



GREECE

Methodology and Data
Quality Assurance Framework
for Recreational Fishing



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Περιεχόμενα

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1. INTRODUCTION

1.2. General Information

For several decades it has been established that catches from marine recreational fisheries constitute a large part of the total catch.

In areas such as North America and Australia, marine recreational fishing catches have been monitored and recorded for decades. In the EU, control and recording started in some countries in the last 10 years or so, while various working groups (ICES WGRFS, GFCM, RCG) have been formed that monitor and in some way 'guide' the process. Greece has been actively participating in these groups since 2013.

The ultimate goal of recording is to reach the point of collecting reliable data from marine recreational fishery so that these can be included in the Stock Assessment of species of interest.

During 2018-2021, FRI in collaboration with Hellenic Center for Marine Research (HCMR) have implemented a pilot study with the aim of estimating the catches of recreational fishing in Greece (catch and releases in total, by species and length-weight data) in the three main modes of marine recreational fishing namely: shore, boat and underwater fishing, as well as the recording and assessment of demographic and economic data related to the activity.

The pilot study consisted of both off-site (National telephone survey and self-reporting survey) and On-site (Personal interviews with fishermen on-site while fishing). The national telephone survey was first conducted in 2018, repeated in 2022-23 and is planned to be repeated in regular intervals. On-site survey is a continuous survey. On-site survey was implemented for the first time in 2019 by conducting personal interviews, and was focused in the Thracian Sea (GSA 22) and the Ionian Sea (GSA 20) (FRI Team) and Saronikos Gulf (GSA 22) (HCMR Team). Yet, the restricted spatial monitoring, does not allow the acquisition of a representative sample and thus reliable estimates at the national level, since there is a knowledge gap on the status of MRF in the rest of the country. In order to fill-in information gaps, during the period 2020-2021, FRI expanded the on-site sampled area activating also its collaborators in North and Central Aegean (GSA 22) who conducted interviews of marine recreational fishers in their area of responsibility, with random sampling throughout the range of the areas they cover, avoiding repeated sampling in the same areas.

From 1/1/2022, the recording of marine recreational fishing is one of the regular actions of the National Program. The applied sampling scheme is carried out in parallel with the off-site surveys. It is a spatially, temporally, and technically stratified random sampling scheme, recording fishing trips along with socio-economic, catches from randomly selected sites in geographical areas covering the

two representative GSAs (20, 22). The locations of the sampling scheme include piers, ports, beaches and remote sites, in order to record in situ all fishing activities (boat, coast and underwater), catches (species, numbers) and to supplement data reported from the off-site survey.

1.2 Regulations regarding marine recreational fishing (MRF) in Greece

National legislation (Presidential Decree 373/1985) allow the following fishing gears for the purposes of recreational fishing: Hooks and lines, longlines, harpoons, spearguns, cast nets, scoop nets, pots and traps. The use of lift nets, set nets, trammel nets, boat and beach seines is prohibited for the purposes of recreational fishing.

They allow for up to five (5) kilograms of fish or cephalopods (squids, cuttlefish, octopuses), or shellfish, per 24 hours, per fisher as long as fishes with any of the permitted tools, except long lines, with which he is allowed to fish up to ten (10) kilograms. The case where a single fish has a greater weight is excluded. A single individual of the genus *Epinephelus*.

More recent national legislation (Presidential Decree 109/2002) allows fishing (without a boat) for up to thirty (30) individuals of the live bait species *Ophelia bicornis* (sand worm), *Pattela* spp (butterfly) and Paguridea (catchimamal, flounder, purpura, krika, skaltsini), per species, per day, the permitted for these fishing seasons. As long as a boat is used, fishing is allowed for up to sixty (60) individuals per species, day and boat of the above marine organisms. (NOTE: Sandworm is prohibited from February 1 to May 31 if smaller than 5 cm. Butterflies from April 1 to May 31 smaller than 3 cm and the rest from May 1 to August 31 if smaller than 5 cm). Finally Presidential Decree 65/2014 also allow, up to twenty (20) sea urchins per day and if there is a boat up to thirty (30) sea urchins for all the fishers on board.

2. DESCRIPTION OF THE POPULATION

2.1. Off-site Survey

2.1.1. Population Targeted

The research area is all urban (over 2,000 inhabitants) and rural areas (under 2,000 inhabitants) of the country. The above research population includes all the regions of mainland and island Greece including the semi-urban areas of the country (with population 2,000-9,999 inhabitants).

- The research population consists of individuals aged 15 and over, men and women who can communicate in the Greek language regardless of nationality.
- The research population consists of people based on the latest available population census of Hellenic Statistical Authority (ELSTAT).

2.1.2. Population Sampled

Out of the total number of interviews, the overall response rate is recorded and corresponds to the ratio of interviews to the total of interviews and refusals.

Of the total of interviews, the number of interviews with marine recreational fishers is recorded. Also the number of interviews conducted with adults as well as the number of these adults that agreed to participate in the off- site diary survey. The rest which either declined participation in the research or refused to have their consent recorded, are also recorded.

2.2. On-site Survey

2.2.1. Population targeted

The Primary Sampling Unit (PSU) is the fishing trip for recreational fishing. The target population is recreational fishers performing all three modes of MRF in Greece namely boat, coast and underwater per GSA, for the reference years. A licensing system for recreational fisheries does not exist in the country, thus the on-site survey will add and complete the results of the off-site survey, which main purposes are mainly the estimation of the number of recreational fishers in Greece, demographic characteristics (such as sex, age, education level etc.) and fishing practices.

2.2.2 Population sampled

The on-site sampling scheme includes marine recreational fishers in randomly selected sites and their fishing trips for the three marine recreational modes of fishing (boat, coast and underwater). The rationale behind on-site sampling is the collection of primary data. A randomized probabilistic design is followed in order to collect primary data, after the fishing effort has taken place. Furthermore, the on-site survey, which is a multispecies survey, aims to provide additional data, such as catch rate,

harvest size, taxa composition and efficiency of each mode of fishing. However, identification and tracking of underwater fishing activities remain a notable issue, so the establishment of solid and credible relationships with federations and associations is a constant and continuous endeavor which continues until today, to attain underwater fishers' participation.

3. SAMPLING DESIGN AND PROTOCOLS

3.1. Off-site Survey

3.1.1. Off-Site Survey Stratification & description

The selection of the sample is based on stratified random sampling where the regional housing units are used as strata and can be seen in **ANNEX 1**.

The following steps are followed to find the sample:

- During the research, the sampling distributions based on gender, age, and educational level of the respondents are monitored.
- During the research, successful telephone interviews, refusals to participate in the research as well as absenteeism occur during the telephone calls.
- In the case of absence, a 2nd call is made at a different time and/or day as a second attempt to find the respondent. In case the 2nd call is not answered, then this household is replaced by another.
- Those households that agree to participate in the survey are included in the "Successful telephone interviews" category. In these households the entire questionnaire is administered depending on whether the respondent is a marine recreational fisher or not.
- From all the successful interviews, households with one or more marine recreational fishers and households with no one involved in marine recreational fishing emerge. In case there is more than one member of the household engaged in recreational fishing, this information is also recorded.
- Respondents aged 18+, were they had engaged in recreational fishing during the last 12 months prior to the survey, are recorded as to their interest in participating in a diary survey using the self-reporting tools. If there is an interest, contact details of the fisher are requested and recorded only if it is an adult. During this process, all the prescribed rules for the protection of personal data are observed.

