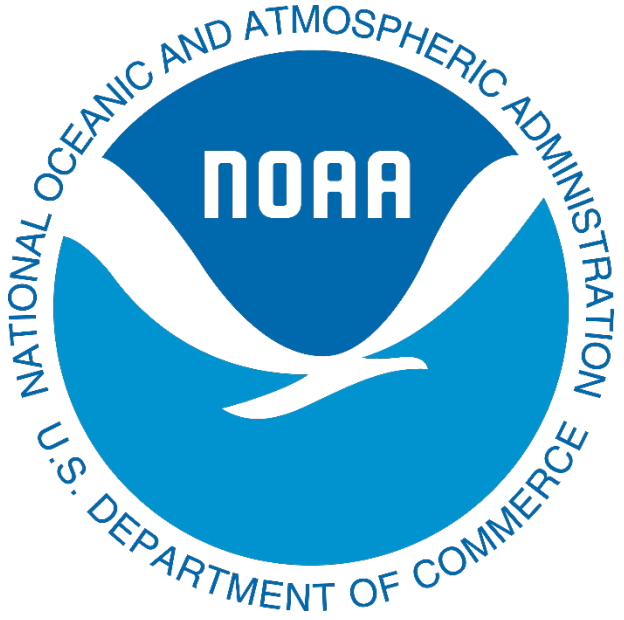

Fishing Effort Survey

2022 Annual Report

Acknowledgments

We would like to thank RTI International for administering the Fishing Effort Survey on behalf of NOAA, National Marine Fisheries Service during 2022.

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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 anglers and non-anglers by broadening the scope of inquiries 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, obtain information about individual demographic characteristics and recreational saltwater shore and private boat fishing effort during the previous two and 12 months (Appendix A). In 2022, 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 09/30/2023.

2. Sampling Methodology

Recreational saltwater fishing data are collected for all household members. Consequently, each household receiving a survey represents a sampling unit. The FES utilizes address-based samples (ABS) within coastal states to collect information about recent recreational saltwater fishing activity. The sample frame is derived from the USPS 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 2022 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. The goal of the Neyman allocation is to maximize the precision of estimates for a fixed sample size. Standard deviations are based upon historical FES data and estimates. 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 2022 FES.

Table 1. Sample size by state and wave during 2022

State	Survey Wave						Total
	1	2	3	4	5	6	
AL	4,354	2,668	2,401	2,575	5,403	2,841	20,242
CT	.	7,992	2,577	1,757	2,590	6,528	21,444
DE	.	4,968	2,251	2,128	2,626	4,180	16,153
FL	1,500	2,166	1,606	1,675	1,844	1,705	10,496
GA	.	12,630	5,909	7,059	6,985	6,727	39,310
HI	6,393	4,914	2,790	3,028	4,543	2,944	24,612
ME	.	.	2,597	1,924	3,094	.	7,615
MD	.	4,760	2,898	2,953	3,204	4,385	18,200
MA	.	10,646	2,812	1,800	3,760	10,783	29,801
MS	5,776	4,867	3,313	3,123	3,831	3,377	24,287
NH	.	.	3,547	3,672	6,460	.	13,679
NJ	.	9,533	2,847	3,126	3,804	5,500	24,810
NY	.	12,822	4,665	3,127	4,961	8,316	33,891
NC	6,868	3,307	2,467	2,732	3,681	2,869	21,924
RI	.	8,746	3,151	1,592	2,037	5,112	20,638
SC	.	3,986	3,382	3,178	3,081	3,972	17,599
VA	.	7,591	3,231	2,163	3,495	3,260	19,740
Total	24,891	101,596	52,444	47,612	65,399	72,499	364,441

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 2022 is provided in Table 2.

