



U.S. Fish & Wildlife Service

NATIONAL WILDLIFE REFUGE VISITOR SURVEY

*2018 Results for
Guam National Wildlife Refuge*



**THE OHIO STATE
UNIVERSITY**



Acknowledgments

This study was funded by the U.S. Fish & Wildlife Service/National Wildlife Refuge System's Natural Resource Program Center, Division of Visitor Services & Communications, and Division of Facilities, Equipment, & Transportation. The study design and survey instrument were developed collaboratively with representatives from the U.S. Fish & Wildlife Service and researchers from The Ohio State University. We would also like to thank any staff and volunteers at Guam

National Wildlife Refuge who assisted with the implementation of this survey effort. We would like to especially acknowledge the following American Conservation Experience team members for their work in implementing the on-the-ground sampling for the 2018 survey effort: Ellen Bley, Kylie Campbell, Michelle Ferguson, Justin Gole, James Puckett, Nicole Stagg, and Angelica Varela. Lastly, we thank Emily Neidhardt for designing this report.

Note: This report summarizes responses from a small sample of visitors (see pg. 3 for details). Thus, results may not reflect the full range of visitor experiences on this refuge and should be interpreted with caution.

Report citation:

Dietsch, A. M., Sexton, N. R., Lyon, K. M., Hartel, C. M., & Mengak, L. F. (2019). National Wildlife Refuge Visitor Survey: 2018 Results for Guam National Wildlife Refuge. Columbus, OH: The Ohio State University, School of Environment and Natural Resources.

Front cover: Pathway to the beach area at Guam National Wildlife Refuge. Photo credit: U.S. Fish & Wildlife Service.

Contents

Acknowledgments	ii
Understanding Wildlife Refuge Visitors & Their Experiences	1
Surveying Visitors at This Wildlife Refuge	3
Visitor Characteristics	5
Trip Characteristics	6
Information Sources Used for Trip Planning.....	9
Use of Social Media	11
Participation in Recreational Activities	12
Comfort in Nature/Feeling Safe & Welcome	14
Satisfaction with Refuge Experiences	16
Economic Benefits to Local Communities & Visitors.....	20
Encouraging Return Visits & Future Recreation Participation.....	22
Conclusion.....	25
References	26
Appendix A: Survey Methodology	27
Appendix B: Response Frequencies and Averages by Survey Question	29
Appendix C: Open-Ended Survey Responses by Question.....	41

Understanding Wildlife Refuge Visitors & Their Experiences

A hundred years in the making, the National Wildlife Refuge System (Refuge System) is a vast network of habitats that supports over 2,000 species of birds, mammals, reptiles, amphibians, and fish across the United States on national wildlife refuges (wildlife refuges). Wildlife refuges also provide unparalleled outdoor recreation experiences and health benefits to people by offering a chance to unplug from the stresses of modern life and reconnect with their natural surroundings. The National Wildlife Refuge System Improvement Act of 1997 specifically identified six priority recreational uses: hunting, fishing, wildlife observation and photography, environmental education, and interpretation (Fig. 1). These recreational activities are prioritized on every refuge where compatible with the refuge's stated purposes. Visitors may also engage in many other activities (for example, hiking, paddling, boating, and auto tour routes) where compatible.

At least one wildlife refuge exists within an hour's drive of most major metropolitan areas. With over 55 million visits per year, the Refuge System is committed to maintaining customer satisfaction and public engagement while helping people and wildlife to thrive. Increased

visitation is not limited to the Refuge System—over the past few years, there has been a rise in the number of people traveling to public lands and waters for recreation (Outdoor Foundation, 2018). This nationwide trend demands effective management of visitor access and use to ensure benefits for present and future generations.

The need to understand visitors and their experiences, as well as preferences for future opportunities, is further underscored by widespread societal changes that are shaping how people engage with nature and wildlife (Kellert et al., 2017; Manfredo et al., 2018). Researchers and land management professionals alike recognize the need to connect the next generation to nature and wildlife to enhance mental and physical well-being and build a broader conservation constituency (Charles & Louv, 2009; Larson, Green, & Cordell, 2011).

The National Wildlife Refuge Visitor Survey is a Refuge System-wide effort to monitor visitor characteristics, experience, and satisfaction with refuge experiences, as well as visitor economic contributions to local communities. The survey is conducted every five years on a rotating basis on wildlife refuges that have at least 50,000 visits per year. This effort provides refuge professionals with reliable baseline information and trend data that can be used to plan, design, and deliver quality visitor experiences, communicate the value of wildlife refuges to different audiences, and set future priorities. The National Wildlife Refuge Visitor Survey is a collaboration between the U.S. Fish & Wildlife Service (Service), The Ohio State University (OSU), and American Conservation Experience (ACE).

This report summarizes visitors and their experiences at Guam National Wildlife Refuge, referred to as “this wildlife refuge” or “refuge” throughout this report. Percentages noted throughout the report were rounded to the



Fig. 1: Priority recreational uses of National Wildlife Refuges.

nearest whole number and, when summarized per survey question, may not equal 100%. Additionally, most figures do not display a percentage for any category containing less than 5% of visitors. See Appendix A for the

survey methodology and limitations of findings. See Appendix B and C for visitor responses to specific survey questions for this wildlife refuge.



2018 National Visitor Survey interns in action at wildlife refuges across the United States. Photo credit: U.S. Fish & Wildlife Service.

Surveying Visitors at This Wildlife Refuge

REFUGE DESCRIPTION

Guam National Wildlife Refuge is located on the northern tip of the island of Guam, an unincorporated U.S. Territory situated in the western Pacific Ocean approximately 3,800 miles west of Honolulu and 1,500 miles south of Tokyo. The refuge was established in 1993 in response to the 1984 listing of six species as endangered. This wildlife refuge was designated critical habitat in 2004 for three of these species: the Mariana fruit bat, the Guam Micronesian kingfisher, and the Mariana crow. The Ritidian Unit is located on the northern tip of Guam and hosts a unique and fragile blend of native plants and animals found nowhere else in the world. The refuge encompasses 1,217 acres, including 385 terrestrial acres and 832 acres of submerged areas offshore.

Guam National Wildlife Refuge attracts over 140,000 visitors annually (U.S. Fish and Wildlife Service, 2018, written comm.). Ritidian is a popular destination for both locals and tourists, offering over a mile of sandy beach where the public may picnic, swim, snorkel, and fish. Visitors can also hike roughly two miles of trails, tour the rediscovered ancient village, or

explore the numerous caves found along the majestic limestone cliffs.

SAMPLING

Refuge professionals at this wildlife refuge identified two separate 14-day sampling periods and one or more sampling locations that best reflected the primary uses of the refuge as well as the diversity of activities that occur (Fig. 2). For more details on methodology for the National Wildlife Refuge Visitor Survey, see Appendix A.

- During the two sampling periods, a total of 228 visitors agreed to participate in the survey by providing their names and addresses.
- In all, 56 visitors completed the survey online (71%) or by mail (29%) after their refuge visit, resulting in a 29% response rate. **Due to the small sample size, results contained in this report should be interpreted with caution.**
- Results for this wildlife refuge have a $\pm 10\%$ margin of error at the 95% confidence level. For more details on limitations of results and survey methodology, see Appendix A.



Caves at Guam National Wildlife Refuge contain important cultural resources. Photo credit: Katie Lyon.

Visitor Characteristics

An important first step in managing visitor experiences is to understand the characteristics of those who currently visit wildlife refuges. Refuge professionals can compare visitor demographics to the demographic composition of nearby communities or the nation to inform engagement efforts with new audiences. Useful tools for these comparisons include Headwaters Economics' Economic Profile System and their Populations at Risk (<https://headwaterseconomics.org>) or U.S. Census Bureau products (www.census.gov; www.socialexplorer.com).

AGE & GENDER

- 58% of visitors were female with an average age of 41 years (Fig. 3).
- 42% were male with an average age of 45 years.

EDUCATION

- 6% of visitors had a high school degree or less.
- 46% had at least some college.
- 48% had an advanced degree.

RACE & ETHNICITY

Most prevalent race or ethnicity (Fig. 4):

- White (38%).
- Asian (27%).
- Some other race (21%).

INCOME

- Visitors had a mean income range of \$75,000-\$99,999 (Fig. 5).

OTHER TRIP CHARACTERISTICS

- Average group size of 5 people.
- 13% visited the refuge alone.
- 38% visited with at least one other adult.
- 49% visited with a combination of at least 1 adult and 1 child.

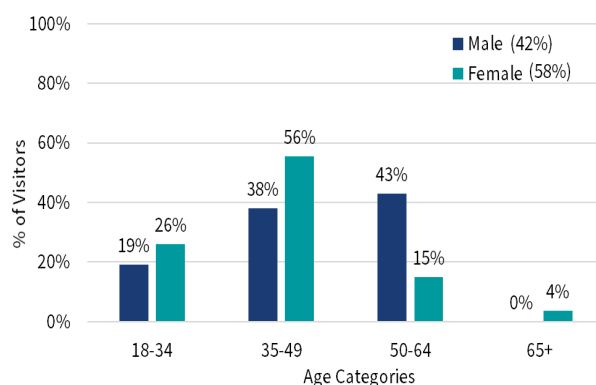


Fig. 3: Distribution of visitors to this refuge by gender and age group.

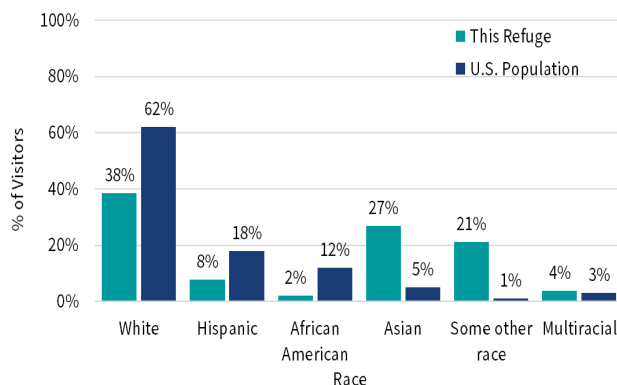


Fig. 4: Race and ethnicity of visitors to this refuge compared to the national average.

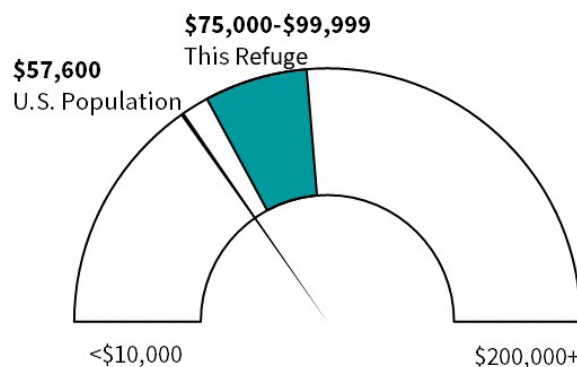


Fig. 5: Mean income range of visitors to this refuge compared to the national median income.

Trip Characteristics

Understanding the travel patterns of visitors and why they choose to visit wildlife refuges is important for effective visitor use management. Comparisons of responses from local visitors (those living ≤ 50 miles from the refuge) and nonlocal visitors (those living > 50 miles from the refuge) can inform communication efforts with current visitors and those who have yet to visit. Understanding seasonality helps refuge professionals better understand visitor use patterns and gauge supply and demand.

LOCAL VISITORS

Highlights of trip characteristics for local visitors to this wildlife refuge (70%) include:

- For locals, this refuge was the primary reason for their trip (84%) (Fig. 6).
- Local visitors traveled an average of 41 minutes to arrive at this refuge (Fig. 7).

NONLOCAL VISITORS

Highlights of trip characteristics for nonlocal visitors to this wildlife refuge (30%) include:

- For nonlocals, this refuge was the primary reason for their trip (53%) (Fig. 6).
- Nonlocal visitors traveled an average of 12 hours to arrive at this refuge.
- Of the 86% of visitors who lived in the U.S., nonlocal visitors were most often from Colorado (22%).
- 14% of respondents were international visitors.

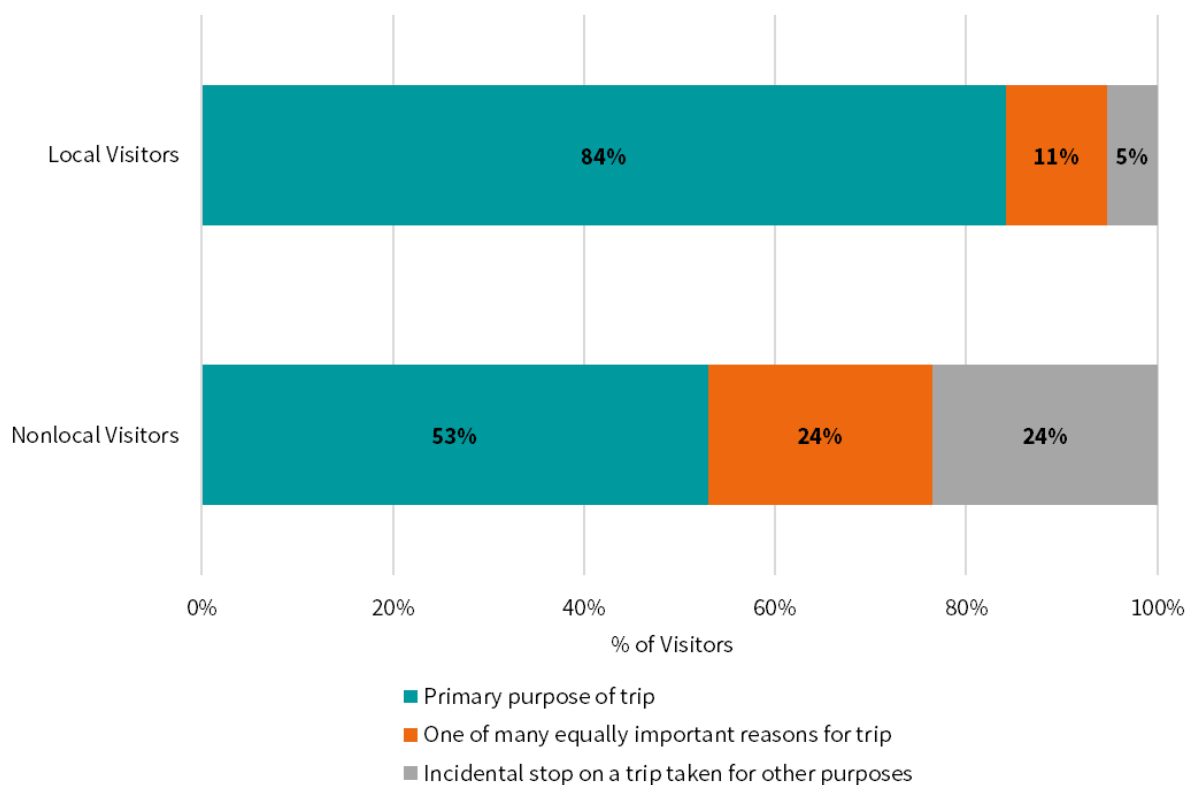


Fig. 6: Purpose of most recent refuge visit for local (living ≤ 50 miles from the refuge) and nonlocal (living > 50 miles from the refuge) visitors.

