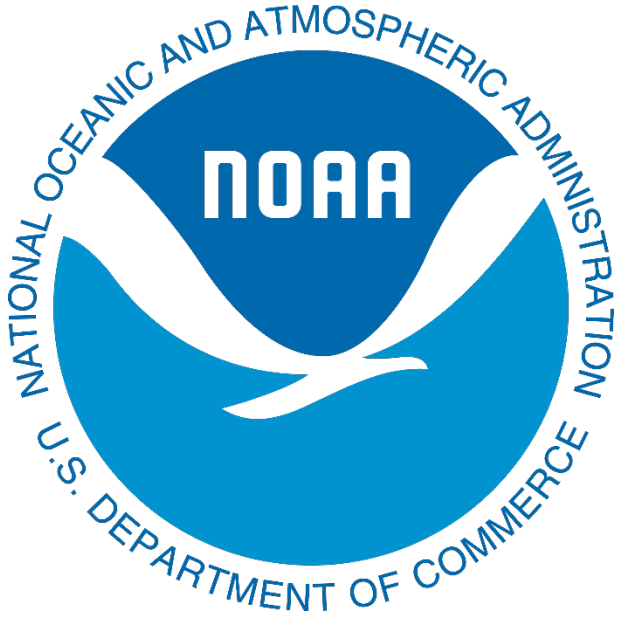

Fishing Effort Survey

2023 Annual Report

Acknowledgments

We would like to thank Gallup for administering the Fishing Effort Survey on behalf of NOAA, National Marine Fisheries Service during 2023.

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1. Overview

Recreational fisheries catch and effort data collection are necessary to fulfill the requirements of Section 303 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852 et. seq.) and to comply with Executive Order 12962 on Recreational Fisheries. Section 303 (a) of the Magnuson-Stevens Fishery Conservation and Management Act specifically mandates that data and analyses be included in Fishery Management Plans. As per these requirements, recreational fishing catch and effort data are used on an ongoing basis by NOAA Fisheries, regional fishery management councils, interstate marine fisheries commissions and state natural resource agencies in developing, implementing and monitoring fishery management programs. These statistics are used to determine the effects of fishing on fish stocks and to develop sound management strategies and policies. Continuous monitoring of recreational fishing catch and effort is also used to assess trends, evaluate the impacts of management regulations, and project how different management scenarios may influence a fishery.

The Fishing Effort Survey (FES) is a cross-sectional, self-administered mail survey that estimates recreational saltwater fishing effort in coastal states along the Atlantic coast, Gulf of Mexico and Hawaii. The FES utilizes an "engaging" approach designed to encourage participation of the household population by broadening the scope of the survey to include both fishing and non-fishing questions. Household-level priming questions ask respondents about different types of outdoor activities and household characteristics while person-level questions, collected for up five household members, ask about individual demographic characteristics and recreational saltwater shore and private boat fishing effort during the previous two and 12 months (Appendix A). In 2023, the FES was administered in 16 states along the Atlantic Coast and Gulf of Mexico, as well as Hawaii (Table 1). The survey is administered for six, independent two-month reference waves beginning with wave 1 (January/February) and ending with wave 6 (November/December). The FES is consistent with OMB guidelines, and has received clearance in accordance with the Paperwork Reduction Act (5 CFR 1320.5(b)) under OMB Control No. 0648-0652. The current clearance is valid through 09/30/2026.

2. Sampling Methodology

The FES utilizes address-based samples (ABS) within coastal states to collect information about recent recreational saltwater fishing activity. Fishing data are collected for up to five residents associated with each sampled address. The sample frame is derived from the United States Postal Service Computerized Delivery Sequence File (CDS) and includes all full-time (non-seasonal), residential addresses, with the exceptions of group quarters and PO boxes that are not flagged as the only way to get mail. Within each coastal state, sampling is stratified by sub-state region, which is defined by geographic proximity to the coast. Generally, counties with borders that are within 25 miles of the coast are in the "coastal" stratum and all other counties are in the "non-coastal" stratum. Rhode Island, Connecticut, Delaware, Florida and Hawaii are not geographically stratified due to relatively consistent fishing rates among counties. The designation of coastal counties in North Carolina, South Carolina, Georgia, Alabama, and Mississippi changes throughout the year to reflect seasonal changes in fishing activity. Coastal county designation by state and wave for 2023 are provided in Appendix B.

Because angling households represent a relatively rare component of the general population, the ABS frame is supplemented by matching addresses on the CDS to lists of licensed saltwater

anglers in each state. State license lists are derived from the National Saltwater Angler Registry (NSAR) and include all anglers licensed to participate in saltwater fishing in the study area between the beginning of each wave and the time the lists are compiled, approximately one month prior to the end of the wave. Augmenting the ABS sample frame with fishing license information creates additional strata (license matched and unmatched) and allows households with and without licensed anglers to be sampled at different rates.

The sample size for each state and wave is targeted to produce estimates of fishing effort with coefficients of variation of 0.20. Within each state, stratum sample sizes are initially determined using a Neyman allocation (e.g. Wright 2014) where the sample is distributed among strata in proportion to the product of the population size and the standard deviation for the measure of interest. The goal of the Neyman allocation is to maximize the precision of estimates for a fixed sample size. Standard deviations are for the mean number of household fishing trips and are based upon historical FES data from the previous five years. Following the initial allocation, base weights are reviewed, and sample may be manually re-distributed among strata to reduce extreme weights and minimize the variation of weights among strata. Sample may also be re-distributed to maximize the probability of detecting fishing activity. Table 1 provides final sample sizes by wave and state for the 2023 FES.

Table 1. Sample size by state and wave during 2023

State	Survey Wave						Total
	1	2	3	4	5	6	
AL	4,812	3,263	2,703	2,381	5,045	3,653	21,857
CT	.	8,053	2,625	2,168	2,607	7,586	23,039
DE	.	5,341	2,592	1,800	2,536	4,814	17,083
FL	1,613	1,916	1,493	3,617	1,929	1,762	12,330
GA	.	11,311	5,619	6,805	6,323	6,299	36,357
HI	5,249	5,091	2,780	2,948	3,849	2,831	22,748
ME	.	.	2,816	1,921	2,987	.	7,724
MD	.	4,785	2,701	2,648	3,107	4,262	17,503
MA	.	12,696	2,543	1,759	3,937	10,502	31,437
MS	6,342	4,375	3,226	3,277	4,281	6,678	28,179
NH	.	.	3,070	3,538	5,329	.	11,937
NJ	.	9,106	3,069	2,686	3,225	5,227	23,313
NY	.	12,603	5,029	3,314	5,370	7,856	34,172
NC	6,345	3,962	2,449	2,647	3,315	3,230	21,948
RI	.	8,190	2,797	2,113	1,898	4,921	19,919
SC	.	3,756	2,977	7,236	3,072	4,667	21,708
VA	.	7,578	2,937	2,451	3,214	3,448	19,628
Total	24,361	102,026	51,426	53,309	62,024	77,736	370,882

3. Data Collection

FES data collection begins with an initial survey mailing one week prior to the end of each reference wave to ensure survey materials are received as close to the end of the wave as possible. This initial mailing, delivered by regular, first class mail, includes a cover letter stating the purpose of the survey, a survey questionnaire, business reply envelope (BRE), and a $2 prepaid cash incentive.

One week after the initial mailing, a follow-up, thank you and reminder postcard is delivered via regular first class mail to all sampled addresses.

Three to four weeks after the initial survey mailing, a final mailing is delivered to all addresses that have not yet responded to the survey. The follow-up includes a nonresponse conversion letter, a second questionnaire, and a pre-paid return envelope. As with prior mailings, the follow-up is delivered via first class mail. All FES supporting materials are available in Appendix C.

Data collection for each reference wave is terminated thirteen weeks after the initial survey mailing. Questionnaires returned after thirteen weeks are scanned but are not committed to the final survey datasets. The complete data collection schedule for 2023 is provided in Table 2.

