**Background Technical Document in Support of the Management Plan for turbot fisheries in the Black Sea (GSA 29)**

**October 2014**

**TABLE OF CONTENTS**

|  |  |
| --- | --- |
| Summary | 3 |
| 1. Environmental and geographical settings | 4 |
| 1. Fisheries resources | 5 |
| 1. Fishing activities | 15 |
| 1. Market situation | 19 |
| 1. Fisheries governance and management frameworks | 20 |
| References | 40 |
| Annex 1. Characteristics of the turbot fisheries in the Black Sea | 42 |
| Annex 2. Summary of management measures for turbot fisheries in the Black Sea | 45 |

**Summary**

This document was prepared as part of the GFCM Framework Programme case study on the management of turbot fisheries in the Black Sea (GSA 29). The document makes a synthesis of the available knowledge on the fishery based on information sourced from the literature and obtained through the application of a questionnaire to GFCM National Focal Points. The synthesis covers aspects related to resources and ecosystems, catches and fishing fleets, national fisheries legislation and management plans. The document is expected to serve as baseline to support the future development of sub-regional management measures and plans for the turbot fisheries in the Black Sea.

**1. Environmental and geographical settings**

The Black Sea is an inland semi-enclosed basin which lies between Bulgaria, Romania, Ukraine, Russian Federation, Georgia and Turkey (Figure 1). Since 2007, with the accession of Romania and Bulgaria to the EU, part of the Black Sea became also EU jurisdictional waters. With a total shoreline of 4 868 km and a total surface area of 436 400 km2, the Black Sea is the largest Sub-Area of the GFCM (Sub-Area 29). Romania, Bulgaria and Turkey are the only riparian states that are members of the GFCM.



Figure 1. Map of the Black Sea in 2013.

The continental shelf is wider in the north-west (up to 190 km wide) and narrower in the southern and eastern part of the basin. The central abyssal plain has depths of 2000 - 2200 m, being the maximum depth of 2 212 m. The Black Sea receives freshwater runoff from three large rivers (Danube, Dnieper and Don), which drain a basin of more than 2 million Km2 (representing almost one third of continental Europe) containing more than 160 million people (Heileman et al., 2008). These three rivers are the main source of nutrients (and pollutants) input into the Black Sea basin (Panin and Jipa, 2002). The water exchange with the Mediterranean through the Strait of Bosphorus is limited. High river water supply, together with restricted circulation through the Strait of Bosporus, creates the conditions for the peculiar stratification of the Black Sea waters that effectively inhibits vertical mixing of waters and results in permanent lack of oxygen (anoxia) below ca. 150 m depth. Marine life is mostly concentrated in the upper oxygenated layer that covers the continental shelf. The wide north-western shelf in particular is the most important spawning and feeding area for the Black Sea fish species (Heileman et al., 2008).

The Black Sea coastal zone population numbers nearly 16 million, being Turkey and Ukraine the countries with the longest coasts and largest populations (Popescu, 2010). Coastal tourism, short-sea shipping, inland waterway transport, fisheries, as well as exploration and exploitation of oil and natural gas constitute important economic activities. Fisheries are an important economic sector in the Black Sea countries, and virtually all the commercial fish stocks in the Black Sea are shared among the bordering countries. Up to 150,000 people were estimated to depend directly on the Black Sea fisheries (GFCM, 2012).

About 200 fish species inhabit the Black Sea (Black Sea Commission, 2008). However no more than two dozens of species account for more than 90% of the catches. Pelagic fish are the most abundant fish species, the main target species being the European anchovy (*Engraulis encrasicolus*), European sprat (*Sprattus sprattus*), Mediterranean horse mackerel (*Trachurus mediterraneus*), Atlantic bonito (*Sarda sarda*) and bluefish (*Pomatomus saltatrix*). The most important demersal fish species are turbot (*Psetta maxima*), whiting (*Merlangius merlangus*), picked dogfish (*Squalus acanthias*), striped and red mullets (*Mullus barbatus*, *M. surmuletus*), and four species of the family Mugilidae. The anadromous species include the Pontic shad (*Alosa pontica*) and three sturgeon species (*Acipenser gueldenstaedtii*, *Acipenser stellatus* and *Huso huso*). Among molluscs, the clams (*Chamelea gallina*, *Tapes* spp.), the Mediterranean mussel (*Mytilus galloprovincialis*), and the sea snail (*Rapana* sp.) have the greatest commercial value (GFCM, 2012).

The Black Sea ecosystem has undergone substantial changes over the last century resulting from a complex interaction of different processes, including eutrophication, introduction of alien species, overfishing and climate-driven changes in water mass stratification, circulation and temperature (Daskalov et al., 2007; Caddy, 2008; Oguz, 2014). Overfishing is an important threat to Black Sea marine resources that needs to be tackled by effective fisheries management at the basin scale. However, the past experience demonstrates that, to be effective, the management of fisheries in the Black Sea has to account for other anthropogenic and environmental processes that influence the dynamics of the ecosystem.

**2. Fisheries resources**

Turbot (*Psetta maxima*/*Scophthalmus maximus*) has been historically fished by countries in the Black Sea using gillnets and bottom trawl (GFCM, 2012). Currently the only legal target fishery is the bottom set gillnet fishery. The main associated species of commercial interest in the target fishery are the picked dogfish (*Squalus acanthias*), thomback ray *(Raja clavata*) and the common stingray (*Dasyatis pastinaca*). Turbot is also caught as bycatch in other commercial fisheries, including in bottom trawl, dredge, purse seine and long line fisheries. Available catch data for turbot and associates species are presented in Figure 2.

Significant catches of turbot (mostly by the former USSR) were landed as early as 1950, when the available time series of catch data begins. After a marked drop in the mid-1970s, catches increased during the late 1970s and early 1980s reaching the historic peak of 5 226 tonnes in 1983. Catches then dropped abruptly to 428 tonnes in 1986, the lowest landings on record since 1950. In the last two decades the total landings (including the estimated unreported catches) oscillated between about 1 000 to 3 000 tonnes per year, without a trend. The amount of unreported catches (estimated by STECF since 2002), is significant, reaching over 50% of the total catches. Historically the former USSR and Turkey were the main country harvesting turbot in the Black Sea, with Bulgaria, Romania, Russian Federation and Ukraine having a relatively smaller participation. Catches by Georgia have been less 1 tonne per year. The share of Ukrainian catches increased in recent years. The total estimated landings in 2012 were 963 tonnes, with 241 tonnes from Ukraine, 172 from Turkey, 35 tonnes from Russian Federation, 43 tonnes from Romania and 36 tonnes from Bulgaria. An additional 435 tonnes were estimated to be unreported in this year.

The earliest record of picked dogfish catches from the Black Sea are from the late 1960s by Turkey. The largest catches of the species occurred along the coast of Turkey where the species was caught as bycatch in trawl and purse seine fisheries (STECF, 2013). In the remaining countries most of the picked dogfish was caught by a target gillnet and longline fishery or as bycatch in the trawl fisheries for sprat (STECF, 2013). The largest catches on record (12 296 tonnes) occurred in 1979 and since then catches followed a gradual declining trend. Recent catches are less than 100 tonnes per year, most of it from Bulgaria and Turkey. There is no information on the relative importance of the catches of picked dogfish caught as bycatch in the turbot fishery compared to the catches in other fisheries (target and bycatch). Nonetheless, the available information about the status of the stock is reviewed below.

Specific data on catches of thornback ray and the common stingray are scarce. Both species have a secondary economic importance and are caught mainly as bycatch. Only Bulgaria and Ukraine started reporting catches of the species in the last decade. Mean annual catches of thornback ray of 52.06 tonnes and 3.4 tonnes were reported respectively by Ukraine in Bulgaria in recent years. The available time series of catches of Rajiformes (rays, stingrays nei) is shown in Figure 2. Turkey and the former USSR were historically the main countries reporting catches of rays and stingrays. Catches peaked at 4 490 tonnes in 1979 and declined since then to an average of 160 tonnes per year in recent years. There is no information on the relative importance of the bycatch of these species in the turbot fishery compared to the bycatch in other fisheries (target and bycatch).

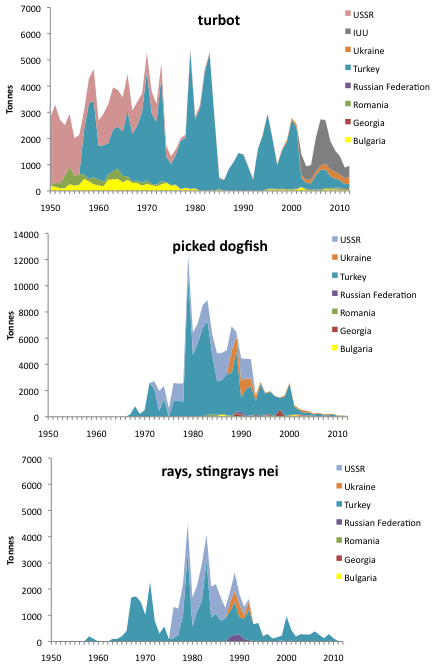


Figure 2. Landings of turbot, picked dogfish and rays and skates (Rajiformes) in the Black Sea (GSA29). Sources: FAO FishStat, Prodanov et al., 1997; STECF 2013.

Brief descriptions of the species biology and population status of the target and associated species are provided below and in Table 1. Of the associated species, only the picked dogfish has been assessed in the Black Sea. There is very limited biological information about the thornback ray and the common stingray. Biomass was estimated in the early in 1990 at 6 000 tonnes for thornback ray and 10 000 tonnes for the common stingray (Prodanov et al., 1997).

