



GENERAL FISHERIES COMMISSION FOR
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Transversal workshop on the monitoring recreational fisheries in the GFCM area

Palma de Majorca, Spain, 20-22 October 2010

EVALUATION OF THE PHENOMENON OF RECREATIONAL FISHERIES IN ITALY: DESIGN AND IMPLEMENTATION OF AN INTEGRATED MONITORING SYSTEM

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AIMS OF PROJECT

The main objectives of the proposed project are:

- ❖ To acquire sufficient knowledge about the state and dynamics of "sport fisheries" over the time by **proposing an efficient and feasible system of data collection.**
- ❖ To contribute towards the **amelioration of conflicts between recreational and professional fishermen** by proposing the monitoring of sources of conflicts between the two segments of fisheries.
- ❖ To facilitate towards **the improvement of fisheries management** by developing the quality of scientific advice for a sector such as recreational fisheries, that has been greatly neglected in the CFP.
- ❖ To provide the necessary information over time for **expanding our knowledge about 1) the fishing fleet capacity and the rate of exploitation of fisheries resources, 2) the quality of marine environment 3) the socio-economics aspects in the fisheries sector.**

Sampled Regions	No of yearly interviews (Database A) <u>Face to face interviews , during 13 meeting</u>	No of monthly <u>Telephone interviews</u> (Database B)	Ports covered
Liguria	6	30	1
Toscana	4	10	1
Lazio	13	65	2
Sicila	23	115	3
Marche	29	138	3
Veneto	9	44	1
TOTAL	84	402	11

Summary of interviews made

Both the recreational fishermen and their associations judged the project very interesting and they gave a good degree of collaboration.

After these meetings, the **sample of recreational fishermen amounted to 84.**

DATA COLLECTION SYSTEM

Two **questionnaire** were planned in order to collect informations by recreational fishermen .

Related to these questionnaires, have been developed and tested two databases to manage the data collection :

- Database a,- STARFISH RF1** in order to **collect data on annual basis** to target a general picture of phenomenon, and to collect "*una tantum*" information such as social status of fisherman ,characteristics of vessels

- Database b, - SARFISH RF2** contains the routine informations to **collect on monthly basis** concerning catches, number of fishing trips, gears used and so on

- For the management of data has been developed **a coding system for all fields covered by the two databases.**

- Data collected by questionnaires were processed using the **software package STARFISH –RF** to test all different phases of data processing (data input, data checking, data printing, etc).

code	scientific name	english	italian
0100	SURFACE PELAGIC FISH	SURFACE PELAGIC FISH	PESCI PELAGICI DI SUPERFICIE
0101	Belone belone	Needlefish, Garfish	Aguglia
0102	Scomberesox saurus	Atlantic Saury, Skipper	Costardella
0200	MIGRATORY PELAGIC FISH	MIGRATORY PELAGIC FISH	PESCI PELAGICI GRANDI MIGRATORI
0201	Thunnus alalunga	Albacore	Alalunga
0202	Euthynnus quadripunctatus	Atlantic little tuna	Alletterato
0203	Sarda sarda	Atlantic bonito	Palamita
0204	Xiphias gladius	Broadbill swordfish	Pesce spada
0205	Seriola dumerili	Amberjack	Ricciola
0206	Thunnus thynnus	Bluefin tuna	Tonno rosso
0207	Thunnus spp.	Tunas (other)	Tonnidi (altri)
0300	SMALL PELAGIC FISH	SMALL PELAGIC FISH	PESCI PICCOLI PELAGICI GREGARI
0301	Engraulis encrasicolus	European anchovy	Alice
0302	Engraulis encrasicolus juv. + Sardina pilchardus juv.	Whitebait, Engraulis encrasicolus juv. + sardina pilchardus juv.	Bianchetto, Minnata
0303	Auxis rochei	Bullet tuna	Biso
0304	Scomber japonicus	Chub mackerel	Lanzardo
0305	Atherina boyeri	Sand smelt	Latterino
0306	Aphia minuta	Transparent goby	Rossetto
0307	Scomber scombrus	Atlantic mackerel	Sgombro
0308	Sardina pilchardus	European pilchard	Sarda
0309	Sprattus sprattus	Sprat	Spratto

