

DYNAMICS OF ROMANIAN COMMERCIAL FISHING IN THE BLACK SEA (2008 – 2021)

D.C. Ibănescu^{1*}, A. Popescu¹, I. Vasilean¹

¹"Dunarea de Jos" University of Galati, Galati - Romania

Abstract

Fishing makes a fundamental contribution to food, services, leisure, commerce and of course the economic well-being of the population, whether it is for present or future generations, and must be managed in a responsible manner.

The purpose of this paper is to present the quantitative and qualitative dynamics of the structure of commercial marine catches of Romania in the period 2008 - 2021. Also, an analysis was carried out regarding the volume of catches made against the total allowable catches (TAC), established by annual orders. The raw data presented in this paper are obtained from the official website of the National Agency for Fisheries and Aquaculture.

Until 2017, the catches in the Black Sea had an upward evolution, after which they had a downward trend.

*The dominant species in catches is the rapana snail (*Rapana venosa*) (90.78%), followed by sprat (*Sprattus sprattus*) (2%), mussels (*Mytilus* sp) (1.8%), anchovy (*Engraulis encrasicolus*) (1.38%).*

Key words: *catch, dynamics, commercial fishing, Black Sea*

INTRODUCTION

The Black Sea is one of the most isolated inland seas in the world. It is considered a young sea, which began to acquire the properties of a brackish sea about 7000 years ago.

A key sector for the Black Sea economy is fisheries, which generates an annual revenue of USD 350 million, with more than 350 tonnes fished every year. The Black Sea fishery resources have been shared by Bulgaria, Georgia, Romania, Russia Federation, Ukraine and Turkey (Duzgunes et. al., 2008).

Following the entry of Romania and Bulgaria into the European Union, the Black Sea has reached the area of interest of the EU.

Thus, the Black Sea became the sovereign responsibility of the EU Common Fisheries Policy and the GFCM (General Fisheries Commission for the Mediterranean).

The management of fisheries resources under the Common Fisheries Policy (CFP) is based on the need to ensure the sustainable exploitation of marine biological resources from an environmental perspective, as well as the long-term viability of the sector. In order to achieve this objective, the European Union has adopted legislation on access to Union waters, allocation and use of resources, total allowable catches, fishing effort limitations and technical measures.

Fishing on the Romanian coast of the Black Sea has experienced a winding evolution over time, in close connection with the supply of living resources of the marine ecosystem, with the evolution of exploitation technologies, but also with the evolution of the socio - economic system in the sector. Romanian marine fishing is carried out along the coastline, being limited to the marine area located up to the 60 - 70 m isobath. It is carried out with ships and boats that make up the Romanian fishing fleet. Starting from 2007, the fishing fleet of Romania is an integral part of the Community fishing fleet and is subject to European legal regulations regarding the conservation and sustainable

*Corresponding author: dgheorghe@ugal.ro

The manuscript was received: 31.10.2022

Accepted for publication: 12.01.2023

exploitation of fishing resources in accordance with the Common Policy in the field of Fisheries. By Regulation (EC) no. 2371/2002, as of December 31, 2002, the total capacity of the Community fleet was "frozen" in order to maintain a stable balance between fishing capacity and available aquatic resources. Detailed fisheries catch statistics are required for effective management of marine resources (Pauly, 2013).

MATERIAL AND METHOD

This paper is based on data collected by the National Fisheries and Aquaculture Agency between 2008 and 2021 from commercial fishermen through the landing declaration. The data on the total allowable catch (TAC), fishing effort were extracted from the annual orders regarding the approval of measures to regulate fishing effort and fishing quotas. (Annual orders regulating fishing effort and fishing quotas 20100-2021).

RESULTS AND DISCUSSIONS

In the period from 2008 to 2021 in the Black Sea, the total catch declared by commercial fishermen was 49889.92 t. The situation of catches in this period records variations between a minimum of 230.9 t in 2010 and a maximum of 9553.2 t in 2017 (figure 1) after which the trend was downward.