Table 2. Data collection schedule for the 2022 FES

	Reference Period					
Task/Event	**Wave 1, 2022**	**Wave 2, 2022**	**Wave 3, 2022**	**Wave 4, 2022**	**Wave 5, 2022**	**Wave 6, 2022**
Wave begins	1/1/2022	3/1/2022	5/1/2022	7/1/2022	9/1/2022	11/1/2022
Initial survey mailing	2/21/2022	4/23/2022	6/22/2022	8/23/2022	10/23/2022	12/21/2022
Wave ends	2/28/2022	4/30/2022	6/30/2022	8/31/2022	10/31/2022	12/31/2022
Postcard reminder mailing	3/1/2022	5/2/2022	7/1/2022	9/1/2022	11/1/2022	12/30/2022
Follow-up mailing	3/19/2022	5/19/2022	7/18/2022	9/19/2022	11/19/2022	1/16/2023

4. Data Processing

During the 13 week data collection window, 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 sets. 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 2022.

State	Prelim.		Final*	
	%	N	%	N
AL	75.43	3,878	24.57	1,263
CT	75.57	4,479	24.43	1,448
DE	76.51	3,632	23.49	1,115
FL	76.53	2,031	23.47	623
GA	73.45	5,875	26.55	2,124
HI	75.93	6,543	24.07	2,074
MA	73.99	5,977	26.01	2,101
MD	74.49	3,530	25.51	1,209
ME	77.68	1,872	22.32	538
MS	75.76	4,713	24.24	1,508
NC	76.59	4,806	23.41	1,469
NH	74.39	3,065	25.61	1,055
NJ	74.46	4,587	25.54	1,573
NY	73.14	4,989	26.86	1,832
RI	76.99	4,761	23.01	1,423
SC	77.16	4,209	22.84	1,246
VA	76.05	4,170	23.95	1,313
Total	75.35	73,117	24.65	23,914

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

Following data delivery for each wave, a 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 to identify large-scale 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 response are examined via an automated process which attempts to match the number of people responding to the number of reported 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 counted 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 greater than the number of reported household members are automatically edited to inapplicable if their removal allows the number of people to equal the number of reported household members.

Once data are corrected for missing and illogical values, 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 poor handwriting that resulted in scanning errors. Surveys flagged

via logic checks for large amounts of reported effort or effort with contradictory information (e.g. checked the shore or boat did not fish box but reported non-zero effort) undergo a critical but conservative review.

Edits applied during automated or manual processing are documented through the creation of unique identifier variables. Original, unedited, values are also retained to maintain accountability and permit comparisons between edited and original values. Overall, 11.67% of eligible surveys returned during 2022 received some form of data edit. Edit rates across waves were consistently below 15% ranging from 10.61% to 12.60% (Table 4).

Table 4. FES survey edit rates by wave during 2022

Survey Wave	Not Edited		Data Edit	
	N	%	N	%
1	6,324	87.64	892	12.36
2	23,143	88.19	3,099	11.81
3	12,931	89.39	1,535	10.61
4	11,206	88.81	1,412	11.19
5	14,778	88.63	1,895	11.37
6	16,728	87.40	2,412	12.60
Total	85,110	88.33	11,245	11.67

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 contain 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 46 households (0.05%) were identified as non-representative during 2022; rates were consistently low across waves ranging from 0.01% to 0.10% (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 2022

Survey Wave	Not Edited		Non-Representative	
	N	%	N	%
1	7,215	99.99	1	0.01
2	26,232	99.96	10	0.04
3	14,459	99.95	7	0.05
4	12,605	99.90	13	0.10
5	16,664	99.95	9	0.05
6	19,134	99.97	6	0.03
Total	96,309	99.95	46	0.05

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 2022 was 25.45% (Table 6). By wave, weighted response rates fluctuated slightly ranging from 23.72% during wave five to 27.43% during wave one (Table 6).

