METHODOLOGY REPORT:
MARINE LIFE SURVEY

Prepared for The Pew Charitable Trusts

Prepared by:

Robyn Rapoport

Sarah Glancey

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OVERVIEW

The Pew Charitable Trusts (PCT) engaged SSRS to conduct the 2021 Marine Life Survey. PCT initiated this survey to help examine policies within their Conserving Marine Life in the United States (CMLUS) project. PCT was interested in surveying adults, ages 18 and older, living on the East Coast of the US about several policy proposals.

The 2021 Marine Life Survey was conducted online via the SSRS Opinion Panel and an independent address-based sample supplement in New England to reach our target number of interviews. A total of 1,847 adults living in one of the fourteen states along the East Coast, or DC, participated. Data collection was conducted from February 11 to March 10, 2021.

This report provides information about the sampling procedures and the methods used to collect, process, and weight data for the 2021 Marine Life Survey.

SSRS PROFILE

SSRS is a full-service survey and market research firm managed by a core of dedicated professionals with advanced degrees in the social sciences. SSRS designs and implements research solutions for complex strategic, tactical, public opinion, and policy issues in the U.S. and in more than 40 countries worldwide. The SSRS team specializes in creative problem-solving and informed analysis to meet its clients' research goals. SSRS provides the complete set of analytical, administrative and management capabilities needed for successful project execution. We partner with clients interested in conducting high-quality research. In the industry, SSRS is renowned for its sophisticated sample designs and its experience with all facets of data collection, including those involving multimodal formats. SSRS also has extensive statistical and analytical capabilities for extracting important insights from the survey data and suggesting strategies based on those insights.

QUESTIONNAIRE DESIGN

PCT developed the survey instrument in collaboration with SSRS. Questionnaire development occurred between December 8, 2020 and January 13, 2021, with PCT providing an initial draft and SSRS supplying survey feedback. The SSRS team provided feedback regarding question wording, order, clarity, and other issues pertaining to questionnaire quality. Together, SSRS and the PCT team worked to finalize the questionnaire for pretesting.

Upon final approval, SSRS formatted and programmed the survey for completion online. Additional steps were employed to ensure a quality experience in survey administration regardless of the device utilized by respondents, whether a desktop computer, tablet or phone.

Pretest

Once the survey was programmed, SSRS completed eleven cognitive pretest interviews to help identify any questions that were confusing or not understood as intended, to evaluate the usability of the online survey instrument and to gauge the efficacy of the mailing materials. Upon completion of the pretest interviews,

SSRS provided recordings and a detailed memo to PCT which included feedback on the overall instrument and mailing materials. Following the pretest, adjustments were made to both the mailing materials and questionnaire.

SAMPLE DESIGN

SSRS Opinion Panel

The majority of interviews for the Marine Life Survey were completed using the SSRS Opinion Panel. Panelists in the SSRS Opinion Panel are recruited randomly based on a nationally representative ABS (Address Based Sample) design (including Hawaii and Alaska). Addresses are randomly sampled by our sister company, Marketing Systems Group (MSG), through the U.S. Postal Service's Computerized Delivery Sequence (CDS), a regularly-updated listing of all known addresses in the U.S. For the Opinion Panel, known business addresses are excluded from the sample frame.

Additionally, the SSRS Opinion Panel recruits hard-to-reach demographic groups via our Omnibus survey platform.[1] The SSRS Omnibus survey is a nationally representative (including Hawaii and Alaska) bilingual telephone survey designed to meet standards of quality associated with custom research studies. The SSRS Omnibus completes more than 50,000 surveys annually with 80% cell allocation.

The advantage of this recruiting design is that it relies on a high-quality ABS design that yields a higher response rate. Additionally, it leverages the SSRS Omnibus platform to ensure adequate representation of typically under-represented groups in public opinion polls such as Hispanics, African Americans, lower educated, or lower income populations.

ABS Sample

To reach our minimum sample goal in New England, SSRS supplemented the SSRS Opinion Panel with an independent address-based sample (ABS).

Sample for the ABS component was randomly selected from all New England addresses through the U.S. Postal Service's CDS by MSG. Since individuals with lower education often respond at lower rates to survey requests and are, therefore, often underrepresented, households likely to include individuals with less than a high school education were sampled at a higher rate. Likely lower-education households were defined as those within Census block groups where at least 12.4% of adults have less than a high school education based on American Community Survey 5-year estimates. This represents the 25% of block groups within New England with the highest proportion of low education residents.