The qualitative structure of commercial catches consists of 18 species to which a category called "other species" is added. From a quantitative point of view, the dominant species in catches is the gastropod (snail) *Rapana venosa* which has registered a significant increase in recent years. During the studied period, its share in catches was 90.78%. Along with this, the catch situation, in order of percentage, is as follows (table 1): sprat (2%), mussels (*Mytilus* sp., 1.8%), european anchovy (1.38%), turbot (1.35%), pontic shad (0.597%), atlantic horse mackerel (0.585%), guvids (0.362%).

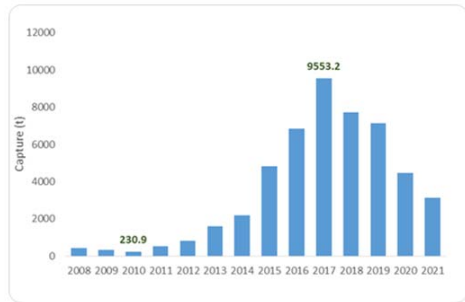


Figure 1 Annual dynamics of marine catches in the period 2008 - 2021

The reported rapana catches recorded values between a minimum of 0.1 t in 2010 and a maximum of 9244.25 t in 2017 when its share in the annual catch reached 96.76%

The sprat is the second species that holds the share in the catches (2%). Its annual variation ranged from a high of 234 t (2008) to a low of 4.97 t (2020).

Mussels (*Mytilus* sp.) have a percentage of 1.8% of the reported catches, observing an increasing trend of them in the catches. Thus, if in 2008 a quantity of 0.3 t was caught (representing the minimum catch), in 2018 a maximum catch of 230.57 t was recorded. In the next three years, a slight decrease in the amount of mussels caught is observed.

European anchovy, an economically important species, was caught during the study period in small quantities (minimum 1.2 t in 2014 and maximum 111.9 t in 2015).

The turbot is one of the most valuable marine species. Reported commercial catches follow allowable exploitation quotas (fixed by the EU) of 43.2 t (2011 – 2017) which has increased to 57 t (2018 and 2019) and 75 t (2020 and 2021).

The other catches from the Black Sea are represented by specific species (pontic shad, atlantic horse mackerel, *Gobies* species, etc.) which have a small share in the total annual catch (below 1%). The dynamics of the main fish species from marine catches in the period 2008 – 2021 are presented in figure 2.