Table 6. Weighted response rates by wave during 2022

Survey Wave	Response		Unknown Eligibility		Other*		
	N	Weighted %	N	Weighted %	N	Weighted %	Total
1	7,212	27.43	15,839	72.27	51	0.30	23,102
2	26,223	25.95	69,819	73.85	211	0.20	96,253
3	14,454	26.69	35,057	73.13	89	0.18	49,600
4	12,606	25.18	32,320	74.48	134	0.34	45,060
5	16,660	23.72	46,387	75.95	211	0.33	63,258
6	19,122	25.04	49,764	74.59	233	0.36	69,119
Total	96,277	25.45	249,186	74.27	929	0.28	346,392

*** Includes nonresponse and removed surveys**

Across states, weighted response rates varied substantially ranging from 20.42% in Georgia to 36.83% in Hawaii (Table 7).

Table 7. Weighted response rates by state during 2022

State	Response		Unknown Eligibility		Other*		Total
	N	Weighted %	N	Weighted %	N	Weighted %	
AL	5,099	24.37	13,749	75.29	51	0.34	18,899
CT	5,893	27.18	14,576	72.57	49	0.26	20,518
DE	4,717	28.87	10,855	70.89	33	0.23	15,605
FL	2,638	25.73	7,214	73.97	25	0.30	9,877
GA	7,937	20.42	28,979	79.34	92	0.24	37,008
HI	8,572	36.83	14,590	62.88	60	0.29	23,222
MA	8,006	27.23	20,356	72.49	76	0.28	28,438
MD	4,713	26.48	12,665	73.31	31	0.21	17,409
ME	2,395	33.15	4,824	66.65	16	0.20	7,235
MS	6,171	24.22	15,961	75.37	91	0.41	22,223
NC	6,231	26.99	14,482	72.76	45	0.25	20,758
NH	4,092	31.12	9,169	68.69	31	0.19	13,292
NJ	6,093	23.93	17,728	75.76	73	0.31	23,894
NY	6,730	22.94	25,762	76.78	111	0.28	32,603
RI	6,141	30.02	13,686	69.73	45	0.25	19,872
SC	5,409	27.34	11,179	72.31	55	0.35	16,643
VA	5,440	28.22	13,411	71.50	45	0.28	18,896
Total	96,277	25.45	249,186	74.27	929	0.28	346,392

*** 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 2022 were high at over 94% for all household and person level questions (Table 8).

Table 8. Response rates by question (item) during 2022

Question	Response		Nonresponse		Multiple Response	
	N	%	N	%	N	%
Weather	96,140	99.86	137	0.14	.	0.00
Evac	95,954	99.66	306	0.32	17	0.02
Warning	95,074	98.75	1,118	1.16	85	0.09
Beach Flag	96,019	99.73	241	0.25	17	0.02
Fresh Fish	95,889	99.60	326	0.34	62	0.06
Salt Fish	95,893	99.60	313	0.33	71	0.07
HH Phone	94,599	98.26	478	0.50	1,200	1.25
HH Description	95,109	98.79	1,033	1.07	135	0.14
HH Years	95,630	99.33	632	0.66	15	0.02
HH Members	96,225	99.95	52	0.05	.	0.00
Age	218,014	95.15	11,108	4.85	.	0.00
Gender	220,598	96.28	8,133	3.55	390	0.17
Origin	216,286	94.40	12,769	5.57	66	0.03
Race	216,530	94.50	12,591	5.50	.	0.00
Boat Trips	215,661	94.13	13,460	5.87	.	0.00
Shore Trip	216,997	94.71	12,124	5.29	.	0.00
Total	2,260,618	96.71	74,821	3.20	2,058	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 sample marginal distributions match the auxiliary marginal distributions for all selected varialbes. 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 allows for evaluating 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

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Appendix A. Questionnaire

HOUSEHOLD MEMBER 4

11 What is this person's gender?
- ☐ 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 North Carolina.

15 **How many days did this person go recreational saltwater fishing from the SHORE in North Carolina?**

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 January and February of 2022

☐☐☐ Number of days saltwater shore fishing in last 12 months, including January and February

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

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 January and February of 2022

☐☐☐ Number of days saltwater boat fishing in last 12 months, including January and February

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 gender?
- ☐ 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 North Carolina.

