Republic of Bulgaria
Executive Agency for Fisheries and Aquacultures

Bulgarian Annual Report on the efforts in 2022 to achieve a sustainable balance between fishing capacity and fishing opportunities

In accordance with Article 22 of the Regulation(EU) 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 of the Council and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC
and following the *Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy (COM/2014/545)*

Burgas, May 2023

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Summary of the report

During the period 2007 – 2022, the Bulgarian fishing fleet has decreased in number of vessels, as well as GT and kW in all segments. The fleet development is shown on **Table 9** and **Figures 5** and **6**. Each entry (or increase the tonnage or the engine power) in the fishing fleet register has been covered by the withdrawal of at least same quantity from the fleet.
The economic condition of the fleet was significantly affected by the temporary suspension of fishing activities due to the war in Ukraine threatening the security of fishing operations. This in turn has resulted in lost revenue, additional unanticipated costs due to market disruptions and supply chain disruptions of fishery products.
Other factors influencing the fleet are: the relatively high average age of fishing vessels, which is about 24 years; imbalance between variable costs and current revenues; low purchasing power of the population; the annual migrations of some of the species of economic importance; lack of a market regulator guaranteeing equal levels of purchase prices to set maximum and minimum values, lack of a sufficient number of fish auctions and first-sale centers near ports.
The inactivity of fishing vessels is mainly due to the war in Ukraine, the effects of the COVID-19 crisis and the resulting lack of markets, as well as repair activities, conversions or pending sales and transfers of ownership and, to a lesser extent, the procurement of new fishing gear. Inactive fishing vessels in 2022 conditionally divided by total length are as follows: LOA 0006 - 251 pcs.; LOA 0612 – 318 pcs.; LOA 1218 – 7 pcs.; LOA 1824 – 3 pc; LOA over 24 m – nil.
With regard to inactive vessels, a step-by-step withdrawal continues in the past year, in accordance with the measures described in national legislation (Article 18c of the LFA Act).

SECTION A

A.1. Description of the Bulgarian fishing fleet

Bulgaria has a coastline of 378 km, a continental shelf of 10,886 km² and an Exclusive Economic Zone in the Black Sea of about 25,699 km². Most of fishing activities are carried out within the territorial waters (up to 12 nautical miles area). At 31 December, 2022, the Bulgarian fishing fleet consists of 1,778 vessels, operating only in Black Sea, with total capacity of GT 5868.07 and 52050.18 kW. The fishing vessels assigned to small-scale fishing with LOA of up to 12 meters, represent 95% or 1,688 vessels. The most of them are using as a preferred gear gillnets (anchored). The average age of the Bulgarian fishing fleet is 24 years. As it is shown in **Table 9** and **Figure 1**(presented below), the number of registered vessels is reduced by 30 % from the date of accession of Bulgaria to the EU (01 January 2007). Active ships in 2022 have increased by 22 units, although the total number of the registered ones has decreased by 36, compared to 2021. There is a significant decrease in days at sea by as much as 24% compared to the reference values from 2021 (**Figure 1**).

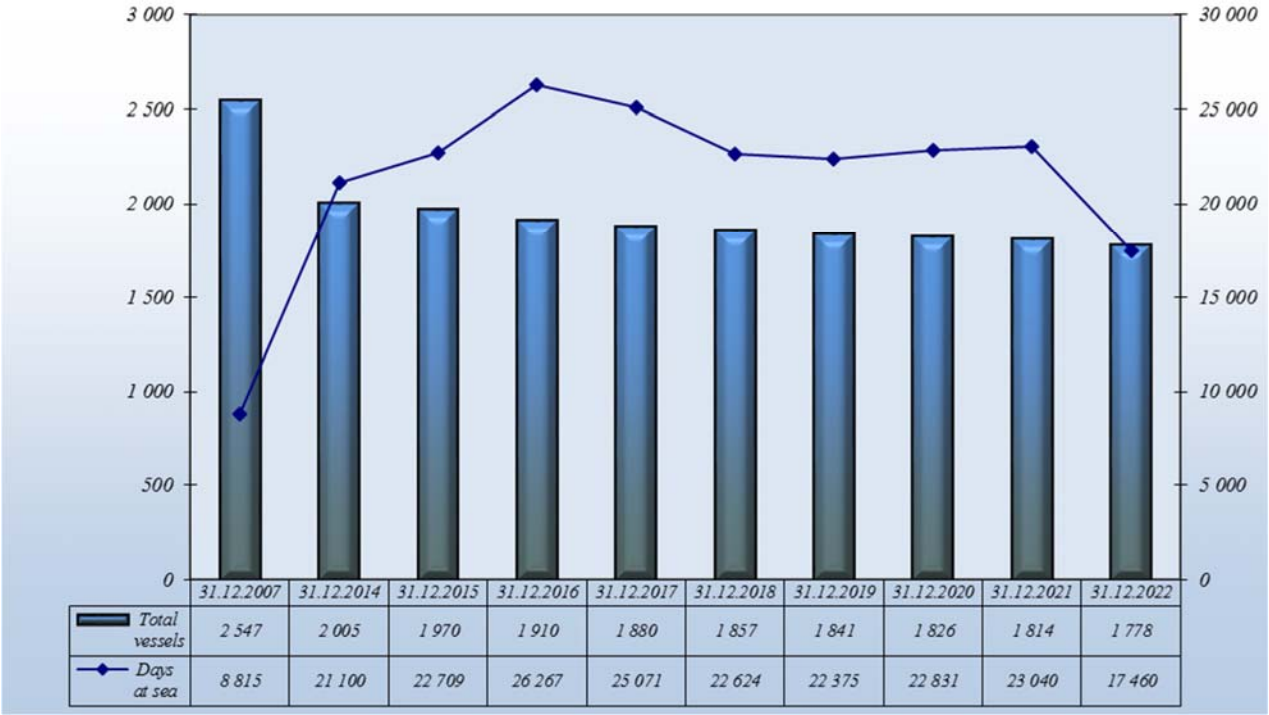

Figure 1. Number of the vessels and days at sea for the period 2007-2022

The active fishing vessels in 2022 are 1,204, with the majority of them, a total of 1,124, falling within the scope of small-scale (mainly coastal) fishing. The percentage of active fishing vessels is 93% for vessels up to 12 m and 7% for vessels over 12 m. The fleet's fishing activity in 2022, expressed in days at sea, totaled 17,460 days, as 66% belong to the fishing vessels featuring up to 12 m in length overall.

Table 1: Fishing activity of the vessels during 2022.

LOA	Number of vessels	GT	kW	Days at sea	Vessels' ratio	Days at sea ratio
LOA 0012	1,124	1,832.86	24,284.04	11,549	93%	66%
LOA 1240	80	2,945.25	15,428.86	5,911	7%	34%
Total	**1,204**	**4,778.11**	**39,712.90**	**17,460**		

"Days at sea", Decision 2010/93/EU.

Segmentation of vessels, doing commercial fishing, by fishing gear in the Black Sea waters, shall be carried out in accordance with Decision 2010/93 / EU. The groups of similar fishing activities and fishing gear, typical for each group, are listed in **Table 2.**

Table 2: Groups similar fishing activities and gear

Fishing Technique	DFN - Drift and/or fixed nets		TM - Pelagic trawlers		HOK-using hooks			FPO- pots and/or traps		PS- Purse seiners		PGP- passive gears	PMP	
Fishing Gear	GNS Gillnets (set)	GND Gillnets (drift)	TBB beam trawlers	OTM pelagic trawlers	LLD Longlines drifting	LLS Longlines (set)	LHP Hand lines	FPO Pots	FPN stat. pound trap nets	PS Purse seine	SB Beach seine	Only passive gears	No prevailing gear	NO-no gear

Table 3: Days at sea by segments for 2018, 2019, 2020, 2021 and 2022.

	2018			2019			2020			2021			2022	
Segment	LOA	Days at Sea	Segment	LOA	Days at Sea	Segment	LOA	Days at Sea	Segment	LOA	Days at Sea	Segment	LOA	Days at Sea
DFN	VL0006	2351	DFN	VL0006	2239	DFN	VL0006	2650	DFN	VL0006	2621	DFN	VL0006	2042
	VL0612	3491		VL0612	3116		VL0612	4551		VL0612	5064		VL0612	3860
	VL1218	200		VL1218	420		VL1218	1543		VL1218	1254		VL1218	737
Total:		6042		VL2440	72		VL1824	458		VL1824	322		VL1824	260
PS	VL0006	202	Total:		5847		VL2440	98		VL2440	75	Total:		6899
	VL0612	31	PS	VL0006	127	Total:		9300	Total:		9336	FPO	VL0006	2
Total:		233		VL0612	35	PS	VL0006	74	FPO	VL0612	525		VL0612	464
FPO	VL0006	2		VL1218	64		VL0612	47	Total:		525	Total:		466
	VL0612	533	Total:		226	Total:		121	HOK	VL0006	43	HOK	VL0006	67
Total:		535	FPO	VL0006	28	FPO	VL0006	28		VL0612	66		VL0612	177
HOK	VL0006	42		VL0612	499		VL0612	690	Total:		109	Total:		244
	VL0612	139	Total:		527	Total:		718	PGP	VL0006	62	PGP	VL0006	24
Total:		181	HOK	VL0006	85	HOK	VL0006	80		VL0612	72		VL0612	38
PGP	VL0006	68		VL0612	249		VL0612	123		VL1218	108	Total:		62
	VL0612	150	Total:		334		VL1218	102	Total:		242	PMP	VL0006	995
	VL1218	34	PGP	VL0006	28	Total:		305	PMP	VL0006	1398		VL0612	3458
Total:		252		VL0612	68	PGP	VL0006	30		VL0612	4290		VL1218	1282
PMP	VL0006	2427	Total:		96		VL0612	38		VL1218	1343		VL1824	215
	VL0612	4710	PMP	VL0006	2021		VL1218	88		VL1824	55	Total:		5950
	VL1218	1517		VL0612	4503	Total:		156	Total:		7086	PS	VL0006	47
	VL1824	534		VL1218	2408	PMP	VL0006	1383	PS	VL0006	84		VL0612	12
	VL2440	99		VL1824	1203		VL0612	4409		VL0612	24	Total:		59
Total:		9287	Total:		10135		VL1218	1484	Total:		108	TBB	VL0612	62
TBB	VL0612	177	TBB	VL0612	179		VL1824	392	TBB	VL0612	64		VL1218	476
	VL1218	464		VL1218	652	Total:		7668		VL1218	151		VL1824	101
	VL1824	199		VL1824	150	TBB	VL1218	98		VL1824	113	Total:		639
Total:		840	Total:		981	Total:		98	Total:		328	TM	VL0612	301
TM	VL0612	79	TM	VL0612	105	TM	VL0612	201	TM	VL0612	248		VL1218	1107
	VL1218	2378		VL1218	1783		VL1218	1768		VL1218	2123		VL1824	524
	VL1824	1084		VL1824	631		VL1824	901		VL1824	1109		VL2440	1209
	VL2440	1713		VL2440	1710		VL2440	1595		VL2440	1826	Total:		3141
Total:		5254	Total:		4229	Total:		4465	Total:		5306	SUM:		17460
SUM:		22624	SUM:		22375	SUM:		22831	SUM:		23040			

Table 3 shows the fishing activity data for fishing vessels for 2018, 2019, 2020, 2021 and 2022, showing that, compared to the data of the previous four years, the activity has dropped significantly. A decline was observed in all segments except beam trawl fishing vessels. Their activity has increased by 95%.

Table 4: Activity of the fishing vessels by segments for 2022.

Segment	Segment	Number of Vessels	GT	kW	Days at Sea	Segment activity	Activity to the Fleet
DFN	VL0006	362	284.38	3736.63	2042	29.60%	11.70%
	VL0612	505	961.03	13623.48	3860	55.95%	22.11%
	VL1218	14	231.42	1821.28	737	10.68%	4.22%
	VL1824	3	104	702.76	260	3.77%	1.49%
	Total	884	1580.83	19884.15	6899		39.51%
FPO	VL0006	1	0.29	0	2	0.43%	0.01%
	VL0612	31	98.24	933.36	464	99.57%	2.66%
	Total	32	98.53	933.36	466		2.67%
HOK	VL0006	17	13.03	216.38	67	27.46%	0.38%
	VL0612	12	17.24	305.24	177	72.54%	1.01%
	Total	29	30.27	521.62	244		1.40%
PGP	VL0006	6	4.11	43.69	24	38.71%	0.14%
	VL0612	7	16.19	206.66	38	61.29%	0.22%
	Total	13	20.3	250.35	62		0.36%
PMP	VL0006	54	44.78	531.6	995	16.72%	5.70%
	VL0612	110	284.46	3761.84	3458	58.12%	19.81%
	VL1218	16	303.83	2350.45	1282	21.55%	7.34%
	VL1824	2	65	418.91	215	3.61%	1.23%
	Total	182	698.07	7062.8	5950		34.08%
PS	VL0006	8	4.56	23.83	47	79.66%	0.27%
	VL0612	2	1.85	13.61	12	20.34%	0.07%
	Total	10	6.41	37.44	59		0.34%
TBB	VL0612	2	19.62	88.26	62	9.70%	0.36%
	VL1218	6	120.8	922.8	476	74.49%	2.73%
	VL1824	2	78	488	101	15.81%	0.58%
	Total	10	218.42	1499.06	639		3.66%
TM	VL0612	7	83.08	799.46	301	9.58%	1.72%
	VL1218	18	408.78	3247.4	1107	35.24%	6.34%
	VL1824	8	440.74	2188.36	524	16.68%	3.00%
	VL2440	11	1192.68	3288.9	1209	38.49%	6.92%
	Total	44	2125.28	9524.12	3141		17.99%
SUM		1204	4778.11	39712.9	17460		

Table 4 shows the number of fishing vessels for each segment, as well as the data on their activity against the segment and on the total activity for the year. For 2022, the activity was highest in segments DFN - 39.51%, PMP - 34.08% and TM - 17.99%. The two largest segments are DFN - 884 fishing vessels and PMP - 182 fishing vessels, representing 89% of the entire fleet.

Coastal fishing with fishing vessels with a total length of up to 12 meters (VL 0012) has the most representatives in the DFN and PMP segments, the most active being DFN VL 0612 with 33.42% and PMP VL 0006 with 29.94% compared to the total small-scale fishing activity for 2022 - **Table 5** and **Figure 2**.

Table 5: Fishing in **s**egment VL 0012 for 2022

Segment		LOA	Number of Vessels	%	GT	kW	Dyas at Sea	
LOA 0012	DFN	VL0006	362	32%	284.38	3736.63	2042	17.68%
		VL0612	505	45%	961.03	13623.48	3860	33.42%
	FPO	VL0006	1	0%	0.29	0	2	0.02%
		VL0612	31	3%	98.24	933.36	464	4.02%
	HOK	VL0612	17	2%	13.03	216.38	67	0.58%
		VL0006	12	1%	17.24	305.24	177	1.53%
	PGP	VL0612	6	1%	4.11	43.69	24	0.21%
		VL0006	7	1%	16.19	206.66	38	0.33%
	PMP	VL0612	54	5%	44.78	531.6	995	8.62%
		VL0006	110	10%	284.46	3761.84	3458	29.94%
	PS	VL0612	8	1%	4.56	23.83	47	0.41%
		VL0006	2	0%	1.85	13.61	12	0.10%
	TBB	VL0612	2	0%	19.62	88.26	62	0.54%
	TM	VL0612	7	1%	83.08	799.46	301	2.61%
		Total	1124		1832.86	24284.04	11549	

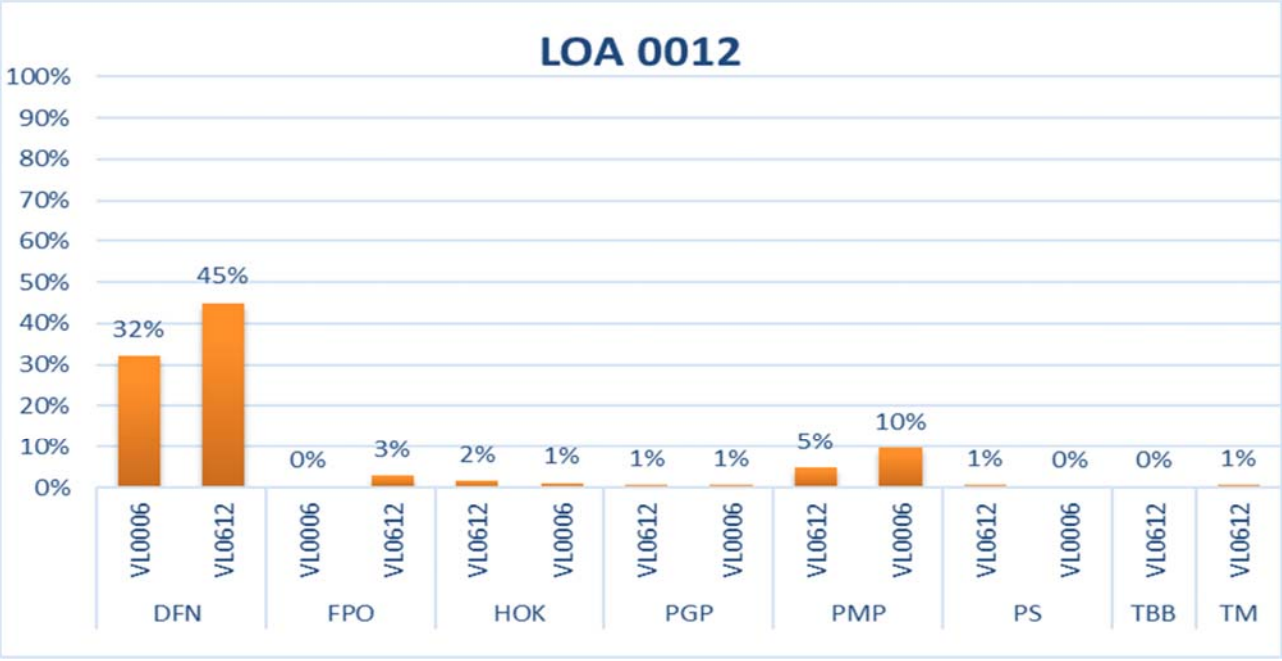

Figure 2: Percentage distribution of the fishing vessels VL 0012

In terms of fishing vessels with a total length of VL 1240, the most numerous is the TM segment - 37 fishing vessels. The most active ones are PMP VL 1218 with 21.69%, TM VL 2440 with 20.45% and TM VL 1218 with 18.73%. See **Table 6** and **Figure 3**.