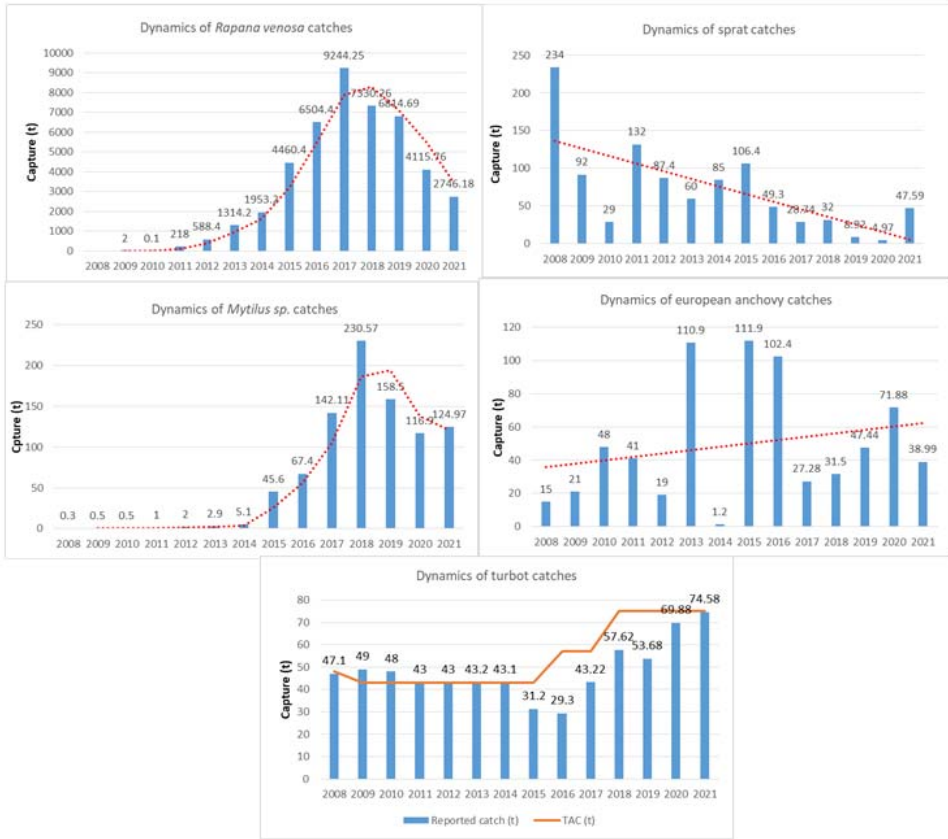


Figure 2 The dynamics of the main species in commercial catches

Analyzing the total allowable catches regulated by annual orders for the main species (the allocated TACs) and the declared

catches in the period 2010 - 2021, the ratio between them was calculated. The situation is presented (table 1) as follows:

Table 1 The situation of catches in the Black Sea (2008 – 2021)

Year		European sprat	Whiting	Gobies species	Turbot	Picked dogfish	<i>Rapana venosa</i>	<i>Mytilus sp.</i>
2010	Allocated quota (TAC's)	10000	500	100	48	50		
	Catch declared	29	10	13	48	3		
	%	0.29	2	13	100	6		
2011	Allocated quota (TAC's)	3442.5	600	100	43.2	50	5700	
	Catch declared	132	0.2	20	43	4	218	
	%	3.83	0.033	20	99.54	8	3.82	
2012	Allocated quota (TAC's)	3442.5	600	60	43.2	50	5700	
	Catch declared	87.4	0.4	16.5	43	2.1	588.4	
	%	2.54	0.066	27.5	99.537	4.2	10.32	
2013	Allocated quota (TAC's)	3442.5	600	60	43.2	50	5700	
	Catch declared	60	1.1	9.8	43.2	3.1	1314.2	
	%	1.74	0.183	16.33	100	6.2	23.06	

2014	Allocated quota (TAC's)	3442.5	500	30	43.2	max 30	5000	
	Catch declared	85	0.3	13	43.1	2	1953.2	
	%	2.47	0.06	43.33	99.77	6.67	39.064	
2015	Allocated quota (TAC's)	3442.5	500	30	43.2	max 30	4000	
	Catch declared	106.4	0.2	22.1	31.2	13.2	4460.4	
	%	3.09	0.04	73.67	72.22	44	111.51	
2016	Allocated quota (TAC's)	3442.5	500	30	43.2	max 30	5000	
	Catch declared	49.3		18.9	29.3	2.6	6504.4	
	%	1.43		63	67.82	8.67	130.09	
2017	Allocated quota (TAC's)	3442.5	500	30	43.2	max 13.2	8000	
	Catch declared	28.74	0.17	9.41	43.22	2	9244.25	
	%	0.83	0.034	31.37	100.04	15.15	115.55	
2018	Allocated quota (TAC's)	3442.5	500	30	57	max 13.5	10000	300
	Catch declared	32		4.99	57.62	0.51	7330.26	230.57
	%	0.93		16.63	101.08	0.037	73.3026	76.85
2019	Allocated quota (TAC's)	3442.5	500	30	57	max 13.5	10000	330
	Catch declared	8.95	1.86	8.58	53.68	0.58	6814.69	158.5
	%	0.26	0.372	28.6	94.17	4.29	68.15	48.03
2020	Allocated quota (TAC's)	3442.5	500	30	75	max 13.5	10000	330
	Catch declared	4.97	0.5	10.44	69.88	0.88	4115.76	116.9
	%	0.144	0.1	34.8	93.17	6.52	41.16	35.42
2021	Allocated quota (TAC's)	3442.5	500	30	75	max 13.5	8000	500
	Catch declared	47.59	2.97	5.97	74.58	0.68	2746.18	124.97
	%	1.38	0.594	19.9	99.44	5.04	34.33	24.994
Min %		0.144	0.033	13	67.82	0.038	3.82	24.994
Max%		3.83	2	73.66	101.08	44	130.088	76.86