15 **How many days did this person go recreational saltwater fishing from the SHORE in North Carolina?**

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 January and February of 2022

☐☐☐ Number of days saltwater shore fishing in last 12 months, including January and February

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

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 January and February of 2022

☐☐☐ Number of days saltwater boat fishing in last 12 months, including January and February

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

RTI International
5265 Capital Boulevard, Raleigh NC 27690-1652

22199999

OMB#: 0648-0652
Exp. Date: 9/30/2023

North Carolina

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.

0004933

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 North Carolina?

- ☐ Yes
- ☐ No

6 During the past 12 months, has anyone in this household been saltwater fishing in North Carolina?

- ☐ 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

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

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 gender?

- ☐ Male
- ☐ Female

12 How old are you?
If less than 1 year, mark 0 years

☐☐ 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 North Carolina.

15 How many days did you go recreational saltwater fishing from the SHORE in North Carolina?

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 January and February of 2022

☐☐☐ Number of days saltwater shore fishing in last 12 months, including January and February

16 How many days did you go recreational saltwater fishing from a private or rental BOAT that returned to shore in North Carolina?

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 January and February of 2022

☐☐☐ Number of days saltwater boat fishing in last 12 months, including January and February

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 gender?

- ☐ 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
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☐ Did not recreational saltwater fish from private boat in last 12 months

☐☐ Number of days saltwater boat fishing in January and February of 2022

☐☐☐ Number of days saltwater boat fishing in last 12 months, including January and February

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 gender?

- ☐ 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.

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- ☐ Black, African-American
- ☐ Asian
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☐☐ Number of days saltwater boat fishing in January and February of 2022

☐☐☐ Number of days saltwater boat fishing in last 12 months, including January and February

If you have more people in your household, continue to Household Member 4. 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 2022

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

H4571-W1#-0004933 P004 T00037 **********5-DIGIT 28470

NORTH CAROLINA RESIDENT

February 21, 2022

Dear North Carolina Resident,

I am writing to ask for your help in a study that RTI International 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 North Carolina, and we can't replace you with someone else. Your responses will help all residents of North Carolina 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 of $2 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 1-877-212-7229.

Thank you very much for your help with this important study. Please return your finished survey to RTI International 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.

0004933

L1

301_22199999

Commonly Asked Questions

- **How did you get my address?**
  Your address was randomly selected from all addresses in North Carolina. You and your household represent many other households in your part of North Carolina.

- **Nobody in my household participates in outdoor recreational activities. Should I still complete the survey?**
  Yes. It is important that everyone who receives this short questionnaire complete it and return it. For the results of the study to be accurate, we need basic information about all households who received the survey – regardless of whether they participate in outdoor recreational activities.

- **Why can't you interview another household instead of mine?**
  We can't select another household. For the results to be accurate, we need all households who receive this short questionnaire to complete it and send it back.

- **How much time will this survey take?**
  On average, it should take less than ten minutes to complete, including reviewing instructions, and answering the questions.

- **Who is sponsoring the survey?**
  This study is being sponsored by the National Oceanic and Atmospheric Administration (NOAA). NOAA's mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs.

- **How will the information I provide be used?**
  This survey collects information about how outdoor and marine resources in North Carolina are used and will help us better manage these resources for the future.

  Your answers are completely confidential and will be used only for this study in accordance with the Privacy Act of 1974. Call RTI International, toll-free, at 1-877-212-7229 with questions about this survey.

North Carolina Weather and Outdoor Activity Survey
c/o RTI International (0217587.000.006)
5265 Capital Boulevard
Raleigh, NC 27616-2925

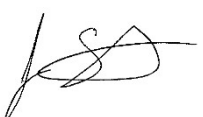
0001246 P003 T00003 *********ALL FOR AADC 283
NORTH CAROLINA RESIDENT

March 1, 2022

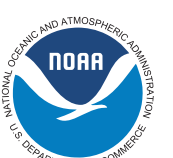
Last week we sent your household a North Carolina Weather and Outdoor Activity Survey that RTI International is conducting on behalf of the National Oceanic and Atmospheric Administration (NOAA). If you have already completed and returned the survey, please accept our sincere thanks. If not, I hope you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

RTI International and NOAA are conducting this study to learn more about outdoor activities and natural resources in North Carolina. 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 RTI International toll-free at 1-877-212-7229.