Table 6: Fishing vessels having LOA VL 1240

Segment		LOA	Number of Vessels	%	GT	kW	Days at Sea	
LOA 1240	DFN	VL1218	14	18%	231.42	1821.28	737	12.47%
		VL1824	3	4%	104	702.76	260	4.40%
	PMP	VL1218	16	20%	303.83	2350.45	1282	21.69%
		VL1824	2	3%	65	418.91	215	3.64%
	TBB	VL1218	6	8%	120.8	922.8	476	8.05%
		VL1824	2	3%	78	488	101	1.71%
	TM	VL1218	18	23%	408.78	3247.4	1107	18.73%
		VL1824	8	10%	440.74	2188.36	524	8.86%
		VL2440	11	14%	1192.68	3288.9	1209	20.45%
		Total	80		2945.25	15428.86	5911	

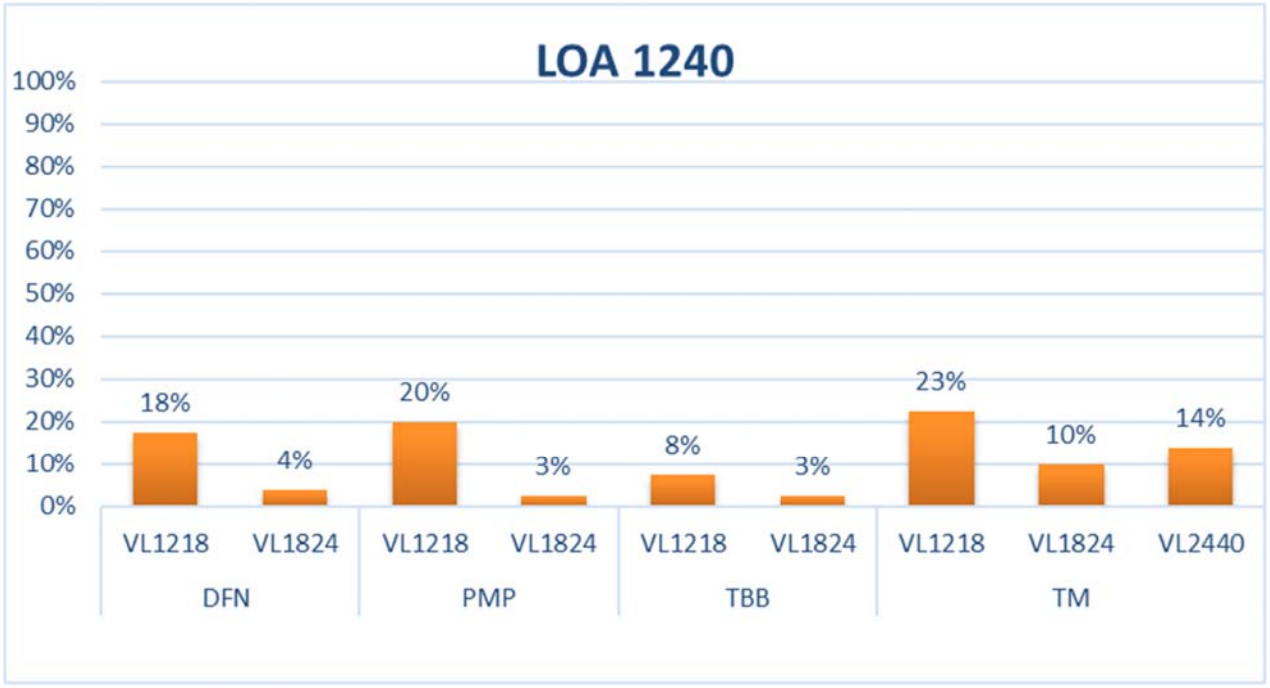

Figure 3: Percentage distribution of the fishing vessels VL 1240

A. 2. Relation to fisheries

In the analysis of the fishing activities of the Bulgarian fishing fleet, it has to be taken into account the ecological characteristics of the Black Sea as a closed sea basin, other than other marine basins in terms of natural environment, with less salinity and over 90% of its deeper water volume, consisting of anoxic water affecting biodiversity in the Black Sea. The Black Sea is a relatively closed water basin, connected to the Medireranean Sea through the Turkish Straits. For this reason, and due to the presence of some of the great rivers in Europe, flowing into its waters, the salinity of the Black Sea is much lower than that of the World Ocean, which affects the distribution of a number of species that do not tolerate low salinity. It should also be borne in mind that, due to the high concentration of hydrogen sulphide at depths exceeding 200 meters, which in addition to biodiversity also has a significant impact on fishing activities, as in practice it severely restricts fishing fleets' hunting grounds.
The most targeted species in Black Sea are:

- Pelagic species: European sprat (*Sprattus sprattus sulinus*), Mediterranean Horse Mackerel (*Trachurus mediterraneus ponticus*), Flathead Grey Mullet (*Mugil cephalus*), Bonito (*Sarda sarda*), Bluefish (*Pomatomus saltatrix*);
- Demersal species: Red Mullet (*Mullus barbatus*), Piked Dogfish (*Squalus acanthias*), Thornback ray (*Raja clavata*), Turbot (*Scophthalmus maximus*), Gobies (*Gobiidae*).
- Molluscs: Rapa wealk (*Rapana venosa*) and White sand clam (*Mya arenaria*).

For 2022 the total amount of landings in Black Sea from Bulgarian fishing fleet is 5,546.5 tons, which is a decrease of 38 % to 2021 figures.
Most of the vessels of less than 12 meters in length are mainly engaged in small-scale fisheries deploying gill-nets (anchored). Vessels of over 12 m in length use mainly pelagic trawls to fish as a preferred gear. Amongst all species in the Black Sea, for our country there are introduced quotas only for turbot and sprat, applicable since 2007. For 2022 the fishing opportunities for Black Sea were laid down in Council Regulation 2022/110 dated 27 Jan, 2022, and the quotas are as follows:

- For turbot – 75.00 tons;
- For sprat – 8,032.50 tons.
- For Piked Dogfish (DGS) - there is no total allowable catch or quota for catches of the Piked Dogfish((*Squalus acanthias)* in Black Sea. In 2015, when defining the fishing opportunities for certain fish stocks in the Black Sea for 2016, the Republic of Bulgaria has made a political commitment for 2016 not to exceed the landings of Piked Dogfish, discharged in 2015, up to 133 tons ceiling. This commitment is taken as a precautionary measure aimed at protecting the Piked Dogfish in Black Sea and is renewed annually when determining the annual fishing opportunities for certain fish stocks in the Black Sea waters. Since then, the catch of the Black Sea Piked Dogfish has fallen considerably.

During the 44th session of the GFCM, held in the period of 02-06 Nov., 2021, in Appendix № 13- Recommendation GFCM /44/2021/10, a text was adopted, concerning the management measures for sustainable fishing of the Black Sea Piked Dogfish. In it, the general objectives of the transitional management measures set out in Paragraph 1 shall be attained while maintaining the fishing fleet capacity or fishing effort at the levels authorized and exerted during the years 2015-2021.
For 2022, the catches of Turbot are 54.92 tons, Sprat – 1,561 tons, Piked Dogfish – 17.13 tons, incl. IUU fishing.
Detailed information on the catches of the main species of fish and other aquatic organisms in the Black Sea is presented in the tables below.

Table 7: Catches of the main species of fish in Black Sea in metric tons 2007 – 2022.

Main targeted species	FAO Code	2007	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Anchovy	ANE	60.4	9.9	369.6	12.5	54.5	3.6	4.8	70.6	422.2	1 176.8	152.8
Bluefish	BLU	8.2	49.0	304.7	138.4	712.2	71.0	260.7	24.0	253.2	302.1	513.3
Atlantic bonito	BON	0.9	6.1	5.5	7.7	68.2	13.0	22.9	3.7	31.5	1.5	44.8
Soft-shelled slam	CLS	0.0	10.3	61.0	124.3	583.4	818.9	600.5	507.8	462.2	758.1	336.8
Piked dogfish	DGS	24.0	30.9	34.0	133.0	83.5	50.5	10.1	16.8	47.5	19.7	17.1
Gobies nei	GPA	73.9	74.0	63.7	47.9	64.2	39.7	25.1	31.2	33.7	32.4	17.3
Med. horse mackerel	HMM	115.9	271.4	113.1	87.2	166.2	153.5	196.7	101.6	108.8	274.1	194.5
Red mullet	MUT	12.6	256.8	328.8	632.6	877.4	374.6	595.2	554.3	319.3	445.4	181.0
Thornback ray	RJC	3.6	56.1	70.3	43.2	35.7	48.9	13.1	9.1	17.2	17.6	16.8
Rapana venosa	RPW	4 310.0	4 819.1	4 732.4	4 100.6	3 436.3	3 653.1	3 515.4	4 222.1	2 745.6	2 166.4	2 165.2
European sprat	SPR	2 984.6	3 784.2	2 279.1	3 297.0	2 295.5	3 188.9	3 187.8	4 584.6	1 622.7	3 478.8	1 561.0
Turbot	TUR	66.9	39.6	39.4	43.0	42.4	41.8	55.4	54.9	61.6	70.4	54.9

The total yearly amount of IUU-fishing is 0.61 tons.

Table 7.1. Catches of bulky species trends.

As can be seen from **Table 7** and **Figure 7.1**, there is a significant reduction in catches of all species, both of local and economic importance. As can be seen from the data presented, Russia's military aggression against Ukraine has a direct impact on food security and the accessibility of fishery products to the final consumer. This undoubtedly leads to heavy losses for the sector. High fuel prices are also one of the main problems in the pricing of the final product and leads to the main problem in the realization of the output (affordability of prices).

On **Figure 4** is visible the percentage distribution of the landings in 2022. The largest share have the segments TM 2440 – 27.0 %, PMP 0612 – 14.6 % TM 1218 – 13.8 %.

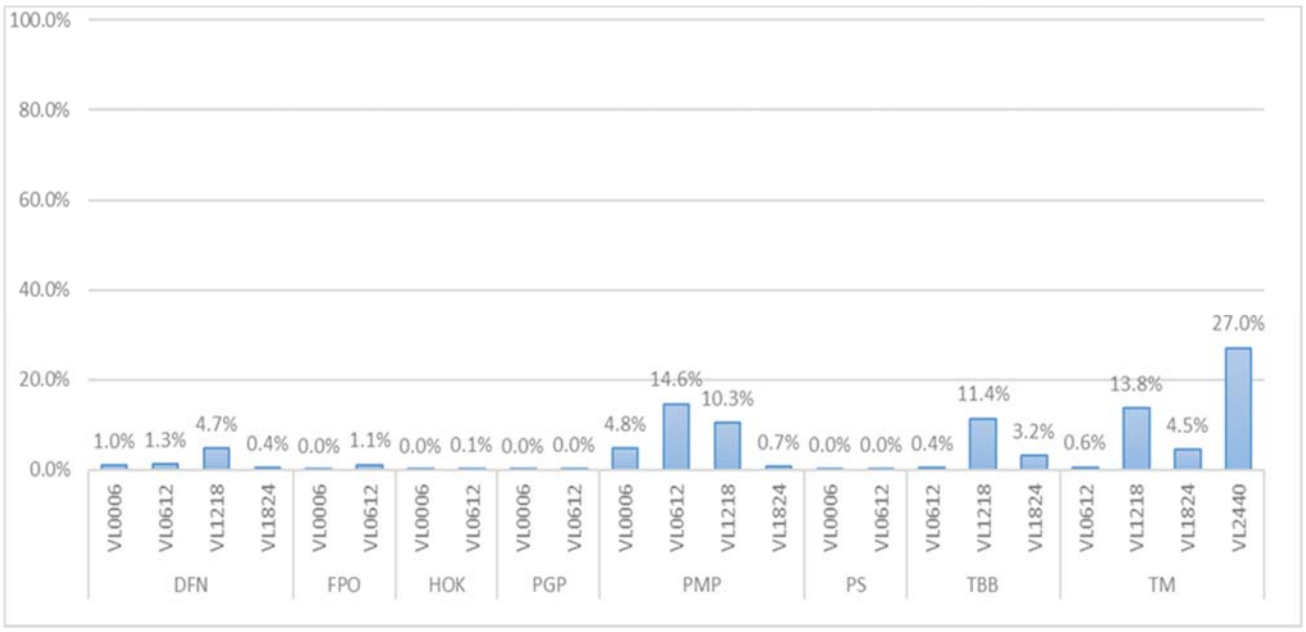

Figure 4: Percentage ratio of landings by the fleet segments to total landings for 2022.

Table 8: Value of the landings of the top of the species, using the average first sale price, for each of the segments – 2022 .