Table 2. Data collection schedule for the 2023 FES

	Reference Period					
Task/Event	**Wave 1, 2023**	**Wave 2, 2023**	**Wave 3, 2023**	**Wave 4, 2023**	**Wave 5, 2023**	**Wave 6, 2023**
Wave begins	1/1/2023	3/1/2023	5/1/2023	7/1/2023	9/1/2023	11/1/2023
Initial survey mailing	2/20/2023	4/21/2023	6/23/2023	8/23/2023	10/23/2023	12/22/2023
Wave ends	2/28/2023	4/30/2023	6/30/2023	8/31/2023	10/31/2023	12/31/2023
Postcard reminder mailing	3/1/2023	5/1/2023	7/3/2023	9/1/2023	11/1/2023	1/2/2024
Follow-up mailing	3/20/2023	5/18/2023	7/20/2023	9/18/2023	11/20/2023	1/19/2024

4. Data Processing

All surveys received by the FES data collection contractor are sorted by response status (e.g. complete, refusal) or return status designated by the Postal service (e.g. postal return with no new address, postal return with new address, type of undeliverable) and categorized by mailing. Return rates by state, sub-state region, and license match for each wave may be found in Appendix D.

Returned questionnaires are electronically scanned and, in the case of multiple returns by a household, only the first return is accepted to minimize recall bias. The total number of scanned pages is matched to the number of pages per survey to ensure no pages are missed, and the contrast and brightness is adjusted to provide a clear image. After scanned images are generated, a classification and optical character recognition (OCR) process converts the scanned images to an initial survey dataset. Several rounds of verification are then performed during which all open ended questions are manually entered.

Following verification, data are committed to a dataset, and PDFs of each survey are created. Preliminary data processing identifies missing responses, instances where a respondent marked more options than should have been marked, and recodes observations to inapplicable or missing based upon the number of reported household members relative to the number of individual person sections containing information. An initial survey disposition is assigned using a combination of standardized USPS codes, for undeliverable surveys and postal returns, and classifications of survey completeness.

Data from each reference wave are delivered to NOAA on two separate occasions as preliminary and final data. Preliminary data are delivered approximately four weeks after the end of the wave and include data received up to three weeks after the conclusion of the reference wave. Final data are delivered thirteen weeks after the end of the reference wave and include all data collected up to 12 weeks after completion of the wave. Preliminary data generally includes 70-80% of all returned surveys and is used to produce preliminary estimates of recreational

saltwater fishing effort (Table 3). Upon delivery of final data, estimates are updated to minimize variance by including data captured over the entire 12 week sample collection.

Table 3. Number and percentage of total surveys included in preliminary and final data by state during 2023.

State	Prelim.		Final*	
	%	N	%	N
AL	73.94	4,174	26.06	1,471
CT	74.58	4,753	25.42	1,620
DE	76.63	3,803	23.37	1,160
FL	73.81	2,342	26.19	831
GA	74.65	5,811	25.35	1,973
HI	74.41	5,559	25.59	1,912
MA	74.34	6,943	25.66	2,396
MD	74.21	3,424	25.79	1,190
ME	77.22	1,912	22.78	564
MS	72.55	4,951	27.45	1,873
NC	76.55	4,767	23.45	1,460
NH	75.44	2,771	24.56	902
NJ	76.19	4,556	23.81	1,424
NY	71.95	5,142	28.05	2,005
RI	77.27	4,689	22.73	1,379
SC	74.31	4,888	25.69	1,690
VA	74.79	4,079	25.21	1,375
Total	74.72	74,564	25.28	25,225

*** Final data are additional surveys that were not yet received in the preliminary data**

Following data delivery for each wave, an automated check-in process verifies the presence and formatting of all variables, confirms responses are within acceptable ranges, and compares response distributions for each survey measure to historical data from the previous five reference waves to identify obvious inconsistencies relative to the time-series.

Once data validity is confirmed, item nonresponse (missing data) and illogical responses (extra data) are examined. Identifying missing (nonresponse) and extra (illogical) responses requires a determination of the expected number of individual residents within each household. This is achieved by comparing the reported number of household members to the count of individual household residents for whom information is provided. A person is enumerated if any effort question (Q15 and/or Q16) and at least one demographic question (Q11-Q14) are completed (Appendix A). Item response and illogical response are then placed into one of five categories:

1) Complete – household and person-level items are complete and consistent

2) Missing people – the count of responding persons is fewer than the reported number of household members

3) Extra people – the count of responding persons is greater than the reported number of household members

4) Extra information – the count of responding persons equals the reported number of household members, but there are demographic or effort responses present for at least one uncounted person

5) Missing household members – the number of reported household members is missing or zero

Surveys containing item nonresponse and illogical responses are examined via an automated process that attempts to match the number of individual respondents within a household to the reported number of household members. The automated process ranks individual person sections from complete to blank and, using imputation and automatic edits, additively retains the most complete to less complete people, while also removing extra information, until the sum of individual persons matches the number of reported household members or the number of household members is adjusted to match additional people that responded. This process maximizes the completeness of individual person sections within a survey while minimizing the number of edits. Any nonresponse or illogical response that cannot be resolved by automated processing is flagged for manual examination.

Imputation is the process of assigning values to missing data (item nonresponse). A common imputation in the FES results when an individual reports complete demographic information but fails to check the "did not fish" box and reports no value for shore or private boat effort. In this scenario, the count of people is often less than the number of reported household members, and it is assumed that effort questions were intentionally left blank because questions about fishing activity were not applicable to the respondent. As a result, zeros are imputed for missing effort which results in the correct number of people relative to the reported number of household members and reconciles item nonresponse.

Automatic edits work in reverse of imputation and serve to eliminate extra responses or adjust existing responses that are illogical. A common automatic edit occurs when all person sections (five) are completed regardless of the reported number of people in the household. The result is that the count of completed person sections exceeds the reported number of household members. Extra people are often identifiable as duplicates, containing the same age and gender as other household members. Any duplicate people beyond the number of reported household members are automatically edited to inapplicable if their removal allows the number of people to equal the reported number of household members.

After missing and illogical values have been corrected, all surveys, including those previously flagged for manual review by automated processing, are examined via logic checks for contradictory, nonsensical, and unlikely/extreme values and flagged for manual review upon failure. During manual review changes may be made to the survey disposition, number of household members, demographic information, and saltwater fishing effort. Scanned images of surveys flagged for manual review are compared directly to coded data to ensure anomalous values are not the result of scanning errors. Surveys flagged via logic checks for extreme values

or contradictory information (e.g. checked the shore or boat did not fish box but reported non-zero effort) undergo a critical but conservative review. Unless an error is obvious, we generally assume that the reported number of two-month fishing trips is accurate.

Edits applied during automated or manual processing are documented through the creation of unique identifier variables. Original, unedited, values are also retained in the data to maintain accountability and permit comparisons between edited and original values. Overall, 14.03% of eligible surveys returned during 2023 received some form of data edit. Edit rates across waves were consistently below 15.5% ranging from 12.80% to 15.21% (Table 4).

Table 4. FES survey edit rates by wave during 2023

Survey Wave	Not Edited		Data Edit	
	N	%	N	%
1	5,626	84.79	1,009	15.21
2	22,835	85.23	3,956	14.77
3	12,144	87.20	1,783	12.80
4	12,253	87.28	1,786	12.72
5	14,006	86.85	2,121	13.15
6	17,563	84.92	3,119	15.08
Total	84,427	85.97	13,774	14.03

Following automated and manual data processing, a final review of data is completed to identify surveys that are unlikely to be representative of other households within the stratum. Total two month saltwater shore and private boat effort within a household are examined relative to other households during each reference wave and relative to the time series to identify data that are non-representative. For example, a household may be identified as non-representative if it is hundreds of miles from the coast, does not include a licensed angler, and reported dozens of saltwater private boat trips. The non-representative examination is based on expert review and assigned sparingly. A total of 44 households (0.04%) were identified as non-representative during 2023; rates were consistently low across waves ranging from 0.01% to 0.08% (Table 5). Survey weights for households deemed non-representative were adjusted to be self-representative (assigned a final weight of 1) and residual weights were re-distributed among other sampled addresses within the same stratum.

