Food and Agriculture Organization of the United Nations

General Fisheries Commission for the Mediterranean
Commission générale des pêches pour la Méditerranée

BlackSea4Fish Project

Workshop on the harmonization of data collection at landing sites and in scientific surveys-at-sea

Burgas, Bulgaria, 3-5 April 2019

Report

EXECUTIVE SUMMARY

The General Fisheries Commission for the Mediterranean (GFCM), at its forty-second session Commission (FAO headquarters, Italy, November 2018), decided to establish a regional research programme towards the sustainable exploitation of rapa whelk (*Rapana venosa)* in the Black Sea. This programme should support the Working Group on the Black Sea (WGBS) and it is coordinated within the BlackSea4Fish project. It aims to improve scientific, technical and socio-economic knowledge of fisheries exploiting rapa whelk. A roadmap and a work plan were drafted at the session of the WGBS (Bulgaria, July 2018) and were approved by the forty-second session of the Commission. On the occasion of the Forum on Fisheries Science in the Mediterranean and the Black Sea (FishForum) (FAO headquarters, Italy, December 2018), two short meetings were held with Black Sea specialists and necessities for the implementation of the work plan were discussed. Two important issues were underlined: i) the elimination of differences in landing data collection programmes currently carried out by most of the Black Sea riparian countries; and ii) fundamental needs such as sampling gear, protocol and sampling period for conducting a harmonized scientific survey-at-sea. This workshop[1] was organized to meet the harmonization needs addressed by the Black Sea specialists within the context of the GFCM BlackSea4Fish project, which supports the implementation of the mid-term strategy (2017–2020) towards the sustainability of Mediterranean and Black Sea fisheries, particularly in relation to its aim of improving regional technical capacity.

[1] This meeting was supported by the European Union under grant agreement no SI2.795396.

Background

The terms of reference of the meeting focused on the following elements:

- landing site sampling strategies;
- identification of potential sources of bias in the landing data;
- harmonization of the landing site survey protocols;
- elaboration of the GFCM Technical Guidelines for Scientific Surveys in the Mediterranean and the Black Sea – procedures and sampling for beam trawl surveys; and
- preparation of the cruise plan for the surveys-at-sea to be conducted in summer 2019.

Introduction

The meeting was opened by Galin Nikolov, Executive Director of the Executive Agency for Fisheries and Aquaculture (EAFA). After his welcome speech and the introduction of the participants, the BS4Fish Project Coordinator presented the agenda of the meeting for adoption. He then presented the objectives and the expected outcomes of the meeting. Afterwards, participating countries presented existing data collection programmes on statistics and biological data on landings. During this part of the meeting, the current status of landing data collection, that had been tabulated in the short meetings held during the FishForum (FAO headquarters, Italy, December 2018), was updated. The updated report is presented in Table 1.

Table 1. Landing data collection by countries

	Bg	**Ro**	**Tr**	**Ua**
Fishing season	April –Oct (May-Sep)	April – Nov (May-Sep)	Aug 31st - Apr 15th (for BT)	Late May – Late Nov
# of landing sites	4 main ports for BT	3 main ports for BT	>50	4
Fishing gears used	2	2	2	2
Beam trawl	Yes	Yes (2013 -)	Yes	Yes (2016 - experimental)
Dredge	No	No		Yes
Diver	Yes	Yes	Yes	Yes
Fleet segments	BT-(3 seg) Diver (3 seg)	BT-(4 seg); Diver-(2 seg)	No	No all polyvalent
# of boats engaged in RW fishery	Yes	Yes	Yes	Yes
# of vessels in each port	Yes	Yes	Yes	Yes
Sampling frequency	Every 3 monthss	Monthly	Seasonal	Twice in a month
# of ports sampled	Yes	All ports	6	2
# of boats sampled	BT	4 BT, 1 diver	Diver, BT	BT
Specifications of the sampled boat (Length, HP)	EAFA	NAFA	SUBIS	Yes
Length measurements	0.5 cm	0.5 cm	0.5 cm	0.5 cm
Weight measurements	Individual weight	Individual weight, fresh	Individual weight, fresh	To nearest 0.1 g
Age determination	No	Yes	No	Yes - Spawning libs
Catch of the sampled boat	Yes	Yes	Yes	Yes
# of samples	100 ind/each haul	200 ind/trip	Min 100 ind/trip	100-200 ind/trip
Raising method	Unweighted	Unweighted	Unweighted sum	Unweighted
Landings by month	Yes	Yes	No	Yes

Landings by port	Yes	Yes	Yes	Yes
Landings by gear	Yes	Yes	No	Yes
Sources of variance accounted				
seasonal variability	No	No	No	No
gear associated var.	No	No	No	No
port associated var.	No	No	No	No
Other	Bycatch discard	Bycatch discard	No	Bycatch Discard

Moving from this table, the points that could cause incompatibility between the data submitted by the countries were determined and the discussion continued on these points.

In this part of the discussion, countries were asked to present how the biological data collected at the landing sites were being raised to the total catch, i.e. the derivation of inputs to the age--based or length--based stock assessment models used. While deriving the rapa whelk input data for the assessment models, all countries were based on an assumption that the variability associated with sampling port, sampling date and sampled fishing gear is negligibly low. The common formula used to raise the samples is as follows:

$$Data = \sum D_{i,j,q,k} \qquad \text{e.q.1}$$

Where ***Data*** is the input to the model,
i is the port
j is the date
q is the gear
k is the country

Discussions on the length frequency distribution (LFD) raising factors

The accuracy of the assessment models that are currently used to assess the status of rapa whelk stock in the Black Sea and that will be used in the near future is determined, to a great extent, by the representativeness of the length composition data collected in the field. For this reason, the group emphasized the importance of following a standardized procedure combining LFDs collected at certain time intervals, in different ports and by different gear.

Within this context, an exercise was carried out based on LFD data monthly collected in three different regions on the Black Sea coast of Turkey (Fig. 1). The purpose of the exercise was to draw attention to various sources of inconsistency that resulted from lack of standardization, and to underline the crucial importance of estimating and incorporating an appropriate raising factor for different factors that display variability such as monthly differences, regional variability or fishing gear -associated differences.

In the exercise, the LFD representing the annual landings of Turkey was estimated using the common formula used by all countries (see above). Then, the mean lengths of the rapa whelk in each data set were calculated and compared. The results showed a strong temporal and regional impact on the mean lengths of rapa whelk (Fig. 2). Following, the LFD representing Turkey's annual rapa whelk landings were re-estimated considering the regional and monthly variations in the quantity of the landings. The LFD derived in this way were compared with the LFD initially estimated (Fig. 3).