3.1.2. Off-site Questionnaire

The survey questionnaire consists of 24 numbered questions (and some additional questions in case the respondent agrees to take part in the diary survey). Most of the questions are closed questions and in some cases the respondents could report spontaneous, in addition to the pre-coded, answers. There are also some open-ended questions such as the regions/counties that the respondent fishes or the type of fish they fish. The average length of interviews is about 6 minutes. The questionnaire can be seen in **ANNEX 2**.

3.2. On-site Survey

3.2.1 On-Site survey stratification & description

The applied sampling scheme is spatially, temporally, and technically stratified. The spatial stratification takes into account that fishing activities cover North Aegean Sea, Ionian Sea and Saronikos Gulf. Furthermore, the sampling scheme is temporally stratified seasonally, by quarter, to conform with seasonal variations of all fishing activities and species' composition. Finally, the technical stratification is related to the different types of marine recreational fishing (the three major types of fishing as described by the Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al., 2021), along with the relevant fishing gears and techniques.

The methodological framework facilitates the proposal of an “optimal” sampling plan (in terms of number of trips and individuals to sample) following the process integrated with the outcomes of the first meeting of the Working Group on Small-Scale and Recreational fisheries (WGSSF) (GFCM, 2017) and the documentation of sampling design of the ICES Working Group on Recreational Fisheries Surveys (WGRFS) (ICES, 2013). In principle, the on-site sampling design includes samples that will be selected randomly in specific fishing sites after the end of the fishing effort. The methodological framework of the on-site survey follows a randomized probabilistic design. Apart from the abovementioned, the sampling design will record non-response rates.

The two national institutes FRI and HCMR collaborators systematically record parameters of recreational fishing activity, in randomly selected sites using an ad-hoc questionnaire created for this purpose.

The areas investigated are Eastern Macedonia & Thrace (EMT), Ionian Sea and Saronic Gulf in an effort to cover the main water bodies surrounding the country. The study covers the main fishing methods a) from the shore, b) by boat and c) underwater fishing, as identified through a previous telephone survey (Papadopoulos et al., 2022), is multi-species and records all marine species caught, harvested and released.

Coasts, piers and ports of EMT and Ionian Sea were surveyed by FRI. Saronic Gulf by HCMR (Fig. 1) The on-site survey adopts two established survey methods to capture a representative sample of fishing trips: the roving creel method is followed for shore fishing because access to the fishing locations is relatively diffuse and fishers typically leave in unpredictable times and through unpredictable routes (ICES, 2010), and the access point method for boat fishing since fishers can be accessed through predictable, fixed points after they have finished fishing for the day (ICES, 2010). Description and methods for their analysis are given by Pollock et al. (1994, 1997) and a critical overview is given by Jones (2012).

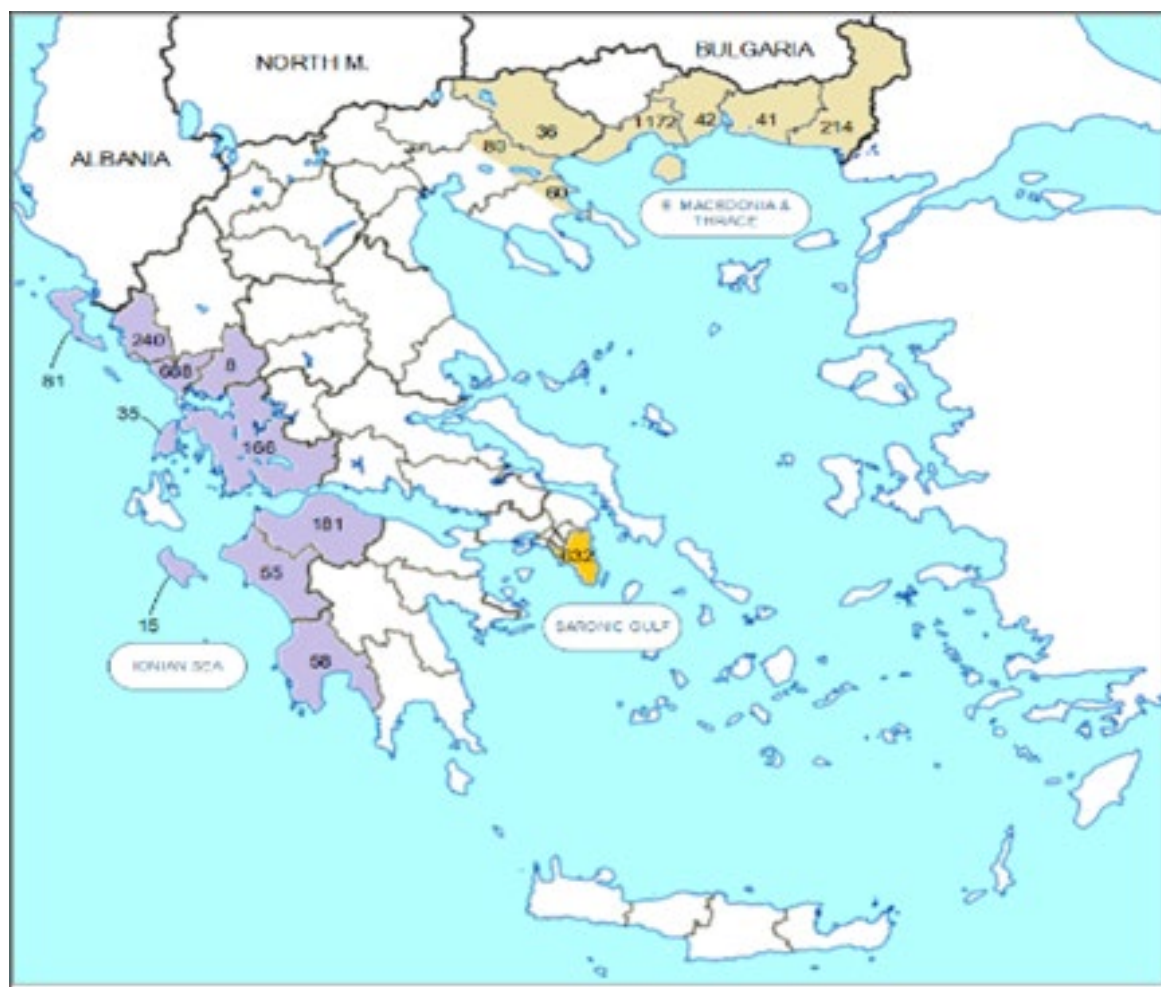


Figure 1: On-site sampling areas (labeled/colored areas) during 2019-2022 sampling period. The lines indicate the borders between the Greek regional units. Numbers indicate the number of interviews in each regional unit.