Table 5. Non-representative surveys during 2023

Survey Wave	Not Edited		Non-Representative	
	N	%	N	%
1	6,630	99.92	5	0.08
2	26,782	99.97	9	0.03
3	13,919	99.94	8	0.06
4	14,029	99.93	10	0.07
5	16,118	99.94	9	0.06
6	20,679	99.99	3	0.01
Total	98,157	99.96	44	0.04

5. Response Rates

After data processing, unit response rates were calculated using the American Association for Public Opinion Research (AAPOR) Response Rate 2 (RR2) calculation for un-named mail surveys which excludes ineligible samples from the sample total. Response rates were calculated as

$$RR2 = \frac{(\mathrm{I} + \mathrm{P})}{(\mathrm{I} + \mathrm{P}) + (\mathrm{R} + \mathrm{NC} + \mathrm{O}) + (\mathrm{UH} + \mathrm{UO})}$$

where I and P are the number of eligible interviews containing complete (I) and partially complete (P) surveys,
R, NC, and O are the number of eligible non-interviews including refusals (R), non-contacts (NC), and Other (O) and,
UH and UO are the number of unknown eligible surveys including housing occupancy (UH) or other unknowns (UO).

The overall, weighted, unit response rate during 2023 was 25.38% (Table 6). By wave, weighted response rates fluctuated slightly ranging from 24.50% during wave five to 26.32% during wave one (Table 6).

Table 6. Weighted response rates by wave during 2023

Survey Wave	Response		Unknown Eligibility		Other*		
	N	Weighted %	N	Weighted %	N	Weighted %	Total
1	6,631	26.32	15,815	73.08	129	0.59	22,575
2	26,773	25.66	69,728	73.25	936	1.09	97,437
3	13,918	25.90	34,649	73.68	189	0.42	48,756
4	14,022	25.59	36,329	74.22	109	0.18	50,460
5	16,119	24.50	42,754	75.31	124	0.19	58,997
6	20,669	24.93	53,886	74.79	185	0.29	74,740
Total	98,132	25.38	253,161	74.18	1,672	0.44	352,965

*** Includes nonresponse and removed surveys**

Across states, weighted response rates varied substantially ranging from 21.21% in Georgia to 34.88% in Hawaii (Table 7).

Table 7. Weighted response rates by state during 2023

State	Response		Unknown Eligibility		Other*		Total
	N	Weighted %	N	Weighted %	N	Weighted %	
AL	5,541	24.98	14,609	74.39	104	0.62	20,254
CT	6,289	26.94	15,707	72.75	84	0.31	22,080
DE	4,865	28.87	11,477	70.57	99	0.56	16,441
FL	3,125	25.82	8,403	73.67	48	0.51	11,576
GA	7,632	21.21	26,570	78.41	153	0.38	34,355
HI	7,394	34.88	13,730	64.78	77	0.34	21,201
MA	9,156	27.28	21,011	72.34	184	0.38	30,351
MD	4,547	26.56	12,164	73.03	67	0.41	16,778
ME	2,458	33.95	4,784	65.64	20	0.41	7,262
MS	6,667	24.50	18,837	74.93	158	0.58	25,662
NC	6,124	25.24	14,720	74.18	105	0.58	20,949
NH	3,645	31.33	7,845	68.36	28	0.31	11,518
NJ	5,834	24.20	16,595	75.31	146	0.49	22,575
NY	7,027	23.48	25,751	76.18	124	0.34	32,902
RI	5,922	29.68	13,237	69.84	148	0.47	19,307
SC	6,526	26.72	14,169	73.05	52	0.23	20,747
VA	5,380	27.41	13,552	72.21	75	0.38	19,007
Total	98,132	25.38	253,161	74.18	1,672	0.44	352,965

*** Includes nonresponse and removed surveys**

Item response rates are also evaluated to provide insight into the way respondents interpret individual questions. Unusually high nonresponse rates for individual questions (items) can help illuminate issues with question interpretation and content sensitivity. Item response rates during 2023 were greater than 94% for all household and person level questions (Table 8).

Table 8. Response rates by question (item) during 2023

Question	Response		Nonresponse		Multiple Response	
	N	%	N	%	N	%
Weather	98,014	99.88	118	0.12	.	0.00
Evac	97,922	99.79	204	0.21	6	0.01
Warning	96,978	98.82	1,063	1.08	91	0.09
Beach Flag	97,905	99.77	223	0.23	4	0.00
Fresh Fish	97,812	99.67	304	0.31	16	0.02
Salt Fish	97,847	99.71	261	0.27	24	0.02
HH Phone	96,080	97.91	460	0.47	1,592	1.62
HH Description	96,908	98.75	1,077	1.10	147	0.15
HH Years	97,403	99.26	712	0.73	17	0.02
HH Members	98,072	99.94	60	0.06	.	0.00
Age	221,820	95.16	11,294	4.84	.	0.00
Sex	225,122	96.57	7,768	3.33	224	0.10
Origin	220,926	94.77	12,131	5.20	57	0.02
Race	220,717	94.68	12,397	5.32	.	0.00
Boat Trips	216,819	93.01	16,295	6.99	.	0.00
Shore Trip	218,638	93.79	14,476	6.21	.	0.00
Total	2,298,983	96.60	78,843	3.31	2,178	0.09

6. Weighting

After data processing, sample weights for each survey are calculated in stages. In the first stage, base weights (w_i) for each sampled address within a given stratum are calculated as the inverse of the inclusion probabilities

$$w_i = \frac{1}{\pi_i}$$

where π_i is the probability that unit *i* is included in the sample.

In the second stage, base weights are adjusted to compensate for unit nonresponse (e.g. when households fail to mail back the completed survey). The sample is partitioned into nonresponse adjustment cells, or weighting classes, by state, sub-state region (coastal or non-coastal), license match (matched or unmatched), and boat ownership registration (e.g. whether a sampled address

could be matched to state boater registration list). The base weights of the respondents in each adjustment cell ($w_{ci.r}$) are then divided by the response rate for that cell ($\widehat{\emptyset}_c$) to calculate the adjusted weight (w_{ci}^*)

$$w_{ci}^* = \frac{w_{ci.r}}{\widehat{\emptyset}_c}$$

where $\widehat{\emptyset}_c = \frac{\sum w_{ci.r}}{\sum w_{ci.r} + \sum w_{ci.nr}}$,
$\sum w_{ci.r}$ is the sum of the base weights of each respondent within adjustment cell c, and
$\sum w_{ci.nr}$ is the sum of the base weights of each nonrespondent within adjustment cell c.

In the third stage, nonresponse weights are further adjusted through a process known as raking, which adjusts weights so that the separate or marginal distributions for select variables in the sample data conform to corresponding distributions from independent data sources (Brick and Kalton 1996). For the FES, auxiliary variables are derived from the American Community Survey, Current Population Survey and National Health Interview Survey, and include households with seniors, households with children, household tenure (own/rent), households with three or more household members, and wireless-only households. Raking is an iterative procedure that sequentially adjusts weights to force sample distributions to match marginal distributions for each auxiliary variable. The weights are repeatedly adjusted until the weighted, sample marginal distributions match the auxiliary distributions for all raking variables. Raked weights are calculated as

$$w_{ri}^* = w_{ci}^* R_s$$

where R_s is a generalized raking adjustment in state s.

During the fourth stage, raked weights are post-stratified to account for incomplete coverage of the target population. Post-stratification is commonly used to make respondent data conform to target population totals from other sources independent from the survey (Brick and Kalton 1996). The most recent estimates of the number of residential households available from the American Community Survey (United States Census Bureau 2016) are used as population control totals. Nonresponse adjusted weights are post-stratified to household-level control totals within coastal and non-coastal strata (as defined at the time of sampling for each wave). The resulting post-stratified weight (w_{hi}^*) of address i in stratum h is calculated as

$$w_{hi}^* = w_{ri}^* \left(\frac{H_h}{\widehat{H}_h} \right)$$

where the adjustment factor is equal to the ratio of the control total (H_h, from the American Community Survey) to the estimated total based upon the sum of nonresponse adjusted weights ($\widehat{H}_h$).