Table 1. Summary information on biology and population status of turbot and associated species in the Black Sea. TL: total length; SL: standard length; DW: disk width. Sources: Prodanov et al. (1997); Demirhan et al. (2005); Radu and Maximov (2012); STECF (2013); Froese and Pauly (2014) and GFCM (2014a).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Species | Max. size (cm) | Size at maturity (cm) | Max. age (years) | Spawning season | Stock status |
| Turbot, *Psetta maxima/Scophthalmus maximus* | 85-100 TL | 34 – 36 TL | 25 (NE Atl.)  16-17 (Black Sea) | April - June | Black Sea stock: Depleted and in overfishing (Fcurr/Flim = 2.1)  Northwest population (Ukrainian waters):  in overfishing (Fcurr/Flim = 3.8), with a slight decreasing trend in SSB . |
| Picked dogfish, *Squalus acanthias* | 150 SL | 88 – 115 SL (female); 80 – 110 SL (male) | 20 | March – May; August - September | Depleted and in overfishing (Fcurr/Flim = 1.15). |
| Thornback ray, *Raja clavata* | 88.2 TL (females)  95 TL (males) | 66.7 TL and 47.27 DW (females)  64.03 TL and 44.24 DW (males) | \_ | \_ | \_ |
| Common stingray, *Dasyatis pastinaca* | \_ | \_ | \_ | \_ | \_ |

**Turbot (***Psetta maxima/Scophthalmus maximus)*

Turbot is distributed in the Northeast Atlantic, throughout the Mediterranean and Black Sea and along the European coasts to the Arctic Circle. Turbot in the Black Sea is considered a subspecies (*Psetta maxima maeotica*). The species is distributed on shelf waters of all Black Sea countries up to 100 - 140 m depth. Data from Bulgaria and Romania indicate that adults migrate to coastal waters up to 40 m during the spawning period (April to June) and move to deeper waters after spawning (STECF, 2009). The highest abundance occurs between 50 and 75 m depth. Juveniles are found on sandy bottoms close to shore and move to deeper waters as they grow (Maximov et al., 2013). The species is long lived (max observed age of 25 years in NE Atlantic; in the Black Sea individuals with more than 17 years are rare (Prodanov et al., 1997) with a slow growth rate. The current hypothesis about the population structure in the Black Sea is that there are different local populations with limited migration flux among them (GFCM, 2014a).

Two stock assessment models were presented during the GFCM Subgroup on Stock Assessment of the Black Sea in 2014 (GFCM, 2014a). One model considered that turbot in the Black Sea constitute a single population, and therefore combined data from all Black Sea countries (STECF, 2013; Sampson et al., 2014). The second assessment covered the western waters off Ukraine (Shlyakhov, 2014) and was based only on Ukranian data. Different models, data and assumptions were used in each stock assessment. The assessment of turbot at the Black Sea scale was based on a state-space assessment model applied to catches and catch-at-age data from 1950 to 2012. The Ukranian assessment was based on a length cohort analysis applied to catch and age-length composition data from 1997 to 2013. Both assessments relied also on fishery-independent data from surveys. The assessments also incorporated estimates of IUU catches. The Black Sea model assumed that IUU catches were a proportion of the Turkish catch during 1993- 2001 and 2009-2010, while the Ukranian model assumed a flat amount of IUU catches of 800 tonnes per year.

Both assessments concurred that the current fishing mortality on the stock is not sustainable and that the stocks is in overfishing (Fcur/Flim=2.1 in the Black Sea and 3.8 in Ukranian waters). According to the assessment of the Ukrainian western stock, fishing mortality increased from 1997 to 2013 while the spawning stock biomass remained relatively stable, with a slight negative trend in the period (Figure 3). Therefore in relation to the biomass reference point, and despite the relatively short time series, the stock was not considered to be overexploited (GFCM, 2014a). On the other hand the assessment at the Black Sea scale (STECF, 2013; Sampson et al., 2014) estimated that the spawning stock biomass (SSB) reached its peak in 1979 and then declined dramatically during the 1980s (Figure 4). In recent years SSB declined steadily and reached its historic low in 2012 (around 1 100 tonnes), which is approximately one third of the estimated Blim (2 914 tonnes). Recruitment also declined substantially in the period, with a slight recovery between the mid-1990s and mid-2000s. However the last years classes (2006-2010) are among the lowest observed in the time series. The fishing mortality is currently around the historical high level at 0.85, more than three times the estimated FMSY (Figure 4).



Figure3. Estimated spawning stock biomass, fishing mortality and recruitment for the Ukraine western stock of turbot (source: Shlyakhova, 2014).

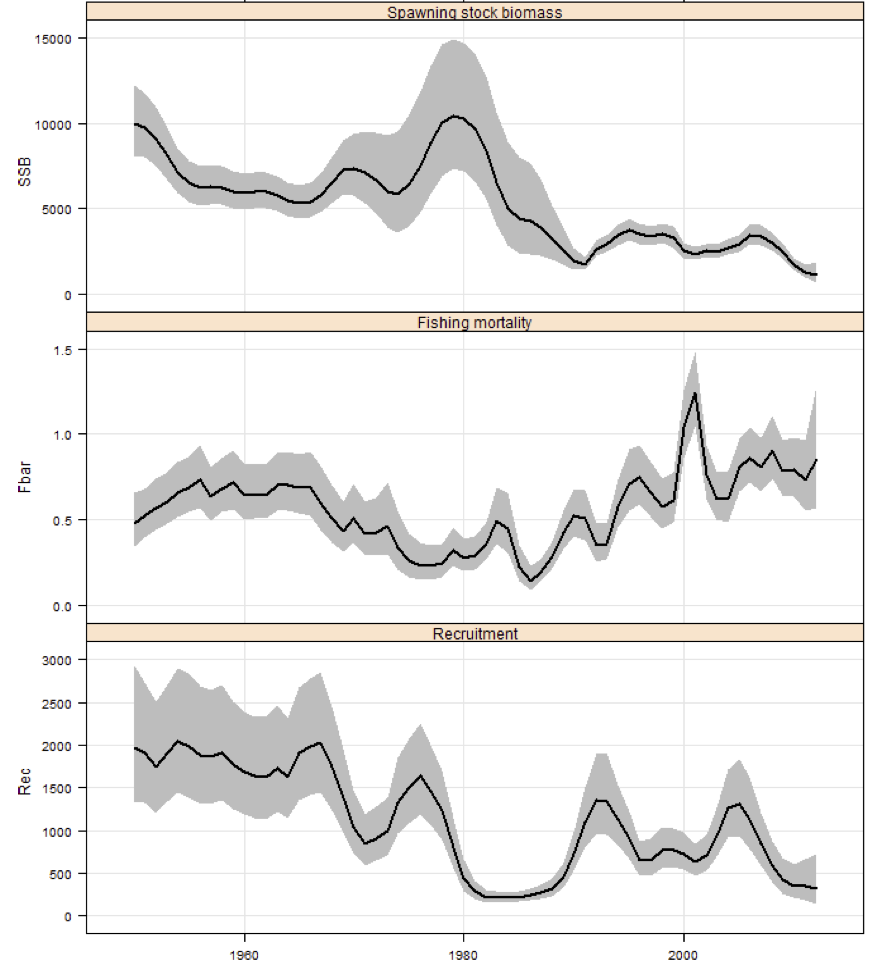


Figure 4. Estimated spawning stock biomass (SSB), fishing mortality (ages 4 -8) and recruitment (confidence limits in gray) for turbot in the Black Sea (source: STECF, 2013).

Based on these results, the SAC of GFCM recommended a reduction of fishing mortality at the Black Sea scale to allow the turbot biomass to recover (GFCM, 2014a). It was also recommended that the reduction in F be implemented through a stock recovery plan that ensures close monitoring of the required actions to achieve the recovery. SAC also recommended a series of needed actions to improve the quality of the stock assessment advice, including improving the definition of stock boundaries, improving the quality of catch statistics and improving coordination/harmonization of surveys carried out by the different Black Sea countries (GFCM, 2014a).

**Picked dogfish** (*Squalus acanthias*)

The picked dogfish, *Squalus acanthias*, is widely distributed on continental shelves in temperate and boreal waters of the northern and southern hemispheres, and is most common at depths 10-200 m. It is the most common of all shark species. Different populations within the distribution of the species have been identified, separated by deep ocean waters, tropical areas and polar areas. Individuals in the Northeast Atlantic from the Barents Sea to northwestern Africa are considered to be a single population for fishery management purposes (ICES WGEF, 2006). The relationship of individuals in the Mediterranean and Black Sea to this population and to each other is not known. In the Black Sea, all stock assessment studies assume the existence of a single stock, which is apparently supported by early studies conducted by the former USSR (Shlyakhov, 2013).

The specie inhabits the whole Black Sea shelf and undertakes extensive migrations (Shlyakhov and Daskalov, 2008; Radu and Maximov, 2012). In autumn feeding migrations are aimed at the grounds of the formation of the wintering concentrations of anchovy and horse mackerel in the vicinity of the Crimean, Caucasus and Anatolian coasts. Reproductive migrations take place towards the coastal shallows, particularly in spring and autumn. The main spawning grounds are located along the Crimean coastal waters.

Picked dogfish is a demersal predator, reaching in the Black Sea the length of about 1.50 m and a maximum age of 20 years. Different values for the age and size at maturity have been reported (Radu and Maximov, 2012; Shlyakhov, 2013): male 80 cm SL and female 100 cm SL (average age for both sexes combined of 12 years); male 82 cm and female 88 cm; male100-110 cm SL and female 110 – 115 cm SL (between 13 and 17 years); males 87.57 cm SL (10.5 years) and females 102.97 cm SL (11.9 years). The mean biennial fecundity was estimated at 12.9 pups (Shlyakhov, 2013) and 8 pups per female (Radu and Maximov, 2012).

Results of a virtual population analysis (Prodanov et al., 1997) indicated that the stock biomass increased by about a factor of 3 between 1972 and 1982, and subsequently declined to 1992 by about the same extent (Figure 5). Radu and Maximov (2012) estimated a decrease of almost 30 times in stock biomass in the last 20 years. The authors estimated the current F at 0.262 year-1, compared to an estimated F0.1 of 0.227 year-1, concluding that the stock is currently in overfishing.

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Figure 5. Spiny dogfish exploited biomass (age 4+, thousand tonnes) during 1972-1992 (source: Prodanov et al., 1997).