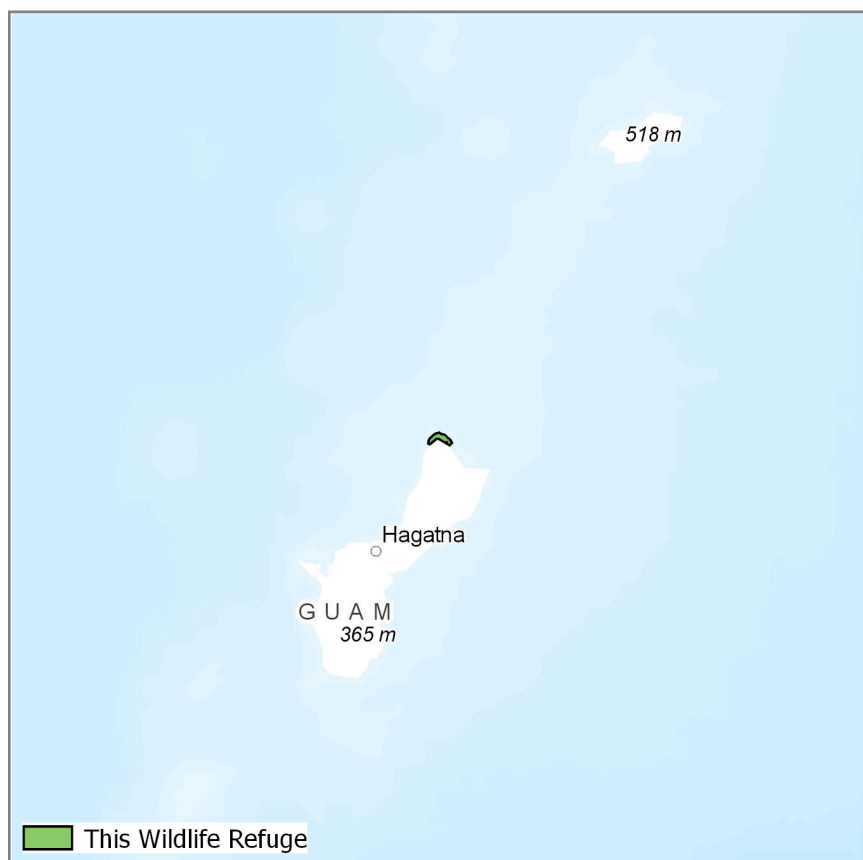


Fig. 7: Map showing residence of local visitors to this refuge. Darker shading represents relatively higher visitation from that area.



A stretch of beach along the coast of Guam National Wildlife Refuge. Photo credit: U.S. Fish & Wildlife Service.

OTHER TRIP CHARACTERISTICS

Other trip characteristics include:

- To get to this wildlife refuge, visitors primarily traveled by private vehicle without a trailer (96%) and by foot (7%) (Fig. 8).
- Once on the refuge, visitors primarily traveled by private vehicle without a trailer (39%) and by foot (23%) (Fig. 8).
- Visits occurred during winter (19%), spring (33%), summer (59%), and fall (63%).
- 100% of visitors made a single-day trip to this refuge, spending an average of 4 hours.

During the 12 months prior to completing the survey, visitors also made multiple trips to this wildlife refuge, other wildlife refuges, and other public lands:

- 52% were repeat visitors to this wildlife refuge, visiting an average of 5 times.
- 26% visited other national wildlife refuges, averaging 1 visit.
- 63% visited other public lands, averaging 3 visits.

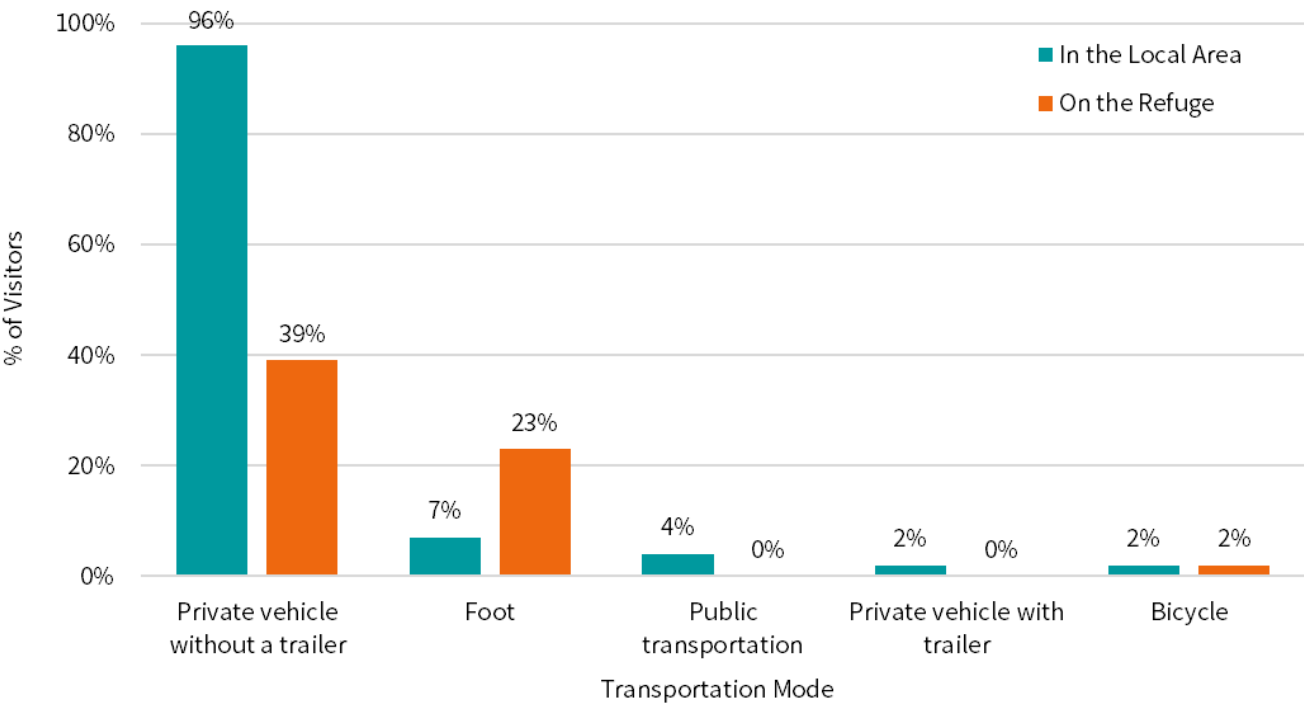


Fig. 8: Modes of transportation used by visitors to get from the local area to this refuge and within the boundaries of this refuge.

Information Sources Used for Trip Planning

Knowing more about which information sources visitors use (or do not use) to plan their trips can improve communication strategies and facilitate positive experiences on refuges. The Refuge System's success in reaching new and diverse audiences as well as current visitors also depends on its ability to keep pace with communication trends (U.S. Fish & Wildlife Service, 2016a).

Visitors to this wildlife refuge found a variety of in-person, print/internet, and refuge-specific information sources helpful when planning their trips. Details for information sources identified as very or extremely helpful include:

- In-person sources such as word of mouth (74%) and tourist information/welcome center (73%) (Fig. 9).
- Print and internet sources such as a web-based map (77%) (Fig. 10).
- Refuge-specific information sources such as employees/volunteers (71%) (Fig. 11).

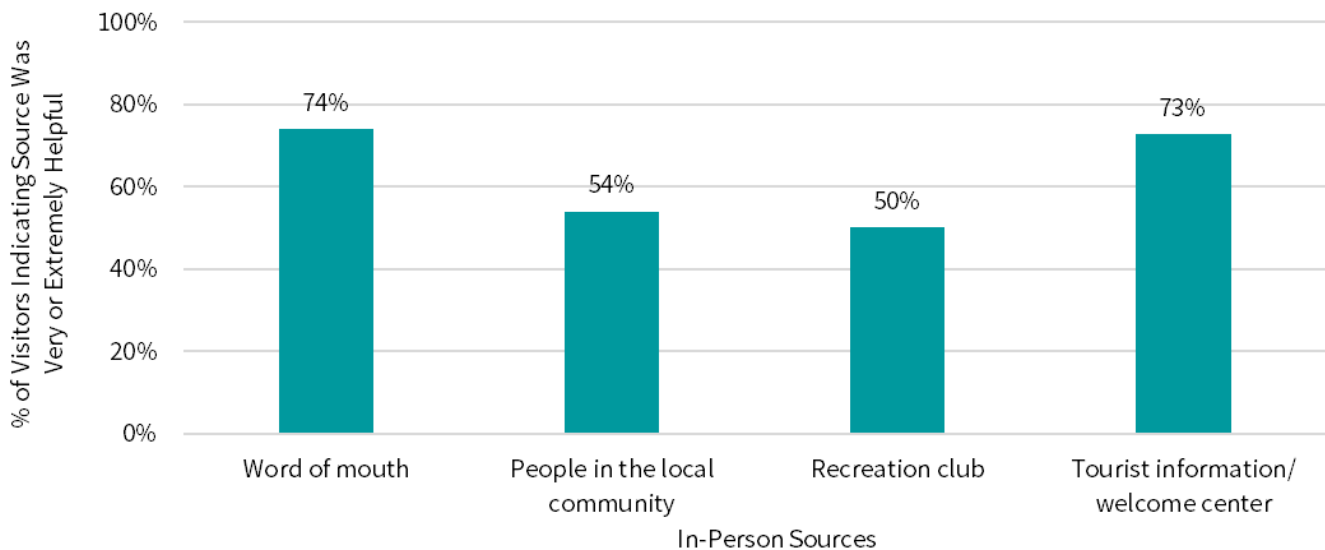


Fig. 9: Percent of visitors who found in-person information sources very or extremely helpful in planning their trip.

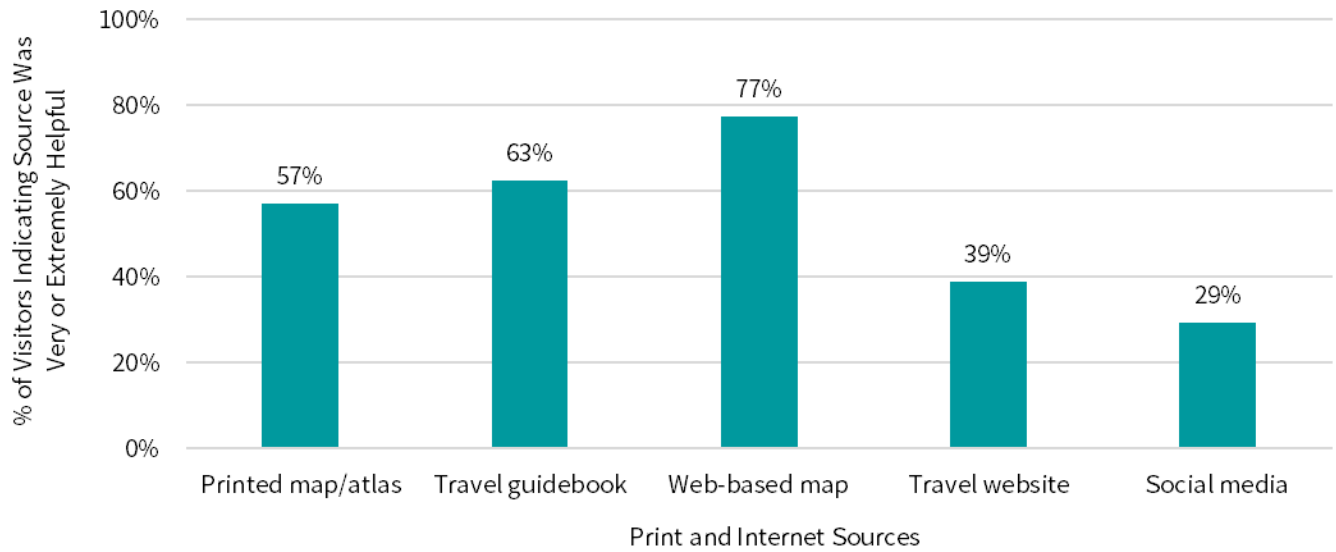


Fig. 10: Percent of visitors who found print and internet information sources very or extremely helpful in planning their trip.

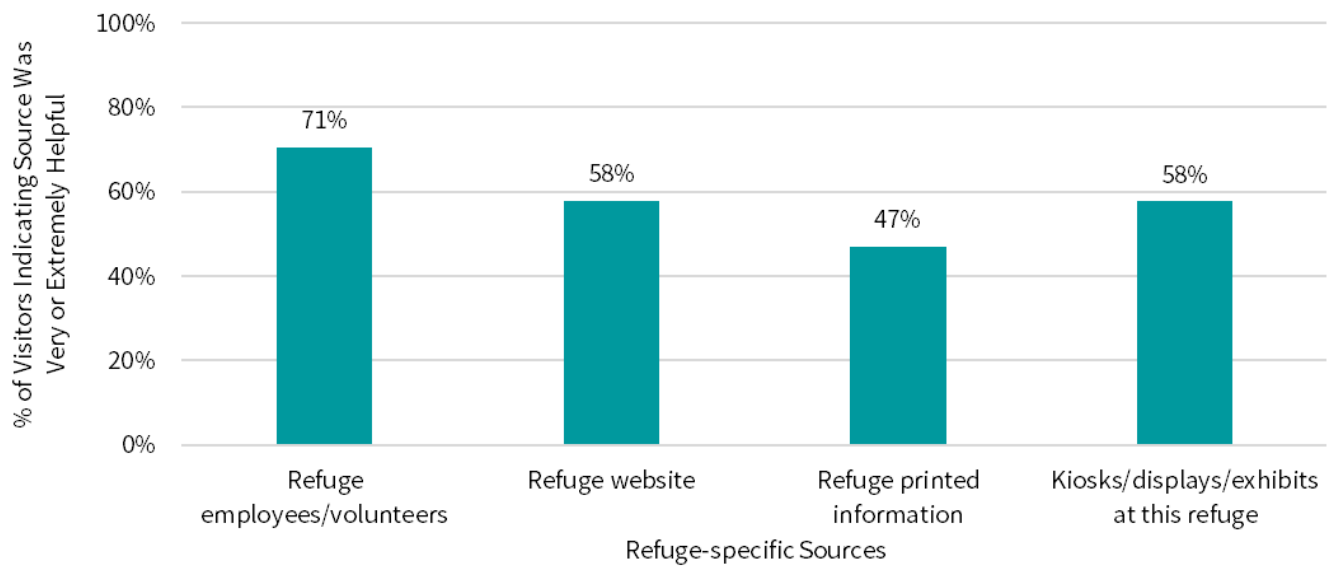


Fig. 11: Percent of visitors who found refuge-specific information sources very or extremely helpful in planning their trip.

Use of Social Media

Around 70% of Americans use social media to connect with one another, engage with news content, share information, and entertain themselves (Smith & Anderson, 2018). Social media posts can act as a virtual “word of mouth” method for increasing awareness about the refuge to the visitor’s network and beyond. A social media presence can further generate awareness of the refuge and its resources among audiences that do not use or did not otherwise learn about the refuge through traditional advertising outlets.

Social media was used by 63% of visitors to share their experience on this refuge with others. Visitors used the following specific social media platforms to share about their refuge experiences (Fig. 12):

- Facebook (46%),
- Instagram (33%), and
- Snapchat (6%).

