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DATA DESCRIPTOR

Beyond the catch: Survey data on the human dimensions of commercial fishing in England

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A thriving fishing industry, that sustains livelihoods whilst sustainably exploiting marine resources, requires policy and management decisions that consider social sustainability objectives alongside environmental and economic objectives. Currently there is no robust monitoring of social conditions and the motivations and attitudes of commercial fishers in the UK. To address this gap, we compiled a dataset from a survey on a sample ($N = 435$) of the commercial fishing vessel owners and skippers in England. The survey collected data on respondents' fishing activity, job satisfaction and job security, perception of and engagement with fisheries management, health and wellbeing and demographic profile. Analyses of these data will enable scholars, policymakers, fisheries managers and the fishing industry to gain valuable insights about the social conditions and opinions of English commercial fishers and will provide a baseline for future longitudinal surveys to monitor change in social conditions over time. Such data will contribute to delivery of the 'social sustainability' objective of the Fisheries Act (2020).

Background & Summary

Against the backdrop of continued global concerns about the depletion of marine capture fish stocks, fisheries management and the research that underpins decision-making has understandably concentrated on biological sustainability^{1,2}. Despite increasing recognition of the importance of adopting an Ecosystem Approach to fisheries that includes assessing ecological sustainability alongside social and economic sustainability, applying this in practice remains a significant challenge³⁻⁶. In the UK, as in other countries globally, commercial fishing is important economically, socially and culturally to many coastal communities⁷. However, prevailing economic conditions and the social and demographic shifts in coastal communities mean that fishing livelihoods are becoming more difficult to sustain for some. Changes to quota allocation, effort management and climate impacts on the distribution of fish species have a high social cost, with impacts on livelihoods, economic resilience, social fabric and well-being^{8,9}.

In the UK, the Fisheries Act (2020) legally binds fisheries policy to the 'sustainability objective', which includes managing fishing to achieve economic, social and employment benefits, alongside ensuring long-term environmental sustainability. Implementing this social sustainability objective, however, requires robust social data to assess and monitor the social condition of commercial fishing and change over time. Existing data is mostly economic, with social data focused on profitability, employment, crew demographics and workforce structure¹⁰. Data on broader social issues affecting fishing communities and driving behaviour includes identity in fishing communities, social capital, gender roles, institutional arrangements and resilience, but is mainly limited to qualitative studies of the inshore sector¹¹⁻¹⁴. While these provide an important in-depth understanding of local contexts, there is currently no robust monitoring of social conditions and the motivations and attitudes of commercial fishers at the national level in the UK. Through delivery mechanisms of the Fisheries Act, the UK fisheries authorities have committed to undertaking such social monitoring¹⁵.

The Fishing Industry Social Survey (FISS) dataset is the first national, statistically robust, open access dataset, funded by (and developed in collaboration with) the UK government, that collects data on the social conditions, fishing activities and attitudes towards policy and management of commercial fishermen in England.

