



U.S. Fish & Wildlife Service

NATIONAL WILDLIFE REFUGE VISITOR SURVEY

*2018 Results for
San Diego National Wildlife Refuge*



**THE OHIO STATE
UNIVERSITY**



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Front cover: View from the Interpretive Loop trail at San Diego National Wildlife Refuge. Photo credit: Angelica Varela.

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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 San Diego National Wildlife Refuge, referred to as “this wildlife refuge” or “refuge” throughout this report. Percentages noted throughout the report were rounded



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

to the 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

San Diego National Wildlife Refuge is located in southern California within close proximity to the city of San Diego, thus providing environmental educational opportunities for many of the city's inhabitants. The refuge was established in 1996 for the protection of endangered and threatened species of wildlife. The 11,152 acres are composed of six habitat types: coastal sage scrub, chaparral, grassland, riparian forest, oak woodlands, and vernal pools. The San Miguel and McGinty Mountains within this refuge provide variable topography. This wildlife refuge is home to at least three endangered species of animals including two birds, the California gnatcatcher and the Least Bell's Vireo, and the Quino Checkerspot butterfly. In addition, the refuge contains three endangered plant species. Much of the land was formerly used for agriculture and the habitats are being actively restored to maximize benefits to wildlife.

San Diego National Wildlife Refuge attracts over 32,000 visitors annually (U.S. Fish and Wildlife Service, 2018, written comm.). Three hiking trails of varying difficulty level provide visitors with myriad ways to experience the refuge. In

addition to hiking, the trails are open to bike riding and horseback riding. The trail system is the best way for visitors to observe wildlife. Birdwatching and wildlife photography are also common activities.

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 326 visitors agreed to participate in the survey by providing their names and addresses.
- In all, 110 visitors completed the survey online (52%) or by mail (48%) after their refuge visit, resulting in a 36% response rate.
- Results for this wildlife refuge have a $\pm 7\%$ margin of error at the 95% confidence level. For more details on limitations of results and survey methodology, see Appendix A.



Sycamore trees growing at San Diego National Wildlife Refuge. Photo credit: Michelle Ferguson.

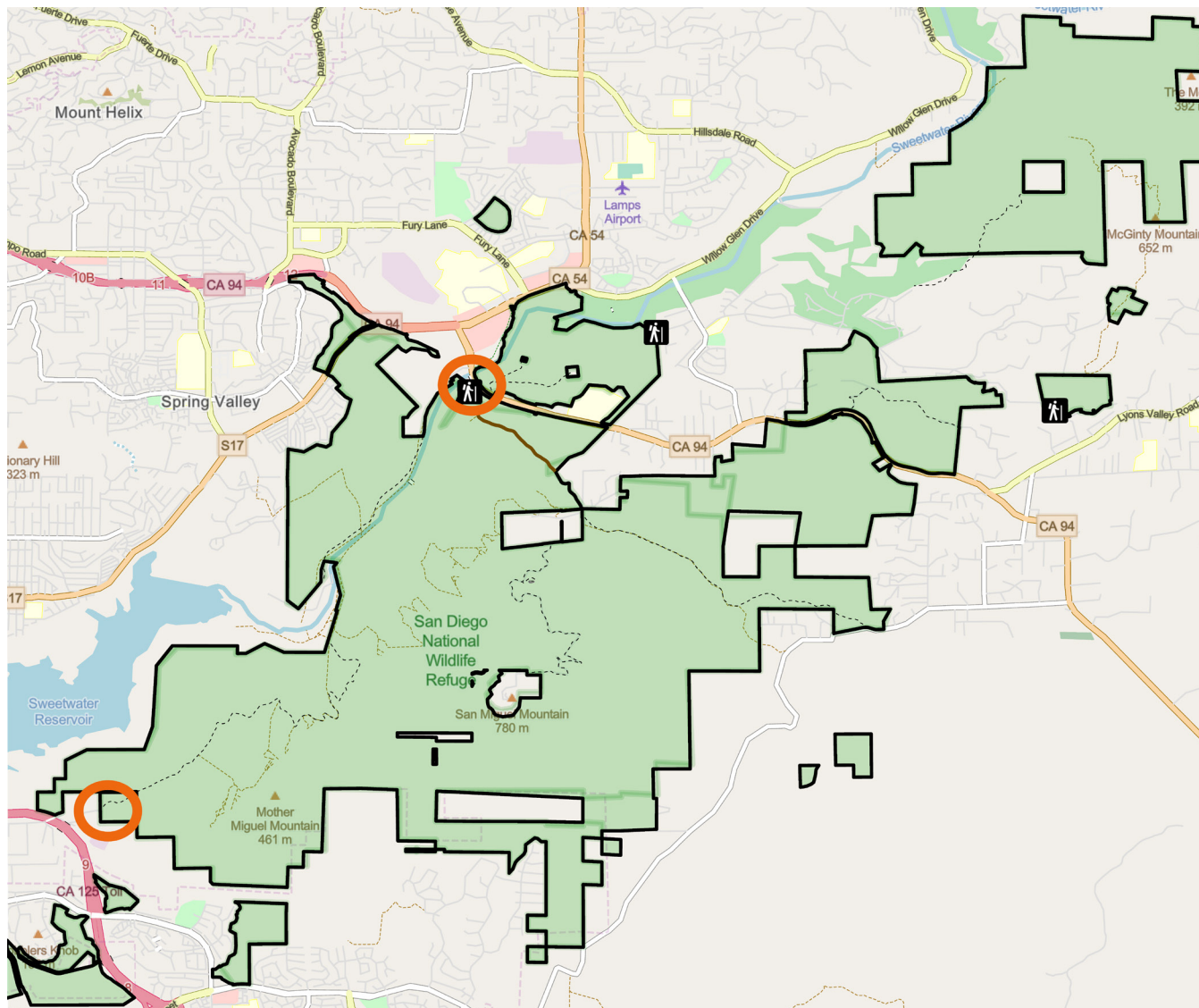


Fig. 2: Map of San Diego National Wildlife Refuge. Visitors were contacted at the circled locations from 4/6/2018–4/14/2018 and 11/30/2018–12/16/2018.

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

- 42% of visitors were female with an average age of 42 years (Fig. 3).
- 58% were male with an average age of 50 years.

EDUCATION

- 7% of visitors had a high school degree or less.
- 64% had at least some college.
- 29% had an advanced degree.

RACE & ETHNICITY

Most prevalent race or ethnicity (Fig. 4):

- White (72%).
- Hispanic (21%).
- Asian (4%).

INCOME

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

OTHER TRIP CHARACTERISTICS

- Average group size of 3 people.
- 47% visited the refuge alone.
- 31% visited with at least one other adult.
- 22% visited with a combination of at least 1 adult and 1 child.

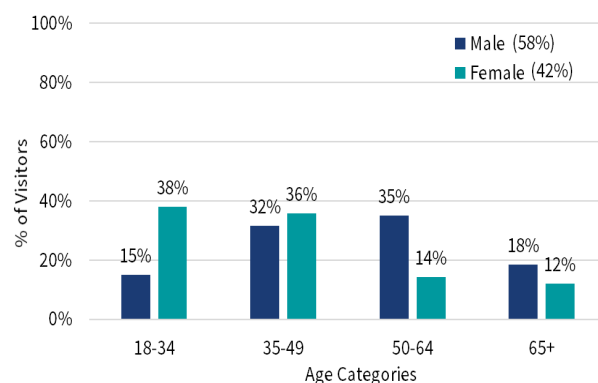


Fig. 3: Distribution of visitors to this refuge by gender and age group.

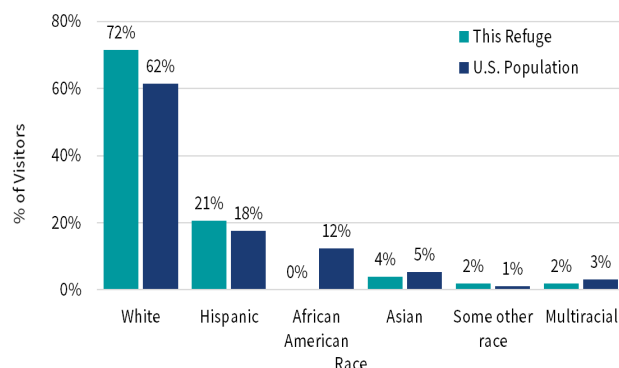


Fig. 4: Race and ethnicity of visitors to this refuge compared to the national average.

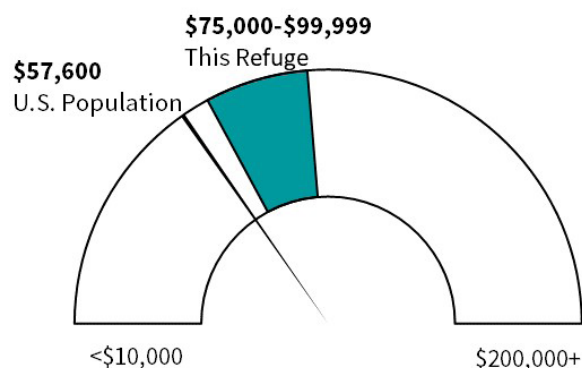


Fig. 5: Mean income range of visitors to this refuge compared to the national median income.

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 (93%) include:

- For locals, this refuge was the primary reason for their trip (90%) (Fig. 6).
- Local visitors traveled an average of 15 minutes to arrive at this refuge (Fig. 7).

NONLOCAL VISITORS

Highlights of trip characteristics for nonlocal visitors to this wildlife refuge (7%) include:

- For nonlocals, this refuge was most often the primary reason for their trip (38%) or a stop on a trip taken for other purposes (38%) (Fig. 6).
- Nonlocal visitors traveled an average of 8 hours to arrive at this refuge (Fig. 8).
- Of the 100% of visitors who lived in the U.S., nonlocal visitors were most often from California (96%) and Colorado (1%).

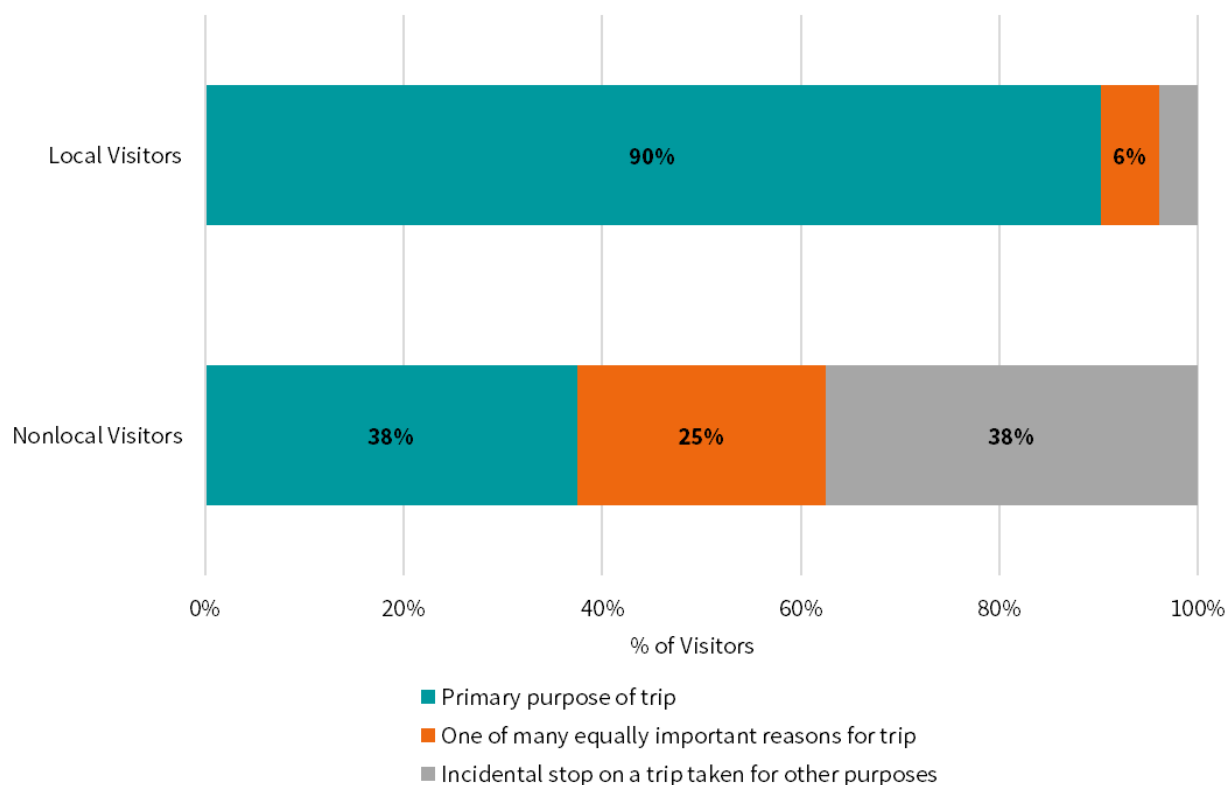


Fig. 6: Purpose of most recent refuge visit for local (living ≤ 50 miles from the refuge) and nonlocal (living > 50 miles from the refuge) visitors.