Selection of sites and days to sample

The sampling plan for the on-site survey takes into account the different modes of fishing identified, namely shore and boat fishing, as well as underwater fishing. The sites surveyed are randomly selected but information originally obtained through preliminary map survey, local administration, fishing clubs, individual fishers and visits from FRI experts, evaluated in a way that all of the areas surveyed are accommodating all three modes of fishing.

The statistical unit for this part of the survey is the fishing trip. The sample stratified according to the geographical area (North Aegean: East Macedonia & Thrace, Ionian Sea, South Aegean), the season and the mode of fishing.

Each institute provide its trained surveyors with randomized site selections for the allocated areas. Each year is divided into four quarters: 1st: January, February, March 2nd: April, May, June, etc. Four seasonal trips (one each quarter to cover the seasonality of fish catch rates and species), four days

each including two weekdays and one weekend is planned in order to record fishing patterns during the week.

Sampling consists of two daily intervals, four hours each, one in the morning and one in the evening taking into consideration the time boats are returning to the harbor. For shore fishing, interviewers visit sites along the way (beaches, ports, piers, etc.). Shore fishers are interviewed only if they are fishing for at least an hour.

Catch, effort and reasons for release.

Three terms are applied to catch information and are used throughout this report: 'catch'— refer to all organisms caught during the fishing trip whether harvested or released into the water, 'harvest'—the part of the catch that were kept and 'released'—the part of the catch released back into the water.

3.2.2. On-Site Sampling Questionnaire

Prior to the survey, a preliminary questionnaire created to cover aspects of the fishers and the fishing trip's profile. The questionnaire was tested in a number of short simulated on-site surveys and feedback used to adjust and adapt questions and topics. The final questionnaire (**ANNEX 3**) consist of five topics with twenty six questions broadly relate to fishers profile (number of fishers in the company, age, nationality, residence), fishing trip details (area, mode of fishing, distance from coast, depth, gear, soaking time, catch and release), activity in the preceding quarter (number of days fishing, three main retained species in kg.), associated costs (transport accommodation, food, gears, fuels, baits) and interactions with other species (mammals, turtles, seabirds). Four main reasons for releasing the catch are recorded. At the end of the interview promotional material is handed to the fishers (figure 2).



Figure 2: Promotional material handed to recreational fishers during the on-site survey.

The sampling design and protocols are not developed as part of a regional or multi-lateral agreement. The sampling design documentation follows the guidelines of the latest handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al., 2021).

4. SAMPLING IMPLEMENTATION

4.1. Off-site Sampling Implementation

The national telephone survey is implemented every three to five years by FRI in collaboration with specialized independent market research and opinion polling agency, which is assigned in order to assist the survey, under the supervision of the FRI. The national telephone survey has a duration of few months. The research staff responsible for collecting the data consist of one CATI Manager, few Supervisors and dozens of interviewers. To start the research, the interviewers receive appropriate training on the objectives of the research and the structure of the questionnaire under instructions prepared by FRI specialized staff. The training and the implementation of the survey is taking place at the relevant company's headquarters, by the interviewers and monitored by the CATI manager and the supervisors.

Off-site, self-reporting survey is implemented by fishers who fish for recreation in the sea and who are willing to keep diaries through the provided site and app, readily available through the internet. As there are no comprehensive lists of marine recreational fishers in Greece a sample by other means should be derived. Therefore, different methods of recruitment are being used:

- through the national telephone survey
- through informing them during the on-site survey and providing details for the action (e.g. face-to-face, flyers)
- through social media (e.g. Facebook, Google).
- through monthly and yearly prize draws via site & app participation

However, both participation rates and response rates to the self-reporting survey are relatively low in Greece.

4.2. On-site Sampling Implementation

The on-site survey is implemented by trained FRI and HCMR collaborators on-site at randomly selected sites. The on-site survey is seasonal and its structure is explained in detail in Section 3.2 of this document. The staff responsible for collecting the data consists of more than necessary available interviewers as to address any staff shortages or weaknesses in the implementation of each seasonal survey. Prior to the beginning of seasonal survey, the interviewers receive appropriate training and instructions on the targeted areas and sites, the objectives of the survey and the structure of the questionnaire.

5. DATA CAPTURE

5.1. Off-site Data Capture

The national telephone survey is a quantitative research method, following the Computer Assisted telephone interviews (CATI) approach and using a structured questionnaire.

The telephone survey has a duration of few months. During the survey, daily inspections are carried out in order to determine the consistent conduct of the survey by the researchers. The methodology followed is that of the parallel co-hearing of the interviews by the supervisors of the telephone research department, as a percentage of the work of each interviewer. Also, at regular intervals from the beginning of the survey, coders receive the completed questionnaire file and check the logical flow of each question, as well as coding open-ended questions. At the end of the survey, 100% of the completed questionnaires are checked for any inconsistent answers or incorrectly entered values. Maximum sampling error is calculated at a typical 95% confidence interval.

The off-site survey related to self-reporting uses a specially dedicated internet site <https://erasitexniki.inale.gr/> (Figure 3) and a mobile application under the name **GRecFish** that was made for Android, iOS and Microsoft mobile telephones and can be found in relevant play stores.

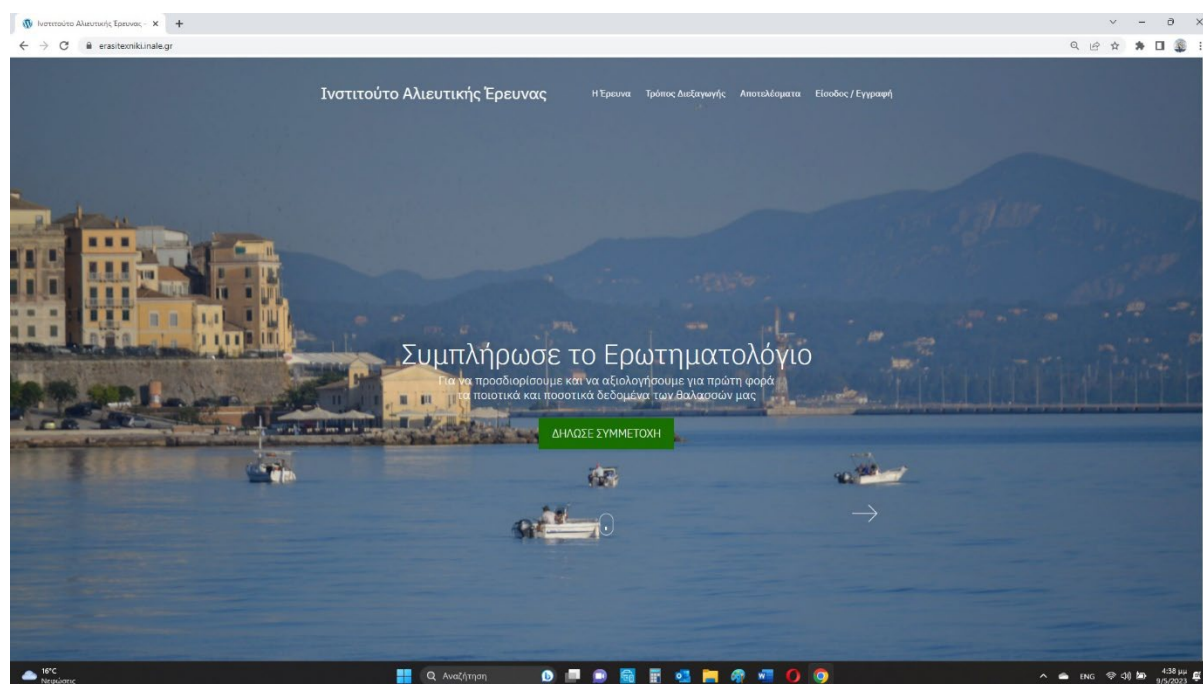


Figure 3: Internet site (<https://erasitexniki.inale.gr/>) dedicated self-reporting of Greek recreational fishers.