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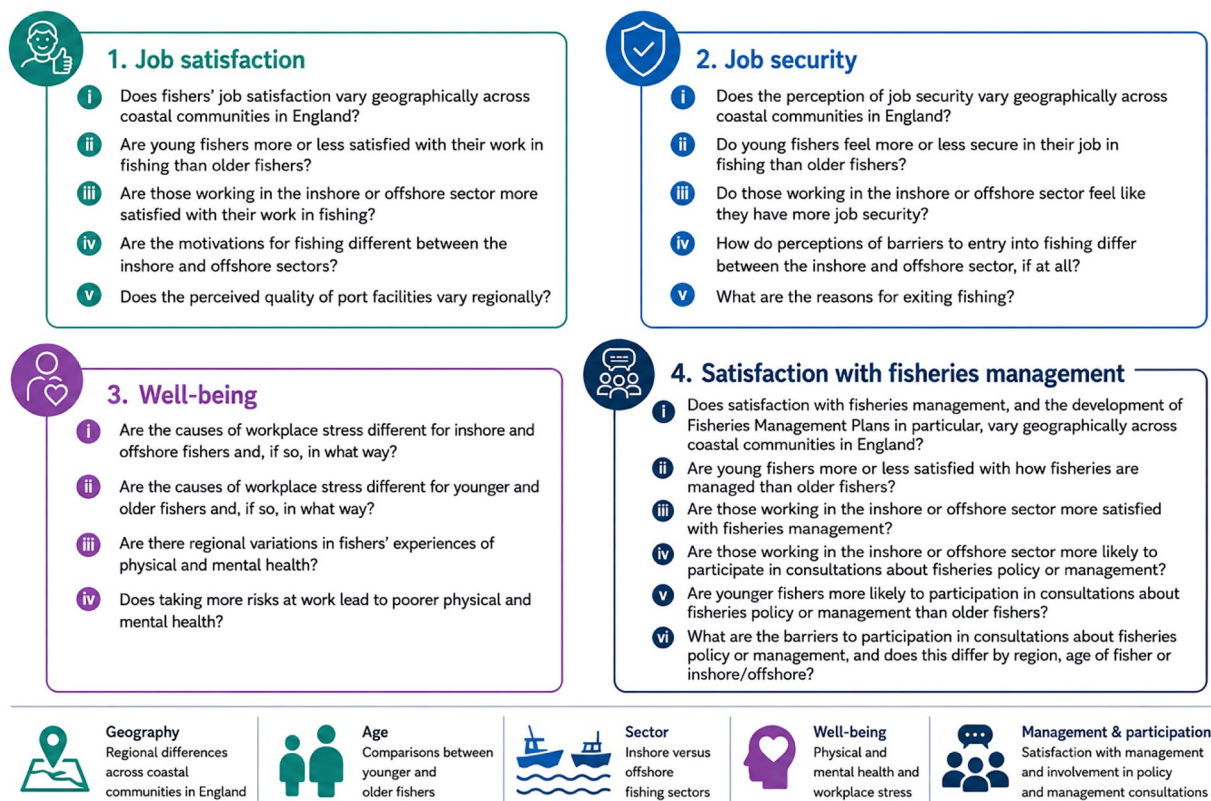


Fig. 1 Potential research questions that can be investigated with the dataset.

We collected these data through a national survey of commercial fishers in England. The dataset contains data on fishing activity, job satisfaction and job security, perception of and engagement with fisheries management, health and wellbeing and socio-economic demographics.

This dataset provides the first, representative national dataset on the social condition of the fishing industry. Methodologically, the survey team applied a novel co-design approach¹⁶ to extend participation in the design and development of the survey to individual commercial fishers, fishers' associations and representatives and fishing charities. The purpose of this was to ensure that the dataset would be of value to the fishing sector, as well as to fisheries' policymakers and managers.

We expect the dataset to be of interest to policymakers, fisheries managers, scholars and the fishing industry and the richness and granularity of the data will allow valuable insights about the social conditions and opinions of English commercial fishers and will provide a baseline for future longitudinal surveys to monitor changes in social conditions over time. This paper provides univariate statistics of the data, which provides an overview of the response distributions in the data and highlights some thematic areas for further analyses. More specifically, multivariate modelling of the data will allow analyses of the interactions between independent demographic and contextual variables with fisher behaviour and attitudinal variables to identify causal relationships and predictors of change. For instance, the data can be interrogated to provide evidence on research questions highlighted in the literature about job satisfaction, job security, well-being and satisfaction with fisheries management (Fig. 1). In addition, subsequent iterations of the survey (annually or biennially) will provide longitudinal data to monitor change over time, providing additional potential uses of the dataset in quasi-cohort trend or long-interval (i.e. 5–10 years) follow-up studies.

An important consideration when collecting data from fishers is addressing research fatigue, whereby fishers feel overwhelmed by the quantity of consultations and requests to participate in research studies¹⁷. By making this dataset publicly available and in accordance with FAIR principles, we suggest this will limit the need for the collection of similar data and, thus, reduce research fatigue. It is also important to note that a non-probability sample is hard to achieve without access to the contact details for all registered UK fishing vessels, which are not publicly available. Only Government research teams can access such personal information for valid fisheries management purposes, such as this survey. It is hoped that the data quality achieved through otherwise hard-to-achieve probability sampling will encourage researchers, in many cases, to use this secondary data over non-probability approaches such as convenience sampling.