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[1] Prior to July 2019, the SSRS Opinion Panel was recruited entirely from the SSRS Omnibus.

DATA COLLECTION

SSRS Opinion Panel

All SSRS Opinion Panel members drawn for the Marine Life Survey were adult, English-language panelists who were known to be living in one of the fourteen East Coast states of interest, or the District of Columbia.[2]

Panelists were emailed an invitation, that included a unique passcode-embedded link, to complete the survey online. In appreciation for their participation, panelists received a modest incentive (in the form of an electronic gift card). All respondents who did not respond to their first invitation received up to four reminder emails or text reminders.

A "soft launch" inviting a limited number of panelists to participate was conducted on February 11th. After checking soft launch data to ensure that all questionnaire content and skip patterns were correct, additional sample was released to ensure the final sample met the study goals.

For the Marine Life Survey, the survey administration schedule for Panelists was as follows:

Table 1: SSRS Opinion Panel Fieldwork Schedule

Touchpoint	Date
Soft launch invitation	2/11/2021
Full launch invitation	2/12/2021
Field Close	3/10/2021

Address-based Sample

ABS respondents were sent an invitation letter followed by a reminder postcard asking them to participate in the study. The invitation letter included a one-page letter, printed on PCT stationery, inviting respondents to participate in an important research study. To increase participation, the invitation letter included a $1.25 cash pre-incentive and offered a $10 post-incentive in the form of an electronic gift card if they qualified and completed the survey. Two days after mailing the invitation letter, a reminder postcard was sent to all respondents to remind the respondent to reply to the initial mailing they received.

For the Marine Life Survey, the survey administration schedule for ABS respondents was as follows:

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[2] Panel information included a flag to identify the state where the panelist resided. Prior to completing the survey, panelists had to confirm the state where they currently lived.

Table 2: ABS Fieldwork Schedule

Touchpoint	Date
Invitation letter mailed	3/1/2021
Reminder postcard mailed	3/3/2021
Field Close	3/10/2021

Overall, the median length of the Marine Life Survey was eight minutes.

COMPLETION RATE/RESPONSE RATE

Tables 3 and 4 detail the completion and response rates for the different sample types for this study.

Table 3: Completion Rate/Response Rate – SSRS Opinion Panel[3]

Sample Productivity	
Invited to Participate/Total Sample	3,073
Completed	1,660
Removals	8
Terminates	118
Survey Completion Rate	56%
Composite Response Rate	2%[4]

Table 4: Response Rate – ABS

Sample Productivity	
Complete (I)	187
Eligible, non-interview (R)	7
Unknown eligibility, non-interview (UH)	2,845
Not eligible, returned (IN)	111
Total records contacted	3,150
Response Rate (RR3)	9.3%

DATA PROCESSING AND INTEGRATION

SSRS implemented several quality assurance procedures in data file preparation and processing. Prior to launching data collection, extensive testing of the web survey was completed to ensure it was working as anticipated. After the soft launch, survey data were carefully checked for accuracy, completeness, and non-response to specific questions so that any issues could be identified and resolved prior to the full launch.

[3] Web-panel response rates are a product of (1) response rates to the original invitation to participate as a panelist; (2) the completion rate, among panelists, with the invitation to participate in the study.
[4] Product of the SSRS Opinion Panel recruitment response rates and the Marine Life Survey completion rate.

The data file programmer implemented a "data cleaning" procedure in which web survey skip patterns were created in order to ensure that all questions had the appropriate numbers of cases. This procedure involved a check of raw data by a program that consisted of instructions derived from the skip patterns designated on the questionnaire. The program confirmed that data were consistent with the definitions of codes and ranges and matched the appropriate bases of all questions.

As a standard practice, quality checks were incorporated into the survey. Quality control checks for this study included a review of "speeders", reviewing the internal response rate (number of questions answered divided by the number of questions asked) and open-ended questions. Respondents who failed the quality checks employed were not included in the final data set. A total of n=9 cases were removed due to quality control removals.