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



H4575-W1#-0000399 P001 T00003 **********3-DIGIT 287

NORTH CAROLINA RESIDENT

March 19, 2022

Dear North Carolina Resident,

A few weeks ago we sent a survey to your household on severe weather events and outdoor activities. RTI International is conducting this study on behalf of the National Oceanic and Atmospheric Administration (NOAA). 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 North Carolina.

Your address was randomly selected from a list of all addresses in North Carolina. 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 1-877-212-7229.

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.

0000399

L1

303_22199999

Commonly Asked Questions

- **How did you get my address?**
  Your address was randomly selected from all addresses in North Carolina. You and your household represent many other households in your part of North Carolina.

- **Nobody in my household participates in outdoor recreational activities. Should I still complete the survey?**
  Yes. It is important that everyone who receives this short questionnaire complete it and return it. For the results of the study to be accurate, we need basic information about all households who received the survey – regardless of whether they participate in outdoor recreational activities.

- **Why can't you interview another household instead of mine?**
  We can't select another household. For the results to be accurate, we need all households who receive this short questionnaire to complete it and send it back.

- **How much time will this survey take?**
  On average, it should take less than ten minutes to complete, including reviewing instructions, and answering the questions.

- **Who is sponsoring the survey?**
  This study is being sponsored by the National Oceanic and Atmospheric Administration (NOAA). NOAA's mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs.

- **How will the information I provide be used?**
  This survey collects information about how outdoor and marine resources in North Carolina are used and will help us better manage these resources for the future.

  Your answers are completely confidential and will be used only for this study in accordance with the Privacy Act of 1974. Call RTI International, toll-free, at 1-877-212-7229 with questions about this survey.

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 1			Returns	N	% Returned
AL	Coastal	Match	220	672	32.7
		Unmatch	667	2,695	24.7
	Non-Coastal	Match	27	98	27.6
		Unmatch	198	889	22.3
FL	Coastal	Match	128	433	29.6
		Unmatch	283	1,067	26.5
HI	Coastal	Unmatch	2,345	6,393	36.7
MS	Coastal	Match	72	160	45.0
		Unmatch	886	3,408	26.0
	Non-Coastal	Match	11	38	28.9
		Unmatch	458	2,170	21.1
NC	Coastal	Match	674	1,837	36.7
		Unmatch	522	2,041	25.6
	Non-Coastal	Match	187	560	33.4
		Unmatch	584	2,430	24.0

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 2			Returns	N	% Returned
AL	**Coastal**	**Match**	120	337	35.6
		Unmatch	381	1,488	25.6
	Non-Coastal	**Match**	21	74	28.4
		Unmatch	178	769	23.1
CT	**Coastal**	**Match**	168	365	46.0
		Unmatch	1,978	7,627	25.9
DE	**Coastal**	**Match**	104	254	40.9
		Unmatch	1,425	4,714	30.2
FL	**Coastal**	**Match**	124	430	28.8
		Unmatch	392	1,736	22.6
GA	**Coastal**	**Match**	201	715	28.1
		Unmatch	599	2,721	22.0
	Non-Coastal	**Match**	186	792	23.5
		Unmatch	1,609	8,402	19.2
HI	**Coastal**	**Unmatch**	1,686	4,914	34.3
MA	**Coastal**	**Match**	54	145	37.2
		Unmatch	2,514	9,622	26.1
	Non-Coastal	**Match**	23	79	29.1
		Unmatch	242	800	30.3
MD	**Coastal**	**Match**	410	1,345	30.5
		Unmatch	747	3,166	23.6
	Non-Coastal	**Match**	37	76	48.7
		Unmatch	57	173	32.9
MS	**Coastal**	**Match**	111	240	46.3
		Unmatch	755	2,714	27.8
	Non-Coastal	**Match**	26	61	42.6
		Unmatch	423	1,852	22.8
NC	**Coastal**	**Match**	223	699	31.9
		Unmatch	271	1,178	23.0
	Non-Coastal	**Match**	310	870	35.6
		Unmatch	142	560	25.4

