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Prepared by NORC at the University of Chicago

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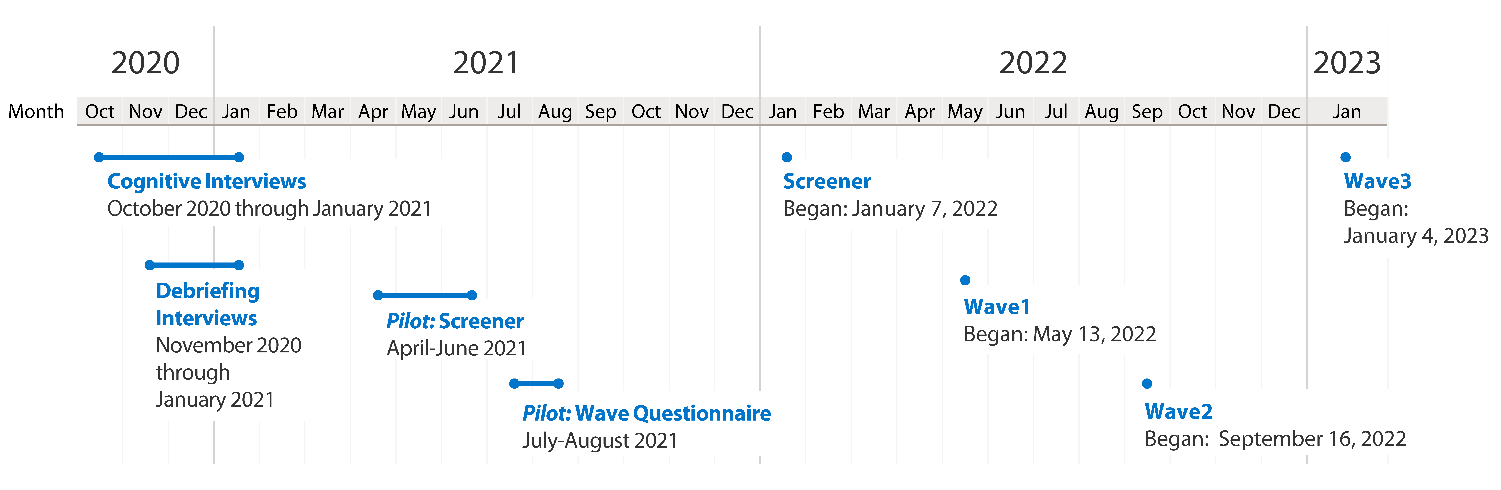
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## Introduction

NORC assisted the Association of Fish and Wildlife Agencies (AFWA) and the US Fish and Wildlife Service (USFWS) in fielding the 2022 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR). The National FHWAR Survey, conducted about every five years since 1955, is a comprehensive survey of anglers, hunters, and wildlife watchers and includes information on their participation and how much they spend on these activities in the United States. This methodology report serves as an important resource for those using the 2022 National FHWAR data. This report lays out the procedural details of the many phases of the project, including pretesting, the screener, and Waves 1, 2, and 3. All elements of this project were reviewed and approved by NORC’s Institutional Review Board in addition to the Office of Management and Budget.

This project spanned three years and included many phases, as highlighted in Exhibit 1 below.

Exhibit 1. Project Timeline



## Pre-Testing Phase

In preparation for launching the 2022 National FHWAR Survey, NORC developed a questionnaire to collect information on fishing, hunting, and wildlife watching participation. In consultation with AFWA, NORC redesigned the survey instruments for 2022 to address concerns about response bias, recall bias, and respondent burden with special attention to items AFWA/USFWS specifically requested be addressed. This process included cognitive and debriefing interviews and a pilot test to improve data reliability and reduce respondent burden.

### Cognitive and Debriefing Interviews

#### Cognitive Interviews

NORC methodologists conducted cognitive testing of the questionnaires to ensure the optimal design of the survey and that the survey questions worked well with respondents from a variety of backgrounds. Cognitive interviews are used to test and improve survey questions prior to fielding a survey. The cognitive interview phase tested for issues such as question clarity, respondent ability to answer the questions, potential sensitivity of the questions, and overall flow of the questionnaires. These interviews provided information to assess the functioning of the questionnaire and inform improvements.

Interview participants were recruited via email outreach made to lists of hunting and fishing license holders and through personal networks in Arizona, California, Florida, Iowa, Kentucky, Maryland, Ohio, Oregon, Virginia, and Washington. Interested individuals were asked to complete a screener that collected demographic information as well as information on their fishing, hunting, and wildlife watching activities. NORC recruitment staff selected individuals who represented a range of characteristics and invited them for an interview. Over the course of two rounds of cognitive interviewing and one round of expenditure interviews, 64 interviews were completed between October 2020 and January 2021. Testing was conducted over three rounds to allow for analysis of interleafed vs. grouped screener approaches (See Question Grouping section below), the accuracy and burden of bounding questions, and follow up expenditure debriefings. Interviews were conducted in English only. A $40 incentive was given to all who participated in the interviews.

Exhibit 2: Recruitment Totals by Cognitive Interviewing Round

|  |  |  |  |
| --- | --- | --- | --- |
| Round | Dates | Instrument | Number of Respondents |
| Round 1 | 10/9/20 – 10/29/2020 | Screener  Fishing  Hunting  Wildlife Watching | N = 3  N = 6  N = 2  N = 6 |
| Round 2 | 11/18/20 – 1/8/21 | Screener  Fishing  Hunting  Wildlife Watching | N = 11  N = 9  N = 10  N = 7 |
| Round 3 | 11/18/20 – 1/8/21 | Expenditure Follow-Up | N = 10 |

Due to the COVID-19 pandemic, all interviews were conducted online using the Zoom platform. The screener survey was programmed in Voxco and presented on the screen during the interview. Mockups of a web version of the wave questionnaires were created in PowerPoint. The interviews were video recorded with respondent permission. Interviews lasted no longer than one hour.

NORC staff who were trained and experienced in online cognitive interviewing conducted the interviews. Interviewers first obtained informed consent from respondents. They then began video recording if respondents provided permission and launched the survey. Respondents read the questions presented on the screen to themselves and then stated their response out loud to the interviewer. Interviewers conducted cognitive probing on selected survey items to explore respondents’ processing of the questions.

The interview procedures were detailed in cognitive interview protocols. An example of protocol is available for reference in Appendix A. The protocol included a consent statement, a listing of questions to be tested, and suggested probing language to use in the interview. Although new items and items that the project team considered potentially difficult for respondents were highlighted in the protocol for testing, any of the items in the questionnaire could be examined in depth during the interview if the interviewer observed an issue based on respondent comments or reactions to the question. The protocol included guidance on neutral probing that could be applied to any survey item.

#### Debriefing Interviews

NORC also conducted debriefing interviews with ten of the cognitive interview respondents to understand their expenditure reports. Expenditure debriefings were conducted between November 2020 and January 2021 in English only. These interviews were conducted online via Zoom with staff members who also conducted the cognitive interviews. The interviews were video recorded with respondent permission. Interviews lasted about half an hour. These interviewers were conducted as part of the cognitive interviews, so no additional incentive was provided beyond the $40 cognitive interview incentive amount.

The purpose of these debriefings was to gain a deeper understanding of the accuracy of expenditures reported during the main cognitive interview. Respondents were recruited from Round 2 for the additional interview, and asked several questions, including what processes they used to recall and calculate activity-specific expenses, how they typically paid for these expenses, and which types of records or receipts (if any) would be accessible to document such expenses.

#### Cognitive and Debriefing Interview Conclusions

##### Forgetting and Telescoping

A common problem when collecting estimates about past events is that respondents may have difficulty assigning dates accurately to the events of interest. Recall bias can be substantial when recalling fishing, hunting, and wildlife-watching activities over a 12-month reference period (Fisher et al., 1991; Chu et al., 1992). The result of misremembering when something happened (such as when they went fishing or hunting) can result in misreporting of information. For example, activities from outside the reference period might be recalled as having occurred within it, and activities from within the reference period might be recalled as having occurred earlier. Further, activities reported in one wave of the survey may be reported again in the next introducing error and potentially bias in the estimates.

Bounding is a common solution to aid recall in a longitudinal study. Using this method, information collected in an early wave of the study is presented to the respondent as cues to remind them of relevant activities from within the reference period to report and activities from outside the reference period to exclude.

For Round 1 of cognitive testing, NORC added questions to the FHWAR screener to collect information for use in bounding in the Wave 1 survey (see Appendix A). The bounding information was of two types. For those who did not participate in fishing, hunting, or wildlife-watching activities yet in the reference year, their most recent activity from the prior year was collected in the screener and presented in Wave 1 with the instruction to exclude these activities from the prior year and to report any subsequent activities. For those who did participate in fishing, hunting, or wildlife-watching activities in the reference year, information on these eligible activities was collected in the screener for presentation in Wave 1 to remind respondents to report these activities.

The bounding questions collected the states that the screener respondent or household member visited so far in the reference year for fishing, hunting, or wildlife watching, as well as the number of trips taken so far in the reference year. If the respondent or household member had not yet taken a trip in the reference year but did so the previous year, the states visited, and month and total days of those trips were asked.

These screener questions were grouped in two ways to see which would result in better recall about household activities and reduce respondent burden. In the interleafed approach, respondents were asked to report on activities for their entire household, selecting one person at a time then cycling through all types of activities. In the grouped approach, respondents were asked to report on a single activity first, recalling participation in that activity for all household members before moving on to the next activity.

The cognitive testing focused on the accuracy of household screener respondent answers to the bounding questions. During the cognitive interviews, screener respondents were asked about the difficulty of reporting this information and their perception of the accuracy of their reports. Wave respondents were asked to comment on the accuracy of the bounding information reported by the household respondent.

Through the cognitive interviews, the bounding questions were found to be burdensome with respondents reporting difficulty recalling details about activities for other household members. Also, the accuracy of proxy reports was not high enough to justify the burden with many respondents reporting inaccurate or conflicting information. As a result, NORC removed the detailed bounding questions from the screener. Instead, the questionnaire simply asked if a household member had engaged in an activity. With a reduced set of questions, the grouped format resulted in a choppy sequence, so the interleafed version, which was the approach used in prior National Survey administrations, was chosen for these engagement questions.

##### Collection of Expenditure Data

The FHWAR collects data on expenditures for fishing, hunting, and wildlife-watching activities. National estimates are created for total expenditures and average per participant for each of these activities broken down by detailed categories such as trip-related expenses and equipment. In prior FHWAR surveys, respondents reported total trip expenditures by state and then reported the amount spent for each item on a detailed list by state. However, there was concern that this method could be burdensome for respondents and increase measurement error by requiring respondents to add up expenditures across trips rather than report expenditures for a single trip. NORC considered an alternative approach based on typical expenditures to determine whether it could yield higher accuracy and/or lower burden. In this approach, respondents were asked for typical trip expenditures by category (e.g., gas, food, lodging) and also the number of trips over the time period. Total expenditures were calculated by multiplying the typical expenditures by the number of trips. This approach has been used to collect outdoor recreation trip expenditures in other studies (Lesser et al., 2012).

In cognitive testing, respondents were randomly routed to questions incorporating either the total expenditure approach that had been used previously in the FHWAR or the typical expenditure approach. We found that the typical expenditure approach confused many respondents, who were not sure how to calculate this figure. For example, some participants were unsure if the median and mean should be used to determine typical expenditures. Other participants who were particularly avid or took both short outings and longer trips were unsure which type of trip should be considered typical. Due to these difficulties, the previously used method of capturing total trip related expenses was used in the 2022 survey.

##### Wildlife Watching Question Changes

The Wildlife Watching Recreation questionnaire includes measures of participation in activities that qualify as wildlife watching, both around-the-home and away-from-home. As part of NORC’s initial questionnaire review process aimed at reducing the survey length and cognitive burden, many detailed activity questions were removed or streamlined in partnership with the AFWA technical working group and USFWS. For around-the-home wildlife watching, respondents are considered a wildlife-watching participant if they participate in at least one of six major activities: closely observing wildlife, photographing wildlife, feeding wildlife, maintaining natural areas, maintaining plantings, and visiting parks or natural areas. In the 2022 Wildlife Watching questionnaire, each of these major activities is asked about separately, so the respondent has six separate chances to provide an answer that would confirm their participation in around-the-home wildlife watching.

At the end of each of the three activity questionnaires (Hunting, Angling, and Wildlife Watching), respondents are asked if they have participated in the other two respective activities throughout the year (e.g., those receiving the Hunting questionnaire are asked about their participation in wildlife-watching and angling, etc.). To better streamline the activity questionnaires across the study, NORC implemented changes at the end of the Angler and Hunter questionnaires to match the redesign of the around-the-home wildlife-watching questions implemented on the Wildlife Watching questionnaire. Previous versions of the Hunting and Angling surveys included a single wildlife-watching question, in which all wildlife watching activities were lumped together. To reduce the cognitive burden on the respondent and standardize the definition of around-the-home wildlife-watching, the Hunting and Angling questionnaires were changed from a single yes/no question to a series of six yes/no questions in alignment with the way wildlife watching is organized in the Wildlife Watching questionnaire.

Cognitive interviews revealed confusion about the meaning of the question pertaining to photographing wildlife. Participants were unsure if this should include the use of cell phone cameras. After consultation with AFWA/USFWS, it was decided that pictures of wildlife taken with cell phones should be included in wildlife photography. As a result, the question was edited to clarify that cell phone pictures of wildlife count as a form of wildlife photography.

Cognitive testing was also used to examine the impact of question order on the reporting of wildlife-watching activities. In the 2016 survey, away-from-home wildlife-watching and associated expenditures were asked about before around-the-home wildlife watching. NORC found that due to the prevalence and avidity of around-the-home wildlife watching activities, participants often confused the intent of the away-from-home wildlife-watching questions (when they were asked first) and were prone to mistakenly include around-the-home activities. As a result, we switched the question order so that around-the-home wildlife-watching was asked about first, then away-from-home wildlife watching and associated expenditures, which seemed to aid in better recall and resulted in less confusion.

##### Removed Questions

USFWS requested that certain questions be reviewed before the 2022 administration to reduce the survey length and respondent burden beyond the survey cuts AFWA/USFWS had already made.

Questions about 2022 hunting, fishing, and wildlife-watching activity were removed from the screener questionnaire knowing that few would have participated in these activities already at that early point of 2022. Expenditure questions asking about the state in which a purchase was made, fishing-type, or hunting-type were removed from the questionnaire. Fishing and hunting licenses and special fee questions were not asked at the state level as was done in the past.

Fishing questions were reworked to not explicitly ask about fishing in the Great Lakes. Instead, fishing in the Great Lakes was included through freshwater fishing questions. Instead of asking for the number of days one fished for shellfish and finfish, the 2022 questionnaires asked what kind of saltwater fishing was done in each coastal state in which one reported fishing, including fishing for finfish, shellfish, or both, to shorten the survey. Species-specific questions were removed from the fishing questionnaire. Also, fishing trip expenditures questions were asked overall rather than asking about freshwater and saltwater fishing separately. Special fishing method questions were also removed. The Wave 3 fishing questionnaire did not ask specifically about bass boats when asking about large purchases made in 2022. Instead, they were included in the “motorboat” category

Species-specific questions were removed from the hunting questionnaire and instead it asked about four broad categories: big game, small game, migratory birds, and other animals. Expenditure questions asking about these four hunting categories were also removed. Target shooting, shooting range use, and plantings for hunting questions were also removed. Species-specific questions were removed from the wildlife watching questionnaire as were state-level expenditure questions.

### Pilot Test

NORC conducted a full pilot test in 2021 with the goals of:

* Field test the instruments that had been cognitively tested.
* Field test the study procedures to be used in the main data collection.
* Conduct a split-ballot test of the two versions of the trips question to determine whether to incorporate the new question on outings.
* Test the use of nonprobability sample, including response rates and data quality.

Four questionnaires were tested, including the screener and the fishing, hunting and wildlife-watching questions that will be referred to as the wave questionnaires. The screener pilot took place April through June 2021 while the wave questionnaire pilot with the fishing, hunting, and wildlife-watching samples took place July through August 2021. The screener obtained a roster of all individuals age 16 and older living in the household, including email addresses. The following information was collected in the screener for each rostered individual: basic demographic characteristics; participation in fishing, hunting, and wildlife watching activities extending back to 2017; and past year participation in target shooting, motorized boating, and archery activities. The wave 3 version of the wave questionnaires was fielded to include the annual questions on big ticket purchases and owned or leased land. The pilot test was conducted in English only.