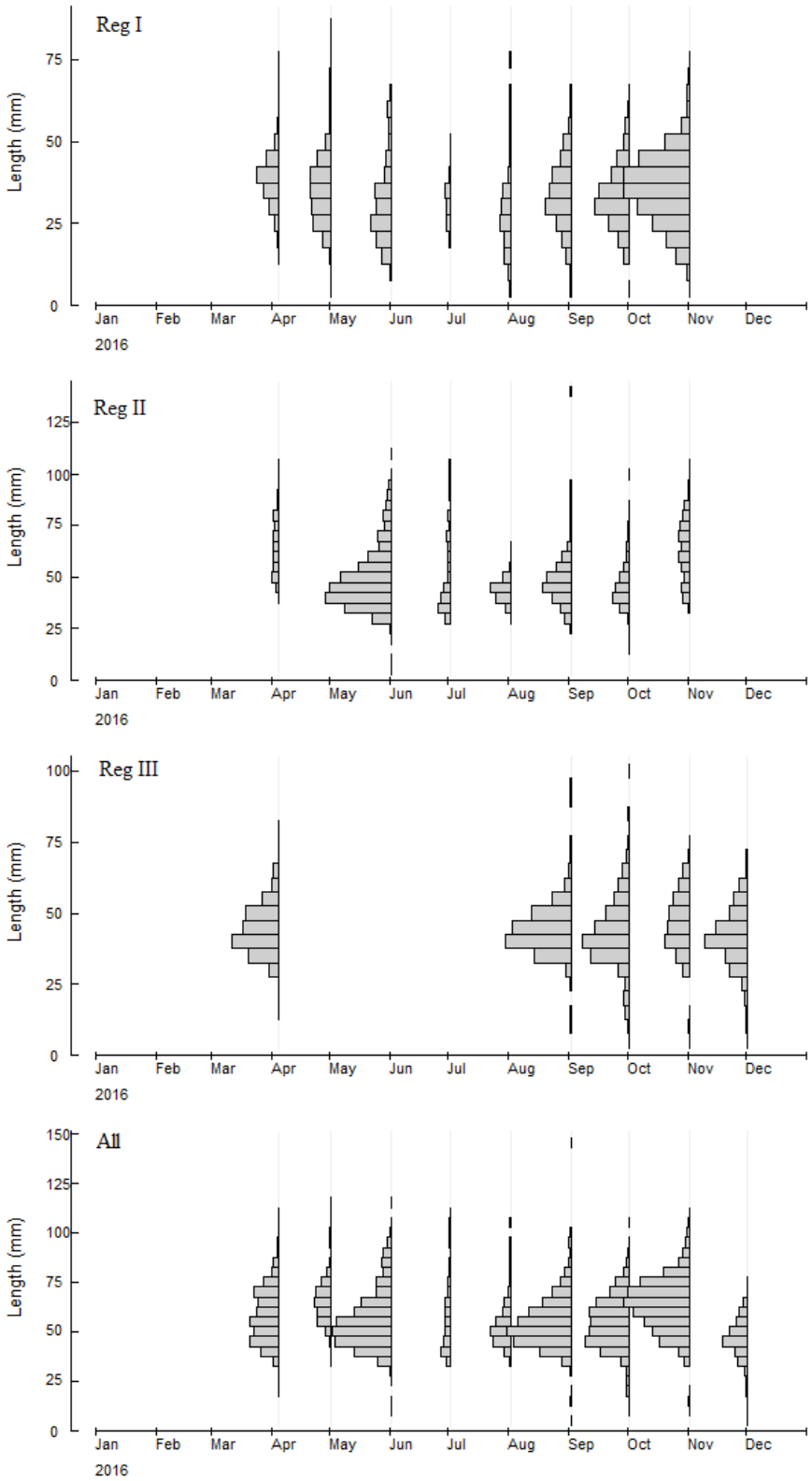


Figure 1. Length frequency plots of Turkish rapa whelk landings in 2016 per trip in 5 mm length bins

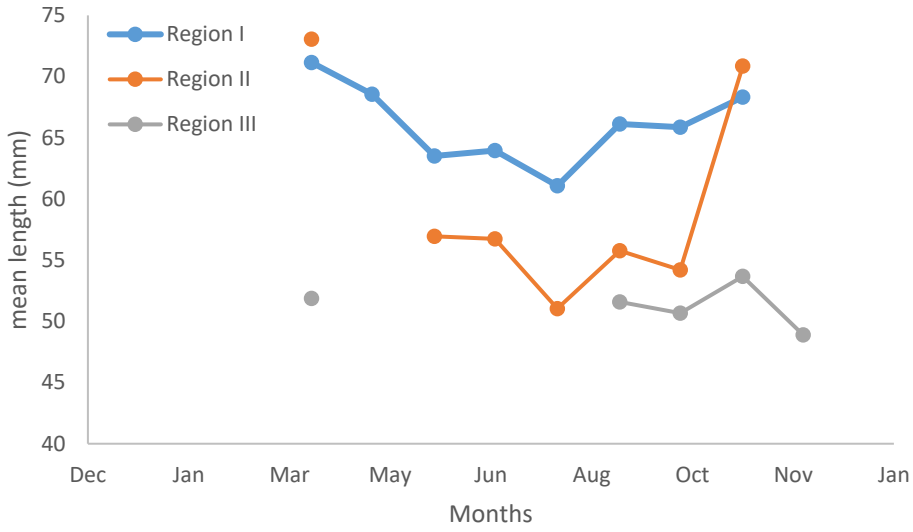


Figure 2. Mean length distribution of the Turkish rapa whelk landings in 2016 by month and region

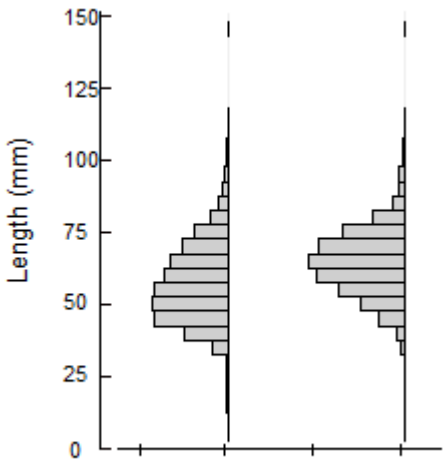


Figure 3. Length frequency plots of rapa whelk before and after treatment

Changes in length composition before and after the derivation were compared using a Kolmogorov--Smirnoff (K–S) test from the function *clus.lf()* from the R package "fishmethods" (Nelson, 2014) applied to calculated per 5 mm length bin. The results showed that change in length structure of the treated and un-treated LDFs of rapa whelk landings of Turkey was significant (Kolmogorov–Smirnov test, $p > 0.1$).