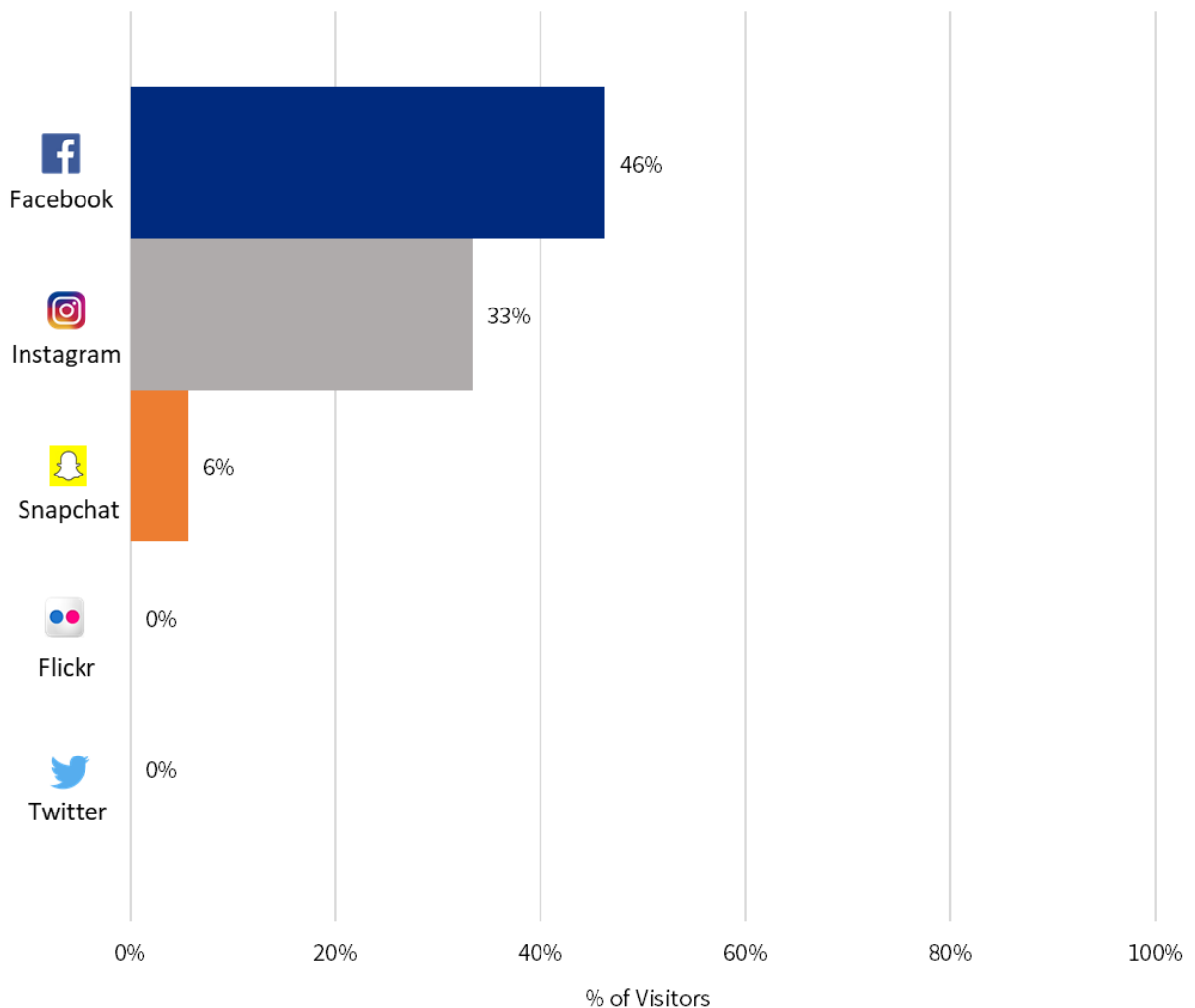


Fig. 12: Percent of visitors who used various social media platforms to share their experience on this refuge with others.

Participation in Recreational Activities

Some research shows that rates of participation in outdoor recreation activities have increased (Outdoor Foundation, 2018), while other studies have indicated declines in participation in heritage activities such as hunting (U.S. Fish & Wildlife Service, 2016a). In light of these trends it is important to understand recreation participation on refuges to create quality visitor experiences and foster personal and emotional connections to the refuge and its resources (U.S. Fish & Wildlife Service, 2011). Understanding what people do while visiting refuges can also aid in developing programs that facilitate meaningful interactions between visitors and refuge professionals. Finally, such information can help to ensure impacts to resources and conflicts among visitor groups are minimized.

Participation in recreational activities at this wildlife refuge can be characterized as follows:

- The top three activities in which visitors participated during the past 12 months were hiking (64%), picnicking (52%), and wildlife observation (50%) (Fig. 13).
- The top three activities noted as their primary activity on the day visitors were contacted to participate in the survey were picnicking (26%), hiking (22%), and beach activity (12%) (Fig. 13).
- Approximately 18% of visitors went to the visitor center, and they most often viewed the exhibits (90%), asked for information (50%), viewed a list of bird/wildlife sightings (30%), and used the facilities (30%) (Fig. 14).



Photo credit: U.S. Fish & Wildlife Service.

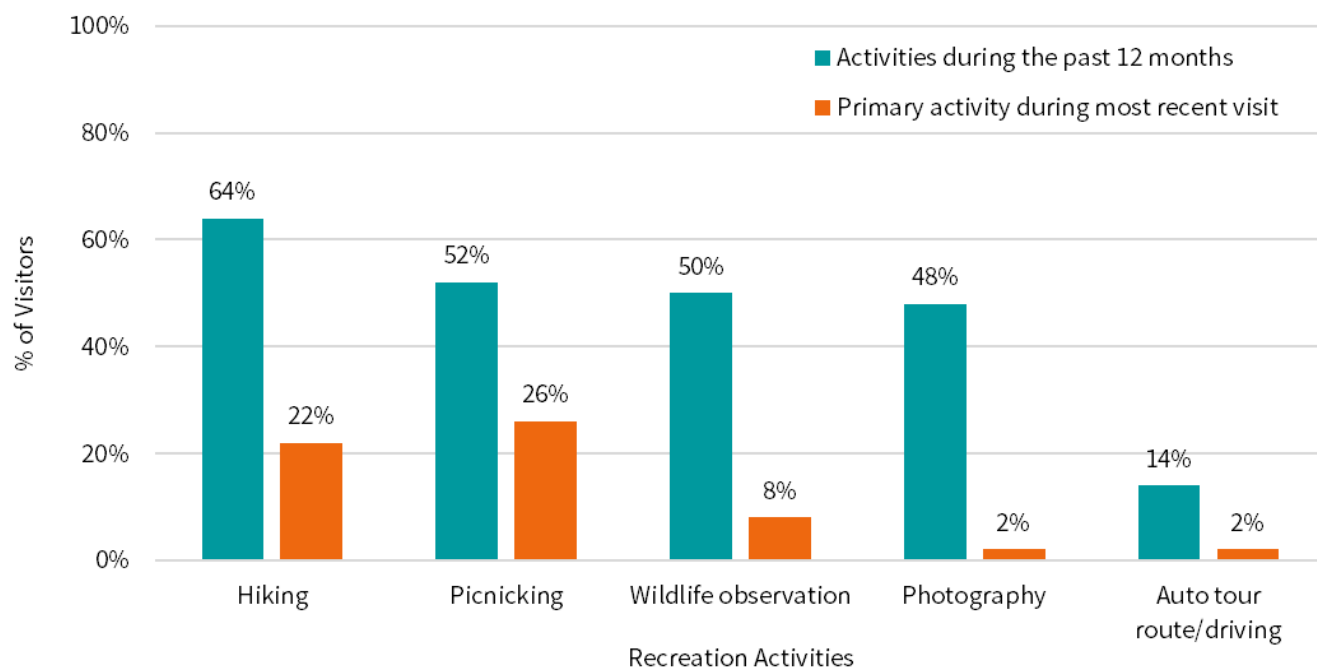


Fig. 13: Recreational activities visitors participated in during the past 12 months and their primary activity during their most recent visit to this refuge.

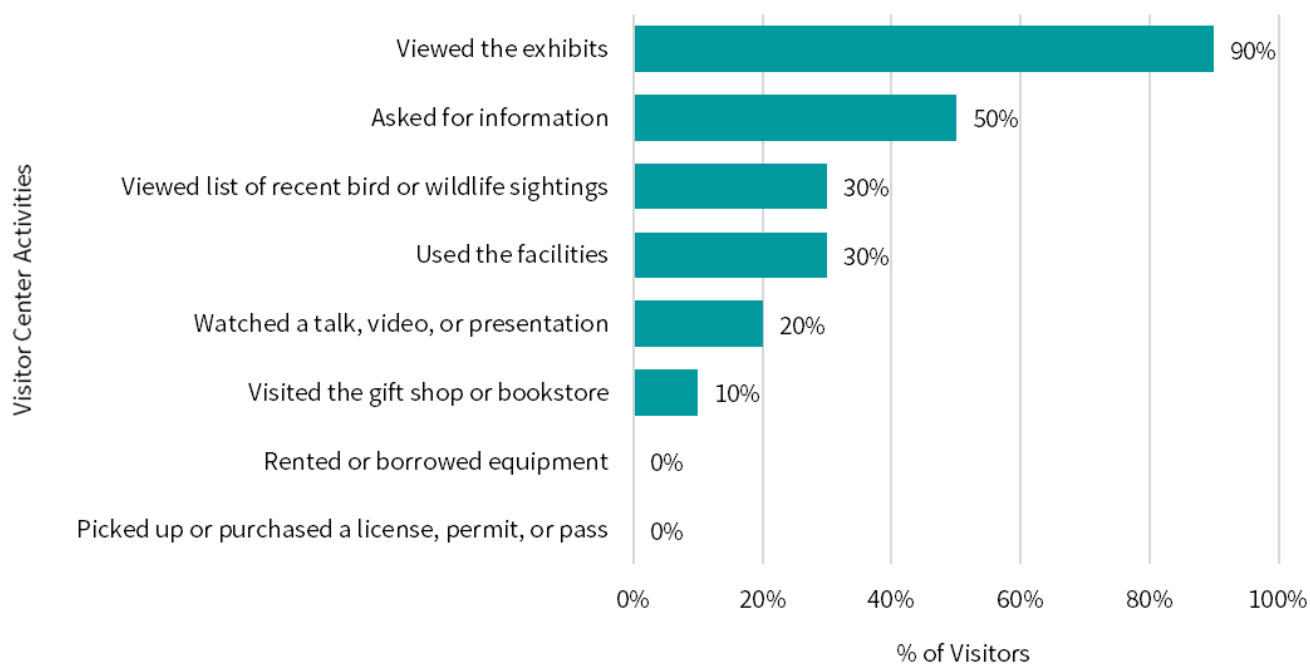


Fig. 14: Reasons visitors used the visitor center during their most recent visit to this refuge.

Comfort in Nature/Feeling Safe & Welcome

While many people are repeat visitors to refuges, each year thousands of people experience these lands and waters for the first time. One barrier for some visitors, particularly those living in urban areas or with little past exposure to nature-based recreation, is the perception that being in nature is dangerous or unsafe (U.S. Fish & Wildlife Service, 2014). There may also be negative stigmas associated with outdoor spaces that arise from social contexts (for example, people associating being outdoors with poverty or ‘dirty’ contexts) and historical contexts in which being ‘in the woods’ was dangerous and unsafe (Sexton, Ross-Winslow, Pradines, & Dietsch, 2015).

While ensuring that visitors feel safe and welcome is a foundational standard of the Urban Wildlife Conservation Program (<https://www.fws.gov/urban>), these basic needs apply across the Refuge System.

Before visitors can appreciate the wonders of nature, their basic need for safety and belonging must be met. Thus, an understanding of how visitors perceive safety, belonging, accessibility, and comfort in nature is critical to ensure real threats to safety are minimized, and that individuals from all demographic groups feel as welcome and comfortable in nature as possible.

Visitors to this wildlife refuge shared the following about safety, belonging, and their comfort while being in nature:

- 78% of visitors felt welcome during their refuge visit (Fig. 15).
- 88% of visitors felt safe during their refuge visit (Fig. 15).
- 94% of visitors reported that they feel comfortable being in nature, but 18% do not like being in nature alone (Fig. 16).

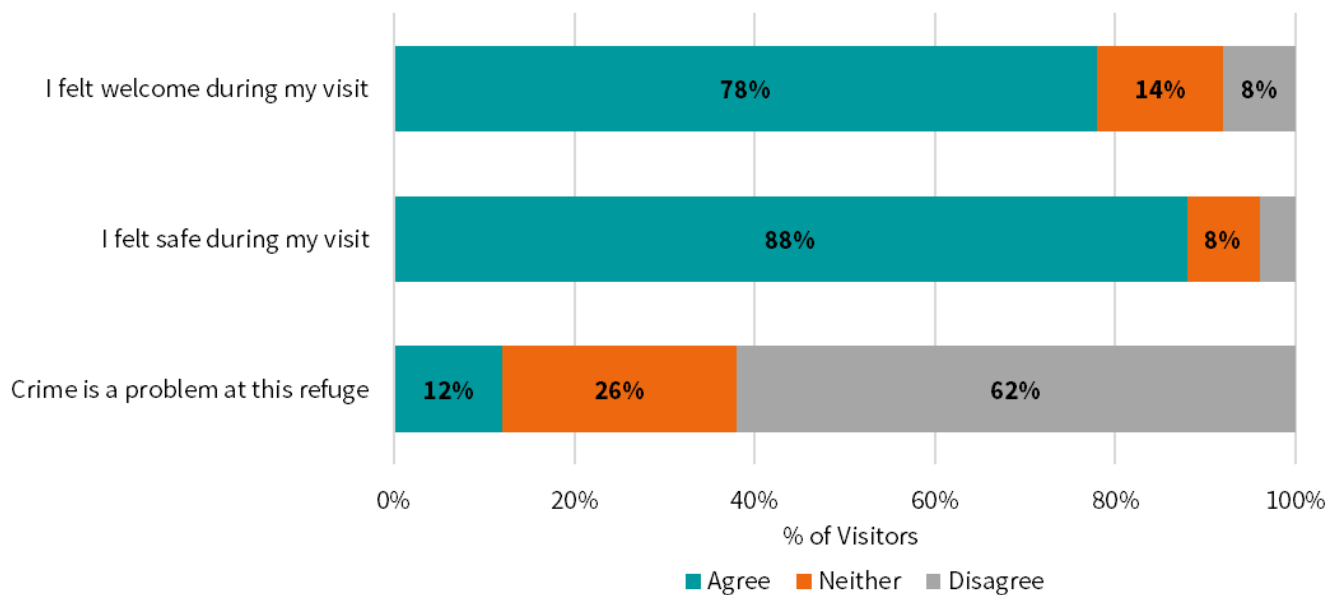


Fig. 15: Visitors' perceptions of safety and feeling welcome at this refuge during their visit.

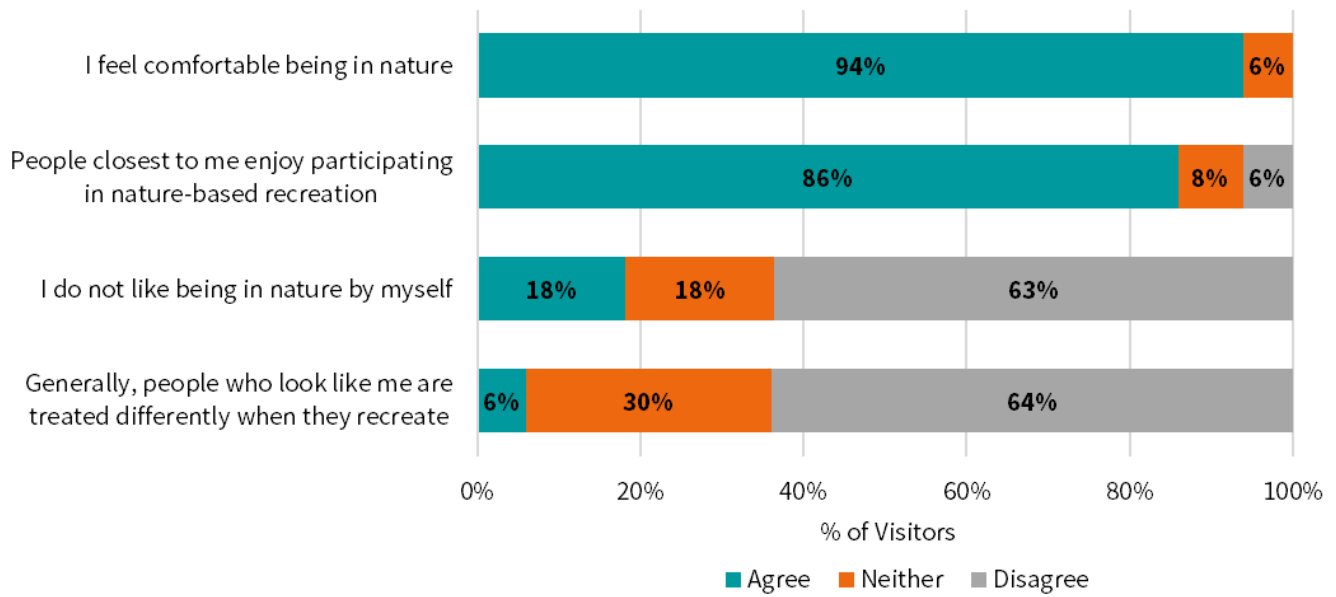


Fig. 16: Visitors' comfort with being in nature.



Photo credit: U.S. Fish & Wildlife Service.