Methods

The dataset contains complete responses from 435 commercial fishers in England, collected between January and March 2025. The required sample size was determined using Yamane's formula: $n = N / (1 + N \times e^2)$, where n is the sample size, N is the population size and e is the margin of error. The population size is 2,136 vessels, based

Region	MMO Vessel List 2024		FISS Dataset		% difference between population & sample*	
	<10m N (%)	>10m N (%)	<10m N (%)	>10m N (%)	<10 m %	>10 m %
East of England	186 (8.7)	47 (2.2)	21 (4.8)	5 (1.2)	−3.9	−1.0
East Midlands	7 (0.3)	16 (0.7)	0 (0)	1 (0.2)	−0.3	−0.5
North East	137 (6.4)	41 (1.9)	30 (7.0)	5 (1.2)	0.6	−0.7
North West	66 (3.1)	22 (1.0)	21 (4.8)	0 (0)	1.7	−1.0
South East	325 (15.2)	41 (1.9)	58 (13.3)	11 (2.5)	−1.9	0.6
South West	890 (41.7)	177 (8.3)	216 (49.6)	37 (8.5)	7.9	0.2
Yorkshire & Humber	97 (4.6)	54 (2.6)	12 (2.8)	4 (0.9)	−1.8	−1.7
Other	19 (0.9)	11 (0.5)	5 (1.1)	9 (2.1)	0.2	1.6
Total	1,727	409	363	72		
% of fleet	80.9%	19.1%	83.4%	16.6%		

Table 1. Population and sample distribution by region and vessel size. *Positive values indicate FISS data over-represents vessel size in region compared to MMO vessel register. Negative values indicate FISS under-represents.

on the Marine Management Organisation’s (MMO) Fleet Register in England, a list of all vessels with a port of registration in England, both over and under 10 metres in length and fishing in both inshore and offshore waters. The standard margin of error of 5% was used, indicating an acceptable range of + or − 5% in accuracy in the results. Using this calculation, a sample size of 337 was required to achieve a 95% confidence level. Recognising that not all those invited to take part would complete the survey, a random sample of 1,282 vessels were selected from the MMO Fleet Register, representing approximately 60% of the English fleet. Inviting 60%, rather than 100%, of the fleet to take the survey ensured a balance between achieving the required sample size and avoiding survey fatigue. In addition, the sampling procedure employed a probability approach, using targeted quota sampling to ensure representativeness across geographical regions in England and between vessel sizes. Quotas were based on official government statistics on regional fleet size and composition¹⁸ (Table 1). Alternative methods considered included convenience sampling where data collectors approach fishers in ports. However, such approaches have a high selection bias, low generalisability and are not representative of the broader population. The survey was granted ethical approval by the University of Gloucestershire’s Research Ethics Committee (CRDEF01_130723) and was subject to the conditions of the Government Social Research Ethical Assurance for Social and Behavioural Research¹⁹.

The survey questions were co-designed with fishers through a series of scoping, question design and delivery design workshops. In addition, a stakeholder steering group, representing a cross-section of the fishing industry geographically and sector-wide, advised the survey design team. Survey topics, response options, question wording and data collection approaches were scrutinised through the co-design process. The stakeholder steering group were also consulted on how the data could be curated, stored and disseminated in ways that would be usable for them. This included publishing the data open access and publishing high level summaries of the data to ensure it is accessible.

The final survey instrument consisted of 81 questions, including multiple choice and five-point Likert-scale response options, together with a limited number of open-ended questions. To minimize respondent burden, only 41 questions were included in this iteration of the survey, aiming for a maximum completion time of 15 minutes. Questions not used in this survey will be adopted in future iterations, with sets of questions rotating every 3–4 years.

Data was collected via the online survey platform ‘JISC’. This is certified to ISO 27001, the recognised information security standard, and is compliant with UK General Data Protection Regulations (GDPR). In addition, a hard-copy version of the survey was created for in-person completion. All participants provided informed consent at the start of the survey, including agreement for their anonymised data to be collected, stored and used for research purposes as outlined in Defra’s Privacy Notice²⁰. Any data transfer and/or storage during processing of the data was done through secure SharePoint servers with managed individual and institutional access. Participants were invited to take part in the survey via an email from the UK Department for Environment, Food and Rural Affairs (Defra). No personal data was collected and the dataset made available is fully anonymised and does not contain any identifying information, as set out in the ethical approval for this project. To incentivise participation, respondents were invited to enter a prize draw for the chance of winning one of twenty £100 gift vouchers. Entry to the draw was provided by a link accessible once the main survey was completed, in order to store contact details separately from the survey data.

A mixed data collection approach was adopted involving digital and in-person approaches. The digital approach involved an initial email invitation and, where necessary, three follow up emails from government social scientists. In-person contact was made where digital approaches were not successful or where respondents indicated a preference for in-person completion. Managed by Howell Marine Consultancy, regional surveyors contacted non-completers to encourage them to take part and / or to offer help completing the survey (by phone or face-to-face). The survey was delivered in collaboration with Fishing into the Future, a fishermen-led UK-wide charity that supports people in the fishing industry to engage with fisheries science and management.