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 2			Returns	N	% Returned
NJ	**Coastal**	**Match**	285	637	44.7
		Unmatch	2,003	8,661	23.1
	Non-Coastal	**Match**	13	32	40.6
		Unmatch	70	203	34.5
NY	**Coastal**	**Match**	210	786	26.7
		Unmatch	2,157	11,360	19.0
	Non-Coastal	**Match**	116	360	32.2
		Unmatch	94	316	29.7
RI	**Coastal**	**Match**	405	1,182	34.3
		Unmatch	2,178	7,564	28.8
SC	**Coastal**	**Match**	510	1,331	38.3
		Unmatch	472	1,576	29.9
	Non-Coastal	**Match**	121	361	33.5
		Unmatch	177	718	24.7
VA	**Coastal**	**Match**	455	1,306	34.8
		Unmatch	1,316	5,199	25.3
	Non-Coastal	**Match**	62	172	36.0
		Unmatch	271	914	29.6

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 3			Returns	N	% Returned
AL	**Coastal**	**Match**	151	453	33.3
		Unmatch	278	1,078	25.8
	Non-Coastal	**Match**	40	119	33.6
		Unmatch	163	751	21.7
CT	**Coastal**	**Match**	144	354	40.7
		Unmatch	593	2,223	26.7
DE	**Coastal**	**Match**	263	708	37.1
		Unmatch	441	1,543	28.6
FL	**Coastal**	**Match**	186	576	32.3
		Unmatch	262	1,030	25.4
GA	**Coastal**	**Match**	122	423	28.8
		Unmatch	459	2,061	22.3
	Non-Coastal	**Match**	81	303	26.7
		Unmatch	635	3,122	20.3
HI	**Coastal**	**Unmatch**	974	2,790	34.9
MA	**Coastal**	**Match**	86	250	34.4
		Unmatch	541	2,240	24.2
	Non-Coastal	**Match**	30	70	42.9
		Unmatch	68	252	27.0
MD	**Coastal**	**Match**	237	840	28.2
		Unmatch	420	1,844	22.8
	Non-Coastal	**Match**	24	64	37.5
		Unmatch	36	150	24.0
ME	**Coastal**	**Match**	193	560	34.5
		Unmatch	634	1,949	32.5
	Non-Coastal	**Match**	15	41	36.6
		Unmatch	14	47	29.8
MS	**Coastal**	**Match**	69	140	49.3
		Unmatch	652	2,405	27.1
	Non-Coastal	**Match**	15	38	39.5
		Unmatch	175	730	24.0

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 3			Returns	N	% Returned
NC	Coastal	Match	291	799	36.4
		Unmatch	245	982	24.9
	Non-Coastal	Match	100	286	35.0
		Unmatch	104	400	26.0
NH	Coastal	Match	258	779	33.1
		Unmatch	756	2,418	31.3
	Non-Coastal	Match	21	69	30.4
		Unmatch	83	281	29.5
NJ	Coastal	Match	148	367	40.3
		Unmatch	560	2,327	24.1
	Non-Coastal	Match	19	39	48.7
		Unmatch	30	114	26.3
NY	Coastal	Match	181	684	26.5
		Unmatch	670	3,551	18.9
	Non-Coastal	Match	37	96	38.5
		Unmatch	101	334	30.2
RI	Coastal	Match	162	449	36.1
		Unmatch	824	2,702	30.5
SC	Coastal	Match	251	682	36.8
		Unmatch	472	1,667	28.3
	Non-Coastal	Match	155	384	40.4
		Unmatch	155	649	23.9
VA	Coastal	Match	265	750	35.3
		Unmatch	442	1,779	24.8
	Non-Coastal	Match	64	162	39.5
		Unmatch	148	540	27.4