Satisfaction with Refuge Experiences

OVERALL SATISFACTION

Refuge professionals strive to maintain a high level of customer satisfaction by operating visitor centers; designing, installing, and maintaining accessible trails; constructing viewing blinds; and much more to facilitate quality recreational experiences. A solid understanding of visitors' perceptions of their experiences provides a framework for monitoring and responding to trends across time. Overall satisfaction with this wildlife refuge is summarized as follows:

- 72% of visitors were very or extremely satisfied with the overall experience at this wildlife refuge (Fig. 17).
- 72% of visitors were very or extremely satisfied with this wildlife refuge's job of conserving fish, wildlife, and their habitats (Fig. 17).

CUSTOMER SERVICE

Refuge professionals regularly interact with visitors and maintain facilities to ensure high quality experiences. From greeting visitors, to keeping bathrooms clean, to clearly stating regulations, providing quality customer service is important to ensuring overall satisfaction.

Satisfaction with customer service was highest among visitors for the following (Fig. 18):

- courteous and welcoming employees/volunteers (65%),
- availability of employees/volunteers (61%), and
- visitor center (61%).

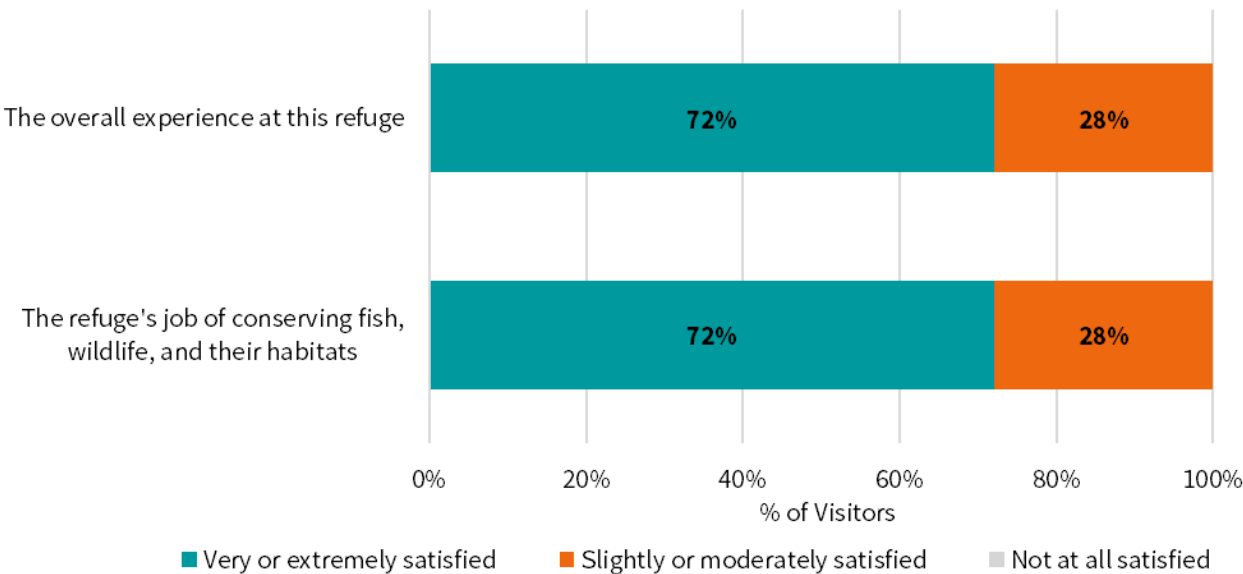


Fig. 17: Visitors' satisfaction with their experience at this refuge and with this refuge's job of conserving fish, wildlife, and habitats.

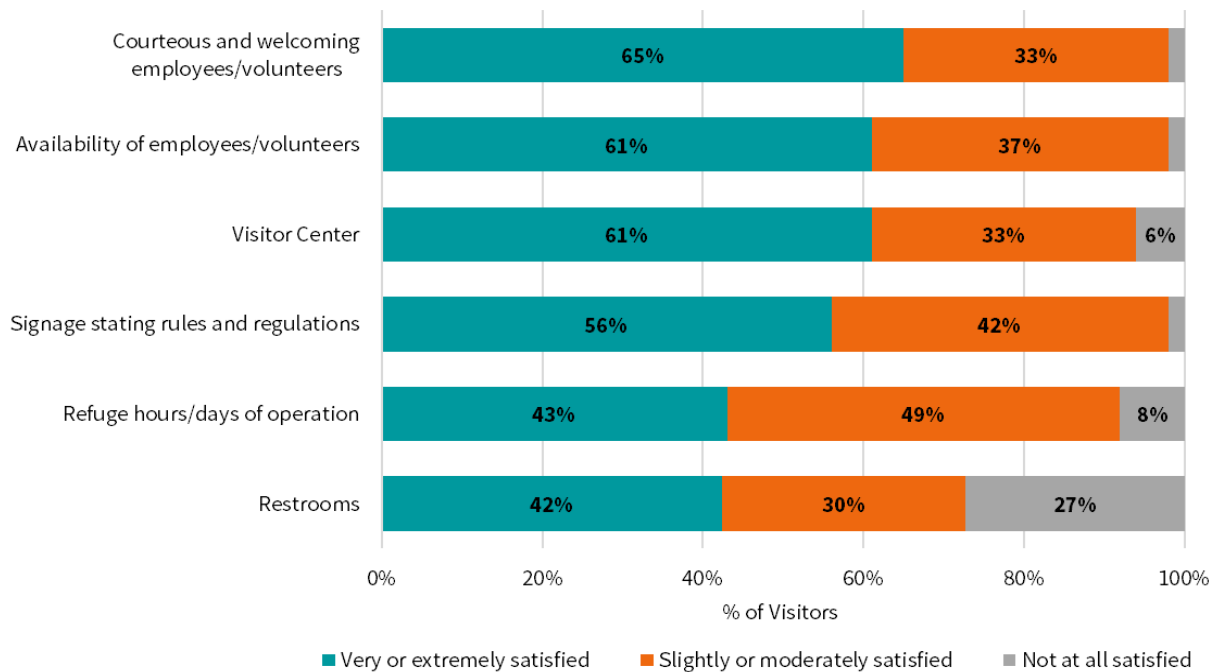


Fig. 18: Visitors’ satisfaction with customer service and amenities at this refuge.

RECREATIONAL OPPORTUNITIES

Outdoor recreation on wildlife refuges is a fundamental part of a visit. As American’s values toward wildlife and their relationship with nature continue to shift (Kellert et al., 2017; Manfredo et al., 2018), public desires for recreational experiences on public lands are also likely to shift. In addition, researchers and land management professionals recognize the need to connect the next generation to nature and wildlife (Charles & Louv, 2009; Larson et al., 2011). A solid understanding of visitors’ perceptions of their experiences provides a

framework for monitoring and responding to these recreation trends across time.

Satisfaction with recreation opportunities among visitors who had participated in the activity during the last 12 months was highest for the following (Fig. 19):

- photography (75%),
- wildlife observation (67%), and
- trail hiking (59%).

“Ritidian Point is one of my most favorite beaches on [Guam]. It’s well preserved and not crowded. I would go here every single day if I could. As soon as I hit the entrance from the main gate...all [the] weight on my shoulders disappears.” - Visitor to Guam National Wildlife Refuge

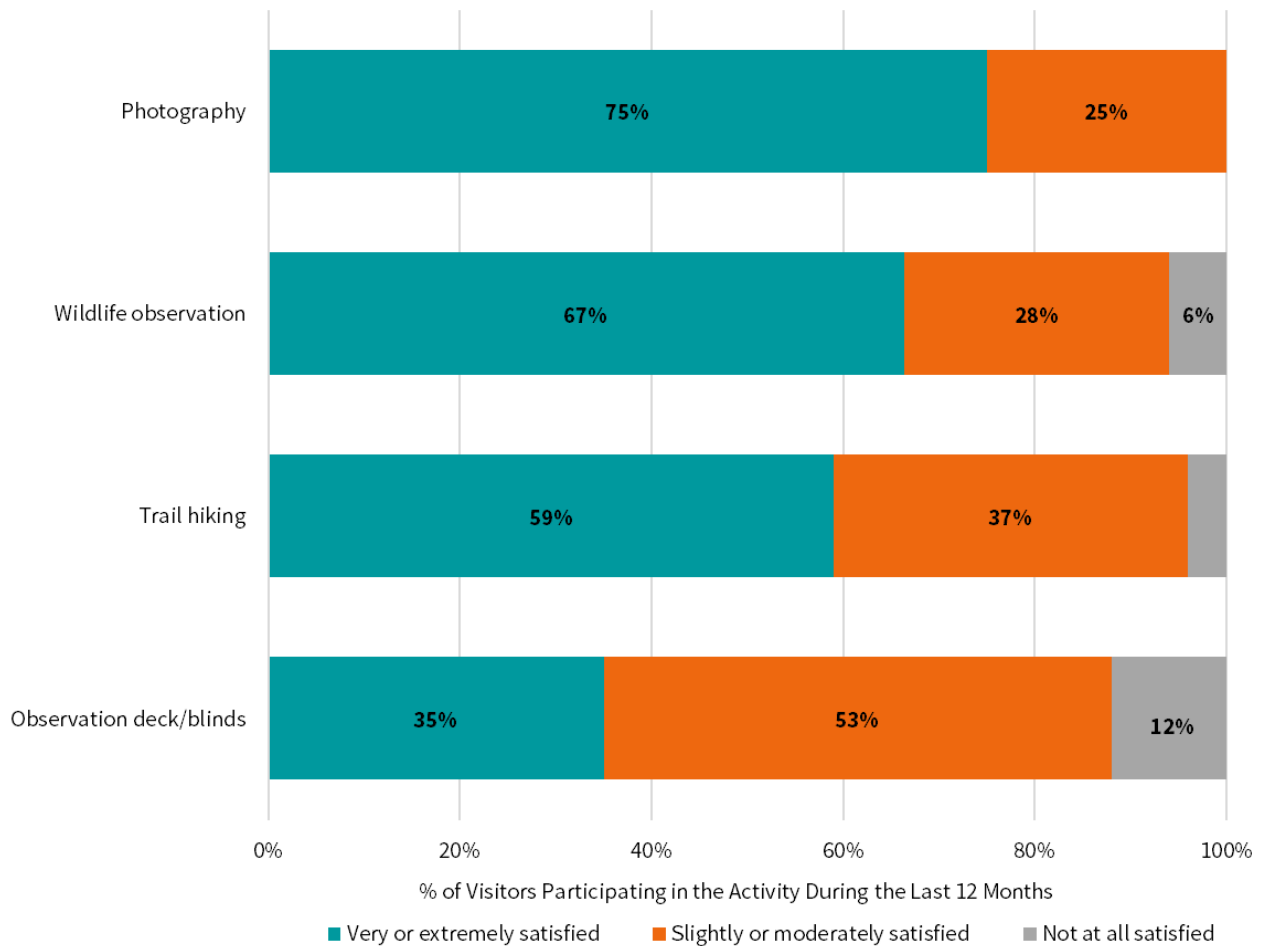


Fig. 19: Visitors' satisfaction with recreational opportunities at this refuge. Only visitors (10 or more) who participated in activities related to each opportunity at this refuge during the last 12 months were included.

TRANSPORTATION SAFETY & ACCESS

Transportation networks connect local communities to refuges and are critical to visitors' experiences there. Visitors access refuges by plane, car, train, boat, bike, and foot. The Service works to ensure that the roads, trails, and parking areas are welcoming and safe for visitors of all abilities. A goal of the Service's National Long-Range Transportation Plan is to enhance experiences on wildlife refuges and fish hatcheries through improvement to the transportation network (U.S. Fish & Wildlife Service, 2016b). How visitors perceive different transportation features can be used to prioritize access and transportation improvements.

Visitors were satisfied with transportation safety and access at this wildlife refuge as follows (Fig. 20):

- Getting to this wildlife refuge, visitors were satisfied with directional signs on highways (48%) and safety of refuge road entrances and exits (47%).
- Getting around this wildlife refuge, visitors were most satisfied with number of parking places (56%), directional signs on the refuge (46%), and number of places to pull over on refuge roads (45%).
- Accessing recreation on this wildlife refuge, visitors were most satisfied with condition of boat launches (56%) and directional signs on trails (53%).

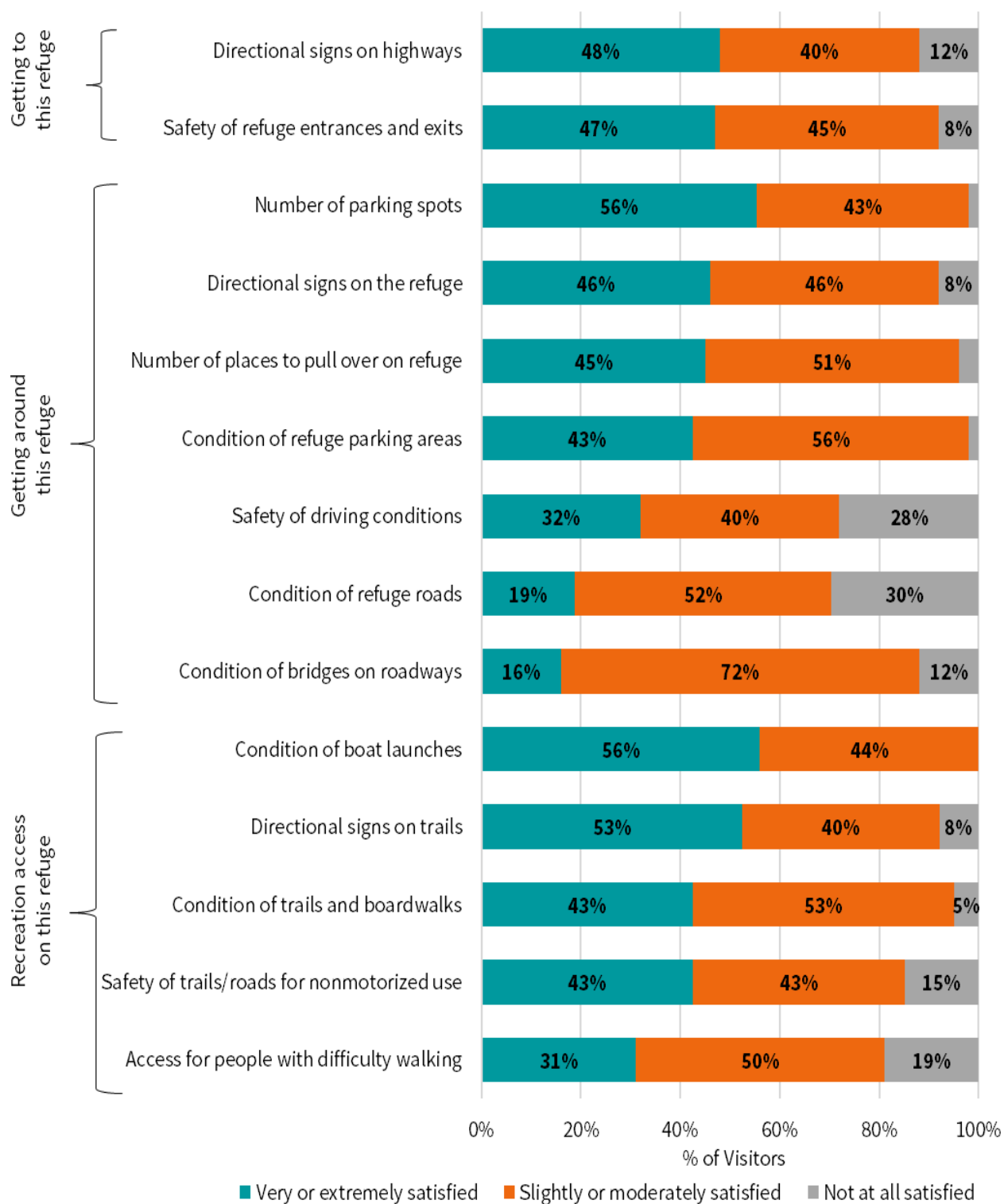


Fig. 20: Visitors' satisfaction with how the refuge is managing transportation-related features.

