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ORIGINAL ARTICLE OPEN ACCESS

Distrust as a Driver of Survey Nonresponse: Implications for Fisheries Data Collection and Management in the Northeast United States

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Received: 13 January 2026 | **Revised:** 6 April 2026 | **Accepted:** 11 April 2026

Keywords: cooperative research | fisheries management | socioeconomics | stakeholder engagement | stakeholder trust | survey nonresponse

ABSTRACT

The Greater Atlantic Region Commercial Fishing Business Cost Survey (Cost Survey) collects essential cost information from federally permitted commercial fishing vessel owners in the Northeast United States to inform management decisions and meet the data needs of multiple statutory requirements. Despite design improvements and a heightened focus on limiting burden on participants prior to the most recent survey effort, the 2022 Cost Survey yielded a lower-than-anticipated response rate of 14.8%. When nonresponse is systematic, the data collected may not accurately reflect the full range of economic conditions across fishing fleets, making nonresponse an important area to investigate and mitigate. A nonresponse postcard was distributed for the first time in the Cost Survey's history to investigate the following research objectives: understand survey nonresponders' motivations for choosing not to participate in the effort, explain the dynamic between harvesters and managers using qualitative analysis, and identify actions that can be used to enhance voluntary research participation and relationships among all stakeholders. The results indicate that distrust of the National Oceanic and Atmospheric Administration (NOAA) Fisheries was the primary reason for nonresponse. Qualitative analysis of open-ended comments identified recurring themes, including concerns about the use of sensitive financial information and an overall dissatisfaction with NOAA Fisheries in the region due to perceptions of overregulation and misaligned management priorities. This research can be used as a case study for both identifying and analysing participation barriers to fisheries data collection and provides diagnostic indicators of broader management challenges. The importance of qualitative analysis is showcased to bridge knowledge gaps between stakeholders and managers in a natural resource context. Approaches are suggested for improving survey engagement, strengthening stakeholder trust and ultimately enhancing the quality of economic data available for cost-based policy decisions.

1 | Introduction

Surveys are an important tool used in social science research to monitor and evaluate stakeholder perceptions and attitudes across a variety of disciplines (Rogelberg and Stanton 2017; Smith et al. 2019). In fisheries research, surveys are the primary method used to understand the economic and social dynamics associated with fishing communities (Lew et al. 2015; Haworth et al. 2024). This includes collecting information on harvesters' contributions to fisheries through livelihood and employment, landed economic value, food security, and fishing behaviour, all of which help create assessment indicators (Bennet et al. 2021).

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Surveys can also be a rich source of qualitative data, which can uncover valuable insights to gain a deeper understanding of complex fishery systems (Barclay et al. 2017; Conley et al. 2026). Qualitative methods are useful for elevating harvester perceptions and ground-truthing quantitative assumptions or analyses, helping to close knowledge gaps (Voyer et al. 2015). Qualitative research can uncover multiple salient truths due to varying knowledge systems that individual people possess (Barclay et al. 2017). Human behaviour cannot be fully understood through quantitative research stemming from one objective truth but must be situated within its specific cultural and economic contexts (Denzin and Lincoln 2011). Without surveys, evidence-based management through the incorporation of harvesters' knowledge would be limited. As fisheries policy cannot effectively manage a fishery system without the use of socioeconomic data, survey research is therefore imperative (Pomeroy and Berkes 1997). Although surveys are a key method for social and economic research, obtaining responses to voluntary efforts can be challenging. Globally, survey response rates have been declining since the 1990s, and increased costs associated with implementing a survey have been correlated with nonresponse rates (Atrostic et al. 2001; Pew Research Center 2017; Luiten et al. 2020). For example, the Greater Atlantic Region Commercial Fishing Business Cost Survey (Cost Survey) has been implemented semi-regularly by the Social Sciences Branch of the Northeast Fisheries Science Center (NEFSC), collecting essential socioeconomic data for the region. Along with tracking cost trends over time and across fleets, the data are also used for calculating important economic performance metrics such as vessel-level profits and documenting harvester perceptions and insights. This survey, unlike a number of other regional surveys in the United States, is voluntary rather than mandatory, which plays an important role in nonresponse, as participation depends on willingness to engage with the administering agency (Thunberg et al. 2023). The combination of the voluntary nature of the survey, the collection of potentially sensitive information and other drivers, has contributed to lower-than-desirable response rates over the lifespan of the survey, with an average response rate of 16.5% over seven different survey implementation periods between 2006 and 2022.

Increases in survey nonresponse can negatively affect the quality of research and thus the potential impact on policy (Groves et al. 2009). When nonresponse is systematic rather than random, cost estimates derived from survey data may be biased, potentially leading to inaccurate regulatory impact analyses and flawed cost-based policy decisions that directly affect fishing communities (Lew et al. 2015). Although response rates are not indicative of nonresponse bias, a decrease in the number of responses can create higher uncertainty around estimates, reduce the reliability in survey findings, and create challenges in using the data (Groves 2006; Darvin 2013; Peytchev 2013; Hendra and Hill 2019). Understanding the mechanisms driving nonresponse is therefore critical not only for improving data quality but also for ensuring that management decisions are informed by representative economic information. To improve data quality and the resulting management decisions, we must first understand the factors driving nonresponse. Nonresponse can also indicate issues with the survey itself, such as design, complexity, and implementation timing. Furthermore, nonresponse can increase the overall cost per survey returned, creating more expensive data collections with the need for additional staffing time and materials due to extended solicitation efforts to boost participation. Finally, an increase in nonresponse decreases researchers' ability to collect data that reflect varied perspectives, resulting in less engagement in the management process from harvesters. In the fisheries sector, this could reveal a larger issue with regulators or policies, which can be an indicator of noncompliance (King and Sutinen 2010). Ultimately, nonresponse in the collection of cost data creates a barrier to fully examining industry perceptions and economic implications, negatively impacting both the robustness of policy and the relationship between industry and the government sector.