WEIGHTING

Data were weighted to provide representative and projectable estimates of the East Coast adult population. There are three regions within this population: New England (CT, NH, RI, MA, ME); Mid-Atlantic (NJ, NY, DE, MD, VA, DC); and the Southeast (NC, SC, GA, FL).

Base Weight

The first step in weighting was the application of a base weight, which was calculated based on whether the respondent was contacted through the SSRS Opinion Panel or part of the New England sample reached through the independent ABS sample.

SSRS Opinion Panel

The panel base weight (PBW) was computed differently depending on whether the panelist was recruited from the SSRS Omnibus or from ABS.

The base weight for the Omnibus recruits is the original base weight assigned at the time of the original Omnibus interview.

The Omnibus base weight, PBW_{Omni} can be expressed as a function of the size of the landline and cell phone sample frames (F_{LL} and F_{CELL}), the size of the landline and cell phone samples (S_{LL} and S_{CELL}), and the number of adults in each household (AD) as follows.[5]

$$PBW_{Omni} = \left((LL \times AD \times S_{LL}/F_{LL}) + (CP \times S_{CELL}/F_{CELL}) - (LL \times AD \times CP \times S_{LL} \times S_{CP}/(F_{LL} \times F_{CP}))\right)^{-1}$$

Where $LL = 1$ if the respondent has a landline phone and $LL = 0$ otherwise and $CP = 1$ if the respondent has a cell phone and $CP = 0$ otherwise.

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[5] Buskirk, T. D., & Best, J. (2012). Venn Diagrams, Probability 101 and Sampling Weights Computed for Dual Frame Telephone RDD Designs. Journal of Statistics and Mathematics, 15, 3696-3710.

The base weight for ABS recruits is the product of a sampling weight and a household size adjustment. The sampling weight accounts for selection probabilities of addresses across the 16 ABS strata and also the probability of selection of one adult in each sampled household.

The ABS base weight, PBW_{ABS}, can be expressed as a function of the proportion of the ABS frame in stratum i, P_i, the proportion of the ABS sample that was pulled from stratum i, p_i and the number of adults in household j as follows.

$$PBW_{ABS} = (P_i/p_i) \times AD_{ij}$$

ABS Sample (New England)

New England ABS respondents were assigned a base weight of the frame's probability of selection, adjusted for disproportionate sampling in strata with a higher proportion of low education population.

Non-Internet Adjustment

In addition to the base weight, a non-Internet Adjustment (NIA) was made to the data. For this adjustment, SSRS applies a propensity score to model non-Internet households so that estimates can be projectable to the full U.S. population and not just Internet users. Propensity scores were estimated by fitting a regression of internet status on a range of demographic and attitudinal covariates. Adjustments for each respondent are then calculated as the reciprocal of the estimated internet access propensity found from the model.

Final Base Weight

The base weights were then trimmed by sample source (Omni-Recruit Panelists, ABS-Recruit Panelists, ABS Sample) and standardized by region.

Post-Stratification to Population Benchmarks

The next step in the weighting is balancing sample demographics to population benchmark distributions within each region (New England, Mid-Atlantic, Southeast).

To handle missing data among some of the demographic variables we employ a technique called hot decking. Hot deck imputation replaces the missing values of a respondent randomly with another similar respondent without missing data. These are further determined by variables predictive of non-response that are present in the entire file. We use an SPSS macro detailed in 'Goodbye, Listwise Deletion: Presenting Hot Deck Imputation as an Easy and Effective Tool for Handing Missing Data' (Myers, 2011).

Weighting was accomplished using SPSSINC RAKE, an SPSS extension module that simultaneously balances the distributions of all variables using the GENLOG procedure.

Data were weighted to distributions of: sex, age, education, race/ethnicity, region, civic engagement , and density . The sex, age, education, race/ethnicity, and region benchmarks were derived from the 2019 American Community Survey data. Civic Engagement was defined by respondents' involvement in volunteering and talking with neighbors daily.

Weights were trimmed at the 3.5th and 96.5th percentiles within regions to prevent individual interviews from having too much influence on the final results.