Segment	Species	Code	Landings, kilos	Value, BGN	Value, EUR
DFN VL0006	Anchovy	ANE	93.80	142.58	72.90
	Bluefish	BLU	12793.19	42345.46	21650.89
	Atlantic bonito	BON	7254.40	24519.87	12536.81
	Soft-shelled clam	CLS	898.00	5459.84	2791.57
	Common shrimp	CSH	34.00	111.32	56.92
	Piked dogfish	DGS	18.00	59.40	30.37
	Flounder	FLE	4.90	14.70	7.52
	Garpike	GAR	483.00	3477.60	1778.07
	Gobies	GPA	6884.35	14801.35	7567.81
	Med. horse mackerel	HMM	6126.88	18319.37	9366.55
	Leaping mullet	LZS	849.60	2081.52	1064.26
	Golden grey mullet	MGA	243.90	243.90	124.70
	Black mussel	MSM	12884.00	21387.44	10935.22
	Flathead mullet	MUF	2930.60	10432.94	5334.28
	Red mullet	MUT	200.00	466.00	238.26
	So-iuy mullet	MYZ	165.00	605.55	309.61
	Thornback ray	RJC	18.00	39.42	20.16

	Rapa whelk	RPW	2.80	2.21	1.13
	Shad	SHC	1203.05	8457.44	4324.22
	Silverside	SIL	77.50	95.33	48.74
	European sprat	SPR	299.00	263.12	134.53
	Turbot	TUR	826.35	8726.26	4461.66
DFN VL0612	Anchovy	ANE	1553.70	2361.62	1207.48
	Bluefish	BLU	7045.46	23320.47	11923.57
	Atlantic bonito	BON	24510.53	82845.59	42358.28
	Soft-shelled clam	CLS	3935.50	23927.84	12234.11
	Common shrimp	CSH	96.00	336.00	171.79
	Piked dogfish	DGS	677.40	2235.42	1142.95
	Eryphia spinifrons	EIK	6.00	42.00	21.47
	Flounder	FLE	2.00	6.00	3.07
	Garpike	GAR	675.90	4866.48	2488.19
	Gobies	GPA	8051.20	17310.08	8850.50
	Med. horse mackerel	HMM	3809.20	11389.51	5823.36
	Common stingray	JDP	65.15	115.97	59.29
	Leaping mullet	LZS	1061.30	2600.19	1329.45
	Golden grey mullet	MGA	23.60	23.60	12.07
	Flathead mullet	MUF	1250.40	4451.42	2275.98
	Red mullet	MUT	1847.00	4303.51	2200.35
	So-iuy mullet	MYZ	28.50	104.60	53.48
	Thornback ray	RJC	2543.55	5570.37	2848.09
	Rapa whelk	RPW	4831.00	3816.49	1951.34
	Shad	SHC	1832.00	12878.96	6584.91
	European sprat	SPR	719.30	632.98	323.64
	Turbot	TUR	9606.13	101440.73	51865.82
	Whiting	WHG	139.00	325.26	166.30
DFN VL1218	Bluefish	BLU	21129.30	69937.98	35758.72
	Atlantic bonito	BON	60.00	202.80	103.69
	Piked dogfish	DGS	2230.00	7359.00	3762.60
	Med. horse mackerel	HMM	1135.90	3396.34	1736.52
	Common stingray	JDP	20.00	35.60	18.20
	Black mussel	MSM	1800.00	2988.00	1527.74
	Red mullet	MUT	8077.50	18820.58	9622.81
	Thornback ray	RJC	6951.00	15222.69	7783.24
	Rapa whelk	RPW	206989.50	163521.71	83607.32
	Turbot	TUR	10501.00	110890.56	56697.44
	Whiting	WHG	1317.00	3081.78	1575.69
DFN VL1824	Bluefish	BLU	1783.00	5901.73	3017.51

	Piked dogfish	DGS	4083.00	13473.90	6889.10
	Flounder	FLE	108.00	324.00	165.66
	Med. horse mackerel	HMM	2677.00	8004.23	4092.50
	Common stingray	JDP	110.00	195.80	100.11
	Red mullet	MUT	543.00	1265.19	646.88
	Thornback ray	RJC	1238.00	2711.22	1386.22
	Rapa whelk	RPW	8250.00	6517.50	3332.34
	Turbot	TUR	2695.00	28459.20	14550.96
FPO VL0006	Common shrimp	CSH	11.00	38.50	19.68
FPO VL0612	Anchovy	ANE	10277.50	15621.80	7987.30
	Bluefish	BLU	1612.50	5337.38	2728.96
	Atlantic bonito	BON	802.50	2712.45	1386.85
	Soft-shelled clam	CLS	4022.00	24453.76	12503.01
	Piked dogfish	DGS	62.00	204.60	104.61
	Gobies	GPA	302.00	649.30	331.98
	Med. horse mackerel	HMM	17258.00	51601.42	26383.39
	Common stingray	JDP	10.50	18.69	9.56
	Golden grey mullet	MGA	17.60	17.60	9.00
	Red mullet	MUT	137.50	320.38	163.81
	Shad	SHC	1289.80	9067.29	4636.03
	European sprat	SPR	27846.00	24504.48	12528.94
	Whiting	WHG	75.00	175.50	89.73
	Bluefish	BLU	21.30	70.50	36.05
	Atlantic bonito	BON	12.90	43.60	22.29
	Gobies	GPA	88.30	189.85	97.07
	Med. horse mackerel	HMM	91.40	273.29	139.73
	Shad	SHC	5.00	35.15	17.97
HOK VL0612	Bluefish	BLU	138.10	457.11	233.72
	Atlantic bonito	BON	1963.30	6635.95	3392.91
	Piked dogfish	DGS	959.10	3165.03	1618.25
	Gobies	GPA	93.60	201.24	102.89
	Med. horse mackerel	HMM	239.70	716.70	366.44
	Flathead mullet	MUF	60.60	215.74	110.30
	Thornback ray	RJC	383.00	838.77	428.86
	Shad	SHC	14.50	101.94	52.12
	Turbot	TUR	329.60	3480.58	1779.59
PGP VL0006	Bluefish	BLU	10.80	35.75	18.28
	Soft-shelled clam	CLS	60.00	364.80	186.52
	Gobies	GPA	49.05	105.46	53.92
	Med. horse mackerel	HMM	15.00	44.85	22.93

	Rapa whelk	RPW	243.00	191.97	98.15
	Shad	SHC	9.40	66.08	33.79
PGP VL0612	Anchovy	ANE	92.00	139.84	71.50
	Bluefish	BLU	54.00	178.74	91.39
	Atlantic bonito	BON	408.00	1379.04	705.09
	Common shrimp	CSH	20.00	70.00	35.79
	Piked dogfish	DGS	541.00	1785.30	912.81
	Gobies	GPA	7.00	15.05	7.69
	Med. horse mackerel	HMM	237.00	708.63	362.32
	Leaping mullet	LZS	6.00	14.70	7.52
	Black mussel	MSM	20.00	33.20	16.97
	Flathead mullet	MUF	100.00	356.00	182.02
	Thornback ray	RJC	228.00	499.32	255.30
	Rapa whelk	RPW	236.00	186.44	95.33
	Shad	SHC	110.00	773.30	395.38
	European sprat	SPR	15.00	13.20	6.75
	Turbot	TUR	329.10	3475.30	1776.89
PMP VL0006	Bluefish	BLU	340.60	1127.39	576.42
	Atlantic bonito	BON	150.00	507.00	259.22
	Soft-shelled clam	CLS	68079.00	413920.32	211634.10
	Common shrimp	CSH	639.20	2183.60	1116.46
	Eryphia spinifrons	EIK	21.70	151.90	77.67
	Gobies	GPA	325.50	699.83	357.81
	Med. horse mackerel	HMM	185.10	553.45	282.97
	Leaping mullet	LZS	31.20	76.44	39.08
	Black mussel	MSM	5443.80	9036.71	4620.40
	Flathead mullet	MUF	332.00	1181.92	604.31
	Rapa whelk	RPW	188014.40	148531.38	75942.89
	Shad	SHC	819.40	5760.38	2945.24
	Silverside	SIL	39.80	48.95	25.03
PMP VL0612	Bluefish	BLU	15518.00	51364.58	26262.29
	Atlantic bonito	BON	4477.50	15133.95	7737.87
	Soft-shelled clam	CLS	259848.44	1579878.52	807779.06
	Common shrimp	CSH	324.00	1109.68	567.37
	Piked dogfish	DGS	1098.00	3623.40	1852.62
	Gobies	GPA	610.00	1311.50	670.56
	Med. horse mackerel	HMM	6897.40	20623.23	10544.49
	Black mussel	MSM	195971.50	325312.69	166329.74
	Flathead mullet	MUF	76.00	270.56	138.34
	Red mullet	MUT	3293.00	7672.69	3922.98

	Thornback ray	RJC	252.00	551.88	282.17
	Rapa whelk	RPW	320056.00	252844.24	129277.21
	Shad	SHC	56.80	399.30	204.16
	Silverside	SIL	2.00	2.46	1.26
	Turbot	TUR	2055.15	21702.38	11096.25
	Whiting	WHG	1629.00	3811.86	1948.97
PMP VL1218	Anchovy	ANE	3.00	4.56	2.33
	Bluefish	BLU	53597.15	177406.57	90706.54
	Piked dogfish	DGS	3328.50	10984.05	5616.06
	Flounder	FLE	7.00	21.00	10.74
	Gobies	GPA	622.00	1337.30	683.75
	Med. horse mackerel	HMM	13108.60	39194.71	20039.94
	Common stingray	JDP	54.00	96.12	49.15
	Black mussel	MSM	500.00	830.00	424.37
	Red mullet	MUT	35799.50	83412.84	42648.31
	Thornback ray	RJC	1311.00	2871.09	1467.97
	Rapa whelk	RPW	454900.50	359371.40	183743.68
	Shad	SHC	177.00	1244.31	636.21
	Silverside	SIL	5.00	6.15	3.14
	European sprat	SPR	150.00	132.00	67.49
	Turbot	TUR	9251.00	97690.56	49948.39
	Whiting	WHG	959.00	2244.06	1147.37
PMP VL1824	Anchovy	ANE	20.00	30.40	15.54
	Bluefish	BLU	19417.00	64270.27	32860.87
	Piked dogfish	DGS	708.00	2336.40	1194.58
	Med. horse mackerel	HMM	1566.00	4682.34	2394.04
	Red mullet	MUT	791.00	1843.03	942.33
	Thornback ray	RJC	1348.10	2952.34	1509.51
	Rapa whelk	RPW	8910.00	7038.90	3598.93
	Turbot	TUR	2180.00	23020.80	11770.35
	Whiting	WHG	1296.00	3032.64	1550.56
PS VL0006	Anchovy	ANE	180.00	273.60	139.89
	Bluefish	BLU	20.00	66.20	33.85
	Common shrimp	CSH	25.70	81.73	41.79
	Gobies	GPA	76.00	163.40	83.55
	Med. horse mackerel	HMM	116.00	346.84	177.34
	Leaping mullet	LZS	52.50	128.63	65.76
	Flathead mullet	MUF	49.00	174.44	89.19
	Red mullet	MUT	5.00	11.65	5.96
	Silverside	SIL	267.00	328.41	167.91

	European sprat	SPR	1158.00	1019.04	521.03
PS VL0612	Anchovy	ANE	32.00	48.64	24.87
	Common shrimp	CSH	2.00	6.36	3.25
	Flounder	FLE	2.00	6.00	3.07
	Gobies	GPA	134.00	288.10	147.30
	Med. horse mackerel	HMM	293.00	876.07	447.93
	Leaping mullet	LZS	76.00	186.20	95.20
	Flathead mullet	MUF	470.00	1673.20	855.49
	Red mullet	MUT	35.00	81.55	41.70
	Silverside	SIL	31.00	38.13	19.50
	European sprat	SPR	313.00	275.44	140.83
TBB VL0612	Black mussel	MSM	2295.00	3809.70	1947.87
	Rapa whelk	RPW	17790.00	14054.10	7185.75
TBB VL1218	Bluefish	BLU	7846.00	25970.26	13278.38
	Piked dogfish	DGS	45.00	148.50	75.93
	Med. horse mackerel	HMM	2054.00	6141.46	3140.08
	Red mullet	MUT	2579.00	6009.07	3072.39
	Thornback ray	RJC	143.00	313.17	160.12
	Rapa whelk	RPW	613498.00	484663.42	247804.47
	Shad	SHC	42.00	295.26	150.96
	Silverside	SIL	592.00	728.16	372.30
	Turbot	TUR	3221.00	34013.76	17390.96
TBB VL1824	Anchovy	ANE	4895.00	7440.40	3804.22
	Bluefish	BLU	150.00	496.50	253.86
	Piked dogfish	DGS	270.00	891.00	455.56
	Med. horse mackerel	HMM	135.00	403.65	206.38
	Black mussel	MSM	2100.00	3486.00	1782.36
	Rapa whelk	RPW	163325.00	129026.75	65970.33
	Silverside	SIL	4780.00	5879.40	3006.09
	European sprat	SPR	350.00	308.00	157.48
	Turbot	TUR	919.00	9704.64	4961.90
TM VL0612	Bluefish	BLU	11914.00	39435.34	20162.97
	Atlantic bonito	BON	35.00	118.30	60.49
	Piked dogfish	DGS	929.00	3065.70	1567.47
	Med. horse mackerel	HMM	922.00	2756.78	1409.52
	Red mullet	MUT	10346.00	24106.18	12325.29
	Thornback ray	RJC	100.40	219.88	112.42
	Turbot	TUR	2068.15	21839.66	11166.44
	Whiting	WHG	8118.00	18996.12	9712.56
TM VL1218	Anchovy	ANE	15470.00	23514.40	12022.72

	Bluefish	BLU	113497.00	375675.07	192079.61
	Atlantic bonito	BON	2542.00	8591.96	4393.00
	Piked dogfish	DGS	960.00	3168.00	1619.77
	Gobies	GPA	30.00	64.50	32.98
	Med. horse mackerel	HMM	12095.00	36164.05	18490.39
	Common stingray	JDP	155.00	275.90	141.07
	Black mussel	MSM	3686.00	6118.76	3128.47
	Red mullet	MUT	54662.00	127362.46	65119.39
	Thornback ray	RJC	568.00	1243.92	636.01
	Rapa whelk	RPW	154642.00	122167.18	62463.09
	Shad	SHC	39.40	276.98	141.62
	Silverside	SIL	4308.00	5298.84	2709.25
	European sprat	SPR	386098.00	339766.24	173719.72
	Turbot	TUR	6161.00	65060.16	33264.73
	Whiting	WHG	8009.00	18741.06	9582.15
TM VL1824	Anchovy	ANE	310.00	471.20	240.92
	Bluefish	BLU	89878.00	297496.18	152107.38
	Atlantic bonito	BON	2600.00	8788.00	4493.23
	Piked dogfish	DGS	990.00	3267.00	1670.39
	Med. horse mackerel	HMM	39840.00	119121.60	60905.91
	Common stingray	JDP	60.00	106.80	54.61
	Red mullet	MUT	34540.00	80478.20	41147.85
	So-iuy mullet	MYZ	30.00	110.10	56.29
	Thornback ray	RJC	1737.00	3804.03	1944.97
	Rapa whelk	RPW	23507.00	18570.53	9494.96
	Silverside	SIL	87.00	107.01	54.71
	European sprat	SPR	48603.00	42770.64	21868.28
	Turbot	TUR	2956.00	31215.36	15960.16
	Whiting	WHG	5833.00	13649.22	6978.74
TM VL2440	Anchovy	ANE	119868.00	182199.36	93157.05
	Bluefish	BLU	156499.00	518011.69	264855.17
	Piked dogfish	DGS	230.00	759.00	388.07
	Med. horse mackerel	HMM	85695.00	256228.05	131007.32
	Common stingray	JDP	200.00	356.00	182.02
	Flathead mullet	MUF	295.00	1050.20	536.96
	Red mullet	MUT	28147.00	65582.51	33531.80
	Thornback ray	RJC	19.00	41.61	21.27
	Shad	SHC	1236.00	8689.08	4442.66
	Silverside	SIL	5736.00	7055.28	3607.31
	European sprat	SPR	1095428.00	963976.64	492873.43

	Turbot	TUR	1823.00	19250.88	9842.82
	Whiting	WHG	290.00	678.60	346.96

A.3. Development of the fleet

The development of the Bulgarian fishing fleet from 1 January 2007 to 31 December 2022 is presented in **Table 9**, **Fig. 5** and **Fig. 6**. As evidenced, the number of registered vessels has decreased by 29% according to data from the end of 2022, compared to the data of 31 Dec, 2007. Overall, the Bulgarian fishing fleet has decreased both in terms of tonnage and power, as a substantial decrease is recorded in the segment of 18 - 24 meters (both for vessels and tonnage). A significant drop is also seen in the segments of 6 to 12 meters, as well as 0 to 6 meters.

Table 9. Development of the Bulgarian Fishing Fleet.