The group then decided to use the following raising factors wherever available:

$$Data = \sum^{i,j,q,k} D_{p,m,g,c} . \frac{p_i}{P} \frac{m_j}{M} \frac{g_q}{G} \frac{c_k}{C} \qquad \text{e.q.2}$$

Where ***Data*** is the input to the model,
p_i is the rapa landings in port "i"
mj is the rapa landings in month "j"
g is the rapa landed by gear "q"
c is the rapa landed by the country "k"
P is the total landings by all ports
M is the total landings in all months
G is the total landings by all gears
C is the total landings by all countries

In order to provide a raising factor, the minimum information provided in the data logbooks of the surveyors were listed as follows:

The minimum information needed to estimate accurate raising factor

Date:
Time:
Port:
Total number of vessels in the port (by gear)[1] :
Name/Code of the vessel sampled:
Length of the vessel (m):
HP/kWa of the engine (*specify which is used*):
Gear used:
Length of the beam – Number of divers:
Number of hauls in the trip:
Location of the fishing operation(s):
Approx. depth range of operation(s):
The weight of the landing of the vessel of the trip (kg):
Total weight of the sample (kg):

Fisherman's self-declaration on the monthly RW landing distribution [1].

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
%	%	%	%	%	%	%	%	%	%	%	%

Fisherman's self-evaluation on the catch of the day, with respect to the monthly average *

	Poor/small	Normal	High/large
Amount			
Sizes			

[1] *Not necessary for the countries where official data is available*

The group also agreed on the following principles:

- The landing site surveys should be focused on the main landing ports. In this context, the minimum number of ports to be sampled should be 4 in Bulgaria, 3 in Romania and 2 in Ukraine. Considering the vast and highly mobile nature of the rapa whelk fishery in Turkey, sampling should target at least 6 ports representing the eastern (Ordu-Hopa), central (Unye – Sinop) and western (Sinop-Igneada) Black Sea coast.
- In the landing site surveys, the monthly sampling frequency should be targeted and the interval between two successive samplings should not exceed 2 months and should be repeated at least 4 times in a fishing season.
- In accordance with the existing data collection programmes, the target fishing gear in the landing site surveys should be the beam trawl; however, further research is needed to investigate whether or not the LFD and/or age composition of the rapa whelk landed by divers are identical to those landed by beam trawlers.
- At least 2 boats should be sampled at each survey.
- The samples taken from the boats should not be less than 100 individuals. The total number of samples collected in a fishing season should not be less than 1 000 (if possible 1 200) individuals and should reflect the temporal, spatial and regional variability. Given that the Turkish coastline is more than 3 times longer than the coastline of other countries, the number of individuals to be sampled in a fishing season should not be less than 3 000 in this country.
- Individual samples should be raised to total landings considering the monthly, regional and gear-associated differences in the quantity of the rapa whelk landings.
- The raising factor to be applied should be calculated based on the equation given above (Eq. 2).
- The major biological parameters to be considered in the sampling should be:

    1) Shell length (in mm)
    2) Shell width (in mm)
    3) Total weight (in g)
    4) Individual weight or length class weight (in g).

These parameters should be provided for all samples.

- A subset of samples should also be examined for:

    1) Age
    2) Meat weight
    3) Gonad weight
    4) Sex.

For these secondary parameters, at least one individual from each 0.5 cm length class should be subsampled provided that the number of individuals subsampled should not be less than 25percent of the total samples examined.

Joint scientific rapa whelk surveys-at-sea

Another task of the meeting was to decide on the guidelines to be used during the joint surveys at sea. As it was decided in the previous meetings, the beam trawl survey guidelines drafted by GFCM were presented to the participants. The group then discussed all the points that may be a matter of incompatibility. When consensus was reached among the participants, amendments were made on the draft beam trawl survey guidelines accordingly. The final guidelines for the Black Sea rapa whelk survey are depicted in Annex 1.

Discussions on the budget of the joint scientific rapa whelk survey

The group considered all items of the budget and agreed on the following table:

Table 2. Suggested budget of the joint scientific rapa whelk survey

Budget Item	**Bg**	**Ro**	**Tr (X 3 team)**	**Ua**	**Total**
Field cost					
Rental commercial vessels	15000	15000	45000	12000	87000
Cost of the gear (+ custom)	2500	2500	6000	1500	12500
Scientific material	500	500	1500	500	3000
Unexpected expenditures (5%)	750	750	2250	750	4500
Subtotal - Running cost	18750	18750	54750	14750	107000
Travel cost					
Number of people involved	3	3	9	3	
Number of days at sea	10	10	10	10	
Daily rate*	130	130	130	130	
Subtotal - Travel	3900	3900	11700	3900	23400
Honorarium					
Number of experts	4	3	9	3	
Number of days	30	30	30	30	
Daily rate*	150	110	110	110	
Subtotal - Honorarium	18000	9900	29700	9900	67500
Total Budget	**40650**	**32550**	**96150**	**28550**	**197900**

*) arbitrarily estimated

BEAM TRAWL SURVEYS FOR BLACK SEA RAPA WHELK: GUIDELINES AND METHODOLOGIES

(Modified from "draft Technical guidelines for Scientific Surveys in the Mediterranean and Black Sea" of GFCM, and revised after a test survey participated by experts from 5 Black Sea countries)

1. Vessel characteristics

A beam trawl survey on the Black Sea rapa whelk (*Rapana venosa*) should be carried out with a commercial or a research vessel equipped with an engine of at least 186 kW (250 HP) to be able to tow the sampling gear at a constant speed. Trawling speed during each operation should be between 1.5 to 2.0 knots. The speed of the BT should be monitored continuously; care should be given to remain at a constant speed and report in case of deviation. In addition, detailed information on the haul (e.g. latitude, longitude, duration of the haul, depth, speed, direction, etc.) should be monitored and reported (as in Annex 1.1).

2. Sampling gear

In the implementation of the survey, a Turkish design beam trawl described in a recent article (Kaykaç *et al.*, 2014)[2] should be used. All hauls should be undertaken using this beam trawl gear and the net, as specified in the design. Detailed information of the gear is provided below.