Both the site and the app are mirrored and in order to use each one of them, the user must register. The protocol used inside to record fishing trip details are similar to the one used for the on-site survey, adapted to a digital form.

5.2. On-site Data Capture

Specialized interviewers follow a standardized protocol when introducing themselves to a potential interviewee on-site. At the beginning interviewers tell their name and describe the details of the institutes register. Moreover, the objective of the study is thoroughly explained, and the anonymity of the interviewee is ensured. Furthermore, the interviewers request and record general information for each specific fishing trip according to the template for on-site surveys. Finally, the interviewers are specialized to recognize different species and use standard scales for recording sample per species, while measuring boards and scales are used for recording individual lengths (figure 4 & 5). By the end of the interview the questionnaire includes all the information that the interviewee is able and willing to give.



Figure 4: Measuring boards and scales used to record sizes and weight of recorder species.

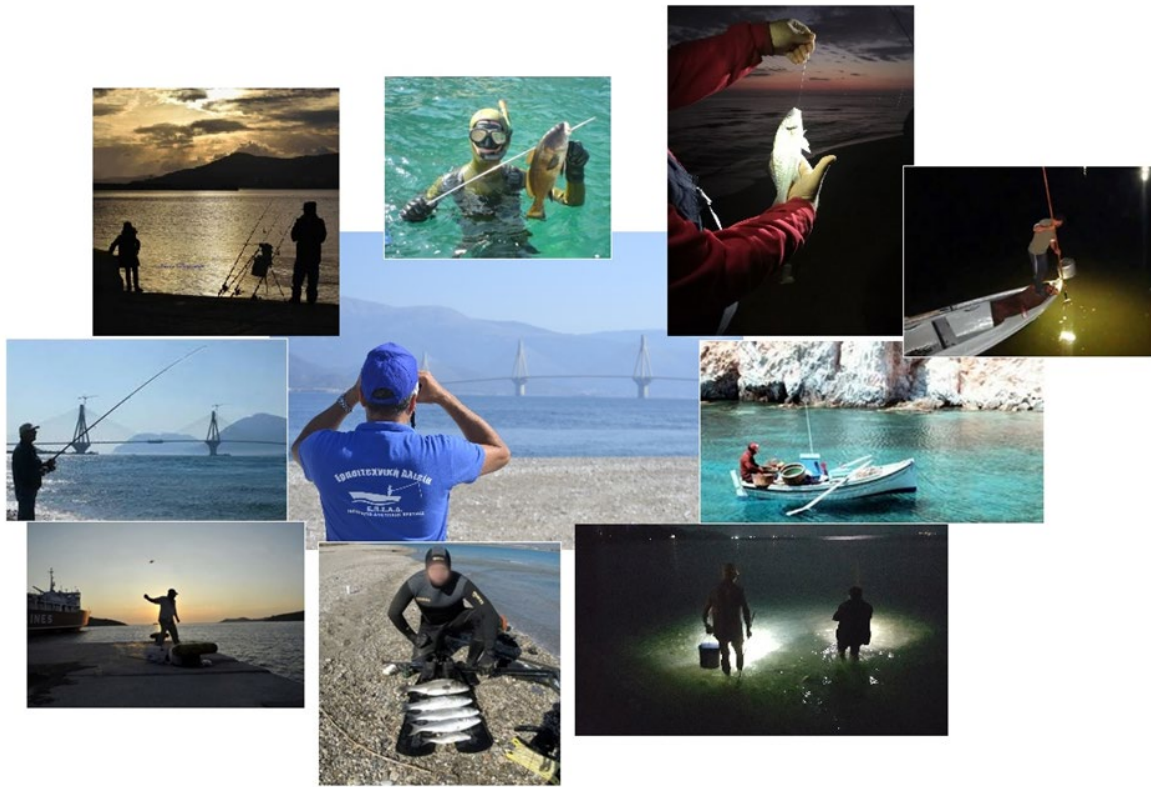


Figure 5: Snapshots from on-site recreational fishing survey.

6. DATA STORAGE

6.1. Off-site Data Storage

The national telephone survey data are stored in a database not accessible via internet due to the recording of personal data during the interviews. The data are extracted in a processed form for further analysis and handling. The same applies to the data arising from self-reporting tools namely the relevant site and app.

6.2. On-site Data Storage

Similarly, data from on-site survey are stored in database not accessible via internet. After any given seasonal on-site survey, 100% of the questionnaires completed is checked for any inconsistent answers. All the relevant data are subject to regular various quality checks, by FRI and HCMR specialized collaborators during both the interview and the computing phase of the data to the database. After the computing of the data to the database, additional quality checks are made in order to identify and correct recording errors, with the main purpose to detect outliers, misprinting, species misidentification and discrepancies between gear of fishing and species caught. In a second phase additional quality checks are done to the whole year data set (see section 7.2).

7. DATA PROCESSING

Currently the guidelines for data accuracy in recreational fisheries follow the latest directives of FAO in the Mediterranean and the Black Sea (Grati et al., 2021).

Both, off-site and on-site approaches for collecting data on marine recreational fisheries are subject to error. Uncertainty in the Greek estimates of participation, effort, and expenditure arises from two sources: measurement error (precision); and biases from issues with design and implementation of each survey and methods used for extrapolation (Pollock et al., 1994; ICES, 2010; Jones and Pollock, 2013). Diary surveys are used in many countries but are subject to a larger set of biases than onsite approaches (Jones and Pollock, 2013).

7.1. Off-site Data Processing

In the planning phase of the national telephone survey, it was decided the distribution of the sample in relation to the population distribution of the regional housing unit. The survey sample is weighted for this parameter based on the population distribution. Also, additional weightings of the sample are made based on educational level and gender distribution by age groups, in order to deal with deviations from the population data.

The sampling errors of the survey for a percentage p , is calculated under the assumption of simple random sampling at the 95% confidence level, with the following formula:

$$\text{Sampling Error} = 1.96 \cdot \sqrt{p \cdot q / n}$$

where p is the estimated percentage, $q=1-p$ and n is the sample size. The maximum sampling error in the total survey sample (corresponding to $p=50\%$ and $n=16,500$) is $\pm 0.8\%$ and in recreational fishermen it is $\pm 2.6\%$.