Year	31.12.2007			31.12.2018			31.12.2019			31.12.2020			31.12.2021			31.12.2022			Decrease to 2007		
Vessels	Vsl	GT	kW	Vsl.	GT	kW	Vsl.	GT	kW	Vsl.	GT	kW	Vsl.	GT	kW	Vsl.	GT	kW	Vsl.	GT	kW
up to 6 m.	845	601	6594	663	496	6086	674	508	6282	682	519	6450	688	523	6635	697	538	6939	-18%	-10%	5%
6 - 12 m	1 595	3463	42173	1 099	2317	30484	1073	2260	29675	1050	2201	28861	1032	2173	28468	991	2115	27687	-38%	-39%	-34%
12 - 18 m	66	1273	8625	66	1270	10129	65	1244	9809	65	1262	9974	65	1274	9974	61	1201	9614	-8%	-6%	11%
18 - 24 m	29	1309	4819	18	813	4535	18	822	4535	18	822	4535	18	822	4535	18	822	4520	-38%	-37%	-6%
24 - 40 m	12	1587	3304	11	1193	3289	11	1193	3289	11	1193	3289	11	1193	3289	11	1193	3289	-8%	-25%	0
Total	2 547	8232	65515	1857	6088	54523	1841	6027	53590	1826	5997	53110	1814	5985	52902	1778	5868	52050	-30%	-29%	-21%

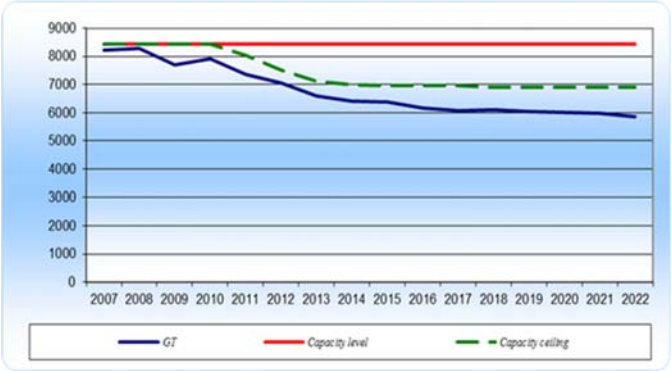

Figure 5. Capacity in **GT** for 2007-2022

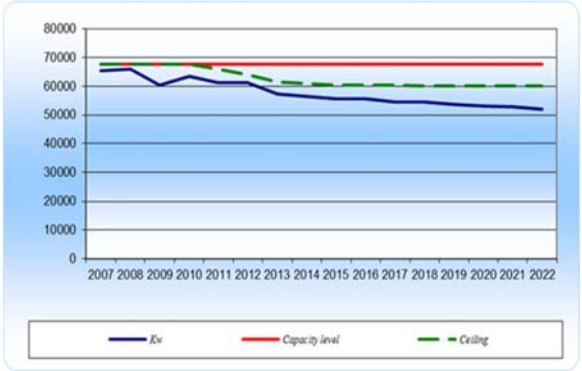

Figure 5. Capacity in **kW** for 2007-2022

SECTION B.

B.1. Report on effort reduction schemes

In compliance with the Operational Program “Fisheries sector development” for Programming period 2007-2013, Priority axis 1 “Measures for adaptation of the fishing fleet”, Measure 1.1. “Public aid for permanent cessation of fishing activities”, as well as under the Maritime Affairs and Fisheries Program for the 2014-2020 programming period, Union Priority 1 "Promoting environmentally sustainable, innovative, competitive and knowledge-based fisheries characterized by resource efficiency", Measure 1.3 "Permanent cessation of fishing activities", the decrease of the capacity is achieved, based on the

national plans for adjustment of the fishing effort in direction of restructuring of the fishing fleet and conservation of its sustainable management, in compliance with the principles of the Common Fisheries Policy.
From the applied table for the implementation of the scheme for withdrawing from exploitation of vessels from the Bulgarian fishing fleet, it is obvious, that Bulgaria makes the greatest effort for withdrawing from exploitation of vessels in the segments LOA 12-18, LOA 18-24, LOA 24-40, as well as in the segment LOA 6-12. The implementation of the fishing effort adjustment plan is resumed in **Table 10.** The final effect of the implementation of the measure is shown on **Table 10.1** below.

Table 10: Implementation of the fishing fleet efforts adjustment plan (FEAP) until 31 Dec, 2018.

Bulgarian fishing fleet by 31 Dec, 2009								Implementation by 31 Dec, 2018				
Fleet segment	Vessels	kW	GT	kW	GT	kW %	GT %	Vessels	kW	GT	kW %	GT %
LOA<6	708	5,462.35	507.20	4,369.88	405.76	-20%	-20%	14	70.22	10.50	-1.29%	-2.07%
LOA 6<12	1,392	37,160	2,985.48	26,012	2,089.84	-30%	-30%	55	2,858.93	345.22	-7.69%	-11.56%
LOA 12<18	65	9,106.23	1,290	6,374.36	903.00	-30%	-30%	23	2,390.1	407.13	-26.25%	-31.56%
LOA 18<24	28	4,773.66	1,253.4	2,864.2	752.04	-40%	-40%	9	1,201.92	400.56	-25.18%	-31.96%
LOA >24	13	3,877.5	1,665	2,326.5	999.00	-40%	-40%	2	1,029.65	431.36	-26.55%	-25.91%
Total	**2,206**	**60,379.7**	**7,701.08**	**41,946.9**	**5,149.64**			**103**	**7,550.82**	**1,594.77**	**-12.51%**	**-20.71%**

Table 10.1. Scrapped vessels during 2018**,** DCF segmentation

Scrapped vessels during 2018			
DCF Segmentation	**Брой кораби**	**GT**	**kW**
DFN 6-12	6	40	349.37
PMP 6-12	2	9.72	71.98
Total	**8**	**49.72**	**421.35**

B.2. Impact of effort reduction schemes on fishing capacity

During 2018, as a result of the implementation of FEAP, 8 fishing vessels have been scrapped, as all of them fall within LOA 6-12 segment (6 in DFN 6-12 and 2 in PMP 6-12, accoprding to the DCF segmentation), as the total vessels number incteases to 103 vessels, with total fishing capacity of 1,594.77 GT and 7,550.82 kW.
In 2022, there are no scrapped fishing vessels due to the end of the measure.
In conclusion from the data presented, it can be considered that after the adoption of the FEAP, the Republic of Bulgaria has made the necessary efforts to reduce the pressure on fish stocks and the restructuring of its fishing fleet. The result of the permanent cessation of fishing activities of vessels has reduced the pressure on stocks, which is a key factor in improving the condition of the entire population and in achieving a balance between fishing capacity and fishing opportunities.

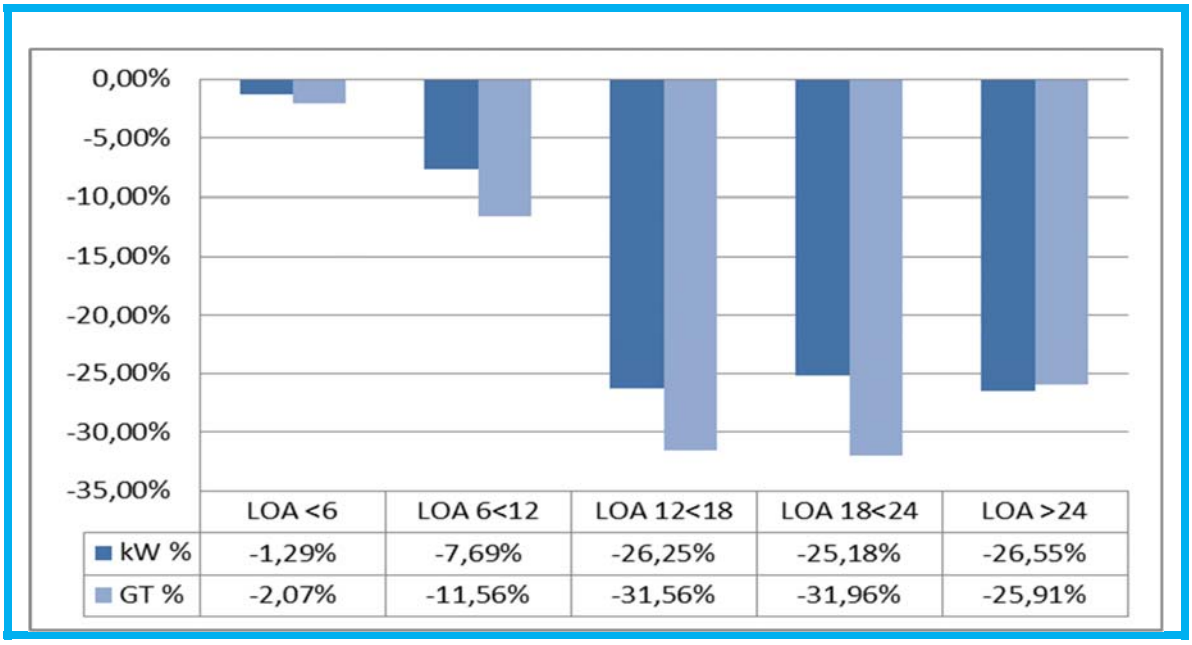

Figure 7. Reduction of Bulgarian fishing fleet in kW and GT

SECTION C

C.1. Statement on the compliance with the entry/exit scheme and the referent level

The capacity of the Bulgarian fishing fleet on 1 January, 2007 is as follows: GT_{07} = 8,448 GT and kW_{07} = 67,607 kW.

Table 11: Calculation of the baseline: (GT_{07} and kW_{07}) at 01 January, 2007

GT_{FR}	GT_1	GT_2	GT_3	GT_4	GT_{07}
8,147	301	0	0	0	8,448

kW_{FR}	kW_1	kW_2	kW_3	kW_4	kW_{07}
64,924	2,683	0	0	0	67,607

Each entry (or increase in tonnage or engine power) in the fleet register has been accompanied by the at least the same quantity withdrawal from the fleet. So Bulgaria can guarantee that the national fleet capacity in tonnage (GT) and (kW) is equal or less than the referent level at the date of the accession in EU, in line with article 8 of Regulation 1013/2010 and article 23 of Regulation 1380/2013

Table 12: Information on the vessel capacity, entered or withdrawn from the fleet register in the period 2007-2022.

Entry/Exit regime		GT									kW								
		2007	2015	2016	2017	2018	2019	2020	2021	2022	2007	2015	2016	2017	2018	2019	2020	2021	2022
ENTRY	Vessels entered the FR after withdrawal	3	77	208	44	202	97	118	84	122	55	787	2 720	766	2 160	950	1 362	1 428	1 637
	Vessels entered the FR after the accession date,	86	-	-	-	-	-	-	-	-	700	-	-	-	-	-	-	-	-
	Total	89	77	208	44	202	97	118	84	122	756	787	2 720	766	2 160	950	1 362	1 428	1 637
EXIT	Financed with public aid	-	24	-	-	50	-	-	-	-	-	249	-	-	421	-	-	-	-
	Without public aid	2	109	403	148	146	167	156	103	251	164	1 365	3 006	2 049	1 741	1 708	1 958	16	16
	Total	2	133	403	148	196	167	156	103	251	164	1 614	3 006	2 049	2 162	1 708	1 958	1 613	2 649

Table 13: Management of the entry/exit regime on 31 December, 2022.

	Item	GT		kW	
1	Capacity of the Fleet on 01 Jan, 2007	GT_{FR}	8 147	kW_{FR}	64 924
2	Capacity level fo the application of the entry/exit regime	GT_{07}	8 448	kW_{07}	67 607
3	Entries of vessels of more than 100 GT financed with public aid	GT_{100}	0	kW_{100}	0
4	Other entries or capacity increases (not included in 3 & 5)		3 052		32 886
5	Increases in the tonnage (GT) for safety reasons	GT_S	0		0
6	**Total entries (3+4+5)**		3 052		32 886
7	Exits before 1 January, 2007, financed with public aid	GT_{a1}	0	kW_a	0
8	Exits after 1 January, 2007, financed with public aid	GT_{a2}	1 595		7 551
9	Other exits (not included in items 7 and 8)		3 735		38 209
10	**Total exits (7+8+9)**		5 330		45 759
11	Power of the engines, replaced using public aid, subject to power reduction.		0	kW_r	0
12	**Fleet capacity on 31 Dec, 2022 (1+6-10)**	GT_t	5 868	kW_t	52 050
13	**Fleet ceiling on 31 Dec, 2022**		6 917		60 056

Clarifications:

-Lines 1, 3, 5, 7, 8, 9, 11 and 12 present figures as registered in the Community Fleet Register on 31/12/2022

-Line 4 is calculated as : 4 = (12 - 1) + 10 - (3 + 5)

-Line 13 : Ceiling GT = 2 - 35% 3 - 98,5% 7 - 96% 8 and kW = 2 -35% 3 - 7 - 8 - 20% 11

SECTION D. SWOT

D.1. Summary of the strengths and weaknesses of the fleet management system

Under the national law, all fishing vessels used for commercial fishing, must be registered first in the register of vessels, kept by the Executive Agency Maritime Administration (the Bulgarian institution

responsible for the technical characteristics and condition of the vessels), as well as in the register of the fishing vessels, kept by the Executive Agency for Fisheries and Aquaculture (the Bulgarian institution responsible for fisheries control).
In the management of the Bulgarian fleet, the basic principle is that the fishing capacity, representing an aggregate of the gross tonnage and the power of the vessel, can never be increased without firstly at least the same or greater fishing capacity to be withdrawn from the Bulgarian fishing fleet.
The implementation of fisheries management measures adopted in recent years at European and regional level has led to improved management of marine resources and their sustainable exploitation.
In the national legislation, measures are laid down which allow termination of the validity of the issued license for commercial fishing in case of non-practice of fishing activity for two consecutive calendar years. The released capacity consequently remains in favor of the state and is allocated to fishing vessels that have expressed their desire to engage in commercial fishing.
Regarding the management of the fishing effort regime, Bulgaria applies the provisions of Recommendation GFCM / 41/2017/4, according to which fishing vessels catching turbot must not exceed 180 days at sea per year.

D.1.1. Weaknesses

- Lack of conditions for direct sale between owners of fishing vessels and „end user" (customer), due to insufficiency of fish auctions - so far 5 have been identified, while the discharging ports are 75;
- High percentage of depreciation of fishing vessels obstructing the good economic efficiency;
- Low degree of investment in the replacement of fishing gears with more selective ones, and also in the safety conditions of the fishing vessels and ensuring better working conditions;
- High age of the fishing fleet;
- High average age of the employees in the sector;
- Dependence of fisheries on the seasonal catches of some valuable species;
- Relatively low average consumption of fish per capita;
- Use of fishing vessels (mainly in segment VL0006) to catch fish for personal use without being placed on the market;
- Restricted navigation area of significant part of the fleet. As it was mentioned above, Bulgarian fishing fleet consists mainly of small boats, major part of them are permitted to navigate within the area of 2 miles from the coast;
- The existence of provision in the Fisheries and Aquaculture Act, which does not allow the fishing capacity of inactive fishing vessels to be withdrawn, if they have applied for repair. This requirement does not oblige the proving of repairs and does not specify a period within which they can be performed, which allows the "retaining" of fishing capacity. This way it is impossible to transfer it to another fishing vessel that actually wish to carry out fishing activities;
- Low price of the first sale of some species;
- Unsufficient number of patrol boats, equipped with modern means of control.

D.1.2. Strengths

- Existence of Informational-Statistical system, where data from fishing fleet and catch reporting are recorded;

- Permanent presence of EAFA officials in most important ports and landing places, that, except power for efficient control, grants possibility for provision of important information, related to management of the fisheries, to the parties concerned;
- Raising the awareness of the persons concerned in the branch, through informational campaigns, regular meetings and publishing of information of EAFA's website;
- Permanent monitoring of fishing vessels targeting turbot. According to the rules established at national level, each vessel that intends to target turbot, shall be equipped with device, allowing monitoring its track, linked to the Fisheries Monitoring Center. In 2019, a large-scale project to modernize the center was completed, making it the most multifunctional in the region. It provided automated real and complete control over the movement and activities of fishing vessels and boats engaged in commercial fishing. Tracking devices have been replaced by new ones allowing the use of an electronic fishing logbook;
- Cooperation with other national authorities regarding the technical parameters of fishing vessels (with Executive Agency Maritime Administration-EAMA) and fight against IUU (Border Police, Bulgarian Food Safety Agency);
- Enhanced cooperative inspection of EAFA and EAMA in terms of controls and measurement of the engine power of fishing vessels;
- Regular training sessions of the EAFA staff;
- Increased monitoring and control activities, that improves the due management of fisheries through improved communication and coordination between regional offices and HQs;
- Improved legislative framework through adapting Fisheries and Aquacultures Act in order to undertake effective measures against inactive fishing vessels and non-submission of economic statistics form. These measures allow collecting of more reliable information of the state of fishing fleet of Bulgaria;
- The presence of administrative measures against IUU fisheries, through the implementation point system for serious infringements, allowing a withdrawal of fishing license;
- New by-laws to the national legal framework, supplementing its part for the management of the fishing fleet;
- Given that a major part of the Bulgarian fishing fleet can be classified as small-scale and coastal fishing, it can be concluded that fishing is carried out in an environmentally friendly manner.

D.2. Plan for improving the fleet management system

The dedicated fish auctions, specialized in the recent years in the newly built fishing ports, do not work with its full capacity. Meetings with representatives of the fish industry and interested parties are planned in order to promote their use.

The Fisheries and Aquaculture Act provides a legal opportunity to withdraw fishing vessels that have not engaged in fishing activities for two consecutive years. The released capacity will be allocated to fishing vessels whose entering in the register will ensure renewal and modernization of the fleet as well as a more efficient use of fishing capacity.