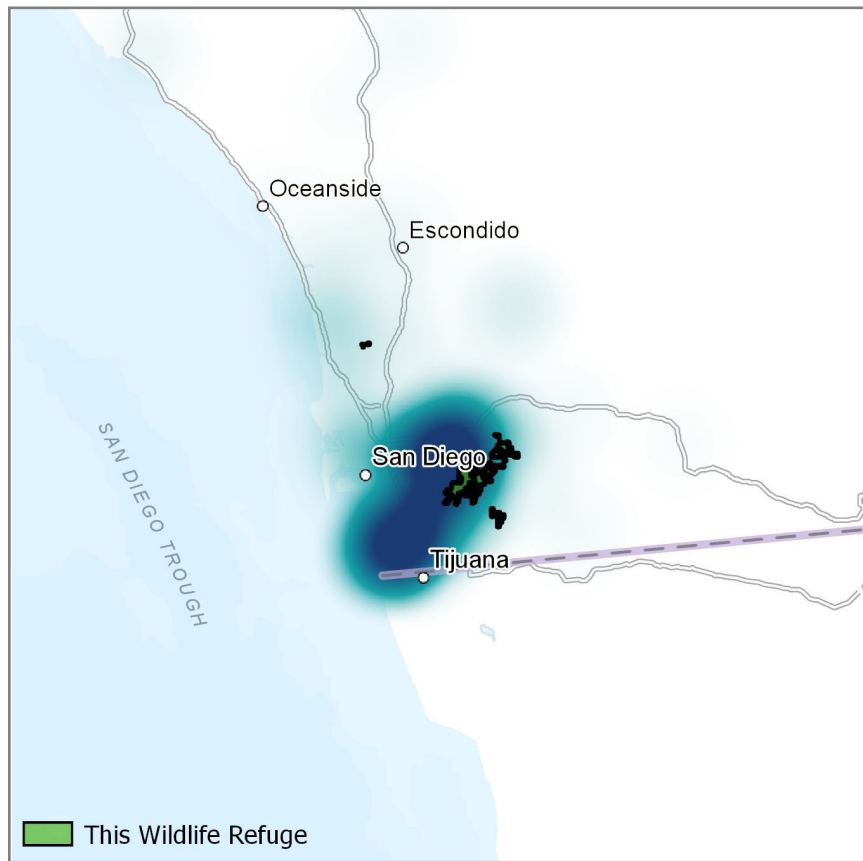


Fig. 7: Map showing residence of local visitors to this refuge. Darker shading represents relatively higher visitation from that area.

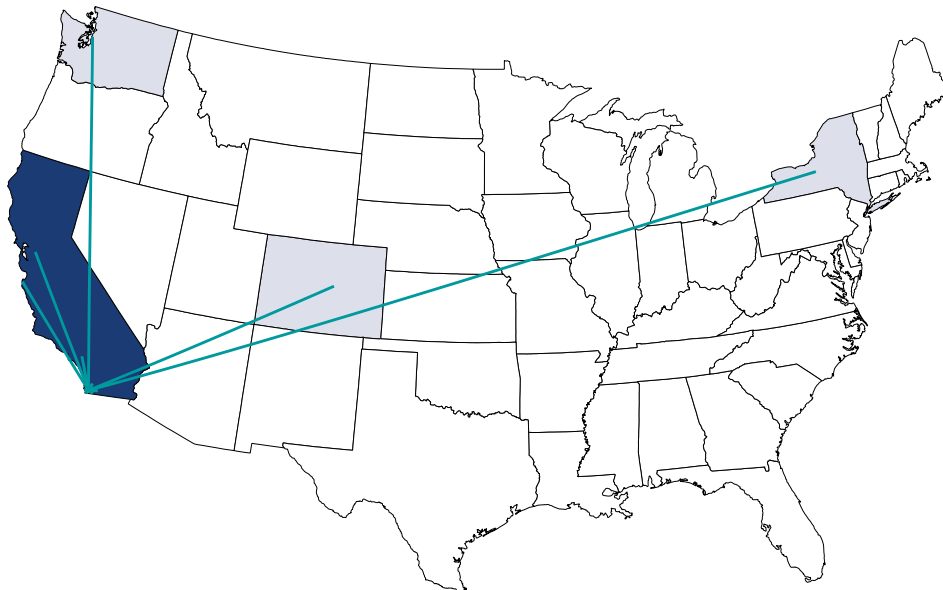


Fig. 8: Map showing residence of visitors to this refuge by zip code, with each line representing visitation from a different zip code. The convergence point of the lines is the geographical center of the refuge. Darker shading of the states represents higher visitation from that state.

OTHER TRIP CHARACTERISTICS

Other trip characteristics include:

- To get to this wildlife refuge, visitors primarily traveled by private vehicle without a trailer (84%) and by foot (23%) (Fig. 9).
- Once on the refuge, visitors primarily traveled by foot (47%) and by bicycle (17%) (Fig. 9).
- Visits occurred during winter (86%), spring (78%), summer (58%), and fall (77%).
- 98% of visitors made a single-day trip to this refuge, spending an average of 2 hours, while 2% of visitors were on a multi-day trip to this wildlife refuge that averaged 3 days.

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:

- 89% were repeat visitors to this wildlife refuge, visiting an average of 31 times.
- 64% visited other national wildlife refuges, averaging 8 visits.
- 76% visited other public lands, averaging 13 visits.

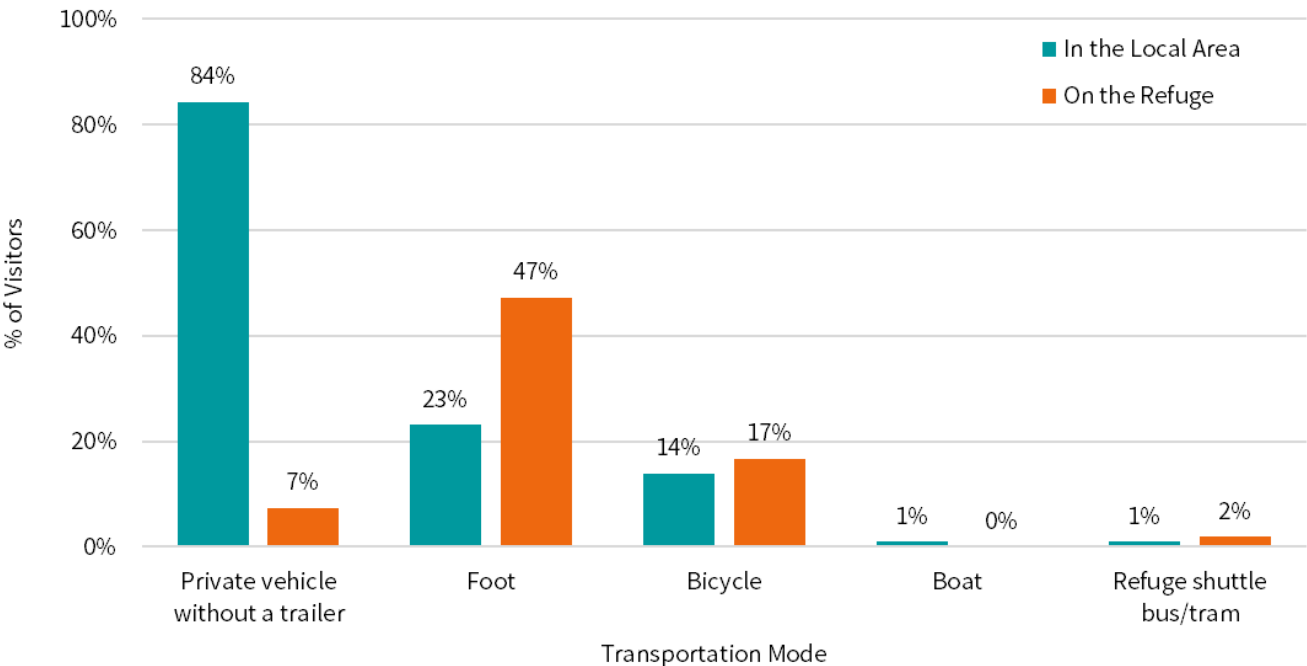


Fig. 9: Modes of transportation used by visitors to get from the local area to this refuge and within the boundaries of this refuge.

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 that were most helpful to visitors regardless of age included word of mouth and people in the local community.
- Print and internet sources that were most helpful to visitors regardless of age included web-based map and printed map/atlas.
- Refuge-specific sources that were most helpful to visitors regardless of age included refuge employees/volunteers and kiosks/displays/exhibits at this refuge.
- Use of information sources varied by age groups (see Figs. 10-12 for details).

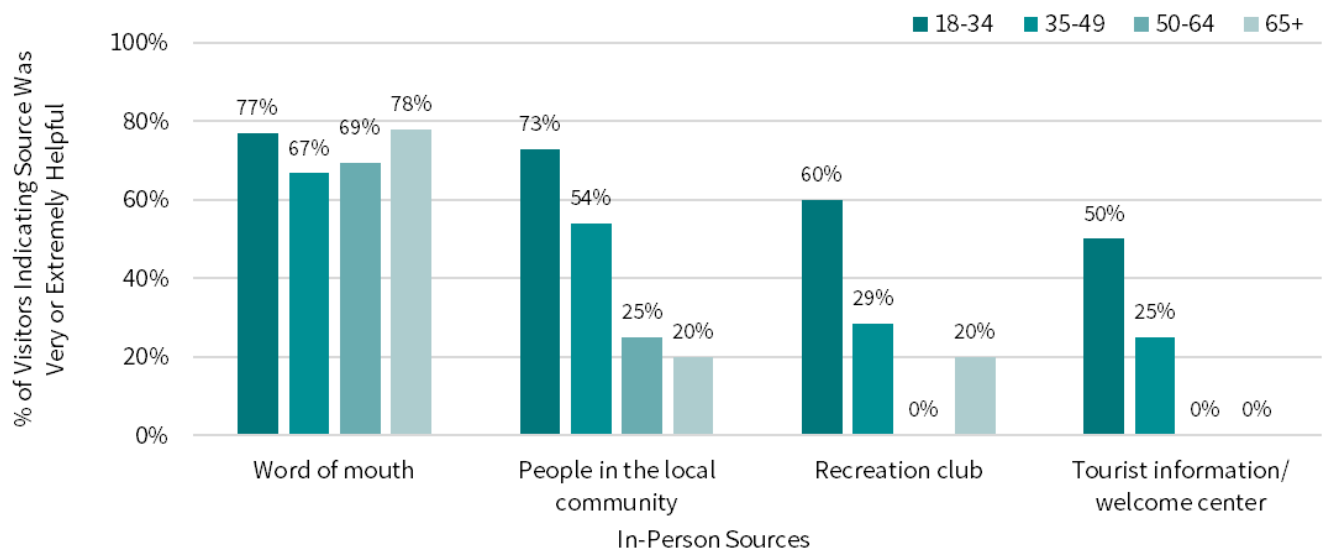


Fig. 10: Percent of visitors by age group who found in-person information sources very or extremely helpful in planning their trip.

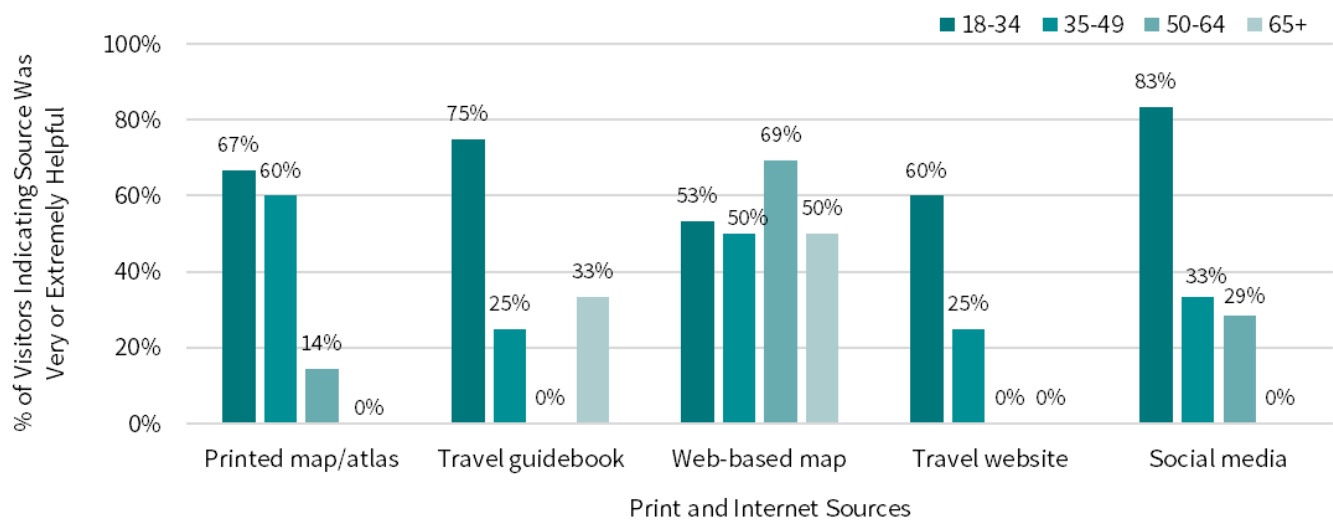


Fig. 11: Percent of visitors by age group who found print and internet information sources very or extremely helpful in planning their trip.