Table 5: Parameters, Unweighted and Weighted Distributions for New England

	Parameter	Unweighted Sample	Weighted Sample
Gender			
Male	48.1%	47.1%	48.6%
Female	51.9%	52.9%	51.4%
Age			
18 to 29	18.7%	13.6%	18.0%
30 to 49	32.1%	32.7%	32.5%
50 to 64	27.0%	29.6%	27.0%
65+	22.2%	24.2%	22.5%
Education			
Less than HS	8.5%	2.0%	7.4%
HS grad	26.4%	13.6%	26.2%
Some college	25.5%	24.7%	26.0%
College +	39.6%	59.8%	40.5%
Race/Ethnicity			
White, non-Hisp	76.0%	83.3%	76.1%
Black, non-Hisp	6.2%	4.1%	6.1%
Hispanic	10.3%	6.2%	10.5%
Other race, non-Hisp	7.4%	6.4%	7.3%
Region			
Connecticut	24.9%	28.1%	25.0%
Massachusetts	48.3%	43.0%	48.5%
Maine	9.7%	10.6%	9.9%
New Hampshire	9.7%	12.6%	9.9%
Rhode Island	7.4%	5.7%	6.7%
Density			
1 – Lowest 20%	6.6%	7.4%	6.7%
2	13.2%	13.9%	13.3%
3	25.0%	27.3%	25.5%
4	49.6%	48.0%	49.0%
5 – Highest 20%	5.6%	3.4%	5.5%
Civic Engagement			
Yes	62.5%	52.8%	62.0%
No	37.5%	47.2%	38.0%

Table 6: Parameters, Unweighted and Weighted Distributions for Mid-Atlantic

	Parameter	Unweighted Sample	Weighted Sample
Gender			
Male	47.7%	47.5%	47.5%
Female	52.3%	52.5%	52.5%
Age			
18 to 29	19.4%	16.7%	19.3%
30 to 49	33.8%	34.6%	33.2%
50 to 64	25.8%	27.0%	26.3%
65+	21.0%	21.7%	21.2%
Education			
Less than HS	10.5%	2.9%	8.9%
HS grad	25.6%	22.2%	26.1%
Some college	25.9%	30.5%	26.5%
College +	38.0%	44.5%	38.5%
Race/Ethnicity			
White, non-Hisp	57.7%	63.2%	58.2%
Black, non-Hisp	17.1%	16.6%	16.9%
Hispanic	14.8%	12.9%	15.0%
Other race, non-Hisp	10.5%	7.3%	9.9%
Region			
Delaware	2.2%	1.0%	1.9%
District of Columbia	1.6%	2.9%	1.7%
Maryland	13.5%	13.4%	13.6%
New Jersey	19.9%	20.3%	19.8%
New York	43.8%	42.6%	43.7%
Virginia	19.0%	19.9%	19.3%
Density			
1 – Lowest 20%	8.0%	7.7%	7.6%
2	12.1%	11.5%	12.0%
3	13.0%	15.9%	13.3%
4	22.7%	26.3%	22.8%
5 – Highest 20%	44.2%	38.6%	44.2%
Civic Engagement			
Yes	66.5%	57.1%	66.5%
No	33.5%	42.9%	33.5%

Table 7: Parameters, Unweighted and Weighted Distributions for Southeast

	Parameter	Unweighted Sample	Weighted Sample
Gender			
Male	47.6%	44.4%	48.0%
Female	52.4%	55.6%	52.0%
Age			
18 to 29	19.0%	17.1%	18.9%
30 to 49	32.5%	31.9%	32.8%
50 to 64	25.1%	26.5%	25.2%
65+	23.4%	24.5%	23.2%
Education			
Less than HS	11.7%	3.1%	8.9%
HS grad	28.1%	23.2%	26.1%
Some college	30.7%	37.2%	26.5%
College +	29.6%	36.5%	38.5%
Race/Ethnicity			
White, non-Hisp	59.0%	61.0%	59.1%
Black, non-Hisp	20.2%	21.2%	20.7%
Hispanic	15.6%	13.3%	15.4%
Other race, non-Hisp	5.2%	4.4%	4.8%
Region			
Florida	46.1%	45.4%	46.6%
Georgia	21.5%	24.7%	21.5%
North Carolina	21.7%	18.9%	21.3%
South Carolina	10.7%	11.0%	10.6%
Density			
1 – Lowest 20%	11.6%	10.7%	11.0%
2	25.8%	28.1%	25.4%
3	27.2%	25.0%	27.2%
4	31.8%	29.8%	32.6%
5 – Highest 20%	3.7%	6.4%	3.8%
Civic Engagement			
Yes	67.3%	57.9%	66.4%
No	32.7%	42.1%	33.6%

Region Adjustment

The three regions were then adjusted to put the regions into their proper proportions relative to each other.