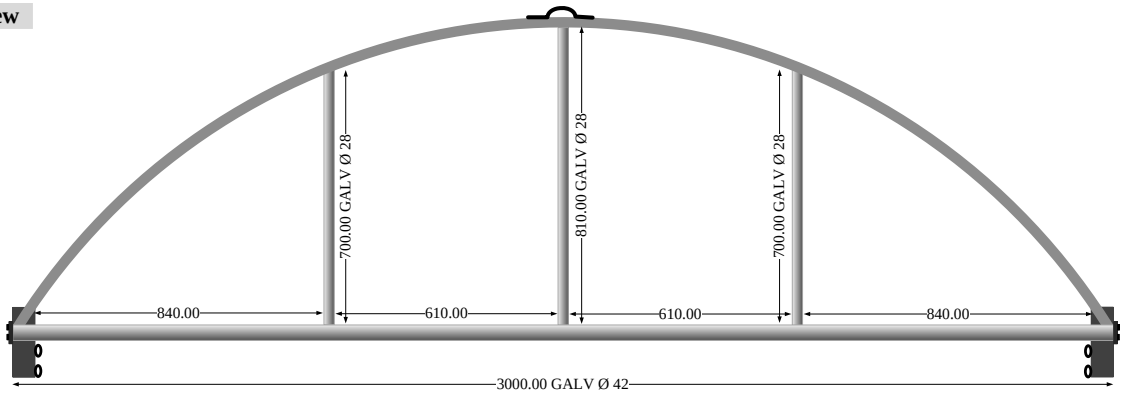
The most important specifications of this gear are as follows:

- It is able to work in all areas and at all depths (from 5 to 35 m).
- Its selectivity is as low as possible to have a good representation of the population structure.

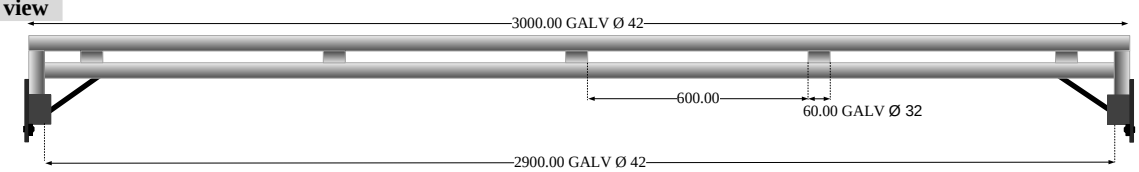
The mesh size of the cod end should be 72 mm (diamond, stretch).
The nets should be made of good-quality polyamide netting (nylon).

[2] Kaykaç, M. H., Zengin, M., Özcan-Akpınar, İ., Tosunoğlu, Z., 2014. Structural characteristics of towed fishing gear used in the Samsun coast (Black Sea). Ege J Fish Aqua Sci 31(2): 87-96. doi: 10.12714/egejfas.2014.31.2.05.