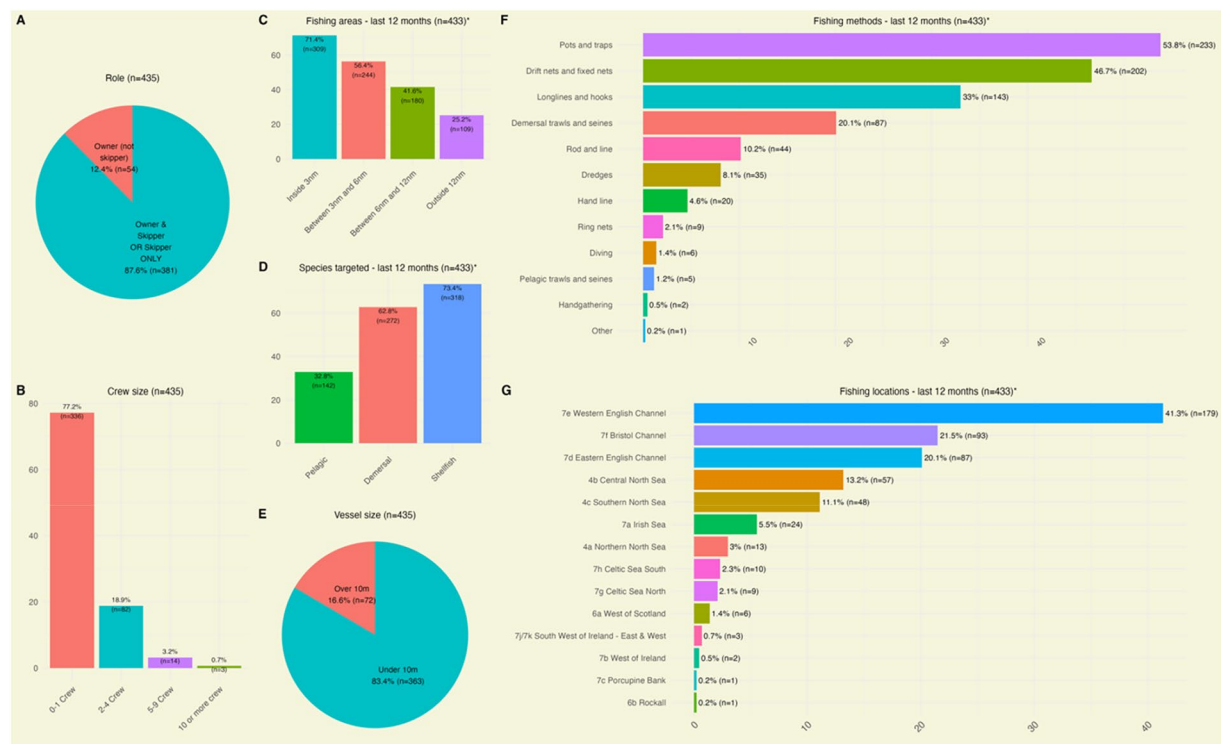


Fig. 2 Descriptive graphs of fishing activity. Panels A, B and E show the respondent role (skipper/vessel owner), crew size and vessel size. Panels C and G show where fishing activity takes place. Panels D and F show fish species targeted and gear type. *Denotes questions that were multiple answer, multiple choice.

Fishing into the Future supported awareness-raising and communication about the survey within the fishing industry.

Overall, the data collection approach worked well, achieving a high response rate. However, the sample relies on the MMO Fleet Register being up-to-date and accurate. Frame errors may arise due to inaccuracies in the register (e.g. incorrect emails or non-response due to inactive vessels). In addition, it was crucial for the survey delivery team to receive the sampling vessel list early to enable appropriate recruitment of the survey team and for managing the sample allocation across the team. Having surveyors located in the areas in which they were collecting data was important.

The data was checked to identify if post-stratification weighting is needed on the regional and vessel size quota. The distribution of responses in the sample according to vessel size was within 2.5% of the distribution in the fleet population. Distribution of responses across the regions varied from -3.9% to 7.9%, with over-representation of under 10 m vessels in the South West and under-representation in the East of England. Over 10 m vessels responses had less than 2% variation compared to the fleet population. However, given the small sample sizes for some segments, any weighting should be applied with careful consideration due to the potential for increased variability and instability of small samples. Future iterations of the survey should seek to ensure that any difference between the distribution of responses in the sample is minimised. This could be undertaken by reviewing response rates before survey closure and targeting additional respondents from under-represented regions.