Economic Benefits to Local Communities & Visitors

The value of any commodity is comprised of two elements: 1) the amount paid and 2) the additional benefit derived above and beyond what is paid. The first element equates to direct expenditures. Visitors to wildlife refuges pay for a variety of things, including nearby lodging, gas, food, and other purchases from local businesses. This spending has a significant positive contribution to local economies. The *Banking on Nature* report (Caudill & Carver, 2017) highlights how nearly 54 million visits to wildlife refuges during 2017 generated \$3.2 billion of economic output in local communities and supported over 41,000 jobs. The report further indicates that recreational spending on wildlife refuges generated \$229 million in tax revenue at the local, county, and state levels.

Determining benefits derived above and beyond what is paid is commonly estimated by “willingness to pay” for an experience. Studies show people are often willing to pay more for a recreational experience than what they actually spent (Neher, Duffield, & Patterson, 2011; Rosenberger & Loomis, 2001). For example, a visitor may have spent \$500 on lodging, food, and gasoline to make the trip possible, while also indicating that they would be willing to pay an additional \$50 to visit this wildlife refuge if total trip costs were to increase.

Results for local visitors (those living ≤ 50 miles from this wildlife refuge; 70%) are as follows:

- On average, local visitors accounted for 7% of expenditures.
- Top trip expenditures by locals were for food/drink and transportation (Fig. 21).
- The average amount paid by locals to visit this wildlife refuge was \$40 per person per day (Fig. 22).
- Local visitors were personally willing to pay an additional \$33 per day on average to visit this wildlife refuge (Fig. 22).

Results for nonlocal visitors (those living >50 miles from this wildlife refuge; 30%) are as follows:

- On average, nonlocals accounted for 93% of expenditures.
- Top trip expenditures by nonlocals were for lodging and transportation (Fig. 21).
- The average amount paid by nonlocals to visit this wildlife refuge was \$191 per person per day (Fig. 22).
- Nonlocal visitors were personally willing to pay an additional \$134 per day on average to visit this wildlife refuge (Fig. 22).
- Nonlocal visitors spent an average of 6 days in the local community during this visit.





Fig. 21: Individual daily expenditures in the local community for local, nonlocal, and all visitors. Expenditures were reported by respondents on a per group basis; the total expenditures were divided by the number of people in the group who shared trip expenditures and the number of days spent in the local community. The number of people sharing trip expenditures was often smaller than the total group size.

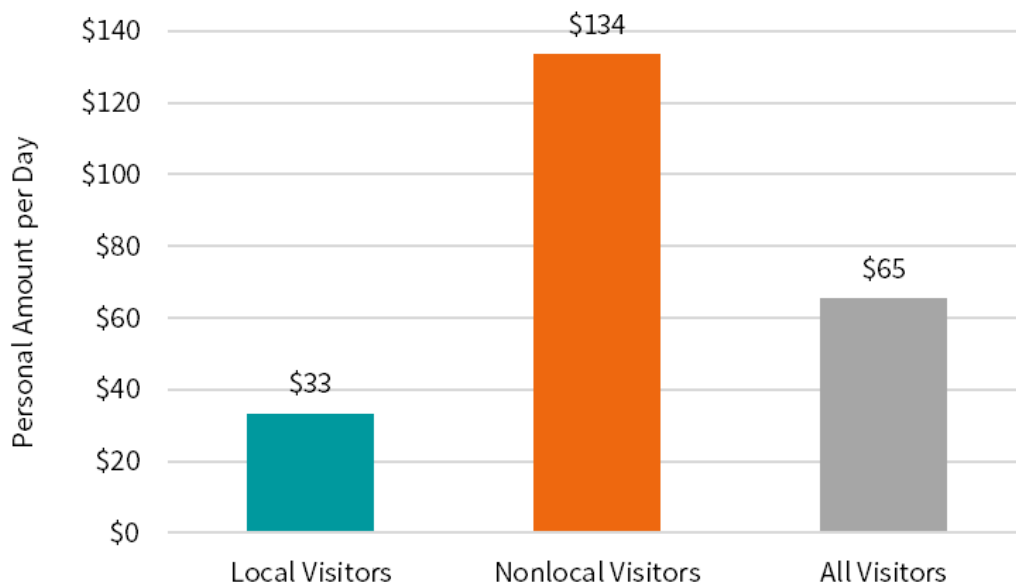


Fig. 22: Total personal willingness to pay per day above and beyond most recent trip expenses if costs were to increase for local, nonlocal, and all visitors. Due to the fixed-response question format, estimates of willingness to pay may underestimate the amount visitors would actually pay. Responses were divided by the number of days spent at the refuge.

Encouraging Return Visits & Future Recreation Participation

Public land managers strive to maximize benefits for visitors while achieving and maintaining desired resource conditions. This complex task requires that managers accurately estimate visitor numbers, as well as where visitors go, what they do, their impacts on resources, how they perceive their experiences, and their desires for future visits. Gaining a sense of what would encourage visitors to return and how management activities affect their likelihood of returning can lead to improved visitor use and resource management (U.S. Fish & Wildlife Service, 2014).

PROGRAMS AND OTHER OFFERINGS

Programming and other offerings that are compatible with the purpose of a refuge and the Refuge System mission can encourage people to continue visiting the refuge. Additionally, changes to regulations and access for improving resource availability may increase or decrease future participation, or have little effect at all.

In the future, changes in programming, offerings, or regulations would have an effect on visitation to this wildlife refuge as follows:

- Programs most likely to encourage visitors to return to this wildlife refuge included those focused on highlighting unique local culture (72%), skill-building (54%), and engaging families and multiple generations (51%) (Fig. 23).
- The top two factors likely to increase visitors' future participation in their primary recreation activity were more infrastructure (58%) and recreation equipment available for rent (34%) (Fig. 24).
- The top two factors likely to decrease visitors' future participation in their primary recreation activity were less regulations on hunting (29%) and more people participating in their primary activity (20%) (Fig. 24).

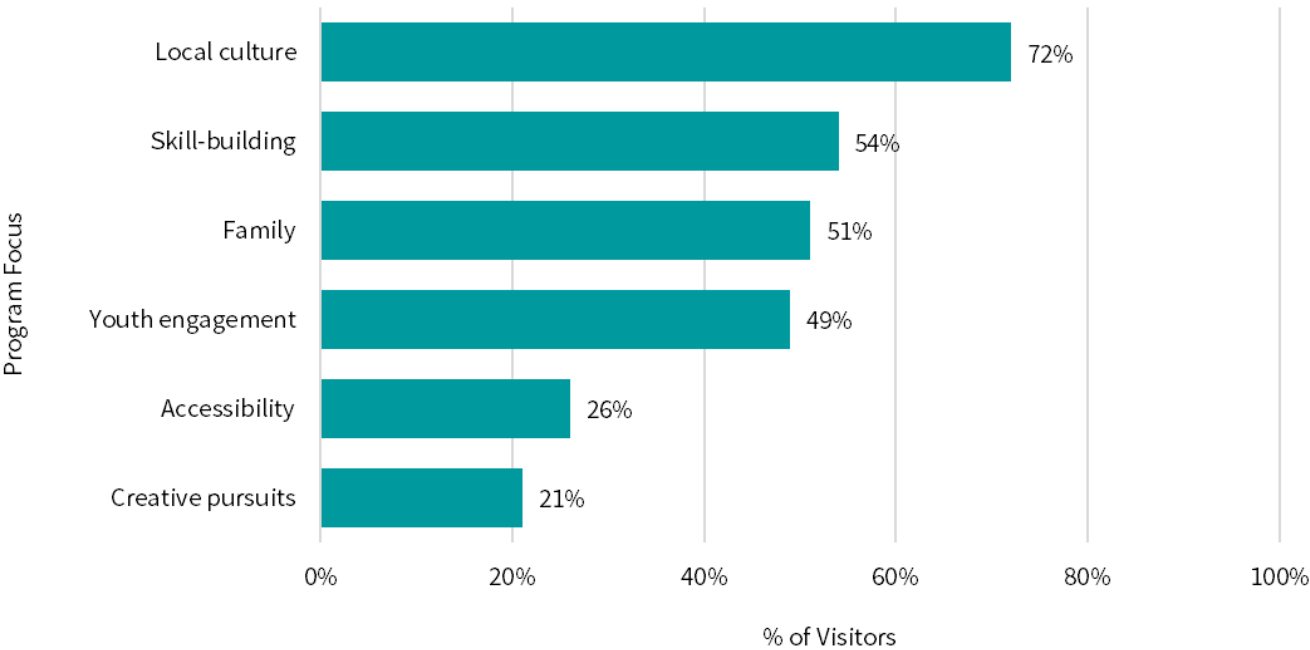


Fig. 23: Types of programs that would encourage visitors to return to this refuge.

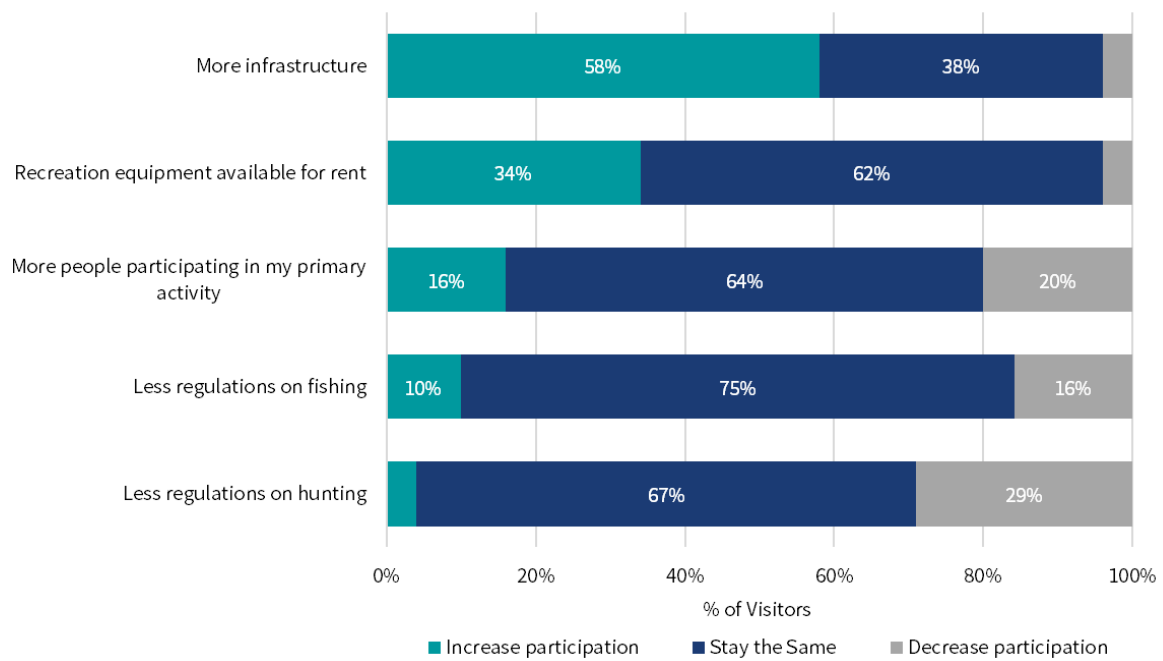


Fig. 24: Changes in visitors' participation in their primary activity if the listed recreation factors were to change.

ALTERNATIVE TRANSPORTATION

Understanding visitor demand for alternative transportation options is a goal of the Service's National Long-Range Transportation Plan (U.S. Fish & Wildlife Service, 2016b). Alternative transportation options can be valuable in realizing refuge goals to conserve natural resources, reduce visitors' carbon footprint (Volpe Center, 2010), and improve visitor experiences. Even though demand may be relatively small, any use of alternative transportation that is feasible at a wildlife refuge can help to meet goals.

The top future alternative transportation options supported by visitors at this wildlife refuge included (Fig. 25):

- bus/tram that provides a guided tour (30%),
- refuge-sponsored shuttle with a stop in the local community for picking up people at set times (19%), and
- pedestrian paths (18%).

ECOSYSTEM SERVICES

Natural processes associated with wildlife refuges can provide benefits to people, including provisioning services such as food

and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and educational benefits; and supporting services such as nutrient cycling (Millennium Ecosystem Assessment, 2005). Understanding how changes in natural resources and related processes may impact future visitation and participation in certain recreation activities can improve resource and visitor management, as well as inform communication efforts with stakeholders and policy-makers (Patton, Bergstrom, Covich, & Moore, 2012).

In the future, changes to resources would affect visitation to this refuge as follows (Fig. 26):

- The top resource changes likely to increase visitors' future participation in their primary recreation activity were a greater diversity of species (46%), an improvement in the quality of wetlands (32%), and an improvement in the quality of wildlife habitat other than wetlands (32%).
- The top resource changes likely to decrease visitors' future participation in their primary recreation activity were more acreage open to hunting and fishing (41%) and less water available for recreation (36%).

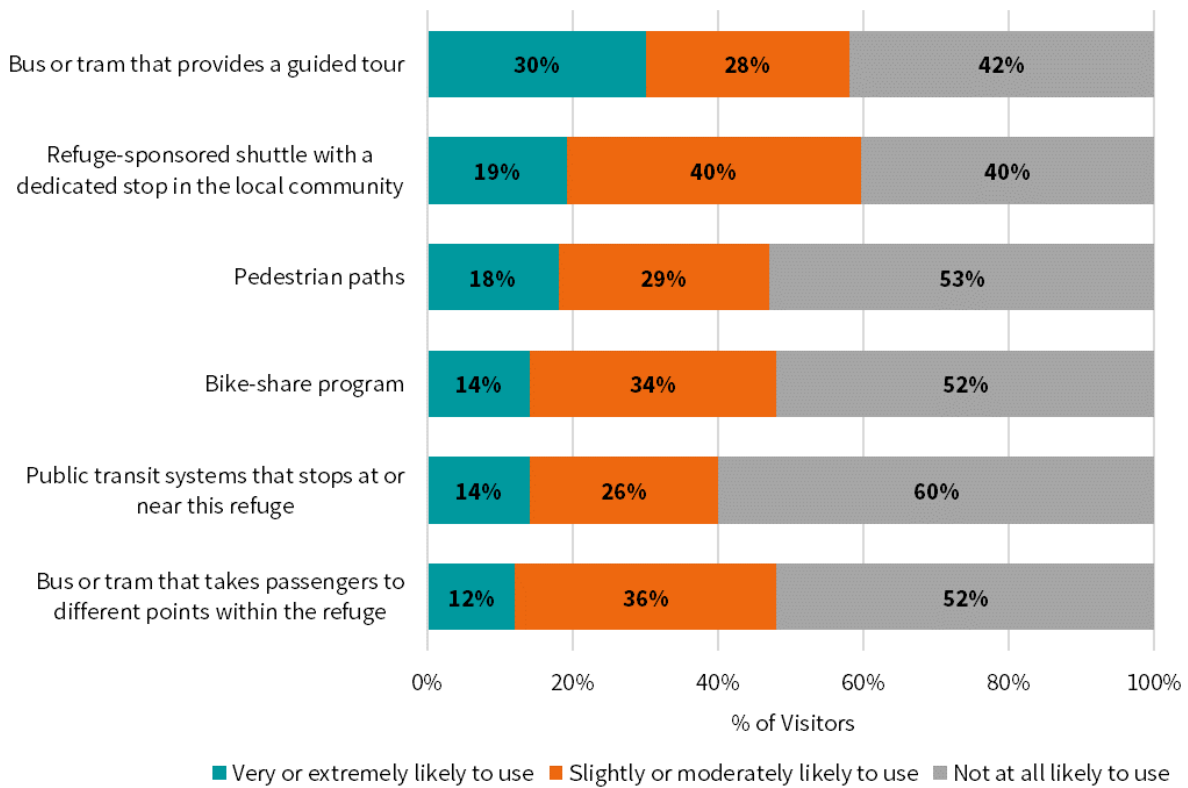


Fig. 25: Visitors' likelihood of using alternative transportation options if offered at this refuge.