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 4			Returns	N	% Returned
AL	Coastal	Match	152	488	31.1
		Unmatch	295	1,109	26.6
	Non-Coastal	Match	36	115	31.3
		Unmatch	215	863	24.9
CT	Coastal	Match	102	302	33.8
		Unmatch	361	1,455	24.8
DE	Coastal	Match	269	880	30.6
		Unmatch	332	1,248	26.6
FL	Coastal	Match	164	598	27.4
		Unmatch	233	1,077	21.6
GA	Coastal	Match	24	105	22.9
		Unmatch	496	2,229	22.3
	Non-Coastal	Match	28	112	25.0
		Unmatch	905	4,613	19.6
HI	Coastal	Unmatch	1,079	3,028	35.6
MA	Coastal	Match	182	509	35.8
		Unmatch	256	1,015	25.2
	Non-Coastal	Match	27	71	38.0
		Unmatch	51	205	24.9
MD	Coastal	Match	215	729	29.5
		Unmatch	512	2,065	24.8
	Non-Coastal	Match	35	72	48.6
		Unmatch	28	87	32.2
ME	Coastal	Match	205	625	32.8
		Unmatch	394	1,164	33.8
	Non-Coastal	Match	15	68	22.1
		Unmatch	18	67	26.9
MS	Coastal	Match	48	117	41.0
		Unmatch	495	1,873	26.4
	Non-Coastal	Match	18	46	39.1
		Unmatch	228	1,087	21.0

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 4			Returns	N	% Returned
NC	Coastal	Match	326	974	33.5
		Unmatch	307	1,267	24.2
	Non-Coastal	Match	52	149	34.9
		Unmatch	87	342	25.4
NH	Coastal	Match	245	760	32.2
		Unmatch	733	2,437	30.1
	Non-Coastal	Match	21	55	38.2
		Unmatch	139	420	33.1
NJ	Coastal	Match	111	301	36.9
		Unmatch	624	2,728	22.9
	Non-Coastal	Match	15	48	31.3
		Unmatch	17	49	34.7
NY	Coastal	Match	74	276	26.8
		Unmatch	434	2,477	17.5
	Non-Coastal	Match	22	61	36.1
		Unmatch	80	313	25.6
RI	Coastal	Match	164	484	33.9
		Unmatch	310	1,108	28.0
SC	Coastal	Match	363	929	39.1
		Unmatch	284	1,108	25.6
	Non-Coastal	Match	144	404	35.6
		Unmatch	150	737	20.4
VA	Coastal	Match	151	436	34.6
		Unmatch	307	1,187	25.9
	Non-Coastal	Match	27	94	28.7
		Unmatch	126	446	28.3

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 5			Returns	N	% Returned
AL	Coastal	Match	203	548	37.0
		Unmatch	688	2,976	23.1
	Non-Coastal	Match	30	70	42.9
		Unmatch	395	1,809	21.8
CT	Coastal	Match	188	537	35.0
		Unmatch	497	2,053	24.2
DE	Coastal	Match	311	1,083	28.7
		Unmatch	381	1,543	24.7
FL	Coastal	Match	197	679	29.0
		Unmatch	272	1,165	23.3
GA	Coastal	Match	49	200	24.5
		Unmatch	503	2,645	19.0
	Non-Coastal	Match	13	85	15.3
		Unmatch	688	4,055	17.0
HI	Coastal	Unmatch	1,511	4,543	33.3
MA	Coastal	Match	282	853	33.1
		Unmatch	613	2,544	24.1
	Non-Coastal	Match	26	72	36.1
		Unmatch	77	291	26.5
MD	Coastal	Match	272	876	31.1
		Unmatch	514	2,128	24.2
	Non-Coastal	Match	21	52	40.4
		Unmatch	50	148	33.8
ME	Coastal	Match	254	813	31.2
		Unmatch	626	2,091	29.9
	Non-Coastal	Match	14	62	22.6
		Unmatch	28	128	21.9
MS	Coastal	Match	160	514	31.1
		Unmatch	659	2,783	23.7
	Non-Coastal	Match	30	95	31.6
		Unmatch	80	439	18.2