Not a minor part of the valuable fish species and other aquatic organisms are migratory and their catches in the annual aspect are influenced by the number of passages, passing along the Bulgarian coast. The Fleet Management System through commercial fishing licenses is not aimed at issuing a license for a target species (except for the turbot) and thus enables fishermen to catch all allowable species, which would compensate for annual fluctuations in catches of migratory fish and other aquatic organisms.

The system for certification and engine power inspection system allows monitoring and control of the

actual power of the propulsion engine and not exceeding the recorded power in the fishing license. The Executive Agency for Fisheries and Aquaculture and the Executive Agency Maritime Administration will continue their joint actions on the implementation of the Sample Plan for the Measurement of Engine Power of Fishing Vessels, approved in 2016. It is expected to be revised by the end of 2022.
Over the next 3 years, Bulgaria will continue to apply at national level a ban on the use of trawling equipment in the waters up to 3 nautical miles from the coast, applying a derogation for a certain number of vessels in the area between 1 and 3 nautical miles. This allows smaller fishing vessels with a limited navigating area to deploy their fishing gear in the closer coastal zone, thus avoiding contact with larger vessels using active fishing gear.

D.3. Information about the general level of respecting the fleet policy tools

The fleet is managed through a system of commercial fishing licenses, as it is laid down in the Fisheries and Aquacultures Act. The order and conditions for issuance of the commercial fishing licenses, special lisences and authorizations are determined in line with the legislation of the European Union, according to the provision of art. 17, par. 7 of the Fisheries and Aquacultures Act.
The approach of implementation of the point system for serious infringements is applied into the national legislation through Ordinance 3 from 19 February 2013 for the implementation of point system for serious infringements according to Regulation (EC) 1005/2008 of the Council dated 29 Sept 2008 for creation of Community system for preventing, deterring and eliminating of the illegal, undeclared and unregulated fishing, for amendment of regulations (EIC) 2847/93, (EC) 1936/2001 and (EC) 601/2004 and for repealing of regulations (EC) 1093/94 and (EC) 1447/1999.
In 2020, electronic fishing logbook (ERS) equipment was installed on board fishing vessels of over 12 meters, and technical tests of the operation and training of masters of vessels were carried out. From 1 January 2021, information on fishing activities of vessels of over 12 meters in length is be reported electronically only.

SECTION E

E.1. Information about the changes in the administrative procedures for the fleet management

Two new by-laws regulating the management of the fishing fleet, the allocation of the fishing capacity and keeping the required registers have been prepared and are in force since Nov. 21, 2019. The Regulation on the terms and conditions for management of the fishing fleet of the Republic of Bulgaria is aimed at determining the terms and conditions for entry and withdrawal of vessels in the register of fishing vessels, as well as those for allocation of free fishing capacity in the navy released as a result of:

- Official withdrawal of fishing vessels from the Register of fishing vessels, kept by the Executive Agency for Fisheries and Aquaculture, pursuant to Art. 18c, para. 3 of the Fisheries and Aquaculture Act;
- Withdrawal of fishing vessels from the Register of Vessels, kept by the Executive Agency "Maritime Administration" under Art. 22, para. 1, item 1, item 3 and para. 2 of Ordinance № 1 of 2003 for entry in the Register of Ships;
- Expiration of validity certificates for free fishing capacity. Conducting a procedure for allocating a free fishing capacity from two to three calendar years.

There is a text regulating as inadmissible for participation in the procedure for allocation of fishing capacity persons with granted public aid for permanent cessation of fishing activities under European fisheries funds. A minimum of eligibility and assessment criteria for participants in a procedure for allocating fishing capacity in the fleet have been established. An evaluation criterion is established, setting a ratio between the average registered gross tonnage and the average registered engine power in the register of fishing vessels for the respective segment by the total length overall of fishing vessels.

SECTION F

Indicators

Referring to the Guidelines for Improved Analysis of the Balance of Fishing Capacity and Fishing Opportunities, Bulgaria calculates the technical and economic indicators for 2019, 2020 and 2021, as shown below. For the calculation of the indicators, the data collected under the Data Collection Framework (DCF) for 2019, 2020 and 2021, and the EAFA information and statistical system, were used.

F.1. Technical Indicator

The technical indicator assessment has made according to the Guidelines and it is relevant for all active vessels during 2018, 2019, 2020, 2021 and 2022. The vessels are considered as active ones if they have fishing licenses and have reported at least one day at sea during the reference year. Vessels with or without a fishing license that did not report at least one day at sea and landings during the reference year are inactive (due to vessel repairs, sale, etc.)

Table 14: Proportion of inactive vessels in the whole fleet for during 2018, 2019, 2020, 2021 and 2022.

LOA	<6					6 - 12 m					12 - 18 m					18 - 24 m					24 - 40 m				
Representative yea	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Inactive vessels	249	268	255	260	251	400	444	333	363	318	9	9	8	12	7	2	1	1	3	3	0	0	0	0	0
Total number	662	674	682	688	697	1 100	1 073	1 050	1 032	991	66	65	65	65	61	18	18	18	18	18	11	11	11	11	11

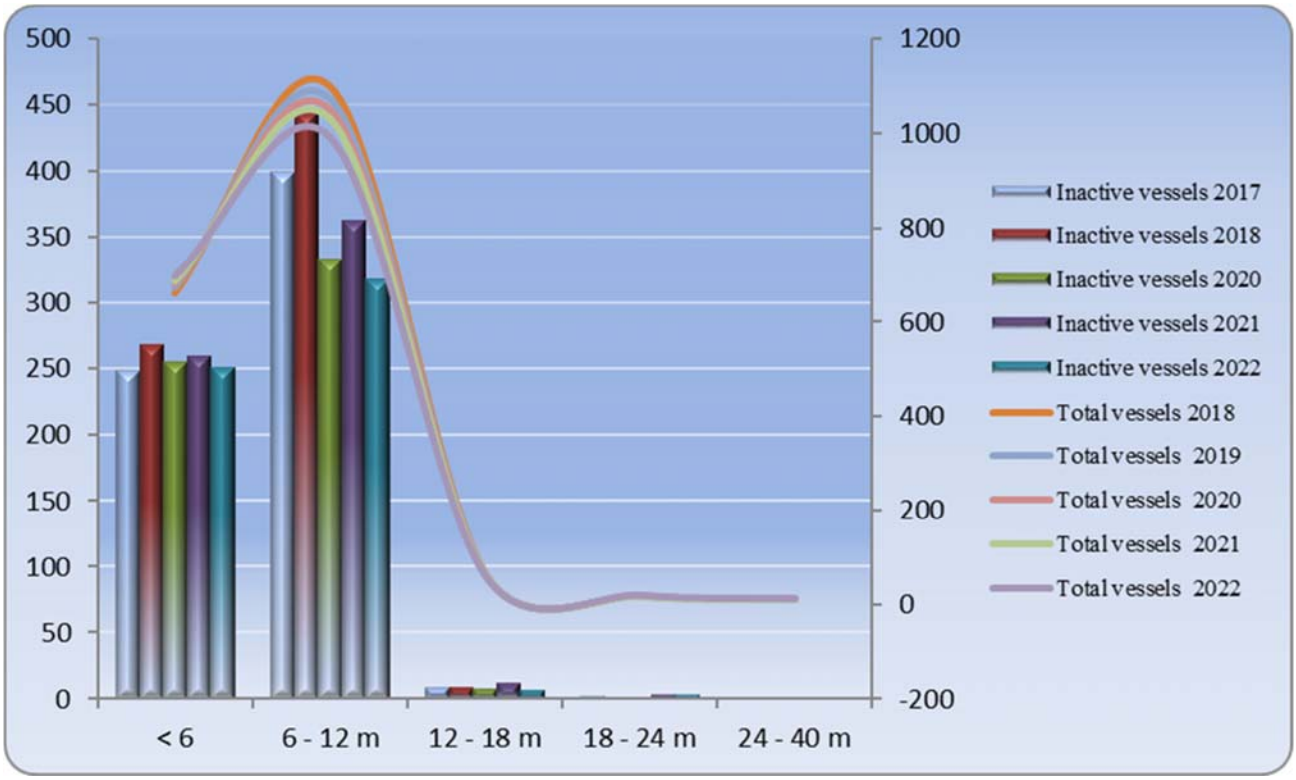

Figure 8. Chart of the inactive vessels throughout the years.

Figure 8 shows the ratio between inactive fishing vessels and total number of fishing vessels in each fishing segment. As it is visible from the above shown chart, the percentage of inactive vessels, which represents the unused capacity, in the segments under 12 m (95.0 % from the Bulgarian fishing fleet), in 2019 to 2022, is still high-about 34 %, despite the fact of the observed decline from the previous 36%.
Table 15 presents a summary of the technical indicator for the period from 2019 to 2022, calculated as the ratio between the current effort and the theoretical maximum. The observed theoretical maximum effort is calculated based on the average number (from the top 10 of the highest values) of days at sea realized by the ships in the respective segment. The reason for choosing the theoretical number of days at sea is the possibility of comparability of data from previous years.
Considering biodiversity as target species related to the economic activity in all segments of the Bulgarian fishing fleet, it must be taken into account that this also reflects on the variations of the fishing gear used for the catches. This gives its reflection in the smaller number of vessels in the segmentation so represented. There is also a policy to promote the use of gentle passive fishing gear, with imposed restrictions on the mesh size of the nets, as well as the setting of minimum size ranges, for the purpose of conservation the fish stocks and biodiversity. This, in turn, should be taken into account for the segments, in which imbalance is observed.
A large number of the fishing vessels during the summer season are directed to the performing of tourist services.

Table 15. Technical indicator.

Métier	Vessel length	No of vessels 2019	No of vessels 2020	No of vessels 2021	No of vessels 2022	Technical indicator 2 Ratio Current/ Teoretical Maximum							
						GT/Days 2019	GT/Days 2020	GT/Days 2021	GT/Days 2022	kW/Days 2019	kW/Days 2020	kW/Days 2021	kW/Days 2022
DFN	VL0006	298	326	332	362	0.19	0.16	0.15	0.16	0.19	0.16	0.13	0.16
PS	VL0006	13	8	11	8	0.98	1.32	0.95	0.98	0.90	1.50	1.10	0.88
PMP	VL0006	70	68	64	54	0.35	0.34	0.33	0.38	0.35	0.33	0.32	0.36
FPO	VL0006	3	3	-	1	-	-	-	-	-	-	-	-
HOK	VL0006	17	15	13	17	0.83	0.76	1.10	0.66	0.89	0.76	1.18	0.70
PGP	VL0006	7	8	11	6	0.80	0.63	0.94	1.00	0.80	0.80	0.67	1.13
Total number		**408**	**428**	**431**	**448**	**0.63**	**0.64**	**0.70**	**0.63**	**0.63**	**0.71**	**0.68**	**0.64**
DFN	VL0612	403	515	476	505	0.20	0.10	0.09	0.09	0.20	0.10	0.09	0.09
PS	VL0612	4	3	3	2	-	-	-	-	-	-	-	-
FPO	VL0612	32	34	29	31	0.42	0.43	0.48	0.45	0.44	0.44	0.50	0.48
HOK	VL0612	25	24	17	12	0.50	0.64	0.97	0.87	0.50	0.64	0.97	0.87
PGP	VL0612	14	9	7	7	0.69	0.60	1.03	1.09	0.69	0.60	1.03	1.09
PMP	VL0612	148	132	133	110	0.25	0.29	0.30	0.29	0.25	0.29	0.30	0.29
TM	VL0612	2	3	6	7	-	-	1.01	1.00	-	-	1.01	1.00
TBB	VL0612	3	-	1	2	-	-	-	-	-	-	-	-
Total number		**631**	**720**	**672**	**676**	**0.41**	**0.41**	**0.64**	**0.63**	**0.41**	**0.42**	**0.65**	**0.64**
DFN	VL1218	9	19	14	14	0.99	0.74	0.78	0.76	0.99	0.74	0.78	0.76
PGP	VL1218	-	1	1	-	-	-	-	-	-	-	-	-
PMP	VL1218	19	14	16	16	0.80	0.91	0.81	0.81	0.80	0.91	0.81	0.81
TBB	VL1218	7	1	2	6	1.00	-	-	1.00	1.00	-	-	1.00
HOK	VL1218	-	1	-	-	-	-	-	-	-	-	-	-
TM	VL1218	21	21	20	18	0.70	0.65	0.71	0.62	0.70	0.65	0.71	0.62
Total number		**56**	**57**	**53**	**54**	**0.87**	**0.76**	**0.77**	**0.80**	**0.87**	**0.76**	**0.77**	**0.80**
DFN	VL1824	-	3	2	3	-	-	-	-	-	-	-	-
PS	VL1824	1	-	-	-	-	-	-	-	-	-	-	-
PMP	VL1824	9	3	1	2	1.00	-	-	-	1.00	-	-	-
TBB	VL1824	2	-	2	2	-	-	-	-	-	-	-	-
TM	VL1824	5	11	10	8	1.00	0.92	1.00	0.99	1.00	0.92	1.00	0.99
Total number		**17**	**17**	**15**	**15**	**1.00**	**0.92**	**1.00**	**0.99**	**1.00**	**0.92**	**1.00**	**0.99**
TM	VL2440	10	10	10	11	1.00	1.00	1.00	0.96	1.00	1.00	1.00	0.96
DFN	VL2440	1	1	1	-	-	-	-	-	-	-	-	-
PMP	VL2440	-	-	-	-	-	-	-	-	-	-	-	-
Total number		**11**	**11**	**11**	**11**	**1.00**	**1.00**	**1.00**		**1.00**	**1.00**	**1.00**	

* The segments with * consist of 5 or less than 5 vessels and their data are not included due to the unrepresentativeness of the sample

F.2. Economic indicators

The data used for the calculation of economic indicators is from questionnaires for economic statistics in 2019, 2020 and 2021 collected under the National Programme for the collection, management and use of fisheries data in regards to the Data Collection Framework (DCF) pursuant to Art. 18f. (9) of the Fisheries and Aquaculture Act. Economic variables were calculated for each segment.

F.2.1. Return on Fixed Tangible Assets (RoFTA)

The Return on Fixed Tangible Assets (RoFTA) is used as an approximation of RoI, because the data on intangible assets (e.g. fishing right) are not relevant for the Bulgarian fleet, because the fishing rights are not tradable.
The RoFTA represents the profitabily per unit (in percentage) of capital invested in the fisheries sector.

RoFTA is compared to the interest rate of a low risk long term investment. That interest rate respresents the profitability that the same invested capital will obtain if it was invested in the next best available alternative (normally long term government bonds).
In 2019, the highest values of the indicator were in PMP 0006 segment, followed by segments PMP 0612 and TM 2440. Values of RoFTA for 2020 show that the most profitable segments were again PMP 0612, PMP 0006, PGP 0006 and TM 2440. In 2021, again PMP 0006 and PMP 0612 were the most profitable ones, followed by TM 2440. The number of segments, for which the values of RoFTA are positive and greater than the low risk long term interest rate, suggesting that extraordinary profits are being generated, is highest in 2021 – 10 segments and 5 clusters (the 5 clusters combine 12 segments).
The data collection scheme used in Bulgaria is Census and the data is collected from each vessel. Clusters are not used for data collection purposes, but for the reporting of economic and social data from segments with less than 5 vessels.
The clustering is based on the aggregation of segments with a fishing technique similar to other segments.
Clustering scheme is explained below.
The segments DFN 1218, DFN 1824 and DFN 2440 are reported as DFN 1218, because the number of vessels in DFN 1824 is 2 and in DFN 2440 there is only 1 vessel.
The segments PS 0006 and PS 0612 are reported as PS 0006, because the number of vessels in PS 0612 is 3.
The segments PGP 0612 and PGP 1218 are reported as PGP 0612, because in PGP 1218 there is only 1 vessel.
The segments TBB 0612, TBB 1218 and TBB 1824 are reported as TBB 1218, because in TBB 0612 there is only 1 vessel and in TBB 1218 and TBB 1824 there are 2 vessels in each segment.
The segments PMP 1218 and PMP 1824 are reported as PMP 1218, because in PMP 1824 there is only 1 vessel.
All the segments with less than 5 vessels are marked with *.

RoFTA is compared against a Target Reference Point (TRP). For this exercise, the 5-year average of the risk-free long-term interest rate for each year was used:

- the average of the risk-free long-term interest rate for the period 2014-2018 was used for the calculation for 2019 – 2.12%;
- the average of the risk-free long-term interest rate for the period 2015-2019 was used for the calculation for 2020 – 1.54%;
- the average of the risk-free long-term interest rate for the period 2016-2020 was used for the calculation for 2021 – 1.09%.