Statistical analysis of the data and statistical tests are performed using relevant statistical packages. Statistical tests to identify statistically significant differences between socio-demographic categories for each questionnaire question are performed at a significance level of 0.01% ($p \text{ value} < 0.01$). The X2 test are used to compare responses between discrete variables. One-way analysis of variance (ANOVA) is used to compare discrete and quantitative variables.

The findings of the national telephone survey were published in Papadopoulos et al., (2022).

As to the composition of diary panel for the self-reporting off-site survey, the precision of the results generated for any survey strata increases with the size of the diary panel in that stratum, so it is important to recruit enough diarists in each stratum to achieve the precision needed. This proves to be difficult in the Greek survey where for few consecutive years the number of panelists remained

extremely low, ruling out any possibility for further analysis. However, extra effort is being made to increase the panelist number.

7.2. On-site Data Processing

The final datasets are subject to various quality checks, with main purpose to detect the structural errors in the provided datasets and non-sampling errors. Specific control functions are performed as described by Grati et al., (2021). Nevertheless, for most purposes the WGRFS quality assurance toolkit is used to assess the quality of marine recreational fishing data (ICES, 2013, p. 43-45) (Annex 5).

Data analysis foresees estimations for each season (4 seasons) and each fishing mode (3 modes):

- (1) the total catch in number (N) and weight (kg);
- (2) the composition of the catch by species in number (N) and weight (kg);
- (3) length distribution of species (if sizes are recorded);
- (4) species share in the total seasonal catch for each fishery, both by number (N) and weight (kg);
- (5) the mean value and its confidence interval (95%), as well as the Standard Deviation (SD), of the distribution of Catch per Unit Effort (CPUE) values by species, in number of fish per fishing hour seasonally and by type of fishing;
- (6) the mean and its confidence interval (95%), as well as the Standard Deviation (SD), of the distribution of Catch per Unit Effort (CPUE) values by species, in kilograms of fish per fishing hour seasonally and by type of fishing;
- (7) the probability of catching any given species by marine recreational fisheries as a function of season and fishing type.

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ANNEX I

Stratified survey sample design

A/A	Regional Units	Population	STRATIFIED SAMPLING WITH GRADUATED FOCUS ON AREAS OF POTENTIAL FISHING	% OF STRATIFIED SAMPLE	ACHIEVED SAMPLE	% OF ACHIEVED SAMPLE
1	REGIONAL UNIT OF RODOPI (Capital: Komotini)	1,0%	200	1,2%	198	1,2%
2	REGIONAL UNIT OF EVROS (Capital City: Alexandroupoli)	1,3%	250	1,5%	250	1,5%
3	REGIONAL UNIT OF KAVALA (Capital City: Kavala)	1,1%	300	1,8%	301	1,8%
4	REGIONAL UNIT OF XANTHI (Capital City: Xanthi)	1,0%	200	1,2%	200	1,2%
5	REGIONAL UNIT OF THESSALONIKI (Capital City: Thessaloniki)	10,5%	1.450	8,8%	1450	8,8%
6	REGIONAL UNIT OF PIERIA (Capital City: Katerini)	1,1%	200	1,2%	200	1,2%
7	REGIONAL UNIT OF CHALKIDIKI (Capital City: Poligiros)	1,0%	200	1,2%	200	1,2%
8	REGIONAL UNIT OF ARTA (Capital City: Arta)	0,6%	130	0,8%	130	0,8%
9	REGIONAL UNIT OF THESSALOTIA (Capital City: Igoumenitsa)	0,4%	80	0,5%	80	0,5%
10	REGIONAL UNIT OF PREVEZA (Capital City: Preveza)	0,5%	100	0,6%	100	0,6%
11	REGIONAL UNIT OF LARISA (Capital City: Larisa)	2,6%	400	2,4%	400	2,4%
12	REGIONAL UNIT OF MAGNESIA (Capital City: Volos)	1,7%	400	2,4%	400	2,4%
13	REGIONAL UNIT OF PHTHIOTIS (Capital City: Lamia)	1,3%	250	1,5%	250	1,5%
14	REGIONAL UNIT OF BOEOTIA (Capital City: Livadia)	1,0%	200	1,2%	200	1,2%
15	REGIONAL UNIT OF PHOCIS (Capital City: Amfissa)	0,3%	70	0,4%	70	0,4%
16	REGIONAL UNIT OF ACHAEA (Capital City: Patra)	2,9%	450	2,7%	450	2,7%
17	REGIONAL UNIT OF AETOLIA-ACARNANIA (Capital City: Messolonghi)	1,8%	350	2,1%	350	2,1%
18	REGIONAL UNIT OF ILIA (Capital City: Pirgos)	1,4%	250	1,5%	250	1,5%
19	REGIONAL UNIT OF ARCADIA (Capital City: Tripoli)	0,7%	150	0,9%	150	0,9%
20	REGIONAL UNIT OF ARGOLIDA (Capital City: Nafplio)	0,9%	200	1,2%	200	1,2%
21	REGIONAL UNIT OF CORINTHIA (Capital City: Corinth)	1,3%	250	1,5%	250	1,5%
22	REGIONAL UNIT OF LACONIA (Capital City: Sparta)	0,8%	200	1,2%	200	1,2%
23	REGIONAL UNIT OF MESSINIA (Capital City: Kalamata)	1,4%	300	1,8%	300	1,8%
24	REGIONAL UNIT OF ATTICA SOUTH ATHENS	5,1%	800	4,8%	800	4,8%
25	REGIONAL UNIT OF ATTICA EAST ATHENS	5,0%	750	4,5%	754	4,6%
26	REGIONAL UNIT OF ATTICA WEST ATHENS	1,6%	200	1,2%	200	1,2%
27	REGIONAL UNIT OF ATTICA PIRAEUS	4,2%	800	4,8%	801	4,9%
28	REGIONAL UNIT OF THASSOS	0,1%	30	0,2%	30	0,2%
29	REGIONAL UNIT OF SPORADES	0,1%	30	0,2%	30	0,2%
30	REGIONAL UNIT OF ITHACA	0,0%	10	0,1%	10	0,1%
31	REGIONAL UNIT OF IKARIA	0,1%	20	0,1%	20	0,1%
32	REGIONAL UNIT OF LIMNOS	0,2%	30	0,2%	30	0,2%
33	REGIONAL UNIT OF SYROS	0,2%	40	0,2%	40	0,2%
34	REGIONAL UNIT OF ANDROS	0,1%	20	0,1%	18	0,1%
35	REGIONAL UNIT OF THIRA	0,2%	30	0,2%	32	0,2%
36	REGIONAL UNIT OF KALYMNOS	0,3%	70	0,4%	69	0,4%
37	REGIONAL UNIT OF KARPATOS-KASOS	0,1%	20	0,1%	20	0,1%
38	REGIONAL UNIT OF KEA-KYTHNOS	0,0%	10	0,1%	9	0,1%
39	REGIONAL UNIT OF KO	0,4%	80	0,5%	80	0,5%
40	REGIONAL UNIT OF MILOS	0,1%	20	0,1%	20	0,1%
41	REGIONAL UNIT OF MYKONOS	0,1%	20	0,1%	19	0,1%
42	REGIONAL UNIT OF NAXOS	0,2%	40	0,2%	40	0,2%
43	REGIONAL UNIT OF PAROS	0,1%	30	0,2%	30	0,2%
44	REGIONAL UNIT OF RHODES	1,2%	310	1,9%	310	1,9%
45	REGIONAL UNIT OF TINOS	0,1%	20	0,1%	22	0,1%
46	REGIONAL UNIT OF EUBOEA (Capital City: Chalcis)	2,0%	450	2,7%	450	2,7%
47	REGIONAL UNIT OF CORFU (Capital City: Corfu)	1,0%	200	1,2%	200	1,2%
48	REGIONAL UNIT OF ZAKYNTHOS (Capital City: Zakynthos)	0,4%	120	0,7%	120	0,7%
49	REGIONAL UNIT OF KEFALONIA (Capital City: Argostoli)	0,3%	120	0,7%	120	0,7%
50	REGIONAL UNIT OF LEFKADA (Capital City: Lefkada)	0,2%	60	0,4%	60	0,4%
51	REGIONAL UNIT OF ATTICA ISLANDS	0,7%	200	1,2%	197	1,2%
52	REGIONAL UNIT OF LESVOS (Capital City: Mytilene)	0,8%	250	1,5%	250	1,5%
53	REGIONAL UNIT OF SAMOS (Capital City: Samos)	0,3%	80	0,5%	80	0,5%
54	REGIONAL UNIT OF CHIOS (Capital City: Chios)	0,5%	130	0,8%	130	0,8%
55	REGIONAL UNIT OF HERAKLION (Capital City: Heraklion)	2,9%	600	3,6%	600	3,6%
56	REGIONAL UNIT OF LASITHI (Capital City: Agios Nikolaos)	0,7%	150	0,9%	150	0,9%
57	REGIONAL UNIT OF RETHYMNO (Capital City: Rethymno)	0,8%	180	1,1%	180	1,1%
58	REGIONAL UNIT OF CHANIA (Capital City: Chania)	1,5%	300	1,8%	300	1,8%
59	REGIONAL UNIT OF DRAMA (Capital City: Drama)	0,8%	90	0,5%	90	0,5%
60	REGIONAL UNIT OF KILKIS (Capital City: Kilkis)	0,7%	80	0,5%	80	0,5%
61	REGIONAL UNIT OF PELLA (Capital City: Edessa)	1,2%	140	0,8%	140	0,8%
62	REGIONAL UNIT OF KOZANI (Capital City: Kozani)	1,3%	140	0,8%	140	0,8%
63	REGIONAL UNIT OF GREVENA (Capital City: Grevena)	0,3%	20	0,1%	20	0,1%
64	REGIONAL UNIT OF KASTORIA (Capital City: Kastoria)	0,4%	60	0,4%	60	0,4%
65	REGIONAL UNIT OF FLORINA (Capital City: Florina)	0,4%	60	0,4%	60	0,4%
66	REGIONAL UNIT OF IOANNINA (Capital City: Ioannina)	1,5%	250	1,5%	250	1,5%
67	REGIONAL UNIT OF KARDITSA (Capital City: Karditsa)	1,0%	130	0,8%	130	0,8%
68	REGIONAL UNIT OF TRIKALA (Capital City: Trikala)	1,2%	150	0,9%	150	0,9%
69	REGIONAL UNIT OF EVRYTANIA (Capital City: Karpenisi)	0,2%	20	0,1%	20	0,1%
70	REGIONAL UNIT OF ATTICA CENTRAL SECTOR OF ATHENS	9,6%	1.160	7,0%	1160	7,0%
71	REGIONAL UNIT OF ATTICA NORTH SECTOR OF ATHENS	5,7%	650	3,9%	650	3,9%
72	REGIONAL UNIT OF ATTICA WEST SECTOR OF ATHENS	4,6%	450	2,7%	450	2,7%
73	REGIONAL UNIT OF IMATHIA (Capital City: Veroia)	1,2%	150	0,9%	150	0,9%
74	REGIONAL UNIT OF SERRES (Capital City: Serres)	1,4%	150	0,9%	150	0,9%
	TOTAL	100,0%	16.500	100,0%	16.500	100,0%