**Ecosystem interactions**

In addition to the effect of the target fishery on the stock, turbot fisheries are affected and affect the marine ecosystem of the Black Sea through distinct processes. GFCM (2014b) recognized the following as important ecosystem interactions that need to be accounted for in the turbot fisheries management plan: the bycatch of turbot in other commercial fisheries; the incidental catches of small cetaceans in the target gillnet fishery for turbot; and the environmental changes occurring in the Black Sea.

Since the adoption of the Recommendation GFCM/37/2012/2 bottom set gillnets is the only legal fishing gear for turbot in the Black Sea. However the species is frequently caught as bycatch in other fisheries, including in bottom trawls, midwater trawls, pound nets, beach seines, longline as well as in beam trawl and dredges used for instance in the *Rapana* fishery in Bulgaria and Turkey (GFCM, 2012; GFCM, 2014b). There is scarce data on the the amount of turbot caught in these fisheries. In Turkey for instance the bycatch of turbot in bottom trawling accounted for 30% of the total Turkish turbot catches in the recent past (Zengin et al., 1998). There is no updated information on the extent of turbot bycatch in these fisheries.

Three species of small cetaceans are present in the Black Sea: harbour porpoises (*Phocoena phocoena relicta*), short-beaked common dolphins (*Delphinus delphis ponticus*) and common bottlenose dolphins (*Tursiops truncatus ponticus*). The common dolphin is considered Vulnerable while the harbour porpoise and the bottlenose dolphin are considered Endangered in the IUCN Red List of Threatened Species. All three species are covered by the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and by the Conservation Plan for Black Sea Cetaceans adopted by ACCOBAMS and the Black Sea Commission in 2006 (Birkun et al., 2006). The incidental catch in commercial fisheries is recognized as the major source of human-induced mortality of these species, particularly for the harbour porpoises. The bottom-set gillnet fisheries for turbot, spiny dogfish and sturgeon are fisheries with high rates of cetaceans bycatch (Birkun, 2002; Birkun et al., 2006). Birkun (2002) conducted a review of cetaceans interactions with fisheries in the Black Sea showing that: i) cetacean bycatch occurs throughout the Black Sea waters of all six riparian countries; ii) most cases of incidental entanglement in fishing nets occur not far from the shore and in the shallow waters of the continental shelf; and iii) harbour porpoises almost always represented the major part of cetacean bycatch. Data on the rate of bycatch is scarce. In Bulgaria the bycatch index of *P. phocoena* was estimated at 22 per 100 km net set and that of *T. truncatus* of 2 per 100 km net set (GFCM, 2011 apud STECF, 2013). Table 2 presents the available data on incidental catches of cetaceans in Romania for the last 12 years. Other data compiled by Birkun (2002) is reproduced in Table 3. It must be also noted that dolphins are sometimes viewed as nuisance by fishers because of the depredation of catches and the damaging of the nets (Kose, 2014), although no quantitative data exist on the magnitude of fishers losses due to the interaction with dolphins.

Table 2. Registered incidental catches of cetaceans in the Romanian littoral in the last 12 years (source Romanian National Focal Point).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Species | | | Total |
| *Phocoena phocoena* | *Delphinus delphis* | *Tursiops truncatus* |
| 2001 | 40 | 2 | 1 | 43 |
| 2002 | 20 | − | − | 20 |
| 2003 | 7 | − | − | 7 |
| 2004 | − | − | − | − |
| 2005 | − | − | − | − |
| 2006 | 20 | 2 | − | 22 |
| 2007 | 70 | 1 | − | 71 |
| 2008 | − | − | − | − |
| 2009 | − | − | − | − |
| 2010 | 15 | − | 2 | 17 |
| 2011 | 54 | − | − | 54 |
| 2012 | − | − | − | − |

Table 3. Compilation of studies on incidental catch of cetaceans in the Black Sea due to fishing operations (adapted from Birkun, 2002).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Russia and Ukraine | Romania | Turkey | Bulgaria | Georgia | Ukraine |
| Study period | 1968 - 1993 | 1984 - 1990 | 1993 - 1997 | 1977 – 1999 (2 years) | 1977 – 1999 (2 years) | 1977 – 1999 (2 years) |
| Study area | Crimea and north Caucasus | Southern coast | From Bulgarian border to Istanbul | Entire coast | Adjaria and Georgia | Crimea |
| Length of study area, km | 1 637 | 60 |  | 355 | 100 | 650 |
| Numbers caught, *n* (%) | 2 086 | 566 | 63 | 14 | 11 | 130 |
| *Phocoena phocoena* | 1 685 (80.8) | 541 (95.6) | 62 (98.4) | 13 (92.9) | 7 (63.6) | 123 (94.6) |
| *Delphinus delphis* | 297 (14.2) | 22 (3.9) | 0 (0.0) | 0 (0.0) | 3 (27.3) | 0 (0.0) |
| *Tursiops truncatus* | 104 (5.0) | 3 (0.5) | 1 (1.6) | 1 (7.1) | 1 (9.1) | 7 (5.4) |

The Black Sea underwent drastic ecosystem changes in the last decades in response to a combination factors, including natural processes and anthropogenic stressors such as eutrophication, species introductions and overfishing (Daskalov et al., 2007; Caddy, 2008; GFCM, 2012; Oguz, 2014; Table 4). By affecting the functioning of the Black Sea ecosystem, these processes and stressors can also affect the performance of fisheries management. GFCM (2014b) recommended the consideration of at least three factors on the performance of turbot fisheries management: water temperature during the spawning period, water temperature stratification and the spatial extent of hypoxia. All of them are conditioned by natural and anthropogenic processes.

Table 4. Examples of stressors that affected the Black Sea ecosystem in the last decades (source: Daskalov et al., 2007; Black Sea Commission, 2008; Caddy, 2008; GFCM, 2012; Oguz, 2014)

|  |  |
| --- | --- |
| Stressor | Examples |
| High nutrient discharge | High nutrient discharges from the Danube and northern rivers due to the downstream flow of high inputs of fertilizers and domestic and industrial effluents from the very large catchment basin of the Black Sea. |
| Eutrophication | Eutrophication of the surface layers of the sea caused by the high nutrient levels leading to the dominance of the phytoplankton by cyanobacteria, not as suitable as fish and invertebrate food as diatoms. |
| Species introduction | The jellyfish *Mnemiopsis leidyi* was probably introduced in the ballast tanks of ships. The species thrived and became a major consumer of zooplankton, fish eggs and juveniles. The sinking of decomposing of dead jellyfish led to oxygen deficiency and die-offs of benthic species.  The snail *Rapana* sp. was introduced accidentally with commercial shellfish from Japan. The species adapted to the eutrophic conditions, thrived and became an important export item to Japan.  The ctenophore jellyfish *Beroe* sp. was introduced by unknwon events and exerted a pressure on its prey species *Mnemiopsis* *leidy.* |
| Hypoxia | Low levels of oxygen in the bottom caused by eutrophication, low light penetration and the decomposition of organic material. The poor light penetration led to the collapse of beds of brown algae, which in turn contributed to low oxygen levels in the shallow waters. The low oxygen levels in part caused the dissapearance of the extensive blue mussels beds in the Northern Black Sea which previously cleaned the water of supended particles.  The total shelf area exposed to hypoxia reached 14 thousand km2 in 2000 (representing 38% of the northwestern shelf), a decline from 1983, when more than 50% of the shelf was exposed to hypoxia |
| Overfishing | Excess fishing has caused a marked decrease in abundance of important fisheries resources, including turbot, dogfish and strurgeons. |
| Habitat modification | River dams and water degradation affected the migration of anadramous species such as sturgeons. Together with overfishing, these stressors have placed some of these species at risk of extinction. |

**3. Fishing activities**

**Bulgaria**

Turbot is the target species of a fleet of 130 gill netters, ranging in size from 6 to 24 m. The fishery operates throughout the year in depths ranging from 5 to 65 m (Annex 1). The main associated species are whiting *Merlangius merlangus*, shad *Alosa immaculata*, red mullet *Mullus barbatus* and bluefish *Pomatomus saltatrix*. Since 2008 catches of turbot are regulated by an annual quota established by the European Commission. In 2012 the fleet caught 36.4 tonnes of turbot, valued at EUR 252 460. According to data provided by national focal point the fishery involved 2 436 fishers in 2012 (Table 5). The amount of turbot caught by IUU fishing is considerable. According to data provided by the national focal point, in 2012 there were 254 recorded infringements and a total of 23 984 kgs of confiscated fish (of this total 3 300 kg were turbot).

Table 5. Economic data for the Bulgarian turbot fishery in 2012 (source Bulgarian National Focal Point).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operational Unit | Number of fishers (full time equivalent) | Turbot catches (tonnes/year) | Ex vessel price (EUR/kg) | Value of catches (EUR) |
| Vessels 0-6 m | 428 | 1,50 | 6,94 | 10 422,35 |
| Vessel 6-12 m | 1 575 | 11,36 | 6,94 | 78 845,20 |
| Vessels 12-18 m | 265 | 15,43 | 6,94 | 107 121,40 |
| Vessels 18-24 m | 101 | 6,25 | 6,94 | 43 387,35 |
| Vessels 24-40 m | 67 | 1,83 | 6,94 | 12 684,20 |

**Georgia**

Turbot is not commercially targeted in Georgia. Catch is not significant, being around 500 kg per year. The species is generally caught by bottom gill nets. A quota is established yearly for the species, being set at 20 tonnes in 2013-2014 and at zero in previous years.

**Romania**

In the last 13 years the turbot catches in the Romanian littoral increased from 2 tonnes (2000) to almost 50 tonnes in 2009 and 2010 (Figure 6). After Romania's accession to the EU (2007), the turbot fishery was regulated by annual quotas, starting with 50 tonnes in 2008 and decreasing annually since then. In 2012 and 2013 the total allowable catch was 43.2 tonnes (CR/EU-No.1261/2012). For 2014 the proposal of the Commission (COM 818/26.11.2013) was for a quota of 37 tonnes. The decrease is justified by the poor state of the stock of turbot.