Table 16. Return on Fixed Tangiable Assets (RoFTA)

Fleet segment	**Income from landings + other income**	**Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs**	**Net profit**	**Fleet capital asset value (vessel replacement value + estimated value of fishing rights)**	**RoFTA**	**RoFTA-risk free long term interest rate[1]**

Values for 2019 (€'000)						
DFN 0006	60.47	83.23	-25.09	717.43	-3.50%	-5.62%
DFN 0612	243.31	242.23	-9.01	2121.29	-0.42%	-2.54%
DFN 1218	113.33	113.29	-40.80	1247.55	-3.27%	-5.39%
DFN 2440* (clustered with DFN 1824)	-	-	-	-	-	-
FPO 0006* (clustered with FPO 0612)	-	-	-	-	-	-
FPO 0612	119.56	107.38	8.50	217.26	3.91%	1.79%
HOK 0006	3.59	3.50	-0.32	46.36	-0.69%	-2.81%
HOK 0612	8.35	11.58	-3.23	176.40	-1.83%	-3.95%
PGP 0006	4.08	2.14	1.94	15.08	12.84%	10.72%
PGP 0612	2.85	3.81	-0.96	126.34	-0.76%	-2.88%
PMP 0006	940.26	172.15	765.12	228.43	334.94%	332.82%
PMP 0612	1496.99	381.12	1110.21	974.47	113.93%	111.81%
PMP 1218	657.13	372.36	245.13	1518.75	16.14%	14.02%
PMP 1824	424.17	261.92	137.90	1290.22	10.69%	8.57%
PS 0006	39.25	21.74	17.43	231.70	7.52%	5.40%
PS 0612* (clustered with PS0006)	-	-	-	-	-	-
PS 1824* (clustered with PS0006)	-	-	-	-	-	-

TBB 0612* (clustered with TBB 1218)	-	-	-	-	-	-
TBB 1218	482.21	192.21	270.83	1119.47	24.19%	22.07%
TBB 1824*(clustered with TBB 1218)	-	-	-	-	-	-
TM 0612*(clustered with TM 1218)	-	-	-	-	-	-
TM 1218	703.78	487.99	171.46	1943.18	8.82%	6.70%
TM 1824	297.54	196.21	97.75	939.24	10.41%	8.29%
TM 2440	1196.58	475.18	712.44	1746.57	40.79%	38.67%
Fleet segment	**Income from landings + other income**	**Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs**	**Net profit**	**Fleet capital asset value (vessel replacement value + estimated value of fishing rights)**	**RoFTA**	**RoFTA-risk free long term interest rate[2]**
Values for 2020 (€'000)						
DFN 0006	105.54	105.77	-5.14	838.57	-0.61%	-2.15%
DFN 0612	294.57	241.74	25.03	2811.75	0.89%	-0.65%
DFN 1218	588.68	441.36	73.37	2315.11	3.17%	1.63%
DFN 1824* (clustered with DFN 1218)	-	-	-	-	-	-
DFN 2440* (clustered with DFN 1218)	-	-	-	-	-	-

FPO 0006* (clustered with FPO 0612)	-	-	-	-	-	-
FPO 0612	123.84	98.66	21.66	286.64	7.56%	6.02%
HOK 0006	0.92	3.46	-2.53	39.98	-6.34%	-7.88%
HOK 0612	28.09	37.69	-14.51	289.75	-5.01%	-6.55%
HOK 1218* (clustered with HOK 0612)	-	-	-	-	-	-
PGP 0006	8.66	3.93	4.33	14.57	29.71%	28.17%
PGP 0612	8.36	5.16	3.07	198.38	1.55%	0.01%
PGP 1218* (clustered with PGP 0612)	-	-	-	-	-	-
PMP 0006	445.91	224.03	219.50	205.16	106.99%	105.45%
PMP 0612	1305.30	307.37	989.88	906.21	109.23%	107.69%
PMP 1218	516.63	363.01	41.82	2241.42	1.87%	0.33%
PMP 1824* (clustered with PMP 1218)	-	-	-	-	-	-
PS 0006	6.62	4.46	2.14	21.27	10.05%	8.51%
PS 0612* (clustered with PS 0006)	-	-	-	-	-	-
TM 0612* (clustered with TM 1218)	-	-	-	-	-	-
TBB 1218* (clustered with TM 1218)	-	-	-	-	-	-

TM 1218	569.56	384.14	133.34	1631.90	8.17%	6.63%
TM 1824	323.55	256.95	26.19	1504.72	1.74%	0.20%
TM 2440	873.77	510.46	341.07	1291.65	26.41%	24.87%
Fleet segment	**Income from landings + other income**	**Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs**	**Net profit**	**Fleet capital asset value (vessel replacement value + estimated value of fishing rights)**	**RoFTA**	**RoFTA-risk free long term interest rate[3]**
Values for 2021 (€'000)						
DFN 0006	162.20	108.57	50.21	938.54	5.35%	4.26%
DFN 0612	345.22	254.30	44.32	2584.00	1.72%	0.63%
DFN 1218	435.65	352.78	48.87	1813.04	2.70%	1.61%
DFN 1824* (clustered with DFN 1218)	-	-	-	-	-	-
DFN 2440* (clustered with DFN 1218)	-	-	-	-	-	-
FPO 0612	155.10	91.86	60.28	167.28	36.04%	34.95%
HOK 0006	0.52	2.21	-1.69	31.44	-5.36%	-6.45%
HOK 0612	0.95	3.55	-2.63	72.09	-3.64%	-4.73%
PGP 0006	6.00	3.24	2.50	18.15	13.77%	12.68%
PGP 0612	67.04	45.66	16.38	192.76	8.50%	7.41%
PGP 1218* (clustered with PGP 0612)	-	-	-	-	-	-
PMP 0006	649.64	170.87	475.15	170.77	278.23%	277.14%
PMP 0612	1372.99	403.73	959.19	918.05	104.48%	103.39%

PMP 1218	618.64	358.83	210.76	1528.69	13.79%	12.70%
PMP 1824* (clustered with PMP 1218)	-	-	-	-	-	-
PS 0006	4.69	2.06	1.77	19.68	9.02%	7.93%
PS 0612* (clustered with PS 0006)	-	-	-	-	-	-
TBB 0612* (clustered with TBB 1218)	-	-	-	-	-	-
TBB 1218	214.92	119.73	95.19	403.66	23.58%	22.49%
TBB 1824* (clustered with TBB 1218)	-	-	-	-	-	-
TM 0612	81.07	36.93	43.83	209.63	20.91%	19.82%
TM 1218	1253.54	566.14	659.44	1778.02	37.09%	36.00%
TM 1824	827.56	343.19	453.32	1950.61	23.24%	22.15%
TM 2440	2352.43	753.24	1575.62	2054.64	76.69%	75.60%

* Segments with * are with less than 5 vessels and the data is clustered with data of the most similar segment because of confidentiality.
Data on direct subsidies are excluded from the calculation.
[1] average risk-free long-term interest rate for Bulgaria for the period 2014-2018 (source: European Central Bank) – 2.12% is used for the calculation of the indicator for 2019.
[2] average risk-free long-term interest rate for Bulgaria for the period 2015-2019 (source: European Central Bank) – 1.54% is used for the calculation of the indicator for 2020.
[3] average risk-free long-term interest rate for Bulgaria for the period 2016-2020 (source: European Central Bank) – 1.09% is used for the calculation of the indicator for 2021.

Table 17. Return on Fixed Tangiable Assets (RoFTA) for 2019, 2020 and 2021.

RoFTA			
SEGMENT	2019	2020	2021
DFN 0006	-3.50%	-0.61%	5.35%
DFN 0612	-0.42%	0.89%	1.72%
DFN 1218	-3.27%	3.17%	2.70%
FPO 0612	3.91%	7.56%	36.04%
HOK 0006	-0.69%	-6.34%	-5.36%
HOK 0612	-1.83%	-5.01%	-3.64%
PGP 0006	12.84%	29.71%	13.77%
PGP 0612	-0.76%	1.55%	8.50%
PMP 0006	334.94%	106.99%	278.23%
PMP 0612	113.93%	109.23%	104.48%
PMP 1218	16.14%	1.87%	13.79%
PMP 1824	10.69%	-	-
PS 0006	7.52%	10.05%	9.02%
TBB 1218	24.19%	-	23.58%
TM 0612	-	-	20.91%
TM 1218	8.82%	8.17%	37.09%
TM 1824	10.41%	1.74%	23.24%
TM 2440	40.79%	26.41%	76.69%

Table 17 shows the RoFTA values for 2019, 2020 and 2021. All the values are calculated in accordance with the Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries (COM (2014) 545 final). Data on subsidies were excluded from the calculation. The meaning of the colours used in the table are: RoFTA ≥ TRP "in balance"; > 0 RoFTA ≤ TRP "insufficiently profitable" and RoFTA < 0 "out of balance", where TRP is the 5-year average of the risk-free long-term interest rate.
Significant fluctuations of RoFTA indicator are observed for the segments PMP 0006, PMP 0612, PMP 1218, FPO 0612, PGP 0006, TM 1218, TM 1824 and TM 2440.
In both segments with the largest number of fishing vessels (DFN 0006 and DFN 0612), the rate of return on fixed tangiable assets increased a bit in 2021, compared to the previous two years. RoFTA was a negative value in 6 segments in 2019, 3 segments in 2020 and 2 segments in 2021. The RoFTA values for the other segments show overcapitalisation, which in the long run also makes them economically ineffective.

F.2.2. Ratio between current revenue and break-even revenue (CR/BER).

For 2019-2021 the indicator CR/BER is calculated in the short and long term-**Table 18.**
In the short term, in 2019 the value of the indicator in 11 of the segments representing 32% of the active fleet of the Republic of Bulgaria has a indicator value greater than 1. In these segments, sufficient income is generated to cover variable, fixed and capital costs and are considered profitable, with potential undercapitalisation. For 4 segments (HOK 0006, DFN 0612, DFN 1218 and PGP 0612), this ratio is positive but below 1. In these segments, insufficient income is generated to cover all costs and categorized as non-profitable with a potential overcapitalisation. In view of the long-term profitability

of the segments, the calculation also includes the potential loss of benefits - calculated as a product of the value of the capital assets and the average interest rate on long-term low risk investments for Bulgaria for the period 2014-2018. They are added to the fixed costs. The lowest value of the CR/BER[1] ratio in 2019 is the DFN 0006 and HOK 0612 segments, followed by PGP 0612. These results show that investing in these segments is with high risk in the long-term.
The 2020 results show that 12 of the segments are profitable and able to cover their costs. The value of the CR/BER indicator for these segments is higher than 1. The highest indicator value is observed for segments PMP 0612, PMP 0006, TM 2440. Calculations are also made for the CR/BER[1] ratio for 2020 with loss of benefits included, which is calculated as a product of the value of the capital assets and the average interest rate on long-term low risk investments for Bulgaria for the period 2015-2019. In long-term, the indicator has a positive value of over 1 in 11 of the segments, including 29% (352 vessels) of the fleet. For 2 segments (DFN 0006 and DFN 0612), this ratio is positive but below 1 and a negative value is observed for the other 2 segments (HOK 0006 and HOK 0612), which are unprofitable in short-term and in long-term.
In the short term, in 2021 the value of the indicator in 10 segments and in the 5 clusters, which include 12 segments representing 97% of the active fleet of the Republic of Bulgaria has an indicator value greater than 1. In these segments, sufficient income is generated to cover variable, fixed and capital costs and are considered profitable, with potential undercapitalisation. For 2 segments (HOK 0006 and HOK 0612), this ratio is negative value In these segments, insufficient income is generated to cover all costs and categorized as non-profitable with a potential overcapitalisation. In view of the long-term profitability of the segments, the calculation also includes the potential loss of benefits - calculated as a product of the value of the capital assets and the average interest rate on long-term low risk investments for Bulgaria for the period 2016-2020. They are added to the fixed costs. The lowest value of the CR/BER[1] ratio in 2021 is the HOK 0006 segment, followed by HOK 0612. These results show that investing in these segments is with high risk in the long-term.

Table 18. Ratio between current revenue and break-even revenue 2019, 2020 and 2021 (€'000)

2019 **Fleet segment**	**Current revenue (CR)** = Income from landings + other income	**Fixed costs** = Non variable costs + depreciation	**Fixed costs[1]** = Non variable costs + depreciation + opportunity cost of capital	**Variable costs** = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	**BER** = (Fixed Costs) / (1-[Variable costs / Current Revenue])	**BER[1]** = (Fixed Costs[1])/(1-[Variable costs / Current Revenue])	**CR / BER**	**CR / BER[1]**

DFN 0006	60.47	21.81	37.02	63.75	-402.29	-682.86	-0.15	-0.09
DFN 0612	243.31	60.83	105.80	191.50	285.63	496.80	0.85	0.49
DFN 1218	113.33	48.23	74.68	105.90	736.28	1140.05	0.15	0.10
DFN 2440* (clustered with DFN 1824)	-	-	-	-	-	-	-	-
FPO 0006* (clustered with FPO 0612)	-	-	-	-	-	-	-	-
FPO 0612	119.56	11.37	15.97	99.69	68.41	96.13	1.75	1.24
HOK 0006	3.59	1.65	2.63	2.27	4.46	7.13	0.80	0.50
HOK 0612	8.35	2.65	6.39	8.92	-38.73	-93.32	-0.22	-0.09
PGP 0006	4.08	0.14	0.46	2.00	0.27	0.90	15.02	4.53
PGP 0612	2.85	1.19	3.87	2.62	14.61	47.46	0.20	0.06
PMP 0006	940.26	14.32	19.17	160.82	17.28	23.12	54.42	40.67

PMP 0612	1496.99	28.60	49.26	358.18	37.59	64.75	39.82	23.12
PMP 1218	657.13	51.28	83.48	360.72	113.69	185.07	5.78	3.55
PMP 1824	424.17	27.58	54.93	258.69	70.70	140.81	6.00	3.01
PS 0006	39.25	0.16	5.08	21.66	0.37	11.32	107.52	3.47
PS 0612* (clustered with PS0006)	-	-	-	-	-	-	-	-
PS 1824* (clustered with PS0006)	-	-	-	-	-	-	-	-
TBB 0612* (clustered with TBB 1218)	-	-	-	-	-	-	-	-
TBB 1218	482.21	24.56	48.30	186.82	40.10	78.84	12.03	6.12
TBB 1824*(clustered	-	-	-	-	-	-	-	-

with TBB 1218)								
TM 0612*(clustered with TM 1218)	-	-	-	-	-	-	-	-
TM 1218	703.78	63.49	104.68	468.83	190.18	313.58	3.70	2.24
TM 1824	297.54	10.31	30.22	189.48	28.38	83.21	10.48	3.58
TM 2440	1196.58	21.48	58.50	462.67	35.01	95.38	34.17	12.54
2020 Fleet segment	**Current revenue (CR)** = Income from landings + other income	**Fixed costs** = Non variable costs + depreciation	**Fixed costs[1]** = Non variable costs + depreciation + opportunity cost of capital	**Variable costs** = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	**BER** = (Fixed Costs) / (1-[Variable costs / Current Revenue])	**BER[1]** = (Fixed Costs[1])/(1-[Variable costs / Current Revenue])	**CR / BER**	**CR / BER[1]**
DFN 0006	105.54	24.42	37.34	86.25	133.66	204.32	0.79	0.52
DFN 0612	294.57	68.13	111.43	201.40	215.42	352.33	1.37	0.84
DFN 1218	588.68	98.40	134.05	416.91	337.23	459.42	1.75	1.28

DFN 1824* (clustered with DFN 1218)	-	-	-	-	-	-	-	-
DFN 2440* (clustered with DFN 1218)	-	-	-	-	-	-	-	-
FPO 0006* (clustered with FPO 0612)	-	-	-	-	-	-	-	-
FPO 0612	123.84	13.07	17.48	89.11	46.61	62.35	2.66	1.99
HOK 0006	0.92	1.62	2.23	1.84	-1.63	-2.25	-0.57	-0.41
HOK 0612	28.09	9.37	13.83	33.23	-51.26	-75.66	-0.55	-0.37
HOK 1218* (clustered with HOK 0612)	-	-	-	-	-	-	-	-