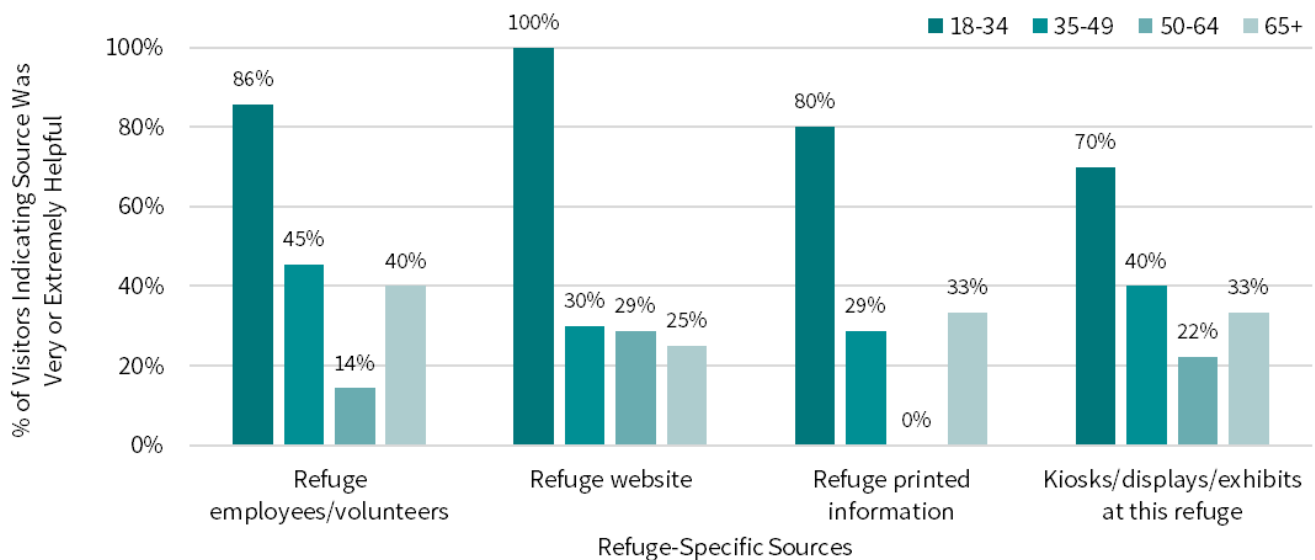


Fig. 12: Percent of visitors by age group who found refuge-specific information sources very or extremely helpful in planning their trip.

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 58% of visitors to share their experience on this refuge with others. Use of specific social media platforms varied by age group (Fig. 13):

- Visitors 18-34 years old preferred to use Instagram (59%) and Facebook (41%).
- Visitors 35-49 years old preferred to use Facebook (41%) and Instagram (31%).
- Visitors 50-64 years old preferred to use Facebook (44%) and Instagram (20%).
- Visitors 65 or older preferred to use Facebook (33%).

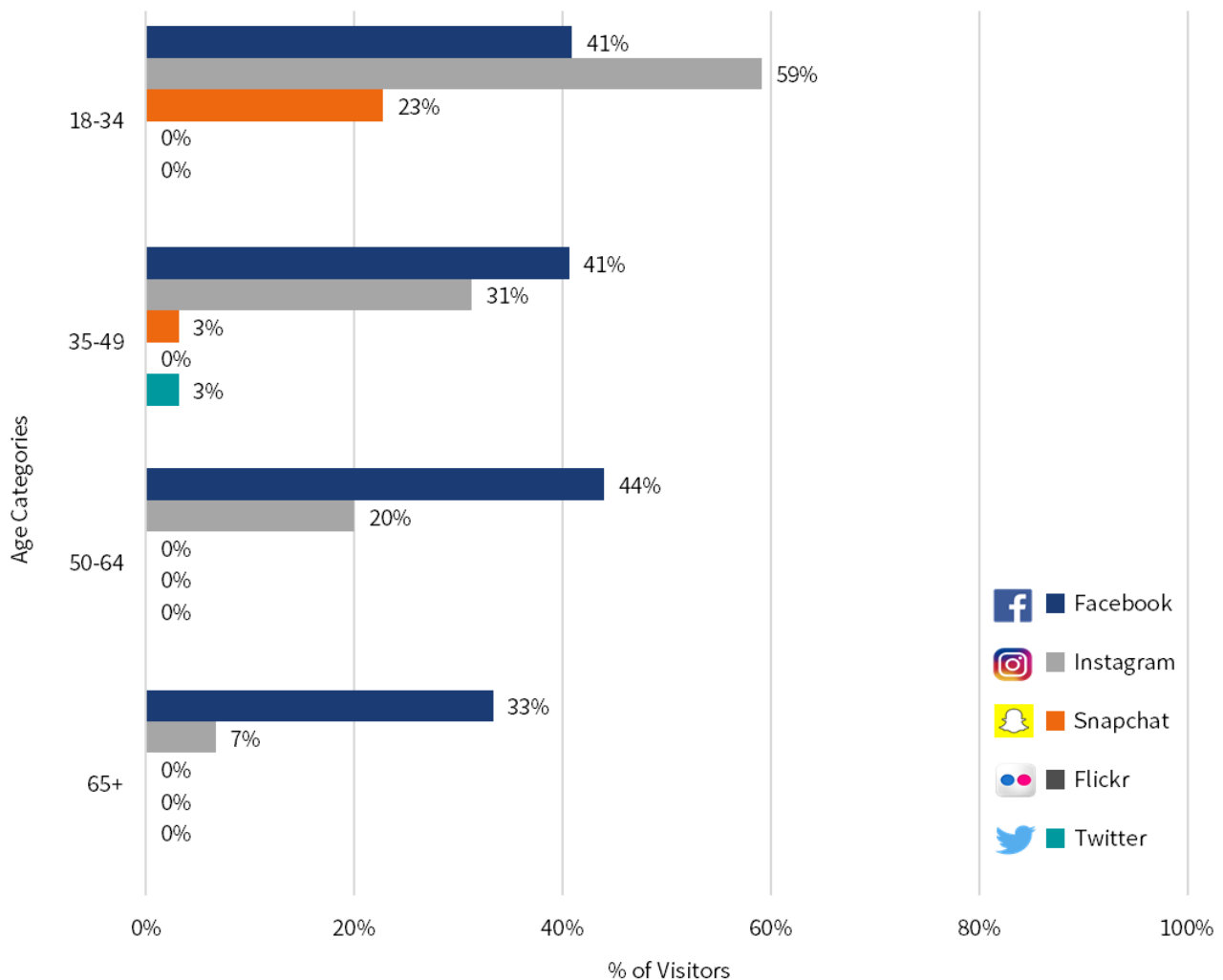


Fig. 13: Percent of visitors by age group who used various social media platforms to share their experience on this refuge with others.

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 (89%), exercising (40%), and wildlife observation (35%) (Fig. 14).
- The top three activities noted as their primary activity on the day visitors were contacted to participate in the survey were hiking (64%), jogging/exercising (15%), and bicycling (10%) (Fig. 14).



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

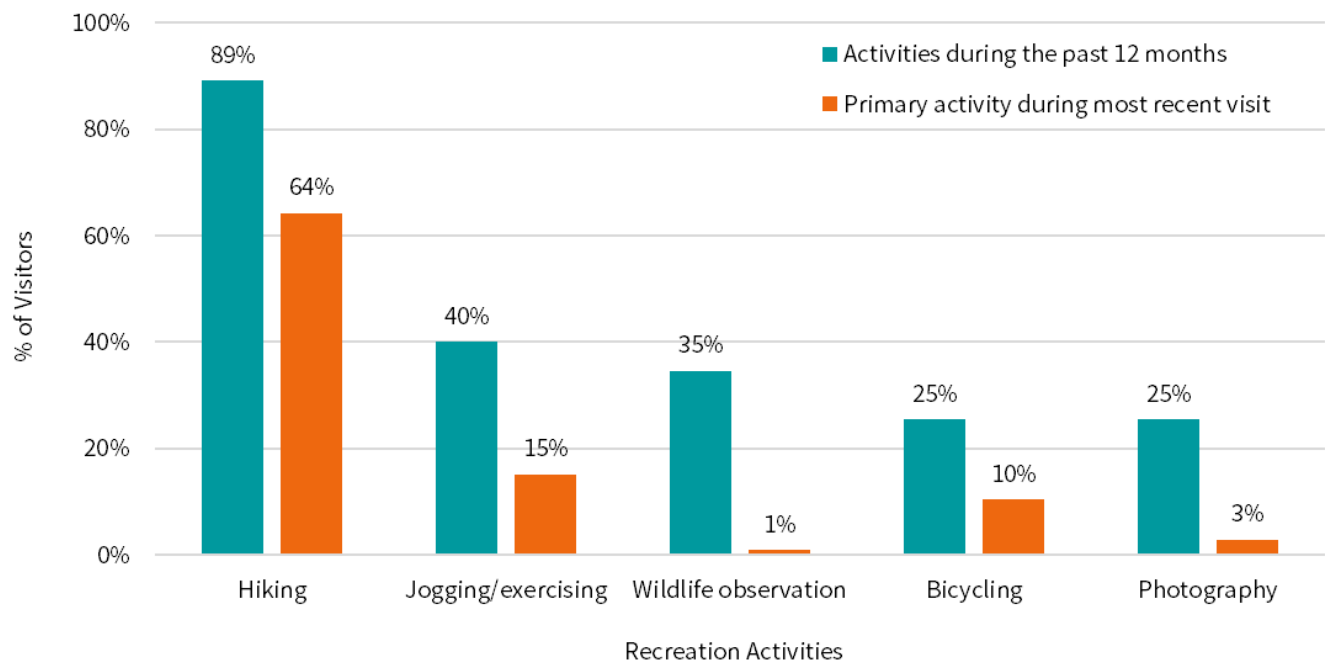


Fig. 14: Recreational activities visitors participated in during the past 12 months and their primary activity during their most recent visit to this refuge.



A path leading to Sweetwater Marsh at San Diego National Wildlife Refuge. Photo credit: Michelle Ferguson.

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:

- 70% of visitors felt welcome during their refuge visit (Fig. 15).
- 86% of visitors felt safe during their refuge visit (Fig. 15).
- 98% of visitors felt comfortable in nature, but 11% did not like being in nature alone (Fig. 16).

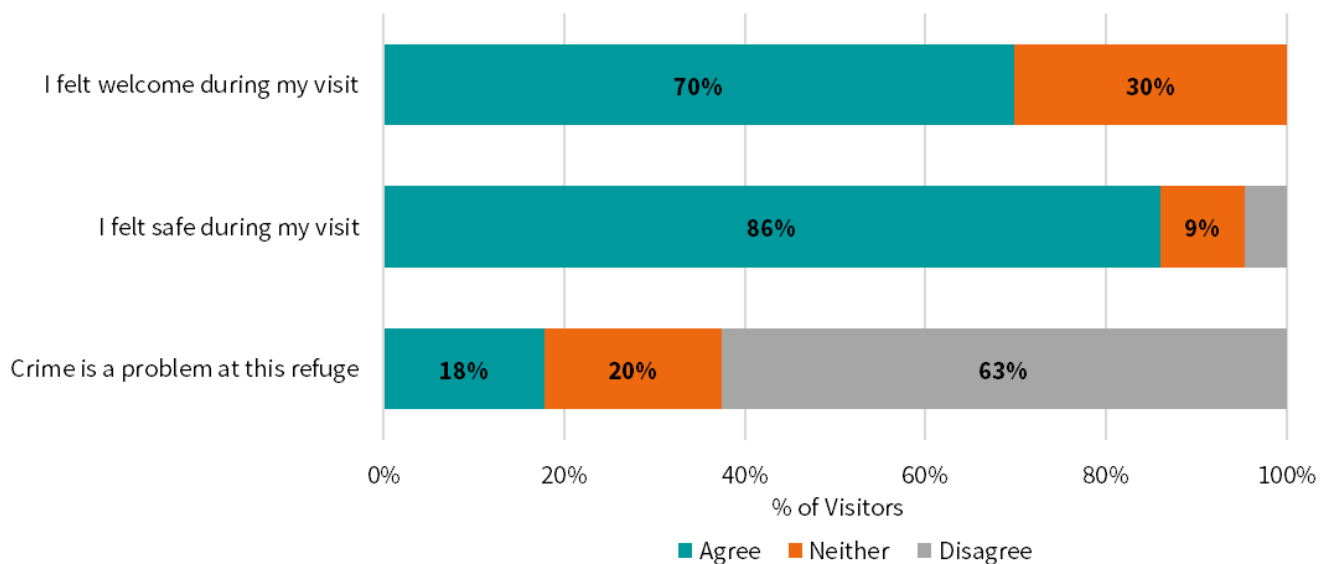


Fig. 15: Visitors' perceptions of safety and feeling welcome at this refuge during their visit.