Figure 6. Turbot catches at Romanian littoral in the period 2000-2012 (data provided by National Focal Point).

Fishing for turbot is carried out mainly with gillnets. In 2012, from the 43.2 tonnes of turbot landed only 0.11 tonnes were caught as bycatch in pound nets and 0.036 tonnes as by-catch in trawls. The number of the turbot gillnets ranged between 1 974 units (2009) and 4 450 units in 2008 (Figure 7). A total of 67 vessels were active in 2012, ranging in size from less than 6 m to 40 m (Annex 1). The fishery operates in shallow waters (22 to 70 m) from January to April and from June to December. The main associated species of commercial importance in the catch are *Raja clavata* and *Dasyatis pastinata*. IUU fishing from vessels from Turkey and Ukraine occurs with small intensity and takes an estimated catch of 5-10% of the national quota. According to information provided by the national focal point, enforcement actions conducted between January and October 2012 have confiscated 4 785 kgs of turbot, 864 gears and 6 boats.

Figure 7. Number of the turbot gillnets used in the Romanian littoral in the period 2008-2012 (data provided by National Focal Point).

The number of special authorizations for turbot fishing was 71 in 2012 and 81 in 2013 for a catch of 43.2 tonnes. The number of professional fishers involved in the fishery was about 180 (Table 6). Despite the low volume of catches, turbot is the second species of importance in value terms. In 2011, for instance, rapa whelk accounted for the highest value of landings (EUR 0.89 million) followed by turbot (EUR 0.21 million) and the Pontic shad (EUR 0.1 million). The three species represented about 85% of the total value of Romanian fisheries in that year, estimated at ca. EUR 1.4 million (Figure 8). The prices obtained for these key species generally declined between 2008 and 2010. In 2010 turbot achieved the highest average price per kilo by the Romanian national fleet (EUR 4.79 per kg), followed by rapa whelk (EUR 2.46 per kg in 2011) and Pontic Shad (EUR 2.19 per kg).

Table 6. Economic data for the Romanian turbot fishery in 2012/2013 (source FWP National Focal Point).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operational Unit | Number of fishers | Turbot catches (tonnes/year) | Ex vessel price (EUR/kg) | Value of catches (EUR) |
| Vessels < 6 m | 15 | 1.65 | 4.79 | 8 030 |
| Vessels 6 – 12 m | 136 | 31.68 | 4.79 | 20 145 |
| Vessels 12 – 18 m | 12 | 3.94 | 4.79 | 18 699 |
| Vessels 18 – 24 m | 7 | 4.25 | 4.79 | 150 154 |
| Vessels 24 – 40 m | 7 | 1.69 | 4.79 | 7 802 |



Figure 8. Total landings and landings value of Romanian marine fisheries. Weight units in thousand tonnes.

**Russian Federation**

No information on turbot fisheries in Russian Federation.

**Turkey**

In Turkey, turbot fisheries have been traditionally conducted by bottom set gill nets and by bottom trawls (STECF, 2013; Zengin, 2014). Since the adoption of Recommendation GFCM/37/2012/2 gillnets are the only gear allowed in the target fishery for turbot in the Black Sea. At present turbot is not a target species of the bottom trawling fishery but a bycatch of the fishery for whiting and red mullet (Zengin, 2014).

Bottom trawls have a mesh size of 40 mm in the codend. They are operated over three miles distance from the coast, being more common in the western part of the Black Sea where the shelf is wider. According to available data for 2012/2013, a total of 447 fishing vessels between 12 and 30 m overall length were actively operating in the eastern and western Black Sea (Zengin, 2014; Annex 1). However not all of the vessels operate exclusively as bottom trawlers, some operate also pelagic trawls for sprat, anchovy and horse mackerel. According to Zengin et al. (1998) turbot catches in bottom trawling account for 30% of the total Turkish turbot catches. In the season 2011/2012 it is estimated that 35.1 tonnes were landed by bottom trawlers in the west Black Sea and 16.56 tonnes in the east Black Sea (Zengin, 2014).

Gill nets are the main gear type used to catch turbot in east and west Black Sea coast of Turkey. The fishery is conducted by artisanal fishers using vessels with an average size between 7.3 and 9.9 m (Annex 1). The gill nets are single walled tangle nets with a hanging ratio of 0.3 – 0.38 and 0.33 – 0.41 in the float and lead lines, respectively. Mesh sizes vary from 240 mm to 400 mm. The artisanal turbot fishery generated the highest income among the fisheries in the Black Sea coast until the end of the 1980s. The fishery decreased in importance with the decline of the stock. According to available data reported by Zengin (2014) landings by gillnetters was around 3 500 tonnes/year in 1980 – 1990, decreasing to 200 – 250 tonnes/year by the end of the 2010s. The average landing per unit of effort decreased from 47.2 kg/boat/operation in 1980-1990 to 3.9 kg/boat/operation in 2000-2010. During the same period an opposite trend was observed in the number of fishers and in the fishing effort. The number of fishers increased from 170 in the end of the 1980s to 568 in the end of the 2010s. The number of gillnets used by fishers increased five-fold in the same period (Zengin, 2014). A total of 38.64 tonnes and 81.90 tonnes were landed by the gillnet fishery in the 2011/2012 season in the east and west Black sea, respectively (Zengin, 2014).

The gillnet fishery is conducted in areas up to 15 nautical miles from the coast, at depths between 25 and 100 m. Catches are however highest within depths of 50 – 60 m. The fishing season begins in April and ends in the last week of June (a fishing closure is in place from 15 April – 15 June). Nets are set end to end. One net is 60 fathom length (=108m). One set of nets has 5-15 anchors, with 12 - 30 nets between two anchors (one set of 50 nets is approximately 5 km long; Ozturk, 2013). Ozturk (2013) estimated that a total of 14 000 nets were used by vessels operating from the main fishing ports in the west coast.

**Ukraine**

Turbot is targeted by industrial and small-scale gillnet fisheries. The species is also caught as bycatch in other fisheries, including in the mid-water trawl fishery for sprat and whiting, in pound nets, beach seines, gillnet fishery for dogfish and in the longline fishery for dogfish, rays and stingrays. The target fishery employs anchored gillnets with minimum mesh sizes of 180 – 200 mm (size of half mesh). This fishery is only allowed from 1st February to 31st October, although a closed period during the spawning season is also applied (see section on National Legislation). Gillnet fishing is more efficient during spawning on spawning grounds (usually from late April to mid-May), in the periods of local spawning and post-spawning migrations (March-April, June-early July), and during wintering migrations (October – November). Nets are often set at depths from 40 m to 60 m, on the migration routes of turbot off Tarkhankut Peninsula and in the North-Eastern Black Sea – in front of the Kerch Strait and in the Feodosia Bay. For several years turbot formed major spawning concentrations along the northwestern coasts of Tarkhankut Peninsula and in the Karkinitsky Bay, but more often the concentrations occurr along the southern coasts of Tarkhankut Peninsula and sometimes in the Kalamitsky Bay.

The target gillnet fishery involves 162 vessels, the majority of them smaller than 12 m (Annex 1). The fishery employed 668 fishers in 2011, 594 fishers in 2012 and 619 in 2013. Turbot exploitation in Ukraine has been regulated by a Total Allowable Catch since 1996. The TAC in 2012 was 430 tons while the actual reported catches were 241.7 tonnes (reported catches in 2011 and 2013 were 239.9 tonnes and 193.5 tonnes, respectively). However, the official data only marginally reflect the real turbot catch in the Ukrainian waters due to large-scale IUU-fishing (estimated at about 800 tonnes per year; Shlyakhov, 2014). There is no data on prices and value of the catches. The species is the most valuable commercial fish, and was for many years a traditional target species in the Ukrainian Black Sea. Its importance has decreased in recent years due to the reduction of stocks.

**4. Market situation**

**Bulgaria**

The greater part of the Bulgarian catches is exported fresh, mainly to Turkey (GFCM, 2012). In general, the local market has a limited demand. Bulgaria has one of the lowest per capita fish consumptions in the EU (4.6 kg/capita/year compared to an EU average of 22.1 kg/capita/year; FAO FishStat). The country has 37 fish processing enterprises that employ 325 persons. Since turbot is exported fresh, catches of the species are not processed locally. The processing of *Rapana venosa* is on the other hand a significant activity.

**Georgia**

No information.

**Romania**

Turbot catches are mostly consumed locally, with approximately 25% of the catches exported mainly to Turkey. The fish is marketed fresh (50%), frozen (40%) and partitioned (preliminary processing; 10%). There are no specialized processing units for turbot.

**Russian Federation**

No information.

**Turkey**

Turbot is one of the main commercial species of Turkey in terms of market value. Although there is a great demand in the market, supply is rather limited in comparison to other marine species. Since the beginning of 2000s, due to descending market supply, the price of turbot has increased in relation with other marketed species (the price of turbot in the Sansun Fish Market in recent years has been between 4.1 and 35.9 times higher than other commonly marketed species; Zengin, 2014). Around 26 companies are involved in the production and storage of fresh and frozen fish in the Black Sea coast, mainly anchovies (Kose, 2014). Products are both marketed domestically and exported. No data was available on the number of industries processing turbot or the amount of turbot marketed domestically and or exported.

**Ukraine**

Most of the turbot catches are consumed locally. Part of the production is exported to Turkey. Fish is marketed fresh, chilled and sometimes frozen. The level of processing is therefore minimal. In 2010 there were 166 enterprises and organizations of various kinds of property that performed canning, preserving and other packaging of fish and sea products.

**5. Fisheries governance and management frameworks**

**5.1. National jurisdictions**

In the Black Sea, all States have declared Exclusive Economic Zones (Vivero, 2010). For this reason all the waters are under the jurisdiction of the coastal states and there are no high seas. With the exception of Turkey, all coastal states have signed and ratified UNCLOS.