% - the share of the catch achieved against the TAC's

The volume of marine catches (by species) made from commercial fishing compared to the maximum limit of the total allowable catch (TAC) established by annual orders of the MADR was between a minimum of 0.033% and a maximum of 130%.

Regarding the share of the declared catches compared to the allocated TACs, the situation for the main species is as follows:

- The european sprat was fished between min 0.144% - max 3.83% of the allocated quota (TACs);
- The whiting was fished between min 0.033% - max 2% of the allocated quota (TACs);
- The Gobies sp. the percentage in which it was fished varied between min 13% and max 73.66% of the allocated quota (TACs);

- The percentage in which turbot was fished varied between min 67.82 and max 101.08% of the allocated quota (TACs);
- The percentage of shark that was fished varied between min 0.038% and max 44% of the allocated quota (TACs);
- The percentage in which rapana was fished varied between min 3.82% and max 130.088% of the allocated quota (TACs);
- The percentage in which mussels (*Mytilus sp*) were fished varied between min 24.994% and max 76.86% of allocated quota (TACs).

CONCLUSIONS

The quantitative dynamics of catches in the Black Sea varied during the study period between a minimum of 230.9 t in 2010 and a maximum of 9553.2 t in 2017. The total value of the declared catch being 49889.92 t.

The qualitative structure of commercial catches consists of 18 species to which a category called "other species" is added.

The species whose multiannual weight in catches is greater than 1% are: *Gobies sp.* (0.362%), atlantic horse mackerel (0.585%), pontic shad (0.597%), turbot (1.35%), european anchovy (1.38%), mussels (*Mytilus sp.*) (1.8%), sprat (2%).

The dominant species in the catches is the gastropod (snail) *Rapana venosa*, which had a share of 90.8% in the multi-year catches. *Rapana* catch registered a significant increase during the study period, a significant increase, with a tendency of excessive exploitation, reaching a maximum of 96.76% of the annual catches in 2017.

The volume of catches made from commercial fishing against the maximum limit of the total allowable catch (TAC's) established by annual orders was, in the period 2010 - 2021, between a minimum of 0.033% of the TAC for cod and a maximum of 130.088% of the TAC for turbot.

It should be noted that the quotas for the main species, regulated annually through TAC's, had a downward trend (shark, *Gobies sp.* and sprat), the only species for which they increased were: turbot (following negotiations with the EU, the quotas were increased for years 2020 – 2022) and rapana (species whose harvesting method is quite destructive for benthic habitats).

ACKNOWLEDGMENT

This work was supported by Center for Scientific Research "Romania Center for Modeling of Recirculating Aquaculture Systems" (MoRAS), from University Dunărea de Jos, of Galați which was established as a result of the implementation of the POSCE project 622/11.03.2014.