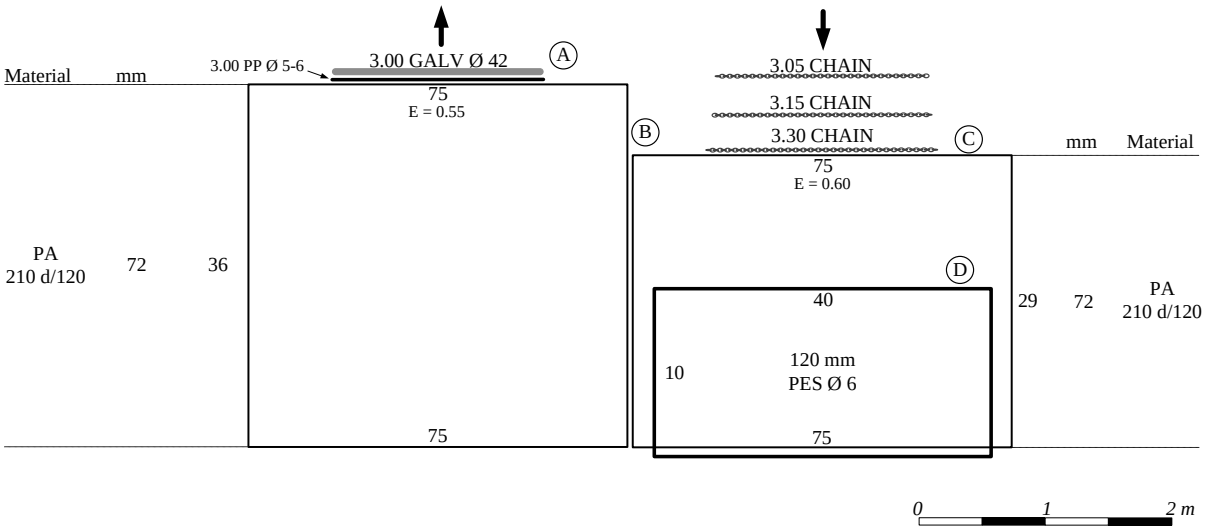
Top view

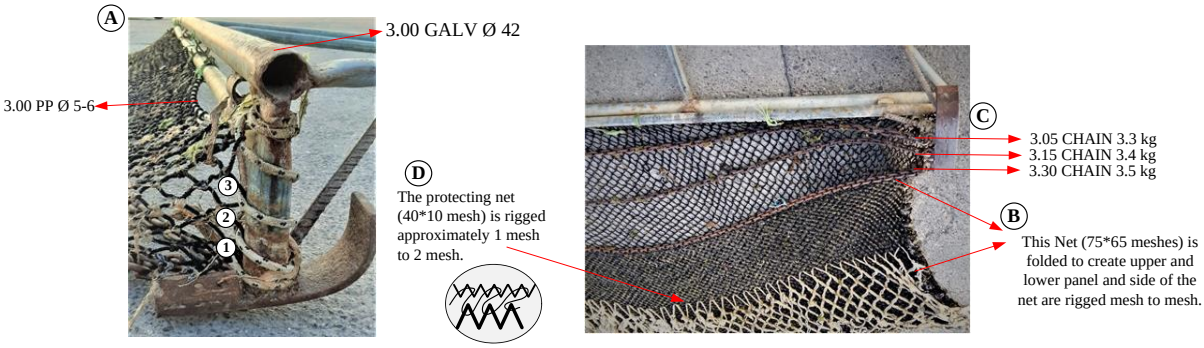


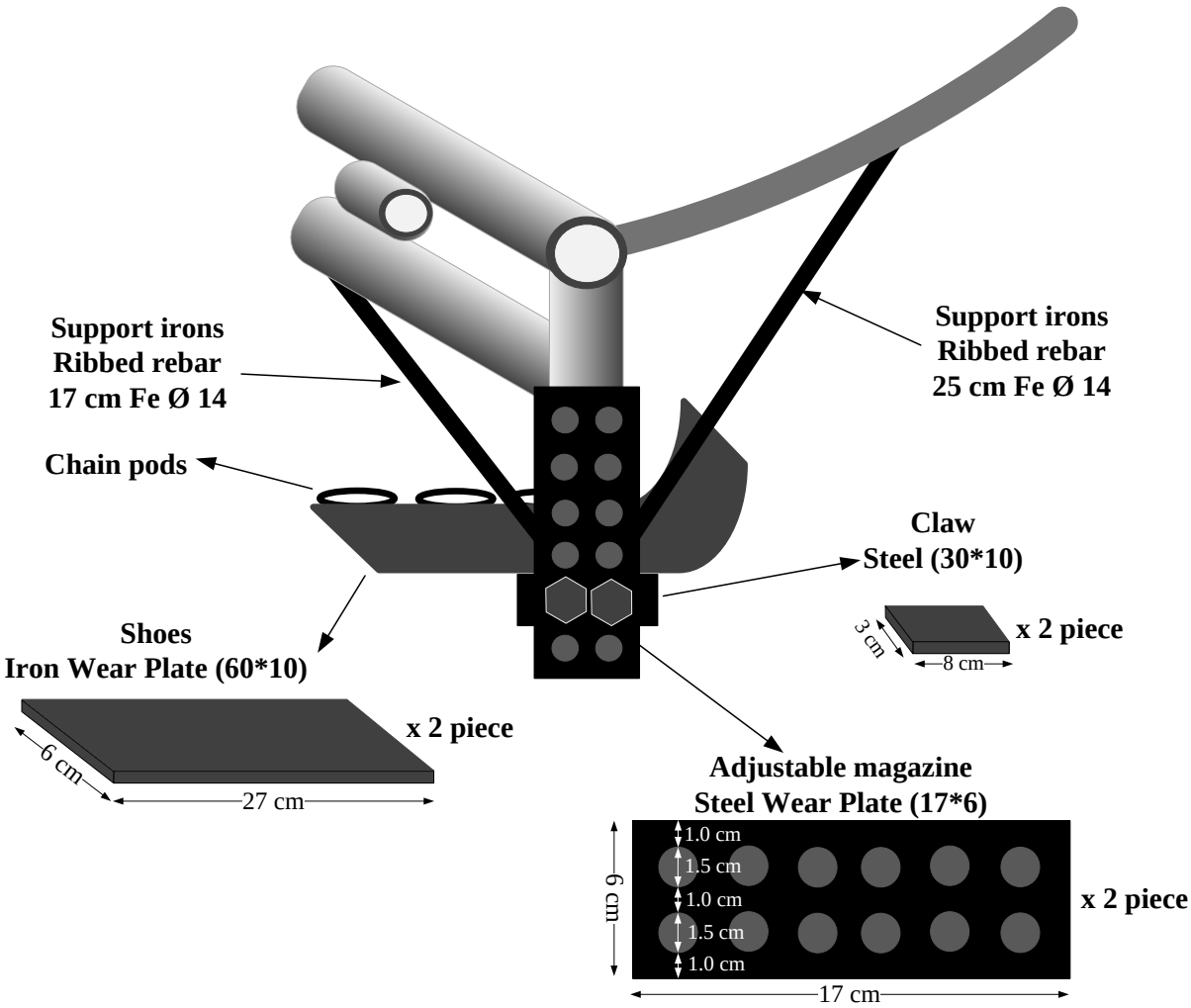
Front view



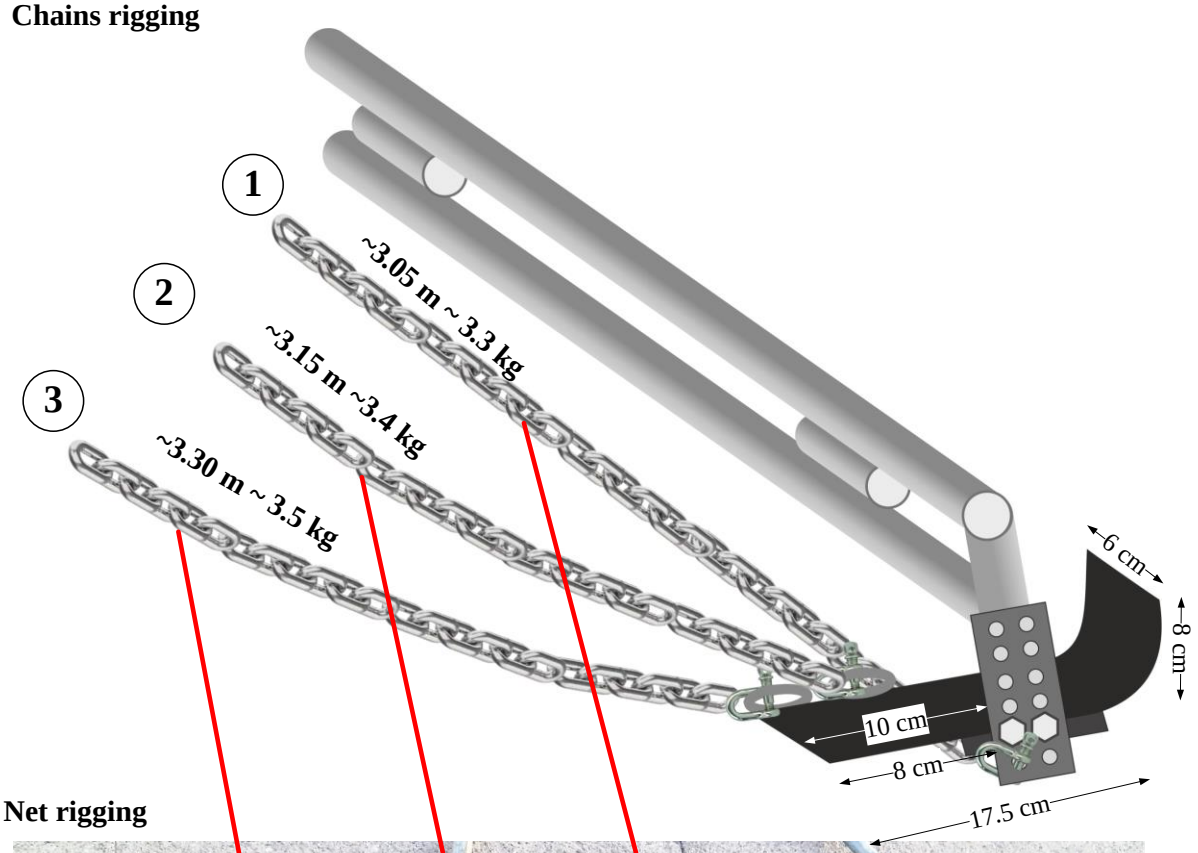
Side view




A
3.00 GALV Ø 42
3.00 PP Ø 5-6
3
2
1
D
The protecting net (40*10 mesh) is rigged approximately 1 mesh to 2 mesh.
C
3.05 CHAIN 3.3 kg
3.15 CHAIN 3.4 kg
3.30 CHAIN 3.5 kg
B
This Net (75*65 meshes) is folded to create upper and lower panel and side of the net are rigged mesh to mesh.