Behavioural and sociodemographic factors can impact an individual's propensity to respond to a survey (Korkeila et al. 2001; Mölenberg et al. 2021). When targeting specific populations, such as commercial fish/shellfish harvesters, a number of challenges to garnering survey participation are expected. The nature of working in the fishing industry, including atypical hours at sea, demanding physical labour, and a preference for the self-actualisation components to the occupation, such as adventure and independence over administrative paperwork, can make it more difficult to obtain responses from these individuals (Pollnac and Poggie 1988; Pollnac and Poggie 2006; Seara et al. 2017). In addition, harvesters may experience research fatigue from being consistently surveyed in mandatory reporting requirements or be deterred from responding, given the sensitivity of information being requested in the case of voluntary survey efforts (Tourangeau and Yan 2007; Ashley 2020; Casal-Ribeiro et al. 2024). Finally, an ageing population of harvesters with fewer new and younger individuals entering the industry, also known as the greying of the fleet phenomenon, can contribute to less engagement as overall participation in regional fisheries declines (Cramer et al. 2018; Cutler et al. 2022). These factors suggest that there are a number of reasons why nonresponse may not be random within fisheries surveys, and understanding the specific drivers within a given survey population is essential for diagnosing and addressing potential sources of bias.

A primary driver of decreased engagement within fisheries is the existing 'legitimation crisis'. This crisis stems from discrepancies between ideals and realities of fish stock abundances, a mismatch between local and global perspectives, and a lack of opportunities for stakeholders to contribute to the development of management (Jentoft 2000). This has led to a fundamental breakdown in belief in the scientific system that supports policy decisions. The legitimacy of management can be undermined when it does not align with the moral principles and values of stakeholders (Jentoft 2000). In addition, if a knowledge gap exists between the experiential knowledge that harvesters can provide and the statistical knowledge researchers and managers depend on, this can ultimately lead to lower investment in management goals and compliance with regulations (de Vos and van Tatenhove 2011; Hamm 2017). Nonresponse to voluntary surveys may serve as a behavioural signal of this broader legitimacy crisis, making the diagnosis of nonresponse drivers key for survey improvement as well as in understanding the state of stakeholder relationships.

Trust comes in many forms and is composed of multiple components, which can vary in importance based on context. This

makes trust a challenging concept to assess as well as address (Levin et al. 2002; Stern and Coleman 2015). Distrust can arise from a number of factors, including a lack of consistency, soundness, credibility, responsiveness, flexibility, participation and communication (Glenn et al. 2012). Distrust in the intention of management motives can create an unstable foundation for collaboration and be detrimental to progress (Johnson 2011; Jenkins 2015). In the Northeast United States, a historically perceived lack of transparency and autonomy in the management decision-making process has increased distrust among industry members (Johnson and McCay 2012). Harvesters have expressed concerns about sharing their data in the past through surveys due to the fear of the information being used against them to create policies that could negatively impact their business, such as quota reductions, gear restrictions and area closures, which has further hindered knowledge sharing efforts (Dobbs 2000; Silver and Campbell 2005; Johnson 2011). In addition, changes in regulatory measures can further provoke distrust in governance systems. For example, stock assessment models and input data sources evolve, altering fishery regulations. This inherently complicated process has been a contributor to a history of distrust between harvesters and managers within the Northeast region (Dean et al. 2023). This history has also led to scepticism about the validity of fish stock assessments as well as the perception that there has been a general dismissal of harvester knowledge and that decision-making has been non-inclusive (Johnson and McCay 2012; Jenkins 2015). Trust is necessary for the success of research undertakings such as surveys, as well as building industry's confidence in management (Johnson and McCay 2012). Increasing opportunities to collect and meet the values that harvesters have can lead to trust building as well as increased compliance with regulations (Boonstra et al. 2017).

NOAA Fisheries defines sustainability as the 'ability to persist in the long-term' (NOAA Fisheries 2023). This can refer to harvesting fish without significantly depleting a population or damaging the ecosystem to which it is connected. It is a holistic concept with three major complementary pillars: ecological, economic, and social (Asche et al. 2018; Purvis et al. 2019). Within fisheries, the social and economic pillars of sustainability have traditionally not been prioritised as high relative to the environmental pillar, which has led to a perceived lack of legitimacy in the management system (Charles 2001). Most relevant to this work is participation equity, or the appropriate representation of different stakeholders as well as access to resources (Klein et al. 2015). When barriers to survey participation fall disproportionately on certain segments of the harvester population, those voices can be excluded from the data used to inform management, undermining both equity and sustainability goals (Halpern et al. 2013). Efforts to increase equity in fishing policy and to prioritise social and economic dimensions of fishery systems can help achieve legitimacy and build trust between stakeholders (Halpern et al. 2013). Engaging harvesters in scientific research and data collection is an important step toward the conservation of fishery resources, yet empirical studies assessing the effectiveness of this approach remain limited (Taylor et al. 2021).