Further data cleaning included removing duplicate entries ($n = 11$), correcting incorrect listing of species against pelagic, demersal and shellfish categories and creating new categories for gear types from the 'other' category. The final dataset of 435 valid responses exceeded the target sample size by 109 responses and represented a response rate of 33.9%, or 20.0% of the population of fishing vessel owners/skipper in England. Completions included 331 online self-completions and 104 surveyor completions (although it is likely that some of the online completions resulted from surveyor intervention).

The following sections describe the survey questions and data collected through the survey instrument. Descriptive graphs for some of the variables are provided as examples of the type of data generated.

Fishing activity. The questions about fishing activity were designed to capture the role of the respondent (skipper or vessel owner), size of crew and vessel, where fishing activity takes place, gear used and what fish species are targeted. These questions provide a fishing demographic of the sector. The user can link these data to the job satisfaction, health and wellbeing and perception of fisheries management to identify regional and sectoral differences in social sustainability and satisfaction with fisheries management. Figure 2, panels A-G, visualise the variation in these fishing demographic variables.

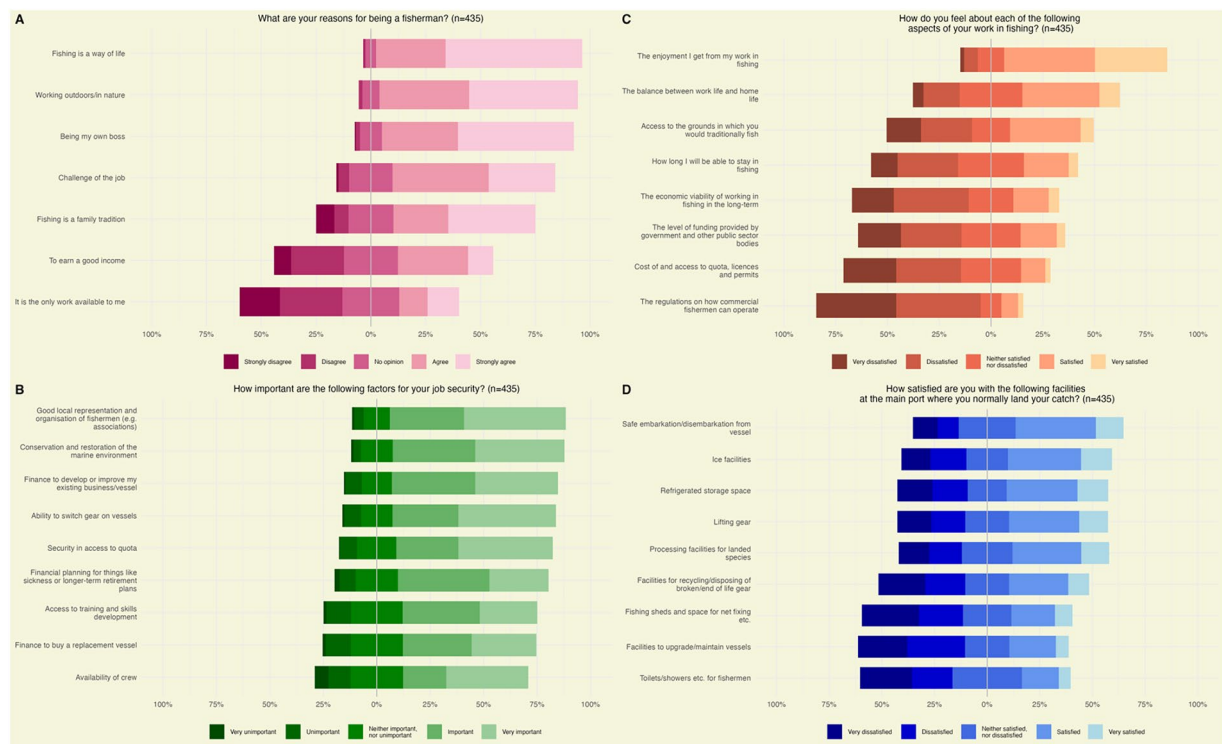


Fig. 3 Descriptive graphs of job satisfaction and job security. Panel A shows motivations for being a fisherman. Panel B shows influences on job security. Panels C and D show factors that influence job satisfaction, and satisfaction with port facilities. Panels E and F show membership of groups or organisations. *Denotes questions that were multiple answer, multiple choice.