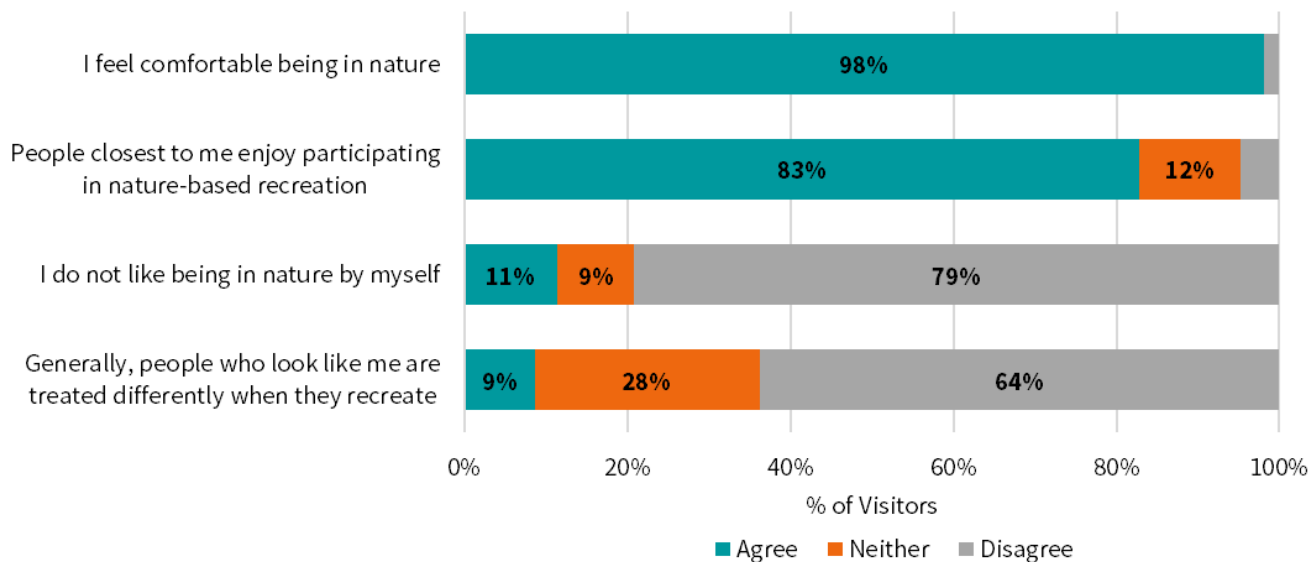


Fig. 16: Visitors' comfort with being in nature.



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).
- 65% 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):

- refuge hours/days of operation (85%),
- courteous and welcoming employees/volunteers (53%), and
- signage stating rules and regulations (51%).

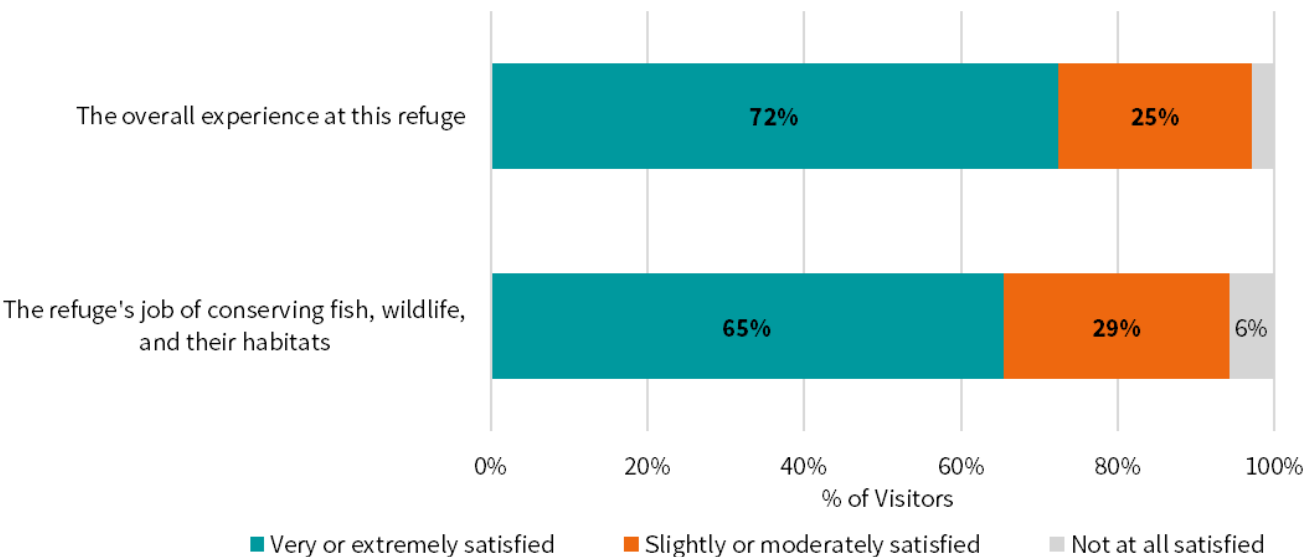


Fig. 17: Visitors' satisfaction with their experience at this refuge and with this refuge's job of conserving fish, wildlife, and habitats.

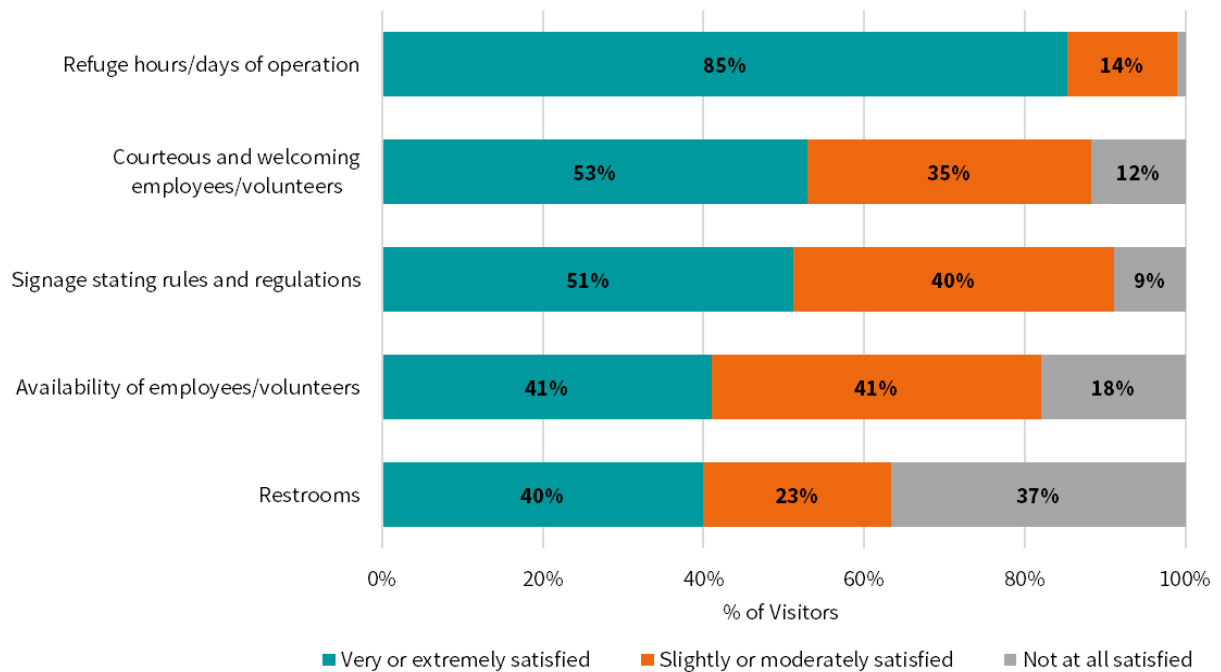


Fig. 18: Visitors' satisfaction with customer service and amenities at this refuge.

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):

- bicycling (96%),
- hiking (86%),
- photography (61%), and
- wildlife observation (61%).

"Our family lives close by and uses the trails [at San Diego National Wildlife Refuge] for running, hiking, and biking and a place to get away so we can relax and take in nature." – Visitor to San Diego National Wildlife Refuge

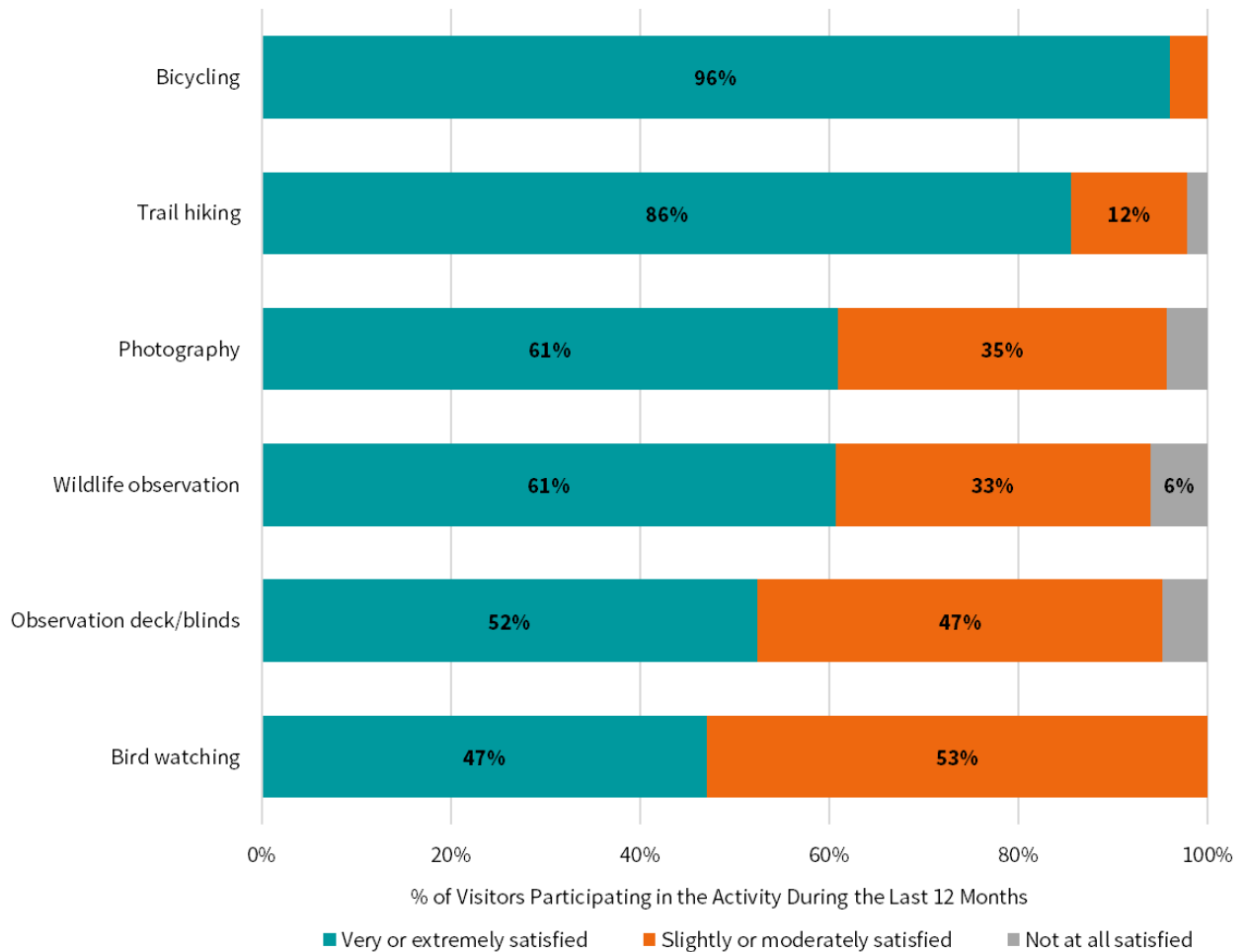


Fig. 19: Visitors' satisfaction with recreational opportunities at this refuge. Only visitors (10 or more) who participated in activities related to each opportunity at this refuge during the last 12 months were included.