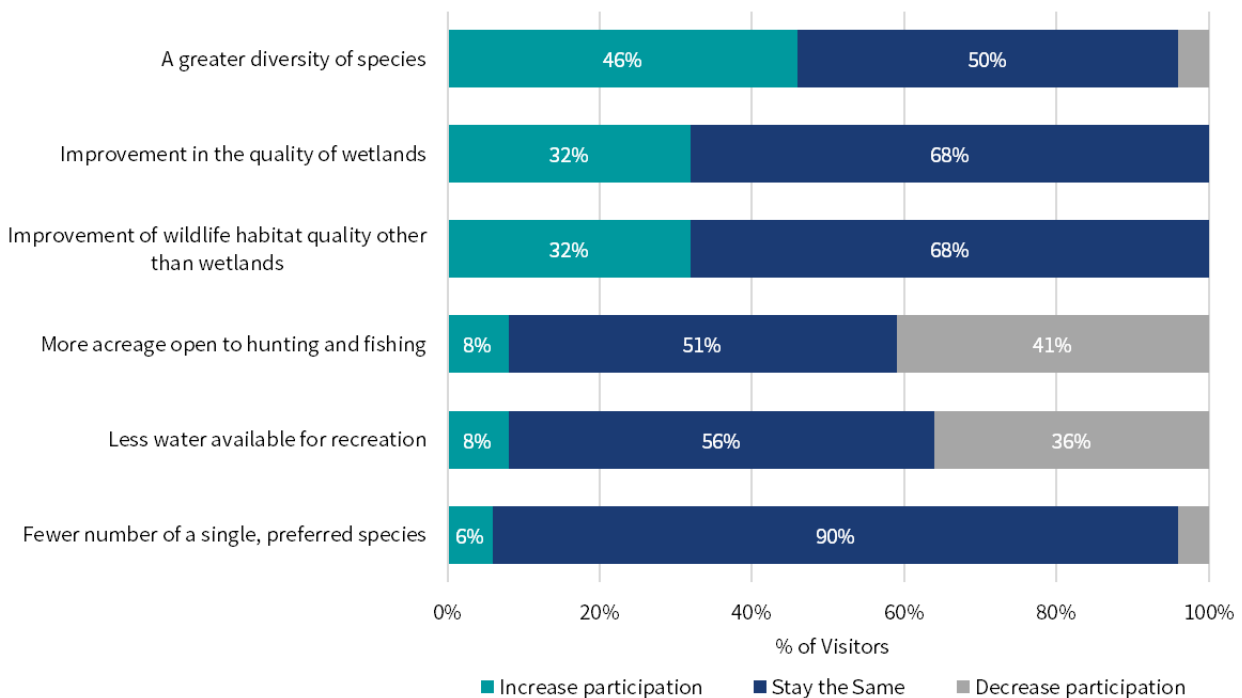


Fig. 26: Changes in visitors' participation in their primary activity if the listed resources were to change.

Conclusion

These individual refuge results provide a summary of trip characteristics and experiences of a sample of visitors to Guam National Wildlife Refuge during 2018. They are intended to inform refuge planning, including the management of natural resources, recreation, and the design and delivery of programs for visitors. These results offer a baseline that can be used to monitor and evaluate efforts over time. Refuge professionals who understand

visitor demographics, trip characteristics, and desires for future conditions can make informed decisions for proactive visitor management and resource protection. Integrating this social science with biophysical science ensures that management decisions are consistent with the Refuge System mission while fostering a continued public interest in and connection with these special places we call national wildlife refuges.



Photo credit: U.S. Fish & Wildlife Service.

References

- Caudill, J., & Carver, E. (2019). Banking on Nature 2017: The Economic Contributions of National Wildlife Refuge Recreational Visitation to Local Communities. Washington, DC: U.S. Department of the Interior, U.S. Fish & Wildlife Service. Retrieved from <https://www.fws.gov/uploadedFiles/Banking-on-Nature-Report.pdf>.
- Charles, C., & Louv, R. (2009). Children's Nature Deficit: What We Know—And Don't Know. Minneapolis, MN: Children and Nature Network. Retrieved from <https://www.gufsee.org/uploads/6/5/0/5/65052893/cnnevidenceofthedeficit.pdf>.
- Kellert, S. R., Case, D. J., Escher, D., Witter, D. J., Mikels-Carrasco, J., & Seng, P. T. (2017). The Nature of Americans: Disconnection and Recommendations for Reconnection—National Report. Mishawaka, IN: DJ Case & Associates.
- Larson, L. R., Green, G. T., & Cordell, H. K. (2011). Children's Time Outdoors: Results and Implications of The National Kids Survey. Journal of Park and Recreation Administration, 29, 1-20.
- Manfredo, M. J., Sullivan, L., Don Carlos, A. W., Dietsch, A. M., Teel, T. L., Bright, A. D., & Bruskotter, J. (2018). America's Wildlife Values: The Social Context of Wildlife Management in the U.S. National report from the research project entitled "America's Wildlife Values". Fort Collins, CO: Colorado State University, Department of Human Dimensions of Natural Resources.
- Millennium Ecosystem Assessment. (2005). Ecosystems and Human Well-Being: A Framework for Assessment. Washington, DC: Island Press. Retrieved from <https://www.millenniumassessment.org>.
- Neher, C., Duffield, J., & Patterson, D. (2013). Valuation of National Park system visitation: the efficient use of count data models, meta-analysis, and secondary visitor survey data. Environmental Management 52(3), 683-698.
- Outdoor Foundation. (2018). 2018 Outdoor Participation Report. Washington, DC: The Outdoor Foundation. Retrieved from <https://outdoorindustry.org/resource/2018-outdoor-participation-report/>.
- Patton, D., Bergstrom, J., Covich, A., & Moore, R. (2012). National Wildlife Refuge Wetland Ecosystem Service Valuation Model, Phase 1 Report. Washington, DC: U.S. Department of the Interior, U.S. Fish & Wildlife Service. Retrieved from https://www.fws.gov/economics/Discussion%20Papers/USFWS_Ecosystem%20Services_Phase%20I%20Report_04-25-2012.pdf.
- Rosenberger, R. S., & Loomis, J. B. (2001). Benefit transfer of outdoor recreation use values: A technical document supporting the Forest Service Strategic Plan (2000 revision). Gen. Tech. Rep. RMRS-GTR-72. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Retrieved from: <https://www.fs.usda.gov/treearch/pubs/4578>.
- Sexton, N. R., Ross-Winslow, D., Pradines, M., & Dietsch, A. M. (2015). The Urban Wildlife Conservation Program: Building a Broader Conservation Community. Cities and the Environment (CATE),8(1), Article 3. Retrieved from <https://digitalcommons.lmu.edu/cate/vol8/iss1/3>.
- Smith, A., & Anderson, M. (2018). Social Media Use in 2018. Washington, DC: Pew Research Center. Retrieved from http://assets.pewresearch.org/wp-content/uploads/sites/14/2018/03/01105133/PI_2018.03.01_Social-Media_FINAL.pdf.
- U.S. Fish & Wildlife Service. (2011). Conserving the Future: Wildlife Refuges and the Next Generation. Washington, DC: U.S. Department of the Interior, U.S. Fish & Wildlife Service, National Wildlife Refuge System. Retrieved from <https://www.fws.gov/refuges/pdfs/FinalDocumentConservingTheFuture.pdf>.
- U.S. Fish & Wildlife Service. (2014). Standards of Excellence. Retrieved from <https://www.fws.gov/urban/soe.php>.
- U.S. Fish & Wildlife Service. (2016a). National Wildlife Refuge System Communications Strategy. Retrieved from <https://www.fws.gov/refuges/vision/pdfs/NWRSCommunicationsStrategy.pdf>.
- U.S. Fish & Wildlife Service. (2016b). Plan 2035: The National Long Range Transportation Plan - Moving People, Conserving Wildlife. Retrieved from <https://ecos.fws.gov/ServCat/DownloadFile/118522?Reference=76318>.
- Volpe Center. (2010). Transit and Trail Connections-Assessment of Visitor Access to National Wildlife Refuges. Washington, DC: U.S. Department of Transportation, Volpe National Transportation Systems Center; U.S. Fish & Wildlife Service.

Appendix A: Survey Methodology

The National Wildlife Refuge Visitor Survey (NVS) team consisted of staff from The Ohio State University (OSU), U.S. Fish & Wildlife Service (Service), and American Conservation Experience (ACE) who collectively developed the following NVS methodology. Staff from OSU and the Service designed the survey instrument with multiple reviewers within the Refuge System providing feedback about content and wording. The logistical coordinator and interns from ACE conducted sampling on refuges. OSU staff coordinated survey mailings, analyzed data, and in cooperation with Service staff, designed the report template and created each refuge report.

SAMPLING SCHEDULE

Interns (survey recruiters) sampled on each participating refuge for two 14-day sampling periods between March 2018 and February 2019. Refuge staff identified the sampling periods and locations that best reflected the diversity of use and visitation patterns of the refuge.

The national visitor survey team developed a sampling schedule for each refuge that included eight randomly selected sampling shifts during each 14-day sampling period. Shifts were four-hour time bands stratified across mornings and afternoons/evenings. The NVS team customized the schedule as needed to accommodate the individual refuge sampling locations and specific spatial and temporal patterns of visitation. The target number of contacts was 25 adult visitors (18 years of age or older) per shift for a total of 375 participants contacted per refuge. Shifts were moved, added, or extended to address logistical limitations (for example, bad weather or low visitation).

CONTACTING VISITORS ONSITE

ACE interns received a multi-day training that included role-play exercises on a refuge to

simulate engagement of visitors. Once onsite, the interns contacted visitors following a protocol developed by OSU and Service staff. Interns surveyed across the entire sampling shift and only one visitor per group was asked to participate. If a visitor declined to participate, interns recorded a direct refusal. Visitors willing to participate provided their name, mailing address, language preference (English or Spanish), and answered a few initial questions about their experience that could be used for nonresponse comparisons. Willing visitors were also given a small token incentive (for example, sticker) as a thank you and reminder of their participation.

COMPLETING A SURVEY AT HOME

All visitors that agreed onsite to participate in the survey received a postcard mailed to their address within 10 days. The postcard thanked visitors for agreeing to participate, provided a weblink and unique password, and invited the visitor to complete the survey online. All participants then received the following sequence of correspondence by mail from OSU until a survey was returned and the address removed from the mailing list (as suggested by Dillman et al., 2014):

- 1) A packet consisting of a cover letter, survey, and postage-paid return envelope approximately seven days after the first postcard was mailed.
- 2) A reminder postcard mailed 14 days after the first packet was mailed.
- 3) A final packet consisting of a cover letter, survey, and postage-paid return envelope mailed seven days after the reminder postcard.

All printed correspondence and online material were provided in the language chosen by visitors onsite; however, visitors who went online to complete the survey were able to switch between English and Spanish. The

survey was designed to take no more than 25 minutes to complete, and the average completion time recorded by the online survey software was approximately 20 minutes.

DATA ENTRY & ANALYSIS

The NVS team used Qualtrics survey software to collect survey data online. OSU staff then exported the data for cleaning (for example, treatment of missing data) and analyses. The team entered data from the paper surveys into Microsoft Excel using a standardized survey codebook and data entry procedures. All data from the two sources (paper and online) were merged and analyzed using Statistical Package for the Social Sciences (SPSS, v.25) software.

LIMITATIONS OF RESULTS

The degree to which these results represent overall visitation at a wildlife refuge depends on the number of visitors who completed the survey (sample size), and how well the sample reflects the degree of use at the refuge (Scheaffer et al., 2011). Many respondents completing the survey will produce a smaller margin of error, leading to greater confidence in results, but only to a point. For example, a margin of error of $\pm 5\%$ at a 95% confidence level signifies that if a reported percentage is 55%, then 95 out of 100 times that sample estimate would fall between 50% and 60% (if the same question was asked in the same way of the same sample). The margin of error for this survey was calculated with an 80/20

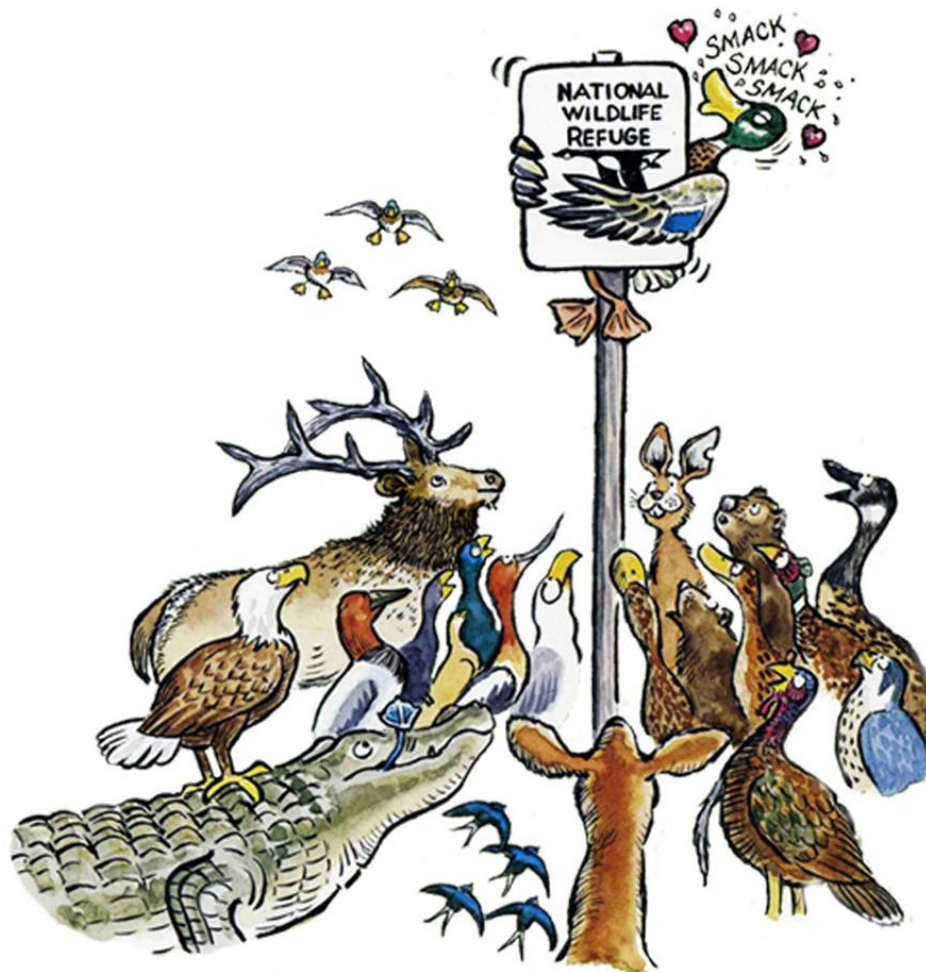
response distribution, meaning if respondents were given a dichotomous choice question, approximately 80% of respondents would select one choice and 20% would select the other (Salant & Dillman, 1994).

While OSU designed the standardized sampling protocol to account for spatial and temporal visitation patterns, the geography and infrastructure of wildlife refuges vary widely. This variation can affect who is ‘captured’ as part of the survey. For example, contacting visitors is much easier if everyone must pass through a single-entry point and much more difficult if a refuge has multiple access points over a large area. Additionally, the two 14-day sampling periods may not have effectively captured all visitor activities throughout the year on some wildlife refuges (for example, visitors who solely engage in ice fishing). As such, results presented in any one of these reports are aimed at representing overall visitation at a wildlife refuge while recognizing that particular visitor groups may vary in their beliefs and activities.

REFERENCES

- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (4th ed.). Hoboken, NJ: Wiley.
- Salant, P., & Dillman, A. D. (1994). *How to Conduct Your Own Survey*. New York, NY: Wiley.
- Scheaffer, R. L., Mendenhall, W. III, Ott, R. L., & Gerow, K. G. (2011). *Elementary Survey Sampling*. Boston, MA: Cengage Learning.

National Wildlife Refuge Visitor Survey



Front cover of the 2018 National Wildlife Refuge Visitor Survey instrument. Artwork credit: Kent Olson.

PLEASE READ THIS FIRST:

Thank you for visiting a national wildlife refuge and agreeing to participate in this study! We hope that you had an enjoyable experience. The U.S. Fish and Wildlife Service and The Ohio State University are conducting this survey to learn more about refuge visitors and their experiences in order to improve management and enhance visitor opportunities.

Please respond regarding the refuge and the visit for which you were asked to participate in this survey. The cover letter indicates the refuge you visited.

SECTION 1. Your visit to this refuge

1. Including your most recent visit, which activities did you participate in during the past 12 months at this refuge?
(Mark all that apply.)