Following these three weighting adjustments, a final weight trimming process is applied to mitigate the impacts of extreme values on the precision of survey estimates. Highly variable weights can result in large sampling variances, so it is often desirable to minimize the frequency and size of extreme weights. There is a tradeoff, however, between increasing precision and

biasing estimates through weight trimming procedures. The Estimated Mean Square Error (MSE) Trimming procedure evaluates various trimming levels to identify an optimal level that minimizes the estimated mean square error of an estimate (i.e. minimizes the sum of sampling variance and the square of the estimated bias, Potter 1990; Potter 1988). The MSE for various levels of trimming ($\widehat{MSE}(\hat{T}_t)$) is estimated as

$$\widehat{MSE}(\hat{T}_t) = (\hat{T}_t - \hat{T})^2 - V(\hat{T}) + 2[V(\hat{T}_t)V(\hat{T})]^{1/2}$$

where $\hat{T}$ is the effort estimate using untrimmed weights,
$\hat{T}_t$ is the effort estimate using trimmed weights, and
$V(\hat{T})$ and $V(\hat{T}_t)$ are the estimated variance of $\hat{T}$ and $\hat{T}_t$ respectively.

The automated procedure is carried out by repeatedly reducing maximum weighted values by increments of 5% and redistributing excess weights among untrimmed sample cases. The $\widehat{MSE}(\hat{T}_t)$ is estimated for each incremental adjustment until the minimum value is identified, indicating that the optimal level of trimming has been reached. Trimming is performed separately for each fishing mode resulting in two final survey weights, one for private boat fishing and one for shore fishing.

7. Estimates and Survey Data

After weights are finalized, total shore and private boat fishing effort by residents of coastal states are estimated as weighted sums. Correction factors to account for fishing effort by residents of non-coastal states are derived from the complementary Access Point Angler Intercept Survey (APAIS).

Upon completion of the review and estimation processes, estimates of recreational saltwater fishing effort are available, first for preliminary data and updated with final, within 45 days of the end of the reference wave. Current and prior year estimates can be found at: https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index. Public-use microdata are available for download from https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

8. Quality Management

The FES contractor performs quality and project management functions, and NOAA Fisheries monitors and assesses performance by reviewing the contractor's planning documentation, hosting project kickoff meetings, tracking all survey tasks, and attending weekly conference calls.

At the start of each new FES contract, the contractor is required to develop and submit a quality and project management plan to NOAA Fisheries. The plan includes a detailed schedule of project activities, and reflects the requirements specified in the contract and/or describes and justifies revisions to any of those requirements. The plan also reflects a set of quality management procedures to ensure the collection of high quality data at all stages of the process, addressing each of the following activities: printing, preparing mailing packages, processing

returned questionnaires (paper and/or web), data entry/data verification, and data file production. It further specifies procedures and management controls, and includes a template and schedule for reporting results of quality management operations to NOAA Fisheries staff.

9. Process Improvement

The MRIP Fishing Effort Survey was designed and tested through a series of pilot studies completed between 2007-2014. We continue to evaluate nonsampling errors and potential survey improvements. Below is a comprehensive list of pilot study reports available on our website.

1. A Comparison of Recreational Fishing Effort Survey Designs (2012): Coverage error (ABS vs. RDD, Household vs. License), Nonresponse, Measurement (Gatekeeper, recall, salience)
2. Continued Development and Testing of Dual-Frame Surveys of Fishing Effort: Testing a Dual-Frame, Mixed Mode Design (2013): Coverage error (ABS vs. license sampling) and measurement error (mail vs. phone)
3. Development and Testing of Recreational Fishing Effort Surveys: Testing a Mail Survey Design (2014): Test of FES design. Includes results from initial nonresponse follow-up study and assessment of various sources of nonsampling error
4. Evaluating a Gatekeeper Effect in the Coastal Household Telephone Survey (2018): Evaluates screening error in the CHTS
5. A comparison of recall error in recreational fisheries surveys with one and two-month reference periods (2015): Measurement error in FES (Andrews, William & Papacostas, Katherine & Foster, John. (2018). A Comparison of Recall Error in Recreational Fisheries Surveys with One- and Two-Month Reference Periods. North American Journal of Fisheries Management. 10.1002/nafm.10233.)
7. Testing a Web-Push Design for Estimating Recreational Fishing Effort (2018)
8. Evaluating Nonresponse Bias in the MRIP Fishing Effort Survey (2022): FES nonresponse bias study and weighting procedures
9. Brick M, Andrews W, Foster J (2022) Two sources of nonsampling error in fishing surveys. In: Keung H, Ng T, Heitjan D (eds) Recent Advances on Sampling Methods and Educational Statistics: In Honor of S. Lynne Stokes. Springer International Publishing AG, pp 141- 155

References

Brick, J.M. and G. Kalton. 1996. Handling Missing Data in Survey Research. Statistical Methods in Medical Research. 5: 215-238.

Potter, F.J. 1988. A Study of Procedures to Identify and Trim Extreme Sampling Weights. Proceedings of the Section on Survey Research Methods. American Statistical Association. 225-230.

Potter, F.J. 1990. Survey of Procedures to Control Extreme Sampling Weights. Proceedings of the Section on Survey Research Methods. American Statistical Association. 453-458.

Wright, T. 2014. A Simple Method of Exact Optimal Sample Allocation under Stratification with Any Mixed Constraint Patterns. Center for Statistical Research & Methodology Research Report Series (Statistics #2014-07). U.S. Census Bureau. Available: https://www.census.gov/srd/papers/pdf/rrs2014-07.pdf.

Appendix A. Questionnaire

Survey

HOUSEHOLD MEMBER 4

11 What is this person's sex?
- ☐ Male
- ☐ Female

12 How old is this person?
If less than 1 year, mark 0 years
- ☐☐ Age in years

13 Is this person of Hispanic, Latino, or Spanish origin?
- ☐ Yes, of Hispanic origin
- ☐ No, not of Hispanic origin

14 What is this person's race? Mark one or more boxes.
- ☐ White
- ☐ Black, African-American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander

Please think only about recreational saltwater fishing in <Merged State>.

15 **How many days did this person go recreational saltwater fishing from the SHORE in <Merged State>?**

The shore includes docks, bridges, causeways, beaches, banks, or any other shore-based place or area. Do not include freshwater fishing.
- ☐ Did not recreational saltwater fish from shore in last 12 months ➔ ***Go to question 16***
- ☐☐ Number of days saltwater shore fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater shore fishing in last 12 months, including Jan. and Feb.

16 **How many days did this person go recreational saltwater fishing from a private or rental BOAT that returned to shore in <Merged State>?**

Do not include freshwater trips or trips where a paid captain or crew helped locate and catch fish.
- ☐ Did not recreational saltwater fish from private boat in last 12 months
- ☐☐ Number of days saltwater boat fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater boat fishing in last 12 months, including Jan. and Feb.

If you have more people in your household, continue to Household Member 5.

If you have answered for all people in your household, please return your survey.

HOUSEHOLD MEMBER 5

11 What is this person's sex?
- ☐ Male
- ☐ Female

12 How old is this person?
If less than 1 year, mark 0 years
- ☐☐ Age in years

13 Is this person of Hispanic, Latino, or Spanish origin?
- ☐ Yes, of Hispanic origin
- ☐ No, not of Hispanic origin

14 What is this person's race? Mark one or more boxes.
- ☐ White
- ☐ Black, African-American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander

Please think only about recreational saltwater fishing in <Merged State>.