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 most satisfied with safety of refuge road entrances and exits (60%).
- Getting around this wildlife refuge, visitors were most satisfied with condition of bridges on roadways (75%), condition of refuge roads (69%), and safety of driving conditions on refuge roads (66%).
- Accessing recreation on this wildlife refuge, visitors were most satisfied with condition of trails and boardwalks (75%) and safety of roads or trails for nonmotorized use (67%).

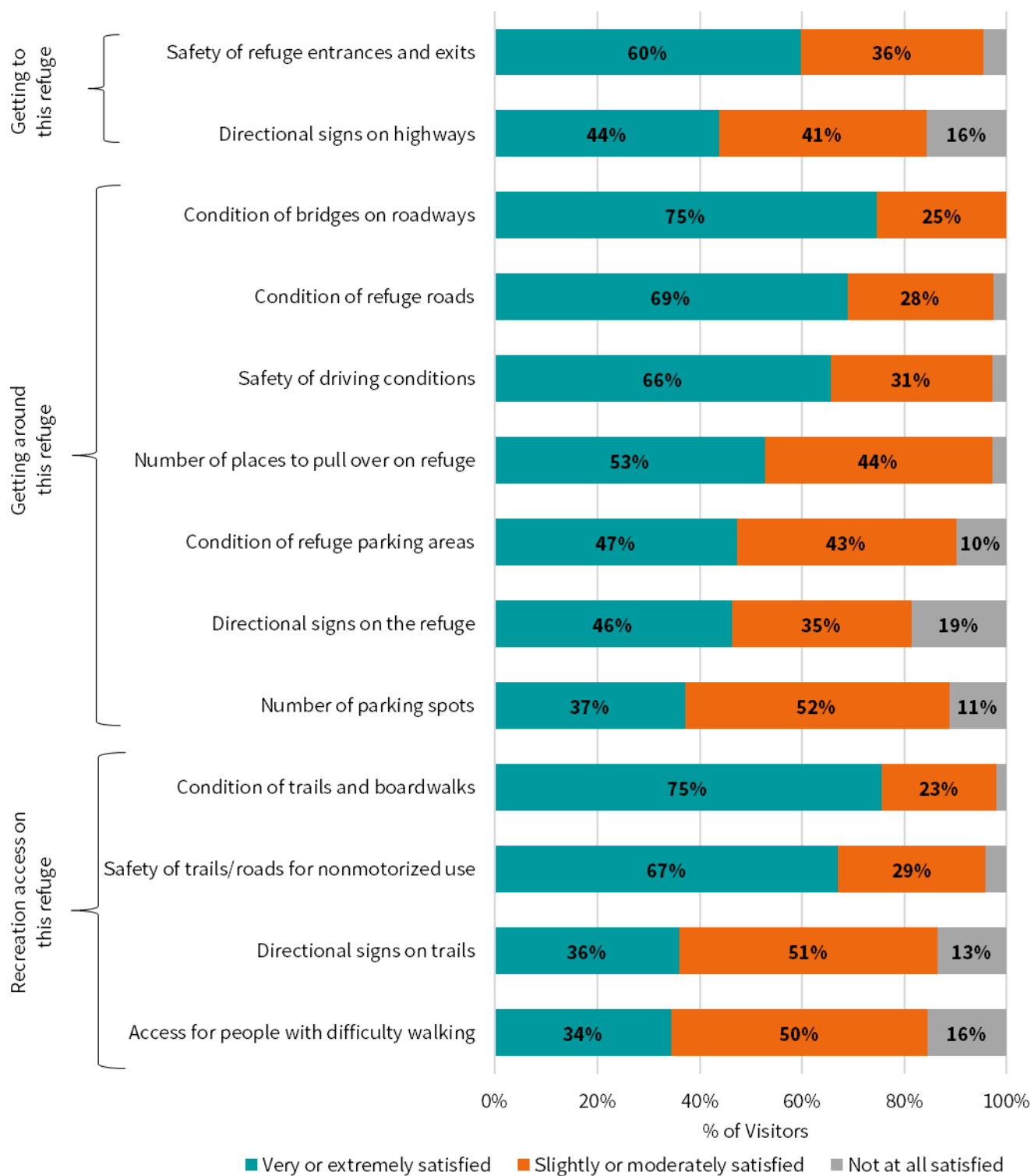


Fig. 20: Visitors' satisfaction with how the refuge is managing transportation-related features.

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; 93%) are as follows:

- On average, local visitors accounted for 63% of expenditures.
- Top trip expenditures by locals were for food/drink and retail (Fig. 21).
- The average amount paid by locals to visit this wildlife refuge was \$25 per person per day (Fig. 21).
- Local visitors were personally willing to pay an additional \$17 per day on average to visit this wildlife refuge (Fig. 22).

Results for nonlocal visitors (those living >50 miles from this wildlife refuge; 7%) are as follows:

- On average, nonlocals accounted for 37% of expenditures.
- Top trip expenditures by nonlocals were for food/drink and lodging (Fig. 21).
- The average amount paid by nonlocals to visit this wildlife refuge was \$49 per person per day (Fig. 21).
- Nonlocal visitors were personally willing to pay an additional \$86 per day on average to visit this wildlife refuge (Fig. 22).
- Nonlocal visitors spent an average of 3 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.

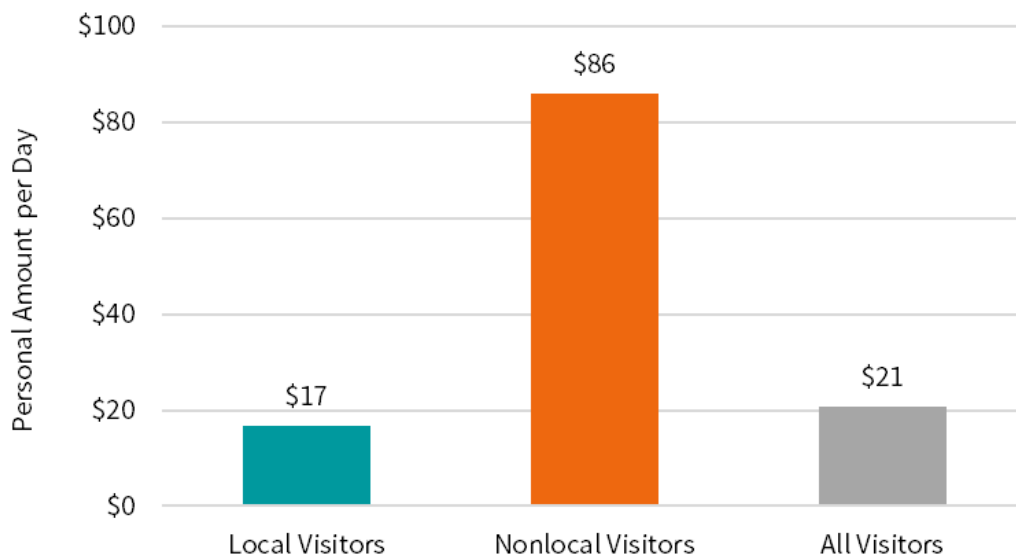


Fig. 22: Total personal willingness to pay per day above and beyond most recent trip expenses if costs were to increase for local, nonlocal, and all visitors. Due to the fixed-response question format, estimates of willingness to pay may underestimate the amount visitors would actually pay. Responses 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 skill-building (68%), highlighting unique local culture (52%), and engaging youth (45%) (Fig. 23).
- The top factors likely to increase visitors' future participation in their primary recreation activity were more infrastructure (35%), recreation equipment available for rent (11%), and more people participating in their primary activity (11%) (Fig. 24).
- The top factors likely to decrease visitors' future participation in their primary recreation activity were less regulations on hunting (36%) and more people participating in their primary activity (23%) (Fig. 24).

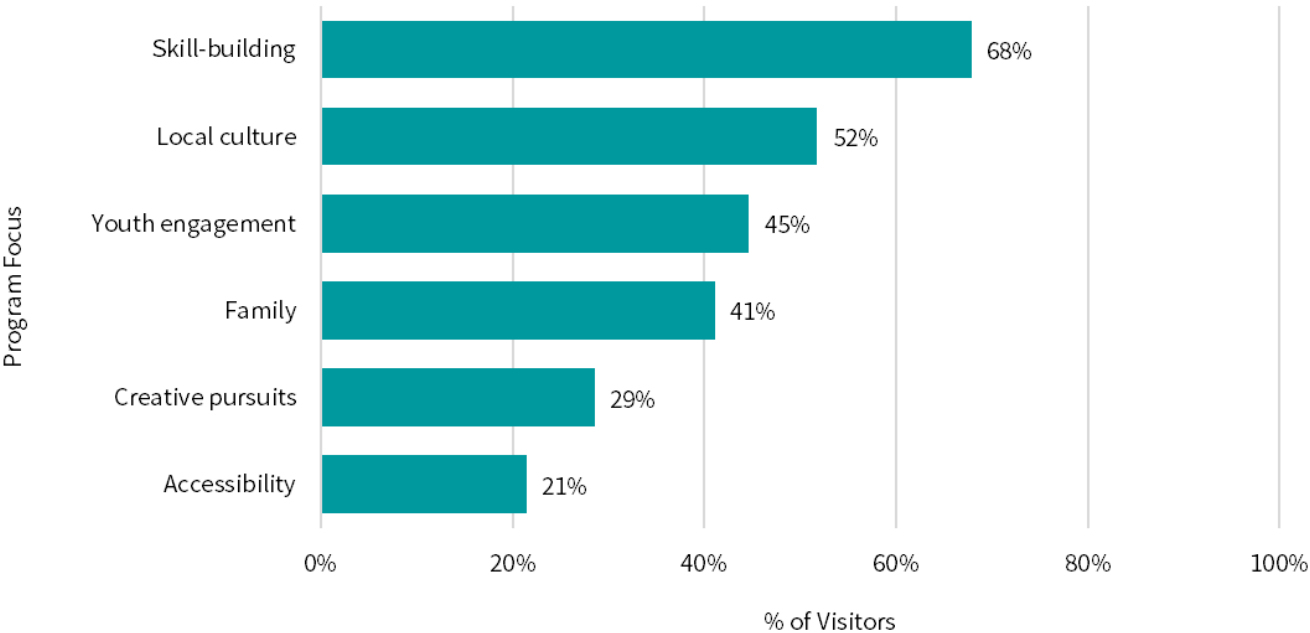


Fig. 23: Types of programs that would encourage visitors to return to this refuge.

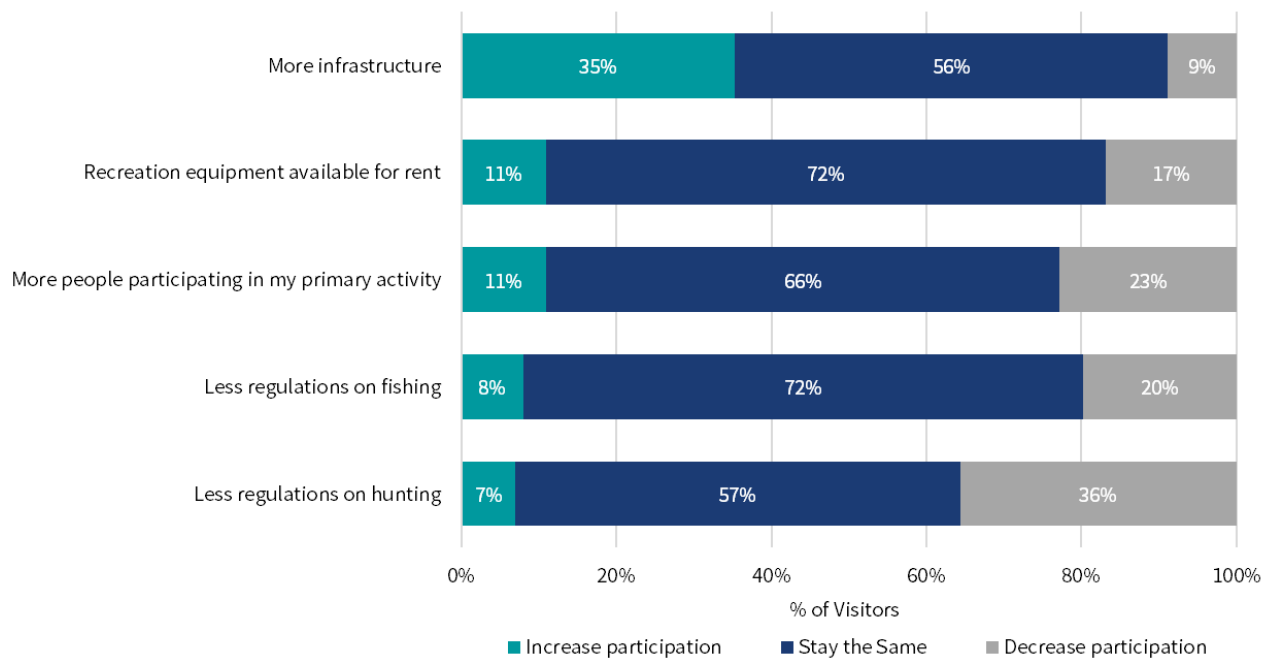


Fig. 24: Changes in visitors’ participation in their primary activity if the listed recreation factors were to change.