<input type="checkbox"/> 50% Wildlife observation	<input type="checkbox"/> 64% Hiking/Walking	<input type="checkbox"/> 2% Volunteering
<input type="checkbox"/> 9% Bird watching	<input type="checkbox"/> 9% Jogging/Running/Exercising	<input type="checkbox"/> 2% Environmental education program (classroom visits, labs)
<input type="checkbox"/> 48% Photography	<input type="checkbox"/> 4% Bicycling	
<input type="checkbox"/> 0% Big game hunting	<input type="checkbox"/> 14% Auto tour route/Driving	<input type="checkbox"/> 4% Interpretative program (bird walks, staff/volunteer-led talks)
<input type="checkbox"/> 0% Upland/Small game hunting	<input type="checkbox"/> 0% Motorized boating	
<input type="checkbox"/> 0% Waterfowl/Migratory bird hunting	<input type="checkbox"/> 0% Nonmotorized boating (canoeing, kayaking)	<input type="checkbox"/> 4% Refuge special event (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 0% Freshwater fishing	<input type="checkbox"/> 4% Foraging (berries, nuts, other)	<input type="checkbox"/> 21% Other (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 11% Saltwater fishing	<input type="checkbox"/> 52% Picnicking	

2. Which of the activities above was the primary purpose of your most recent visit to this refuge?

(Please write **only one activity** here.) See Appendix C

3. Which of the following best describes your most recent visit to this Refuge? (*Mark only one.*)

<input type="checkbox"/> 75% It was the primary purpose or sole destination of my trip.
<input type="checkbox"/> 15% It was one of many equally important reasons or destinations for my trip.
<input type="checkbox"/> 11% It was just an incidental or spur-of-the-moment stop on a trip taken for other purposes or to other destinations.

4. How many people were in your personal group, including yourself, on your most recent visit to this refuge?
(Please answer each category.)

3 number of people 18 years and older 1 number of people under 18 years

5. Did you go to a visitor center at this refuge during your most recent visit?

☐ 82% No / Not Applicable

☐ 18% Yes → If yes, what did you do there? (*Mark all that apply.*)

☐ 50% Asked information of employees/volunteers

☐ 30% Looked at list of recent bird/wildlife sightings

☐ 20% Attended a talk/video/presentation

☐ 30% Stopped to use the facilities (for example, got water, used restroom)

☐ 90% Viewed the exhibits

☐ 0% Picked up/purchased a license, permit, or pass

☐ 0% Rented/borrowed equipment (for example, binoculars, fishing rod, snowshoes)

☐ 10% Visited the gift shop or bookstore

☐ 0% Other (*specify*) See Appendix C

6. How much time did you spend **at this refuge** during your most recent visit?

If you spent less than one day at this refuge, enter the number of hours: 4 hour(s)

If you spent one day or more at this refuge, enter the number of days: 0 day(s)

7. Do you live in the local area (within 50 miles of this refuge)?

☐ 70% Yes

☐ 30% No → How much time did you spend in **the local area** on this trip?

If you spent less than one day in the local area, enter the number of hours: 4 hour(s)

If you spent one day or more in the local area, enter the number of days: 6 day(s)

8. Approximately how many hours/minutes (one-way) did you travel from your home to this refuge?

If you travelled less than one hour, enter the number of minutes: 36 minutes

If you travelled more than one hour, round to the nearest hour: 9 hours

9. Including this visit, during which seasons did you visit this refuge in the last 12 months? (*Mark all that apply.*)

☐ 33% Spring
(March-May)

☐ 59% Summer
(June-August)

☐ 63% Fall
(September-November)

☐ 19% Winter
(December-February)

10. In the last 12 months, how many times have you visited...

...this refuge (including this visit)? 3 number of visits

...other national wildlife refuges? 1 number of visits

...other public lands (for example, national or state parks) to participate in the same primary activity as this visit? 3 number of visits

11. Which, if any, of the following social media outlets did you use to share your refuge experience with other people? (*Mark all that apply.*)

<input type="checkbox"/> 46%	Facebook	<input type="checkbox"/> 6%	Snapchat	<input type="checkbox"/> 2%	Personal blog (for example, Tumblr, Wordpress)
<input type="checkbox"/> 0%	Flickr	<input type="checkbox"/> 0%	Twitter	<input type="checkbox"/> 0%	Travel-related website (for example, Trip Advisor)
<input type="checkbox"/> 33%	Instagram	<input type="checkbox"/> 0%	Vimeo	<input type="checkbox"/> 2%	Other (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 0%	Pinterest	<input type="checkbox"/> 4%	YouTube	<input type="checkbox"/> 37%	I do not use social media

SECTION 2. Information about this refuge and its resources

1. How helpful was each of the following sources to get information about this refuge and its resources? (*Circle one number for each source, or mark the box if you did **not** use a source.*)

Information source	For those who used a source, the % who found it to be...					Did not use
	Not at all helpful	Slightly helpful	Moderately helpful	Very helpful	Extremely helpful	
Personal knowledge from previous visit(s)	<input type="checkbox"/> 0%	<input type="checkbox"/> 8%	<input type="checkbox"/> 21%	<input type="checkbox"/> 36%	<input type="checkbox"/> 36%	<input type="checkbox"/> 29%
Word of mouth (for example, a friend or relative)	<input type="checkbox"/> 3%	<input type="checkbox"/> 13%	<input type="checkbox"/> 10%	<input type="checkbox"/> 36%	<input type="checkbox"/> 38%	<input type="checkbox"/> 30%
People in the local community near the refuge	<input type="checkbox"/> 4%	<input type="checkbox"/> 12%	<input type="checkbox"/> 31%	<input type="checkbox"/> 35%	<input type="checkbox"/> 19%	<input type="checkbox"/> 53%
Refuge employees or volunteers	<input type="checkbox"/> 0%	<input type="checkbox"/> 12%	<input type="checkbox"/> 18%	<input type="checkbox"/> 32%	<input type="checkbox"/> 38%	<input type="checkbox"/> 39%
Printed map or atlas	<input type="checkbox"/> 7%	<input type="checkbox"/> 7%	<input type="checkbox"/> 29%	<input type="checkbox"/> 29%	<input type="checkbox"/> 29%	<input type="checkbox"/> 49%
Web-based map (for example, Google Maps, Waze)	<input type="checkbox"/> 6%	<input type="checkbox"/> 3%	<input type="checkbox"/> 13%	<input type="checkbox"/> 45%	<input type="checkbox"/> 32%	<input type="checkbox"/> 44%
Refuge website	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 42%	<input type="checkbox"/> 32%	<input type="checkbox"/> 26%	<input type="checkbox"/> 65%
Travel website (for example, TripAdvisor)	<input type="checkbox"/> 11%	<input type="checkbox"/> 17%	<input type="checkbox"/> 33%	<input type="checkbox"/> 28%	<input type="checkbox"/> 11%	<input type="checkbox"/> 67%
Other website (<i>specify</i>) <u>See Appendix C</u>	<input type="checkbox"/> 33%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 67%	<input type="checkbox"/> 0%	<input type="checkbox"/> 93%
Social media (for example, Facebook, Instagram)	<input type="checkbox"/> 0%	<input type="checkbox"/> 29%	<input type="checkbox"/> 41%	<input type="checkbox"/> 12%	<input type="checkbox"/> 18%	<input type="checkbox"/> 69%
Recreation club or organization	<input type="checkbox"/> 33%	<input type="checkbox"/> 0%	<input type="checkbox"/> 17%	<input type="checkbox"/> 33%	<input type="checkbox"/> 17%	<input type="checkbox"/> 89%
Refuge printed information (for example, brochure)	<input type="checkbox"/> 0%	<input type="checkbox"/> 6%	<input type="checkbox"/> 47%	<input type="checkbox"/> 18%	<input type="checkbox"/> 29%	<input type="checkbox"/> 69%
Kiosks/displays/exhibits at the refuge	<input type="checkbox"/> 0%	<input type="checkbox"/> 4%	<input type="checkbox"/> 38%	<input type="checkbox"/> 23%	<input type="checkbox"/> 35%	<input type="checkbox"/> 53%
Travel guidebook or other book	<input type="checkbox"/> 0%	<input type="checkbox"/> 13%	<input type="checkbox"/> 25%	<input type="checkbox"/> 50%	<input type="checkbox"/> 13%	<input type="checkbox"/> 85%
Tourist information or welcome center	<input type="checkbox"/> 9%	<input type="checkbox"/> 9%	<input type="checkbox"/> 9%	<input type="checkbox"/> 45%	<input type="checkbox"/> 27%	<input type="checkbox"/> 80%
Other source (<i>specify</i>) <u>See Appendix C</u>	<input type="checkbox"/> 100%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 97%

SECTION 3. Transportation and access at this refuge

1. First rate how important each of the following transportation-related features 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 have a specific feature or you did not experience it during this visit, please rate how important it is to you and then circle NA “Not Applicable” under the satisfaction column.*

Importance <i>Circle one for each item.</i>					Transportation-Related Features	Satisfaction <i>Circle one for each item.</i>					
Not at all Important	Slightly Important	Moderately important	Very Important	Extremely Important		Not at all Satisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied	Extremely Satisfied	Not Applicable
2%	10%	24%	41%	24%	Surface conditions of refuge roads	30%	22%	30%	15%	4%	NA
2%	17%	31%	31%	19%	Surface conditions of parking areas	2%	11%	44%	31%	11%	NA
9%	9%	30%	30%	23%	Condition of bridges on roadways	12%	20%	52%	8%	8%	NA
2%	6%	31%	38%	23%	Condition of trails and boardwalks	5%	10%	43%	33%	10%	NA
49%	15%	17%	12%	7%	Condition of boat launches	0%	0%	44%	11%	44%	NA
0%	12%	27%	45%	16%	Number of places for parking	2%	4%	39%	37%	19%	NA
6%	15%	40%	27%	13%	Number of places to pull over on refuge roads	4%	17%	34%	30%	15%	NA
0%	10%	24%	30%	36%	Safety of driving conditions on refuge roads	28%	17%	23%	17%	15%	NA
0%	8%	22%	31%	39%	Safety of refuge road entrances/exits	8%	10%	35%	24%	24%	NA
8%	10%	25%	25%	31%	Safety of roads/trails for nonmotorized users (for example, bicyclists and hikers)	15%	10%	33%	18%	25%	NA
6%	10%	29%	27%	29%	Signs on highways directing you to this refuge	12%	10%	30%	34%	14%	NA
2%	8%	25%	29%	35%	Signs directing you around refuge roads	8%	17%	29%	27%	19%	NA
6%	2%	19%	35%	38%	Signs directing you on trails	8%	15%	25%	35%	18%	NA
17%	13%	20%	26%	24%	Access for people with physical disabilities or who have difficulty walking	19%	16%	34%	16%	16%	NA

2. If you have any comments about transportation-related features at this refuge, please write them here.

See Appendix C

3. What modes of transportation did you use to travel from the local area to this refuge and within this refuge during your most recent trip? (*Mark all that apply.*)

Transportation modes used to travel...	...from the local area to this refuge	...within the boundaries of this refuge
Private/rental vehicle without a trailer	96%	39%
Private/rental vehicle with a trailer (for boat, camper, or other)	2%	0%
Recreational vehicle (RV)	2%	0%
Refuge shuttle bus/tram	0%	0%
Tour bus/van	0%	0%
Public transportation	4%	0%
Motorcycle	2%	0%
Bicycle	2%	2%
Foot (for example, walking/hiking)	7%	23%
Boat	0%	0%
Other (<i>specify</i>): <u>See Appendix C</u>	0%	0%
Other (<i>specify</i>): <u>See Appendix C</u>	0%	0%

4. Please tell us how likely you would be to use each transportation option **at this refuge** if it were available in the future. Not all options are currently available at every refuge. (*Circle one number for each option.*)

Transportation options	Not at all Likely	Slightly Likely	Moderately Likely	Very Likely	Extremely Likely
Bus or tram that takes passengers to different points within refuge boundaries (such as the Visitor Center)	52%	18%	18%	6%	6%
Bus or tram that provides a guided tour of the refuge with information about this refuge and its resources	42%	12%	16%	16%	14%
Refuge-sponsored shuttle with a dedicated stop in the local community for picking up people at set times	40%	13%	27%	12%	8%
Public transit system that stops at or near this refuge	60%	8%	18%	10%	4%
Bike-share program that offers bicycles for rent on or near this refuge	52%	20%	14%	4%	10%
Pedestrian paths for access to this refuge from the local community	53%	16%	14%	10%	8%

SECTION 4. Your expenses related to your refuge visit

1. Record the amount of money that you and other members of your group spent in the local 50-mile area during your most recent visit to this refuge. Your group would include you and those with whom you shared expenses (for example, family members, traveling companions). *Enter the amount spent or enter 0 (zero) if you did not spend any money in a particular category.*

Categories	Amount spent in the local area/communities & at this refuge (within 50 miles of this refuge)
Hotel, bed & breakfast, cabin, etc.	
Camping fees (for example, tent, RV)	
Restaurants and bars	
Groceries	
Gasoline and oil (for private vehicles, boats, RVs, or other motors)	
Local transportation (for example, public transit, rental car)	See report for summary of visitor expenditures
Guides and tour fees	
Equipment rental (for example, bicycle, canoe, kayak)	
Sporting goods (for example, bait, binoculars)	
Souvenirs/clothing and other retail	
Other (specify) <u>See Appendix C</u>	

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

2 number of people sharing expenses

3. As you know, costs of travel such as gasoline, hotels, and public transportation often increase. If your total trip costs were to increase, what is the maximum extra amount you would pay and still visit this refuge? (*Mark the dollar amount that represents your response.*)

<input type="checkbox"/> 8% \$0	<input type="checkbox"/> 23% \$30	<input type="checkbox"/> 9% \$100	<input type="checkbox"/> 0% \$250
<input type="checkbox"/> 9% \$5	<input type="checkbox"/> 8% \$45	<input type="checkbox"/> 2% \$125	<input type="checkbox"/> 4% \$350
<input type="checkbox"/> 8% \$10	<input type="checkbox"/> 6% \$60	<input type="checkbox"/> 2% \$150	<input type="checkbox"/> 4% \$500
<input type="checkbox"/> 15% \$20	<input type="checkbox"/> 4% \$75	<input type="checkbox"/> 0% \$200	<input type="checkbox"/> 0% \$750

SECTION 5. Your experience at this refuge

1. First rate how important each of the following services, facilities, and opportunities 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 item or you did not experience it on this visit, please rate how important it is to you and then circle NA "Not Applicable" under the satisfaction column.*

Importance <i>Circle one for each item.</i>					Refuge Services, Facilities, and Opportunities	Satisfaction <i>Circle one for each item.</i>					
Not at all Important	Slightly Important	Moderately important	Very Important	Extremely Important		Not at all Satisfied	Slightly Satisfied	Moderately satisfied	Very Satisfied	Extremely Satisfied	Not Applicable
0%	0%	18%	40%	42%	Convenient hours/days of operation for this refuge	8%	22%	27%	29%	14%	NA
16%	16%	26%	32%	10%	Availability of employees or volunteers	2%	12%	24%	41%	20%	NA
16%	8%	32%	28%	16%	Courteous and welcoming employees or volunteers	2%	14%	19%	40%	26%	NA
4%	2%	28%	38%	28%	Signs with rules/regulations for this refuge	2%	10%	31%	33%	23%	NA
6%	15%	32%	26%	21%	Visitor center	6%	15%	18%	39%	21%	NA
2%	4%	16%	31%	47%	Well-maintained restrooms	27%	9%	21%	30%	12%	NA
13%	9%	30%	28%	20%	Recreational structures (decks, blinds, platforms)	17%	25%	25%	17%	17%	NA
20%	17%	28%	22%	13%	Bird-watching opportunities	9%	14%	32%	36%	9%	NA
11%	15%	19%	38%	17%	Opportunities to observe wildlife other than birds	3%	10%	33%	43%	10%	NA
8%	4%	20%	47%	20%	Opportunities to photograph wildlife and scenery	0%	2%	29%	41%	27%	NA
8%	13%	23%	40%	17%	Environmental education opportunities	12%	6%	32%	29%	21%	NA
78%	2%	9%	9%	2%	Hunting opportunities	10%	20%	10%	20%	40%	NA
34%	15%	28%	13%	11%	Fishing opportunities	11%	16%	21%	26%	26%	NA
0%	8%	28%	32%	32%	Trail hiking opportunities	5%	11%	29%	37%	18%	NA
20%	20%	33%	12%	14%	Bicycling opportunities	16%	5%	37%	21%	21%	NA
17%	17%	28%	26%	13%	Water trail opportunities for canoeing or kayaking	6%	19%	38%	19%	19%	NA
19%	13%	30%	21%	17%	Volunteer opportunities	8%	21%	38%	13%	21%	NA
7%	11%	26%	35%	22%	Wilderness experience opportunities	3%	7%	48%	28%	14%	NA

