concern.

They preserve land, offer stop over sites for migrating birds, nesting sites for birds, and provide people with an opportunity to enjoy the outdoors. It's too bad that hunting is allowed other than to cull the white-tailed deer population.

They provide an environment in which the fauna and flora can thrive in their natural habitat, while providing visitors with an area for recreation that is most natural.

They seem managed primarily to support the habitat and wildlife, rather than as tourist attractions, which is the case with the National Parks.

They're commitment to preserving wildlife.

This is pristine habitat territory in the midst of a highly populated and urbanized area, which makes it invaluable to nature lovers.

This refuge has one of the most beautiful shorelines in Virginia. The trails often follow the shoreline, giving beautiful views. We often see wildlife, eagles, deer, many rabbits, birds, etc. We also feel safe hiking here, which allows us to hike with confidence.

Unspoiled, less visited, fewer amenities, and more interesting hikes.

Very peaceful and a lot of wildlife.

What makes them unique is that the primary purpose of the refuge is to be a sanctuary for flora and fauna and the secondary purpose is for us to be able to go in and enjoy nature at its best. I hope and wish that this purpose is never forgotten, as there is already a lot of parks that emphasize the human recreational usage aspect (biking, picnic, playing, etc.). The less human footprint, the more refuges have a chance to serve their purpose.

Wildlife habitat and conservation is a primary concern.

You are able to learn about wetland animals. To see the change of the land from spring to summer to fall to winter.

You don't have to worry about hunters. I like the fact it is totally dedicated to preserving and restoring natural areas.

Additional Comments (n = 34)

Don't let our ranger retire!

I am a lucky guy to work near Occoquan Bay National Wildlife Refuge and to have found it. My only suggestion is to not close so early. Maybe it could use more advertising. It is a great place, and the people there are knowledgeable and nice!

I am out nearly every weekend. Thanks for all you do with the wildlife refuge program. I have visited many refuges and find them interesting, usually well managed, and essential!

I find this refuge accommodating and affordable.

I go out most every weekend, all year long to walk, bird, and enjoy the outdoors. I often go to the National Parks, local parks, and wildlife refuges. This refuge is great for birding. I appreciate that dogs and bikes are not allowed. This park has some great habitat. The tidal freshwater wetlands, sheltered bays, and open fields are a magnet for birds all year. I have been there a number of times since becoming aware of it and plan to continue to visit.

I heard that Occoquan Bay (this refuge) is the last undeveloped square mile in northern Virginia. That's too bad, as it is a lovely place and would probably be spectacular during waterfowl migration. Nice ospreys, green tree frogs, and a huge wolf spider in the bathroom!

I visit often, and recommend this place to others.

I will come back in the spring and hope to see more animals.

I will use this refuge much more often with my children and will spread the word to other members of my community, because I really enjoyed it!

I'd like to receive an occasional email/newsletter notifying me of refuge activities, sightings, stories, photos, etc. I'm so glad this refuge was acquired and set aside for future generations. Thank you for all you do.

In addition to the 5 outdoor recreation trips of more than two days, we lead bird walks of half-day to a daylong at least once a month.

It is great for the community.

It's a wonderful asset to our community!

Most years, during the summer, the presence of ticks (including deer ticks) at this refuge can be VERY severe. For example, last year, just walking on the trails one day in early May, I brought home 7 large ticks and 4 deer ticks on my clothes in one day. Because of this, the summer season is the only season that I do not visit the refuge. While I understand that this is part of the natural habitat, perhaps you would consider spraying areas next to the main hiking routes to diminish the problem.

My main concern is not to 'over manage' the refuges, to keep them as close as possible to how nature intended. Do everything possible to provide 'refuge' to the native flora and fauna (I think the staff on Occoquan Bay Refuge are doing a pretty good job at that). Would be great to reduce the coyote population. Have personnel in the refuge to check that people follow the rules to protect the wildlife and habitat. My other great concern is the hunting of waterfowl commercially: I would love to see steps in the direction of a protection of the surrounding waterways, at least a certain radius around the refuge. Please let me know if there is anything that could be done, maybe a petition to change some old (colonial times, I could imagine) laws that seem to be inadequate anymore in today's situation. So far, the waterfowl are left out of the protection, unless they come ashore.

My visits to this refuge are always interesting and educational. The FWS personnel are excellent and very knowledgeable.

My wife was just recovering from hip replacement surgery (usually we visit this refuge more often).

Occoquan Bay NWR is a small refuge surrounded by suburban sprawl. This heightens its importance both for limited recreational viewing of wildlife and conservation of semi-open habitat. With the decline of local farming in the 20th century, this area is one of the last meadow areas in the region that has not gone to second growth forest.

Please do more advertising, so people know about these places. I would like to see information offered as to how we can be more environmentally friendly. I feel there can be a balance of this and economics. There are enough smart people who can figure out how to balance and appease environmentalists and those who care more about money and economy. If something can be done to alleviate concerns of both sides, it is a win-win. I would love to work at a refuge. I am active duty military and love serving. Keep up the good work, but think outside the box as far as the conservation and economics.

PLEASE publicize your events!

Road signs would be helpful. The refuge map shows the names of the roads, but there are no signs. In all refuges, the restrooms should have hooks for hanging coats.

Tell us more about the ospreys. Provide a list (with pictures if possible) of the wildlife most commonly seen in the refuge. I'd like to know what I'm looking for.

Thank you for providing areas where I can enjoy nature walks!

Thank you for the chance to participate in this survey. This was the first time I ever had a chance to meet the ranger at Occoquan and I thought he cared greatly for the park and wished he had the resources to do more. I support any effort that can be made to improve this park and the contributions derived from the local community.

The deer population in the refuge has to be controlled. There are options other than the public/lottery hunt that could do the job, but would not provide the recreational hunting opportunities that the public hunt provides. I'm very glad you are choosing the public hunt option. I really look forward to the annual hunt days at the refuge.

The refuge is always great.

The refuge is fine as is, but may want to open up the service roads to foot traffic. Mason Neck is large enough for an at length foot trail.

This is a great birding site. We love to visit the refuge. Ranger Marty is tops!

This refuge is a small tract on the edge of a residential/commercial area. It is well managed and enjoying increasing visitation, but its small size may impact its ability to get the necessary funding to provide more services that would increase visitor numbers. A Visitor Center would be a great addition and would help advertise this refuge. The amount of migrating birds/butterflies is a real draw for those enthusiasts, and sometimes there are expert "volunteers" available who provide assistance to anyone with questions. Overall, it's a super nice, enjoyable refuge.

This refuge needs a Visitor Center. With the office several miles away in a strip mall, there are no staff members on the refuge, nor is there any real information about the refuge and its purpose. And what about Mason Neck NWR and Featherstone NWR? Both are kind of step children tied to the strip mall.

This was our family's first trip to this refuge. We really like walking through natural habitats and seeing birds and other wildlife, but my main interest is wildflowers. Wildflower identification or brochures seem lacking in most wildlife areas I visit. I would be interested in attending formal wildflower walks, if offered. We will definitely visit this area again.

Very concerned that refuge staff lacks the resources to implement its management plan and, especially, address the encroachment of non-native invasive plants and animals.

Very friendly, knowledgeable and helpful ranger.

Very nice small refuge.