Building trust is crucial for the legitimacy of management decisions made by governing bodies and to increase voluntary compliance, leading to a higher likelihood that management goals can be reached (Ostrom 2000; Pretty 2003; R. A. Turner et al. 2016). One mechanism for cultivating trust is cooperative research, which involves a partnership between scientists and industry members to improve the quality of science and trust in policy (National Research Council 2004; Johnson and van Denson 2007). Cooperative research has expanded in the Northeast since the early 2000s in response to socioeconomic hardship, declining fish stocks and growing distrust and has demonstrated advantages, including increased research efficiency, finer-scale data collection and stronger relationships between researchers and industry (Hartley and Robertson 2006; Yochum et al. 2011). Harvesters broadly agree on the importance of and their interest in cooperative research, which is a vital foundation for trust-building (Hartley and Robertson 2006). Creating opportunities for dialogue between industry members and researchers can pave the way for more effective policy, although sustaining these collaborations comes with challenges given stakeholders' time, willingness and interest in continuous engagement with researchers and managers (Calderwood et al. 2023).

Using a novel source of data as well as descriptive and qualitative methods, this research aims to (1) identify and assess motivators of survey nonresponse for commercial fishing vessel owners in the Northeast region, (2) improve our understanding of the relationship between industry, researchers, and managers in the Northeast region by elevating various perspectives and (3) suggest practical steps that can be taken to improve survey participation. By identifying and examining nonresponse drivers, this study offers diagnostic insight into the barriers, including distrust and participation inequities, that limit engagement in voluntary fisheries data collection. These insights, as well as the methodological approach focusing on leveraging qualitative data analysis and using a structured nonresponse instrument to diagnose these barriers, can serve as a case study in addressing underlying research participation issues within other fisheries and across disciplines within natural resource management.

2 | Methods

2.1 | Cost Survey Population and Postcard Description

A postcard assessing reasons for not participating in the voluntary 2022 Cost Survey was mailed with prepaid postage to all survey nonrespondents 6 months after the initial survey contact letters (Figure SA1). A total of 1696 federally permitted commercial fishing vessel owners received a nonresponse postcard. These vessel owners operate from Maine to Cape Hatteras, North Carolina and are governed by fishery management plans (FMPs) to meet the national mandates of the Magnuson Stevens Act (MSA) (NOAA Fisheries 2007). The New England and Mid-Atlantic Fishery Management Councils are tasked with managing specific species through FMPs. In addition, American lobster is managed cooperatively by NOAA Fisheries and individual states through the Atlantic States Marine Fisheries Commission. Due to the large number of fisheries managed in these regions and the varying types of management systems, this contributes to a complex governance structure in the Northeast region.

Any respondent who refused to participate in the survey, was asked to be removed from future contacts, or was ineligible to

take the survey in 2022, was excluded from the nonresponse effort. The postcard prompted the vessel owners to select the reason(s) they did not respond to the survey from a list of 12 options. The options presented included a pre-generated list, rather than an open-ended question, to decrease cognitive burden and increase response rate. The list of options was developed through a combination of the researcher's experience accumulated across multiple prior Cost Survey implementations and insights from both formal and informal pre-testing of the Cost Survey instrument with selected industry members. This iterative development process was prioritised over a purely literature-derived list to ensure that the options reflected the specific context of the Northeast commercial fishing population. The list included: 'I don't trust NOAA/NMFS', 'The survey is too long', 'The survey is too complicated', 'I did not have my 2022 financial information available', 'I would have to pay my accountant to fill it', 'I was too busy', 'I was unaware of this survey', 'I was ineligible to take the survey', 'There was no monetary incentive offered to complete the survey', 'Someone else handles the finances so I am not the right person', 'I did not want to' and 'Other'. The 12 choices were randomised across five different postcard versions to avoid anchoring bias behaviour (Krosnick and Alwin 1987). The only choice that was not randomised on each postcard was 'Other', which was placed at the end of each postcard version accompanied by an open-ended prompt for individuals to describe their alternative reason for not responding to the survey. Once postcards were returned to the NEFSC, responses were input manually into an online spreadsheet. For data assurance and quality control purposes, 5% of the postcard data entries were randomly selected to be cross-checked by a member of the Cost Survey team.

2.2 | Analysis Methods

Given the sensitive nature of the cost data, all individuals reviewing disaggregated data were required to sign a non-disclosure agreement. Individual comments were kept confidential. The analysis methods employed were twofold: (1) postcard responses were tabulated to identify the percentage of options selected across all respondents and (2) qualitative data analysis was used to analyse the open-ended comments provided on each postcard, either associated with the 'Other' answer choice and/or any written text provided anywhere on the postcard. Utilising a qualitative approach allowed this research to capture the localised meaning and complex realities of fishermen's experiences. Qualitative analysis of the harvester's own words provides the 'how' and 'why' behind the disconnect, generating the layered, experiential data necessary for driving transformative changes in management practices (Denzin and Lincoln 2011; McAleese and Kilty 2019). The qualitative analytical framework that was used to analyse written comments, which was exploratory and descriptive, was consistent with the use of qualitative methods in fisheries social science to capture meaningful variations in stakeholder perspectives and provide context that quantitative approaches alone cannot offer (Barclay et al. 2017; Conley et al. 2026). As such, findings should be interpreted as directional signals rather than statistically representative estimates. In addition, convenience sampling was used to analyse the qualitative comments written on the postcards received, which could have led to more outspoken harvesters being overrepresented (Stratton 2021). This limitation is inherent to convenience sampling in qualitative research and does not invalidate the themes identified, but does constrain the generalisability of the findings. This qualitative analysis was primarily guided by Saldaña (2015). The qualitative data analysis software MAXQDA was used for thematic coding of the data to identify common themes expressed by commercial fishing vessel owners. For certain parts of this analysis, comments were summarised by specific managed species groups (FMPs) based on the fishery that generated the most revenue for the vessel surveyed in 2022. If no revenue was generated for a vessel in 2022 or if the response was anonymous due to participants removing their name before returning the postcard, no permit or FMP could be linked to that particular response, and the comments were omitted from the FMP summary[1].