15 **How many days did this person go recreational saltwater fishing from the SHORE in <Merged State>?**

The shore includes docks, bridges, causeways, beaches, banks, or any other shore-based place or area. Do not include freshwater fishing.
- ☐ Did not recreational saltwater fish from shore in last 12 months ➔ ***Go to question 16***
- ☐☐ Number of days saltwater shore fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater shore fishing in last 12 months, including Jan. and Feb.

16 **How many days did this person go recreational saltwater fishing from a private or rental BOAT that returned to shore in <Merged State>?**

Do not include freshwater trips or trips where a paid captain or crew helped locate and catch fish.
- ☐ Did not recreational saltwater fish from private boat in last 12 months
- ☐☐ Number of days saltwater boat fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater boat fishing in last 12 months, including Jan. and Feb.

Please return your survey to Gallup in the enclosed postage-paid envelope.

Barcode

Wave 01

##WAVE_ENTITY_ID##

OMB # 0648-0652
Exp. Date 12/31/2025

<MERGED STATE>

Weather and Outdoor Activity Survey

Public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Rob Andrews, NOAA Fisheries Service, 1315 East-West Hwy., Silver Spring, MD 20910.

No personally identifiable information will be collected through this survey. Responses will only be associated with a unique, randomly assigned identification code. Any public release of survey data will be without identification as to its source or in aggregate statistical form. All survey data will be stored on secured, password protected servers, and all transfer of survey data will utilize secure file transfer protocols.

This survey should be filled out by an adult member of the household. Complete and return this form even if no one in your household participates in any of these activities.

▼ START HERE

Please carefully follow the steps below when completing this survey.
- Use only a blue or black ink pen that does not blot the paper
- Make solid marks inside the response boxes
- Do not make other marks on the survey ➔

EXAMPLE
RIGHT WAY ▼ ☒
WRONG WAY ▼ ✓ ☒

1 How do members of this household obtain information about the weather, including current weather conditions, forecasts, and warnings? Mark all that apply.
- ☐ Television
- ☐ Radio
- ☐ Newspaper
- ☐ Internet
- ☐ Other

2 During the past 12 months, has anyone in this household had to evacuate or seek shelter due to a severe weather event, such as a tornado, hurricane, or thunderstorm?
- ☐ Yes
- ☐ No

3 In your area, how often do the advanced warnings you get for severe weather events allow you enough time to prepare properly?
- ☐ All the time
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

4 During the past 12 months, has anyone in this household visited a public beach, national seashore, coastal state park, or other coastal nature reserve or protected area?
- ☐ Yes
- ☐ No

5 During the past 12 months, has anyone in this household been freshwater fishing in <merge state>?
- ☐ Yes
- ☐ No

6 During the past 12 months, has anyone in this household been saltwater fishing in <merge state>?
- ☐ Yes
- ☐ No

7 Which of the following best describes how your household receives telephone calls?
- ☐ All are received on cell phones
- ☐ Most are received on cell phones
- ☐ Some are received on cell phones and some on landline phones
- ☐ Most are received on landline phones
- ☐ All are received on landline phones
- ☐ No calls are received on cell phones or landline phones

8 Which of the following best describes this house, apartment, or mobile home?
- ☐ Owned with a mortgage or loan
- ☐ Owned (without a mortgage)
- ☐ Rented
- ☐ Occupied without payment or rent

9 How long have you lived at this address?
- ☐ 1 year or less
- ☐ Less than 5 years, more than 1 year
- ☐ 5 years or more

10 How many people, including all adults and children, live in this household?
- ☐☐ Number of people

Please answer the next section for each member of your household, starting with yourself. Please answer for all people in your home, including people who fish and people who do not fish.

If you have more than 5 people living at this address, answer for the oldest members of the household.

Please use the calendars to help answer questions 15 and 16.

JANUARY 2023

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY 2023

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

HOUSEHOLD MEMBER 1 (YOU)

11 What is your sex?
- ☐ Male
- ☐ Female

12 How old are you?
- ☐☐ Age in years

13 Are you of Hispanic, Latino, or Spanish origin?
- ☐ Yes, of Hispanic origin
- ☐ No, not of Hispanic origin

14 What is your race? Mark one or more boxes.
- ☐ White
- ☐ Black, African-American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander

Please think only about recreational saltwater fishing in <Merged State>.

15 **How many days did you go recreational saltwater fishing from the SHORE in <Merged State>?**

The shore includes docks, bridges, causeways, beaches, banks, or any other shore-based place or area. Do not include freshwater fishing.
- ☐ Did not recreational saltwater fish from shore in last 12 months ➔ ***Go to question 16***
- ☐☐ Number of days saltwater shore fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater shore fishing in last 12 months, including Jan. and Feb.

16 **How many days did you go recreational saltwater fishing from a private or rental BOAT that returned to shore in <Merged State>?**

Do not include freshwater trips or trips where a paid captain or crew helped locate and catch fish.
- ☐ Did not recreational saltwater fish from private boat in last 12 months
- ☐☐ Number of days saltwater boat fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater boat fishing in last 12 months, including Jan. and Feb.

If you have more people in your household, continue to Household Member 2.

If you have answered for all people in your household, please return your survey.

HOUSEHOLD MEMBER 2

11 What is this person's sex?
- ☐ Male
- ☐ Female

12 How old is this person?
If less than 1 year, mark 0 years
- ☐☐ Age in years

13 Is this person of Hispanic, Latino, or Spanish origin?
- ☐ Yes, of Hispanic origin
- ☐ No, not of Hispanic origin

14 What is this person's race? Mark one or more boxes.
- ☐ White
- ☐ Black, African-American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander

Please think only about recreational saltwater fishing in <Merged State>.

15 **How many days did this person go recreational saltwater fishing from the SHORE in <Merged State>?**

The shore includes docks, bridges, causeways, beaches, banks, or any other shore-based place or area. Do not include freshwater fishing.
- ☐ Did not recreational saltwater fish from shore in last 12 months ➔ ***Go to question 16***
- ☐☐ Number of days saltwater shore fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater shore fishing in last 12 months, including Jan. and Feb.

16 **How many days did this person go recreational saltwater fishing from a private or rental BOAT that returned to shore in <Merged State>?**

Do not include freshwater trips or trips where a paid captain or crew helped locate and catch fish.
- ☐ Did not recreational saltwater fish from private boat in last 12 months
- ☐☐ Number of days saltwater boat fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater boat fishing in last 12 months, including Jan. and Feb.

If you have more people in your household, continue to Household Member 3.

If you have answered for all people in your household, please return your survey.

HOUSEHOLD MEMBER 3

11 What is this person's sex?
- ☐ Male
- ☐ Female

12 How old is this person?
If less than 1 year, mark 0 years
- ☐☐ Age in years

13 Is this person of Hispanic, Latino, or Spanish origin?
- ☐ Yes, of Hispanic origin
- ☐ No, not of Hispanic origin

14 What is this person's race? Mark one or more boxes.
- ☐ White
- ☐ Black, African-American
- ☐ Asian
- ☐ American Indian or Alaska Native
- ☐ Native Hawaiian or other Pacific Islander

Please think only about recreational saltwater fishing in <Merged State>.

15 **How many days did this person go recreational saltwater fishing from the SHORE in <Merged State>?**

The shore includes docks, bridges, causeways, beaches, banks, or any other shore-based place or area. Do not include freshwater fishing.
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- ☐☐ Number of days saltwater shore fishing in Jan. and Feb. of 2023
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16 **How many days did this person go recreational saltwater fishing from a private or rental BOAT that returned to shore in <Merged State>?**

Do not include freshwater trips or trips where a paid captain or crew helped locate and catch fish.
- ☐ Did not recreational saltwater fish from private boat in last 12 months
- ☐☐ Number of days saltwater boat fishing in Jan. and Feb. of 2023
- ☐☐☐ Number of days saltwater boat fishing in last 12 months, including Jan. and Feb.

If you have more people in your household, continue to Household Member 4 on the back.

If you have answered for all people in your household, please return your survey.