Example of coding system for species fished

QUESTIONNAIRES FORM Database a & b

EU project 00000 "Sport fisheries in Eastern and Central Mediterranean: Design, implementation and economic evaluation of an integrated monitoring system"

STARFISH - RF Recreational Fisheries
GENERAL QUESTIONNAIRE (on yearly basis, database a)

mod. STARFISH - RF2, p. 10

a- HEADING SECTION

a-b. Country: Y

a-b. Enumerator code: Y

a-c. Filling date (dd/mm/yy): Y

a-d. Number of interview: Y

a-1. RF SECTION

a-1.1 Code of RF: Y

a-1.2 Family name: N

a-1.3 First name: N

a-1.4 Permanent address: N

a-1.5 Post code: N

a-1.6 City where RF is resident: N

a-1.7 Telephone (yyyy): N

a-1.8 Telephone (number): N

a-1.9 Sex (M/F): N

a-1.10 Age: N

a-1.11 Marital Status: N

a-1.12 Education: N

a-1.13 Profession: N

a-1.14 No. of RF license: Y

a-1.15 Expiration of license (dd/mm/yy): Y

a-1.16 Cost of license: G

a-2. RF CLUB SECTION

a-2.1 Member of Recreational Club (Y/N): Y

a-2.2 Code of Club who the RF belong: N

a-2.3 Name of Recreational Club: N

a-2.4 Address of Recreational Club: N

a-2.5 City of Recreational Club: N

a-2.6 Membership fee: N

a-2.7 Participation to RF game (Y/N): Y

Remark 1: Euro is the currency to be used.
Remark 2: Y = mandatory fields; N = no mandatory fields; G = field used only by Greece; I = field used only by Italy.

EU project 00000 "Sport fisheries in Eastern and Central Mediterranean: Design, implementation and economic evaluation of an integrated monitoring system"

STARFISH - RF Recreational Fisheries
RECREATIONAL FISHERMEN INTERVIEWS (on monthly basis, database b)

mod. STARFISH - RF2, p. 10

b- HEADING SECTION

b-a. Country: Y

b-b. Enumerator code: Y

b-c. Filling date (dd/mm/yy): Y

b-d. Number of interview: Y

b-1. RF - INTERVIEWED

b-1.1 Code of RF: Y

b-2. RF - MONTHLY FISHING TRIPS SECTION

b-2.1 No. of fishing trips during the month: N

b-2.2 Mean duration of fishing trip (hour): Y

b-2.3 Mean number of people on board during fishing trip: Y

b-2.4 Mean time dedicated to fishing operation in each trip (h): N

b-2.5 Employment in Full Time (equivalent on monthly basis): Y

b-2.6 Monthly cost of fuel: Y

b-2.7 Other operational costs (new weights, ice, boxes, treatment of fish, etc.): N

b-3. RF - MONTHLY FISHING GEAR / CATCHES SECTION

b-3.1.1 Gear mainly used (code): N

b-3.1.2 Gear mainly used (no. of fishing days): N

b-3.1.3 Gear mainly used (fishing area): N

b-3.1.4 Monthly catches for gear 1 (kg): N

b-3.1.5 Prevailing species (code), gear 1: Y

b-3.1.6 Prevailing species (%), gear 1: Y

b-3.2.1 2nd gear used (code): N

b-3.2.2 2nd gear used (no. of fishing days): N

b-3.2.3 2nd gear used (fishing area): N

b-3.2.4 Monthly catches for gear 2 (kg): N

b-3.2.5 Prevailing species (code), gear 2: N

b-3.2.6 Prevailing species (%), gear 2: N

b-3.3.1 3rd gear used (code): N

b-3.3.2 3rd gear used (no. of fishing days): N

b-3.3.3 3rd gear used (fishing area): N

b-3.3.4 Monthly catches for gear 3 (kg): N

b-3.3.5 Prevailing species (code), gear 3: N

b-3.3.6 Prevailing species (%), gear 3: N

Remark 1: Euro is the currency to be used.
Remark 2: Y = mandatory fields; N = no mandatory fields; G = field used only by Greece; I = field used only by Italy.