For comment data, an iterative inductive coding approach consisting of two cycles of coding was used. The first coding cycle focused on applying grounded theory methods and developing themes that were presented directly from the raw data. The second cycle of coding focused on consolidating and merging codes into coherent groups. One coder was responsible for both rounds of coding, which is acknowledged as a limitation of the study. To partially offset this constraint, input on the coding system was gathered iteratively from project collaborators representing a range of theoretical and disciplinary perspectives, providing a form of triangulation. Codes were refined through collective discussion to improve code consistency, leading to the development of a more concise list of broader themes (Saldaña 2015). The code system used in this study is a subset of Conley et al. (2026).

A total of seven parent codes were devised from major themes that were presented in the data, each with a series of sub-codes to further break down these main themes. To promote transparency and reproducibility of the qualitative analysis, the coding framework was documented in a detailed codebook containing the code system used, representative definitions, and counts for each code (Table SA1). Content analysis was conducted by generating mention-rate tables that consisted of frequency percentages of parent codes based on the total number of comments provided for each variable. In addition, a comparative analysis was conducted to understand how external variables such as FMPs influenced emerging themes. A sufficient sample for drawing conclusions was achieved when recurring themes emerged consistently across responses (Green and Thorogood 2004; Bernard 2017).

3 | Results

3.1 | Reasons for Nonresponse: Descriptive Findings

There were 272 nonresponse postcards returned of the 1696 sent to nonrespondents, indicating a 16.0% response rate. All addresses were verified in the survey mailing effort, such that all postcards had a valid mailing address. All postcards returned had at least one answer choice selected and/or a written comment. As many individuals chose more than one answer out of the 12

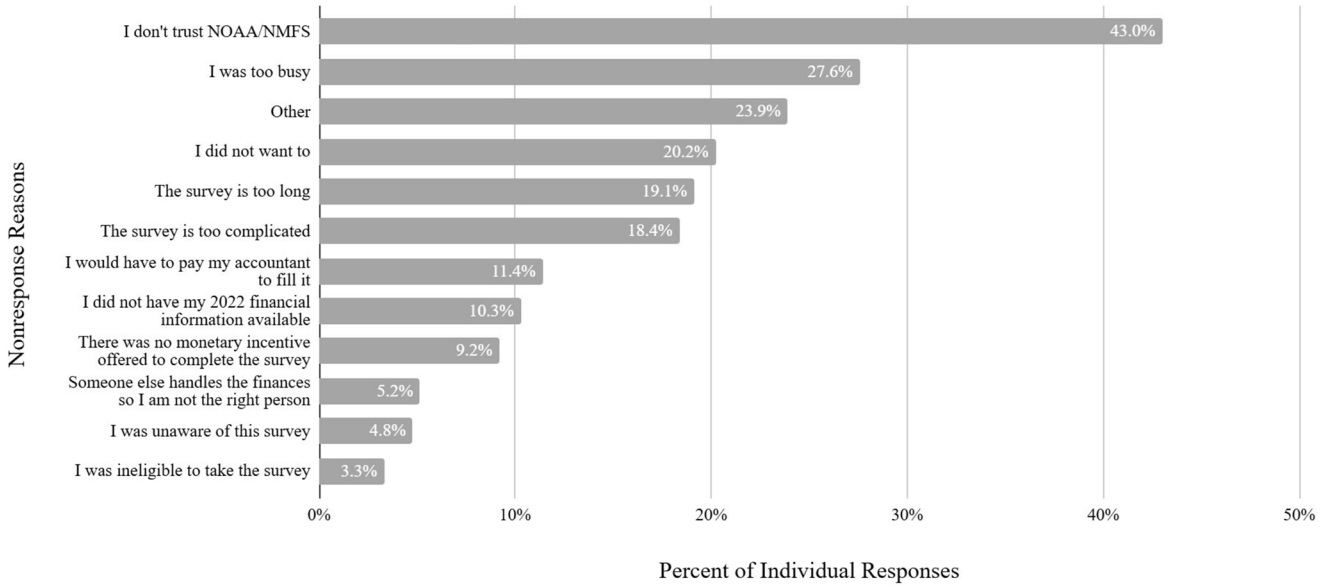

FIGURE 1 | Percent of individuals who chose each response presented on the 2022 Nonresponse Postcard.

TABLE 1 | Categorisation of reasons provided under the 'Other' response option and the number of individuals whose response fell into each category.

Reason Provided	Number of Individuals
Did not take commercial fishing trips[a] (e.g., the individual was retired or deceased, the vessel only partook in recreational fishing in 2022, or the vessel owner only participated in fishing part-time[b])	18
General displeasure with NOAA's action (e.g., regarding wind farms, whale regulations, overregulation, and the general consensus that NOAA does not care about fishermen)	11
Logistical reasons (e.g., not remembering receiving the survey, additional context around why the survey was too complicated or why they were too busy[c])	10
Do not feel comfortable giving personal information	6
Too many surveys being distributed/Cost Survey is voluntary	5

[a]For the 2022 Cost Survey, the sampling frame included vessel owners who were both active and inactive.
[b]Vessel owners who took any commercial fishing trips between 2021 and 2022 were eligible to take the survey, but some individuals believed this made them ineligible to participate.
[c]'The survey was too complicated' and 'I was too busy' were answer choices provided on the nonresponse postcard, but some individuals chose to elaborate on those options under 'Other'.

options provided on the postcard, 534 data points were recorded. The most common option chosen by participants was 'I do not trust NOAA/NMFS' (43.0%, $n = 117$), followed by 'I was too busy' (27.6%, $n = 75$) and 'I did not want to' (20.2%, $n = 55$) (Figure 1). In addition, 23.9% ($n = 65$) of respondents chose the answer choice 'Other'. Fifty of those individuals either left an alternative answer in the space provided or used the space to provide additional context pertaining to their choice selections (Table 1). The remaining 15 respondents who checked 'Other' did not provide any additional details. Among the 'Other' write-in responses, the most common theme was that the individual was no longer participating in commercial fishing. This was not unexpected given that the survey sampling frame included vessels that were active in either 2021 or 2022, as opposed to only 2022. Other written options included displeasure with NOAA, logistical complications, issues providing sensitive information and survey fatigue.