ANNEX II

Telephone Survey Questionnaire

UNIT 1st: SCREENING QUESTIONS

Q.1. Good morning/Good afternoon. My name is and I am an interviewer for the market research and public opinion polling company METRON-ANALYSIS. These days we are conducting a public opinion research in your area and your opinion would be valuable. Could I please speak to a gentleman/madam over the age of 15? IF MOBILE NUMBER CONTINUE WITH THE INTERVIEWEE/ IF LANDLINE ASK A RANDOM MEMBER OF THE HOUSEHOLD (FOR EXAMPLE THE ONE THAT CELEBRATES HIS/HER BIRTHDAY SOONER) OR BASED ON SEX/AGE PERCENTAGES

- YES (WHEN YOU CONNECT)
- NO

IF THE ANSWER IS YES THEN CONTINUE, IF NEEDED

We would like to inform you that our company follows the legislation in regards with data protection which is described thoroughly on our website www.metronanalysis.gr. Your answers will be kept confidential, they are not shared with third parties and will be used exclusively for statistical analysis. For quality assurance purposes and to ensure the credibility of the interview we maintain a record of calling this phone number for a 3-month period and afterwards this record is deleted.

Could we begin the interview?

- Yes
- No
- An eligible individual is absent, then arrange an appointment.
- Refusal (why? ____)
- There is no eligible individual.

IF THE ANSWER IS YES, THEN CONTINUE

Q.2. What year were you born? _____

CONTINUE ONLY WITH INTERVIEWEES THAT ARE BORN BEFORE 2007

Q.3. SEX (*CONTINUE WITHOUT READING*)

Q.4. HOME REGIONAL UNIT (*CONFIRM FROM THE LIST*)

UNIT 2nd: RECREATIONAL FISHING

Q.5. To begin with I would like to ask you if you have been fishing recreationally within Greece at the sea, from the shore or at ports in the last 12 months, from (MONTH OF THE YEAR) till today?

ONE ANSWER

- Yes
- No

Q.6. Is there another member/members of your household excluding yourself that has been fishing recreationally at sea, from coast or ports withing Greece the last 12 months? How many members of your household of any age, apart from you, have been fishing?

- Yes (number of members of household_____)
- No

PROGRAMMER: IF YES TO Q.5., GO TO NEXT QUESTION OTHERWISE GO TO DEMOGRAPHICS

UNIT 3rd: MARINE RECREATIONAL FISHING, COASTAL AND PORT FISHING, GENERAL FISHING INFORMATION

Q.7. At which regional units (or areas) have you been fishing recreationally the past 12 months?