Support irons
Ribbed rebar
17 cm Fe Ø 14
Support irons
Ribbed rebar
25 cm Fe Ø 14
Chain pods
Claw
Steel (30*10)
3 cm
8 cm
x 2 piece
Shoes
Iron Wear Plate (60*10)
6 cm
27 cm
x 2 piece
Adjustable magazine
Steel Wear Plate (17*6)
1.0 cm
1.5 cm
1.0 cm
1.5 cm
1.0 cm
6 cm
17 cm
x 2 piece

Chains rigging



Net rigging

Rapa whelk beam trawl warp length (m) and towing speed (knot) according to most common working depths (5-30 m) and various ground characteristics (sandy, muddy and gravel).

Depth (m)	Warp length (m)	Towing speed (knot)
5	70-90	3
10	90-110	3
20	140	2.5
30	185	2
40	230	2
50	275	2

3. Rigging, warp diameter and length

In the implementation of the survey, a single BT should be used. The gear should be trawled from the aft of the vessel. The warp length should be 4 times the station depth. Adaptations can be made by the skipper to assure that the gear fishes well and is in good contact with the bottom. The chief scientist decides, in accordance with the skipper, when the circumstances are no longer appropriate to deliver valid hauls. The BT should be equipped with DST Logic Temperature and Depth Recorders.

4. Survey design

To reduce the variance of the estimated biomass and abundance indices, a depth-stratified sampling design should be adopted as distribution of rapa whelk is controlled by the depth. Therefore, the following depth strata should be adopted:

- 5 - 15 m
- 15 - 25 m
- 25 - 35 m

At least 45 stations should be visited in each country, except in Turkey; where the number of stations should be tripled to cover the Western, Central, and Eastern parts of the coast.

It is recommended that 90% of the stations are distributed evenly throughout the study area within the identified bathymetric stratum, prior to the first cruise assuring that each stratum is proportionally represented. The remaining stations are advised to be placed around the stations where rapa whelk exhibit high density, taking the results of the work being carried out into account. It is also recommended to avoid officially designated sensitive habitats and military zones in the selection of the sampling stations. It is advisable to control the bottom condition to understand if the area is suitable for trawling or gathering information from local fishermen. To avoid covariance between fishing stations in the adjacent strata, stations should be separated by at least 5-10 miles (ICES, 2010). Before the survey, the surface area and the number of fishing hauls and for each identified stratum should be identified based on previous experience. Once identified and selected, the same stations should be visited every year.

The area swept needs to be standardized, as the catchability of target species and sizes often depends on the duration of the haul. The haul duration should be 30 minutes. The duration begins when the gear settles on the bottom and ends when the vessel is stopped to retrieve the beam trawl. The duration may be shortened if, for instance, a large quantity of debris is

encountered. If the haul needs to be stopped before the end of the standard duration, it can be considered valid if at least one-third of the time or of the distance has been successfully attained.

The hauls should be performed at a constant depth and should be rectilinear as far as possible. The gear should stay in good contact with the seabed during the entire haul. This can be checked by the depth profile available from the minilog data logger and reported.

The surveys should be conducted annually between August and October. Each country should choose the best sampling days within these periods to carry out the survey. The sampling period of the survey selected by the country should be consistent from one year to another to reduce the "time-of-the-survey" effect on the time series (ICES, 2012).

It is ***recommended*** to conduct haul operations during daylight hours. The daylight period is defined as the time between 30 minutes after sunrise and 30 minutes before sunset.

5. Treatment of catches

Once the haul is completed and after the catch is secured on the deck, all finfish species, rays, sharks, and commercially important crustaceans and bivalves should be sorted, counted and measured to the 0.5 cm below (B). For fish (bony fish and Elasmobranches) the length is the overall length, the tail being extended following its longer dimension. The measurement unit is the lower millimetre. For Crustaceans, the length is measured in terms of cephalo-thoracic length at the lower millimetre. For commercially important bivalves, the shell length at the lowest millimetre is recorded.

The weight of the remaining catch should be measured and recorded (A). When the quantity of the catch is too high, it is usually difficult to weigh the total weight of rapa whelk on board of a commercial vessel. In such cases, the catch should be placed in boxes (or buckets), the number of boxes (or buckets) should be counted, the total weight of a single box/bucket should be taken as precisely as possible and then, the total catch should be estimated accordingly.

If the total catch is too large to be measured (more than 10 kg) subsampling may be considered. In this case, at least 10 kg of rapa whelk should randomly be subsampled from the main catch. The subsample should not contain less than 100 individuals. The size of the individuals should be measured to the nearest 0.5 cm length class below and the individuals in each length class should be groups in different containers (Figure 3).

Figure 3. Sorting the rapa whelk into length classes

Once the length of all individuals in the subsample is measured, the number of individuals in the contained should be counted and recorded in the data record sheets (N1). The total weight of the Rapa whelk in each container should be weigh and recorded in the data recording sheet as well (BW). Also, the weight of the remnants (debris) should also be weighed and recorded (D').

A total of at least 20 individuals should be selected from the containers carrying the individuals separated into length classes for age determination. Care should be paid to equal representation of the length classes in the selection of the individual. The selected individuals should be cleaned using a wire brush to remove the material covering the shell surface, and so that to improve the visibility of the spawning marks. The ages of these individuals should be determined following the protocol modified by Hulak. The shell length and shell width of each specimen selected for age reading should be measured to the nearest 1 mm. Shell length should be measured from the apex to the end of the siphonal canal.