3.2 | Thematic Findings From Open-Ended Comments

In addition to the 50 individuals who left comments associated with the 'Other' answer choice, 35 individuals also left miscellaneous comments written on the postcards that were not directly associated with the 'Other' answer choice, generating a total of 85 qualitative comments. Forty-four of these comments contained logistical content (e.g., 'I am retired', 'did not fish commercially', 'I thought I responded') and were therefore eliminated from the qualitative analysis. Fifty-two total segments were coded from the 41 remaining comments. The parent codes *do not trust NOAA* (27.7%) was the most frequently cited by harvesters, with one suggesting that 'NOAA failed us!! We protect the waters NOAA regulates and sells out on' (Table 2). A child code to the parent code *do not trust NOAA* included *personal information* (13.5%), which was the primary theme that was presented regarding

TABLE 2 | Parent code mention rates on the 2022 Nonresponse Postcard.

Parent Code	Mention Rate (%)
Do not trust NOAA	27.7
Dissatisfaction with NOAA	19.1
Mismanagement	14.9
Survey recommendations/comments	14.9
Survey barriers	10.6
No profit	6.4
Industry uncertainty	6.4
Count (# of coded segments)	*47*
Number of total comments	*41*

Note: The colour intensity is relative to each cell in the table, and the closer a value is to the highest value, the darker its green highlight. If a code occurred multiple times in the same comment, it was only counted once to prevent bias, resulting in 47 unique parent code mentions across the 52 total coded segments.

distrust (Table 3). For example, an individual suggested that it was 'none of (NOAA's) business' what it costs to run my business. *Dissatisfaction with NOAA* (19.1%) also had a high mention rate with harvesters, suggesting that NOAA 'doesn't have a clue', 'regulates us out of fishing' and 'wants to eliminate commercial fishing'. These perceptions of *overregulation* (5.8%) and feeling as if *NOAA does not care about fishermen* (5.8%) are the main drivers of a buildup of dissatisfaction with management. These findings suggest that for at least a segment of the nonresponse population, nonresponse to the Cost Survey reflects a deliberate withdrawal from engagement with NOAA rather than logistical barriers. Therefore, cost data may be least complete for vessel owners with the most adversarial relationship with the agency, although the characteristics and cost profiles of this group relative to respondents cannot be determined from the postcard data alone.

The parent code *survey recommendations/comments* (14.9%) also showed a relatively high mention rate. Respondents suggested that there was 'too much info asked for' and 'too much time needed to find the requested info'. This feedback is noteworthy given that the 2022 survey length was decreased by half from the last survey implementation in 2015, suggesting that future design efforts may need to focus on communication of the survey's scope. Child code *survey fatigue* (5.8%), associated with parent code *survey barriers* (10.6%), was prevalent, with a harvester suggesting that there are 'too many surveys out there'. Perceptions of *mismanagement* (14.9%) were mainly linked to the perceived *negative environmental impacts* of offshore wind farms (5.8%), although NOAA is not responsible for permitting lease areas for offshore wind. Respondents suggested that they chose not to participate in the 2022 Cost Survey due to NOAA's 'total disregard for the ocean and marine life (windfarms)', with one individual suggesting that NOAA is 'strangling our fisheries and promoting wind energy to raise our electricity costs and destroy our marine environment'. The presence of this misattribution in postcard responses suggests that for some vessel owners, nonresponse to the Cost Survey may be embedded in a broader pattern of dissatisfaction with federal governance that extends beyond the survey itself and therefore is not correctable through survey design improvements alone.

When assessing codes by fishery management group (e.g., FMP), the majority of individuals (69.7%) who left comments were associated with the lobster fishery[2]. In particular, the collection of *personal information* (21.4%) was the most frequently mentioned code for members of the lobster FMP, relating to factors causing distrust in NOAA (Table 4). *Survey recommendations/comments* (14.3%) and *dissatisfaction with NOAA* (10.7%) also had high mention rates from those associated with the lobster FMP. The concentration of qualitative responses among lobster FMP participants likely reflects both the size of the lobster fleet in the region and the heightened regulatory tension surrounding large whale area closures and gear restrictions at the time of the survey, rather than indicating that distrust is uniquely a lobster fishery issue.