SPONTANEOUS ANSWER (PRECODED LIST OF REGIONAL UNITS AND SPONTANEOUS REFERENCE TO AREAS), INTERVIEWER CHOOSE OR NOTE (UP TO THREE REGIONAL UNITS OR AREAS)

- _____

Q.8. How many times have you been fishing recreationally the last 12 months?

- From the coast _____
- From boat _____
- Underwater fishing (or spearfishing) _____
- Other (NOTE WHAT AND HOW MANY TIMES _____)

PROGRAMMER: IF AT Q.8. THE INTERVIEWEE HAS BEEN FISHING FROM COAST AT LAST ONCE: ONE ANSWER FOR EACH CASE, INTERVIEWER ASSIST FOR EVEN AN ESTIMATE RESPONSE BETWEEN 1 TO 300

Q.9. And how many times have you been fishing from the coast **READ PERIODS?**

PROGRAMMER: IF THE SURVEY TAKES PLACE NOVEMBER OR DECEMBER 2022:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till today: ____

PROGRAMMER: IF THE SURVEY TAKES PLACE JANUARY 2023 AND ONWARDS:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till December 2022: ____

INTERVIEWER: IF THE INTERVIEWEE IS UNABLE TO STATE FOR A CERTAIN PERIOD, THEN NOTE N/A

PROGRAMMER: IF AT Q.8. THE INTERVIEWEE HAS FISHED FROM THE COAST AT LEAST ONCE:

Q.10. And with which methods/techniques, have you been fishing from the coast? **MULTIPLE ANSWERS, INTERVIEWER READ THE LIST AND RANDOMIZE ITEMS**

- Handlines and Poles lines (mechanized or hand operated)
- Casting
- Spinning
- English, Apiko, Bolognese
- Squid Troll Line / Octopus Troll Line
- Polyagkistro (multi hook)
- Other what (INTERVIEWER NOTE_____)

PROGRAMMER: PROGRAMMER: IF AT Q.8. THE INTERVIEWEE HAS BEEN FISHING FROM BOAT AT LAST ONCE: ONE ANSWER FOR EACH CASE, INTERVIEWER ASSIST FOR EVEN AN ESTIMATE RESPONSE BETWEEN 1 TO 300

Q.11. And how many times have you been fishing from boat **READ PERIODS?**

PROGRAMMER: IF THE SURVEY TAKES PLACE NOVEMBER OR DECEMBER 2022:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till today: ____

PROGRAMMER: IF THE SURVEY TAKES PLACE JANUARY 2023 AND ONWARDS:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till December 2022: ____

INTERVIEWER: IF THE INTERVIEWEE IS UNABLE TO STATE FOR A CERTAIN PERIOD, THEN NOTE N/A

PROGRAMMER: IF AT Q.8. THE INTERVIEWEE HAS FISHED FROM BOAT AT LEAST ONCE:

Q. 12. And with which methods/techniques, have you been fishing from boat? **MULTIPLE ANSWERS, INTERVIEWER READ THE LIST AND RANDOMIZE ITEMS**

- Handlines and Poles lines (mechanized or hand operated)
- Jigging
- Longline (set)
- Boat troll line
- Drifting troll line
- Set troll line
- Squid Troll Line / Octopus Troll Line
- Polyagkistro (multi hook)
- Other what (INTERVIEWER NOTE_____)

PROGRAMMER: PROGRAMMER: IF AT Q.8. THE INTERVIEWEE HAS BEEN UNDERWATER FISHING AT LAST ONCE: ONE ANSWER FOR EACH CASE, INTERVIEWER ASSIST FOR EVEN AN ESTIMATE RESPONSE BETWEEN 1 TO 300

Q.13. And how many times have you been underwater fishing (spearfishing) **READ PERIODS?**

PROGRAMMER: IF THE SURVEY TAKES PLACE NOVEMBER OR DECEMBER 2022:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till today: ____

PROGRAMMER: IF THE SURVEY TAKES PLACE JANUARY 2023 AND ONWARDS:

From January to March 2022: ____

From April to June 2022: ____

From July to September 2022: ____

From October 2022 till December 2022: ____

INTERVIEWER: IF THE INTERVIEWEE IS UNABLE TO STATE FOR A CERTAIN PERIOD, THEN NOTE N/A

Q.14. Approximately how many kilos of fish, regardless of species, have you caught in total the past 12 months? **ASSIST INTERVIEWEE WITH SCALE**

- 0 kilos
- Up to 1 kilo
- 1,1-2 kilos
- 2,1-3 kilos
- 3,1-4 kilos
- 4,1-5 kilos
- 6-10 kilos
- 11-15 kilos
- 16-20 kilos
- 21-30 kilos
- 31-50 kilos
- Over 50 kilos (how many, approximately? _____)

PROGRAMMER: IF AT Q.8. MORE THAN ONE OPTIONS HAVE BEEN CHOSEN:

Q.15. You mentioned before that you have been fishing with various methods (PROGRAMMER: BRING UP ALL THE MODES USED AT LEAST ONCE THAT HAVE BEEN MENTIONED BY THE INTERVIEWEE AT Q.8. AND INTERVIEWER READ THEM). What percentage of the kilos you have noted before refer to each fishing mode? **NOTE THE PERCENTAGES SO THAT THEIR SUM IS 100%**

- From the coast
- From boat
- Underwater fishing
- Other

ASK THE NEXT TWO QUESTIONS IF MORE THAN 0 KILOS WERE STATED AT Q.14

Q.16. And what is the type of fish that you have caught the most in terms of quantity in the past 12 months? And the second most caught in terms of quantity in the past 12 months? And the third most caught in terms of quantity in the past 12 months?

NOTE IF THE ANSWER IS SPONTANEOUS, ASSIST WITH THE FISH SPECIES MORE SPECIFICALLY (FOR EXAMPLE, EUROPEAN SEABASS, GILT-HEADED BREAM, OCTOPUS, SQUID ETC)

PRECODED ALPHABETICAL LIST OF RESPONSES FROM PREVIOUS SURVEYS WITHOUT READING, PLUS OTHER WHAT

- 1st SPECIES _____
- 2nd SPECIES _____
- 3rd SPECIES _____

REPEAT THE NEXT QUESTION FOR ALL THE SPECIES MENTIONED IN THE PREVIOUS QUESTION Q.16

Q.17. Approximately how many kilos from (MENTION THE SPECIES) have you caught in the past 12 months? **USE THE SCALE FROM Q.14**

UNIT 4th: FINANCIAL INFORMATION

Let's move now to another subject.