The **database a (on annual basis)** and the **database b (on monthly basis)**, gave a picture of the pre-selected sample of recreational fishermen covering the following seven sections:

status of recreational fisherman;
 association of the recreational fishermen;
 fishing vessels characteristics;
 fishing trips;
 fishing gear/catches;
 conflicts with professional fishermen;
 discards at sea.

RESULTS

Database a

In every field of the dataset was calculated the percentage of response obtained during interviews.

In the “**RF Section**” referred to **social aspects**, all recreational fishermen have provided an answer.

In the section “**Vessel Section**” we obtained a high response rate on the characteristics of the boats, but not for the questions of an economic nature such as capital investment to buy the vessel.

Field code	Field name	Sample size	No. of answers	%
a-4.1	No. of annual fishing trips	84	83	99
a-4.2	Mean duration of fishing trip (hour)	84	74	88
a-4.3	Mean number of people on board during fishing trip	84	75	89
a-4.4	Mean time dedicated to fishing operation in each trip (h)	84	74	88
a-4.5	Employment in Full Time Equivalent (on a yearly basis)	84	3	4
a-4.6	Yearly cost of fuel (Euro)	84	52	62
a-4.7	Other operational costs (crew wages, ice, boxes, treatment of fish, etc.)	84	0	0

Fishing Trips Section

Field code	Field name	Sample size	No. of answers	%	No. of RF using 2 nd or 3 rd gear
a-5.1.1	Main gear used (gear 1)	84	84	100	
a-5.1.2	Secondary gear used (gear 2)	84	84	100	52
a-5.1.3	Third gear used (gear 3)	52	52	100	18
a-5.2.1	Annual fishing days estimated for gear 1	84	82	98	
a-5.2.2	Annual fishing days estimated for gear 2	52	51	98	
a-5.2.3	Annual fishing days estimated for gear 3	18	17	94	
a-5.3.1.1	Annual catch estimated for gear 1 (kg)	84	0	0	
a-5.3.1.2	Prevailing species (code) for gear 1	84	64	76	
a-5.3.1.3	Prevailing species (%) for gear 1	64	8	13	
a-5.3.2.1	Annual catch estimated for gear 2 (kg)	52	0	0	
a-5.3.2.2	Prevailing species (code) for gear 2	52	43	83	
a-5.3.2.3	Prevailing species (%) for gear 2	43	2	5	
a-5.3.3.1	Annual catch estimated for gear 3 (kg)	18	0	0	
a-5.3.3.2	Prevailing species (code) for gear 3	18	15	83	
a-5.3.3.3	Prevailing species (%) for gear 3	15	10	67	
a-5.4.1	Cost of gear used (gear 1)	84	38	45	
a-5.4.2	Cost of gear used (gear 2)	52	4	8	
a-5.4.3	Cost of gear used (gear 3)	18	0	0	
a-5.5.1	Repair and maintenance of gear used (gear 1)	84	45	54	
a-5.5.2	Repair and maintenance of gear used (gear 2)	52	4	8	
a-5.5.3	Repair and maintenance of gear used (gear 3)	18	0	0	

Fishing Gear/Catches Section

The table shows that, in addition to the main gear, 52 (equal to 62%) of recreational fishermen of the selected sample made use of secondary gear, and 18 (equal to 21%) of them practised fishing using also a third type of gear.

Field code	Field name	Sample size	No. of answers	%	No. of RF answering Y
a-6.1	Any conflict with professional fishermen during last year ?(Y/N)	84	83	99	46 (55%)
a-6.2	No. of annual conflicts with professional fishermen (estimated)	46	1	2	
a-6.3	Competition for space	46	11	24	
a-6.4	Competition for fishing gear and fishing effort	46	33	72	
a-6.5	Competition for fishing market	46	0	0	

Conflicts section

In case of Italy, the conflicts highlighted by the respondents never referred to direct (personal) quarrels. Rather, they tended to describe the reasons for frequent and sometimes persistent misunderstandings between the two categories of fishermen, although they were never directly involved.