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):

- pedestrian paths (40%),
- a bike-share program (21%), and
- bus/tram that provides a guided tour (17%).

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 two resource changes likely to increase visitors’ future participation in their primary recreation activity were a greater diversity of species (47%) and an improvement in the quality of wildlife habitat other than wetlands (44%).
- The top two resource changes likely to decrease visitors’ future participation in their primary recreation activity were more acreage open to hunting and fishing (38%) and less water available for recreation (16%).

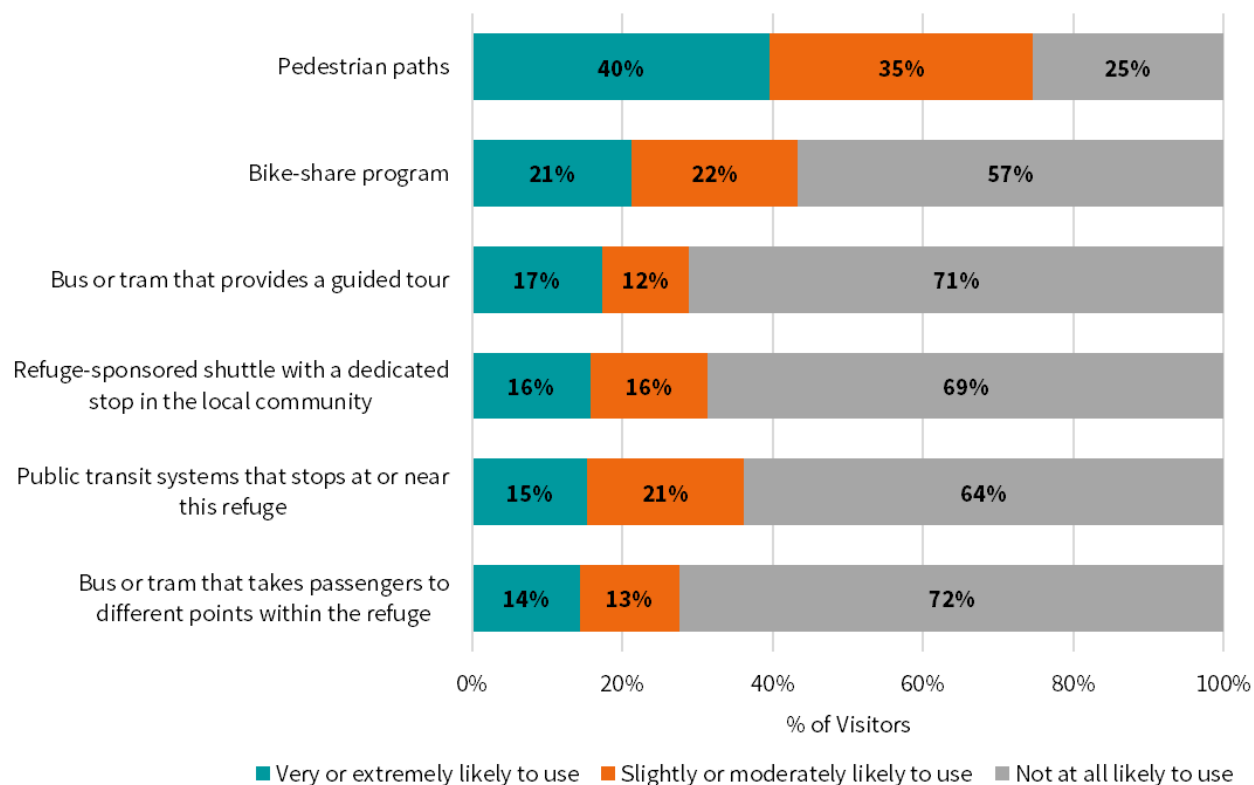


Fig. 25: Visitors' likelihood of using alternative transportation options if offered at this refuge.

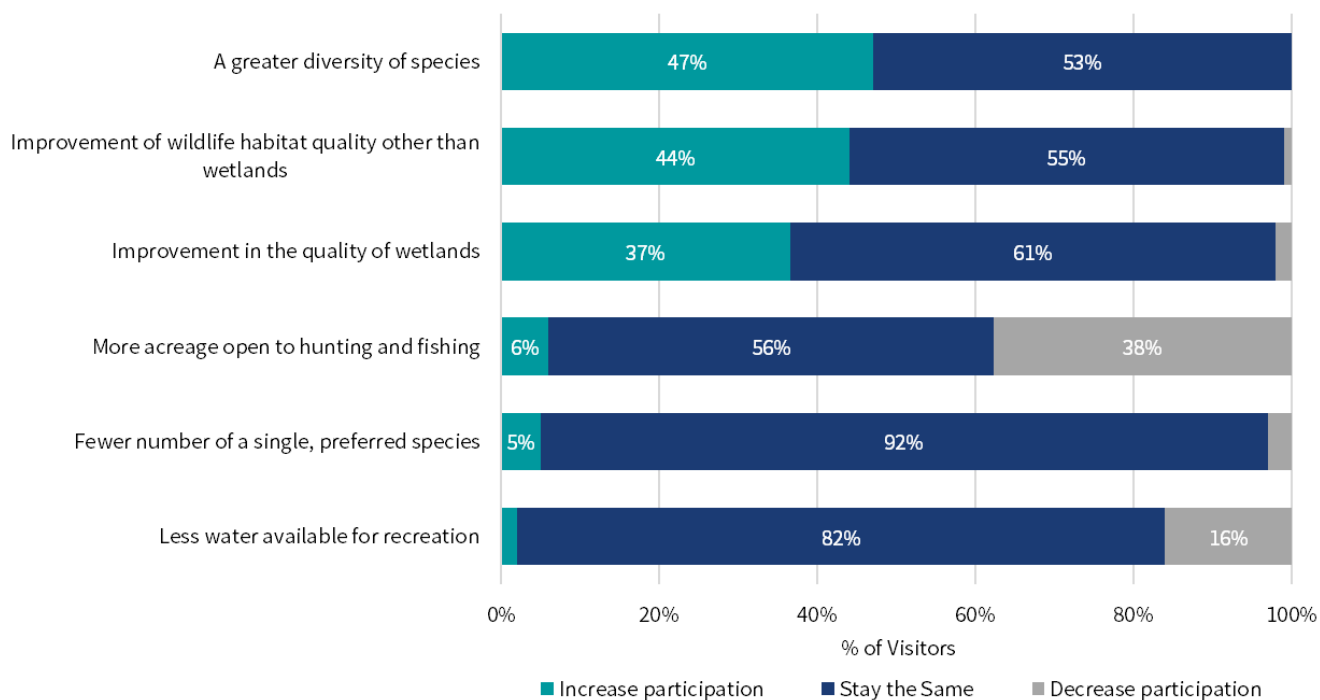


Fig. 26: Changes in visitors' participation in their primary activity if the listed resources were to change.

Conclusion

These individual refuge results provide a summary of trip characteristics and experiences of a sample of visitors to San Diego 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.

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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

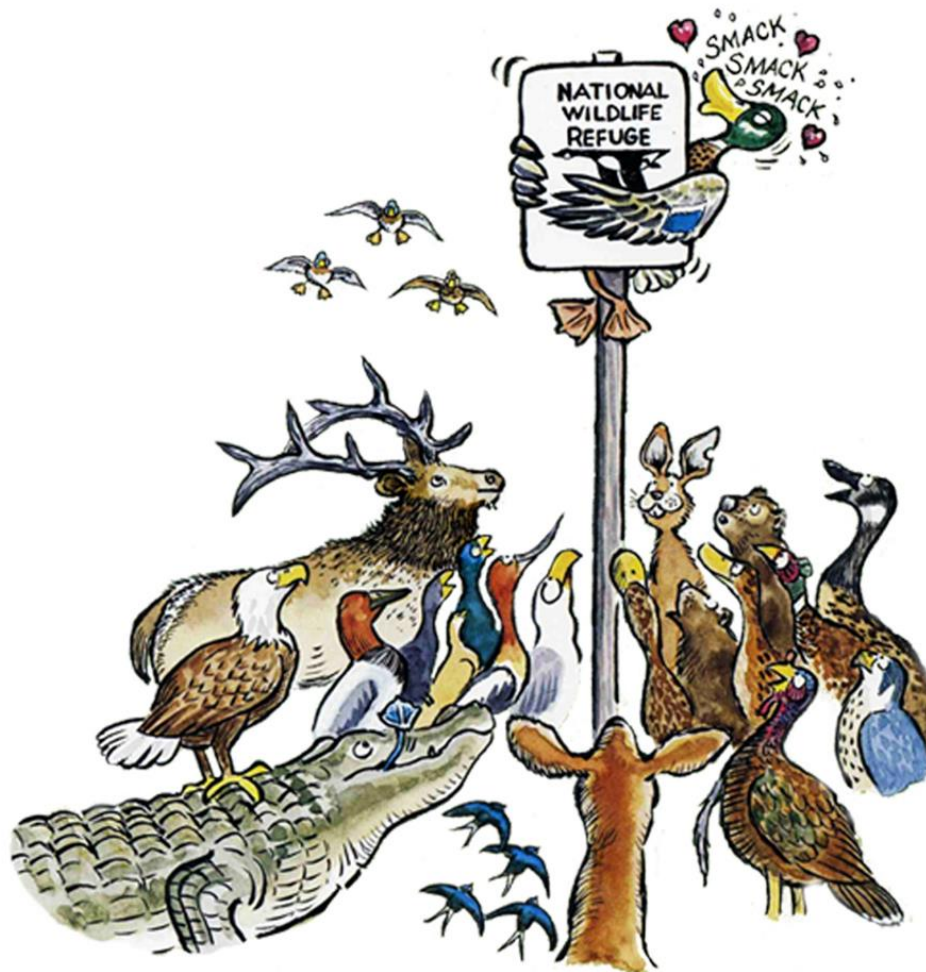
response distribution, meaning if respondents were given a dichotomous choice question, approximately 80% of respondents would select one choice and 20% would select the other (Salant & Dillman, 1994).

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.

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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"/> 35% Wildlife observation	<input type="checkbox"/> 89% Hiking/Walking	<input type="checkbox"/> 1% Volunteering
<input type="checkbox"/> 20% Bird watching	<input type="checkbox"/> 40% Jogging/Running/Exercising	<input type="checkbox"/> 1% Environmental education program (classroom visits, labs)
<input type="checkbox"/> 25% Photography	<input type="checkbox"/> 25% Bicycling	
<input type="checkbox"/> 0% Big game hunting	<input type="checkbox"/> 2% Auto tour route/Driving	<input type="checkbox"/> 1% 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"/> 0% Refuge special event (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 0% Freshwater fishing	<input type="checkbox"/> 1% Foraging (berries, nuts, other)	<input type="checkbox"/> 4% Other (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 0% Saltwater fishing	<input type="checkbox"/> 4% 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"/> 86% It was the primary purpose or sole destination of my trip.
<input type="checkbox"/> 7% It was one of many equally important reasons or destinations for my trip.
<input type="checkbox"/> 6% 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.)

2 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?

This refuge does not have a Visitor Center – no results are presented.