**5.2. National legal frameworks**

**Bulgaria**

Bulgaria is member country of the EU since 2007. Since 2008 turbot fisheries in Black Sea EU waters are being managed through annual fishing quotas and the prohibition of fishing activities during the reproduction period, established by Council Regulations (see section on Regional Legal Frameworks). In addition to the applicable Council Regulations, the following national instruments provide the legal framework for operation of turbot fisheries:

* Fisheries and Aquacultures Act (promulgated SG No. 41/20.04.2001);
* Ordinance № 5 of 08/10/2013 for certification and inspection of the engine power of fishing vessels registered in the register of fishing vessels;
* Ordinance № 3 of 02.19.2013 for the application of a point system for serious infringements within the meaning of Regulation (EC ) № 1005/2008 of 29.09.2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EC ) № 2847/93 , (EC ) № 1936/2001 and (EC ) № 601/2004 and repealing regulations (EC ) № 1093/94 and (EC) № 1447/1999;
* Ordinance № 4 of 13.01.2006 on the terms and conditions for the first sale of fish and other aquatic organisms;
* Ordinance № 4 from 20.10.2000 for water quality for fish farming and shellfish farming;
* Ordinance № 7 of 27.01.2006 on the terms and conditions for use, maintenance and storage of the monitoring and control of fishing vessels and onboard devices;
* Ordinance № 17 of 9.10.2012 on uniforms and official card of the employees in the Executive Agency for Fisheries and Aquaculture, exercising control over the use and conservation of fisheries resources under the Fisheries and Aquaculture act;
* Ordinance № 41 of 20.04.2006 on the terms and conditions for recognition of producer organizations of fish and other aquatic organisms;
* Ordinance № 43 of 20.04.2006 on the procedures for keeping a logbook;
* Ordinance № 54 of 28.04.2006 for recording in registers under art. 16 of the Fisheries and Aquaculture;
* Ordinance on the amount of compensation for damages caused to fisheries resources; and
* Orders of minister of agriculture and foods, Orders of executive director of Executive agency for fisheries and aquacultures.

The country has adopted a Plan for Adjustment of Fishing Effort aimed at adjusting (reducing) fishing capacity according to the availability of resources and managing the entry/exit of vessels from the fleet. A specific monitoring and control plan for turbot in Black Sea is also in place, setting the rules and technical measures to ensure effective control of turbot catches.

Annex 2 summarizes the management measures applied by Bulgaria to turbot fisheries in the Black Sea.

**Georgia**

No updated information could be obtained on the legal framework for fisheries in Georgia. Popescu (2010) noted the lack of a national fisheries policy to regulate the use of marine resources in the country. According to GFCM (2012), the Ministry of Agriculture was preparing a Master Plan for Fishery Sector Development in Georgia, 2005-2020, in collaboration with other relevant ministries and fishery sector stakeholders such as fishers' associations, research institutes and fishing companies. No information could be obtained on the legal norms and measures regulating the fisheries catching turbot.

**Romania**

Romania is member country of EU since 2007. Since 2008 turbot fisheries in Black Sea EU waters are being managed through annual fishing quotas and the prohibition of fishing activities during the reproduction period, established by the adoption of Council Regulations (see section on Regional Legal Frameworks).

The basic law for the fisheries sector in Romania is Law no. 192/ 2001 (modified by OUA no.23/2008) on live aquatic resources, fishing and aquaculture, regulating the conservation, management and exploitation of live aquatic activities, as well as the processing and trading of fishing and aquaculture products. This law has been amended and completed during the pre-accession period, in order to be in line with the *acquis communautaire* for fisheries.

In order to achieve the objectives in the basic legislation and transpose the *acquis* in the Romania legislation, secondary legislation has been drafted using ministerial orders, the most important of which referring to:

* the organization and operation of the Fishing Vessels Register;
* organization and operation of the Aquaculture Company Register;
* setting up of the Satellite Monitoring Center for Fishing Vessels;
* licensing and authorization procedures; and
* prohibition periods.

The general legal framework for the fisheries sector in Romania is in line with the European legislation. For the fishing resources management the following laws were adopted:

* Law on the Constitution of the Biosphere Reserve "Danube Delta" No. 82/20.11.1993;
* Law on Environmental Protection No. 137/1995;
* Law on Fishing Fund, Fishery and Aquaculture No. 23 /2008;
* Order No. 179/1 June 2001 regarding the Registering and transmission of the data related with the marine fishing activity;
* Order No. 262/16 July 2001 regarding the Preparation of the Directory of Vessels and Fishing boats;
* Order no. 422/30 October 2001 for approval of the Regulation on the conditions for development of the commercial fishing activities in the Black Sea waters;
* Annual Order on the Fishing Prohibition (Official Monitor No.109/2010);
* Order no. 344/2008 for approval of the operational and functional manner of fishing vessel and boats file;
* Order no. 342/2008 on minimal size of the aquatic living resources;
* Order no. 449/2008 on technical characteristics and practice conditions for fishing gears used in the commercial fishing.

The National Strategic plan for Fishing and Aquaculture in Romania was drafted according to Article 15 of Council Regulation (CE) no. 1198/2006 of July 27, 2006 on the European Fishing Fund (EFF) following a consultation process with stakeholders, including national local government authorities, trade unions, NGOs and professional organizations. The National Strategic Plan (NSP) for the period between 2007 and 2013 covers all the aspects of the Common Fisheries Policy (CFP) in Romania. The National Strategic Plan shows the priorities, objectives and public financial resources required for the implementation of the CFP in Romania.

Romania has also adopted a National Plan for turbot (Plan of monitoring and control of fishing, landing and trading of turbot in Black Sea waters for 2014) establishing the means, conditions and procedures to ensure the monitoring and control of turbot fisheries in the Black Sea in 2014.

Annex 2 summarizes the management measures applied by Romania to turbot fisheries in the Black Sea.

**Russian Federation**

The Federal Law “On Fishery and Protection of Aquatic Biological Resources” (2004) and the Federal Law “On Environmental Protection” (2002) aim to ensure the conservation of living resources and its sustainable use and protection of the Black Sea (GFCM, 2012). The Law “On Fishery and Protection of Aquatic Biological Resources” of December 2004 foresees the setting Total Allowable Catch (TAC) levels for stocks harvested by industrial fisheries. The rules for setting quotas have been changing since the breakup of the Soviet Union and presently seem to be set every five years and allocated to fishers according to historical criteria (Popescu, 2010). No information could be obtained on the existing quotas for turbot. Besides TAC setting for industrial fisheries, all categories of fisheries are regulated by Fishing Rules (“Pravila rybolovstva”), which are set separately for several major areas including the Black Sea–Azov Sea Basin (Popescu, 2010). The Fishing Rules specify measures such as closed areas, seasonal closures, limitations of particular gear, minimum mesh sizes, minimum allowable size of catch, and allowable by-catch. No information could be obtained on existing Fishing Rules for turbot fisheries in the Black Sea.

**Turkey**

Fisheries Law No. 1380 of 1971, as amended by Laws No. 3288 of 1986 and No. 4950 of 2003, provides the legal framework for fisheries and aquaculture related activities. The law presents the basis for the regulations and communiqués, issued under the authority of the Minister of Food Agriculture and Livestock to regulate fisheries and aquaculture activities.

Fisheries Regulation (Official Gazette dated 10.03.1995 and No: 22223, amended by Official Gazettes No. 25052 dated 18.03.2003, No. 25374 dated 15.02.2004, No. 27455 dated 07.01.2010, No. 27517 dated 10.03.2010) is the fundamental regulatory instrument for marine and inland fisheries. The regulation covers:

* Fishing licence issue and formats;
* Provisions on production areas;
* Prohibition on explosives and hazardous substances;
* Fishing gear;
* Prohibitions, limitations and liabilities;
* Fishery product hygiene;
* Inspection and control.

The main mechanism for the regulation of the fisheries is through Notifications, which are issued half-yearly after consultations. Notifications are published and announced in the Official Gazette. The Notifications set the rules and general principles for the technical measures to be taken, including gear restrictions and prohibitions, control measures for fishing areas, establishment and extent of protected areas, seasonal limitations, species size limits and capture prohibitions for species. Notification 3/1 Regulating Commercial Fishing is of particular relevance to turbot fisheries in the Black Sea.

The basic management measures for turbot fisheries in 2012-2014 provided by the Commercial Fishery Advice of General Directorate of Fishery in Turkey (GFCM Stock Assessment Form 2014, Turbot, Turkey) are summarized in Annex 2. It is worth noting that a fleet restructuring program is ongoing, which is expected to affect the fishing capacity of the fleet that operates in the Black Sea (some 150 vessels operating in the Black Sea were expected to be scraped in 2013; GFCM, 2013).

**Ukraine**

The legal framework that regulates the fishery for turbot is provided by the following laws and resolutions:

* Code of Ukraine on Administrative Offences
* «On Procedure of Temporary Effect of Some Legislative Acts of the USSR», approved by the Resolution of Verkhovna Rada of Ukraine from12.09.91 № 1545-12.
* Law of Ukraine «On Exclusive (Marine) Economic Zone of Ukraine» from 16.05.95 № 162/95.
* «On Approval of Procedure and Conditions for Use of Fish and Other Water Live Resources of Exclusive (Maritime) Economic Zone of Ukraine», approved by the Resolution of the Cabinet of Ministers of Ukraine from 13.08.99 № 1490.
* «On Approval of Procedure of Protection of Sovereign Rights of Ukraine in Its Exclusive (Marine) Economic Zone», approved by the Resolution of the Cabinet of Ministers of Ukraine from 12.06.96 № 642.
* The Law of Ukraine «On Fish, Other Water Bioresources and Food Production Therein» from 06.02.03.
* The Law of Ukraine «On Permit System in the Sphere of Economic Activity».
* «On Approval of Procedure of Industrial Fishing in the Black Sea Basin» from 08.12.98 № 164.
* «On Approval of the Instruction of Special Use of Fish and Other Water Live Resources» from 11.11.2005 № 623/404.
* “On Fish Industry, Commercial Fisheries and Fish Resources Protection”, No. 3677-VI of 2011.