Table 8: Parameters, Unweighted and Weighted Distributions by Region

Region	Parameter	Unweighted	Weighted
New England	13.5%	33.1%	13.5%
Mid-Atlantic	41.7%	33.9%	41.7%
Southeast	44.8%	32.9%	44.8%

Effects of Sample Design on Statistical Inference

Post-data collection statistical adjustments require analysis procedures that reflect departures from simple random sampling. SSRS calculates the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called "design effect" or *deff* represents the loss in statistical efficiency that results from a disproportionate sample design and systematic non-response. The total sample design effect for this survey is 2.05.

SSRS calculates the composite design effect for a sample of size n, with each case having a weight, w, as:[6]

$$deff = \frac{n \sum w^2}{(\sum w)^2}$$

The survey's margin of error is the largest 95% confidence interval for any estimated proportion based on the total sample — the one around 50%. For example, the margin of error for the entire sample is ± 3.3 percentage points. This means that in 95 out of every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 3.3 percentage points away from their true values in the population. Margins of error for subgroups will be larger. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording, and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

How to Analyze Data with Oversamples

It is a common practice to oversample certain groups of interest to provide larger sample sizes for analysis. When groups are oversampled, weighting will correct for the oversampling by "weighting down" the groups to their proper proportion of the sample.

It is important for researchers to understand the weighting implications of these oversamples. SSRS typically computes "balancing weights" which means that the weights across the entire sample sum to the total number of interviews. If we have oversampled a group, the sum of that group's balancing weight will

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[6] Kish, L. (1992). Weighting for Unequal Pi. Journal of Official Statistics, Vol. 8, No.2, 1992, pp. 183-200.

then be less than the number of interviews we completed with the group because that groups has been weighted down in the aggregate. If such data were analyzed with a basic statistics package like SPSS, the margin of error for the oversample population would reflect the weighted n-size and not the number of interviews which would lead to an overestimate of the sample variance.

The following table shows an example of population and interview n-sizes when an oversample is used. For this example, a main cross-section sample of 1,000 was combined with an oversample of 800 among some subpopulation of interest. While the researcher did 920 interviews with the oversample population, the statistical software will run statistical tests as though only 216 interviews were completed.

Table 9: Example of Oversample N-Sizes

	Natural Population Distribution (%)	Example Study Sample Completes:			
		Main Sample	Over-sample	Total	Weighted N-size
Non-oversample population	88%	880 (88%)	0	880 (49%)	1,584 (88%)
Oversample population	12%	120 (12%)	800	920 (51%)	216 (12%)
Total	100%	1,000	800	1,800	1,800

There are two solutions to this problem. The first is to utilize a statistics package that can apply a Taylor Linearization Series to the data. Under this procedure, the researcher would enter a Primary Sampling Unit (PSU) or strata variable into the statistics package that indicates the sample selections upon which under/oversampling occurred. In effect, this will allow the statistics package to calculate proper margins of error for estimates based on the true sample sizes of groups. The researcher will attain a margin of error appropriate to the number of interviews rather than the weighted N-size. Statistics packages with this capability include SAS, R, Stata, and SPSS with the Complex Samples module.

If one does not have access to such a package, SSRS will provide a secondary weight to be used to conduct analyses within oversampled groups or between oversampled groups and other respondents, as the main weight supplied with the data will be appropriate for analysis of the overall population only. Regardless, SSRS will identify the PSU variable whenever there are oversamples so that researchers can properly analyze their data with the correct margins of error.

For this study two weights were developed for varying analytical purposes:

- **Totalweight**: This weight should be used for analysis across the entire sample of completed interviews, or for analysis that spans oversampled groups.
- **Regionweight**: This weight should be used when producing estimates within New England, Mid-Atlantic or Southeast, or when comparing the subgroups to each other.

DELIVERABLES

Final deliverables for this study included a final formatted questionnaire, audio recordings of the cognitive pretest interviews, a memo of the pretest findings, a final weighted SPSS file, one weighted banner, a topline, a memo summarizing key findings, and this methodology report.