Field code	Field name	Sample size	No. of answers	%	No. of RF answering Y
a-7.1.1	Annual catches (estimation, kg)	84	65	77	
a-7.2.1.1	Species 1 caught (code)	84	25	30	
a-7.2.1.2	Species 1 caught (%)	25	13	52	
a-7.2.2.1	Species 2 caught (code)	25	21	84	
a-7.2.2.2	Species 2 caught (%)	21	12	57	
a-7.2.3.1	Species 3 caught (code)	21	16	76	
a-7.2.3.2	Species 3 caught (%)	16	10	63	
a-7.3	% of catches for self-consumption	84	84	100	
a-7.4	Kill no fish: % on total catches	84	7	8.3	
a-7.5.1	Do you usually discard catches at sea? (Y/N)	84	73	87	64 (76%)
a-7.5.2	Percentage of total catches during a fishing trip accounting for discards at sea	64	2	3.1	
a-7.6.1	Which is the discarded species at sea? (1st species)	64	27	42	
a-7.6.2	Which is the discarded species at sea? (2nd species)	27	5	19	
a-7.6.3	Which is the discarded species at sea? (3rd species)	5	2	40	

Catches/Discards section

in this section, the response to the questions about "kill no fish" and "discarding", tended to overlap, since recreational fishermen generally define as "discarding" the release of fish only if it is still alive, in other words what is meant by "kill no fish"

Frequency distribution of most discarded species by RF

Species code	Species (English name)	Species (Scientific name)	no. of specimen among catches	%
0401	Bogue	<i>Boops boops</i>	27	20
0101	Garfish	<i>Belone belone</i>	20	15
1006	Saddled bream	<i>Oblada melanura</i>	13	10
0307	Atlantic mackerel	<i>Scomber scombrus</i>	8	6
0901	Triglidae	<i>Triglidae</i>	8	6
0903	Gobidae (other)	<i>Gobidae</i>	8	6
1018	Blennies	<i>Blennius spp.</i>	6	5
0402	Flathead grey mullet	<i>Mugil cephalus</i>	3	2
1002	European conger	<i>Conger conger</i>	3	2
1007	Gillhead sea bream	<i>Sparus auratus</i>	3	2
1009	Pagellus spp. (other)	<i>Pagellus spp.</i>	3	2

As shown in the table, the most discarded species in quantitative terms was bogue (*Boops boops*), followed by garfish (*Belone belone*), saddled bream (*Oblada melanura*) and so on.

The same evaluation was made for database b, on monthly basis: in this case we obtained a higher percentage of responses with regard to the monthly quantities of fish and species caught, because it was easier for the fisherman to remember better in a more limited period of time.

CONCLUSION

❖ The present study, forms the initial basis for the application of an integrated data collection system for recreational fisheries in Eastern and Central Mediterranean, ***in order to be easily comparable to the data collection related professional fisheries (The Council Regulations no. 1543/2000 and the Commission Regulation no.1639/2001,*** were the two main sources for considering and finally determining the recreational fisheries data in order to be comparable with professional fisheries).

❖ Special effort was exerted in determining the kind of parameters – biological, economic, social and demographic – that portray the state and dynamics of sport fisheries in Italy.

The biological parameters chosen are:

Organization of recreational fishermen (nautical club, association of recreational fishermen, etc.);

Fishing vessel characteristics (GRT, engine power, etc.);

Fishing trips (no. of annual or monthly fishing trips, people on board during fishing trips, etc);

Fishing gear characteristics (type of fishing gear used, catches by fishing gear, etc.);

Conflicts with professional fishermen (causes of conflicts, no. of conflicts, etc.). Conflicts could be also considered as social variables. Their presence here is related to the competition among the recreational and professional fishermen in the same fishing area and the same species;

Catches (by species, by fishing trips, etc.);

Discarded catches (percentage of discards, species discarded, etc.).

Economic parameters (for example consumption of fuel) to make easier **to evaluate fishing effort**.

❖ To give an exact picture of recreational fisheries, a yearly data collection ("minimum program") has been decided for the general picture of the pre-selected sample of recreational fishermen, while a monthly data collection ("extended program") has been decided as the best time frequency that can compromise between the following:

the memory of the recreational fishermen;

the need to process data on monthly/seasonal basis;

the discontinuity of the recreational fishery.

By concluding the theoretical determination of our proposed data collection system the following step was to test it in practice. Thus, the proposed data collection system was tested in practice by face-to-face interviews to a sample of recreational fishermen using the data forms A and B produced.

Fishermen's positive response to the data forms and generally towards a future system for data collection was mainly based on personal communication and mutual trust.



Thank you for your attention !!!