Job satisfaction and job security. This section of the survey collected data that would allow the assessment of fishers' job satisfaction and job security (Fig. 3). The question on reasons for pursuing a career in fishing (Fig. 3: Panel A) were designed to better understand the motivations for fishing and, alongside the fishing demographic and attitudinal responses, can be used to predict socio-psychological and cultural impacts of fisheries policy and management. Job satisfaction was measured using a 5-point Likert scale (very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied) across eight statements (Fig. 3: Panel C). The statements were developed through the co-design process to best reflect current challenges and experiences of working as a fisherman. These included factors such as regulation, economic viability and work-life balance. Additionally, job security was measured through a 5-point Likert scale to capture the importance (very important, important, neither important nor unimportant, unimportant, very unimportant) of nine factors relating to running a fishing business (Fig. 3: Panel B). These included financial considerations (e.g. ability to buy a new fishing vessel, gear, retirement planning etc.), access to fishing resources (e.g. access to fishing quota and licences), crew availability, health status of the marine ecosystem, access to training and trusted representative (e.g. fishermen's associations). These data can be used to assess the social sustainability and long-term viability of the fishing industry, highlighting challenges and areas where future support might be directed. When combined with future iterations of the survey, these aspects of fishing lives can be monitored and any support or management interventions evaluated. A further question collected data relating to satisfaction with nine port facilities (e.g. facilities for load/unloading, fish storage and processing, vessel and gear maintenance, recycling, fisher welfare) using a 5-point Likert scale (very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied) (Fig. 3: Panel D).

Health and well-being. Questions relating to health and wellbeing were designed to collect data on both the physical and mental health status of fishers (Fig. 4). Respondents were asked to indicate how good they thought their health was in general, on a 5-point Likert scale (very good, good, fair, bad, very bad), using a question from the UK Census 2021 to allow for comparison to national population data (Fig. 4: Panel A). They were further asked to indicate how often (always, often, sometimes, rarely, never) eight factors caused them workplace stress (Fig. 4: Panel C). This included day-to-day experiences such as isolation, weather, occupational danger and financial concerns, as well as external factors such as regulations and spatial squeeze. Data on safety at sea was collected through a question asking respondents to indicate how physically safe they feel in their job (always safe, often safe, sometimes safe, rarely safe, never safe) and whether they take risks when fishing, such as spending longer fishing, fishing in bad weather or in dangerous locations or not having sufficient crew (Fig. 4: Panel B and D). When used with the fishing demographic data, these variables can be used to assess the well-being of fishermen, across