The management of turbot fisheries is carried out by limiting the volume of catch, the quantity and types of gear and by spatio-temporal constraints (Annex 2). There is no national management plan for the turbot fisheries.

**5.3 Fisheries Monitoring, Control and Surveillance (MCS)**

Table 7 compares the present capacity of countries to carry on MCS functions, based on selected tools.

Table 7. Status of implementation of selected MCS tools for turbot fisheries in the Black Sea.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Country | VMS | Observers on board | Dockside monitoring | Sea/port inspection |
| Bulgaria | 6 – 12m: 0%  > 12m: 100% | 0% | No | Yes |
| Georgia | ? | ? | ? | ? |
| Romania | 6 – 12m: 0%  > 12m: 100% | 0% | Yes | Yes |
| Russian Federation | ? | ? | ? | ? |
| Turkey | Vessels > 15 m | ? | Yes? | ? |
| Ukraine | <12 m: 0%  Others: 100% | <12 m: 0%  Others: 21% | No | Yes |

**5.4. Regional legal frameworks**

**European Union**

With the accession of Bulgaria and Romania to the EU in 2007, the EU Common Fishery Policy (CFP) has been extended into the Black Sea. The European Common Fisheries Policy (CFP) is the main framework for all fisheries legislation at the EU level, being applicable to all EU member countries. The core principles and mechanisms of the CFP are contained in the Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013.

The objective of the CFP is to ensure that fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies. To this end the CFP shall apply the precautionary approach to fisheries management, and shall aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield. Regulation (EU) No 1380/2013 further states that “in order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks”.

The CFP provides measures concerning the conservation and the management of exploitation of living aquatic resources, the limitation of the environmental impact of fishing, the conditions of access to waters and resources, fleet capacity, control aquaculture, common organization of the markets and international relations. Community fishing vessels all enjoy equal access to waters and resources except in the 12-mile zone, which falls within the sovereignty of the Member States.

Specific provisions are aimed at limiting fishing mortality and the environmental impacts of fishing activities, including measures such as the adoption of recovery plans for stock that are outside safe biological limits, the adoption of multi-annual management plans to maintain stocks within safe biological limits, prohibiting discards of regulated species, measures to adjust and manage fishing capacity according to fishing opportunities, limiting catches and fishing effort and adopting technical measures to promote more selective fishing or fishing with lower impacts on the ecosystem.

Regulation 1579/2007 was the first EC fisheries regulation in the Black Sea. It was later replaced by Regulation 1139/2008, which established catch limits for turbot and sprat. While the TAC for turbot was to be divided between the two States, that of sprat is not specifically divided. Annex II of this regulation sets transitional technical measures for the Black Sea. Since 2008, TACs are annualy established for turbot and sprat by means of new EC Regulations (No 1287/2009, No 1256/2010, No 5/2012, No 1261/2012).

In addition to the above specific regulations concerning fisheries in the Black Sea, there are other Council Regulations of relevance to fisheries management that are also applicable to fisheries in the waters of Bulgaria and Romania, including inter alia,

* Council Regulation (CE) 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing (complemented by Commission Regulation (EC) No 1010/2009).
* Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.
* Council Regulation (EC) No 1224/2009 of 20 November 2009 concerning the establishment of a Community system for control, inspection and enforcement (hereinafter referred to as Community control system) to ensure compliance with the rules of the common fisheries policy.
* Commission Regulation (EU) No 468/2010 of 28 May 2010 establishing the EU list of vessels engaged in illegal, unreported and unregulated fishing.

Other EU policies and resolutions of relevance to fisheries in the Black Sea are described below.

Black Sea Synergy

In 2007 the EU proposed a regional cooperation initiative called “Black Sea Synergy” (Black Sea Synergy – A New Regional Cooperation Initiative’ (COM(2007)0160), intended to increase cooperation with and between countries in the Black Sea region. According to Churchill and Owen (2010) the initiative had the merit of recognising the Black Sea region as strategic for the EU, together with the need for strengthened EU involvement in the area. Fisheries are one of the cooperation areas defined by the Black Sea Synergy, and a number of concrete tasks are formulated (Popescu, 2010):

- Action at regional level to help the Black Sea fish stocks to recover;

- Promotion of sustainable development through fisheries management, research, data collection and stock assessment in the Black Sea region;

- Exploration of new ways to ensure sustainable and responsible use of fisheries resources in the region;

- Better use of the possibilities offered by the General Fisheries Commission for the Mediterranean, which includes the Black Sea in its mandate.

Integrated Maritime Policy (IMP)

The IMP, elaborated in the Communication COM (2007) 575 “An Integrated Maritime Policy for the European Union”, seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas. By accounting for the inter-connectedness of industries and human activities centred on the sea (shipping and ports, wind energy, marine research, fishing, tourism, etc.), the IMP sets up an integrated approach to the management of maritime activities, in a similar fashion to the ICZM approach to coastal zones. The IMP covers five cross-cutting policies: Blue growth; Marine data and knowledge; Maritime spatial planning; Integrated maritime surveillance; and Sea basin strategies.

Marine Strategy Framework Directive (MSFD)

The 2008 Marine Strategy Framework Directive (MSFD; DIRECTIVE 2008/56/EC) is the environment pillar of the IMP. Its overarching aim is to achieve good environmental status (GES) for EU marine waters by 2020. For that purpose, it foresees the development and implementation of marine strategies to:

* protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected;
* prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.

According to the MSFD “marine strategies shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations”.

A common plan of action for all marine strategies is lay down in the MSFD, establishing a program of actions between 2012 and 2016 for the assessment of the environmental status of the region, the establishment of targets and indicators of good environmental status, the establishment of a monitoring programme, and for the development and implementation of a programme of measures designed to achieve or maintain good environmental status of the marine waters in region. The Directive recognizes among the qualitative descriptors to be used for determining the good environmental status that “populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock”. The definition of targets for this descriptor will have direct relevance to the objectives and reference points adopted in fisheries management plans. Likewise the programme of measures to be designed to achieve or maintain a good environmental status will have to be coherent with any existing management plans.

EU Strategy for the Black Sea

In January 2011 the European Parliament adopted a resolution on an EU Strategy for the Black Sea (2010/2087(INI)) which underlines the need for the application of multiannual management plans for fisheries, as well as the creation of a separate regional body for the management of Black Sea fisheries. The Strategy calls on the EU to include the Black Sea region in the Integrated Maritime Policy and, in particular, the Common Fisheries Policy (CFP) on an equal footing with the other European basins.

Black Sea Stakeholder Conference

The Black Sea Stakeholder Conference on “Sustainable development of the blue economy in the Black Sea. Enhancing marine and maritime cooperation”, was held in Bucharest, 30 January 2014. The event, which was attended by government representatives and private stakeholders from all riparian States, affirmed the commitment to work in partnership to support a blue and sustainable economy in the Black Sea region and to maximize marine and maritime cooperation across all bordering countries.

**General Fisheries Commission for the Mediterranean (GFCM)**

The GFCM is the regional fisheries management organization for the Mediterranean and Black Sea, whose goal is to promote the development, conservation, rational management and best utilization of living marine resources in its area of competence, which includes the Black Sea. Three of the Black Sea countries are members of the GFCM: Bulgaria (since 3 November 1969), Romania (since 19 February 1971) and Turkey (since 6 April 1954). Ukraine, Russia and Georgia are not members.

During its thirteenth session (Marseille, France, 7–11 February 2011) the Scientific Advisory Committee of GFCM, agreed on the need to strengthen the collaboration with the Black Sea countries by establishing an ad-hoc Working Group on the Black Sea open to all scientists of the region and to the partner Organizations. It also decided to hold the first meeting of this Working Group in Romania in early 2012. The Ad Hoc Working Group on the Black Sea has been meeting annually since 2012. During the first meeting in 2012 the Working group underlined the fact that “fisheries management in the Black Sea still requires strengthening and regional harmonization of the regulatory and legal framework, especially with regard to the conservation and protection of the migratory and shared marine living resources”.

The meeting further identified the main and priority needs a follows:

- Establishing a comprehensive and standardized fisheries data collection program for the Black Sea in compliance with regional requirements, with the aim to enhance the reliability of the relevant data on landings and discards.

- Performing joint bottom trawl and acoustic surveys and other research activities, including on stock units and on the standardization of biological parameters estimates for shared and migratory stocks.

- Improving the national and regional capability to analyze and assess fisheries data and increasing awareness on the existing expertise in the region including on stock assessment and other relevant subjects.

- Promoting the implementation of the ecosystem approach to fisheries, including the development of criteria and methodologies for evaluation of ecosystems and habitats of importance for marine fisheries resources and for the establishment of fisheries restricted areas.

- Developing common and harmonized approaches for the conservation and restoration of endangered species and their habitats (e.g. sturgeons) and improving knowledge and monitoring of the status of diadromous fish stocks in their distribution area.

- Developing a regional fishery management system where technical measures adopted at national level could be harmonized in the region and increasing MCS compliance including for IUU fishing activities.

The Second Meeting of the Working Group (GFCM, 2013b) highlighted the importance of taking steps towards establishing management plans in the region, including inter-alia to facilitate the setting up of common management rules and to ensure sustainability of exploitation of fishery resources in the Black Sea. The WGBS also endorsed the selection of turbot (as a first priority) and small pelagic fisheries (as a second priority) fisheries as case studies for testing the feasibility of implementing the GFCM guidelines for management plan in the region.

In 2012 a Memorandum of Understanding was signed between the GFCM and the Black Sea Commission, with the following thematic areas:

* Promoting ecosystem based approaches for the conservation of the marine environment and ecosystems and the sustainable use of its living resources;
* Mitigating the impact of fisheries and aquaculture activities on the marine habitats and species;
* Identification, protection and management of marine areas of particular importance (hot spots of biodiversity, areas with sensitive habitats, essential fish habitats, areas of importance for fisheries and/or for the conservation of endangered species, coastal wetlands);
* Integrated Maritime Policy;
* Legal, institutional and policy related cooperation.