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: 2 hour(s)

If you spent one day or more at this refuge, enter the number of days: 4 day(s)

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

☐ 93% Yes

☐ 7% 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: 2 hour(s)

If you spent one day or more in the local area, enter the number of days: 4 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: 15 minutes

If you travelled more than one hour, round to the nearest hour: 7 hours

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

☐ 78% Spring
(March-May)

☐ 58% Summer
(June-August)

☐ 77% Fall
(September-November)

☐ 86% Winter
(December-February)

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

...this refuge (including this visit)? 28 number of visits

...other national wildlife refuges? 8 number of visits

...other public lands (for example, national or state parks) to participate in the same primary activity as this visit? 13 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"/> 40%	Facebook	<input type="checkbox"/> 6%	Snapchat	<input type="checkbox"/> 0%	Personal blog (for example, Tumblr, Wordpress)
<input type="checkbox"/> 0%	Flickr	<input type="checkbox"/> 1%	Twitter	<input type="checkbox"/> 1%	Travel-related website (for example, Trip Advisor)
<input type="checkbox"/> 29%	Instagram	<input type="checkbox"/> 0%	Vimeo	<input type="checkbox"/> 7%	Other (<i>specify</i>) <u>See Appendix C</u>
<input type="checkbox"/> 1%	Pinterest	<input type="checkbox"/> 1%	YouTube	<input type="checkbox"/> 42%	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"/> 4%	<input type="checkbox"/> 9%	<input type="checkbox"/> 34%	<input type="checkbox"/> 54%	<input type="checkbox"/> 26%
Word of mouth (for example, a friend or relative)	<input type="checkbox"/> 0%	<input type="checkbox"/> 9%	<input type="checkbox"/> 19%	<input type="checkbox"/> 40%	<input type="checkbox"/> 32%	<input type="checkbox"/> 47%
People in the local community near the refuge	<input type="checkbox"/> 12%	<input type="checkbox"/> 16%	<input type="checkbox"/> 23%	<input type="checkbox"/> 30%	<input type="checkbox"/> 19%	<input type="checkbox"/> 60%
Refuge employees or volunteers	<input type="checkbox"/> 27%	<input type="checkbox"/> 12%	<input type="checkbox"/> 12%	<input type="checkbox"/> 18%	<input type="checkbox"/> 30%	<input type="checkbox"/> 69%
Printed map or atlas	<input type="checkbox"/> 19%	<input type="checkbox"/> 16%	<input type="checkbox"/> 19%	<input type="checkbox"/> 32%	<input type="checkbox"/> 13%	<input type="checkbox"/> 71%
Web-based map (for example, Google Maps, Waze)	<input type="checkbox"/> 9%	<input type="checkbox"/> 7%	<input type="checkbox"/> 29%	<input type="checkbox"/> 31%	<input type="checkbox"/> 24%	<input type="checkbox"/> 49%
Refuge website	<input type="checkbox"/> 31%	<input type="checkbox"/> 19%	<input type="checkbox"/> 12%	<input type="checkbox"/> 35%	<input type="checkbox"/> 4%	<input type="checkbox"/> 76%
Travel website (for example, TripAdvisor)	<input type="checkbox"/> 59%	<input type="checkbox"/> 18%	<input type="checkbox"/> 0%	<input type="checkbox"/> 12%	<input type="checkbox"/> 12%	<input type="checkbox"/> 84%
Other website (<i>specify</i>) <u>See Appendix C</u>	<input type="checkbox"/> 50%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 25%	<input type="checkbox"/> 25%	<input type="checkbox"/> 86%
Social media (for example, Facebook, Instagram)	<input type="checkbox"/> 38%	<input type="checkbox"/> 17%	<input type="checkbox"/> 4%	<input type="checkbox"/> 33%	<input type="checkbox"/> 8%	<input type="checkbox"/> 78%
Recreation club or organization	<input type="checkbox"/> 35%	<input type="checkbox"/> 22%	<input type="checkbox"/> 17%	<input type="checkbox"/> 22%	<input type="checkbox"/> 4%	<input type="checkbox"/> 79%
Refuge printed information (for example, brochure)	<input type="checkbox"/> 28%	<input type="checkbox"/> 24%	<input type="checkbox"/> 12%	<input type="checkbox"/> 24%	<input type="checkbox"/> 12%	<input type="checkbox"/> 77%
Kiosks/displays/exhibits at the refuge	<input type="checkbox"/> 11%	<input type="checkbox"/> 20%	<input type="checkbox"/> 28%	<input type="checkbox"/> 15%	<input type="checkbox"/> 26%	<input type="checkbox"/> 57%
Travel guidebook or other book	<input type="checkbox"/> 56%	<input type="checkbox"/> 6%	<input type="checkbox"/> 6%	<input type="checkbox"/> 19%	<input type="checkbox"/> 13%	<input type="checkbox"/> 85%
Tourist information or welcome center	<input type="checkbox"/> 67%	<input type="checkbox"/> 13%	<input type="checkbox"/> 0%	<input type="checkbox"/> 13%	<input type="checkbox"/> 7%	<input type="checkbox"/> 86%
Other source (<i>specify</i>) <u>See Appendix C</u>	<input type="checkbox"/> 50%	<input type="checkbox"/> 0%	<input type="checkbox"/> 0%	<input type="checkbox"/> 13%	<input type="checkbox"/> 38%	<input type="checkbox"/> 90%

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
17%	18%	28%	24%	13%	Surface conditions of refuge roads	3%	3%	26%	51%	18%	NA
15%	16%	29%	23%	16%	Surface conditions of parking areas	10%	20%	23%	32%	15%	NA
11%	11%	31%	26%	21%	Condition of bridges on roadways	0%	3%	23%	52%	23%	NA
4%	9%	30%	29%	28%	Condition of trails and boardwalks	2%	5%	18%	50%	25%	NA
59%	5%	14%	14%	8%	Condition of boat launches	13%	0%	6%	50%	31%	NA
12%	9%	29%	35%	15%	Number of places for parking	11%	26%	26%	25%	12%	NA
33%	14%	27%	17%	9%	Number of places to pull over on refuge roads	3%	17%	28%	33%	19%	NA
32%	6%	12%	32%	18%	Safety of driving conditions on refuge roads	3%	9%	23%	40%	26%	NA
22%	9%	17%	33%	19%	Safety of refuge road entrances/exits	4%	9%	27%	42%	18%	NA
8%	10%	17%	31%	34%	Safety of roads/trails for nonmotorized users (for example, bicyclists and hikers)	4%	8%	21%	43%	24%	NA
24%	15%	28%	22%	11%	Signs on highways directing you to this refuge	16%	17%	23%	27%	17%	NA
25%	11%	21%	32%	11%	Signs directing you around refuge roads	19%	15%	20%	33%	13%	NA
14%	7%	25%	32%	23%	Signs directing you on trails	13%	21%	29%	26%	10%	NA
26%	20%	19%	23%	11%	Access for people with physical disabilities or who have difficulty walking	16%	22%	28%	22%	12%	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	84%	7%
Private/rental vehicle with a trailer (for boat, camper, or other)	1%	1%
Recreational vehicle (RV)	1%	0%
Refuge shuttle bus/tram	1%	2%
Tour bus/van	0%	1%
Public transportation	0%	1%
Motorcycle	1%	1%
Bicycle	14%	17%
Foot (for example, walking/hiking)	23%	47%
Boat	1%	0%
Other (<i>specify</i>): <u>See Appendix C</u>	2%	1%
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)	72%	10%	3%	7%	8%
Bus or tram that provides a guided tour of the refuge with information about this refuge and its resources	71%	7%	5%	8%	10%
Refuge-sponsored shuttle with a dedicated stop in the local community for picking up people at set times	69%	9%	7%	5%	11%
Public transit system that stops at or near this refuge	64%	13%	8%	8%	8%
Bike-share program that offers bicycles for rent on or near this refuge	57%	12%	11%	13%	9%
Pedestrian paths for access to this refuge from the local community	25%	16%	19%	20%	20%

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"/> 31% \$0	<input type="checkbox"/> 12% \$30	<input type="checkbox"/> 8% \$100	<input type="checkbox"/> 0% \$250
<input type="checkbox"/> 20% \$5	<input type="checkbox"/> 2% \$45	<input type="checkbox"/> 0% \$125	<input type="checkbox"/> 0% \$350
<input type="checkbox"/> 12% \$10	<input type="checkbox"/> 0% \$60	<input type="checkbox"/> 0% \$150	<input type="checkbox"/> 2% \$500
<input type="checkbox"/> 10% \$20	<input type="checkbox"/> 0% \$75	<input type="checkbox"/> 1% \$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
8%	4%	15%	40%	33%	Convenient hours/days of operation for this refuge	1%	1%	13%	49%	36%	NA
53%	24%	14%	4%	5%	Availability of employees or volunteers	18%	8%	33%	23%	18%	NA
53%	16%	15%	7%	9%	Courteous and welcoming employees or volunteers	12%	12%	24%	38%	15%	NA
12%	10%	31%	27%	20%	Signs with rules/regulations for this refuge	9%	12%	28%	42%	9%	NA
This refuge does not have a Visitor center											
27%	11%	18%	22%	22%	Well-maintained restrooms	37%	0%	23%	23%	17%	NA
38%	19%	26%	11%	6%	Recreational structures (decks, blinds, platforms)	9%	9%	24%	42%	15%	NA
31%	19%	26%	11%	14%	Bird-watching opportunities	5%	8%	34%	38%	14%	NA
15%	18%	35%	20%	13%	Opportunities to observe wildlife other than birds	5%	12%	28%	40%	16%	NA
18%	16%	36%	18%	13%	Opportunities to photograph wildlife and scenery	1%	5%	28%	46%	20%	NA
27%	17%	31%	16%	10%	Environmental education opportunities	16%	10%	32%	29%	13%	NA
86%	4%	9%	1%	0%	Hunting opportunities	9%	22%	26%	26%	17%	NA
73%	8%	14%	3%	2%	Fishing opportunities	8%	23%	19%	31%	19%	NA
2%	2%	7%	29%	59%	Trail hiking opportunities	2%	3%	11%	43%	40%	NA
22%	9%	19%	15%	35%	Bicycling opportunities	1%	7%	20%	36%	36%	NA
58%	7%	15%	13%	8%	Water trail opportunities for canoeing or kayaking	10%	25%	15%	40%	10%	NA
36%	21%	26%	9%	8%	Volunteer opportunities	6%	14%	42%	25%	14%	NA
22%	14%	20%	27%	17%	Wilderness experience opportunities	2%	12%	26%	44%	16%	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.	0%	0%	30%	43%	26%
I felt safe during my visit to this refuge.	0%	5%	9%	49%	37%
Crime <u>is</u> a problem at this refuge.	36%	27%	20%	14%	4%
I feel comfortable being in nature.	2%	0%	0%	38%	60%
I do <u>not</u> like being in nature by myself.	58%	21%	9%	10%	1%
People closest to me enjoy participating in nature-based recreation.	0%	5%	12%	51%	31%
Generally, people who look like me are treated differently when they participate in nature-based recreation.	44%	20%	28%	8%	1%

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.	6%	3%	26%	46%	19%
The quality of the overall experience when visiting this refuge.	3%	0%	25%	48%	25%

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	16%	82%	2%
More acreage open to hunting and fishing	38%	56%	6%
More infrastructure (for example, bathrooms, observation decks)	9%	56%	35%
Recreation equipment available for rent (for example, fishing rods, binoculars, snowshoes)	17%	72%	11%
Less regulations on fishing	20%	72%	8%
Less regulations on hunting	36%	57%	7%
A greater diversity of species	0%	53%	47%
Fewer numbers of a single, preferred species	3%	92%	5%
More people participating in my primary activity	23%	66%	11%
An improvement in the quality of wetlands	2%	61%	37%
An improvement in the quality of wildlife habitat other than wetlands	1%	55%	44%

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

87% Yes 9% No 4% 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.*)

46% 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:

45% Programs that engage youth 29% Programs that focus on creative pursuits (for example, art, writing, meditation)

41% Programs that focus on family/multiple-generations 21% Programs that support people with accessibility concerns (for example, difficulty walking, in a wheelchair)

68% Programs that teach skills to visitors 9% Other (*specify*) See Appendix C

52% 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? ☐ 58% Male ☐ 42% Female

2. In what year were you born? 1971 (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"/> 7%				<input type="checkbox"/> 64%				<input type="checkbox"/> 29%			

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

<input type="checkbox"/> 75% White	<input type="checkbox"/> 1% American Indian or Alaska Native
<input type="checkbox"/> 21% Hispanic, Latino, or Spanish	<input type="checkbox"/> 1% Middle Eastern or North African
<input type="checkbox"/> 0% Black or African American	<input type="checkbox"/> 2% Native Hawaiian or Other Pacific Islander
<input type="checkbox"/> 4% Asian	<input type="checkbox"/> 1% 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"/> 6% Less than \$10,000	<input type="checkbox"/> 10% \$35,000 - \$49,999	<input type="checkbox"/> 29% \$100,000 - \$149,999
<input type="checkbox"/> 3% \$10,000 - \$24,999	<input type="checkbox"/> 6% \$50,000 - \$74,999	<input type="checkbox"/> 17% \$150,000 - \$199,999
<input type="checkbox"/> 6% \$25,000 - \$34,999	<input type="checkbox"/> 13% \$75,000 - \$99,999	<input type="checkbox"/> 10% \$200,000 or more

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

<input type="checkbox"/> 42% Employed full-time	<input type="checkbox"/> 1% Unemployed	<input type="checkbox"/> 26% Retired
<input type="checkbox"/> 10% Employed part-time	<input type="checkbox"/> 3% Homemaker/caregiver	<input type="checkbox"/> 1% Disabled/unable to work
<input type="checkbox"/> 9% Self-employed	<input type="checkbox"/> 5% Student	<input type="checkbox"/> 4% 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?”