Exhibit 3. Design and Data Collection Status for 2021 FHWAR Pilot

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Screener | Wave 1 | | |
| Angler | Hunter | Wildlife-Watching |
| **Field Period** | **4/22 - 6/23** | **7/21 - 8/24** | **7/21 - 8/24** | **7/21 - 8/24** |
| **Modes** |  |  |  |  |
| **Sample** | AmeriSpeak panelists, members of AmeriSpeak panelists' households, nonprobability | | | |
| **Completes:** |  |  |  |  |
| **Web** | 7,128 | 1,258 | 1,318 | 3,366 |
| **Telephone** | 181 | 23 | 6 | 79 |
| **Mail Survey** | 225 | 75 | n/a | n/a |
| **TOTAL** | 7,534 | 1,356 | 1,324 | 3,445 |
| **Mean Length in Minutes:** | |  |  |  |
| **Web** | 7.3 | 9.6 | 9.7 | 8.6 |
| **Telephone** | 15.1 | 18.4 | 14.9 | 18.2 |
| **Mail Survey** | n/a1 | n/a1 | n/a1 | n/a1 |

Note:

1. Data not available.

#### Sample Sources

##### AmeriSpeak®

NORC sampled 10,000 AmeriSpeak® panelists for the screener pilot. Sample members received an invitation to participate in the survey and several follow-up reminders. To test the paper and pencil (PAPI) version of the questionnaire, respondents who received the web version were asked at the beginning of the survey if they would be willing to complete a PAPI questionnaire for a slightly larger incentive. If they agreed to complete a PAPI, the web survey was terminated, and they were sent a PAPI in the mail. The screener and the fishing questionnaire were used for PAPI testing.

Persons ages 16 and over in each household that were screened were eligible to complete a detailed questionnaire. NORC identified and interviewed all AmeriSpeak® panelists reported in the screener to have participated in fishing or hunting already in 2021, or who indicated that they were likely to do so during the remainder of 2021. For wildlife watching, a sample of wildlife watchers identified in the screener were asked to complete a wave questionnaire rather than all wildlife watchers because of the much higher prevalence rate of wildlife watching compared to fishing and hunting. Sample members who participated in more than one activity were assigned to one of the three groups, with preference for the group(s) that were hardest to fill based on participation rates.

##### Nonprobability Sample Cases

The nonprobability sample featured 4,000 interviews from Dynata and Lucid with adults age 18 and over. For panel recruitment, Dynata and Lucid use invitations of all types including email invitations, phone alerts, banners, and messaging on panel community sites to include people with a diversity of motivations to take part in research. Because non-probability panels do not start with a frame where there is known probability of selection, standard measures of sampling error and response rates cannot be calculated.

The nonprobability sample members were only surveyed via web and could not be recontacted across waves. Therefore, separate cross sections from nonprobability samples were selected to complete the web versions of the screener and the detail interviews. Because the wave respondents were not previously screened for fishing, hunting, and wildlife watching, these sample members began with a screener interview. Based on response to the screener, they ended the survey or went on to complete a fishing, hunting or wildlife watching wave questionnaire. Respondents were paid the incentive amount provided by the respective vendor.

Digital fingerprint software and panel-level ID validation was used to prevent respondents from completing the FHWAR web survey multiple times.

#### Data Analysis and Results

NORC completed 7,534 screener interviews, including 7,128 via web, 181 via phone and 225 via PAPI. NORC also completed 6,125 wave interviews, including 5,942 web, 108 phone and 75 fishing-PAPI completes and 1,356 fishing, 1,318 hunting, and 3,366 wildlife-watching completes. In some households, no one completed a wave interview while more than one household member completed a wave interview in others. Because the purpose of the 2021 FHWAR Pilot was to test procedures and to estimate expected response rates and participation rates, the data were not weighted.

##### Data Processing

Data cleaning in the pilot focused on data quality checks for counting completed interviews. The screener included the following rules for excluding someone from the data for web, phone, and PAPI completes:

1. If they answered ‘Don’t Know’/Skipped/ Refused more than 50% of the questions they saw
2. If phone cases completed the survey in less than 1/3 the median interview timing
3. If web cases completed the survey in less than 1/3 the median interview timing when accounting for the number of household members for that case

In the wave interview phase, there was a slight shift in acceptability rules due to new modes of completions and adjustments for the PAPI questionnaires. Like in the screener, data was cleaned to reflect the skip logic of the questionnaire. The following rules were implemented for Wave 1 for excluding someone from the data:

1. If they answered ‘Don’t Know’/Skipped/ Refused more than 50% of the questions they saw
2. If they answered the same numeric response to all items in a grid question for all the grid questions they were asked
3. For web and phone only: If they completed the survey in less than 1/3 the median interview timing based on the mode of interview

#### Pilot Test Conclusions

##### Questions on Trips and Outings

According to the definition of “trip” provided in the U.S. Fish & Wildlife Service report on the 2016 FHWAR[[1]](#footnote-1), a trip can last “an hour, a day, or many days”. During cognitive testing of the 2022 questionnaires, NORC determined that the use of the term “single day” in the trips questions may not adequately cue respondents that trips lasting only an hour would count as trips. To clarify the definition and reduce potential underreporting, NORC developed a set of questions to cue for both shorter and longer trips. The revised wording was cognitively tested and included in a split-ballot study in the pilot test to ascertain whether adding a question on outings could improve trip estimates for fishing and hunting. Note that because the wildlife watching questions already include multiple questions on wildlife watching both at home and away from home, we decided not to expand the trips questions for this questionnaire to avoid adding burden.

In the pilot test, respondents were assigned at random to receive the standard trips questions or the experimental trips and outings questions. The question wording for both conditions can be found in Appendix B. Though the pilot test included both a national probability sample drawn from AmeriSpeak® and a non-probability opt-in sample, only results from the national probability data were examined to obtain a more definitive sense of how the experiment could affect national estimates.

The number of trips reported using the standard questions was compared to that of the sum of the trips and outings questions (see Appendix C). The results showed that for fishing, the trips and outings questions yielded higher trip reporting for both freshwater and saltwater fishing as compared to the standard questions. For hunting, the trips and outings version of the trips question did yield more hunting trips for the overall trips question. However, for the questions on trips by types of game, the trips and outings version did not yield higher reporting of trips than the standard version. Due to the inconsistent pattern of results between the standard and experimental versions for fishing and hunting, the trips and outings questions were not implemented in the 2022 FHWAR.

##### Question Order

For the screener, NORC rearranged the order of the sections so that respondents were asked about wildlife watching first, following by fishing, then hunting. This was done so that respondents would be presented with questions on activities the general population is more likely to have participated in. Since fewer people have hunted, these questions were moved later in the questionnaire.

###### Questions Used for Statistical Testing

Questions about employment status and the community in which the respondent grew up were added so the NORC statistical team could evaluate their usefulness in data weighting.

###### Estimating Response Rates

NORC used information obtained in the Pilot to estimate response rates to the screener and wave questionnaires and to estimate the percentage of the sample that would participate in fishing, hunting, and wildlife watching activities for the 2022 FHWAR.

## 2022 Administration

The 2022 FHWAR survey featured multiple samples and was conducted via the phone, web, and paper questionnaires across a screener wave and three subsequent waves in English and Spanish. Sample sources included an address-based probability sample (ABS), AmeriSpeak® (NORC’s probability-based panel), non-probability sample, and a supplemental ABS sample in Wave 3. This was a major shift in methodology from past years where the survey was conducted primarily by in-person, field interviewers, which has become financially unfeasible for many projects. Exhibit 4 provides a high-level summary of each phase.

Exhibit 4. Screener and Wave Questionnaires

|  |  |
| --- | --- |
| **SCREENER QUESTIONNAIRE**   |  | | --- | | Data collection from January 7 - April 25, 2022  Screener Questionnaire was sent to all sampled households (HH)   * Roster & demographics * Fishing, hunting, wildlife participation screening (questions on ever participated, participated in last 12 months, likelihood to participate in the next 12 months) * Contact information to aid in communicating in the three, subsequent waves   One HH respondent completed the Screener. Based on response to the Screener, respondents within the HH were each assigned to one of the groups outlined below. | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **WAVE 1 DETAIL QUESTIONNAIRES Data collection began May 13, 2022 Reference period January through date of Wave 1 interview**   |  |  |  | | --- | --- | --- | | **Fishing Participation Details** | **Hunting Participation Details** | **Wildlife Watching Participation Details** | | * Detail on fishing activities * Crossover questions to determine if participated in any hunting/wildlife activities | * Detail on hunting activities * Crossover questions to determine if participated in any fishing/wildlife activities | * Detail on wildlife activities * Crossover questions to determine if participated in any fishing/hunting activities | |

|  |
| --- |
| **WAVE 2 DETAIL QUESTIONNAIRES Similar to Wave 1 questionnaires Data collection began September 16, 2022** |

|  |
| --- |
| **WAVE 3 DETAIL QUESTIONNAIRES Similar to Wave 1 questionnaires Data collection began January 4, 2023** |

### Screener

#### Sample Design

Screener sample included an initial address-based sample (ABS) and NORC’s AmeriSpeak® panel. The non-probability sample and supplemental ABS sample did not receive the screener, as they were only contacted once during Wave 3 of data collection. The ABS sample was developed from the November 2021 United State Postal Service’s Delivery Sequence File (DSF), including only city-style residential addresses and PO BOX addresses that were flagged as Only Way to Get Mail (OWGM). Drop delivery and vacant households were removed. The ABS sample allowed for oversampling counties with high hunting participation identified by hunting license lists. The sample was stratified by state. Those excluded from the sample include people with P.O. Box only addresses, some addresses not listed in the USPS Delivery Sequence File, and some newly constructed dwellings. In total, 300,000 addresses were sampled.

The AmeriSpeak® panel is designed to be representative of the U.S. household population. During the initial recruitment phase of the panel, randomly selected U.S. households were sampled with a known, non-zero probability of selection from the NORC National Sample Frame and then contacted by U.S. mail, email, telephone, and field interviewers (face to face). The panel provides sample coverage of approximately 97% of the U.S. household population.

#### Questionnaire

The screener questionnaire was completed by an adult member of the household age 18 or older. This person completed the screener questionnaire for the entire household. The questionnaire included questions on whether someone has ever participated (a filter question), followed by additional questions about those who participated in fishing, hunting, wildlife-watching, target shooting, motorized boating, and archery. The screener also collected participation data for 2021 and prior years for children ages 6 to 15, but children were not sampled for the 2022 data collection. NORC asked the household respondent if each member of the household had participated in fishing, hunting, and wildlife watching ever or over the last 12 months and if they were likely to do so in the next 12 months. The questionnaire also asked basic demographics, household information, and for an email address and phone number to allow for faster communication with empaneled respondents in the three, subsequent waves. All 2022 questionnaires are available by contacting Richard Aiken at [richard\_aiken@fws.gov](mailto:richard_aiken@fws.gov) or Jerry Leonard at jerry\_leonard@fws.gov.

#### Data Collection

Recruitment varied depending on the sample source. Panel members were invited by email or by phone from an NORC telephone interviewer. ABS addresses received up to four contacts.

1. All ABS sample members were sent a letter including a $1 incentive directing them to complete the questionnaire online or over the phone with a live interviewer by calling into the NORC project toll-free number. Because of the large volume of letters sent, these letters were sent between January 7 and 21, 2022.
2. One week later, nonrespondents received a reminder postcard sent between January 14 and 28, 2022.
3. Another week later, nonrespondents received a second reminder postcard or privacy mailer sent between January 21 and February 11, 2022.
4. Two weeks later, between February 11 and 25, 2022, nonrespondents were sent a self-administered, paper questionnaire with a letter explaining the survey.

The ABS sample used an adaptive survey design that focused on balanced samples rather than a high response rate. The adaptive design maximized responses from those reluctant to participate and whose answers might differ from those who did participate. NORC calculated response rates by demographic characteristics during each phase of data collection to identify these individuals.

Based on screener responses, rostered household members were placed in one of five groups for Waves 1, 2, and 3 of data collection: Hunters, Anglers, Wildlife Watching participants, Anyone in more than one of the activities, and Non-participants in any of the activities. Sampled members in more than one activity or with no activity were assigned to an activity, so that no one person completed more than one activity questionnaire in a wave.

Overall, 42,340 households completed the screener questionnaire with a 11% response rate (AAPOR RR3) for ABS and 9% response rate (AAPOR RR3) for AmeriSpeak. By mode, 32,928 households completed by web, 2,341 by phone, and 7,071 by paper survey. Completes by wave and language can also be found in Appendices D and E.

### Wave 1

#### Sample Design

All individuals identified through the ABS screener phase, including household members identified through the screener, were contacted in Wave 1, including 71,670 individuals. Not only were all AmeriSpeak® panelists who participated in the screener phase included in Wave 1, but all of the household members 16 years old or older identified in the screener phase by AmeriSpeak panelists were also included in Wave 1.

#### Questionnaire

Three questionnaires were used in Wave 1; Hunting, Fishing, and Wildlife Watching. The Wave 1 questionnaires asked respondents about activities they had participated in between the dates of "January 1, 2022 and today.".

#### Data Collection

AmeriSpeak® panel members were contacted using web, text, and phone contacts, depending on their preferences, and were paid a $5 incentive. Wave 1 included four contacts for ABS addresses and household members of AmeriSpeak® panelists.

1. Wave 1 ABS cases first received an invitation letter sent between May 13 and 16, 2022.
2. Two weeks later, nonrespondents received a postcard reminder sent between May 27 and 31, 2022.
3. Reminder letter and $1 incentive were sent to nonrespondents between June 10 and 14, 2022, two weeks after the postcard reminder.
4. Lastly, nonrespondents received a letter and self-administered paper questionnaire sent between June 27 and 29, 2022.

Overall, 16,609 Wave 1 surveys were completed. Appendices D and E shows the number of completes by wave, mode, and language and response rates.

### Wave 2

#### Sample Design

The Wave 1 contact file was deduplicated before Wave 2 to remove multiple household members who provided the same name. As a result, a total of 43,338 ABS members were contacted for Wave 2 and all AmeriSpeak® Wave 1 respondents. A supplemental sample of AmeriSpeak® panelists was also included in Wave 2 to improve the precision of the results.

#### Questionnaire

The same Hunting, Fishing, and Wildlife Watching questionnaires used in Wave 1 were used again in Wave 2. The Wave 2 questionnaires had two versions available depending on if the respondent had completed the Wave 1 questionnaire. If they had responded in Wave 1, they were asked to think about their activities since they last completed the Wave 1 questionnaire. If they had not completed the Wave 1 questionnaire, the questions were worded to ask about their 2022 experiences from January 1, 2022 until the day they completed the Wave 2 questionnaire.

#### Data Collection

AmeriSpeak® panel members were contacted using web, text, and phone contacts, depending on their preferences, and were paid a $5 incentive.

Wave 2 included up to five contacts for ABS addresses.

1. Wave 2 ABS addresses first received an invitation letter and $1 incentive sent between September 16 and 19, 2022.
2. A postcard was sent two weeks later to nonrespondents between September 30 and October 3, 2022.
3. Two weeks later, nonrespondents were sent a second reminder postcard between October 14 and 17, 2022.
4. An outbound dialing phase targeted a small subset of nonrespondents from October 10 and 29, 2022.
5. A letter and self-administered, paper questionnaire were sent between October 31 and November 1, 2022 to a subset of nonresponders due to the low paper survey yield of 2.4% during the screener phase. The screener phase showed that the paper survey was most effective with respondents who were older (about 50% of those who completed the mail survey were 65 or older) or who had lower education/income levels (about 60% of mail respondents did not have a college degree). Based on these findings, the Wave 2 paper survey was sent to populations most likely to complete it, including those who had completed a paper version in a previous wave.

In total, 16,968 Wave 2 surveys were completed. Appendices D and E shows the number of completes by wave, mode, and language and response rates.

### Wave 3

#### Sample Design

Wave 3 included six sample types; ABS cases surveyed throughout 2022, AmeriSpeak® cases surveyed throughout 2022, supplemental AmeriSpeak® cases sampled for Wave 2, supplemental ABS cases sampled for Wave 3, supplemental AmeriSpeak® cases sampled for Wave 3 and nonprobability panel cases.

Existing ABS and AmeriSpeak® cases who had responded to the screener were contacted again in Wave 3 to finish collecting 2022 information. Supplemental ABS and AmeriSpeak® samples were added with Wave 3 to improve response and precision, especially among hard-to-reach populations and states with oversamples. For the supplemental ABS sample, households that were likely to engage in fishing and hunting were oversampled using data from a market vendor.

Nonprobability, online panels provided a cost-effective approach for state-level data collection for the 23 coastal states and states who purchased state-level data (see State Opt-in section below). Two on-line panels were used to collect data from non-probability cases, each with their own procedures for recruitment, data collection, and incentive payment amounts and methods. NORC hired two vendors to work with various on-line panels to collect the number and type of cases desired. NORC statisticians determined the sample size needed for each coastal state based on the coefficient of variation (CV) requirement for freshwater and saltwater angler estimates for each state and the national probability sample size for the state. Demographic and state-level targets were included to improve coverage.

#### Questionnaire

Three questionnaires were used in Wave 3; Hunting, Fishing, and Wildlife Watching. Existing ABS and AmeriSpeak® cases were asked about activities they had participated in since completing the previous survey. Again, the date they completed the last survey was included on the questionnaire cover to help with recall. The PAPI version was only sent to respondents who had completed a PAPI in previous waves, so only one version asking about activities since completing the last survey was needed.

The questionnaires were largely the same as past waves. However, questions asking about large purchases, owning and leasing land, and bird watching were added to the Wave 3 questionnaires. Also, supplemental and nonprobability cases were asked additional questions at the beginning of the questionnaire to determine which of the three questionnaires they would receive. An algorithm was constructed that assigned pre-determined percentages of respondents to each questionnaire based on their 2022 experiences hunting, fishing or with wildlife-watching activities. Supplemental sample and nonprobability cases were asked about activities from January 1 to December 31, 2022.