Appendix B. Coastal Designations by County for Each State Sampled During 2023

State	Counties
AL	Baldwin, Clarke**, Escambia**, Mobile, Monroe, Washington**
CT*	All Counties
DE*	All Counties
FL	All Counties
GA*	Appling**, Brantley, Bryan, Bulloch**, Camden, Charlton, Chatham, Effingham, Evans**, Glynn, Liberty, Long, Mc Intosh, Pierce**, Screven**, Tattnall**, Ware**, Wayne
HI	All Counties
MA*	Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk
MD*	Anne Arundel, Baltimore, Baltimore City, Calvert, Caroline, Cecil, Charles, Dorchester, Harford, Howard, Kent, Montgomery, Prince Georges, Queen Annes, Somerset, St Marys, Talbot, Wicomico, Worcester
ME*	Androscoggin, Cumberland, Hancock, Kennebec, Knox, Lincoln, Penobscot, Sagadahoc, Waldo, Washington, York
MS	Forrest**, George, Greene**, Hancock, Harrison, Jackson, Pearl River, Perry**, Stone
NC	Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Cumberland**, Currituck, Dare, Duplin, Durham**, Edgecombe, Franklin**, Gates, Granville**, Greene, Halifax, Harnett**, Hertford, Hoke**, Hyde, Johnston**, Jones, Lenoir, Martin, Moore**, Nash**, New Hanover, Northampton, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Pitt, Richmond**, Robeson, Sampson, Scotland**, Tyrrell, Vance**, Wake**, Warren**, Washington, Wayne, Wilson
NH*	Hillsborough, Merrimack, Rockingham, Strafford
NJ*	Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Union
NY*	Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester
RI*	All Counties
SC*	Allendale**, Bamberg**, Beaufort, Berkeley, Charleston, Clarendon**, Colleton, Dillon**, Dorchester, Florence, Georgetown, Hampton, Horry, Jasper, Marion, Orangeburg**, Williamsburg
VA*	Accomack, Caroline, Charles City, Chesapeake City, Chesterfield, Colonial Heights City, Dinwiddie, Essex, Fredericksburg City, Gloucester, Hampton City, Hanover, Henrico, Hopewell City, Isle Of Wight, James City, King And Queen, King George, King William, Lancaster, Mathews, Middlesex, New Kent, Newport News City, Norfolk City, Northampton, Northumberland, Petersburg City, Poquoson, Portsmouth City, Prince George, Prince William, Richmond, Richmond City, Southampton, Spotsylvania, Stafford, Suffolk City, Surry, Sussex, Virginia Beach City, Westmoreland, Williamsburg City, York

*** State is not sampled every wave; ** County is only considered coastal for waves 3 - 5**

Appendix C. Survey Supporting Materials

Appendix

First Mailing Cover Letter

##WAVE_ENTITY_ID##

GALLUP

<<Date>>

<<State>> Resident
Add 1
Add 2
City, State, Zip

Dear <<State>> Resident,

I am writing to ask for your help in a study that the Gallup Poll is conducting on behalf of the National Oceanic and Atmospheric Administration (NOAA). This survey asks questions about severe weather and outdoor activities. The results will be used to learn more about the environment and help improve the quality of marine and coastal resources.

For this study to be accurate, we need all households who receive this short survey to complete it and send it back. Your address was randomly picked from a list of addresses in <<State>>, and we can't replace you with someone else. Your responses will help all residents of <<State>> have their voices heard.

This survey asks about many outdoor activities. Some people enjoy many of these activities, while others aren't interested in these activities. **It is very important that your household complete the survey, even if no one participates in these activities.**

This survey should be completed by an adult living at this address. We have included a small gift as a way of saying thank you for your help.

This is a voluntary survey, and your responses are confidential and will only be used in combination with answers from other households. If you have any questions or comments about this study, we will be happy to talk to you. Please call 1-888-297-8999 or email galluppoll@gallupmail.com.

Thank you very much for your help with this important study. Please return your finished survey to Gallup using the enclosed postage-paid envelope.

Yours sincerely,

John Foster
Chief, Recreational Fisheries Statistics Branch
NOAA Fisheries Office of Science & Technology

No personally identifiable information will be collected through this survey. Any public release of survey data will be without identification as to its source or in aggregate statistical form.

Reminder Postcard

<<State>> Weather and Outdoor Activities Survey
c/o Gallup
1001 Gallup Drive
Omaha, NE 68102

First-Class Mail
AUTO
U.S. Postage Paid
Gallup

<<State Resident>>
Add 1
Add 2
City, State, Zip

##WAVE_ENTITY_ID##

<<Date>>

Last week we sent your household a <<STATE>> Weather and Outdoor Activities Survey that the Gallup Poll is conducting on behalf of NOAA (National Oceanic and Atmospheric Administration). If you have already completed and returned the survey, please accept our sincere thanks. If not, I hope you will do so today. It should take no more than 5 to 10 minutes to fill out the survey.

The Gallup Poll and NOAA are conducting this study to learn more about the impacts of outdoor activities on natural resources in <<STATE>>. We need to hear from households that do and do not participate in outdoor activities. Your responses are very important to us. Please know that your answers are completely confidential and will be used only for this study in accordance with the Privacy Act of 1974.

If you did not receive the survey or need another copy, please call Gallup toll-free at 1-888-297-8999 or email galluppoll@gallupmail.com.

John Foster
Chief, Recreational Fisheries Statistics Branch
NOAA Fisheries Office of Science & Technology

Second Mailing Cover Letter

##WAVE_ENTITY_ID##

GALLUP

<<Date>>

<<State>> Resident
Add 1
Add 2
City, State, Zip

Dear <<State>> Resident,

A few weeks ago we sent a survey to your household on severe weather events and outdoor activities. The Gallup Poll is conducting this study on behalf of NOAA (National Oceanic and Atmospheric Administration). If you have already returned the survey, we thank you. If you have not returned it, we ask you to please complete the enclosed survey and return it in the postage-paid envelope as soon as possible.

Your completed survey will help our understanding of the environment and coastal resources in the state of <<State>>.

Your address was randomly selected from a list of all addresses in <<State>>. For this study to be accurate, we need **all** households who receive this short survey to fill it out and send it back – whether or not you participate in outdoor activities. The survey should be completed by an adult member of the household.

We are very grateful for your help. If you have any questions or comments, we will be happy to talk with you. Please call 1-888-297-8999 or email galluppoll@gallupmail.com.

Yours sincerely,

John Foster
Chief, Recreational Fisheries Statistics Branch
NOAA Fisheries Office of Science & Technology

No personally identifiable information will be collected through this survey. Any public release of survey data will be without identification as to its source or in aggregate statistical form.

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2023

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 1			Returns	N	% Returned	Households
AL	Coastal	Match	232	676	34.3	23,872
		Unmatch	713	2,819	25.3	272,226
	Non-Coastal	Match	41	117	35.0	15,510
		Unmatch	257	1,200	21.4	1,933,793
FL	Coastal	Match	138	439	31.4	889,766
		Unmatch	298	1,174	25.4	8,418,656
HI	Coastal	Unmatch	1,745	5,249	33.2	483,265
MS	Coastal	Match	83	233	35.6	47,740
		Unmatch	905	3,455	26.2	170,090
	Non-Coastal	Match	12	39	30.8	34,552
		Unmatch	525	2,615	20.1	1,039,989
NC	Coastal	Match	611	1,702	35.9	239,310
		Unmatch	485	1,787	27.1	672,900
	Non-Coastal	Match	189	598	31.6	389,713
		Unmatch	524	2,258	23.2	3,362,275