Two important technical meetings were held recently under GFCM’s Framework Program. The FWP workshop on fisheries data collection in the Black Sea (Varna, Bulgaria, 22-23 April 2013) identified gaps and actions for improvement of the fisheries data collection. The workshop also elaborated recommendations to fight IUU fishing and to improve cooperation on data sharing among all riparian countries. A roadmap to fight IUU fishing in the Black Sea was later elaborated in a specific dedicated workshop to IUU in the Black Sea (Joint GFCM-BSC Workshop on IUU Fishing in the Black Sea, Istanbul, Turkey, 25-27 February 2013).

The GFCM has adopted several recommendations, resolutions and guidelines of relevance to the management of demersal and small pelagic fisheries. Those of relevance to turbot fisheries in the Black Sea are briefly described below and grouped into three categories: Conservation and Management; Monitoring, Control and Surveillance; and Data and Information Reporting.

**Conservation and Management**

Recommendation GFCM/29/2005/1 on management of certain fisheries exploiting demersal and deepwater species. The recommendations call upon Member countries to adopt measures aimed at increasing the selectivity of demersal trawlnets, including the immediate implementation of at least a 40 mm mesh size opening for the whole demersal trawl codend. It also prohibit the use of towed dredges and trawl nets fisheries at depths beyond 1 000 m of depth.

Resolution GFCM/33/2009/1 on the management of demersal fisheries in the GFCM area. Recalling Recommendations GFCM/2002/1 and GFCM/2006/1, which calls for a management programme in relation to fishing effort control in demersal and small pelagic fisheries, GFCM Members resolves that “Unless proven unnecessary by sound scientific advice, a reduction of a minimum of 10% of bottom trawling fishing effort shall be applied in all GFCM areas”.

Recommendation GFCM/ /33/2009/2 on the minimum mesh size in the codend of demersal trawl nets. Members and Cooperating entities of GFCM shall adopt and implement, at latest

by 31 January 2012, a minimum 40 mm square mesh codend or a diamond mesh size of at least 50 mm, of acknowledged equivalent or higher size selectivity, for all trawling activities exploiting demersal stocks when operating in the GFCM Area. Countries are also required to communicate every three months to the Secretariat the list of fishing vessels, and their percentage out of the whole national demersal trawl fleet, equipped with the stipulated trawl cod-end mesh size.

Recommendation GFCM/34/2010/2 on the management of fishing capacity. One important aspects of this recommendation is that it recognizes the need for a Regional Plan of Action to manage fishing capacity at regional level. According to the recommendation the levels of the overall fishing capacity in the GFCM area shall be determined based on a Regional Plan of Action considering the national and regional fishing capacity management plans and scientific advice. In spite of that it is recommended a freeze in the fishing capacity of vessels more than 15 meters. The recommendation further defines fishing capacity and reiterates the need for keeping an updated list of vessels greater than 15 meters authorized to fish in the GFCM area, based on information submitted by Members and cooperating entities. Since the adoption of Recommendation GFCM/34/2010/2 several technical meetings were held with the objective of drafting a Regional Plan of Action for the Management of Fishing Capacity (RPOA) in the GFCM area. A draft RPOA was presented during the 36th Session of Commission in 2012, when the text was amended with proposals made Member countries. The outcome of this process was the Resolution GFCM/37/2013/2 providing general guidelines on the management of fishing capacity in the GFCM area (discussed below).

Recommendation GFCM/36/2012/2 on mitigation of incidental catches of cetaceans in the GFCM area. Direct Members to take actions to study, monitor, prevent, mitigate and, to the extent possible, eliminate incidental taking of cetaceans during fishing operations. For the purpose of mitigating the by-catch of cetaceans during fishing operations, the CPCs shall: i) prohibit, not later than 1st January 2015, gillnet fisheries using monofilament greater than 0.5 mm; ii) require vessels flying their flag to promptly release alive / unharmed to the extent practicable cetaceans that have been incidentally caught and brought alongside the vessel. Members are also requested to collect and report to SAC and the Task 1.4 data on cetaceans bycatch. Based on data compiled and other relevant information the SAC is directed to evaluate the potential impacts of alternative mitigation measures and report to the 39th session of the GFCM in 2015. Upon receipt of advice from the SAC, the GFCM will consider, if appropriate, the adoption of further measures to mitigate incidental catches of cetaceans in the fisheries concerned.

Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area. The recommendation establishes measures to improve the monitoring of shark catches and fisheries management measures to ensure adequate conservation status of sharks. The management measures include the prohibition of “finning“ and the reduction of trawl fishing in coastal areas to enhance protection of coastal sharks. The latter is to be implemented by CPS by ensuring that trawling activities are prohibited within 3 nautical miles off the coast, provided that the 50 meters isobath is not reached, or within the 50 meters isobath where that depth is reached at a shorter distance from the coast. The recommendation also establishes special conditions under which derogations to this measure may apply.

Resolution GFCM37/2013/1 on area based management of fisheries, including through the establishment of Fisheries Restricted Areas (FRAs) in the GFCM convention area and coordination with the UNEP-MAP initiatives on the establishment of SPAMIs. The resolution provides that the GFCM shall designate Fisheries Restricted Areas (FRAs), particular for areas in the high seas, for the conservation and management of fisheries resources within an ecosystem approach to fisheries management. A FRA is defined by GFCM as an area in which all or certain fishing activities are temporarily or permanently banned or restricted in order to improve the exploitation and conservation of harvested living aquatic resources or the protection of marine ecosystems. According to the Resolution, the location of the FRAs may be totally or partially coincident with the Specially Protected Areas of Mediterranean Importance (SPAMI) established by the Parties to the Barcelona Convention through the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol). SPAMIs are designated to promote cooperation in the management and conservation of natural areas, as well as in the protection of threatened species and their habitats. Currently there are 32 SPAMIs in the Mediterranean Sea. The Resolution further stipulates that “the designation of a FRA by the GFCM shall be based on sound scientific and technical identification by the Scientific Advisory Committee (SAC), based inter-alia on proposals by CPCs, Party Organizations, scientific institutions and observers, with a view to maintain and/or recovery of marine living resources to an healthy state while ensuring the conservation of marine biodiversity for the sustainable exploitation. The identification of a FRA shall follow as minimum standard those criteria and conditions as stipulated by the GFCM “Standard Form”.

Resolution GFCM/37/2013/2 on guidelines on the management of fishing capacity in the GFCM area. The resolution provides guidance in the development and implementation of actions at national level for the management of fishing capacity so to rationalize the management of fishing capacity at regional level. Among the recommended actions that may be taken nationally to manage fishing capacity are: undertaking capacity reduction programs where there is evidence of overcapacity; freezing fishing capacity at levels in line with Recommendation 34/2010/2 based on and with reference to the GFCM Vessel Records; and evaluating the effects of modernization, new fishing practices, and technology creep on the management of the national fishing capacity. With the respect to the freeze of fishing capacity the resolution notes that:

“The freeze of fishing capacity is without prejudice to Members and CPCs who have substandard fishing fleets (e.g. navigation and safety capabilities), have obsolete fleets, are in the process of developing/upgrading their fleets, or have other structural problems. These countries are encouraged to follow this guidance to the extent possible”.

In situation where there is no new fishing opportunities, new constructions or imports of fishing vessels should be subject to a system of control that guarantees the destruction or exit from the register of at least the same tonnage and power that the one intended to be built.

The resolution also provides for the GFCM Secretariat the responsibility of updating and displaying the current levels of fishing capacity in GFCM Members. It outlines the different financial, technical and legislative instruments that could be used by CPCs to rationalize the management of fishing capacity at regional level. In terms of financial instruments, it is recommended for instance that public funds for the management of fishing capacity shall not in any circumstance lead to an increase in the catch capacity or the power of fishing vessel's engines. On the other hand financial investments/assistance with private funds “will be allowed to operate only within an organized fisheries management framework, designed and monitored to deliver sustainable exploitation on the basis of scientific advice and rationale management”. In terms of legal and administrative instruments it is highlighted the need for harmonizing policies and regulatory frameworks in CPCs on the management of fishing capacity, including on the basis of relevant GFCM decisions.

Recommendation GFCM/37/2012/2 on the establishment of a set of minimum standards for bottom-set gillnet fisheries for turbot and conservation of cetaceans in the Black Sea. The first part of this recommendation established measures for the management of turbot fisheries in the Black Sea, including: i) ensuring that turbot in the Black Sea (GSA29) is fished exclusively using bottom-set gillnets; ii) mesh size grater or equal to 400 mm (stretched mesh); and iii) minimum catch size of 45 cm total length. The second part of the decision concerns the establishment of measures to mitigate the impact of bottom-set gillnet fisheries on marine mammals’ populations. The main measure is to ensuring that monofilament or twine diameter do no exceed 0.5 mm. Specific provisions to measure the diameter of the monifilament are also provided. Finally the decision calls for the establishment of adequate monitoring program to collect information on the impact of bottom-set gillnets targeting picked dogfish on cetaceans populations in the Black Sea.

Guidelines on precautionary conservation measures pending the development and adoption of GFCM multiannual management plans for relevant fisheries at sub-regional levels in the GFCM area. The guidelines were aimed at encouraging member countries to develop joint management measures for fisheries resources at sub-regional level. The adoption of joint measures is intended to contribute to the future development of multiannual management plans by the GFCM. According to the guidelines “the management measures to be identified shall be based on the evaluation of different management scenarios by SAC and shall be in line with the GFCM guidelines for management plans and, in particular, with the following general objectives:

- to counteract and/or to prevent overfishing with a view to ensure the sustainable economic viability of fisheries

- to provide high long-term yields

- to restore and/or to maintain, to the extent possible, the stock size of harvested species at least at levels which can produce the maximum sustainable yield

- to guarantee a low risk of stocks falling outside safe biological limits to ensure protection of biodiversity to avoid undermining ecosystems' structure and functioning.”