#### Data Collection

AmeriSpeak® panel members, both existing and supplemental, were contacted using web, text, and phone contacts, depending on their preferences. AmeriSpeak® panelists were paid a $5 incentive. Non-probability cases were contacted and compensated per their respective panel’s procedures. Up to three contacts were sent to ABS cases, both existing and supplemental, in Wave 3.

1. In total, 380,641 ABS cases were sent a letter including a $1 incentive directing them to complete the questionnaire online or over the phone with a live interviewer by calling into the NORC project toll-free number. Because of the large volume of letters sent, these letters were sent between January 4 and 26, 2023.
2. Nonrespondents were sent a reminder postcard three weeks later between January 25 and February 16, 2023.
3. Three weeks later, nonrespondents either received a second reminder postcard or a self-administered, paper questionnaire with a letter explaining the survey. All supplemental cases received the second reminder postcard. Existing cases who had completed a paper questionnaire in a previous wave received the paper survey mailing. Existing cases who had not completed a paper questionnaire received the second reminder postcard. The second reminder postcards were mailed between February 16 and March 9, 2023, while the paper questionnaire mailings were sent on February 22, 2023.

Overall, 105,698 people completed the Wave 3 questionnaire, including 49,464 opt-in cases. By mode, 100,867 completed by web, 3,500 by phone, and 1,331 by paper survey. Completes by language and response rates can also be found in Appendices D and E.

#### State Opt-in

NORC provided states with the opportunity to collect state-level data through the 2022 FHWAR survey. Doing so allowed state agencies to collect detailed, reliable information about fishing, hunting and wildlife watching activities in their state at a much lower price than if they had collected the data in a standalone project.

Arkansas, Connecticut, Georgia, Kentucky, Minnesota, Missouri, New Hampshire, New Jersey, New York, Oklahoma, Pennsylvania, Rhode Island, Texas, Virginia, and Washington were part of the state opt-in initiative. All opt-in states received data from the national questionnaires. Some states paid additional funds to include tailored, state questions asked of residents of their respective state. Most of these questions focused on knowledge of state agencies related to wildlife and conservation, support for their organization, and reasons for not partaking in outdoor activities. Some states catered questions to specific activities while others focused on support for potential funding through means other than donations.

### Post-Incentives

FHWAR respondents received a post-incentive for completing the screener and each wave. AmeriSpeak® and non-probability respondents received the incentive amount determined by their panel. ABS addresses were paid $5 or $10 post-incentives per survey (See the Differential Post-Incentive Experiment section below). Respondents who completed via web were offered their choice of two e-gift cards: Amazon or Walmart. These e-gift cards were sent via email through Virtual Incentives. Respondents were told that they should receive their e-gift card within seven business days. Respondents who completed via phone or PAPI were offered a physical Mastercard gift card. These gift cards were sent via USPS. Phone respondents were told that they would receive their physical Mastercard in three to five weeks. PAPI respondents were told that they should receive their physical Mastercard in three to five weeks *after receipt of their completed survey*.

### Data Processing Procedures

#### Definition of Complete

Respondents had to meet three requirements to be considered a complete. First, they had to have a valid response to the final question. Don’t know or refused on the phone or skipped on the web were considered valid responses. Second, a respondent had to provide a response to more than half of the questions. Those who responded with Don’t Know or refused to more than half of the questions on the phone or skipped more than half of the questions on the web or mail survey were dropped. Lastly, web speedsters were dropped. A speedster was defined as someone who completed the survey in less than one-third of the median interview time.

#### Data Cleaning Rules

Data cleaning rules were relatively similar across waves but differed when it came to the timing threshold employed as well as adjustments for the PAPI completes. In addition to that, the data was cleaned to reflect the skip logic of the questionnaire. The screener included the following rules for excluding someone from the data for web, phone, and PAPI completes:

1. If they answered ‘Don’t Know’/Skipped/ Refused more than 50% of the questions they saw
2. If phone cases completed the survey in less than 1/3 the median interview timing
3. If web cases completed the survey in less than 1/3 the median interview timing when accounting for the number of household members for that case

In Waves 1, 2, and 3, there was a slight shift in rules due to new modes of completions and adjustments for the PAPI questionnaires. Like in the screener, data was cleaned to reflect the skip logic of the questionnaire. The following rules were implemented for Waves 1, 2, and 3 for screening someone out of the data:

1. If they answered ‘Don’t Know’/Skipped/ Refused more than 50% of the questions they saw
2. For PAPI: Respondents were given space to answer questions about their trips to up to four states in each Wave. Respondents were instructed to include a state once per Wave. If a respondent included a state more than once in the same Wave, the data from the first entry was included and the other entries for that state from that Wave discarded.

In Wave 1, the following additional rule was implemented:

1. For phone and web: If they completed the survey in less than 1/3 the median interview timing (for AmeriSpeak® sample phone completes, AmeriSpeak® sample web completes, other sample phone completes, and other sample web completes).

In Wave 2, the following additional rule was implemented:

1. For web: If they completed the survey in less than 1/3 the median interview timing (for AmeriSpeak® sample completes and other sample completes), when accounting for whether they participated in the activity in their survey or not.

In Wave 3, the following additional rule was implemented:

1. For web: If they completed the survey in less than 1/3 the median interview timing (for AmeriSpeak® sample completes, new Wave 3 sample completes, and other sample completes), when accounting for whether they participated in the activity in their survey or not.

#### Data Consistency

Respondents occasionally give answers that are inconsistent with their other answers. This was most common in the questions related to days of participation. In the survey, response to any individual question about days of participation could not exceed 240 in Wave 1 and Wave 2 or 365 in Wave 3. It was possible for respondents to give answers across waves that added up to more than the 365 days of 2022. When this was the case, their response was recoded to 365.

Additionally, the survey asked about participation in an activity in general ways (i.e., total days fished in the United States), as well as more specific ways (i.e., total days freshwater fishing in a region). It was possible for the response to the more specific type of participation to be greater than the less specific type of participation (i.e., reporting 10 total days fishing nationally but 15 days freshwater fishing in New England). In these cases, the value captured for the general variable was recoded to match the value for the more specific variable (i.e., using the example above, total days fishing nationally would be recoded as 15).

In cases where the share of total cost of property owned matched the share of total cost of property leased, the variables for cost owned and leased were halved as it was assumed this respondent was double reporting their land. In these cases, we also halved their report acreage owned and leased.

A summary of all data cleaning done to improve data consistency is below.

In the Angler dataset:

* Freshwater days fished in any individual census region (FRDAYSD1-9) could not exceed the total days fished in that census region (STDAYSF1-9).
* Saltwater days fished in any individual census region (SALTDAYSD1-9) could not exceed the total days fished in that census region (STDAYSF1-9).
* Freshwater days fished in any individual census region (FRDAYSD1-9) could not exceed total freshwater days fished (FWDAYS).
* Saltwater days fished in any individual census region (SALTDAYSD1-9) could not exceed total saltwater days fished (SWDAYS).
* Total days fished in any individual census region (STDAYSFD1-9) could not exceed total days fished nationally (USDAYS\_F).
* Any variable related to days fished could not exceed 365.
* When a respondent’s total cost of land owned for fishing (FOWN\_SHR) matched their total cost of land leased for fishing (FLSE\_SHR), these values were each halved.
* When a respondent’s total cost of land owned for fishing (FOWN\_SHR) matched their total cost of land leased for fishing (FLSE\_SHR), their values for acres of land owned (FOWN\_ACRE) and land leased (FLSE\_ACRE) were each halved.

In the Hunter dataset:

* Days hunting big game in any individual census region (BGDAYD1-9) could not exceed the total days hunted in that census region (STDAYSHD1-9).
* Days hunting small game in any individual census region (SMDAYD1-9) could not exceed the total days hunted in that census region (STDAYSHD1-9).
* Days hunting migratory birds in any individual census region (MBDAYD1-9) could not exceed the total days hunted in that census region (STDAYSHD1-9).
* Days hunting other animals in any individual census region (OADAYD1-9) could not exceed the total days hunted in that census region (STDAYSHD1-9).
* Total days hunting in any individual census region (STDAYSHD1-9) could not exceed total days hunted nationally (USDAYS\_H).
* Any variable related to days hunting could not exceed 365.
* When a respondent’s total cost of land owned for hunting (HOWN\_SHR) matched their total cost of land leased for hunting (HLSE\_SHR), these values were each halved.
* When a respondent’s total cost of land owned for hunting (HOWN\_SHR) matched their total cost of land leased for hunting (HLSE\_SHR), their values for acres of land owned (HOWN\_ACRE) and land leased (HLSE\_ACRE) were each halved.

In the Wildlife Watching dataset:

* Days away-from-home watching wildlife in any individual census region (NCUDAYSD1-9) could not exceed total days observing wildlife away from home (OBSERVE\_DAY).
* Any variable related to days observing wildlife (NCUDAYSD1-9, WILDDAYS, PHOTDAY, DYSPARK, OBSERVE\_DAY, BIRD\_DAYAFH, BIRD\_DAYHOME) could not exceed 365.
* When a respondent’s total cost of land owned for wildlife watching (AOWN\_SHR) matched their total cost of land leased for wildlife watching (ALSE\_SHR), these values were each halved.
* When a respondent’s total cost of land owned for wildlife watching (AOWN\_SHR) matched their total cost of land leased for wildlife watching (ALSE\_SHR), their values for acres of land owned (AOWN\_ACRE) and land leased (ALSE\_ACRE) were each halved.

#### Expenditure Topcoding

A weighted topcoding approach was implemented for the expenditure variables to prevent either extreme responses or extreme weights from having a disproportionate impact on the expenditure estimates. Each respondent’s weighted estimate for each expenditure was calculated by multiplying their reported expenditure by their activity weight (ACTWGT). The 90th percentile of the weighted estimate for each expenditure was calculated, and any respondents with a weighted estimate above the 90th percentile were recoded, so their weighted estimate equaled the 90th percentile for that item. This approach was implemented for all regional expenditure variables but not those that are aggregates of multiple regional expenditure variables. For example, in the Anglers dataset, variables OFSHAR1D1-9 that contain regional expenditures on food, drink, and refreshments in each census division were topcoded, but OFFOOD, which is the sum of these variables, was not. In these cases, the expenditure variable was adjusted to reflect the topcoded estimate. Weights were not changed as a result of this approach.

With the weighted topcoding, for any given expenditure type, the census division-level trip expenditure variables may sum to a total greater than that of the national-level expenditure for a given case. To conduct census division-level analysis that sums to the national level expenditure total for a given expenditure type, it is recommended that the census division-level trip expenditure variables each be proportionally adjusted in a way that will equal the national-level expenditure total.

### Review for Disclosure Risk

While the goal is to provider researchers with case-level survey data at the most granular level possible, it is critical to protect the identities of survey respondents. To ensure that individual respondents cannot be identified, the case-level data went through a rigorous process of disclosure review. Demographic and socio-economic data pose the greatest risk for respondent identification. These variables were examined in detail through a three-step process. First, responses were reviewed and flagged if any response (excluding nonresponse) had an unweighted count of less than 5. Second, a weighted joint distribution of region, gender, race and ethnicity, marital status, and age was reviewed for any weighted counts of less than 5. Finally, any open-ended questions included in the survey were reviewed for potentially identifying information.

In the national Survey data files, the following steps were taken to ensure any disclosure risk was minimized:

* In the Screener dataset:
* AGE: Any respondent reporting an age 100 and older was collapsed into a single “Age 100 and older” category due to unweighted counts less than 5.
* MARITAL: One respondent’s marital status was suppressed due to a weighted distribution less than 5.
* In the Angler, Hunter, and Wildlife Watching datasets:
* AGE: Any respondent reporting an age 95 and older was collapsed into a single “Age 95 and older” category due to unweighted counts less than 5.

### Weighting Calculations

Data were weighted after the screener and Wave 3. Data were not weighted separately for Waves 1 and 2 because participation and expenditures estimates were derived for the whole calendar year after Wave 3 data were collected.

#### Screener

##### AmeriSpeak® Weighting

AmeriSpeak® panel data were weighted to account for probability of selection, nonresponse, and population characteristics. Weights were calculated for all spawned household members six years of age through adulthood. The base weights were computed using the AmeriSpeak® panel weight and the probability of selection of the sampled panelist. Nonresponse weights were calculated using AmeriSpeak® panel profile data and market data. The nonresponse weights adjusted for age, sex, race, ethnicity, and education, while the market data were used to predict hunting and fishing participation. Population-based weights were calculated using raking. Raked weights for children six to 15 years old were calculated within each Census Division based on sex, race, ethnicity, and urbanicity. Raked weights for household members 16 years and older were calculated within each Census Division using age, sex, education, race, ethnicity, and urbanicity.

##### ABS Weighting

ABS data, including spawned cases of respondents six years of age and older, were also weighted for probability of selection, nonresponse, and population characteristics. The base weights were derived as the inverse of the probability of selection of the sampled household. Nonresponse weights were calculated using county-level hunting license data and market data used to predict hunting and fishing participation. Raking was used to calculate population-based adjustments. Raked weights for children six to 15 years old were calculated within each opt-in state/rest of Census Division (after excluding any opt-in states) based on sex, race, ethnicity, and urbanicity. Raked weights for household members 16 years and older were calculated within each opt-in state/rest of Census Division using age, sex, education, race, ethnicity, and urbanicity.

##### Combined Weighting

Additional raking was needed to combine AmeriSpeak® and ABS cases and to also adjust for oversampling cases in opt-in states (See State Opt-in section). Raked weights were calculated within each opt-in state/rest of Census Division using age, sex, education, race, ethnicity, urbanicity, and participation in fishing, hunting, archery, target shooting, motor boating, and wildlife watching in 2021. Modeled population totals were calculated for the number of persons participating in fishing, hunting, archery, target shooting, motor boating, and wildlife watching in 2021. The models incorporated data from the 2016 FHWAR survey and 2011 FHWAR survey as well as covariates sourced from the American Community Survey (such as race/ethnicity, education, gender, and urbanicity), and hunting/fishing license data.

#### Wave 3

##### AmeriSpeak® and ABS Weighting

The base weights were calculated as the final screener weights for the AmeriSpeak® and ABS cases that were recruited into the survey through the screener. For the supplemental ABS cases, base weights were computed using the probability of selection of the household. For the supplemental AmeriSpeak® cases in Waves 2 and 3, base weights were computed using the product of the AmeriSpeak® panel weight and the inverse of probability of selection of the sampled panelist. Nonresponse weights were calculated using available data for the specific sample type (reported fishing/hunting data from the screener, AmeriSpeak® profile data, market data, and Census data). Population-based weights were calculated by raking within each opt-in state/rest of Census Division using age, sex, education, race, ethnicity, urbanicity, and within Census Division by sex using model estimates of participation in fishing, hunting, and wildlife watching using data from the FHWAR screener.

##### Opt-in Weighting

The opt-in cases were raked within each opt-in state/rest of Census Division using age, sex, education, race, ethnicity, and urbanicity, and within each Census Division by sex using 2022 hunting, fishing and wildlife watching participation.

##### Combined Sample Weighting

The data from the three waves, fresh sample data, and opt-in cases were combined for the final data set. These data were raked within each opt-in state/rest of Census Division using age, sex, education, race, ethnicity, and urbanicity, as well as within each opt-in state/rest of Census Division by age using small area modeled estimates for 2022 hunting, 2022 fishing, and 2022 wildlife watching. Small area modeling was used to generate the 2022 hunting, fishing, and wildlife watching participation estimates by age using covariates sourced from the American Community Survey (such as race/ethnicity, education, number of adults in the household, urbanicity), hunting/fishing license data, and the 2011 FHWAR survey estimates. Small area models were also used to refine estimates of the number of anglers in coastal states and the ratio of freshwater and saltwater anglers in coastal states using 2011 FHWAR data.

##### Expenditure Weighting

The reported expenditures were weighted separately from the remaining survey responses to adjust for the likelihood of a case being asked either the fishing, hunting, or wildlife-watching specific questions. The base weights were calculated based on the final Wave 3 participation weight and the inverse of the probability of selection for the respondent being assigned to the fishing or hunting or wildlife watching questionnaire. Random forest models that incorporated the 2011 FHWAR survey data were used to refine the estimates for the proportion of big game hunting, small game hunting, migratory bird hunting, and other animal hunting. Participation totals for each activity were estimated at the national level using the final Wave 3 participation weights. These participation population totals were used in raking to adjust the expenditure weights for each activity to the following raking dimensions: age, sex, education, race, ethnicity, urbanicity, and opt-in state/rest of Census Division.

##### Sampling Error

The margins of error can be found in Appendix F. Sampling error is only one of many potential sources of error and there may be other unmeasured error in this or any other survey.

### Experiments

#### Differential Post-Incentive Experiment

NORC conducted an incentive experiment on the screener with 27,000 cases (10% of the 270,000 sampled cases) that had the lowest likelihood to respond based on Census data. Half the cases were offered $5, and the other half were offered $10 for completing the survey. The screener yield rate was 9% for the group offered $10 and 7% for the $5 group. The $10 incentive was associated with a 29% increase in the response rate. The success of this experiment led to differential post-incentive amounts being paid in subsequent mailings based on likelihood to respond.