Q.18. How much have you spent in total in the past 12 months for recreational fishing and more specifically for

INTERVIEWER READ EACH ANSWER AND NOTE THE SPONTANEOUS RESPONSE, IF THE INTERVIEWEE CANNOT ANSWER NOTE APPROXIMATELY BASED ON THE SCALE

- Equipment and gear _____
- Baits _____
- Fishing trip _____
- Boat expenses (such as purchase, rent or maintenance) _____
- Other (NOTE WHAT)

SCALE

- Nothing
- 1-10 euros
- 11-24 euros
- 25-50 euros
- 51-75 euros
- 76-100 euros
- 101-150 euros
- 151-250 euros
- 251-500 euros
- 500-999 euros
- 1000+ euros (how much approximately; _____)

UNIT 5th: SOCIAL DIMENSION
--

Q.19. Last, when do you usually go fishing? READ ONE ANSWER

- Weekdays
- Weekends
- Summer holidays
- Holidays outside of summer
- Other what? ____
- I don't have an opinion on that (spontaneous)

Q.20. You would say that you engage with recreational fishing mostly to? READ AN ANSWER, EXPLAIN MORE ABOUT WHAT MOTIVATES THE RESPONDENT

- To consume the catch
- To have a good time
- Other what? _____
- I don't have an opinion on that (spontaneous)

UNIT 6th: DEMOGRAPHIC DATA (All respondents answer)

Now we will continue with some demographic questions, only for statistical purposes.

Q.21. What is the highest level of education you have completed?

ONE ANSWER, INTERVIEWER READ LIST

- Did not go to school
- Some Primary School classes
- Primary School graduate
- Graduate of third grade Secondary School
- Graduate of sixth grade Secondary School / High School
- Diploma of TEL, TES, TEE, EPAL, EPAS, Polykladiko Lyceum
- Graduate of IEK or professional school

- Graduate of TEI, KATEE
- University graduate
- Holder of a Master's degree or above

Q.22. How many people live in your household including yourself? **A SPONTANEOUS RESPONSE, INTERVIEWER NOTE**

- _____

Q.23. What is your employment status?

ONE ANSWER, INTERVIEWER READ LIST

- Self employed
- Employer
- Public Sector Employee
- Private Sector Employee
- Unemployed
- Housewife
- Pupil/Student
- Retired
- Income earner
- Other (INTERVIEWER NOTE _____)

Q.24. What is your marital status?

ONE ANSWER, INTERVIEWER READ LIST

- Married with children
- Married without children
- Single living with parents
- Single living alone/cohabiting
- Single living with relatives/siblings
- Divorced
- Widowed
- Other (INTERVIEWER NOTE _____)

UNIT 7th: AGGREMENT FOR DIARY

(Only respondents aged 18+ who have said in question 5 that they have fished in the sea, on shores or in ports in the last 12 months)

INTERVIEWER, RECORD THE RESPONSE AND KEEP THE RECORD IF THE INTERVIEWEE CONSENTED

Q.25. Thank you very much for your time.

For security and quality control reasons the rest of our conversation is being recorded.

I would like to inform you that this survey is being conducted on behalf of the Fisheries Research Institute of the Ministry of Rural Development and Food, which in collaboration with the European Fisheries and Maritime Fund is going to conduct another survey on recreational fishermen like you. The purpose of this new survey will be to record data from YOUR FISHING HABITS FOR THE PERIOD OF ONE YEAR either by phone or through a diary that you can find in electronic form through a mobile app and on a website. With your participation you will receive some gifts of symbolic value related to fishing. Also, the more entries you have in this diary survey the higher chance you have of winning additional various fishing related prizes. (RESEARCHER IF ASKED MENTION FISHING BOOKS, HATS OR FISHING ACCESSORIES). In order to do this, you will need to provide us with your contact details which we will pass on to the Fisheries Research Institute along with certain demographic information for statistical purposes such as gender, age and education level.

Q.26. I would like to ask if you would be interested in taking part in this Institute of Fisheries Research diary survey.

- Yes (**ASK THE QUESTION BELOW**)
- No (**INTERVIEWER, THANK AND CLOSE THE INTERVIEW**)

Q.27. I would like to ask you to provide me with your contact information. **INTERVIEWER, ASK FOR AND RECORD THE FOLLOWING DETAILS**

- Name_____
- Residence_____
- Postal address (Street, number, city, postal code) _____
- Contact telephone number (Landline/mobile) _____
- email (if any)_____

Thank you very much for your intention to participate in the diary survey. For any clarification you may need, you can contact the Fisheries Research Institute at 25940-23820.

CLOSING: Thank you very much again for your participation in the Metron Analysis survey.

ANNEX III

On-Site Sampling Questionnaire



FISHERIES RESEARCH INSTITUTE, On Site Sampling Questionnaire

SAMPLING INFORMATION

1. Area	2. Date/...../202	3.
4. Interviewer	5. Weather ¹ °C Beaufort	

1. Sunshine, Temperature, Wind Direction, Sea State (Beaufort) (eg Clear, 15C, NA, 2B)

FISHERS INFORMATION

6. Duration of Fish ¹to.....	7. Time of Interview	8. Interview Conclusion Completed ³ Not Completed ³
9. Age	10. Sex	13. Refused/ Reason for Refusal
11. Nationality	12. Residence	
14. No of fishermen ²	M<15 F<15 M>15 F>15	

1. Duration of fishing from arrival to departure from the fishing site (24h).
2. No of people/sex and age older/younger than 15 years. We ONLY interview anglers >15 years old. We record ONLY THOSE WHO FISH. In the case of a group, we interview ONE for ALL WHO FISH.
3. The interview is COMPLETED ONLY when the interview time coincides with the end of fishing. In any other case, fill in NOT COMPLETED.

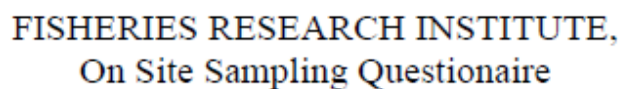
15. INFORMATION - COMMENTS

FISHING TRIP INFO

16. MODE OF FISHING			17. Type, Number, Use of Gears & Bait				
Boat ¹	Underwater	Shore	AA	Gear/Technique	No of Gears	Bait ³	Soaking Time
			1	Line			
			2	Spinning			
			3	Casting			
			4	Jigging			
			5	English/Apico			
			6	Longline			
			7	Line-Tsapari			
			8	Drifting trawling line			
			9	Bottom trawling line			
			10	Squid/Octopus line			
			11	Spearfishing			
			12	Line-Multihook			
			13	Other			

1. IX=Private, EN= Rented, AT=Boat with Fishing Tourism Licence
2. Distance (m), from the nearest shore while fishing. NOT distance traveled from port. Applies to boat and Spearfishing ONLY.
3. Record the bait and specify if it was Live (Regarding Fish or Cephalopod baited live) or Fake.

19. Times fish during the last Trimester		
20. The first 3 species caught (in kilograms) during the last Trimester.	SPECIES	KILOGRAMS

[illegible]

2. AM=Released/Undersize. AK= Released /could be kept. AB= Released / Inedible species. AA= Released /Unknown reason

23. Catches-comments

24. Trip Expenses							
	Travel	Accom/n	Food	Gear	Boat fuels	Baits	Other ¹
€							

26. Interaction with other species				
Species ¹	Damages to tools	Damages to catches	Loss of catches	Interaction with other species-Comments

1. Θ =Seabirds, Φ =Seal, Δ =Dolphins, X =Turtle, A =Other-Clarify