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 2			Returns	N	% Returned	Households
AL	Coastal	Match	144	425	33.9	26,597
		Unmatch	438	1,652	26.5	276,372
	Non-Coastal	Match	48	148	32.4	17,564
		Unmatch	251	1,038	24.2	1,941,219
CT	Coastal	Match	246	595	41.3	24,570
		Unmatch	1,899	7,458	25.5	1,475,798
DE	Coastal	Match	229	634	36.1	14,180
		Unmatch	1,310	4,707	27.8	417,250
FL	Coastal	Match	128	430	29.8	908,116
		Unmatch	387	1,486	26.0	8,449,609
GA	Coastal	Match	134	607	22.1	28,995
		Unmatch	523	2,282	22.9	274,258
	Non-Coastal	Match	483	2,139	22.6	139,755
		Unmatch	1,310	6,283	20.8	3,946,984
HI	Coastal	Unmatch	1,655	5,091	32.5	489,608
MA	Coastal	Match	1,167	2,490	46.9	21,297
		Unmatch	2,473	9,080	27.2	2,155,314
	Non-Coastal	Match	74	148	50.0	8,325
		Unmatch	272	978	27.8	675,744
MD	Coastal	Match	393	1,344	29.2	151,672
		Unmatch	801	3,174	25.2	2,067,764
	Non-Coastal	Match	51	130	39.2	15,435
		Unmatch	41	137	29.9	267,012
MS	Coastal	Match	133	356	37.4	54,655
		Unmatch	579	2,182	26.5	168,883
	Non-Coastal	Match	19	61	31.1	43,777
		Unmatch	423	1,776	23.8	1,037,788
NC	Coastal	Match	365	1,026	35.6	243,044
		Unmatch	416	1,623	25.6	678,654
	Non-Coastal	Match	268	777	34.5	395,404
		Unmatch	120	536	22.4	3,376,557
NJ	Coastal	Match	231	511	45.2	26,415
		Unmatch	2,057	8,381	24.5	3,369,722
	Non-Coastal	Match	13	31	41.9	942
		Unmatch	50	183	27.3	158,840

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 2			Returns	N	% Returned	Households
NY	**Coastal**	**Match**	173	716	24.2	106,711
		Unmatch	2,138	10,762	19.9	4,586,065
	Non-Coastal	**Match**	126	359	35.1	146,350
		Unmatch	214	766	27.9	2,847,846
RI	**Coastal**	**Match**	461	1,364	33.8	30,328
		Unmatch	2,134	6,826	31.3	432,560
SC	**Coastal**	**Match**	411	1,101	37.3	171,892
		Unmatch	425	1,579	26.9	658,687
	Non-Coastal	**Match**	147	375	39.2	219,630
		Unmatch	159	701	22.7	1,320,707
VA	**Coastal**	**Match**	475	1,422	33.4	126,990
		Unmatch	1,305	4,844	26.9	1,506,293
	Non-Coastal	**Match**	86	216	39.8	55,387
		Unmatch	318	1,096	29.0	1,887,429

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 3			Returns	N	% Returned	Households
AL	Coastal	Match	130	403	32.3	29,804
		Unmatch	290	1,098	26.4	306,456
	Non-Coastal	Match	33	112	29.5	17,915
		Unmatch	275	1,090	25.2	1,910,014
CT	Coastal	Match	171	431	39.7	54,984
		Unmatch	585	2,194	26.7	1,445,798
DE	Coastal	Match	305	879	34.7	28,857
		Unmatch	513	1,713	29.9	403,571
FL	Coastal	Match	150	554	27.1	847,610
		Unmatch	221	939	23.5	8,540,570
GA	Coastal	Match	172	647	26.6	40,188
		Unmatch	429	1,990	21.6	345,160
	Non-Coastal	Match	80	350	22.9	133,973
		Unmatch	557	2,632	21.2	3,883,341
HI	Coastal	Unmatch	900	2,780	32.4	489,964
MA	Coastal	Match	191	453	42.2	33,852
		Unmatch	448	1,791	25.0	2,142,909
	Non-Coastal	Match	34	74	45.9	12,508
		Unmatch	52	225	23.1	671,743
MD	Coastal	Match	245	876	28.0	154,691
		Unmatch	404	1,585	25.5	2,067,396
	Non-Coastal	Match	20	53	37.7	15,391
		Unmatch	58	187	31.0	267,401
ME	Coastal	Match	191	553	34.5	31,846
		Unmatch	709	2,167	32.7	483,945
	Non-Coastal	Match	4	39	10.3	3,852
		Unmatch	22	57	38.6	90,847
MS	Coastal	Match	62	153	40.5	59,491
		Unmatch	577	2,298	25.1	207,068
	Non-Coastal	Match	13	39	33.3	38,459
		Unmatch	173	736	23.5	1,000,768
NC	Coastal	Match	286	862	33.2	384,596
		Unmatch	230	949	24.2	1,703,838
	Non-Coastal	Match	87	242	36.0	266,316
		Unmatch	90	396	22.7	2,350,295

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 3			Returns	N	% Returned	Households
NH	**Coastal**	**Match**	262	739	35.5	16,347
		Unmatch	644	2,065	31.2	405,446
	Non-Coastal	**Match**	19	66	28.8	3,169
		Unmatch	61	200	30.5	144,099
NJ	**Coastal**	**Match**	141	316	44.6	51,438
		Unmatch	564	2,553	22.1	3,344,208
	Non-Coastal	**Match**	19	38	50.0	2,054
		Unmatch	56	162	34.6	157,613
NY	**Coastal**	**Match**	119	446	26.7	106,139
		Unmatch	774	4,018	19.3	4,589,951
	Non-Coastal	**Match**	32	102	31.4	141,542
		Unmatch	129	463	27.9	2,854,217
RI	**Coastal**	**Match**	154	398	38.7	11,628
		Unmatch	691	2,399	28.8	451,626
SC	**Coastal**	**Match**	227	616	36.9	188,526
		Unmatch	406	1,501	27.0	718,741
	Non-Coastal	**Match**	138	325	42.5	204,401
		Unmatch	121	535	22.6	1,266,230
VA	**Coastal**	**Match**	226	700	32.3	126,609
		Unmatch	427	1,609	26.5	1,509,271
	Non-Coastal	**Match**	51	148	34.5	55,911
		Unmatch	136	480	28.3	1,889,713

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 4			Returns	N	% Returned	Households
AL	**Coastal**	**Match**	173	480	36.0	38,341
		Unmatch	264	1,085	24.3	299,118
	Non-Coastal	**Match**	45	154	29.2	25,661
		Unmatch	139	662	21.0	1,908,877
CT	**Coastal**	**Match**	194	528	36.7	72,609
		Unmatch	413	1,640	25.2	1,428,951
DE	**Coastal**	**Match**	196	650	30.2	41,662
		Unmatch	323	1,150	28.1	394,629
FL	**Coastal**	**Match**	370	1,193	31.0	935,569
		Unmatch	566	2,424	23.3	8,499,291
GA	**Coastal**	**Match**	106	423	25.1	39,739
		Unmatch	353	1,647	21.4	347,711
	Non-Coastal	**Match**	147	747	19.7	131,752
		Unmatch	764	3,988	19.2	3,899,450
HI	**Coastal**	**Unmatch**	944	2,948	32.0	491,320
MA	**Coastal**	**Match**	154	465	33.1	73,389
		Unmatch	254	1,004	25.3	2,106,516
	Non-Coastal	**Match**	20	70	28.6	19,954
		Unmatch	66	220	30.0	665,147
MD	**Coastal**	**Match**	212	744	28.5	162,282
		Unmatch	425	1,754	24.2	2,064,145
	Non-Coastal	**Match**	31	78	39.7	16,347
		Unmatch	16	72	22.2	266,850
ME	**Coastal**	**Match**	169	522	32.4	44,710
		Unmatch	441	1,297	34.0	472,772
	Non-Coastal	**Match**	14	43	32.6	5,526
		Unmatch	15	59	25.4	89,334
MS	**Coastal**	**Match**	48	134	35.8	60,028
		Unmatch	480	1,997	24.0	206,967
	Non-Coastal	**Match**	14	44	31.8	39,042
		Unmatch	229	1,102	20.8	1,001,719
NC	**Coastal**	**Match**	286	927	30.9	373,771
		Unmatch	291	1,196	24.3	1,724,440
	Non-Coastal	**Match**	39	158	24.7	260,195
		Unmatch	84	366	23.0	2,368,198