#### Text and Email Communications

In Wave 1, NORC sent a text message or email invitation to all respondents who provided their consent to be contacted via text message or email in the screener. The messages let the respondent know the survey was ready and provided a direct link into the survey to complete it. The text messages and emails were sent prior to the mail invitations. In total, NORC sent text messages to 15,994 respondents and email invitations to 34,628 respondents inviting them to take the survey.

In Waves 2 and 3, NORC experimented with varying the timing of the text and email messages. For Wave 2, respondents who consented to be texted in the screener or in Wave 1 were selected into five conditions: receive a text message as the initial contact (n=5615), receive a text message as the initial contact and a text message after the first mailing (n=1247), receive a text message as the initial contact and a text message after the second mailing (1,212), receive a text message after the second mailing (n=5,448), and receive a text message after the final mailing (n=5,535). No emails were distributed in Wave 2. The results indicate that an early text reminder can increase the completion rate and prompt survey respondents to complete the survey more quickly than text reminders sent later.

In Wave 3, respondents who consented to be texted in the screener, Wave 1, or Wave 2 were selected into five conditions: receive a text message as the initial contact and after the first mailing (n=6,200), receive a text message as the initial contact, after the first mailing, and after the second mailing (n=6,200), receive a text message as the initial contact and an email after the first mailing (n=935), receive an email invitation as the initial contact and an email after the first mailing (n=6,439), and receive an email invitation as the initial contact and a text message after the first mailing (n=2,661). Sending a text invitation and one text reminder led to a higher completion rate than when a text invitation and two text reminders were sent with one of the reminders replacing the second postcard mailing.

## About NORC at the University of Chicago

NORC at the University of Chicago is an independent research institution that delivers reliable data and rigorous analysis to guide critical programmatic, business, and policy decisions. Since 1941, NORC has conducted groundbreaking studies, created and applied innovative methods and tools, and advanced principles of scientific integrity and collaboration. Today, government, corporate and nonprofit clients around the world partner with NORC to transform increasingly complex information into useful knowledge.

NORC conducts research in five main areas: Economics; Markets, and the Workforce; Education, Training and Learning; Global Development; Health and Well-Being; and Society, Media and Public Affairs.

For more information, email [info@norc.org](mailto:info@norc.org).

## References

Chu, A. D. Eisenhower, M. Hay, D. Morganstein, J. Neter, and J. Waksberg. 1992. Measuring the recall error in self-reported fishing and hunting activities. Journal of Official Statistics 5:13-39.

Fisher, W. L., A. E. Grambsch, D. L. Eisenhower, and D. R. Morganstein. 1991. Length of recall period and accuracy of estimates from the national survey of fishing, hunting, and wildlife-associated recreation. American Fisheries Society Symposium 12:367-374.

Lesser, V.M., L. Newton, and D.K. Yang. 2012. Comparing Item Nonresponse across Different Delivery Modes in General Population Surveys. Survey Practice, 5 (2).

## Appendices

### Appendix A. Cognitive Interview Protocol

**Angler Questionnaire – v5.1**

**8.5.2020**

**2022 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation**

**Cognitive Interview Protocol Round 1—Fishing**

***MATERIALS NEEDED FOR INTERVIEW***

* + INTERVIEWER PROTOCOL
  + RESPONDENT PHONE NUMBER AND EMAIL ADDRESS
  + YOUR LAPTOP AND ACCESS TO THE PROJECT FOLDER
  + ZOOM LINK FOR INTERVIEW
  + NOTE PAPER, PENS AND PENCILS

Which expenditure questions will be presented?

🞎 Total (PPT VERSION 1A+B)

🞎 Typical (PPT VERSION 1A+C)

What is respondent’s state of residence? \_\_\_\_\_\_\_\_\_\_\_\_G1710001 \_\_\_\_\_\_\_\_\_\_\_\_

***STEP 1: INFORMED CONSENT***

CONFIRM THAT THE RESPONDENT HAS INTERNET ACCESS TO RECEIVE THE ZOOM LINK. CONFIRM EMAIL ADDRESS.  SEND EMAIL WITH ZOOM LINK.

NOTE: PARENTAL CONSENT FOR MINORS WILL BE OBTAINED PRIOR TO THE INTERVIEW, VIA PHONE OR EMAIL.

PRESENT CONSENT/ASSENT STATEMENT AND ASK RESPONDENT TO READ IT. ANSWER ANY QUESTIONS. OBTAIN CONSENT OR ASSENT AND RECORD RESPONSE.

Do you agree to participate?

🞎 Respondent agree to do the interview

🞎 Respondent does not agree to do the interview (STOP INTERVIEW)

May I audio record the discussion?

🞎 Respondent agrees to be recorded

🞎 Respondent does not agree to be recorded

IF CONSENT OR ASSENT TO PARTICIPATE IS PROVIDED:

* IF THE RESPONDENT HAS CONSENTED TO RECORDING, START RECORDING.
* SELECT “RECORD” – “RECORD ON THIS COMPUTER”. DO NOT RECORD TO THE CLOUD.

[TURN ON RECORDER.] Ok. I have turned the audio recorder on. Would you please confirm for me that you agree to participate and to have this interview recorded? [R CONFIRMS.] Thank you.

***STEP 2: COMPLETION OF THE QUESTIONNAIRE***

We are testing a new questionnaire with the help of people like yourself. While you complete the survey I will sometimes ask you about the questions and about how you are figuring out your answers to the questions. Hearing your feedback will help me understand how to improve the survey, so please be sure to tell me if anything is not clear or if you have any suggestions. While you complete the survey I want you to read the questions to yourself and then tell me your answer out loud. Do you have any questions before we begin?

**GO TO QUESTIONNAIRE.**

Let’s begin. [INTERVIEWER/NOTETAKER GOES TO FIRST QUESTION.]

**INTERVIEWER PROBE BANK (USE AS APPROPRIATE):**

* **Can you tell me in your own words what you think the question is asking?**
* **How did you decide on your answer to that question?**
* Can you tell me more about that?
* What does the word [term] in this question mean to you?
* You said [answer]. Can you tell me more about that?

IF YOU PICK UP ON A CUE THAT SUGGESTS AN ISSUE OR CONFUSION:

* I notice you are taking some time on this question. Can you tell me what you are thinking about?

IF R IS UNCERTAIN ABOUT THE SURVEY TASK AND ASKING FOR CONFIRMATION:

* There is not a right or wrong answer for this question. I am interested in hearing your thoughts on what the question is asking.
* [If R asks for clarification] It’s very helpful for me to know that this question is not clear to you (or that it’s not clear to you how to answer this question). Can you tell me what you think this question is asking? If I were not on Zoom/the phone with you, what would you do next?
* Hearing your feedback is very helpful in figuring out how to make this survey better.

***PROBES BY SECTION***

**Topic: Participation**

|  |
| --- |
| F\_PART.  From January 1, 2020 until today, did you do any recreational fishing in the United States? Please do not include occasions when you only observed others fishing.  F\_STATES.  From January 1, 2020 until today, in which state or states did you do any recreational fishing?  **Note: Record the states.** |
| ***Probes (PARTICIPATION IN FISHING):***   * Can you tell me in your own words what this question is asking? * What does recreational fishing mean to you? * Were there any other states you went to for fishing, even if it was only a day? * How certain are you about which states you visited for fishing?   ***Notes to interviewer:***  Do respondents understand the survey terminology? Do they notice key terms? Do they understand what counts as fishing activities and what counts as having participated? Are they able to recall the states they fished in?  Does respondent notice the reference period? |

[ANGLER SPENDING QUESTION FOR NON-PARTICIPANTS]

Topic: States, Trips & Days

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| F\_TRIPS.  From January 1, 2020 until today, how many trips lasting a single day or longer have you taken to do any recreational fishing in each state?  [statenam] [NUMBOX, ALLOW 1-15] Trips   |  |  |  | | --- | --- | --- | | **State** | **# of trips** | **Freshwater / Saltwater / Both** | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |
| ***Coastal states are:***   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Alabama | Florida | Maryland | New York | Texas | | Alaska | Georgia | Massachusetts | North Carolina | Virginia | | California | Hawaii | Mississippi | Oregon | Washington | | Connecticut | Louisiana | New Hampshire | Rhode Island |  | | Delaware | Maine | New Jersey | South Carolina |  |   **You can do both FW and SW fishing in coastal states. Noncoastal states are FW only.** |
| ***Probes (STATES AND TOTAL TRIPS):***   * How did you figure out the states that you visited to fish? * Can you walk me through how you figured out the number of trips you took to each state? * Tell me more about that trip.   + How easy or difficult is it to remember this trip?   + How did you figure out when that trip happened? * This question asked the number of trips you took lasting a single day or longer. Can you tell me in your own words what that means?   + Would it include an afternoon trip? * Based on the wording, single day or longer, would it have to be an overnight trip to count, or not?   ***Notes to interviewer:***  Is respondent able to recall trips? Use general probes as needed. Note that the wording for wildlife watching includes “outings”, but the wording for fishing does not. |

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| F\_DAYS.  From January 1, 2020 until today, how many TOTAL days did you do any recreational fishing in the United States? If you’ve gone on more than one trip, please provide the total number of days of all recreational fishing trips combined. |
| ***Probes (NUMBER OF DAYS):***   * Can you walk me through how you figured out the TOTAL days you did recreational fishing / saltwater fishing / freshwater fishing?   ***Notes to interviewer:***  Is respondent able to total days spent recreational fishing? Does the respondent add up days, or give a general impression? How do those who take multiple trips add up days? |

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| f\_type.  [SHOW for each COASTAL STATE selected in f\_states]  From January 1, 2020 until today, did you do recreational freshwater fishing, recreational saltwater fishing, or both recreational freshwater and recreational saltwater fishing in each state?  Saltwater fishing means recreational fishing for finfish or shellfish in oceans, bays, sounds, and tidal waters of rivers and streams. Fishing in brackish water, such as bays and estuaries, should be considered saltwater fishing. Please do not include occasions when you only observed others fishing. |
| ***Probes (FRESHWATER AND SALTWATER FISHING IN COASTAL STATES):***   * Can you tell me in your own words what this question is asking? * What does saltwater (or freshwater) fishing mean to you? Does the description in this question match what you think of as saltwater (or freshwater) fishing? * How certain are you of your answer to this question?   ***Notes to interviewer:***  Is respondent able to total days spent recreational fishing? Does the respondent add up days, or give a general impression? How do those who take many trips add up days? |

F\_TRIPSFW

F\_DAYSFW

F\_TRIPSSW

F\_DAYSSW

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| f\_swtyp.  [SHOW IF F\_sW=1 and resides in a coastal state]  From January 1, 2020 until today, what kind of recreational saltwater fishing did you do in your state of residence? Please answer for any recreational saltwater fishing you did in your state of residence ONLY and not for any recreational saltwater fishing you may have done in other states.  RESPONSE OPTIONS:   1. Fishing for finfish, but NOT shellfish 2. Fishing for shellfish, but NOT finfish 3. Fishing for both finfish AND shellfish 4. Did not do any recreational saltwater fishing in my state of residence |
| ***Probes (FISHING FOR FINFISH AND SHELLFISH IN COASTAL STATE OF RESIDENCE):***   * Can you tell me in your own words what this question is asking? * What does the term “finfish” mean to you? What does the term “shellfish” mean? * In what state did you do fish for finfish? For shellfish? * How certain are you of your answer to this question?   ***Notes to interviewer:***  Does the respondent understand what the question is asking? Does respondent notice that the question concerns their state of residence? |

Topic: Accuracy of Reports on Fishing from Household Screener Respondent

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| **INSERT SCREENER INFORMATION FROM THE HOUSEHOLD RESPONDENT HERE.**   * Include here the HH respondent’s report on the information relevant to **fishing** only. * Probe at the end of the interview on the accuracy of proxy information on other activities after the crossover participation questions. |
| ***Probes:***  [TO BE ASKED OF RESPONDENTS FOR WHICH THERE IS PROXY INFORMATION COLLECTED IN THE HOUSEHOLD SCREENER.]   * Earlier we interviewed a member of your household, who answered questions about the fishing, hunting, and wildlife watching activities of members of this household. It can be hard to remember information accurately for things that happened a while ago. I would like to review the information we got from HOUSEHOLD MEMBER. Can you let me know if this information is correct?   + REVIEW EACH FISHING TRIP REPORTED BY THE HH RESPONDENT AND WORK WITH WAVE RESPONDENT TO DETERMINE IF THE PROXY REPORT IS CORRECT. * Look for discrepancies:   + Any missing activities for reference year?   + Any activities that respondent did not participate in?   + Any discrepancies in the reporting of information (e.g., appears to be the same trip, but wrong month, wrong number of days, etc.) * Who in your household do you think knows the most about your fishing trips?   ***Notes to interviewer:***  The screener collects information that is used for bounding purposes. Bounding information reminds respondents.   * After completing the participation questions in the wave questionnaire, examine the accuracy of the proxy information. * Compare wave respondent reports on participation to proxy reports provided by the household screener respondent. Do the reports match? * At the crossover questions, also compare respondent reports to the proxy reports provided by the household screener respondent. Do the reports match? |

Topic: Fishing Trip Expenditures

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| F\_TRIP1a. [This question is asked if there is one trip in a state]  [show for each state where F\_TRIPs=1]  The next question is about any expenses you may have had on your recent recreational fishing trip in [STATENAM] that occurred from January 1, 2020 until today.  For your trip in [statenam], how much was spent for your share of each of the following trip-related expenses, even if someone else purchased the item for you? Enter the amount spent by you or someone else for your share of expenses. For any item in the list that was not purchased on this trip, please check the box next to the item that says “This item was not purchased.” |
| F\_trip1b. [TOTAL EXPENDITURES ACROSS TWO OR MORE TRIPS IN A STATE]  [show for each state where F\_TRIPS>1]  The next question is about any expenses you may have had on your recreational fishing trips in [statenam] that occurred from January 1, 2020 until today.  For all fishing trips in [statenam], how much was the total spent for your share of each of the following trip-related expenses, even if someone else purchased the item for you? Enter the amount spent by you or someone else for your share of expenses. For any item in the list that was not purchased for any trips in this state, please check the box next to the item that says “This item was not purchased.” |
| f\_trip1C. [TYPICAL EXPENDITURES FOR TRIPS IN A STATE]  [show for each state where f\_TRIPS>1]  The next question is about any expenses you may have had on your recreational fishing trips in [statenam] that occurred from January 1, 2020 until today.  For a typical fishing trip in [STATENAM], how much was spent for your share of each of the following trip-related expenses, even if someone else purchased the item for you? Enter the amount spent by you or someone else for your share of expenses on a typical trip in [STATENAM]. For any item in the list that was not purchased for a typical trip in this state, please check the box next to the item that says “This item was not purchased.” |
| ***Probes (TRIP EXPENDITURES):***   * [ASK THIS ABOUT THE MAIN EXPENDITURE QUESTION, NOT GRID ITEMS] Can you tell me in your own words what this question is asking? * These questions asked for “your share” of expenses. In your own words, what does that mean? How did you decide on your share of the expenses? * How easy or difficult is it to remember how much you spent (on a typical trip) in STATE?   ***Notes to interviewer:***  We are testing two versions of the trip expenditures question—total expenditures vs. typical expenditures, reported by state. Do respondents notice that they are being asked to report total (or typical) expenditures? Can they report total or typical trip expenditures accurately? Do respondents know how much they spent on trips? Note the thought process respondents take in figuring out their answers.  What do respondents do when they do not recall the expenditure amount? How are DK responses to be handled? Do they know how to enter their responses ($ or “did not purchase”)? |

Topic: Fishing Equipment

F\_EQUIPINTRO

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| f\_equip.  From January 1, 2020 until today, how much did you spend on any of the following items PRIMARILY for your use in recreational fishing? If an item was purchased for you, please estimate its value and enter the amount. For any item in the list that was not purchased, or was purchased but NOT PRIMARILY for your use in recreational fishing, please check the box next to the item that says “This item was not purchased for recreational fishing.”  F\_AUX.  From January 1, 2020 until today, how much did you spend on any of the following items PRIMARILY for use in recreational fishing? …  F\_OTHER  From January 1, 2020 until today, how much did you spend on any of the following items? …  F\_BIG.  From January 1, 2020 until today, how much did you spend on any of the following items PRIMARILY for use in recreational fishing? … |
| ***Probes (EQUIPMENT EXPENDITURES):***   * Can you tell me in your own words what this question is asking? * Did you include items purchased for you, or gifts? * This question is about items primarily for your use fishing. What does that mean to you? * How did you decide whether an item was used primarily for fishing? Were any of the items you purchased used for purposes other than fishing? * Was it easy or hard to remember whether you purchased an item since January 1st of 2020? What month did you purchase ITEM? How did you figure that out? * Can you walk me through how you decided on the amount spent on ITEM? * [FOR BIG TICKET ITEMS (F\_BIG)] How much is the total cost of ITEM? Did you pay the total cost this year, or are you paying for this item over time?   ***Notes to interviewer:***  Does the R notice that they should report items used primarily for fishing? Do they notice it includes items purchased for them? Do they seem to be reporting expenditures from this year?  Does the R include only amount spent so far in 2020? The respondent should not report the total cost of the big ticket item unless it was paid for in full in 2020. |