PGP 0006	8.66	1.36	1.58	2.98	2.07	2.41	4.18	3.59
PGP 0612	8.36	0.62	3.67	4.67	1.40	8.32	5.97	1.00
PGP 1218* (clustered with PGP 0612)	-	-	-	-	-	-	-	-
PMP 0006	445.91	12.63	15.79	213.78	24.26	30.33	18.38	14.70
PMP 0612	1305.30	30.37	44.32	285.05	38.85	56.71	33.60	23.02
PMP 1218	516.63	128.29	162.81	346.51	389.61	494.44	1.33	1.04
PMP 1824* (clustered with PMP 1218)	-	-	-	-	-	-	-	-
PS 0006	6.62	0.65	0.98	3.83	1.55	2.33	4.28	2.85
PS 0612* (clustered with PS 0006)	-	-	-	-	-	-	-	-

TM 0612* (clustered with TM 1218)	-	-	-	-	-	-	-	-
TBB 1218* (clustered with TM 1218)	-	-	-	-	-	-	-	-
TM 1218	569.56	69.30	94.43	366.92	194.79	265.42	2.92	2.15
TM 1824	323.55	61.03	84.21	236.32	226.41	312.37	1.43	1.04
TM 2440	873.77	24.14	44.03	508.57	57.75	105.34	15.13	8.29
2021 Fleet segment	**Current revenue (CR)** = Income from landings + other income	**Fixed costs** = Non variable costs + depreciation	**Fixed costs[1]** = Non variable costs + depreciation + opportunity cost of capital	**Variable costs** = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	**BER** = (Fixed Costs) / (1-[Variable costs / Current Revenue])	**BER[1]** = (Fixed Costs[1])/(1-[Variable costs / Current Revenue])	**CR / BER**	**CR / BER[1]**
DFN 0006	162.20	29.62	39.85	82.37	60.18	80.96	2.70	2.00

DFN 0612	345.22	84.79	112.96	216.10	226.71	302.02	1.52	1.14
DFN 1218	435.65	47.52	67.28	339.26	214.77	304.08	2.03	1.43
DFN 1824*	-	-	-	-	-	-	-	-
DFN 2440*	-	-	-	-	-	-	-	-
FPO 0612	155.10	10.69	12.52	84.12	23.37	27.35	6.64	5.67
HOK 0006	0.52	0.81	1.16	1.39	-0.48	-0.69	-1.07	-0.76
HOK 0612	0.95	1.29	2.08	2.28	-0.92	-1.49	-1.03	-0.64
PGP 0006	6.00	0.62	0.82	2.88	1.20	1.58	5.01	3.80
PGP 0612	67.04	8.40	10.50	42.26	22.72	28.40	2.95	2.36
PGP 1218*	-	-	-	-	-	-	-	-
PMP 0006	649.64	16.39	18.25	158.11	21.66	24.12	29.99	26.93
PMP 0612	1372.99	35.91	45.92	377.89	49.55	63.35	27.71	21.67
PMP 1218	618.64	64.78	81.44	343.10	145.44	182.86	4.25	3.38
PMP 1824*	-	-	-	-	-	-	-	-
PS 0006	4.69	1.05	1.27	1.86	1.75	2.10	2.69	2.23

PS 0612*	-	-	-	-	-	-	-	-
TBB 0612*	-	-	-	-	-	-	-	-
TBB 1218	214.92	7.03	11.43	112.70	14.78	24.03	14.54	8.94
TBB 1824*	-	-	-	-	-	-	-	-
TM 0612	81.07	4.35	6.64	32.89	7.33	11.17	11.07	7.26
TM 1218	1253.54	52.54	71.92	541.56	92.50	126.63	13.55	9.90
TM 1824	827.56	47.42	68.69	326.82	78.38	113.52	10.56	7.29
TM 2440	2352.43	37.33	59.73	739.48	54.45	87.11	43.20	27.00

Data on direct subsidies are excluded from the calculation.
[1] adding opportunity costs to fixed costs.
* Segments with * are with less than 5 vessels and the data is clustered with data of the most similar segment because of confidentiality.
Indicator values for CR / BER for the period 2019-2021 are presented in **Table 19.**

Table 19. Ratio between current revenue and break-even revenue (CR/BER and CR/BER[1]) for 2019, 2020 and 2021

Ratio between current revenue and break-even revenue (CR/BER) for 2019																	
Segment	DFN 0006	DFN 0612	DFN 1218	FPO 0612	HOK 0006	HOK 0612	PGP 0006	PGP 0612	PMP 0006	PMP 0612	PMP 1218	PMP 1824	PS 0006	TBB 1218	TM 1218	TM 1824	TM 2440
CR/BER	-0.15	0.85	0.15	1.75	0.80	-0.22	15.02	0.20	54.42	39.82	5.78	6.00	107.52	12.03	3.70	10.48	34.17
CR/BER[1]	-0.09	0.49	0.10	1.24	0.50	-0.09	4.53	0.06	40.67	23.12	3.55	3.01	3.47	6.12	2.24	3.58	12.54

Ratio between current revenue and break-even revenue (CR/BER) for 2020															
Segment	DFN 0006	DFN 0612	DFN 1218	FPO 0612	HOK 0006	HOK 0612	PGP 0006	PGP 0612	PMP 0006	PMP 0612	PMP 1218	PS 0006	TM 1218	TM 1824	TM 2440
CR/BER	0.79	1.37	1.75	2.66	-0.57	-0.55	4.18	5.97	18.38	33.60	1.33	4.28	2.92	1.43	15.13
CR/BER[1]	0.52	0.84	1.28	1.99	-0.41	-0.37	3.59	1.00	14.70	23.02	1.04	2.85	2.15	1.04	8.29

Ratio between current revenue and break-even revenue (CR/BER) for 2021																	
Segment	DFN 0006	DFN 0612	DFN 1218	FPO 0612	HOK 0006	HOK 0612	PGP 0006	PGP 0612	PMP 0006	PMP 0612	PMP 1218	TM 0612	PS 0006	TBB 1218	TM 1218	TM 1824	TM 2440
CR/BER	2.70	1.52	2.03	6.64	-1.07	-1.03	5.01	2.95	29.99	27.71	4.25	11.07	2.69	14.54	13.55	10.56	43.20
CR/BER[1]	2.00	1.14	1.43	5.67	-0.76	-0.64	3.80	2.36	26.93	21.67	3.38	7.26	2.23	8.94	9.90	7.29	27.00

Status: green (in balance) ≥1; red (out of balance) < 1.0 (according to the 2014 Balance Indicator Guidelines)

Table 20. Direct subsidies for the period 2014 - 2021 (€'000)

Direct subsidies for 2014, 2015, 2016, 2017, 2018, 2019, 2020 and 2021 (€'000).						
Fleet segment	**2014**	**2015, 2016, 2017**	**2018**	**2019**	**2020**	**2021**
DFN 0006	0,1	0	0	0	0,15	1,84
DFN 0612	0	0	18,28	0	9,18	0,12
DFN 1218	0	0	0	0	109,55	0
DFN 1824	0	0	0	0	20,62	0
DFN 2440	0	0	0	0	21,07	0
HOK 1218	0	0	0	0	15,33	0
PMP 0612	0,26	0	0	0	7,84	0
PMP 1218	0	0	0	0	72,11	41,69
PMP 1824	0	0	0	0	55,72	0
PGP 0006	0,26	0	0	0	0	0,1
PGP 1218	13	0	0	0	0	0
TM 1218	0	0	0	0	126,05	0
TM 1824	0	0	0	0	67,70	16,06
TM 2440	0	0	0	0	167,19	0

F.3. Biological indicators

Status of priority stocks

During the eighth meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS), which was held online from 4 to 8 July 2022 advice was provided on the status of seven stocks in the Black Sea: Black Sea turbot (*Scophthalmus maximus*), horse mackerel (*Trachurus mediterraneus ponticus*), piked dogfish (*Squalus acanthias*), whiting (*Merlangius merlangus*), red mullet (Mullus barbatus), rapa whelk (Rapana venosa) and Black Sea anchovy (*Engraulis encrasicolus ponticus*). Of these, qualitative precautionary advice was given for Black Sea anchovy, horse mackerel, piked dogfish and rapa whelk, as the assessments were considered indicative of trends; more comprehensive quantitative advice was provided for turbot, red mullet and whiting. No advice was provided for sprat: the finalization of the benchmark assessment and the status of the stock for the current reference year was postponed to September/October to be analyzed with the newly prepared dataset.
A synthesis of the advice and the recommendations provided by the eighth meeting of SGSABS for each species is presented below:

Turbot: the assessment of the turbot stock performed in 2021 was updated according to the assumptions and model settings agreed upon at the benchmark session of 2019, with one extra year of data. The SGSABS recalled that the eighth session of the WGBS in 2019 and the ninth session of the WGBS in 2021 had considered the reference points emerging from the benchmark assessment as needing revision – a roadmap was proposed for this. Based on this recommendation and in line with the results of the Workshop on Turbot Reference Points, the assessment outputs were used to estimate BMSY instead of Bpa and Blim. The updated assessment confirmed that F/FMSY is higher than 1 (F/FMSY = 1.26), with decreasing trends over the years observed. B/BMSY is lower than 1 (B/BMSY = 0.61), owing to the revision of reference points, although the increasing trend in SSB was confirmed. The stock was considered in overexploitation and overexploited. The advice was immediate action to ensure a reduction in fishing mortality. The SGSABS reiterated the need to improve the input data (notably the standardization of the existing demersal surveys and their expansion to all Black Sea countries) before the next benchmark.
Piked dogfish: The problems encountered in the preparation of the input data for the piked dogfish assessment, including issues related to the creation of catch-at-age matrices during the seventh meeting of the Subregional Group on Stock Assessment in the Black Sea, were not solved completely. Although some improvements were made to the data, the significant deviation observed between the landings, catch-at-age, and weight-at-age data, and very poor correlation between catch and survey data, prevented the age structured model (a4a) proposed from producing reliable results. Likewise, the production model (SPICT) that was proposed as another option produced very high uncertainty in the results (especially in terms of relative and absolute F). Identified issues included: i) the need for a better understanding of life-history parameters; ii) short time series of landings data; iii) insufficient and noisy survey data; v) the importance of obtaining information on smaller individuals; v) the need for harmonization of ageing through a workshop; and v) the current disregard of the data collected through the discards monitoring programs. The Group agreed to draft a roadmap including suggestions for the improvement of input data and a plan for the performance of the assessment by focusing on production models not requiring age structure. As none of the trials made by using a4a and SPICT were validated, the SGSABS agreed to provide precautionary qualitative advice based on previous and new information. The population was thus still considered depleted, and F should be reduced by more than 90 percent and a recovery plan should be established.

Horse mackerel: Some minor differences detected in the data were corrected based on the final data sets presented by the countries during the data preparation meeting. The missing data from the Russian Federation was estimated by averaging the last three years of available landings. Upon the recommendation of the SGSABS in 2021, the Turkish commercial CPUE index was standardized, and the assessment performed in 2021 was updated with one extra year of data. The patterns observed in the retrospective analysis of the stock indicators were deemed in need of further detailed analyses in future assessments. Due to the problems associated with the reference points used and based on previous assessment results, the status of the stock was considered in overexploitation on a precautionary basis; qualitative advice was thus provided. Horse mackerel was thus deemed to be in overexploitation, and the advice was to reduce fishing mortality on a precautionary basis. The Group agreed on a roadmap to improve input data.

Red mullet: The assessment performed in 2021 was updated, adding one extra year to the input data. The maturity ogive used in the previous assessment was discussed, considering the neighbouring stocks in the Mediterranean, and a vector suggesting an earlier maturation was accepted and applied in the current assessment. The outputs of the model revealed a stock in overexploitation (F/FMSY = 1.2) for which F should be reduced. A plan was made to further improve the quality of input data and the assessment, including: i) collating the country-by-country LFDs; ii) using more flexible models (e.g. catch-at-age a4a) that better handlethe variability in selectivity; iii) the establishment of a standardized genetic study to investigate the mixing of *Mullus barbatus* and *Mullus surmuletus* in the catches of all Black Sea countries; and iv) the harmonization of scientific survey protocols and standardization of the survey data.

Whiting: The input data for this assessment were improved, and trawl survey tuning indices provided by Romania were revised, resulting in a significantly improved assessment, with all the models run consistently revealing fishing mortality rates over eight times higher than the target F. In order to further improve the quality of input data and the assessment, the need for LFD data disaggregated by country was underlined, as was the integration of "discard data" and the trialling of alternative models offering more flexibility in the parameterization. The stock was considered to be in overexploitation and the advice was to reduce F. The poor internal consistency and the marked pattern in the residuals resulted in the removal of Turkish survey data, as in the 2021 assessment. Discard data generated by the GFCM's discard monitoring program was not included in the assessment (only two years were available), and this exclusion was highlighted as an important drawback. Future work should therefore delve into i) the use of discard rates-at-length; ii) an in-depth analysis of survey indices; and iii) work towards the possibility of standardizing nominal CPUEs.

Rapa whelk: Very significant improvements were noted in the assessment of this species. Two modelling length-based approaches were used, the principal one being SS3, with the supporting outcomes of the length-based spawning potential ratio method (LBSPR). The two modelling approaches gave very consistent results:

- F and relative F decreased in both models (Current F3-8 from SS3 was 0.30 and F/F0.1=1.0);
- SSB and R estimated by SS3 continued decreasing;
- spawning potential ratio (SPR) estimated by SS3 and LBSPR were 0.51 and 0.63, respectively; and
- all indices used showed the same decreasing signal.

However, the SS3 model suffered from a lack of small individuals, which were underrepresented in the survey data due to the very high selectivity of the net used. Both the data preparation meeting and the SGSABS identified and underlined the need to carry out a benchmark assessment for this stock. Among others, methods to estimate CPUE among countries should be harmonized, catch at length should be provided by 5mm bins and selectivity by fleet should be specified.

Black Sea anchovy: At the benchmark session held in 2021, the attempt to assess the stock with the revised input data set failed; the SAM model did not converge, and the XSA produced unrealistically high SSB and recruitment. A new analysis was performed during the data preparation meeting with a new data set compiled during the intersessional period, which improved the quality of the index, facilitating the use of SAM. The assessment performed using SAM was found to be robust; however, the Group decided to use two additional models (a4a and SPiCT). The Group agreed on a roadmap to guide the work towards the finalization of the Black Sea anchovy benchmark.
European sprat: The input data were found to be too noisy, and the noise, particularly in the index data, could only be handled at the cost of fixing the process error, which meant sacrificing the most important features of the model used. The strange selectivity pattern, constantly producing very high F in the older ages, was also underlined as a possible artifact of the SAM model, which was found to be in need of more in-depth model diagnostics. The exploration of additional complementary models (e.g. production models) was suggested. A new, standardized CPUE time series for Türkiye was made available, as foreseen by the roadmap agreed upon in 2021, but was yet to be included in the current SAM assessment. Additional time was deemed necessary for the finalization of the benchmark and the provision of advice in order to accommodate all issues. The SGSABS proposed performing this final session in September/October 2022 (at least one month in advance of the GFCM annual session).

F.3.1. Sustainable harvest indicator (SHI)

The Bulgarian marine fisheries are performed in the Black Sea. From the catches of fish, only the turbot (*Psetta maxima*) and sprat (*Sprattus sprattus*) are species under quotas and are included in the National Programme for the collection, management and use of fisheries data under the Data Collection Framework (DCF). The applied quotas are based on precautionary advice because it is not possible to calculate the biomass for the whole basin of the Black Sea. During 2020 the allocated national quota was 75 t for turbot and sprat – 8 032.5 t (Council Regulation (EU) 2021/90 of 28 January 2021 fixing for 2021 the fishing opportunities for certain fish stocks and groups of fish stocks applicable in the Mediterranean and Black Seas).
The biological indicator Sustainable harvest indicator reflects the magnitude in which a fleet segment depends on the stocks object to overfishing. In the current context “overfished catch” means that fishing of the stocks exceeds the value Fmsy, i.e. percentage of death from fishing corresponds to maximum sustainable catch. The calculation of the Sustainable indicator is done following the guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries (COM (2014) 545 final) and landings data reported under DCF.
F and Fmsy data, which was used for the calculations for 2019, was taken from the Fifth meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS). For the calculations of SHI indicator only the accepted stock assessments by species were used. The F and Fmsy data was available for the following species in the Report from the Fifth meeting of the Subregional Group on Stock Assessment in the Black Sea in the following pages: turbot – p.54, Black Sea anchovy – p.55 and whiting – p.59.
The results for the estimated value of the Sustainable harvest indicator for 2019 are shown in **Table 21**. SHI indicator values were available for all 24 segments, of which 23 could not be used meaningfully to assess the balance or imbalance because the indicator values are based on stocks that comprise less than 40% of the total value of landings by those fleet segments.