2. If you have comments about the services, facilities, and opportunities at this refuge, please write them here.

See Appendix C

3. How much do you disagree or agree with each statement below? (*Circle one number for each statement.*)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I felt welcome during my visit to this refuge.	4%	4%	14%	42%	36%
I felt safe during my visit to this refuge.	4%	0%	8%	48%	40%
Crime <u>is</u> a problem at this refuge.	38%	24%	26%	6%	6%
I feel comfortable being in nature.	0%	0%	6%	40%	54%
I do <u>not</u> like being in nature by myself.	41%	22%	18%	12%	6%
People closest to me enjoy participating in nature-based recreation.	0%	6%	8%	42%	44%
Generally, people who look like me are treated differently when they participate in nature-based recreation.	36%	28%	30%	6%	0%

4. How satisfied are you with the following? (*Circle one number for each statement.*)

	Not at all Satisfied	Slightly Satisfied	Moderately satisfied	Very Satisfied	Extremely Satisfied
The job this refuge is doing of conserving fish, wildlife, and their habitats.	0%	8%	20%	50%	22%
The quality of the overall experience when visiting this refuge.	0%	2%	26%	44%	28%

SECTION 6. Future visits to this refuge

1. Considering **the primary activity** you participated in during your most recent visit to this refuge, please tell us how the following factors, if they occurred, could affect your future participation in that activity at this refuge. (*Circle one number for each factor.*)

If there was...	My participation in my primary activity would...		
	Decrease	Stay the same	Increase
Less water in lakes, rivers, or streams available for recreation	36%	56%	8%
More acreage open to hunting and fishing	41%	51%	8%
More infrastructure (for example, bathrooms, observation decks)	4%	38%	58%
Recreation equipment available for rent (for example, fishing rods, binoculars, snowshoes)	4%	62%	34%
Less regulations on fishing	16%	75%	10%
Less regulations on hunting	29%	67%	4%
A greater diversity of species	4%	50%	46%
Fewer numbers of a single, preferred species	4%	90%	6%
More people participating in my primary activity	20%	64%	16%
An improvement in the quality of wetlands	0%	68%	32%
An improvement in the quality of wildlife habitat other than wetlands	0%	68%	32%

2. Do you plan to return to this refuge in the next 12 months?

65% Yes 8% No 27% Not sure

3. Which of the following types of programs, if offered, would encourage you to return to this refuge in the future? (*Mark all that apply.*)

18% I do not typically participate in refuge programs

For those that do participate in refuge programs, the % that would be encouraged to return if the following programs were offered:

49% Programs that engage youth	21% Programs that focus on creative pursuits (for example, art, writing, meditation)
51% Programs that focus on family/multiple-generations	26% Programs that support people with accessibility concerns (for example, difficulty walking, in a wheelchair)
54% Programs that teach skills to visitors	3% Other (<i>specify</i>) <u>See Appendix C</u>
72% Programs that highlight unique local culture	

SECTION 7. A little about you

**** Please tell us a little bit about yourself. Your answers to these questions will help us to know more about who visits national wildlife refuges. Answers will not be linked to any individual taking this survey. ****

1. Are you? ☐ 42% Male ☐ 58% Female

2. In what year were you born? 1975 (YYYY)

3. How many years of formal schooling have you had? (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)			
					<input type="checkbox"/> 0%			<input type="checkbox"/> 6%				<input type="checkbox"/> 46%				<input type="checkbox"/> 48%			

4. What race or ethnicity do you consider yourself? (Mark all that apply.)

<input type="checkbox"/> 42% White	<input type="checkbox"/> 2% American Indian or Alaska Native
<input type="checkbox"/> 8% Hispanic, Latino, or Spanish	<input type="checkbox"/> 2% Middle Eastern or North African
<input type="checkbox"/> 6% Black or African American	<input type="checkbox"/> 23% Native Hawaiian or Other Pacific Islander
<input type="checkbox"/> 31% Asian	<input type="checkbox"/> 2% Some other race or ethnicity

5. How many people (including yourself) live in your household? 3 persons

6. What was your approximate household income from all sources (before taxes) last year? (Mark only one.)

<input type="checkbox"/> 0% Less than \$10,000	<input type="checkbox"/> 8% \$35,000 - \$49,999	<input type="checkbox"/> 14% \$100,000 - \$149,999
<input type="checkbox"/> 8% \$10,000 - \$24,999	<input type="checkbox"/> 22% \$50,000 - \$74,999	<input type="checkbox"/> 14% \$150,000 - \$199,999
<input type="checkbox"/> 4% \$25,000 - \$34,999	<input type="checkbox"/> 14% \$75,000 - \$99,999	<input type="checkbox"/> 14% \$200,000 or more

7. Which of the following best describes your current employment situation? (Mark only one.)

<input type="checkbox"/> 59% Employed full-time	<input type="checkbox"/> 2% Unemployed	<input type="checkbox"/> 4% Retired
<input type="checkbox"/> 12% Employed part-time	<input type="checkbox"/> 14% Homemaker/caregiver	<input type="checkbox"/> 2% Disabled/unable to work
<input type="checkbox"/> 4% Self-employed	<input type="checkbox"/> 2% Student	<input type="checkbox"/> 2% Other (specify): <u>See Appendix C</u>

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.

Comments?

See Appendix C

PAPERWORK REDUCTION ACT STATEMENT: The Paperwork Reduction Act requires us to tell you why we are collecting this information, how we will use it, and whether or not you have to respond. The information that we collect in this survey will help us understand visitor satisfaction with and use of national wildlife refuges and to inform management and policy decisions. Your response is voluntary. An agency may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a valid OMB Control Number. We estimate it will take an average of 25 minutes to complete this survey. You may send comments concerning the burden estimate or any aspect of the survey to the Information Collection Clearance Officer, Fish and Wildlife Service, 4401 North Fairfax Drive, MS 222-ARLSQ, Arlington, VA 22203. OMB CONTROL # 0596-0236 EXPIRATION DATE 11/30/2020

Appendix C: Open-Ended Survey Responses by Question

Survey Section 1

Question 1: “Including your most recent visit, which activities did you participate in during the past 12 months at this refuge?”

Special Event	Frequency
Cave visit, pictographs	1
Trail - learning more about our culture and history	1

Other Activity	Frequency
Cave art	1
Policing area’s unusual activities	1
Rest relaxation	1
Seuno keulling	1
Snorkeling	3
Snorkeling, beach	1
Swimming	2
Swimming/water therapy	1
Wanted to see it, first time there	1

Question 2: “Which of the activities above was the primary purpose of your most recent visit to this refuge?”

Primary Activity	Frequency
Auto tour route/driving	1
Beach activity	6
Bicycling	1
Fishing	2
Hiking	11
Other	1
Photography	1
Picnicking	13
Sightseeing	2
Snorkeling	2
Swimming	6
Wildlife observation	4

Question 11: “Which, if any, of the following social media outlets did you use to share your refuge experience with other people?”

Other Social Media Outlets	Frequency
KakaoStory	1

Survey Section 2

Question 1. “How helpful was each of the following sources to get information about this refuge and its resources?”

Other Websites	Frequency
Online newspaper (Pacific News)	1

Survey Section 6

Question 3: “Which of the following types of programs, if offered, would encourage you to return to this refuge in the future?”

Other Programs	Frequency
Volunteering	1

Survey Section 3

Question 2: "If you have any comments about transportation-related features at this refuge, please write them here."

Comments on Transportation-Related Features at This Refuge (n=26)

Access road to refuge from the main road is one of the worst roads on this island.

Disability A.D.A. If can be presented for disability.

Fix the pot holes please.

Fix the road.

Fix the roads.

Guam was amazing.

I had a really good time for my life. I truly appreciate you all!

Enjoyed our visit very much.

Road access is fairly bad. Lots of potholes, etc.

Road condition is not good to drive.

Roadway needs to be fixed. Too many holes and uneven path. It's such a shame for tourists and locals to try and visit a beautiful place but may feel discouraged to drive forward because of the road condition.

The gravel road that leads to the Ritidian Wildlife Refuge is in very poor condition, with very large potholes that are almost unavoidable.

The main access roads to the refuge areas are severely dilapidated, can cause motorized vehicles damage and in a recent visit (caught on my video dashcam) near collision with a visitor and reckless tour van driver. Reckless speeding through these dilapidated roads with vehicles to its advantage is a problem and safety issue for people visiting the refuge.

The main road approaching the refuge is in very bad condition (lots of large potholes).

The public access road to the refuge is terrible. But it is not the responsibility of the refuge. I believe it is the responsibility of the U.S. Government.

The road condition to the refuge was really bad, it would ruin certain small cars.

The road leading into the refuge, although not part of the refuge, is horrible!!! Need to at least have potholes filled. Can only drive <5mph down the road.

The road leading to the refuge is horrible. It needs to be repaired.

The road leading to the refuge is absolutely horrible. The deep potholes are dangerous, and no one follows the rules when driving out of the refuge in order to avoid said potholes. I felt very uneasy driving into the refuge worrying if my van would make it. It's a shame the roads are so unsafe, I'd be inclined to visit more often if it wasn't so bad.

The road leading to the refuge is in need of repair. The potholes have gotten worse in the last 6 months. Also, a sign at the beginning of the pothole road letting visitors know refuge hours (in English and Japanese) would be super helpful for tourists. I've seen many Japanese tourists heading to the refuge when it is already closed.

The road leading to the refuge is in terrible condition. Somebody needs to adopt/maintain it. I almost turned back to avoid damaging my car.

The road to Ritidian Beach is horrific. Potholes like I have never seen anywhere. Quite dangerous and ridiculous if you ask me. The military should provide a safer road.

The road to Ritidian is almost impossible.

The road to the refuge was horrible, not the roads on the refuge, just the roads to the refuge; terrible potholes. Guam has a lot of potholes, but I was actually worried about our vehicle on this road since it was our first time out there, we didn't know what to expect. There needs to be an effort to improve the road out to the refuge, off the main road, I think is the main road.

The roadway getting to the Guam National Wildlife Refuge is a safety concern and also discourages the public from utilizing the refuge. The plan for the LFTRC runs counter to the mission of the refuge and park systems. Shame on DOD and the park service for allowing this destruction to take place.

The roads leading to this refuge are too rough to drive. I worried about damage to cars and am reluctant to go there again!!!

Survey Section 5

Question 2: "If you have comments about these services, facilities, and opportunities at this refuge, please write them here."

Comments on Services, Facilities, and Opportunities at This Refuge (n=18)

Better restroom.

Fishing availability areas for more fishing. Turtle nesting is prohibited, yes, but turtles go to the picnic areas as well.

Gorgeous beach. Loved spending the day there.

Great.

I enjoy so much an "escape" to this refuge as is, though a porta-potty is only available. A permanent restroom and shower rinse facilities would be convenient. Overnight designated camping also would be a great refuge experience with rules and regulation in place and a reasonable fee for maintenance cost.

I'm not sure of any opportunities to volunteer, but that may probably be my own fault as I didn't go to the visitor center to ask. Oops.

Love Ritidian! Best beach on Guam!

Need to allow people to stay overnight.

Please make signs clearer.

Put a sign on RT 3 (at Potts Junction) to tell visitors if the refuge is open or closed. The road from RT 3 to the refuge entrance is long and in very bad condition. A sign at RT 3 would help to avoid that road, if the refuge was closed.

Refuge needs actual restrooms near the beach area (which should be maintained) and showers for rinsing after swimming or trail hikes.

Ritidian is one of our favorite spots on Guam, we often bring guests. Hoping that access will not be restricted by the military.

Sadly, the refuge is closed more often than not.

Should close at dusk, not 4 p.m.

The refuge has great people, clean facilities, etc.! Thank you and good luck to all your members. God bless you all!

The refuge closes at 4 p.m., which is two hours earlier than is convenient for most people. 6 p.m. or sundown would be a better closing time.

The staff is always welcoming and helpful. I wish the refuge was open longer, especially with the amount of time it takes to arrive. It closes so early that we don't get to see the beautiful sunset. I would love to get my kids involved in the educational opportunities of the refuge, but I find it hard to find information or advertisements on such opportunities.

We wish you could provide tour guides or that the visitor center is open to give more guidance to give some information of the place.

End of Survey

General Comments (n=13)

Great refuge on Guam!

I always enjoy my visits to Ritidian Port!!

I want you to develop well without destroying nature. Thank you!

Keep up the great work at making things better. Appreciate the hard work and clean up after the typhoon.

Please make the road comfortable.

Ritidian Beach is gorgeous. A blessing for the community. I heard that the U.S. military will be taking over the area within a few years and I think that is awful.

Ritidian Point is one of my favorite beaches on the island. It's well preserved and not crowded. I would go here every single day if I could. As soon as I hit the entrance from the main gate, all the weight on my shoulders disappears. If I was younger, I would have loved to be part of the staff that works to keep the wildlife and historical sites safe. I truly love nature and I am so thankful that Ritidian is protected. I am blessed to be able to enjoy the area as often as I do. About 8 years ago, my husband and I were fishing out at the reef and a tourist got pulled out over the reef. She freaked out and I knew that she was close to drowning. I'm a good swimmer but have never been trained to save someone. I've seen how to, but was so scared that she would panic and drown me. I turned to shore and waved my arms screaming for help. Two locals that were snorkeling in shore

made their way out to us and the two of them together swam out to bring her in. She was exhausted and couldn't speak English...but I could see in her eyes how scared she was. No matter what signs there are, no matter what they're told, there's always that one person who just doesn't think! People come here and see the beautiful ocean, but don't realize that we are all just visitors to it. We have to respect mother nature. Sorry, went a bit off course there ;-).

Thank you for keeping the refuge open and accessible to locals/visitors. This is one of the most beautiful beaches on the island. I hope that everyone who comes to visit appreciates and respects the place like my family and I have through the years. It's a rare gem that we love to come and visit from time to time. We hope that in the near future that infrastructure will be of priority regarding roadways from main road to refuge, having restrooms, showers and trash bins available for visitors.

The best places on our island of Guam, besides not having access to more of the refuge in military restricted land. I enjoy this peaceful secluded refuge outdoors to escape the stressful routines, control, and crowded places only for a moment's day. For a day, two, or even a weekend would be a medicinal experience and a safe one too! A designated campground within the refuge for these outdoor activities would be great and fun! Experiencing these moments through bicycle touring has educated me more about respect and preserving our natural resources and beauty today, tomorrow, and for the future generations. Thank you :)

The reason we come to the refuge is because my wife has 3rd stage breast cancer and it's the second cleanest beach other than Anderson Air Force Base. Plus, we like the therapy, we like the fresh air. My sign is an Aquarius, my wife is Aries. Thank you for such, being a refuge as it is - the herd activity maybe fishing that we know of.

Water is clean and clear.

We always enjoy our time at the facility, and we would love to visit more often if those roads were fixed. Thanks for keeping this refuge on our island.

We used to live in Guam, military family. Since the moment we found this place, we always loved it. It is a place dear in our hearts, our kids love it. It was one of our favorite places to go on the island in the total years that we lived there (5 1/2 years). Now we had the opportunity to go back and visit, it was amazing to see that it is still almost the same. Including the bad conditions on the road there. This place should stay just like it is. Maybe a restroom would be a very nice thing. We would love to see this place stay open for future generations to come. We are so grateful for visiting this wonderful place. It's where our kids grew up, loving and respecting the ocean.