Given that the shells of Rapa whelk is usually covered with epibionts (such as algae, Polychaeta tubes, tunicates, capsules, etc), the total weight measured would likely be overestimated. In order to account for this bias, the epibiont biomass on the rapa shells should be estimated in every habitat type encountered during the survey. For that, the following procedure should be followed for each habitat type or when differences in the types of epibionts and or in their quantity is recognized. The epibiont biomass should be estimated at least in 3 stations during the survey.

Epibiont biomass estimation: At least 10 individuals should randomly be selected from each container and their brut (uncleaned) weight should be recorded (BW'). As there may be less than 10 individuals in some length classes, number of individuals selected from epibiont biomass estimation should also be recorded (N1'). After cleaning of the epibionts, the net (cleaned) weight of the individuals should be recorded (NW'). As the rate of infestation by epibionts varies with size, the estimation of epibiont biomass should account for the size

composition. The EXCEL sheet should be considered for the estimation of weight, abundance and length composition of the haul.

5. 2. Analyses of marine litter

Sort, count and weight of marine litter items should be carried out directly onboard on fresh material. A photo of litter should be systematically taken at each station.

5. 3. Other parameters

During a single trawl, depth-temperature throughout the tow should be recorded and monitored. A wide range of instruments can be used to measure temperature and salinity.

6. Data reporting and exchange format

Standard formats are defined for the storage and exchange of data produced by beam trawl surveys. Once collected, the basic information on hauls, catch and biological data should be reported using the templates found in **Annex 1.1.**

7. Data policy

Data emanating from national surveys should remain the property of the country executing the survey, and data and information transmitted by countries should be treated by the GFCM secretariat in accordance with all necessary measures to comply with GFCM security and confidentiality provisions.

Each country will be responsible for the quality and completeness of the data. Collected data should be submitted by countries every year following the DCRF provisions (GFCM, 2018a).

Through its secretariat, GFCM will define and maintain high levels of protection for the data transmitted by countries complying with GFCM data submission requirements, as endorsed by the Commission. Data put at the disposal of dedicated expert groups will be treated in the same manner as data used by WGSAs: all participants should have access to the data needed to address the objectives of the meeting. The use of shared data outside the framework of GFCM or for purposes other than the objectives agreed should follow the existing GFCM data confidentiality rules.

Annex 1.1.

Beam trawl haul information

Main characteristics of each haul

Appendix 1.1.1 – Beam trawl hauls information											
Country			**Survey**								
GSA			**Year**								
Gear											
HAULS Number	**HAULS Identification CODE**	**DATE**	**Coordinates**				**DEPTH (m)**		**TIME**		**Av. SPEED**
			START		**END**						
			Latitude	**Longitude**	**Latitude**	**Longitude**	**START**	**END**	**start**	**end**	**(knots)**

Instructions

- Survey: insert the name of the survey.
- GSA: insert the code of the Geographical subarea (GSA)
- GEAR: insert the type of the gear (e.g. bottom trawl, pelagic trawl, etc.) and the main characteristics including the mesh size of the code-end.
- HAULS Number: identification number which shall be assigned to each fishing haul (e.g. progressive numbers from 1 to 30). Fishing hauls are made in the same position from year to year, the same number should be associated with a fishing haul every year.
- HAULS Identification CODE: identification code which shall be assigned yearly to each fishing haul (unique).
- Coordinates: Latitude (start and end) - insert the latitude at the beginning and at the end of each fishing haul. Data should be inserted in degree, minutes and seconds (e.g. 40°51'59"N). Longitude (start and end) - insert the longitude at the beginning and at the end of each fishing haul. Data should be inserted in degree, minutes and seconds (e.g. 124°4'58"W).
- DEPTH (m): insert the depth in metres, at the beginning and at the end, of each fishing haul.
- TIME: insert the time, at the beginning and at the end, of each fishing haul.
- Av. SPEED: insert the average speed maintained during the fishing haul.

Oceanographic characteristics (when available) of each fishing haul

Appendix 1.1.2 - Oceanographic data											
Country			**Survey**								
GSA			**Year**								
HAULS Number	**HAULS Identification CODE**	**DATE**	**Sea Surface**				**Sea Bottom**				**Comments**
			Temperature	**Salinity**	**Other parameters**		**Temperature**	**Salinity**	**Other parameters**		

Instructions

- Survey: insert the name of the survey.
- GSA: insert the code of the Geographical subarea (GSA)
- HAULS Number: insert the identification number which has been assigned to each fishing haul (as in Annex 1.1.1).
- HAULS Identification CODE: insert the identification code which has been assigned to each fishing haul (as in Annex 1.1.1).
- Temperature: Insert an average value of the sea temperature (both recorded on the sea surface and on the bottom) in °C with two decimals; NA if not available.
- Salinity: Insert an average value of the salinity (both recorded at the sea surface and on the bottom) in part per thousand ‰; NA if not available.

Catch composition by fishing haul

Appendix 1.1.3 - Catch composition by haul				
Survey				
Country			**GSA**	
HAUL Identification CODE			**Date**	
Species	**Subsample (y/n)**	**Multiplied by**	**Number**	**Weight (kg)**

Instructions

- Survey: insert the name of the survey.
- GSA: insert the code of the Geographical subarea (GSA).
- HAUL Identification CODE: insert the identification code which has been assigned to the identified fishing haul (as in Annex 1.1.1).
- Species: insert the scientific name for all the species present in the catch composition.
- Subsample (y/n): for each species caught during the same fishing haul, indicate "Yes" if data (on weight and number) have been collected for a subsample, otherwise, indicate "No".
- Multiplied by: indicate the number for which should be multiplied the subsample.
- Number: insert the total number of individuals present in the catch (or in the subsample) for the identified species
- Weight (kg): insert the total weight (in kilos) of the individuals present in the catch (or in the subsample) for the identified species.