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 5			Returns	N	% Returned
NC	**Coastal**	**Match**	478	1,457	32.8
		Unmatch	218	1,030	21.2
	Non-Coastal	**Match**	96	275	34.9
		Unmatch	201	919	21.9
NH	**Coastal**	**Match**	469	1,509	31.1
		Unmatch	1,150	4,125	27.9
	Non-Coastal	**Match**	25	79	31.6
		Unmatch	220	747	29.5
NJ	**Coastal**	**Match**	190	510	37.3
		Unmatch	655	3,174	20.6
	Non-Coastal	**Match**	16	39	41.0
		Unmatch	24	81	29.6
NY	**Coastal**	**Match**	106	461	23.0
		Unmatch	688	3,874	17.8
	Non-Coastal	**Match**	7	43	16.3
		Unmatch	145	583	24.9
RI	**Coastal**	**Match**	227	675	33.6
		Unmatch	379	1,362	27.8
SC	**Coastal**	**Match**	518	1,408	36.8
		Unmatch	232	889	26.1
	Non-Coastal	**Match**	74	233	31.8
		Unmatch	120	551	21.8
VA	**Coastal**	**Match**	291	929	31.3
		Unmatch	437	1,897	23.0
	Non-Coastal	**Match**	49	136	36.0
		Unmatch	148	533	27.8

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 6			Returns	N	% Returned
AL	Coastal	Match	131	359	36.5
		Unmatch	321	1,395	23.0
	Non-Coastal	Match	34	103	33.0
		Unmatch	197	984	20.0
CT	Coastal	Match	553	1,474	37.5
		Unmatch	1,343	5,054	26.6
DE	Coastal	Match	439	1,361	32.3
		Unmatch	782	2,819	27.7
FL	Coastal	Match	155	554	28.0
		Unmatch	258	1,151	22.4
GA	Coastal	Match	125	549	22.8
		Unmatch	428	2,154	19.9
	Non-Coastal	Match	360	1,488	24.2
		Unmatch	488	2,536	19.2
HI	Coastal	Unmatch	1,022	2,944	34.7
MA	Coastal	Match	478	1,320	36.2
		Unmatch	2,093	8,020	26.1
	Non-Coastal	Match	50	126	39.7
		Unmatch	385	1,317	29.2
MD	Coastal	Match	321	1,094	29.3
		Unmatch	771	3,200	24.1
	Non-Coastal	Match	6	32	18.8
		Unmatch	26	59	44.1
MS	Coastal	Match	93	272	34.2
		Unmatch	557	2,120	26.3
	Non-Coastal	Match	21	66	31.8
		Unmatch	179	919	19.5
NC	Coastal	Match	239	618	38.7
		Unmatch	294	1,136	25.9
	Non-Coastal	Match	185	541	34.2
		Unmatch	139	574	24.2

Appendix D. Return Rates by Stratum for Waves 1 – 6, 2022

Wave 6			Returns	N	% Returned
NJ	Coastal	Match	214	586	36.5
		Unmatch	951	4,231	22.5
	Non-Coastal	Match	14	40	35.0
		Unmatch	201	643	31.3
NY	Coastal	Match	346	1,282	27.0
		Unmatch	1,071	6,013	17.8
	Non-Coastal	Match	12	37	32.4
		Unmatch	270	984	27.4
RI	Coastal	Match	396	1,212	32.7
		Unmatch	1,139	3,900	29.2
SC	Coastal	Match	557	1,549	36.0
		Unmatch	442	1,607	27.5
	Non-Coastal	Match	198	508	39.0
		Unmatch	60	308	19.5
VA	Coastal	Match	256	807	31.7
		Unmatch	508	1,939	26.2
	Non-Coastal	Match	51	127	40.2
		Unmatch	109	387	28.2