Table 21. Indicator for sustainable harvest for 2019.

FISHING TECHNIE	VESSEL LENGTH	TUR	ANE	WHG	Sum of the values of species with accepted stock assessments in the report of Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)	Total landing value for the fleet segment	Ratio between the SUM of the values of langings included in the SHI and Total landings value	SHI indicator
DFN	0006	1636.446	77.52	61.62	1775.586	**50502.53**	3.52	3.03
DFN	0612	46303.53	37.485	384.493	46725.5038	**125497.3**	37.23	3.14
DFN	1218	34180.47			34180.468	**92392.48**	36.99	3.15
DFN	**2440**	8796.144			8796.144	**20934**	**42.02**	**3.15**
FPO	0006				0	**960.914**	0.00	0.00
FPO	0612		1457.937	720.48	2178.417	**62082.4**	3.51	1.43
HOK	0006				0	**1034.759**	0.00	0.00
HOK	0612	1637.63	0.51		1638.1404	**5026.095**	32.59	3.15
PGP	0006				0	**4078.285**	0.00	0.00
PGP	0612				0	**2852.042**	0.00	0.00
PMP	0006	1633.814		23.7	1657.514	**933551.4**	0.18	3.14
PMP	0612	17761.53	17.85	2.37	17781.7456	**1494206**	1.19	3.15
PMP	1218	66910.05		831.87	67741.916	**649891.6**	10.42	3.14
PMP	1824	54227.75	19.38	195.92	54443.054	**374938**	14.52	3.15
PS	0006		185.64		185.64	**6561.211**	2.83	1.18
PS	0612		17.136		17.136	**866.957**	1.98	1.18
PS	1824	4869.2	5652.33		10521.53	**31822**	33.06	2.09
TBB	0612	3892.07			3892.07	**27141.56**	14.34	3.15
TBB	1218	28604.91			28604.905	**335392.9**	8.53	3.15
TBB	1824	8772.456			8772.456	**62413.46**	14.06	3.15
TM	0612	3677.43		1609.467	5286.8974	**24779.2**	21.34	2.79
TM	1218	53974.1	8606.25	6692.09	69272.435	**679005**	10.20	2.79
TM	1824	6837.278	1593.75	537.2	8968.228	**297537.9**	3.01	2.73
TM	2440	17240.78	18336.03	181.7	35758.5144	**1186055**	3.01	2.13
Current values (F_{curr})		0.82	0.47	0.78				
Ref. point (F_{MSY} or $F_{0.1}$)		0.26	0.4	0.4				
F_{curr}/F_{unique}		**3.154**	**1.175**	**1.950**				

Reference - Report from the Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)

F and Fmsy data, which was used for the calculations for 2020, was taken from the Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS) and the validated stock assessment forms (SAFs) available at https://www.fao.org/gfcm/data/safs/en/. For the calculations of SHI indicator only the accepted stock assessments by species were used. The F and Fmsy data was available for the following species in the Report from the Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS) in the following pages: turbot – p.3, red mullet – p.10, whiting – p.13, Rapa whelk – p.15.

In the report there is also available values of F and Fmsy for the European sprat - the current exploitation rate (E = 0.36, which corresponds to an F = 0.53) is smaller than EMSY (0.40, which corresponds to an F = 0.64), indicating that sprat in GSA 29 is being fished below EMSY. Since the stock status is cautiously defined as sustainably exploited, it was excluded from the calculations of SHI indicator,

because according to the guidance, this indicator reflects the extent to which a fleet segment is dependent on overfished stocks. Here, "overfished" means that a stock is fished above Fmsy, the fishing mortality rate corresponding to maximum sustainable yield.
The results for the estimated value of the Sustainable harvest indicator for 2020 are shown in **Table 22.** SHI indicator values were available for all 24 segments, of which 15 could not be used meaningfully to assess the balance or imbalance because the indicator values are based on stocks that comprise less than 40% of the total value of landings by those fleet segments.

Table 22. Indicator for sustainable harvest for 2020.

FISHING TECHNIQUE	VESSEL LENGTH	MUT	TUR	WHG	RPW	Sum of the values of species with accepted stock assessments in the report of Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)	Total landing value for the fleet segment	Ratio between the SUM of the values of langings included in the SHI and Total landings value	SHI indicator
DFN	0006	197.47	2174.091	61.06	855	3287.621	**84750.64**	4	1.67
DFN	0612	1566.383	43287.53	317.942	15315.52	60487.37735	**210754.1**	29	1.62
DFN	**1218**	58098.04	78811.45	633.132	75130.94	212673.5595	**298988.4**	**71**	**1.43**
DFN	1824	3766.49	16999.85	79.206	18267.74	39113.281	**109628.9**	36	1.45
DFN	**2440**	263.9	9821.037		5602.72	15687.657	**19979.08**	**79**	**1.55**
FPO	**0006**					0	**775.83**	0	0
FPO	0612	133.133		4.3		137.433	**71930.7**	0	1.42
HOK	**0006**					0	**924.689**	0	0
HOK	0612	3.64	448.1565			451.7965	**2073.181**	22	1.75
HOK	**1218**	10521.42	3312.258	23.22	3142.6	16999.498	**26020.37**	**65**	**1.34**
PGP	**0006**					0	**8664.814**	0	0
PGP	0612	436.8			555.94	992.74	**3231.234**	31	1.22
PGP	**1218**	698.88	2569.569		21.66	3290.109	**5132.234**	**64**	**1.64**
PMP	0006	115.57	949.77		130953.7	132019.04	**440248**	30	1.20
PMP	612	1235.78	9828.303	58.48	323400.4	334523.007	**1295435**	26	1.22
PMP	**1218**	35585.82	43318.85	1091.727	209609.9	289606.304	**362694.6**	**80**	**1.31**
PMP	**1824**	10473.19	23977.28		69857.3	104307.771	**147864.7**	**71**	**1.33**
PS	0006	91.637				91.637	**2496.46**	4	1.25
PS	0612	363.545				363.545	**4126.754**	9	1.25
TBB	**1218**	5921.37	3137.355		50923.04	59981.765	**60921.74**	**98**	**1.23**
TM	**0612**	14499.94	5475.45	2903.36		22878.75	**28566.57**	**80**	**2.08**
TM	**1218**	68831.13	45478.15	5312.65	81915.46	201537.3895	**461295**	**44**	**1.49**
TM	1824	51153.56	19011.85	1785.36	48482.3	120433.0693	**308073.4**	39	1.39
TM	2440	26561.26	11041.26	2164.62	9294.8	49061.9399	**865181.3**	6	1.60
Current values (F_{curr})		0.81	0.28	1.37	0.36				
Ref. point (F_{MSY} or $F_{0.1}$)		0.65	0.16	0.2	0.3				
F_{curr}/F_{unique}		**1.246**	**1.750**	**6.850**	**1.200**				
Reference - Report from the Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)									

For the calculations of SHI indicator for 2021 only the accepted stock assessments by species were used. The F and Fmsy data was available for the following species in the Report from the Eighth meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS) in the following pages: turbot – p.5, red mullet – p.12, whiting – p.13, Rapa whelk – p.17.
The results for the estimated value of the Sustainable harvest indicator for 2021 are shown in Table 19. SHI indicator values were available for all 24 segments, of which 15 could not be used meaningfully to assess the balance or imbalance because the indicator values are based on stocks that comprise less than 40% of the total value of landings by those fleet segments.

Table 23. Indicator for sustainable harvest for 2021

FISHING TECHNIQUE	VESSEL LENGTH	TUR	MUT	WHG	RPW	Sum of the values of species with accepted stock assessments in the report of Seventh meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)	Total value of landing of the fleet segment	Ratio between the SUM of the values of langings included in the SHI and Total value of landings of the segment	SHI indicator
DFN	0006	5431.833	1376.616	27.82	420	7256.269	145856.3057	5	1.25
DFN	0612	59163.77	4825.29	172.27	25084.6	89245.9262	272484.0178	33	1.20
DFN	**1218**	66800.53	61896.06	4075.095	38674	171445.6822	321311.7722	**53**	**1.32**
DFN	**1824**	16596.95	632.22	50.29	16835	34114.464	61047.414	**56**	**1.14**
DFN	2440	7929.9				7929.9	37181.7	21	1.26
FPO	0612		109.47			109.47	78405.46	0	1.16
HOK	0006					0	520.29	0	0
HOK	0612					0	941.218	0	0
PGP	**0006**				3575	3575	5998.237	**60**	**1.00**
PGP	**0612**	1948.32	24.6		5185	7157.92	13095.737	**55**	**1.07**
PGP	**1218**	4817.34	11058.93		18416	34292.27	52408.45	**65**	**1.09**
PMP	0006				86074	86074	648518.283	13	1.00
PMP	0612	15285.11	2536.26	879.54	202727	221427.905	1370640.994	16	1.05
PMP	**1218**	74459.09	85920.42	128.4	339841.5	500349.408	599539.598	**83**	**1.07**
PMP	1824	6058.206				6058.206	17137.846	35	1.26
PS	0006		9.84			9.84	3035.503	0	1.16
PS	0612		98.4			98.4	1489.6	7	1.16
TBB	**0612**				11377.5	11377.5	11377.5	**100**	**1.00**
TBB	**1218**	5559.84	1912.65		97007	104479.49	110785.27	**94**	**1.02**
TBB	1824	8535.78	3393.57		778	12707.35	61055.27	21	1.22
TM	**0612**	11118.79	17319.63	1568.62	1100	31107.039	77616.359	**40**	**1.53**
TM	1218	74067.64	202856.8	2586.725	142370	421881.133	1249924.814	34	1.16
TM	1824	45871.65	90579.66	829.25	88177.5	225458.06	806948.5	28	1.14
TM	2440	14387.27	63299.49	593.85	5570	83850.614	2343838.504	4	1.21
Current values (F_{curr})		**0.24**	**0.81**	**1.254**	**0.3**				
Ref. point (F_{MSY} or $F_{0.1}$)		**0.19**	**0.7**	**0.159**	**0.3**				
F_{curr}/F_{unique}		**1.263**	**1.16**	**7.886792**	**1**				
Reference - Report from the Eighth meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS)									

In **Table 24** are presented the segments for which the SHI could be used meaningfully to assess the balance or imbalance for at least one of the two years. SHI indicator was replaces by "NA" for those segments for which the stocks comprise less than 40% of the total value of landings during the year. In two of the segments in 2020 and one in 2021 there were no vessels, so the indicator is marked as "-" in the table.

For 4 of the segments, the value of the indicator for two consecutive years is above 1, which may be a sign of imbalance. These segments realized income, relying on fishing opportunities which are structurally set at higher levels than the levels of exploitation corresponding to the maximum sustainable catch. In all of these 4 segments there is a decrease in the value of the indicator for 2021. There are no segments for which the indicator was below 1 in 2019, 2020 or 2021.

Table 24. Indicator for sustainable harvest for 2019, 2020 and 2021

FISHING TECHNIQUE	VESSEL LENGTH	SHI indicator 2019	SHI indicator 2020	SHI indicator 2021
DFN	1218	NA	1.43	1.32
DFN	1824	NA	NA	1.14
DFN	2440	3.15	1.55	NA
HOK	1218	NA	1.34	-
PGP	0006	NA	NA	1.00
PGP	0612	NA	NA	1.07
PGP	1218	NA	1.64	1.09
PMP	1218	NA	1.31	1.07
PMP	1824	NA	1.33	NA
TBB	0612	NA	-	1.00
TBB	1218	NA	1.23	1.02
TM	0612	NA	2.08	1.53
TM	1218	NA	1.49	NA

F.3.2. Stocks-at-risk indicator

The stock-at-risk indicator was calculated for 2019, 2020 and 2021, according to the guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy and it was adjusted, in order to be consistent with the approach used by the EWG 22-15, according to which the turbot is excluded from the calculation, because Bulgaria does not have access to the total catches from the stock.
In 2019, in 2 segments the piked dogfish landings made up more than 10% from the total landings of the segment. The percentage of the catches of piked dogfish for each fleet segment was also calculated to assess if any of them is fishing more than 10% of the catches of the stock and in 3 of the segments the % of DGS landings was between 19% and 36%. The stocks-at-risk indicator was with value 1 for 4 segments in 2019.

Table 25. Stock-at-risk indicator calculations for 2019.

2019	% of DGS from all catches of the segment.	% of DGS catches by the segment from the catches of the whole fleet	SAR indicator
DFN 0006	0	1	0
DFN 0612	1	2	0
DFN 1218	3	19	1
DFN 2440	2	3	0
FPO 0006	0	0	0
FPO 0612	0	0	0
HOK 0006	41	1	1
HOK 0612	29	4	1
PGP 0006	0	0	0
PGP 0612	2	0	0
PMP 0006	0	0	0
PMP 0612	0	7	0
PMP 1218	0	19	1
PMP 1824	1	36	1
PS 0006	0	0	0
PS 0612	0	0	0
PS 1824	0	0	0
TBB 0612	0	0	0
TBB 1218	0	0	0
TBB 1824	0	2	0
TM 0612	0	0	0
TM 1218	0	5	0
TM 1824	0	0	0
TM 2440	0	0	0

In 2020, in 4 segments the piked dogfish landings made up more than 10% from the total landings of the segment. The percentage of the catches of piked dogfish for each fleet segment was also calculated to assess if any of them is fishing more than 10% of the catches of the stock and in 4 of the segments the % of DGS landings was between 10% and 38%.
The stocks-at-risk indicator was with value 1 for 6 segments in 2020.

Table 26. Stock-at-risk indicator calculations for 2020.

2020	% of DGS from all catches of the segment.	% of DGS catches by the segment from the catches of the whole fleet	SAR indicator
DFN 0006	0	0	0
DFN 0612	3	8	0
DFN 1218	2	11	1
DFN 1824	19	38	1
DFN 2440	1	0	0
FPO 0006	0	0	0
FPO 0612	0	0	0
HOK 0006	47	1	1
HOK 0612	30	1	1
HOK 1218	18	10	1
PGP 0006	0	0	0
PGP 0612	0	0	0
PGP 1218	0	0	0
PMP 0006	0	0	0
PMP 0612	0	0	0
PMP 1218	1	19	1
PMP 1824	2	8	0
PS 0006	0	0	0
PS 0612	0	0	0
TBB 1218	0	0	0
TM 0612	0	0	0
TM 1218	0	2	0
TM 1824	0	1	0
TM 2440	0	0	0

In 2021, in 2 segments the piked dogfish represented more than 10% from the total segment's landings. The percentage of the catches of piked dogfish for each fleet segment was also calculated to assess if any of them is fishing more than 10% of the catches of the stock. Four of the segments caught more than 10% of the DGS catches for the whole fleet. The stocks-at-risk indicator was with value 1 for 6 segments in 2021.

Table 27. Stock-at-risk indicator calculations for 2021.

2021	% of DGS from all catches of the segment.	% of DGS catches by the segment from the catches of the whole fleet	SAR indicator
DFN 0006	0	1	0
DFN 0612	1	12	1
DFN 1218	2	37	1
DFN 1824	6	16	1
DFN 2440	0	0	0
FPO 0612	0	0	0
HOK 0006	16	0	1
HOK 0612	27	1	1
PGP 0006	0	0	0
PGP 0612	0	0	0
PGP 1218	0	1	0
PMP 0006	0	0	0
PMP 0612	0	6	0
PMP 1218	0	5	0
PMP 1824	0	0	0
PS 0006	0	0	0
PS 0612	0	0	0
TBB 0612	0	0	0
TBB 1218	0	0	0
TBB 1824	0	0	0
TM 0612	0	1	0
TM 1218	0	16	1
TM 1824	0	4	0
TM 2440	0	0	0

In four of the segments (DFN 1218, DFN 1824, HOK 0006 and HOK 0612) the value of SAR is 1 for both years, which might be a sign that they are out of balance.

Table 28. Comparison between stock-at-risk indicator in 2019, 2020 and 2021.

	SAR indicator 2019	SAR indicator 2020	SAR indicator 2021
DFN 0612	0	0	1
DFN 1218	1	1	1
DFN 1824	0	1	1
HOK 0006	1	1	1
HOK 0612	1	1	1
HOK 1218	0	1	0
PMP 1218	1	1	0
PMP 1824	1	0	0
TM 1218	0	0	1