				Annex 1.1.4 - Length data for rapa whelk				
Survey								
Country				**GSA**				
HAUL Identification CODE				**Date**				
A: Total catch (all included)		**Length class**	**Range**	**N1: frequency**	**BW1: Brut weight**	**N1': N cleaned**	**Brut weight**	**NW: Net weight**
BC: Total weight of bycatch in the catch		1.0	1.000 - 1.499					
D' : Debris in the subsample		1.5	1.500 - 1.999					
		2.0	2.000 - 2.499					
		2.5	2.500 - 2.999					
		3.0	3.000 - 3.499					
		3.5	3.500 - 3.999					
		4.0	4.000 - 4.499					
		4.5	4.500 - 4.999					
		5.0	5.000 - 5499					
		5.5	5.500 - 5.999					
		6.0	6.000 - 6.499					
		6.5	6.500 - 6.999					
		7.0	7.000 - 7.499					
		7.5	7.500 - 7.999					
		8.0	8.000 - 8.499					
		8.5	8.500 - 8.999					
		9.0	9.000 - 9.499					
		9.5	9.500 - 9.999					
		10.0	10.000 - 10.499					
		10.5	10.500 – 10.999					
		11.0	11.000 – 11.499					
		11.5	11.500 – 11.999					
		12.0	12.000 – 12.499					
		12.5	12.500 – 12.999					
		13.0	13.000 – 13.499					
		13.5	13.500 – 13.999					
		14.0	14.000 – 14.499					
		14.5	14.500- 14.999					

Length data by fishing haul

Entry sheet: length data for fish and elasmobranchs

Appendix 1.1.5 - Length data ***(rapa whelk, fish, and elasmobranchs)***							
Survey							
Country			**GSA**				
HAUL Identification CODE			**Date**				
TL (cm)	**Species**			TL (cm)	**Species**		
0				0			
0.5				0.5			
1				1			
1.5				1.5			
2				2			
2.5				2.5			
3				3			
3.5				3.5			
4				4			
4.5				4.5			
5				5			
5.5				5.5			
6				6			
6.5				6.5			
7				7			
7.5				7.5			
8				8			

8.5				8.5			
9				9			
9.5				9.5			
0				0			
0.5				0.5			
1				1			
1.5				1.5			
2				2			
2.5				2.5			
3				3			
3.5				3.5			
4				4			
4.5				4.5			
5				5			
5.5				5.5			
6				6			
6.5				6.5			
7				7			
7.5				7.5			
8				8			
8.5				8.5			
9				9			
9.5				9.5			
0				0			
0.5				0.5			
1				1			
1.5				1.5			
2				2			
2.5				2.5			
3				3			
3.5				3.5			

4				4			
4.5				4.5			
5				5			
5.5				5.5			
6				6			
6.5				6.5			
7				7			
7.5				7.5			
8				8			
8.5				8.5			
9				9			
9.5				9.5			
0				0			

✓ This template should be duplicated for the different species caught during the same fishing haul and for which length data (in centimetres) should be collected.

Instructions

- Survey: insert the name of the survey.
- GSA: insert the code of the Geographical subarea (GSA).
- HAUL Identification CODE: insert the identification code which has been assigned to the identified fishing haul (as in Annex 1.1.1).
- Species: insert the scientific name of the identified species.

Annex 1.1.6 - Age data					
Survey					
Country			**GSA**		
HAUL Identification CODE			**Date**		
Species					
Total weight in the catch			**Weight of the sample**		
No	**Shell length (mm)**	**Shell width (mm)**	**Age**	**Sex**	**Remark**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Instructions

- Survey: insert the name of the survey.
- GSA: insert the code of the Geographical subarea (GSA 29).
- HAUL Identification CODE: insert the identification code which has been assigned to the identified fishing haul (as in Annex 1.1.1).
- Species: insert the scientific name of the identified species.
- Length: for each identified specimen insert the shell length and width (in mm),
- Sex: if available, insert the sex of the identified specimen (M=male; F=female; U=undetermined; ND=not determined)

Data on marine macrobenthos

Appendix 1.1.7 - Data on macrobenthos					
Country					
GSA					
Survey					
Date					
Haul identification code					
Total quantity of macroinvertebrates (estimation in kg)					
% of macroinvertebrates in the total catch					
	Total live weight (kg)		**Percentage (%)**		**Notes**
Sponges in the catch*					
Corals in the catch*					
Other benthic species in the catch*					
	Feature*		**Habitat***		**Taxa***
VME Indicator*					
Composition by species*					
Species*	**Family/Genus/Order/Taxa/ Morphological group**	**Total weight (kg)**	**Total number**	**Photo* (Y/N)**	**Notes**

* If available.

Instruction

- Survey: insert the name of the survey. GSA: insert the code of the Geographical subarea (GSA).
- HAUL Identification CODE: insert the identification code which has been assigned to the identified fishing haul (as in Annex 1.1.1).
- Total quantity of macroinvertebrates (estimation in kg): Total weight (or an estimate) of macroinvertebrates (macrobenthos) in kilograms taken during the same fishing haul.
- Percentage of macroinvertebrates in the total catch (%): total macroinvertebrates fraction (in percentage) cumulated during the same fishing haul.
- Composition by species: Whenever possible, insert the name of the macrobenthic species. When the specimens cannot be identified at the species level, the genus, family, order or taxa should be indicated. In cases where species identification is not possible (especially for sessile taxa), assignment of organisms to morphological groups according to their growth form (e.g. massive, tubular, globular, arborescent, stalked, fan-shaped, lollipop-shaped, cup-shaped) combined with information about their color, consistency (e.g. hard/soft) and photographic documentation.
- Total weight (kg): Insert the total weight in kilograms (or an estimate) for each identified species of benthic marine macroinvertebrates caught during the same fishing haul.
- Total number: Insert the total number (or an estimate) for each identified species of benthic marine macroinvertebrates caught during the same fishing haul.
- Photo(Y/N): insert “Yes” or “No” if a photo of the specimen has been taken and, if “Yes”, assign an identification code to the photo.

Appendix 2

AGENDA

1. **Opening and arrangements of the meeting**

   Welcome addresses and introduction of participants
   Adoption of the agenda

2. **General overview of objectives and expected outcomes**

3. **Presentations by countries with regards to the landing site sampling strategies applied**

Bulgaria
Romania
Turkey
Ukraine

4. **Identification of similarities and differences in the sampling strategies**

5. **Presentation on standardization**

6. **Identification of possible sources of bias in the data**

7. **Drafting the standard sampling protocol**

8. **Presentation of GFCM's Technical guidelines for Scientific Surveys in the Mediterranean and Black Sea (Beam Trawl Surveys: Guidelines and Methodologies)**

9. **Discussion on**

   - Vessel characteristics
   - Sampling gear
   - Survey design
   - Survey area
   - Depth strata and sampling stations
   - Survey period and timing of fishing operations
   - Treatment of catches
   - Biological parameters

    - Length measurements
    - Sex and maturity
    - Age, weight at individual level
    - Analyses of epibenthos, benthos, debris and marine litter
    - Other parameters
- Data reporting and exchange format

10. **Drafting the rapa whelk survey protocol**

Appendix 3

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Appendix 4

Workshop on harmonization of data collection at the landing sites and in the scientific surveys at sea participants