REFERENCES

- Duzgunes, E., Erdogan, N. (2008). Fisheries Management in the Black Sea Countries. Turkish Journal of Fisheries and Aquatic Sciences 8, p. 181-192
- Pauly, D. (2013) Fisheries: does catch reflect abundance? Yes, it is a crucial signal, Nature 494 (7437) 303–306.
- Common Order 368/391/2015 on approval of measures to regulate fishing effort and fishing quotas allocated for 2015 by species and zones, <http://www.anpa.ro/wp-content/uploads/file/Legislatie%20Ordine%202015/ORDIN%20COMUN%20TAC%202015%20.pdf>
- Common Order 284/613/2016 approving measures to regulate fishing effort and quotas, <http://www.anpa.ro/wp-content/uploads/file/Legislatie%20Ordine%202016/ordin.comun.284.613.2016.pdf>
- Emergency Ordinance 23/2008 on fisheries and aquaculture (completed and amended by Law 317/2009), <http://www.anpa.ro/wp-content/uploads/2011/05/Legea%203172009.pdf>
- Order no. 19/237 of 27 January 2010 approving the measures to regulate fishing effort and quotas for 2010, http://www.anpa.ro/wp-content/uploads/2011/05/ORDIN%20%20%20Nr.%2019_237%20din%2027%20ianuarie%202010.19_237din27ianuarie2010.pdf
- Order no. 48/2011 on the approval of measures regulating fishing effort and fishing quotas for 2011 by species and zones, <https://lege5.ro/Gratuit/ge2dcnrvgi/ordinul-nr-999-2011-privind-aprobarea-masurilor-de-reglementare-a-efortului-de-pescuit-si-a-cotelor-de-pescuit-pentru-anul-2011-pe-specii-si-zone>
- Order no. 116/2012 on the approval of measures regulating the fishing effort and the fishing quotas allocated for 2012, <https://lege5.ro/Gratuit/gmytmojxe/ordinul-nr-116-2012-privind-aprobarea-masurilor-de-reglementare-a-efortului-de-pescuit-si-a-cotelor-de-pescuit-alocate-pentru-anul-2012>
- Order no. 1.318 / 2013 on the approval of measures regulating the fishing effort and the fishing quotas allocated for 2013, <https://lege5.ro/Gratuit/gm3denjsgi/ordin-nr-1318-2013-privind-aprobarea-masurilor-de-reglementare-a-efortului-de-pescuit-si-cotele-de-pescuit-alocate-pentru-anul-2013>
- Order no. 284/2014 on the approval of measures to regulate fishing effort and the fishing quotas allocated for 2014 by species and zones, <https://lege5.ro/Gratuit/gm4tgojsg4/ordinul-nr-284-2014-privind-aprobarea-masurilor-de-reglementare-a-efortului-de-pescuit-si-cotele-de-pescuit-alocate-pentru-anul-2014-pe-specii-si-zone+>
- Order no. 13/142/2017 approving measures to regulate fishing effort and allocation of fishing quotas for 2017 on species and areas, M.O. nr.141/24 .02.2017 <http://www.anpa.ro/wp->

- content/uploads/file/Legislatie%20/Ordine%202017/13_142_2017%20tac.pdf
12. Order no. 546/352/2018 approving measures to regulate fishing effort and allocation of fishing quotas for 2018 on species and areas, http://www.anpa.ro/wp-content/uploads/file/Legislatie%20/Ordine%202018/ORDIN%20nr_%20546%20din%2028%20martie%202018.pdf
 13. Order no. 243/354/2019 approving measures to regulate fishing effort and quotas allocated for 2019, by species and areas, http://www.anpa.ro/wp-content/uploads/file/ORDIN%20nr_%20243%20-354-2019-TAC.pdf
 14. Order no. 124/1.159/2020 regarding the approval of measures to regulate the fishing effort and the fishing quotas allocated for the year 2020, by species and areas, http://www.anpa.ro/wp-content/uploads/file/ORDIN%20nr_%20124%20din%204%20mai%202020.pdf
 15. Order no. 99/814/2021 regarding the approval of measures to regulate the fishing effort and the fishing quotas allocated for the year 2021, by species and areas, <https://legislatie.just.ro/Public/DetaliiDocument/Afis/242929>
 16. Statistical reports on total catches for commercial fishing 2008 – 2021 - The total catches reported by the authorized economic agents to practice the commercial fishing in the waters under the jurisdiction of Romania, <http://www.anpa.ro/wp-content/uploads/2022/02/pescuit-comercial-ape-interioare.pdf>