Topic: Property Owned or Leased for Fishing

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| F\_LAND. / F\_LEASE.  The next questions are about any property that you may have owned or leased in the United States in 2020.  In 2020, did you own/[lease], in part or whole, property in the United States PRIMARILY to use for recreational fishing? If you owned property but you did not use it PRIMARILY for recreational fishing, please DO NOT include it.  RESPONSE OPTIONS:   1. Yes 2. No   F\_LANDACR. / F\_LEASEACR  How many acres did you own/[lease]? …  F\_LANDGRP. / F\_LEASEGRP  Did you own/[lease] this property that you PRIMARILY used for recreational fishing with anyone else, or not? …  F\_LANDOTH. / F\_LEASEOTH  With whom did you own/[lease] this property that you PRIMARILY used for recreational fishing? … |
| ***Probes (OWNED OR LEASED PROPERTY):***   * Can you tell me in your own words what this question is asking? * How did you decide on your answer? * This question is about property [owned in part or whole / leased] primarily to use for recreational fishing. What does that mean to you? Is this property used/leased for purposes other than fishing? * Was there any property you were not sure whether or not to count? * Did you own (or lease) property that was not used primarily for fishing? * What does it mean to you to own (or lease) the property? * [IF OWNED] How did you figure out the number of acres? Did you include both land and water in the total? How certain are you of the number of acres you owned (or leased)?   ***Notes to interviewer:***  For the series of questions on property owned/leased, probe as needed to understand how the respondent interprets the questions and how they arrived at their answers. Do they note that the questions refer to property they owned/leased, in the US, primarily for fishing? Can they determine number of acres, number of owners/leasers? |

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| F\_ownnum. / F\_LEASENUM  [show if F\_landgrp=1]  How many others owned/[leased] this property with you, not including yourself? |
| ***Probes (HOW MANY OTHERS OWNED OR LEASED PROPERTY):***   * Can you tell me in your own words what this question is asking? * How did you decide on your answer? * With whom do you own (or did you lease) the property? |

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| F\_LANDCST. / F\_LEASECST  [SHOW IF F\_land=1]  From January 1 to December 31, 2020, what was YOUR SHARE of the TOTAL cost of the property used/[leased] for recreational fishing? Include mortgage, taxes, and maintenance. If the property was purchased in 2020, include the down payment and any closing costs or other expenses associated with the purchase. |
| ***Probes (SHARE OF TOTAL COST OF PROPERTY OWNED OR LEASED):***   * Can you tell me in your own words what this question is asking? * How did you decide on your answer?   ***Notes to interviewer:***  Does the R include only their share of the amount spent so far in 2020? |

Topic: Fishing License Expenditures

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| f\_liccost.  From January 1 to December 31, 2020, how much did you spend on any of the following fishing license expenditures? If an item was purchased for you, please estimate its value and enter the amount. For any item in the list that was not purchased, or was purchased but NOT PRIMARILY for your use in recreational fishing, please check the box next to the item that says “This item was not purchased for recreational fishing.”  GRID ITEMS:   1. Annual, multi-day, single-day, or lifetime license or licenses valid for fishing only 2. Annual, multi-day, single-day, or lifetime license or licenses valid for multiple sports, including fishing 3. Any other license valid for fishing 4. Any other stamps, tags, validations, or permits purchased for fishing |
| ***Probes:***   * Can you tell me in your own words what this question is asking? * How did you decide on your answer? * Do you think people would feel uncomfortable answering questions about purchasing fishing licenses?   ***Notes to interviewer:***  Does the R include only licenses they purchased for their own use, or purchased for them for their use in fishing? Are respondents willing to report license expenditures? Do they show any concern about answering if they have not purchased a license? |

Topic: Participation in Other Activities

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| f\_HPART.  The final questions are about some other types of outdoor activities in which you may have participated.  From January 1, 2020 until today, did you do any hunting in the United States? Please do not include occasions when you only observed others hunting or when you only scouted.  RESPONSE OPTIONS:   1. Yes 2. No |
| ***Probes (REFERENCING PARTICIPATION IN HUNTING):***   * Can you tell me in your own words what this question is asking? * What does hunting game or other wildlife mean to you?   ***Notes to interviewer:***  Do respondents understand the survey terminology? Do they notice key terms? Do they understand what counts as hunting activities and what counts as having participated?  Does respondent notice the reference period? |

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| f\_WPARTAFH.  From January 1, 2020 until today, did you take any trips or outings to any location more than one mile away from home within the United States for the PRIMARY PURPOSE of observing, photographing, or feeding wildlife? The question does not refer to noticing wildlife while doing other activities such as hunting and fishing. DO NOT include trips to zoos, circuses, aquariums, museums, or scouting for game.  By wildlife, we mean birds, mammals, fish, insects, reptiles such as snakes and lizards, and amphibians such as frogs. DO NOT include farm animals or pets.  RESPONSE OPTIONS:   1. Yes 2. No |
| ***Probes (REFERENCING WILDLIFE WATCHING AWAY FROM HOME):***   * Can you tell me in your own words what this question is asking? * This question asks about wildlife watching more than one mile away from home. Can you tell me in your own words what that means? * Tell me a little about the wildlife watching that you do away from home. * The question talks about trips or outings you took. Do those terms mean the same thing or different things for you? What counts as a trip and what counts as an outing? * The question talks about trips or outings for the PRIMARY PURPOSE of observing, photographing or feeding wildlife. What does PRIMARY PURPOSE mean to you?   ***Notes to interviewer:***  Do respondents understand the survey terminology? Do they notice key terms? Do they understand what counts as wildlife watching away from home and what counts as having participated? |

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| F\_WPARThome.  This question is about your experiences with wildlife around your home, meaning the area within a one-mile radius of your home. We’re interested in whether you took a SPECIAL INTEREST in observing or viewing wildlife, not just simply noticing wildlife while doing something else such as gardening or exercising.  From January 1, 2020 until today, did you do any of the following wildlife-watching activities around your home, or not?  By wildlife we mean birds, mammals, fish, insects, reptiles such as turtles, snakes, and lizards, and amphibians, such as frogs. DO NOT include farm animals or pets.  grid items:   1. Closely observe wildlife or try to identify types of wildlife you did not know 2. Photograph wildlife 3. Feed birds or other wildlife 4. Maintain natural areas such as wooded lots, hedgerows, or open fields of at least one-quarter acre for the benefit of wildlife, not including farmland 5. Maintain plantings such as shrubs or agricultural crops for the benefit of wildlife 6. Visit parks and natural areas to observe, photograph, or feed wildlife   RESPONSE OPTIONS:   1. Yes 2. No |
| ***Probes (REFERENCING WILDLIFE WATCHING AROUND THE HOME):***   * Can you tell me in your own words what this question is asking? * This question asked about wildlife watching around your home. Can you tell me in your own words what that means? * Tell me a little about the wildlife watching that you do around your home. * What are examples of wildlife watching activities that you would count? That you would not count?   + If you found a bird nest in your yard one day while gardening, would you count that?   + If you watched the nest over a few weeks and took photos, would that count? * The question asks about taking a SPECIAL INTEREST in observing or viewing wildlife. What does SPECIAL INTEREST mean to you? * What does it mean to you to maintain natural areas? * What does it mean to you to maintain plantings for the benefit of wildlife?   ***Notes to interviewer:***  Do respondents understand the survey terminology? Do they notice key terms? Do they understand what counts as wildlife watching around the home and what counts as having participated? |

Topic: Accuracy of Reports on Crossover Activities from Household Screener Respondent

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| **INSERT SCREENER INFORMATION FROM THE HOUSEHOLD RESPONDENT HERE.**   * Include here the HH respondent’s report on the information relevant to **crossover activities** only. |
| ***Probes:***  [TO BE ASKED OF RESPONDENTS FOR WHICH THERE IS PROXY INFORMATION COLLECTED IN THE HOUSEHOLD SCREENER.]   * Earlier we interviewed a member of your household, who answered questions about the fishing, hunting, and wildlife watching activities of members of this household. It can be hard to remember information accurately for things that happened a while ago. I would like to review the information we got from HOUSEHOLD MEMBER. Can you let me know if this information is correct?   + REVIEW EACH ACTIVITY REPORTED BY THE HH RESPONDENT AND WORK WITH WAVE RESPONDENT TO DETERMINE IF THE PROXY REPORT IS CORRECT. * Look for discrepancies:   + Any missing activities for reference year?   + Any activities that respondent did not participate in?   + Any discrepancies in the reporting of information (e.g., appears to be the same trip, but wrong month, wrong number of days, etc.) * Who in your household do you think knows the most about your fishing/hunting/wildlife-watching activities?   ***Notes to interviewer:***  The screener collects information that is used for bounding purposes. Bounding information reminds respondents.   * After completing the participation questions in the wave questionnaire, examine the accuracy of the proxy information. * Compare wave respondent reports on participation to proxy reports provided by the household screener respondent. Do the reports match? * At the crossover questions, also compare respondent reports to the proxy reports provided by the household screener respondent. Do the reports match? |

General Debriefing Questions

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| ***Probes:***  *General feedback*   * If we sent you a letter inviting you to participate do you think you would be willing to complete the survey? * What can we do to make this survey better?   *Sensitivity*   * Would you have any hesitation about completing the questionnaire?   *16- and 17-year-old respondents*   * [IF 16-17 year old is in HH] Would you be willing to have a 16- or 17-year-old in your household complete a questionnaire on their own fishing, hunting, or wildlife watching activities? If not, why not? What would you want to know before you allowed a 16- or 17-year-old in your household participate?   ***Notes to interviewer:***  What suggestions for improving the survey does the respondent have? What concerns or questions do they have about the survey? About the participation of HH members under 18? |

***STEP 3: END OF INTERVIEW***

Thank you for taking part in this survey.

* STOP THE RECORDING.

INTERVIEWER: ANSWER ANY RESPONDENT QUESTIONS.

Would you like an electronic gift code emailed to you or would you like us to send a check via regular US mail?

🞎 Email e-gift code

🞎 Send check via US mail

Email address:

USPS address:

Name:

Street Address:

City:

State:

ZIP code:

This concludes the interview. I would be happy to answer any questions that you have. Thank you for your help with this study.

* THANK THE RESPONDENT AND INDICATE THAT A GIFT CODE WILL BE EMAILED TO THEM.
* SEND THANK YOU EMAIL WITH GIFT CODE.
* SEND FOLLOW-UP RECRUITMENT EMAIL IF RESPONDENT AGREES.

***AFTER THE INTERVIEW***

* + - SECURELY STORE ANY HARD COPY MATERIALS
    - SAVE AUDIO RECORDING. WHEN THE ZOOM SESSION ENDS, A WINDOW WILL POP UP THAT SAYS “CONVERT MEETING RECORDING.” ALLOW THIS PROCESS TO COMPLETE. IT WILL SHOW YOU THE LCOATION OF THE RECORDING ON YOUR LAPTOP. TRANSFER RECORDING TO PROJECT DRIVE. DELETE RECORDING FROM YOUR LAPTOP ONCE THE TRANSFER IS CONFIRMED.
    - NOTETAKER WILL UPDATE INTERVIEWER TRACKER
    - COMPLETE INTERVIEW SUMMARY

**ATTACHMENTS: CONSENT/ASSENT STATEMENTS**

**Consent**

On behalf of the Association of Fish and Wildlife Agencies (AFWA), NORC is conducting research to understand nation-wide participation in fishing, hunting, and wildlife watching in the U.S. You are being asked to take part in this interview to help us better understand and improve the survey questions. I will ask you to answer the survey questions and to discuss some of the questions with me. An assistant is joining me today to help take notes during the interview. The interview will take about 60 minutes.

Please note that your participation in this informational interview is voluntary. We will not include personally identifiable information about you in our report to AFWA or in any public reports. With your permission we would like to audio record our meeting to ensure that we accurately capture our discussion. The recording will not contain any personally-identifiable information. In the event that you mention any personally-identifiable information we will delete it from the interview recording or transcript. We will keep information about you private, and protect it from unauthorized disclosure, tampering, or damage. The recording will be destroyed at the conclusion of the study. You will receive $40 for participating in today’s interview. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life.

If you have any questions regarding your rights as a study participant, you may call the NORC IRB Manager, toll-free, at 866-309-0542. You may also contact the Study Director Kate Bachtell at [bachtell-kate@norc.org](mailto:bachtell-kate@norc.org).

Do you agree to participate?

🞎 Respondent agree to do the interview

🞎 Respondent does not agree to do the interview

May I audio record the discussion?

🞎 Respondent agrees to be recorded

🞎 Respondent does not agree to be recorded

In addition, we may re-contact you for a follow-up interview on your responses. Do you agree to be re-contacted?

🞎 Respondent agree to be re-contacted

🞎 Respondent does not agree to be re-contacted

**Assent**

Your parent/guardian has consented for you to participate in this study. I would like to give you some information about the study so you can decide whether you want to participate.

On behalf of the Association of Fish and Wildlife Agencies (AFWA), NORC is conducting research to understand nation-wide participation in fishing, hunting, and wildlife watching in the U.S. You are being asked to take part in this interview to help us better understand and improve the survey questions. I will ask you to answer the survey questions and to discuss some of the questions with me. An assistant is joining me today to help take notes during the interview. The interview will take about 60 minutes.

Please note that your participation in this informational interview is voluntary. We will not include personally identifiable information about you in our report to AFWA or in any public reports. With your permission we would like to audio record our meeting to ensure that we accurately capture our discussion. The recording will not contain any personally-identifiable information. In the event that you mention any personally-identifiable information we will delete it from the interview recording or transcript. We will keep information about you private, and protect it from unauthorized disclosure, tampering, or damage. The recording will be destroyed at the conclusion of the study. You will receive $40 for participating in today’s interview. Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life.

If you have any questions regarding your rights as a study participant, you may call the NORC IRB Manager, toll-free, at 866-309-0542. You may also contact the Study Director Kate Bachtell at [bachtell-kate@norc.org](mailto:bachtell-kate@norc.org).

Do you agree to participate?

🞎 Respondent agrees to do the interview

🞎 Respondent does not agree to do the interview

May I audio record the discussion?

🞎 Respondent agrees to be recorded

🞎 Respondent does not agree to be recorded

In addition, we may re-contact you and your parent or guardian for a follow-up interview on your responses. Do you agree to be re-contacted?

🞎 Respondent agree to be re-contacted

🞎 Respondent does not agree to be re-contacted

**Parental Consent for Child Participation**

Your child, NAME, is being asked to take part in a study. I would like to give you some information about the study so you can decide whether you want your child to participate.

On behalf of the Association of Fish and Wildlife Agencies (AFWA), NORC is conducting research to understand nation-wide participation in fishing, hunting, and wildlife watching in the U.S. Your child is being asked to take part in an interview to help us better understand and improve the survey questions. I will ask your child to answer the survey questions and to discuss some of the questions with me. An assistant will join me to help take notes during the interview. The interview will take about 60 minutes.

Please note that your child’s participation in this informational interview is voluntary. We will not include personally identifiable information about your child in our report to AFWA or in any public reports. With your permission, we would like to audio record our meeting to ensure that we accurately capture our discussion. Prior to beginning the interview we will ask your child if he/she assents to the interview and to be recorded. The recording will not contain any personally-identifiable information. In the event that you mention any personally-identifiable information we will delete it from the interview recording or transcript. We will keep information about you private, and protect it from unauthorized disclosure, tampering, or damage. The recording will be destroyed at the conclusion of the study. Your child will receive $40 for participating in the interview. Your child’s participation in this study does not involve any physical or emotional risk to you beyond that of everyday life.

If you have any questions regarding your child’s rights as a study participant, you may call the NORC IRB Manager, toll-free, at 866-309-0542. You may also contact the Study Director Kate Bachtell at [bachtell-kate@norc.org](mailto:bachtell-kate@norc.org).

Do you agree for your child to participate?

🞎 Parent agrees for child to do the interview

🞎 Parent does not agree for child to do the interview

May I audio record the discussion?

🞎 Parent agrees for child’s interview to be recorded

🞎 Parent does not agree for child’s interview to be recorded

In addition, we may re-contact you and your child for a follow-up interview on their responses. Do you agree for your child to be re-contacted?

🞎 Respondent agree to be re-contacted

🞎 Respondent does not agree to be re-contacted

### Appendix B: Standard and Experimental Trip Question Wording

*Fishing Trips – Standard Question*

This year (from January 1, 2022 until today), how many recreational fishing trips lasting a single day or longer have you taken in [statenam]?

[show if coastal=1] Please indicate separately the number of trips you took for freshwater and for saltwater fishing. Saltwater fishing means recreational fishing for finfish or shellfish in oceans, bays, sounds, and tidal waters of rivers and streams. Fishing in brackish water, such as bays and estuaries, should be considered saltwater fishing.