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 4			Returns	N	% Returned	Households
NH	**Coastal**	**Match**	229	662	34.6	23,435
		Unmatch	742	2,488	29.8	399,048
	Non-Coastal	**Match**	16	51	31.4	4,312
		Unmatch	98	337	29.1	143,030
NJ	**Coastal**	**Match**	113	283	39.9	71,037
		Unmatch	511	2,284	22.4	3,327,560
	Non-Coastal	**Match**	16	39	41.0	2,968
		Unmatch	26	80	32.5	156,431
NY	**Coastal**	**Match**	56	246	22.8	81,595
		Unmatch	530	2,735	19.4	4,622,784
	Non-Coastal	**Match**	16	61	26.2	107,141
		Unmatch	80	272	29.4	2,892,126
RI	**Coastal**	**Match**	141	390	36.2	21,344
		Unmatch	471	1,723	27.3	442,331
SC	**Coastal**	**Match**	850	2,387	35.6	195,818
		Unmatch	584	2,355	24.8	717,024
	Non-Coastal	**Match**	344	958	35.9	211,197
		Unmatch	353	1,536	23.0	1,265,212
VA	**Coastal**	**Match**	142	447	31.8	127,819
		Unmatch	362	1,466	24.7	1,512,086
	Non-Coastal	**Match**	32	98	32.7	57,977
		Unmatch	132	440	30.0	1,891,842

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 5			Returns	N	% Returned	Households
AL	Coastal	Match	193	572	33.7	39,079
		Unmatch	542	2,265	23.9	299,113
	Non-Coastal	Match	29	104	27.9	26,581
		Unmatch	465	2,104	22.1	1,913,619
CT	Coastal	Match	184	549	33.5	77,197
		Unmatch	480	2,058	23.3	1,425,359
DE	Coastal	Match	346	1,080	32.0	45,096
		Unmatch	377	1,456	25.9	393,495
FL	Coastal	Match	232	745	31.1	903,911
		Unmatch	260	1,184	22.0	8,556,482
GA	Coastal	Match	173	663	26.1	39,853
		Unmatch	387	1,893	20.4	348,817
	Non-Coastal	Match	207	910	22.7	135,252
		Unmatch	536	2,857	18.8	3,914,801
HI	Coastal	Unmatch	1,283	3,849	33.3	483,194
MA	Coastal	Match	260	761	34.2	92,071
		Unmatch	550	2,307	23.8	2,092,045
	Non-Coastal	Match	55	140	39.3	24,058
		Unmatch	201	729	27.6	661,436
MD	Coastal	Match	217	812	26.7	156,275
		Unmatch	507	2,077	24.4	2,074,300
	Non-Coastal	Match	31	70	44.3	15,817
		Unmatch	46	148	31.1	267,906
ME	Coastal	Match	250	781	32.0	47,132
		Unmatch	620	2,042	30.4	471,692
	Non-Coastal	Match	15	52	28.8	5,770
		Unmatch	26	112	23.2	89,361
MS	Coastal	Match	235	761	30.9	59,418
		Unmatch	515	2,271	22.7	208,186
	Non-Coastal	Match	126	434	29.0	39,474
		Unmatch	160	815	19.6	1,002,516
NC	Coastal	Match	461	1,321	34.9	390,855
		Unmatch	244	1,009	24.2	1,716,577
	Non-Coastal	Match	89	279	31.9	271,721
		Unmatch	159	706	22.5	2,364,732

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 5			Returns	N	% Returned	Households
NH	Coastal	Match	366	1,192	30.7	23,435
		Unmatch	1,048	3,527	29.7	399,847
	Non-Coastal	Match	28	92	30.4	4,316
		Unmatch	160	518	30.9	143,666
NJ	Coastal	Match	143	391	36.6	78,372
		Unmatch	616	2,642	23.3	3,323,421
	Non-Coastal	Match	23	48	47.9	3,385
		Unmatch	41	144	28.5	156,303
NY	Coastal	Match	61	272	22.4	65,101
		Unmatch	764	4,160	18.4	4,642,730
	Non-Coastal	Match	25	101	24.8	89,898
		Unmatch	251	837	30.0	2,912,105
RI	Coastal	Match	175	553	31.6	30,301
		Unmatch	370	1,345	27.5	433,923
SC	Coastal	Match	442	1,149	38.5	196,444
		Unmatch	267	1,108	24.1	721,409
	Non-Coastal	Match	84	259	32.4	211,252
		Unmatch	108	556	19.4	1,269,426
VA	Coastal	Match	253	832	30.4	129,843
		Unmatch	357	1,593	22.4	1,513,841
	Non-Coastal	Match	70	208	33.7	59,344
		Unmatch	128	581	22.0	1,894,320

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 6			Returns	N	% Returned	Households
AL	**Coastal**	**Match**	156	471	33.1	21,686
		Unmatch	406	1,703	23.8	284,956
	Non-Coastal	**Match**	38	123	30.9	13,854
		Unmatch	343	1,356	25.3	1,963,241
CT	**Coastal**	**Match**	625	1,702	36.7	78,556
		Unmatch	1,576	5,884	26.8	1,425,265
DE	**Coastal**	**Match**	474	1,530	31.0	45,720
		Unmatch	890	3,284	27.1	394,746
FL	**Coastal**	**Match**	148	599	24.7	1,201,031
		Unmatch	275	1,163	23.6	8,308,069
GA	**Coastal**	**Match**	186	685	27.2	29,994
		Unmatch	441	1,993	22.1	279,082
	Non-Coastal	**Match**	300	1,221	24.6	144,452
		Unmatch	496	2,400	20.7	4,004,509
HI	**Coastal**	**Unmatch**	944	2,831	33.3	483,670
MA	**Coastal**	**Match**	628	1,617	38.8	93,039
		Unmatch	2,087	7,695	27.1	2,095,547
	Non-Coastal	**Match**	51	167	30.5	24,378
		Unmatch	302	1,023	29.5	661,461
MD	**Coastal**	**Match**	315	1,086	29.0	152,364
		Unmatch	744	3,026	24.6	2,082,365
	Non-Coastal	**Match**	17	36	47.2	15,457
		Unmatch	40	114	35.1	269,128
MS	**Coastal**	**Match**	101	282	35.8	54,119
		Unmatch	596	2,571	23.2	170,593
	Non-Coastal	**Match**	13	88	14.8	44,522
		Unmatch	803	3,737	21.5	1,042,090
NC	**Coastal**	**Match**	240	683	35.1	248,496
		Unmatch	337	1,320	25.5	685,791
	Non-Coastal	**Match**	182	549	33.2	409,934
		Unmatch	144	678	21.2	3,420,805
NJ	**Coastal**	**Match**	197	461	42.7	81,773
		Unmatch	994	4,184	23.8	3,325,225
	Non-Coastal	**Match**	19	49	38.8	3,567
		Unmatch	150	533	28.1	156,189

Appendix D. Return Rates by Stratum for Waves 1 – 6

Wave 6			Returns	N	% Returned	Households
NY	Coastal	Match	402	1,554	25.9	45,591
		Unmatch	1,068	5,534	19.3	4,669,382
	Non-Coastal	Match	9	37	24.3	46,190
		Unmatch	180	731	24.6	2,959,397
RI	Coastal	Match	366	1,115	32.8	30,245
		Unmatch	1,105	3,806	29.0	434,438
SC	Coastal	Match	621	1,565	39.7	180,627
		Unmatch	543	1,929	28.1	670,314
	Non-Coastal	Match	257	729	35.3	227,293
		Unmatch	91	444	20.5	1,334,769
VA	Coastal	Match	278	777	35.8	130,672
		Unmatch	496	2,091	23.7	1,521,516
	Non-Coastal	Match	77	223	34.5	59,912
		Unmatch	103	357	28.9	1,897,789