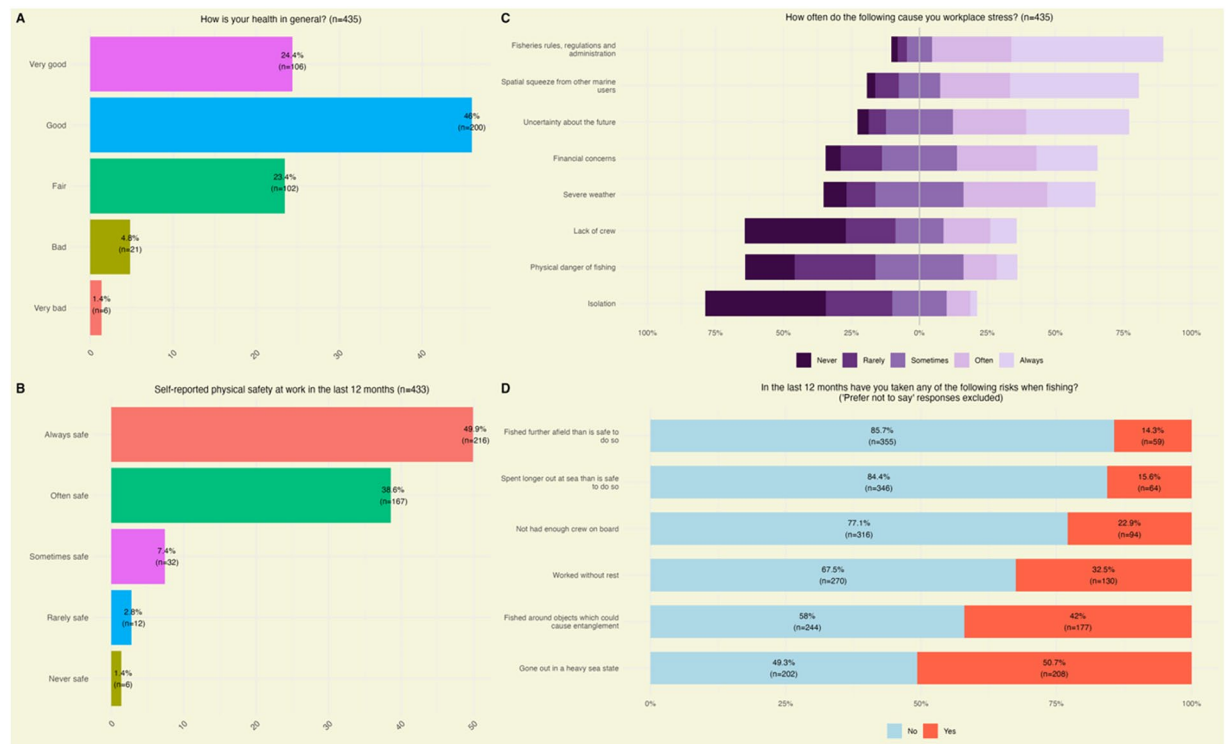


Fig. 4 Descriptive graphs of fishers' health and well-being. Panel A shows general perceived health status of fishers. Panel B shows fishers' perceived physical safety at work and Panel D shows fishers' risk-taking behaviour. Panel C shows influences on fishers' workplace stress.

different sectors and geographical locations. Future longitudinal data of this nature will enable fishers' welfare support and provision of services to be evaluated for effectiveness and targeting of these interventions.

Attitudes towards fisheries management and Fisheries Management Plans (FMPs). Data was collected on fishers' engagement with fisheries management such as participating in meetings with local or national government, fishing industry bodies, data collection as part of a scientific project or responding to government consultations, with four response options: yes; no and I do not want to; no but I would like to; prefer not to say. Perceptions of fisheries management at both regional and national levels were also collected on a 5-point Likert scale (very effective, effective, neither effective nor ineffective, ineffective, very ineffective, don't know). Specific data was collected on fishers' engagement with and perception of the collaborative process of developing the UK government's new Fisheries Management Plans (FMPs). Firstly, a question asked if respondents were aware of and/or involved any FMP activities, such as stakeholder workshops or on an FMP working group. Secondly, questions captured fishers' views on whether the FMP process had improved their knowledge, opinion of and trust in fisheries management. Alongside these questions, a 5-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, don't know) captured perceptions about the FMP collaborative process across seven statements, such as whether fishers' felt listened to, represented and motivated to engage, as well as perceptions about transparency and effectiveness. Thirdly, fishers' views on the impact that FMPs will have were collected via a 5-point Likert scale (very positive, positive, no change, negative, very negative, don't know) across six statements, including impacts of their fishing activity in the short and long-term, the sustainability of fish stocks and the marine environment, the economic performance of the fishing sector and social impacts. This data can be used to monitor the impact and effectiveness of fisheries management and policy over time, with this dataset representing a baseline that captures perceptions in the early phase of Fisheries Management Plan implementation. It can be used to identify different impacts of fisheries management across different parts of the sector, geographies or demographics.

Socio-economic demographic background. The demographic questions were designed to capture the life stage and socio-economic situation of respondents. Demographic traits collected were the following: age, duration of fishing career, nationality, alternative employment, gender and ethnicity. Data on fishers' dependency on fishing was collected through asking what proportion of respondents' household income came from commercial fishing (about a quarter or less, about half, about three quarters, all or almost all) and how fishers' get paid (crew share, fixed salary, via agency). The use of welfare support was collected through questions asking respondents if they had claimed Government benefits, received financial help from a fishing organisation or used a food bank. These data will allow users to evaluate the influence of socio-economic and demographic variables on job satisfaction and job security, health and well-being and perceptions related to fisheries management.

Data Records

The dataset and associated files are available on the UK government Department for Environment, Food and Rural Affairs (Defra)'s 'Science Search' database²¹. It comprises four files: (1) the survey; (2) the cleaned data; (3) methods report; and (4) key findings. All data associated with this study:

- The file 'Fishing Industry Social Survey - England National Pilot (surveyor interview guide).docx' is the same as the online version of the survey but formatted into a Word document for data collectors to collect the data in person or by telephone.
- The file 'Appendix 9b.xlsx' contains the survey responses after data cleaning (as outlined in Methods) and removal of identifying data (e.g. location). Unprocessed data is not included, to preserve anonymity of respondents.
- The file 'Fishing Industry Social Survey (methods report)' provides details about how the survey was developed and administered.
- The file 'Fishing Industry Social Survey – England Pilot Key findings' contains the headline results and descriptive statistics.