Freshwater Fishing Trip(s)

Saltwater Fishing Trip(s)

*Hunting Trips – Standard Question*

This year (from January 1, 2022 until today), how many hunting trips lasting a single day or longer have you taken in [STATENAM]?

Trip(s)

What type(s) of game did you hunt during your trip(s) in [STATENAM]? Please report the number of trips in which you hunted each type of game. If you hunted more than one type of game on the same trip, please count the trip for each type of game you hunted. Please enter “0” for any type of game that you did not hunt on your trip(s) in this state?

Number of trips you hunted big game

Number of trips you hunted small game

Number of trips you hunted migratory birds

Number of trips you hunted other animals

The experimental questions on fishing and hunting trips, called the “trips+outings” version, that were incorporated in the pilot test were:

*Fishing Trips and Outings – Experimental Version*

Now we would like to know how many recreational fishing trips you took in [statenam]. We will ask first about trips where you were away from home for one or more nights. Then we will ask about outings that lasted a single day or less.

This year (from January 1, 2021 until today), how many recreational fishing trips did you take in [statenam] where you were away from home for at least one night? If you did not take any trips in this state where you were away from home for at least one night, please enter “0.”

[show if coastal=1] Please indicate separately the number of trips you took for freshwater and for saltwater fishing. Saltwater fishing means recreational fishing for finfish or shellfish in oceans, bays, sounds, and tidal waters of rivers and streams. Fishing in brackish water, such as bays and estuaries, should be considered saltwater fishing.

Freshwater Fishing Trip(s)

Saltwater Fishing Trip(s)

This year (from January 1, 2021 until today), how many outings of a single day or less did you take in [statenam] to go fishing? *Please count all outings, even if it was a short outing. You can count more than one outing per day.* If you did not take any outings of a single day or less in a state, please enter “0.”

[show if coastal=1] Please indicate separately the number of outings you took for freshwater and for saltwater fishing.

Freshwater Fishing Outing(s)

Saltwater Fishing Outing(s)

*Hunting Trips and Outings – Experimental Version*

Now we would like to know how many hunting trips you took in [statenam]. We will ask first about trips where you were away from home for one or more nights. Then we will ask about outings that lasted a single day or less.

This year (from January 1, 2021 until today), how many hunting trips did you take in [statenam] where you were away from home for at least one night? If you did not take any trips in this state where you were away from home for at least one night, please enter “0.”

Trip(s)

The next questions are about the different kinds of game you may have hunted in the United States: big game, small game, migratory birds, or other animals.

Big game includes deer, elk, bear, wild turkey, moose, wild sheep, feral goat, or some other large animal such as antelope, bison, caribou, mountain goat, or muskox.

Small game includes rabbit, quail, grouse or prairie chicken, squirrel, pheasant, ptarmigan, or some other small animal such as francolin or chukar.

Migratory birds include geese, duck, dove, or some other bird such as coot, rail, gallinule, woodcock, crane, black brant, crow, snipe, or band-tailed pigeon.

Other animals include groundhog or woodchuck, raccoon, fox, coyote, mountain lion, wolf, bobcats, or any other animals not included in the big game, small game, and migratory bird categories.

What type(s) of game did you hunt during these trip(s) in [STATENAM] where you were away from home for at least one night? Please report the number of trips in which you hunted each type of game. If you hunted more than one type of game on the same trip, please count the trip for each type of game you hunted. Please enter “0” for any type of game that you did not hunt on your trip(s) in this state.

Number of trips you hunted **big game**

Number of trips you hunted **small game**

Number of trips you hunted **migratory birds**

Number of trips you hunted **other animals**

This year (from January 1, 2021 until today), how many outings of a single day or less did you take in [statenam] to go hunting? *Please count all outings, even if it was a short outing. You can count more than one outing per day.* If you did not take any outings of a single day or less in a state, please enter “0.”

Outing(s)

What type(s) of game did you hunt during these outing(s) in [STATENAM] of a single day or less? Please report the number of outings in which you hunted each type of game. If you hunted more than one type of game on the same outing, please count the outing for each type of game you hunted. Please enter “0” for any type of game that you did not hunt on your outing(s) in this state.

Number of outings you hunted **big game**

Number of outings you hunted **small game**

Number of outings you hunted **migratory birds**

Number of outings you hunted **other animals**

### Appendix C: Comparison of Trips Reported in the Standard vs. Experimental Question Versions

|  |  |  |
| --- | --- | --- |
|  | Standard “Single Day” Version Mean s.d. (n) | Experimental “Trips+Outings” Version Mean s.d. (n) |
| Fishing |  |  |
| Freshwater | 4.0  10.1  (121) | 6.4  12.1  (155) |
| Saltwater | 0.9  3.7  (121) | 1.7  5.7  (155) |
| Hunting |  |  |
| Overall | 2.0  7.0  (82) | 2.8  7.4  (102) |
| Big game | 1.1  4.3  (82) | 0.5  1.7  (102) |
| Small game | 0.9  2.2  (82) | 0.6  2.4  (102) |
| Migratory birds | 0.8  2.2  (82) | 0.5  1.6  (102) |
| Other animals | 0.7  2.0  (82) | 0.5  2.0  (102) |

### Appendix D: ABS Completes by Wave, Mode, and Language

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Screener | Wave 1 | Wave 2 | Wave 3 |
| CAWI | 21,944 | 8,167 | 8,844 | 41,077 |
| CATI | 1,839 | 474 | 552 | 3,159 |
| PAPI | 7,071 | 1,762 | 961 | 1,331 |
| English | 30,767 | 10,390 | 10,334 | 45,473 |
| Spanish | 87 | 13 | 23 | 94 |
| Total Completes | 30,854 | 10,403 | 10,357 | 45,567 |
| Response Rate | 11% | 4% | 4% | 8% |

### Appendix E: AmeriSpeak® Completes by Wave, Mode, and Language

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Screener | Wave 1 | Wave 2 | Wave 3 |
| CAWI | 10,984 | 6,060 | 6,435 | 10,326 |
| CATI | 502 | 146 | 176 | 341 |
| English | 11,392 | 6,178 | 6,566 | 10,480 |
| Spanish | 94 | 28 | 45 | 187 |
| Total Completes | 11,486 | 6,206 | 6,611 | 10,667 |
| Response Rate | 9% | 8% | 7% | 5% |

### Appendix F: Margins of Error

|  |  |
| --- | --- |
|  | Margin of Error |
| 2022 Participation in Hunting | 0.19% |
| 2022 Participation in Fishing | 0.33% |
| 2022 Participation in Wildlife-Watching | 0.78% |

### Appendix G: Population Totals and Standard Errors

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Participants | | | |
| Number | SE | Low bound | High bound |
| Fishing | | | | |
| Total, all fishing | 39,935,437 | 387,100 | 39,161,237 | 40,709,637 |
| Freshwater | 35,069,217 | 376,221 | 34,316,775 | 35,821,659 |
| Saltwater | 12,704,743 | 228,926 | 12,246,891 | 13,162,595 |
| Hunting | | | | |
| Total, all hunting | 14,374,589 | 235,096 | 13,904,397 | 14,844,781 |
| Big game | 11,521,659 | 250,935 | 11,019,789 | 12,023,529 |
| Small game | 5,290,082 | 133,008 | 5,024,066 | 5,556,098 |
| Migratory birds | 2,812,364 | 92,579 | 2,627,206 | 2,997,522 |
| Other animals | 2,300,439 | 69,260 | 2,161,919 | 2,438,959 |
| Wildlife watching | | | | |
| Total, all wildlife watching | 148,280,092 | 676,058 | 146,927,976 | 149,632,208 |
| Away from home | 73,334,491 | 531,995 | 72,270,501 | 74,398,481 |
| Around the home | 146,502,604 | 673,179 | 145,156,246 | 147,848,962 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Days of Participation | | | |
| Number | SE | Low bound | High bound |
| Fishing | | | | |
| **Total, all fishing** | 785,226,417 | 19,626,129 | 745,974,159 | 824,478,675 |
| Freshwater | 559,005,615 | 16,154,345 | 526,696,925 | 591,314,305 |
| Saltwater | 123,110,918 | 4,988,750 | 113,133,418 | 133,088,418 |
| Hunting | | | | |
| **Total, all hunting** | 240,752,065 | 7,755,891 | 225,240,283 | 256,263,847 |
| Big game | 134,683,681 | 4,841,772 | 125,000,137 | 144,367,225 |
| Small game | 38,056,272 | 1,536,367 | 34,983,538 | 41,129,006 |
| Migratory birds | 22,861,271 | 1,536,845 | 19,787,581 | 25,934,961 |
| Other animals | 19,902,802 | 1,268,062 | 17,366,678 | 22,438,926 |
| Wildlife watching | | | | |
| **Total, all wildlife watching** | 12,993,936,858 | 192,294,060 | 12,609,348,738 | 13,378,524,978 |
| Away from home | 2,443,884,896 | 57,495,220 | 2,328,894,456 | 2,558,875,336 |
| Around the home | 10,550,051,963 | 149,823,699 | 10,250,404,565 | 10,849,699,361 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Trips | | | |
| Number | SE | Low bound | High bound |
| Fishing | | | | |
| **Total, all fishing** | 462,733,320 | 14,711,509 | 433,310,302 | 492,156,338 |
| Freshwater | 359,051,599 | 11,566,583 | 335,918,433 | 382,184,765 |
| Saltwater | 103,681,721 | 5,274,935 | 93,131,851 | 114,231,591 |
| Hunting | | | | |
| Total, all hunting | 165,002,494 | 6,018,377 | 152,965,740 | 177,039,248 |
| Big game | 91,610,000 | 3,955,481 | 83,699,038 | 99,520,962 |
| Small game | 33,996,768 | 1,498,732 | 30,999,304 | 36,994,232 |
| Migratory birds | 19,786,340 | 1,150,201 | 17,485,938 | 22,086,742 |
| Other animals | 19,609,387 | 1,383,662 | 16,842,063 | 22,376,711 |
| Wildlife watching | | | | |
| **Total, all wildlife watching** | 1,075,753,274 | 39,922,059 | 995,909,156 | 1,155,597,392 |
| Away from home | 1,075,753,274 | 39,922,059 | 995,909,156 | 1,155,597,392 |