Other Activity	Frequency
Birthday get together	1
Dog walking	1
Looking at the plants and animals	1
Trail repair	1

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

Primary Activity	Frequency
Activity with dog(s)	3
Bicycling	11
Bird watching	2
Exercising	2
Hiking	68
Interpretation	1
Other	1
Photography	3
Running	14
Wildlife observation	1

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
Google Maps	1
Google+	1
Loselt!	1
Strava	3
Yelp	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
AllTrails	2
Google	1
Yelp	1

Other Information Sources	Frequency
AllTrails	1
Friend	1

Survey Section 4

Question 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).”

Other Expenses	Frequency
Bike shop	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
General environmental education	2
Hiking-related programs	2
Water-based activities	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=29)

Bicycles drive too fast especially on blind corners.

Bicycles often go too fast on trails, impacting safety of hikers. The parking area is clearly the biggest need for improvement. Too small, car break ins.

I always run to the refuge from my house, so transportation is not a factor for me.

I consider this refuge to be perfect! No need to change anything, and definitely don't "improve" anything.

I ride my bike from a local part into this refuge.

I think bicycles should not be allowed. They are dangerous to walkers and prevent cyclists from appreciating the ecosystem of the park.

It would be nice to have a large sign indicating where the refuge is that can be seen from the road. I only found out about this refuge because I drive past it once a week and got curious where everyone was biking to.

Limited parking here.

Los letreros casi no necesitan estar mas grandes. (translation to English: the signs almost don't need to be bigger.)

Parking area is small and minimally structured, however it was adequate for my visit. Can be a bit tedious turning in from/to busy highway.

Parking areas 'sketchy' after rain, large puddles in small parking area. Parking options not clear & very minimal.

Parking bleeds over into an illegal zone over the weekends because there is no place else. I haven't seen anyone get ticketed, but if they did - I'd consider it an injustice.

Parking is the biggest problem. If you can get funding for one improvement, that would be the biggest satisfier. Also there are regular break-ins of parked vehicles. Another issue is trails shared by bikes and hikers. The trails are not wide enough in some places.

Please mark trails. More signs including trail distance.

The condition of the top layer of material (either decomposed granite or native soil/sand) is critical for the usability of each trail path. Bridges and signage are in excellent condition. The trails tend to get narrow, washed out, and overgrown as you go further down each path.

The first walkway bridge washes out with every big rain. Needs to be more secure & stable.

The parking lot is tiny, but I think there's already plans under way to fix that.

The Sweetwater Marsh Unit does not allow cars to enter. A shuttle bus carries visitors to the Discovery Center, and my visits there are to see the exhibits. However, I frequently use the South San Diego Bay Unit as a cycling corridor.

The trails by the Sweetwater River Bridge have scarce parking, and there's nowhere to pull off alongside the road due to landscape features. We were lucky someone was leaving when we arrived so we got a spot but otherwise it was a create-your-own-spot kind of free-for-all situation for parking.

There is a great need for switch-backs on the hills to prevent erosion (fences needed to prevent cutting of switch backs). Mountain bike trails are really thoughtless meanderings – loops are needed. Micro-ponds in drainage areas for wildlife during dry seasons. Nest site for birds of prey.

There is adequate parking most days. The lot could be improved w/some grading & maybe decomposed granite overlay. Just a thought.

There was not a clear indication of where the staging area for the trail was. We parked in a city of Chula Vista Park parking lot and then wandered around until we found the trailhead. The trails in the refuge were all unmarked and it was difficult to navigate.

This particular area has no signage posted. There are no marked trails. I do not particularly care if the trails are maintained or marked. I like the area just the way it is.

This refuge is for hiking and biking mostly. I like taking my dog there.

Tiny parking area.

Two signs = no public access, and no motorized vehicles. Then why are hikers/bicycles allowed? Please make the signs consistent.

We parked on a street in the adjacent neighborhood. There were no signs and no refuge roads.

We went to the refuge after 2 days of heavy rain. Some trails were washed away. Also, there was no sign directing us. We observed the others hiking in the area for directions.

You aren't allowed to bring motorized vehicles through this refuge.

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=27)

Add a bathroom.

At this refuge, perhaps one bathroom facility would be nice.

Drinking water would be nice to have available. A group of kids tried to get fresh water across the street at the YMCA, but were denied by the staff. Possibly a restroom.

For a small trail area there was lots to see! A bird refuge, signs about what certain plants were, a nice bridge spanning over the river (not the historical Sweetwater bridge but a wooden one further in on the trail). We even saw an owl scoping out some prey! Facilities aren't always important because if there's too much bustling it scares away the wildlife who are supposed to live there. More decks or platforms for getting views would always be welcome though.

High voltage power line structures need bird of prey nest sites for viewing. A real trail system would be nice. Signs to advise on what to do when encountering rattlesnakes.

I didn't know it was a refuge. I was surprised to see the volunteers asking for our reactions.

I hike a lot all over San Diego County, and this refuge is the place I hike the most. I like it a lot, but the parking lot needs to be greatly improved, and something should be done to improve bikes and hikers sharing narrow trails. Also there are lots of snakes here (the only place I have ever seen them), and improved warning signs should be considered. I'm very happy with the availability of dog waste bags at the parking lot. I'd be happy if the trail system in the refuge were expanded.

I like how undeveloped it is. Please do not add tours, visitor centers or the like. Maybe an occasional guided walk with a naturalist.

It would be nice but not required if there were trail markers that indicate distance, route info.

Just let everyone in, no motorized vehicles. E-bikes should be an exception. They have minimal impact, unlike dirt bikes.

Many of the signs blocking off interesting off-trail areas should be taken down. Perhaps new trails should be added. But the 'refuge' is better without ridiculous regulations, and people who wish to go off-trail will do so regardless.

Many of these questions do not apply, as this was previously just a fairly small open public space with fire roads and bike trails. Only recently did it apparently become a wildlife refuge.

Need better maintenance. Invasive and nonnative species should be removed. More dog poop bags and more trash receptacles (maybe near bridge) (wood bridge).

No tenian sanitarios para cuando van los estudiantes. (translation to English: They had no bathrooms for when the students go.)

Our family lives close by and uses the trails for running, hiking, and biking and a place to get away from the majority of people so we can relax and take in nature.

Should open up old hiking trails that are off limits now. San Miguel Mountain.

Signs very important of trails.

The concentration of hikers has dramatically increased at this one summit hike, since all other summit trail hikes in the same refuge have been closed permanently. This over-use has dramatically led to trail erosion and need for on-going maintenance. It also takes away from the enjoyment.

There are no restrooms. Not even portable toilets. Toilet paper and people urinating around the tree line near the parking lot is very common.

There is a nice city park adjacent to the refuge with bathrooms/parking with no refuge access that I know of. Most people park on a residential street up the hill and walk past several residences to enter the refuge, which probably annoys them on a daily basis. I would look into creating a clearly marked trail head from the Chula Vista Park into the refuge.

There is nothing here, I like that. Less people are attracted to it, so the hike stays quiet and the area stays cleaner.

There's no visitor center or services available (that I know of), and I like it that way. More space for wildlife.

This is a basic wild space/refuge with few, if any amenities - which is generally fine with me, as someone who likes to just get out and explore.

This is a lovely refuge. I've lived within a few miles of it for 10 years and only learned about it in the last year when my daughter hiked in it. If she hadn't, I still wouldn't know about it. It's lovely.

This is a wilderness refuge. Not much applies...

This place is perfect already. Please do not try to make it better.

This refuge doesn't have facilities - that's how it should be.

End of Survey

General Comments (n=26)

As a runner with knee problems, I enjoy running on trails with sand, dirt, or decomposed granite, as this surface in particular provides greater shock absorption during exercise. Ideally this specific trail would have periodic scraping or shaping to correct washouts and establish legitimate trails. There is a gate that should be open to increase the trails distance at the end of one of the main trails. The smaller trail on the other side of the stream is very narrow and washed out/overgrown in several areas. This will be difficult to improve because of the distance from service roads and the grade. The trails near the steel bridge, entrance sign, and open field area should be widened with brush clearing and tree trimming activities occurring as well. The bridges are in excellent condition although one shifts perpendicularly during heavy rain. Of all the nature trails in San Diego County, this is by far the most maintained. Jagged rocks and washouts keep me away from most other trails.

Everything is very good, except because it's no bathrooms allowed!!

I enjoy quiet places that don't attract a lot of people. Out there is my quiet time...

I go to the 'iron bridge' in Rancho San Diego to exercise. Most people are there to either walk, mountain bike or walk their dog. It is not really for wildlife viewing unless you like to step across rattlesnakes! Therefore, I would prefer Fish and Game be more open to the recreation of the place and do away with their restrictive signs.

I like the refuge the way it is. No improvements are needed.

I like this refuge because it does not have the feel of other refuges. Needs nothing.

I love this refuge.

I primarily use the trails in this refuge for trail running only. The trails are nice but some are blocked off to access and I wish they were open and maintained. Also, some of the trails have limited parking and no restroom facilities at the trailhead. There is a reputation for crime (car break ins) at some areas. The parking at some trailheads is very meager.

I really appreciate the hard work volunteers have put into maintaining and restoring this habitat. Thank you!

I stay with relatives in San Diego for a few days before heading to Baja. I dislike San Diego, but the little slice of nature (San Miguel Ranch Open Space) makes the stay tolerable. There is plenty of wildlife there, if one is a patient observer. I ride mountain bikes and motorcycles off-road. The trail system is sufficiently undeveloped to not be worth my time (too easy). Motorized vehicle should not be permitted now or in the future at SMR open space. The maintenance roads for the high voltage structures are too wide and just plain ugly. They also need water bars, water diversion measures, etc. Some of the uphill trails need fences to prevent cutting of

switchbacks. The erosion is not insignificant. Rattlesnake signs are needed (urge people not to harm them). Some of the arroyos/drainage ravines could use micro-ponds to hold a bit of the water into the dry season. Micro-ponds can be and should be natural in form and appearance. This would help wildlife and the people observing them and as climate change's effects increase, they may be a matter of life and death. Lastly, trash is sometimes a problem. More cans/receptacles, signage, and fines would be welcome. Trail signs also helpful.

I visited this refuge just for trail running. I would like to see more and better defined trails.

I was at Sweetwater and your interns were professional and very friendly. Good choice!

I went to this refuge solely for hiking. Reasons I may not return: no bathroom and no shade along the hike, and there are many other hiking options in my area.

I'm glad to participate in this survey to help the management of refuges and parks. However, I hope these surveys won't make the parks feel they need to cater too much to the human visitors and forget about the residents of the forest and their needs. Keep up the great work!

It's going to take more than putting up signs to save the wildlife.

Keep protecting our wildlife and I will do the same.

Keep up the great work! Long live nature! <3

More parking. Security to prevent vehicle break ins. Improve biker/hiker traffic.

Only adverse comment concerns the number of vagrants and the trash and feces they leave. Current improvements to park are greatly appreciated. Trails, fauna preservation, and doggie (vagrant) poop bag station and trash cans.

Thank you very much for your service. Definitely signs on trails there are zero marked trails. Hiking group programs weekly.

The coordinators that had a table at the refuge were very friendly and helpful. They helped us navigate the park.

There are dozens of random trails across the hills due to the barren terrain and ease of walking anywhere. Efforts are being made to make a more formal switchback trail. I would possibly leave one main steep trail straight up the hill for workouts, because they're going to run it anyway if they want a burn. (zig zag railway ties maybe?) As mentioned before, I would love to see a trailhead from the adjacent Chula Vista City Park, so people aren't peeing/making noise/throwing trash in the residential area of the existing entrance.

This is a small refuge with an ordinary number of birds but little wildlife. Coyotes are quite common and in twenty years I have seen two deer and too many rattle snakes. This refuge is used mostly for exercise walkers/dog walkers and mountain bikers. The dirt trails are in very good condition and footing is not a problem. I am not a biker, but those who are seem to enjoy the varied terrain. We walk our dog here two or three days a week and most of the walkers/hikers and dog walkers are very considerate of one another. This is not a "destination" refuge, but more of a local "hang out" much appreciated by those of us who live in the area. We encourage visitors to pick up their trash and the refuge is quite clean.

This is a very natural reserve without a lot of man-made attractions. The information on the trail about wildlife and plant life is good and could be expanded. It's not overcrowded once on the trail and it attracts people of all abilities for hiking and biking. There are level trails and more difficult ones. It's nice and peaceful. It's very nice for a quiet get away in the city.

This refuge is one piece of a larger one being cobbled together with private developer mitigation lands, lands owned by two cities, as well as lands owned by the county, state and national. So it is a complex endeavor that I am told is near completion. However, the SDBNWR is the only one with outreach to hear from the public. Other areas have been closed entirely without public input and before a master recreational trail plan has been developed.

When approached to participate in this survey, I believe I was in the San Diego National Wildlife Refuge complex on the Sweetwater River upstream from the bay refuge. Therefore, I was a little confused as to how to respond. I visit both areas for different wildlife experiences.