4 | Discussion

4.1 | Drivers of Nonresponse in the Cost Survey Population

Vessel owners chose not to participate in the 2022 Cost Survey for a number of reasons. Factors such as having a busy lifestyle, as well as general fatigue and disinterest, influenced harvesters' unwillingness to respond. The perception that there are too many surveys administered and that having to participate in surveys is contributing to 'putting harvesters out of business' hinders engagement with the Cost Survey. In addition, a large portion of the code capturing survey comments/recommendations focused on concerns around the logistics of the survey, as well as topics affirming their dislike of surveys in general. However, the most prevalent reason chosen, as well as the most frequent theme cited in the comments written on the nonresponse postcard, was a lack of trust in NOAA. This distrust was driven mainly by the collection of personal information or what respondents view as sensitive and/or private. Various individuals wrote 'none of your business' or 'I did not feel comfortable giving financial information'. More broadly, the prevalence of distrust among postcard respondents may signal tensions in the relationship between harvesters and NOAA Fisheries as an institution, as well as the survey administrators/researchers and managers working with or for NOAA. If vessel owners who distrust NOAA or who are experiencing financial hardship are less likely to participate in the Cost Survey, the resulting cost estimates may underrepresent economic distress in the fleet, potentially affecting the accuracy of economic assessments such as vessel-level profitability, which rely on these data (Ardini et al. 2026). Capturing this perception is valuable for managers, government employees, and researchers to consider when liaising with industry. Taking industry members' responses and perceptions into consideration can also help improve the survey's structure so that more harvesters feel included, potentially contributing to improved relationships with NOAA. Such steps may help to increase the survey's response rate in the future as well as the effectiveness of management.

TABLE 3 | Parent, child and grandchild code mention rates on the 2022 Nonresponse Postcard.

Parent Code	Child Code	Grandchild Code	Mention Rate (%)
Survey recommendations/comments			13.5
Do not trust NOAA			9.6
	Personal information		13.5
	Data will be used against me		1.9
Dissatisfaction with NOAA			5.8
	Overregulation		5.8
	NOAA does not care about fishermen		5.8
Survey barriers			3.8
	Survey fatigue		5.8
	Cannot read/write		1.9
Industry uncertainty			1.9
	Out of business		1.9
	Decreased catch		1.9
	No market		—
		Catch	1.9
No profit			1.9
	Too expensive to operate		1.9
		Higher trip costs	3.8
	Low ex-vessel prices		1.9
		Lobster	1.9
Mismanagement			—
	Catch shares		1.9
	Wind farms		—
		Negative environmental impacts	5.8
	Right whales		—
		New rules/area closures	3.8
		Unhappy with incidental takes	1.9

TABLE 4 | Parent code mention rates on the 2022 Nonresponse Postcard by Fishery Management Plan.

Parent Code	Dogfish (%)	Fluke, Black Sea Bass, Scup (%)	Lobster (%)	Ocean Quahog (%)	Scallop (%)	Skate (%)	Other (%)	Total Mention Rate (%)
Survey recommendations/ comments	—	33.3	15.4	—	—	—	20.0	15.8
Survey barriers	—	33.3	7.7	—	100.0	—	—	10.5
No profit	—	—	3.8	—	—	—	20.0	5.3
Industry uncertainty	—	—	3.8	100.0	—	—	—	5.3
Do not trust NOAA	—	33.3	34.6	—	—	100.0	—	28.9
Mismanagement	—	—	11.5	—	—	—	40.0	13.2
Dissatisfaction with NOAA	100.0	—	23.1	—	—	—	20.0	21.1
Count (# of coded segments/FMP)	*1*	*3*	*26*	*1*	*1*	*1*	*5*	*38*

4.2 | Barriers to Research Participation and Equity Implications

Participants mentioned a number of barriers to responding and completing the Cost Survey, which apply more broadly to completing mandatory reporting requirements by NOAA. These barriers expressed through the nonresponse postcards included not being able to read or write, balancing multiple jobs, facing survey fatigue from mandatory reporting and time spent on surveys. Similar access-related barriers and others have been identified through other data streams, such as the Cost Survey comments section of the survey itself, as well as the Cost Survey's hotline provided during the survey's implementation (Conley et al. 2026). These barriers included not having a designated or comfortable office space with access to a computer, increased communication costs associated with higher computer and phone usage to complete online reporting, and challenges or impediments to using a computer to complete mandatory online reporting. In some cases, vessel owners have stated that these challenges have led them to give up their federal permit, showing the significant impact these barriers can have on harvesters. If imposing mandatory online reporting excludes those without computer access or if survey design does not accommodate varying literary levels, participation may be skewed. These are questions that warrant further investigation, as they have implications for whose perspectives are represented in the data used for management. While these expressed barriers cannot be generalised to the full population of nonrespondents, they may point to broader industry concerns that could serve as indicators for equity. Achieving equity is a key component of attaining sustainability as well as a broader goal in fisheries management (Quimby and Levine 2018; Furman et al. 2023). Although progress is possible, equity has not yet been well incorporated into fisheries management (Cochrane 2020). Equity and participation are linked as the ability to improve participation, and the incorporation of increased representation depends on designing and tailoring opportunities to receive input from a variety of stakeholders (Quimby and Levine 2018). Documenting these barriers to access is a first step toward understanding potential equity concerns in fisheries as well as areas to increase trust in a natural resource management system.

4.3 | Understanding Distrust Within Fisheries Management and the Cost Survey Population

Trust has been a primary issue in the Northeast United States since the 1970s with the implementation of the MSA and management actions that followed, primarily to combat overfishing (Dobbs 2000; Hartley and Robertson 2006; Dean et al. 2023). When the MSA was first put into effect in 1976, boosting national production was prioritised. During this time period, short-term boosts in profit, as well as the promise of profit, drove increased political and economic interest in fisheries within the U.S. EEZ (Hennessey and Healey 2000). This, in turn, highly influenced decision-making and scientific processes, which eventually contributed to the collapse of the groundfish fishery in the 1990s, one of the most prominent fisheries in the Northeast. The initial focus on freedom and support of American fishing fleets transitioned to a stricter focus on conservation through controlling national fleets. The scientific uncertainty and complexity of management changes created a misalignment between public financing of fishing activities and actual productivity of stocks, leading to the decreased credibility of scientific assessments, which escalated a culture of distrust (Anthony 1990; Hennessey and Healey 2000; Kaplan and McCay 2004). As a result, harvesters' distrust of scientists and managers in the Northeast region has mainly stemmed from concerns of wrongful use of industry-provided data, changes in the scientific process, disagreement with scientific assessments, and miscommunication between industry, managers, and scientists.