|  |  |  |
| --- | --- | --- |
|  | U.S. Population 16+ | |
| Number | Percent |
| Total persons | 259,434,526 | 100 |
| **Population Density of Residence** | | |
| Urban | 207,550,596 | 80 |
| Rural | 51,273,801 | 20 |
| Population Size of Residence | | |
| Metropolitan Statistical Area (MSA) | | |
| 1,000,000 or more | 120,312,780 | 46 |
| 250,000 to 999,999 | 45,157,567 | 17 |
| 50,000 to 249,999 | 21,052,174 | 8 |
| Micropolitan (10,000 to 50,000) | 18,009,250 | 7 |
| Outside MSA | 54,292,625 | 21 |
| Census Geographic Division | | |
| New England | 12,049,325 | 5 |
| Middle Atlantic | 33,156,736 | 13 |
| East North Central | 36,911,735 | 14 |
| West North Central | 16,677,887 | 6 |
| South Atlantic | 52,601,908 | 20 |
| East South Central | 15,155,523 | 6 |
| West South Central | 31,295,266 | 12 |
| Mountain | 19,697,460 | 8 |
| Pacific | 41,885,355 | 16 |
| Age | | |
| 16 to 17 years | 8,498,598 | 3 |
| 18 to 24 years | 26,877,855 | 10 |
| 25 to 34 years | 44,002,413 | 17 |
| 35 to 44 years | 42,986,685 | 17 |
| 45 to 54 years | 39,901,055 | 15 |
| 55 to 64 years | 42,136,736 | 16 |
| 65 years and older | 54,355,326 | 21 |
| 65 to 74 years | 33,283,182 | 13 |
| 75 and older | 21,072,144 | 8 |
| Sex | | |
| Male | 124,186,349 | 48 |
| Female | 130,810,173 | 50 |
| Other gender | 3,693,781 |  |
| Ethnicity | | |
| Hispanic | 44,808,283 | 17 |
| Non-Hispanic | 213,603,262 | 82 |
| Race | | |
| White | 178,338,033 | 69 |
| African American | 36,128,351 | 14 |
| Asian American | 10,859,254 | 4 |
| All others | 51,100,210 | 25 |
| Annual Household Income | | |
| Less than $10,000 | 29,217,437 | 11 |
| $10,000 to $14,999 | 14,251,099 | 5 |
| $15,000 to $24,999 | 23,940,187 | 9 |
| $25,000 to $34,999 | 27,338,398 | 11 |
| $35,000 to $49,999 | 33,367,728 | 13 |
| $50,000 to $74,999 | 42,227,872 | 16 |
| $75,000 to $99,999 | 30,728,243 | 12 |
| $100,000 to $149,999 | 30,107,820 | 12 |
| $150,000 to $199,999 | 11,557,976 | 4 |
| $200,000 or more | 11,430,857 | 4 |
| Not reported | 5,266,909 | 2 |
| Education | | |
| Less than HS | 14,682,040 | 6 |
| High school degree | 86,266,448 | 33 |
| Some college | 72,864,202 | 28 |
| Bachelor's Degree | 44,926,022 | 17 |
| Graduate School | 37,463,385 | 14 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Fishing | | | |
| Number | SE | Low bound | High bound |
| Total persons | 39,935,437 | 387,100 | 39,161,237 | 40,709,637 |
| Population Density of Residence | | | | |
| Urban | 27,855,117 | 326,808 | 27,201,501 | 28,508,733 |
| Rural | 11,969,721 | 226,207 | 11,517,307 | 12,422,135 |
| Population Size of Residence | | | | |
| Metropolitan Statistical Area (MSA) | | | | |
| 1,000,000 or more | 15,590,976 | 228,938 | 15,133,100 | 16,048,852 |
| 250,000 to 999,999 | 7,753,625 | 188,668 | 7,376,289 | 8,130,961 |
| 50,000 to 249,999 | 3,896,749 | 137,093 | 3,622,563 | 4,170,935 |
| Micropolitan (10,000 to 50,000) | 4,162,340 | 145,226 | 3,871,888 | 4,452,792 |
| Outside MSA | 8,421,147 | 189,854 | 8,041,439 | 8,800,855 |
| Census Geographic Division | | | | |
| New England | 1,501,286 | 42,350 | 1,416,586 | 1,585,986 |
| Middle Atlantic | 4,079,433 | 76,286 | 3,926,861 | 4,232,005 |
| East North Central | 6,456,969 | 220,051 | 6,016,867 | 6,897,071 |
| West North Central | 3,698,524 | 124,799 | 3,448,926 | 3,948,122 |
| South Atlantic | 8,386,234 | 187,832 | 8,010,570 | 8,761,898 |
| East South Central | 3,079,293 | 106,899 | 2,865,495 | 3,293,091 |
| West South Central | 5,418,040 | 109,053 | 5,199,934 | 5,636,146 |
| Mountain | 2,953,654 | 141,432 | 2,670,790 | 3,236,518 |
| Pacific | 4,362,005 | 136,326 | 4,089,353 | 4,634,657 |
| Age | | | | |
| 16 to 17 years | 1,651,838 | 131,179 | 1,389,480 | 1,914,196 |
| 18 to 24 years | 4,263,807 | 152,106 | 3,959,595 | 4,568,019 |
| 25 to 34 years | 6,851,341 | 156,009 | 6,539,323 | 7,163,359 |
| 35 to 44 years | 7,603,045 | 161,188 | 7,280,669 | 7,925,421 |
| 45 to 54 years | 6,208,266 | 160,389 | 5,887,488 | 6,529,044 |
| 55 to 64 years | 6,706,013 | 147,437 | 6,411,139 | 7,000,887 |
| 65 years and older | 6,555,031 | 143,664 | 6,267,703 | 6,842,359 |
| 65 to 74 years | 4,504,351 | 119,064 | 4,266,223 | 4,742,479 |
| 75 and older | 2,050,680 | 92,210 | 1,866,260 | 2,235,100 |
| Sex | | | | |
| Male | 26,932,209 | 334,698 | 26,262,813 | 27,601,605 |
| Female | 12,452,130 | 196,399 | 12,059,332 | 12,844,928 |
| Other gender | 448,059 | 52,374 | 343,311 | 552,807 |
| Ethnicity | | | | |
| Hispanic | 6,463,391 | 193,306 | 6,076,779 | 6,850,003 |
| Non-Hispanic | 33,295,927 | 340,837 | 32,614,253 | 33,977,601 |
| Race | | | | |
| White | 29,972,272 | 327,537 | 29,317,198 | 30,627,346 |
| African American | 4,495,415 | 128,618 | 4,238,179 | 4,752,651 |
| Asian American | 2,202,156 | 111,961 | 1,978,234 | 2,426,078 |
| All others | 6,054,711 | 181,636 | 5,691,439 | 6,417,983 |
| Annual Household Income | | | | |
| Less than $10,000 | 3,226,756 | 129,648 | 2,967,460 | 3,486,052 |
| $10,000 to $14,999 | 1,790,483 | 82,512 | 1,625,459 | 1,955,507 |
| $15,000 to $24,999 | 3,520,605 | 132,754 | 3,255,097 | 3,786,113 |
| $25,000 to $34,999 | 4,189,536 | 143,308 | 3,902,920 | 4,476,152 |
| $35,000 to $49,999 | 5,256,524 | 155,253 | 4,946,018 | 5,567,030 |
| $50,000 to $74,999 | 6,975,141 | 159,204 | 6,656,733 | 7,293,549 |
| $75,000 to $99,999 | 4,936,060 | 130,100 | 4,675,860 | 5,196,260 |
| $100,000 to $149,999 | 5,168,871 | 130,281 | 4,908,309 | 5,429,433 |
| $150,000 to $199,999 | 2,361,030 | 98,317 | 2,164,396 | 2,557,664 |
| $200,000 or more | 1,793,854 | 74,257 | 1,645,340 | 1,942,368 |
| Not reported | 716,577 | 57,096 | 602,385 | 830,769 |
| Education | | | | |
| Less than HS | 2,363,333 | 123,748 | 2,115,837 | 2,610,829 |
| High school degree | 14,350,167 | 278,946 | 13,792,275 | 14,908,059 |
| Some college | 11,904,271 | 184,412 | 11,535,447 | 12,273,095 |
| Bachelor's Degree | 5,986,836 | 116,127 | 5,754,582 | 6,219,090 |
| Graduate School | 4,609,243 | 103,831 | 4,401,581 | 4,816,905 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Hunting | | | |
| Number | SE | Low bound | High bound |
| Total persons | 14,374,589 | 235,096 | 13,904,397 | 14,844,781 |
| Population Density of Residence | | | | |
| Urban | 8,264,303 | 177,119 | 7,910,065 | 8,618,541 |
| Rural | 6,034,917 | 158,450 | 5,718,017 | 6,351,817 |
| Population Size of Residence | | | | |
| Metropolitan Statistical Area (MSA) | | | | |
| 1,000,000 or more | 4,906,065 | 135,105 | 4,635,855 | 5,176,275 |
| 250,000 to 999,999 | 2,542,293 | 94,644 | 2,353,005 | 2,731,581 |
| 50,000 to 249,999 | 1,632,180 | 87,151 | 1,457,878 | 1,806,482 |
| Micropolitan (10,000 to 50,000) | 1,765,228 | 82,036 | 1,601,156 | 1,929,300 |
| Outside MSA | 3,453,454 | 125,434 | 3,202,586 | 3,704,322 |
| Census Geographic Division | | | | |
| New England | 411,523 | 20,883 | 369,757 | 453,289 |
| Middle Atlantic | 1,544,291 | 45,769 | 1,452,753 | 1,635,829 |
| East North Central | 2,768,913 | 141,353 | 2,486,207 | 3,051,619 |
| West North Central | 1,518,281 | 78,131 | 1,362,019 | 1,674,543 |
| South Atlantic | 2,303,439 | 82,456 | 2,138,527 | 2,468,351 |
| East South Central | 1,538,268 | 80,284 | 1,377,700 | 1,698,836 |
| West South Central | 2,003,261 | 63,343 | 1,876,575 | 2,129,947 |
| Mountain | 1,004,367 | 83,845 | 836,677 | 1,172,057 |
| Pacific | 1,282,246 | 72,026 | 1,138,194 | 1,426,298 |
| Age | | | | |
| 16 to 17 years | 537,312 | 77,723 | 381,866 | 692,758 |
| 18 to 24 years | 1,672,225 | 92,869 | 1,486,487 | 1,857,963 |
| 25 to 34 years | 2,304,482 | 82,397 | 2,139,688 | 2,469,276 |
| 35 to 44 years | 2,792,085 | 94,005 | 2,604,075 | 2,980,095 |
| 45 to 54 years | 1,992,740 | 83,451 | 1,825,838 | 2,159,642 |
| 55 to 64 years | 2,581,922 | 100,607 | 2,380,708 | 2,783,136 |
| 65 years and older | 2,449,531 | 93,157 | 2,263,217 | 2,635,845 |
| 65 to 74 years | 1,772,070 | 78,603 | 1,614,864 | 1,929,276 |
| 75 and older | 677,460 | 53,110 | 571,240 | 783,680 |
| Sex | | | | |
| Male | 11,037,478 | 211,953 | 10,613,572 | 11,461,384 |
| Female | 3,133,589 | 97,510 | 2,938,569 | 3,328,609 |
| Other gender | 165,635 | 27,219 | 111,197 | 220,073 |
| Ethnicity | | | | |
| Hispanic | 1,951,569 | 92,518 | 1,766,533 | 2,136,605 |
| Non-Hispanic | 12,330,388 | 216,617 | 11,897,154 | 12,763,622 |
| Race | | | | |
| White | 11,052,032 | 202,742 | 10,646,548 | 11,457,516 |
| African American | 1,535,179 | 74,001 | 1,387,177 | 1,683,181 |
| Asian American | 774,899 | 67,998 | 638,903 | 910,895 |
| All others | 1,711,087 | 87,998 | 1,535,091 | 1,887,083 |
| Annual Household Income | | | | |
| Less than $10,000 | 1,119,378 | 84,000 | 951,378 | 1,287,378 |
| $10,000 to $14,999 | 569,415 | 44,811 | 479,793 | 659,037 |
| $15,000 to $24,999 | 1,062,763 | 73,497 | 915,769 | 1,209,757 |
| $25,000 to $34,999 | 1,236,139 | 64,564 | 1,107,011 | 1,365,267 |
| $35,000 to $49,999 | 1,676,031 | 84,287 | 1,507,457 | 1,844,605 |
| $50,000 to $74,999 | 2,608,914 | 104,833 | 2,399,248 | 2,818,580 |
| $75,000 to $99,999 | 1,960,785 | 87,087 | 1,786,611 | 2,134,959 |
| $100,000 to $149,999 | 2,116,724 | 79,886 | 1,956,952 | 2,276,496 |
| $150,000 to $199,999 | 1,023,192 | 62,340 | 898,512 | 1,147,872 |
| $200,000 or more | 686,090 | 40,165 | 605,760 | 766,420 |
| Not reported | 315,157 | 31,433 | 252,291 | 378,023 |
| Education | | | | |
| Less than HS | 753,338 | 62,734 | 627,870 | 878,806 |
| High school degree | 5,225,753 | 163,124 | 4,899,505 | 5,552,001 |
| Some college | 4,296,921 | 116,547 | 4,063,827 | 4,530,015 |
| Bachelor's Degree | 2,177,871 | 69,330 | 2,039,211 | 2,316,531 |
| Graduate School | 1,649,679 | 57,225 | 1,535,229 | 1,764,129 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Wildlife Watching | | | |
| Number | SE | Low bound | High bound |
| Total persons | 148,280,092 | 676,058 | 146,927,976 | 149,632,208 |
| Population Density of Residence | | | | |
| Urban | 113,106,420 | 630,231 | 111,845,958 | 114,366,882 |
| Rural | 34,834,700 | 392,661 | 34,049,378 | 35,620,022 |
| Population Size of Residence | | | | |
| Metropolitan Statistical Area (MSA) | | | | |
| 1,000,000 or more | 65,159,494 | 492,227 | 64,175,040 | 66,143,948 |
| 250,000 to 999,999 | 26,615,390 | 352,281 | 25,910,828 | 27,319,952 |
| 50,000 to 249,999 | 12,865,505 | 249,074 | 12,367,357 | 13,363,653 |
| Micropolitan (10,000 to 50,000) | 11,631,873 | 231,385 | 11,169,103 | 12,094,643 |
| Outside MSA | 31,668,860 | 392,486 | 30,883,888 | 32,453,832 |
| Census Geographic Division | | | | |
| New England | 6,682,963 | 100,207 | 6,482,549 | 6,883,377 |
| Middle Atlantic | 17,812,661 | 183,945 | 17,444,771 | 18,180,551 |
| East North Central | 21,256,361 | 411,411 | 20,433,539 | 22,079,183 |
| West North Central | 9,744,740 | 182,363 | 9,380,014 | 10,109,466 |
| South Atlantic | 31,739,605 | 395,963 | 30,947,679 | 32,531,531 |
| East South Central | 9,973,215 | 229,747 | 9,513,721 | 10,432,709 |
| West South Central | 17,067,237 | 209,379 | 16,648,479 | 17,485,995 |
| Mountain | 10,349,032 | 268,105 | 9,812,822 | 10,885,242 |
| Pacific | 23,654,278 | 364,364 | 22,925,550 | 24,383,006 |
| Age | | | | |
| 16 to 17 years | 5,539,008 | 271,875 | 4,995,258 | 6,082,758 |
| 18 to 24 years | 15,248,726 | 305,733 | 14,637,260 | 15,860,192 |
| 25 to 34 years | 24,788,515 | 332,153 | 24,124,209 | 25,452,821 |
| 35 to 44 years | 24,291,493 | 310,505 | 23,670,483 | 24,912,503 |
| 45 to 54 years | 21,483,569 | 293,828 | 20,895,913 | 22,071,225 |
| 55 to 64 years | 25,621,204 | 300,980 | 25,019,244 | 26,223,164 |
| 65 years and older | 30,958,223 | 261,864 | 30,434,495 | 31,481,951 |
| 65 to 74 years | 19,807,959 | 249,178 | 19,309,603 | 20,306,315 |
| 75 and older | 11,150,265 | 233,127 | 10,684,011 | 11,616,519 |
| Sex | | | | |
| Male | 74,563,039 | 558,238 | 73,446,563 | 75,679,515 |
| Female | 71,132,877 | 492,700 | 70,147,477 | 72,118,277 |
| Other gender | 2,199,640 | 126,558 | 1,946,524 | 2,452,756 |
| Ethnicity | | | | |
| Hispanic | 25,289,254 | 440,130 | 24,408,994 | 26,169,514 |
| Non-Hispanic | 122,361,533 | 575,997 | 121,209,539 | 123,513,527 |
| Race | | | | |
| White | 107,738,252 | 554,119 | 106,630,014 | 108,846,490 |
| African American | 16,640,593 | 288,249 | 16,064,095 | 17,217,091 |
| Asian American | 7,041,599 | 233,982 | 6,573,635 | 7,509,563 |
| All others | 27,324,852 | 348,798 | 26,627,256 | 28,022,448 |
| Annual Household Income | | | | |
| Less than $10,000 | 13,211,550 | 296,017 | 12,619,516 | 13,803,584 |
| $10,000 to $14,999 | 7,644,081 | 214,685 | 7,214,711 | 8,073,451 |
| $15,000 to $24,999 | 13,179,268 | 264,475 | 12,650,318 | 13,708,218 |
| $25,000 to $34,999 | 15,384,647 | 276,522 | 14,831,603 | 15,937,691 |
| $35,000 to $49,999 | 18,927,053 | 290,617 | 18,345,819 | 19,508,287 |
| $50,000 to $74,999 | 26,015,984 | 335,801 | 25,344,382 | 26,687,586 |
| $75,000 to $99,999 | 18,411,512 | 282,287 | 17,846,938 | 18,976,086 |
| $100,000 to $149,999 | 18,422,654 | 251,428 | 17,919,798 | 18,925,510 |
| $150,000 to $199,999 | 7,195,808 | 151,600 | 6,892,608 | 7,499,008 |
| $200,000 or more | 6,795,317 | 150,947 | 6,493,423 | 7,097,211 |
| Not reported | 3,092,218 | 123,061 | 2,846,096 | 3,338,340 |
| Education | | | | |
| Less than HS | 7,166,124 | 245,187 | 6,675,750 | 7,656,498 |
| High school degree | 46,623,322 | 552,641 | 45,518,040 | 47,728,604 |
| Some college | 43,341,830 | 363,738 | 42,614,354 | 44,069,306 |
| Bachelor's Degree | 26,220,777 | 259,265 | 25,702,247 | 26,739,307 |
| Graduate School | 23,014,078 | 236,480 | 22,541,118 | 23,487,038 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Away from home | | | |
| Number | SE | Low bound | High bound |
| Total persons | 73,334,491 | 531,995 | 72,270,501 | 74,398,481 |
| Population Density of Residence | | | | |
| Urban | 56,927,155 | 479,676 | 55,967,803 | 57,886,507 |
| Rural | 16,207,034 | 273,585 | 15,659,864 | 16,754,204 |
| Population Size of Residence | | | | |
| Metropolitan Statistical Area (MSA) | | | | |
| 1,000,000 or more | 32,361,867 | 358,667 | 31,644,533 | 33,079,201 |
| 250,000 to 999,999 | 13,186,918 | 253,831 | 12,679,256 | 13,694,580 |
| 50,000 to 249,999 | 6,122,879 | 168,778 | 5,785,323 | 6,460,435 |
| Micropolitan (10,000 to 50,000) | 5,820,624 | 167,565 | 5,485,494 | 6,155,754 |
| Outside MSA | 15,641,900 | 278,907 | 15,084,086 | 16,199,714 |
| Census Geographic Division | | | | |
| New England | 3,160,202 | 68,491 | 3,023,220 | 3,297,184 |
| Middle Atlantic | 8,787,042 | 130,477 | 8,526,088 | 9,047,996 |
| East North Central | 10,657,953 | 285,271 | 10,087,411 | 11,228,495 |
| West North Central | 4,624,145 | 123,716 | 4,376,713 | 4,871,577 |
| South Atlantic | 15,172,375 | 277,267 | 14,617,841 | 15,726,909 |
| East South Central | 4,628,910 | 147,996 | 4,332,918 | 4,924,902 |
| West South Central | 8,315,982 | 145,247 | 8,025,488 | 8,606,476 |
| Mountain | 5,511,148 | 187,871 | 5,135,406 | 5,886,890 |
| Pacific | 12,476,735 | 267,493 | 11,941,749 | 13,011,721 |
| Age | | | | |
| 16 to 17 years | 3,226,993 | 203,334 | 2,820,325 | 3,633,661 |
| 18 to 24 years | 8,909,246 | 226,106 | 8,457,034 | 9,361,458 |
| 25 to 34 years | 14,226,795 | 251,224 | 13,724,347 | 14,729,243 |
| 35 to 44 years | 13,438,276 | 229,575 | 12,979,126 | 13,897,426 |
| 45 to 54 years | 10,745,265 | 208,476 | 10,328,313 | 11,162,217 |
| 55 to 64 years | 11,374,693 | 195,146 | 10,984,401 | 11,764,985 |
| 65 years and older | 11,208,540 | 180,681 | 10,847,178 | 11,569,902 |
| 65 to 74 years | 8,061,180 | 160,071 | 7,741,038 | 8,381,322 |
| 75 and older | 3,147,360 | 116,058 | 2,915,244 | 3,379,476 |
| Sex | | | | |
| Male | 38,572,732 | 416,090 | 37,740,552 | 39,404,912 |
| Female | 33,336,451 | 352,449 | 32,631,553 | 34,041,349 |
| Other gender | 1,237,098 | 97,826 | 1,041,446 | 1,432,750 |
| Ethnicity | | | | |
| Hispanic | 14,269,038 | 324,523 | 13,619,992 | 14,918,084 |
| Non-Hispanic | 58,758,332 | 442,065 | 57,874,202 | 59,642,462 |
| Race | | | | |
| White | 52,330,782 | 422,957 | 51,484,868 | 53,176,696 |
| African American | 8,082,342 | 198,806 | 7,684,730 | 8,479,954 |
| Asian American | 3,818,589 | 166,663 | 3,485,263 | 4,151,915 |
| All others | 14,840,790 | 287,635 | 14,265,520 | 15,416,060 |
| Annual Household Income | | | | |
| Less than $10,000 | 6,326,577 | 202,937 | 5,920,703 | 6,732,451 |
| $10,000 to $14,999 | 3,414,608 | 142,719 | 3,129,170 | 3,700,046 |
| $15,000 to $24,999 | 6,170,482 | 184,761 | 5,800,960 | 6,540,004 |
| $25,000 to $34,999 | 7,397,451 | 193,949 | 7,009,553 | 7,785,349 |
| $35,000 to $49,999 | 9,441,125 | 205,028 | 9,031,069 | 9,851,181 |
| $50,000 to $74,999 | 13,171,134 | 241,928 | 12,687,278 | 13,654,990 |
| $75,000 to $99,999 | 9,423,707 | 194,401 | 9,034,905 | 9,812,509 |
| $100,000 to $149,999 | 9,600,674 | 181,042 | 9,238,590 | 9,962,758 |
| $150,000 to $199,999 | 3,761,523 | 106,374 | 3,548,775 | 3,974,271 |
| $200,000 or more | 3,416,756 | 111,677 | 3,193,402 | 3,640,110 |
| Not reported | 1,210,452 | 74,291 | 1,061,870 | 1,359,034 |
| Education | | | | |
| Less than HS | 3,292,067 | 158,601 | 2,974,865 | 3,609,269 |
| High school degree | 22,246,641 | 392,260 | 21,462,121 | 23,031,161 |
| Some college | 21,152,885 | 259,880 | 20,633,125 | 21,672,645 |
| Bachelor's Degree | 13,569,450 | 192,771 | 13,183,908 | 13,954,992 |
| Graduate School | 12,010,130 | 172,443 | 11,665,244 | 12,355,016 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Around the home | | | |
| Number | SE | Low bound | High bound |
| Total persons | 146,502,604 | 673,179 | 145,156,246 | 147,848,962 |
| Population Density of Residence | | | | |
| Urban | 111,619,049 | 626,770 | 110,365,509 | 112,872,589 |
| Rural | 34,544,582 | 390,965 | 33,762,652 | 35,326,512 |
| Population Size of Residence | | | | |
| Metropolitan Statistical Area (MSA) | | | | |
| 1,000,000 or more | 64,287,608 | 487,708 | 63,312,192 | 65,263,024 |
| 250,000 to 999,999 | 26,339,694 | 350,774 | 25,638,146 | 27,041,242 |
| 50,000 to 249,999 | 12,733,641 | 247,680 | 12,238,281 | 13,229,001 |
| Micropolitan (10,000 to 50,000) | 11,498,714 | 230,230 | 11,038,254 | 11,959,174 |
| Outside MSA | 31,303,975 | 390,934 | 30,522,107 | 32,085,843 |
| Census Geographic Division | | | | |
| New England | 6,620,674 | 99,558 | 6,421,558 | 6,819,790 |
| Middle Atlantic | 17,626,005 | 182,927 | 17,260,151 | 17,991,859 |
| East North Central | 21,102,160 | 409,393 | 20,283,374 | 21,920,946 |
| West North Central | 9,664,190 | 181,975 | 9,300,240 | 10,028,140 |
| South Atlantic | 31,292,146 | 391,864 | 30,508,418 | 32,075,874 |
| East South Central | 9,898,275 | 228,634 | 9,441,007 | 10,355,543 |
| West South Central | 16,802,397 | 207,378 | 16,387,641 | 17,217,153 |
| Mountain | 10,181,024 | 266,259 | 9,648,506 | 10,713,542 |
| Pacific | 23,315,735 | 362,114 | 22,591,507 | 24,039,963 |
| Age | | | | |
| 16 to 17 years | 5,418,816 | 269,439 | 4,879,938 | 5,957,694 |
| 18 to 24 years | 15,002,144 | 303,828 | 14,394,488 | 15,609,800 |
| 25 to 34 years | 24,309,849 | 327,416 | 23,655,017 | 24,964,681 |
| 35 to 44 years | 24,016,941 | 309,080 | 23,398,781 | 24,635,101 |
| 45 to 54 years | 21,250,519 | 292,297 | 20,665,925 | 21,835,113 |
| 55 to 64 years | 25,427,651 | 299,729 | 24,828,193 | 26,027,109 |
| 65 years and older | 30,728,037 | 261,516 | 30,205,005 | 31,251,069 |
| 65 to 74 years | 19,659,915 | 248,308 | 19,163,299 | 20,156,531 |
| 75 and older | 11,068,122 | 232,093 | 10,603,936 | 11,532,308 |
| Sex | | | | |
| Male | 73,608,320 | 554,273 | 72,499,774 | 74,716,866 |
| Female | 70,349,915 | 490,567 | 69,368,781 | 71,331,049 |
| Other gender | 2,159,831 | 125,772 | 1,908,287 | 2,411,375 |
| Ethnicity | | | | |
| Hispanic | 24,915,616 | 436,591 | 24,042,434 | 25,788,798 |
| Non-Hispanic | 120,980,766 | 573,708 | 119,833,350 | 122,128,182 |
| Race | | | | |
| White | 106,671,715 | 552,049 | 105,567,617 | 107,775,813 |
| African American | 16,291,188 | 285,224 | 15,720,740 | 16,861,636 |
| Asian American | 6,948,220 | 230,111 | 6,487,998 | 7,408,442 |
| All others | 26,966,137 | 349,311 | 26,267,515 | 27,664,759 |
| Annual Household Income | | | | |
| Less than $10,000 | 12,990,618 | 294,385 | 12,401,848 | 13,579,388 |
| $10,000 to $14,999 | 7,555,351 | 213,712 | 7,127,927 | 7,982,775 |
| $15,000 to $24,999 | 13,038,698 | 263,450 | 12,511,798 | 13,565,598 |
| $25,000 to $34,999 | 15,222,974 | 275,266 | 14,672,442 | 15,773,506 |
| $35,000 to $49,999 | 18,650,392 | 287,031 | 18,076,330 | 19,224,454 |
| $50,000 to $74,999 | 25,731,696 | 332,451 | 25,066,794 | 26,396,598 |
| $75,000 to $99,999 | 18,167,022 | 280,023 | 17,606,976 | 18,727,068 |
| $100,000 to $149,999 | 18,200,731 | 250,057 | 17,700,617 | 18,700,845 |
| $150,000 to $199,999 | 7,131,327 | 151,240 | 6,828,847 | 7,433,807 |
| $200,000 or more | 6,740,979 | 150,478 | 6,440,023 | 7,041,935 |
| Not reported | 3,072,815 | 122,611 | 2,827,593 | 3,318,037 |
| Education | | | | |
| Less than HS | 7,082,429 | 244,516 | 6,593,397 | 7,571,461 |
| High school degree | 45,938,294 | 547,862 | 44,842,570 | 47,034,018 |
| Some college | 42,893,103 | 362,005 | 42,169,093 | 43,617,113 |
| Bachelor's Degree | 25,893,154 | 257,647 | 25,377,860 | 26,408,448 |
| Graduate School | 22,795,597 | 235,455 | 22,324,687 | 23,266,507 |