To maximise utility and reproducibility, the dataset adhere strictly to the FAIR (Findable, Accessible, Interoperable, and Reusable) Data Principles.

- **Findability:** The dataset has been deposited on Defra's Science Search portal, which is freely available for public use. The data can be found by searching for 'Fishing Industry Social Survey' or the project code MF12112.
- **Accessibility:** All data files are retrievable using standard communication protocols (HTTP/HTTPS) and do not require proprietary software to download. The dataset is entirely open access with no restrictions.
- **Interoperability:** Data are stored in standard, non-proprietary formats (.xlsx, docx, pdf).
- **Reusability:** The data is provided under the Open Government Licence (OGL) which is the default licence for Crown copyright material and is fully compatible with the Creative Commons Attribution (CC-BY) licence. Detailed survey instrument configurations and R processing scripts are provided in the accompanying files to enable exact replication.

Technical Validation

The relevance and useability of the survey was achieved through co-designing the survey with fishers ($n = 47$) and policymakers ($n = 51$)²². Three in-person workshops (Newlyn, Newhaven, Bridlington) and two online workshops (including fishers from Scotland, Wales and Northern Ireland) were held with fishers and fisheries representatives. Participants prioritised the social data needs of the fishing industry and advised on data collection methods. Policy workshops were held with Defra ($n = 28$), Scotland's Marine Directorate ($n = 17$) and DAERA ($n = 6$). The purpose was to identify key policy areas and evidence gaps that policymakers expected the survey data to support. Although the survey was administered only in England, policymakers from the devolved governments were consulted to enable consideration of UK-wide issues with the aim of potential future roll-out in Scotland, Wales and Northern Ireland. Further advice and steer was provided by the survey stakeholder steering group, consisting of over 20 fishers, fishing representatives and charities and fisheries social scientists.

Only complete, unique and valid responses were retained ($n = 435$). Eleven duplicate entries were removed. Responses were manually checked for repeated similar or contradictory answers, but none were identified. Two of the respondents were classed as 'inactive' (i.e. they had not fished in the last 12 months).

The following steps were taken to ensure respondents' anonymity. The survey design and data handling team (CCRI) did not have access to the sample data (held by Defra and the data collection team at Howell Marine Consulting), which included contact details of vessel owners. A unique code was assigned to each potential respondent and used to track responses. This meant that personal data (i.e. names, telephone numbers, email addresses) were not held by the CCRI, except for that relating to the prize draw, which was held separately from the survey data. We also removed port names from the dataset, as some ports have very small fleets. To avoid the potential for identifying individuals from their responses at this scale, we aggregated geographical identifiers to regions in England.

Usage Notes

Users should ensure they are familiar with the survey questions and the co-designed nature of the survey before exploration and interpretation of the data. The cleaned dataset can be interrogated using statistical software to answer the research questions identified in the 'Background and Summary' section, or additional questions. Users should consider if weighting of responses is needed for any regional comparative analyses.

Data availability

The entire dataset is available on Defra's 'Science Search' database (<https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectId=21923>). The dataset is titled 'Appendix 9b'. The dataset is accompanied by a Key Findings Report, Methods Report, as well as the full survey instrument.

Code availability

The software R (Version 2024.04.2 + 764 (2024.04.2 + 764)) was used for processing the data and generating the data visualisations. The (R Script) processing file ('FISS_plots.R') contains the code used to generate the data visualisations and can be used alongside the cleaned data²³. Note that AI tools – R Copilot²⁴ and ChatGPT²⁵ – were used to generate / prepare code and assisted with error checking. All outputs were critically evaluated and validated by the authors.

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Author contributions

Julie Urquhart led the study, defining the scope and methods, including developing the co-design methodology, and drafting and revising the survey questions. Hannah Chiswell supported the methodology design, survey question drafting and led on the data analysis and visualization. Nick Lewis supported the design and delivery of the methods, survey development, survey programming onto the survey platform and performed all of the data management, cleaning and initial analysis. Molly Atkins supported initial analysis and formulation of outputs for dissemination to fisheries stakeholders. Edward Hind-Ozan and Rosanna Mann commissioned the study on behalf of Defra, providing a policy steer, co-design support and input on the survey questions. Annabelle Ray, Ella Terasa, Angus Naylor, and Emma Westling contributed to design of the sampling and data collection protocol, supported co-design, and helped administer the survey.

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Competing interests

The authors declare no competing interests.

Additional information

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