Efforts to understand the underlying drivers of distrust, as well as their link to decreased engagement in research efforts, are limited. The findings of this study further highlight themes that have historically contributed to distrust and provide additional qualitative evidence suggesting a link between distrust and reduced participation in research. The themes expressed by post-

card respondents are consistent with previous findings that some harvesters perceive managers and scientists as reluctant to use their knowledge to inform management (Hartley and Robertson 2008). Among respondents in this study, a recurring concern emerged: that providing business-related information would go against their best interest, as they believe the data will be used against them. The integration of industry input and balancing of differing knowledge systems and disciplines has not yet been effectively established within U.S. fisheries management (Gray 2005; Stephenson et al. 2016). Within the Cost Survey population in particular, the collection of financial information by a government entity appears to be a notable deterrent to participation and linked to expressions of distrust. Additional challenges include collecting responses from the array of harvesters in the Northeast region, many of which use various gears and are associated with multiple FMPs. Designing a Cost Survey that balances scientific, management, and industry goals while maximising participation is a challenge. The findings that distrust emerged as a prominent theme among postcard respondents underscore the complex dynamic between NOAA as a governing body and the fishing industry. Improving this relationship is important for meeting management goals. While the specific history of distrust in the Northeast is context dependent, the broader finding that trust influences survey participation and the knowledge gained from identifying drivers of distrust can be utilised in other fisheries and natural resource management settings to promote the success of regulatory actions and compliance.

4.4 | Trust Building Through Cooperative Research and Implications for Conservation

Stakeholder engagement in research efforts and in the management process is crucial to shared problem solving, building consensus around desired management outcomes, and meeting conservation goals (Mackinson et al. 2011; Redpath et al. 2013; McClanahan et al. 2021). Cooperative research can propel effective communication and knowledge transfer and create opportunities for participation in scientific processes from various stakeholders, which is a key component of successful sustainable fisheries management (Kaplan and McCay 2004; Glenn et al. 2012; Fulton et al. 2014). Given the numerous benefits that stem from creating a foundation of trust between stakeholders within fisheries systems, it is important that management authorities, including NOAA Fisheries, continue to work towards establishing and cultivating trust in the Northeast and beyond. Cooperative research in the Northeast expanded in the 2000s due to increased socioeconomic hardship, declining fish stocks and harvesters' emerging distrust as a result of select knowledge sources being leveraged in setting regulations (Hartley and Robertson 2006). At the NEFSC, there are numerous efforts, both past and present, that provide opportunities for industry to connect with researchers. Specifically, the NEFSC Cooperative Research Branch has built a foundational partnership between scientists and the fishing industry. Informal working groups such as the Squid Squad, formed by the NEFSC and shortfin squid industry members, provide a regular virtual meeting space for researchers and industry members to share ideas and improve knowledge sharing (Johnson 2011; Mercer et al. 2023). The Northeast commercial fishing 'Study Fleet' has also been a cooperative research effort since 2006, involving captain and crew members in collecting information on effort, catch and environmental conditions, overall increasing the usability of fishery-dependent data for stock assessments (S. M. Turner et al. 2017; Jones et al. 2022). In addition, industry members participate in various Council Advisory Panels, which are a crucial part of the management process, allowing for a diverse group of stakeholders to provide advice and insight into FMPs. Long-term investment and commitment to these types of opportunities by all stakeholders is essential in creating change and building trust (Tompkins et al. 2008). Although the foundation for cooperative research in this region has been established, engagement from both harvesters and researchers is not guaranteed, with participation usually linked to specific topics or pending management actions (S. M. Turner et al. 2017). This poses challenges to collecting consistent time series data, being able to answer evolving research questions, and the ability to build capacity for research. Future actions to rebuild trust could include strengthening recent and existing outreach efforts, especially with regard to topics that are receiving increased attention. In the case of the Northeast, this could include offshore wind energy development and large whale area closures. For example, NOAA Fisheries is making an effort to dispel misinformation around these topics by creating public comment opportunities and informational web pages (NOAA Fisheries 2024). There has been an effort to predict the socioeconomic impacts of offshore wind energy development on fishery operations and management through industry collaboration (Allen-Jacobson et al. 2023). In addition, trust can improve with higher representativeness, giving stakeholders more independence and influence, as well as involving stakeholders early in the research or management process (Young et al. 2013). Improvements in trust may also create conditions conducive to successful conflict resolution. Facilitated conflict management workshops may be necessary to address historic events that originally caused a breakdown of trust (Dixon et al. 2024). Another important step towards rebuilding a foundation of trust can include moral imagination, which encourages scientists and managers to 'step into the shoes' of other stakeholders to see a problem from an alternative perspective (Gorman et al. 2012, Jenkins 2015). Cooperative research efforts can work to incorporate these elements, which may contribute to rebuilding trust and, over time, support stewardship and conservation of marine resources (Gilden and Conway 2002).