### Appendix H: Expenditure Standard Errors

|  |  |  |  |
| --- | --- | --- | --- |
|  | Total Expenditure SE | Average Expenditure per Participant SE | Average Expenditure per Spender SE |
| **Fishing** | | | |
| **Total, all items** | 1,678,706,869 | 48 | 53 |
| **Total trip-related** | 447,664,019 | 14 | 17 |
| **Fishing Equipment** | 129,520,874 | 4 | 6 |
| **Auxiliary Equipment** | 91,943,548 | 3 | 9 |
| **Special Equipment** | 944,690,649 | 25 | 150 |
| **Other Expenditures** | 859,691,682 | 22 | 31 |
| **Hunting** | | | |
| **Total, all items** | 825,625,337 | 77 | 94 |
| **Total trip-related** | 227,115,480 | 21 | 30 |
| **Hunting Equipment** | 169,234,827 | 15 | 25 |
| **Auxiliary Equipment** | 84,476,944 | 7 | 16 |
| **Special Equipment** | 303,769,653 | 23 | 127 |
| **Other Expenditures** | 436,984,352 | 34 | 46 |
| **Wildlife-Watching** | | | |
| **Total, all items** | 4,396,401,245 | 31 | 42 |
| **Total trip-related** | 702,601,880 | 5 | 28 |
| **Wildlife-watching Equipment** | 259,344,565 | 2 | 4 |
| **Auxiliary Equipment** | 163,785,350 | 1 | 6 |
| **Special Equipment** | 2,523,568,654 | 17 | 152 |
| **Other Expenditures** | 2,838,683,843 | 19 | 41 |

### Appendix I: Nonresponse Bias Analysis

NORC implemented an adaptive design strategy for the 2022 National Survey aimed at assessing and reducing nonresponse bias. As discussed in this report, the sampling and weighting approaches used by NORC were designed to improve the respondent sample relative to benchmarks for both demographic and geographic characteristics.

Survey nonresponse does not necessarily lead to nonresponse bias. There have been studies with high response rates that have significant bias, and conversely, there have been surveys with low response rates that have no bias.[[2]](#footnote-2) Nonresponse bias occurs when those who respond to a survey are different from those who do not respond for a key variable or variables of interest. For the National Survey, a major concern is that those who do not participate in fishing, hunting, and wildlife-associated recreation are less likely to participate in the National Survey, leading to nonresponse bias.

This analysis provides an assessment of several sources of nonresponse bias for the National Survey.[[3]](#footnote-3) The analysis illustrates that those who completed the survey participate in hunting, fishing, and wildlife-associated recreation at higher rates than those who did not complete the survey. The analysis then highlights how the sampling and weighting approaches combined to help mitigate nonresponse bias to provide reliable estimates for participating in fishing, hunting, and wildlife-associated recreation.

***Sample Frame Variables Used to Mitigate Nonresponse Bias***

The sampling approach incorporated several variables to improve representativeness and mitigate nonresponse bias. NORC appended urbanicity, hunting license, and commercial data sourced from a vendor to the sample frame, and the analysis shows each of these three sets of variables helped increase sampling efficiency and mitigate nonresponse bias.

The 2016 National Survey Evaluation Report noted an underrepresentation of rural areas and potential nonresponse bias related to urbanicity. To account for urbanicity in the sample for the 2022 National Survey, NORC used the rural-urban commuting area (RUCA) codesthat classify U.S. census tracts using measures of population density, urbanization, and daily commuting. Each sampled address was assigned to one of six RUCA strata: Metropolitan Core, Metropolitan High, Metropolitan Low, Micropolitan, Small Town, and Rural.

The results in Table 1 below show that response rates vary significantly by urbanicity. Residents living in urban areas have the lowest response rates while those living in rural areas have significantly higher response rates. In addition, those in rural areas have higher participation rates in outdoor activities, on average, than those living in urban areas. The results provide evidence of nonresponse bias as there are differences in both response rates and participation rates across different levels of urbanicity.

**Table 1: Response rate and base weighted participation rate by RUCA group.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RUCA Group** | **Response Rate** | **Fishing participation rate\*** | **Hunting participation rate\*** | **Wildlife recreation participation rate\*** |
| Metropolitan Core | 11.3% | 27.8% | 8.2% | 88.7% |
| Metropolitan High | 13.0% | 40.3% | 20.2% | 94.4% |
| Metropolitan Low | 12.0% | 47.7% | 26.7% | 93.2% |
| Micropolitan | 12.5% | 40.1% | 18.2% | 91.8% |
| Small Town | 13.0% | 43.2% | 25.2% | 94.0% |
| Rural | 18.5% | 44.9% | 23.4% | 94.0% |

\*Base weighted participation rate using the probability sample.

The sample was also stratified by the number of hunting licenses per capita in each county to mitigate potential nonresponse bias and improve efficiency. The U.S. Fish & Wildlife Service collected the number of hunting licenses in each county from all states, and NORC classified each county into one of five groups based on the per capita hunting licenses: highest, second highest, medium, second lowest, and lowest. If those who participate in hunting, fishing, and wildlife-associated recreation are more likely to live in certain counties and response rates vary by county, there could be evidence of nonresponse bias.

The results in Table 2 show some variation in response rates across county groupings. The counties with the lowest per capita hunting licenses have the lowest response rate. The table highlights that, as expected, the participation rates in the activities of interest are significantly higher in counties with more per capita hunting licenses. The differences in participation rates across these county groupings highlight the benefit of incorporating these groupings into the weighting as residents in the lowest county license group are underrepresented and have lower participation rates compared to residents in counties with more per capita hunting licenses.

**Table 2: Response rate and base weighted participation rate by license group.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **License Group** | **Response Rate** | **Fishing participation rate\*** | **Hunting participation rate\*** | **Wildlife recreation participation rate\*** |
| Highest | 12.5% | 42.8% | 24.2% | 91.8% |
| Second highest | 13.4% | 41.1% | 19.2% | 93.4% |
| Medium | 12.3% | 37.6% | 16.7% | 92.0% |
| Second lowest | 12.3% | 34.0% | 12.3% | 90.7% |
| Lowest | 11.4% | 27.6% | 8.8% | 88.9% |

\*Base weighted participation rate using the probability sample.

In Wave 3, NORC appended commercial data to the sample frame to help improve sampling efficiency. NORC developed models using the screener data to determine what commercial data variables were most predictive of a household responding to the survey. The models included variables such as likely hunter/fisher, likely gardener, household income, Do Not Call List, likely pet owner, and block group education. NORC then grouped the Wave 3 sample cases into the following five groups based on their likelihood to respond to the survey: no data match (addresses that were not matched by the commercial data vendor), lowest quartile, second lowest quartile, second highest quartile, and highest quartile.

The results in Tabe 3 below illustrate that both the response rates and participation rates vary across the propensity groups. Those in the highest propensity group respond at almost twice the rate as those in the lowest propensity group. In addition, those in the highest propensity group have hunting participation rates that are 30% higher than those in the lowest propensity group. The results illustrate those most likely to respond also have higher participation rates. The analysis highlights the benefit of incorporating the propensity groups into the final weighting approach to mitigate nonresponse bias.

**Table 3: Response rate and base weighted participation rate by propensity to respond.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Propensity to respond groups** | **Response Rate** | **Fishing participation rate\*** | **Hunting participation rate\*** | **Wildlife recreation participation rate\*** |
| No data match\*\* | 11.7% | 29.7% | 11.1% | 89.7% |
| Lowest quartile | 9.2% | 30.0% | 10.2% | 87.6% |
| Second lowest quartile | 11.0% | 32.1% | 12.2% | 89.6% |
| Second highest quartile | 13.3% | 33.4% | 12.9% | 91.2% |
| Highest quartile | 16.6% | 33.3% | 13.3% | 92.0% |

\*Base weighted participation rate using the probability sample.

\*\*Addresses that were not matched by the commercial data vendor.

***Comparing Sample Composition to Demographic Benchmarks***

Comparing the composition of the survey respondents to demographic benchmarks for residents of the United States can help assess potential areas of nonresponse bias. Many surveys in the United States tend to underrepresent hard-to-reach groups such as young adults, those without college degrees, and racial and ethnic minorities. Table 4 below compares the base weighted demographic composition of respondents to benchmarks from the 2021 American Community Survey (ACS).

Table 4 highlights which demographic groups are overrepresented or underrepresented in the National Survey prior to adjusting the weights (via raking) to ACS benchmarks. The results show that the base weighted age and gender distributions of the survey are relatively similar to the ACS benchmarks. However, the base weighted survey composition overrepresents people with higher levels of education and white adults, and it underrepresents those with a high school degree or less and racial and ethnic minorities. The analysis reveals education, race, and ethnicity to be potential sources of nonresponse bias and highlights the potential benefit of incorporating these variables into the survey weighting.

**Table 4: Comparison of the base weighted distribution and the ACS benchmark for key demographic groups.**

|  |  |  |
| --- | --- | --- |
|  | **Base weighted survey percentage\*** | **ACS benchmark percentage\*\*** |
| **Age** |  |  |
| 16 – 17 | 7.0% | 13.7% |
| 18 – 24 | 17.2% | 17.0% |
| 25 – 34 | 18.0% | 16.6% |
| 35 – 44 | 15.2% | 15.4% |
| 45 – 54 | 18.9% | 16.3% |
| 55 – 64 | 16.8% | 12.9% |
| 65 – 74 | 6.9% | 8.2% |
| **Education** |  |  |
| High school degree or less | 20.4% | 39.6% |
| Some college | 31.4% | 28.3% |
| College degree | 28.6% | 20.0% |
| Graduate degree | 19.6% | 12.2% |
| **Ethnicity** |  |  |
| Hispanic | 10.6% | 17.3% |
| Non-Hispanic | 89.4% | 82.7% |
| **Race** |  |  |
| White | 76.5% | 63.4% |
| Black | 8.3% | 11.5% |
| Asian | 4.7% | 6.2% |
| All Other | 10.4% | 18.9% |
| **Gender** |  |  |
| Male | 50.7% | 48.7% |
| Female | 49.3% | 51.3% |

\*Base weighted percentage using the probability sample.

\*\*Sourced from the 2021 American Community Survey.

***Weighting Models to Mitigate Nonresponse Bias***

The results of this analysis show certain groups of people are more likely to respond to the survey and these groups of people are more likely to participate in fishing, hunting, or wildlife-associated recreation. If these sources of bias are not corrected, survey respondents would be more likely to participate in these activities than nonrespondents and the survey would overestimate participation. The survey weighting approach featured models that incorporated the RUCA, hunting license, and commercial data along with the ACS benchmarks for race, ethnicity, education, gender, and age. In addition, the weighting models included data from both the 2016 National Survey and 2011 National Survey to help refine the estimates and mitigate other sources of nonresponse bias. Table 5 below demonstrates that if the weighting didn’t account for potential sources of error, the participation estimates would be about twice as high for all three activities. While there is always the potential for other unknown sources of nonresponse bias, this analysis highlights how the sampling and weighting approach helped reduce nonresponse bias.

**Table 5: Comparison of the base weighted and final weighted participation rates.**

|  |  |  |
| --- | --- | --- |
|  | **Base weighted percentage\*** | **Final weighted percentage\*\*** |
| Fishing participation | 31.7% | 15.4% |
| Hunting participation | 11.9% | 5.5% |
| Wildlife-associated recreation participation | 90.0% | 57.2% |

\*Base weighted percentage using the probability sample.

\*\*Final weighted percentage using all respondents.

1. <https://www.census.gov/content/dam/Census/library/publications/2018/demo/fhw16-nat.pdf> [↑](#footnote-ref-1)
2. Robert M. Groves, Nonresponse Rates and Nonresponse Bias in Household Surveys, Public Opinion Quarterly, Volume 70, Issue 5, 2006, Pages 646–675, <https://doi.org/10.1093/poq/nfl033>. [↑](#footnote-ref-2)
3. The analysis is limited to the probability sample given the limitations of conducting such an analysis on the nonprobability sample. [↑](#footnote-ref-3)