4.5 | Cooperative Strategies for the Northeast's Cost Survey and Other Voluntary Survey Efforts

The Cost Survey effort in the Northeast region is taking steps toward becoming more cooperative in nature, helping to meet survey goals by building trust through increased dialogue and knowledge exchange with industry members. Opportunities for industry members to engage with the Cost Survey team have expanded beyond the exchange of information while administering the survey. For example, before the most recent survey was fielded, a pre-testing of drafted survey questions took place with a group of selected harvesters who provided their knowledge and feedback to improve upon the survey's design. Other priorities includes working to develop a more continuous and transparent line of communication with stakeholders, exploring ways to maximise the dissemination of analyses generated using the data collected, and increasing the overall applicability and accessibility

of the survey. For instance, a cost data visualisation tool[3] has been created from past Cost Survey data to allow stakeholders to access data summaries for decision-making and to disseminate results to vessel owners. This web-based tool has a feedback page for users to provide comments and recommend potential improvements. Increased dialogue and collaboration with industry members and other stakeholders in different ways to analyse and present Cost Survey data can help to increase participation in the survey effort while simultaneously maximising the utility of the data. Finally, establishing a clear process for how cost data are integrated into management decisions, such as stock assessments, is another goal to increase transparency. These approaches, if adapted to local contexts, may help other fisheries improve the understanding and use of cost data, strengthen stakeholder engagement with important data collection efforts, and contribute to more effective conservation of resources.

5 | Research Limitations

While this study provides useful exploratory insights, several methodological constraints must be acknowledged. First, due to resource limitations, a single coder was responsible for the development and application of the coding framework, which precluded the assessment of inter-rater reliability. To mitigate this, collaborators from multiple disciplines reviewed the coding system and provided input during refinement. Second, only offering a mail-in option with no online data collection may have truncated the sampling frame due to willingness to respond, limiting the demographics of respondents. Third, the findings may be subject to self-selection bias, as the sample likely overrepresents individuals with higher levels of motivation or stronger beliefs regarding the subject matter. This means that the study cannot make representative claims about the full population of nonrespondents. The themes identified most likely reflect the views of the most motivated to respond, not the full spectrum of reasons harvesters did not participate in the Cost Survey. The authors also acknowledge their institutional position as employees of NOAA, which could influence both participant responses and researcher interpretation.

6 | Conclusion

Sending out a nonresponse postcard for the first time in the history of the NEFSC Cost Survey provided an opportunity to hear perspectives from fishing vessel owners that otherwise may not have been heard. There were a number of positives that came out of conducting this data collection. For example, very few individuals reported that they were not aware of the Cost Survey, indicating that outreach efforts were effective at increasing the visibility of the survey. In addition, the postcard allowed for the collection of essential vessel owner information, such as if vessels were no longer in use, which can help improve upon future sampling frames. The incorporation of qualitative analyses into this data collection effort also provided an insightful understanding of the Cost Survey population's values, attitudes, and beliefs regarding the industry at large. Future directions could include conducting semi-structured interviews or collecting oral histories to further analyse themes and origins of distrust, as well as effective pathways to build trust between scientists, researchers and fishing industry members. The Cost Survey's nonresponse postcard is a productive case study for using qualitative data analysis to gain a better understanding of stakeholder perceptions and opening a line of communication for industry members who have chosen not to engage with the management process in the past to share their perspectives. The results reflect a pattern of distrust among these nonrespondents, centred on concerns about sharing personal information and a belief that the data provided will be used to increase regulations. These results highlight the importance of assessing factors contributing to nonresponse in primary data collections and to uplift and understanding various perceptions. Future survey implementations should continue to prioritise trust-building measures prior to deployment, such as pre-survey outreach explaining how cost data are used, offering accessible data summaries to participants, and providing an array of data collection modes. This research suggests that addressing the primary motives of nonresponse, particularly distrust, is not just a methodological concern but one with direct consequences for the quality and quantity of socioeconomic data available for management decisions. By identifying drivers of distrust, additional solutions pertaining to barriers to participating and broader governance themes have been identified that can be applied not only to the Cost Survey but also at the regional level. The approaches used in this research, along with the strategies to address nonresponse, can be applied more widely in various natural resource management settings to elevate voices from regulated bodies who may be resistant to engaging in the policy process.

Author Contributions

Elizabeth D. Conley: conceptualization, visualization, writing – review and editing, validation, methodology, writing – original draft, investigation, formal analysis, software, data curation. **Samantha Werner**: conceptualization, writing – review and editing, validation, methodology, investigation, funding acquisition, project administration, supervision, resources, data curation. **Gregory Ardini**: conceptualization, writing – review and editing, validation, methodology, funding acquisition, investigation, project administration, supervision, resources, data curation.

Acknowledgements

We would like to sincerely thank the industry members who participated in the nonresponse postcard data collection, as well as those who had responded to the Cost Survey in the past. We are grateful to Dr. Tarsila Seara for her helpful feedback as well as for the valuable insight the peer reviewers provided. This research was supported by the Northeast Fisheries Science Center. The scientific results and conclusions, as well as any views or opinions expressed herein, are those of the author(s) and do not necessarily reflect those of NOAA or the Department of Commerce.

Funding

This study was funded by the Northeast Fisheries Science Center.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are not publicly available due to privacy or ethical restrictions.

Ethics Statement

All data collection efforts complied with applicable federal regulations and ethical guidelines for research involving human participants, including the Paperwork Reduction Act (PRA). The survey was approved under OMB control number 0648–0773, and individual responses and participation are kept confidential.

Endnotes

[1] A total of eight comments were omitted from the FMP-based summary.

[2] For the 'Lobster FMP', we are referring to the Interstate Fishery Management Plan for American Lobster, or Lobster Plan, developed by the Atlantic States Marine Fisheries Commission and individual states.

[3] https://apps-nefsc.fisheries.noaa.gov/cost-data/.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

Supporting Materials: aff270251-sup-0001-SuppMat.pdf