The guidelines propose the definition of management measures such as fishing effort, seasonal closures, minimum size, selectivity and characteristics of fishing gears at sub-regional level by stock or group of stocks. With a view to promote more selective fisheries and improve the exploitation pattern in the GFCM area, minimum conservation sizes are proposed to be applied, on a voluntary basis, for selected resources, including *P. longirostris*, sardine and anchovy.

**Monitoring, Control and Surveillance**

Recommendation GFCM/2008/1 on a regional scheme on port state measures to combat illegal, unreported and unregulated fishing in the GFCM area. The objective of this Recommendation is to contribute to the long-term conservation and sustainable use of living marine resources in the GFCM Area through strengthened, harmonized and transparent port State measures to prevent, deter and eliminate illegal, unreported and unregulated fishing.

Recommendation GFCM/33/2009/7 concerning minimum standards for the establishment of a Vessel Monitoring System (VMS) in the GFCM area. According to this recommendation, all Parties and Cooperating non-Contracting Parties shall implement not later than 31 December 2012, a satellite-based VMS for its commercial fishing vessels exceeding 15 meters of length that have been authorized to fish in the GFCM area. The specific requirement of the VMS are lay down in the recommendation.

Recommendation GFCM/33/2009/8 on the establishment of a list of vessels presumed to have carried out IUU fishing in the GFCM area amending the recommendation GFCM/2006/4. Parties and Cooperating non-Contracting Parties are requested to transmit every year to the Executive Secretary information on vessels presumed to be carrying out IUU fishing activities in the GFCM Area during the previous year. This information is to be used by the Secretary to build an IUU Vessel List. The recommendation lays down the conditions and requirements for inclusion and deletion of vessels form the list, as well as, the measures to be adopted against vessels included in the list.

**Data and Information Reporting**

Recommendation GFCM/33/2009/5 on the establishment of the GFCM Regional Fleet Register. The recommendation establishes a Regional Fleet Register (RFR) to host information on all vessels, boats, ships, or other crafts that are equipped and used for commercial fishing activity in the GFCM Area. The RFR is meant to serve as a tool for the management at regional level of the capacity of fishing fleets and their activity.

Recommendation GFCM/33/2009/6 concerning the establishment of a GFCM record of vessels over 15 meters authorized to operate in the GFCM area amending the recommendation GFCM/2005/2. The recommendation establishes a record of fishing vessels larger than 15 meters in length overall authorized to fish in the GFCM Area. Vessels larger than 15 meters in length overall not entered into the record are deemed not to be authorized to fish for, retain on board, transship or land species covered by the Commission. The record of vessels authorized to fish is meant to serve as a tool to help combat IUU fishing in the GFCM area.

Recommendation GFCM/33/2009/3 on the implementation of the GFCM Task 1 statistical matrix and repealing resolution GFCM/31/2007/1. The Recommendation establishes a statistical matrix to be used by CPCs as a tool to communicate in a standardised format relevant information for fisheries management to the GFCM Secretary with a view to develop the GFCM database. The matrix, which includes a comprehensive set of variables concerning fleets, fisheries economics, effort, catches and biological parameters, are to be submitted by countries on annual basis, starting on January 2011 at the latest.

Recommendation GFCM/34/2010/1 concerning the establishment of a GFCM logbook (amended by GFCM/35/2011/1). Masters of fishing vessels more than 15 meters in overall length (LOA) authorized to fish in the GFCM area and registered on the GFCM Record of Vessels are required to keep a bound logbook of their operations, indicating particularly quantities of each species caught and kept on board, above 50kg in live weight, whether the catches are weighed or estimated, the date and geographical position of such catches and the type of gear(s) used in accordance with the minimum specifications and information set out in the recommendation. The minimum quantity of 50 Kg in live weight shall be adopted without prejudice to stricter rules implemented by Contracting Parties who may define a lower threshold between 0 and 50 kg.

**Black Sea Commission**

The Commission on the Protection of the Black Sea Against Pollution (the Black Sea Commission) was established to implement the Convention on the Protection of the Black Sea Against Pollution. The Convention was signed in Bucharest on 21 April 1992 and entered into force on 15 January 1994. The Secretariat of the Black Sea Commission became operational in September 2000. The Contracting Parties to the Convention are Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine. Among the main functions of the Commission is the promotion of scientific and technical research. The work programme of the Commission includes implementation of the Black Sea Strategic Action Plan (2009) (discussed below), coordination with national and regional projects/activities, and with international financing agencies.

In order to support the BSC with advice and information on topics which are key to the implementation of the Convention, Advisory Groups and Activity Centers have been designated to work under the coordination of the Permanent Secretariat. There are seven BSC Advisory Groups for: (a) pollution monitoring and assessment (PMA); (b) control of pollution from land based sources (LBS); (c) development of common methodologies for integrated coastal zone management (ICZM); (d) environmental safety aspects of shipping (ESAS); (e) conservation of biological diversity (CBD); (f) environmental aspects of the management of fisheries and other marine living resources (FOMLR); and (g) information and data exchange (IDE). Within the institutional framework co-ordinated by the BSC, seven Black Sea Regional Activity Centres have been established based of existing national organisations.

In 2009 the contracting parties of the Black Sea Commission adopted the new Strategic Action Plan (SAP) for the Environmental Protection and Rehabilitation of the Black Sea. The SAP adopt as key management approach for fisheries the ecosystem approach and identified Long-term Ecosystem Quality Objectives (EcoQOs):

EcoQO 1: Preserve commercial marine living resources.

*EcoQO 1a: Sustainable use of commercial fish stocks and other marine living resources.*

*EcoQO 1b: Restore/rehabilitate stocks of commercial marine living resources.*

EcoQO 2: Conservation of Black Sea Biodiversity and Habitats.

*EcoQO 2a: Reduce the risk of extinction of threatened species.*

*EcoQO 2b: Conserve coastal and marine habitats and landscapes.*

*EcoQO 2c: Reduce and manage human mediated species introductions*

EcoQO 3: Reduce eutrophication.

EcoQO 4: Ensure Good Water Quality for Human Health, Recreational Use and Aquatic Biota.

*EcoQO 4a: Reduce pollutants originating from land based sources, including atmospheric emissions.*

*EcoQO 4b: Reduce pollutants originating from shipping activities and offshore installations*

Each EcoQO is assigned a number of management targets that address the immediate, underlying and root causes of the concern areas. For regional level interventions, the Black Sea coastal States and the international partners shall work collectively to take the required steps to fulfill those interventions. National level supporting interventions will be the responsibility of individual states. Table 8 lists management targets under EcoQO 1, that are aimed at fisheries management authorities of the Riparian countries.

**Table 8**.Selected management targets and priority status required to meet the EcoQOs of the 2009 Strategic Action Plan of the Black Sea Commission. Only targets aimed at fisheries management authorities are listed. Timing: short-term = 1-5 years, mid-term = >5-10 years and long-term = >10 years (source: Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea, available at <http://www.blacksea-commission.org/_bssap2009.asp>).

|  |  |  |
| --- | --- | --- |
| **Overall Management Target** | **Timing** | **Priority** |
| Adopt and implement a Regional Agreement for fisheries and conservation of living resources of the Black Sea | **Short-term:** Introduce quota regime for turbot and other demersal fish stocks.  **Mid-term:** Establish remote sensing (satellite) system for observing and controlling fishing operations in open sea | High |
| Develop and introduce methodologies to assess the condition of populations of commercial marine living resources | **Short-term:** Scheme developed and adopted at Commission level, including detailed methodologies.  **Mid-term:** Raw assessment data reported to the BSC permanent secretariat by all countries. | Medium |
| Harmonise and improve methodologies for the collation of fisheries statistic data and for assessment of the fish stocks at a regional level | **Short-term:** Stock assessment methodologies agreed by all 6 countries for all demersal fish, anchovy and sprat for improved estimation of individual species and total fish landings.  **Mid-term:** Undertake regular, and where possible, coordinated stock assessments of all commercially important fish. Improved landing statistics. | High |
| Increase resources to regulatory bodies responsible for fisheries management | **Short** | Medium |
| Improved regionally-agreed system to match fishing effort to stocks | **Medium** | High |
| Ban non–precautionary fishing technologies | **Short-term:** Develop draft document, including detailed regionally-agreed definition of unsustainable fishing gear.  **Mid/long-term:** Agreement signed and ratified. Effectiveness of ban assessed. | High/Medium |
| Introduce instruments including management, economic and legal to ensure increased production from environmentally friendly mariculture to encourage a decrease in fishing effort. | **Short** | High/Medium |
| Develop regulations aimed at decreasing by-catch level | **Short-term:** Establish regionally agreed minimum permitted length of commercial fish and minimum mesh sizes for target species.  **Mid-term:** Robust enforcement of regulations | Medium/High |
| Elaborate and implement measures for increasing of the fish recruitment for the protection of juvenile commercial fish. | **Short-term:** Identify and introduce closed nursery areas.  Establish and introduce closed seasons for demersal fish. | Medium |
| Minimise ghost fishing caused by discarded, abandoned or lost fixed and floating nets, including those used in illegal/unregulated fishing activities | **Mid-term** | Medium |

A Memorandum of Understanding between the Black Sea Commission and GFCM was signed in 2012 to ensure mutual involvement in promoting an ecosystem-based approach for the conservation of the marine environment and sustainable use of living marine resources. Among the collaborative activites carried out jointly by GFCM and BSC was the Joint GFCM-BSC Workshop on IUU Fishing in the Black Sea, Istanbul, Turkey, 25-27 February 2013, which led to the development of a roadmap to combat IUU fishing (discussed above).

**Organization of the Black Sea Economic Cooperation (BSEC)**

The Organization of the Black Sea Economic Cooperation (BSEC) was created in 1992 with the objective to "fostering interaction and harmony among the Member States, as well as to ensure peace, stability and prosperity encouraging friendly and good-neighborly relations in the Black Sea region". The BSEC has taken some limited initiatives concerning maritime affairs (Popescu, 2010). However, the BSEC takes part as an observer in continued negotiations about a fisheries convention under the auspices of the BSC.

**Black Sea Ecosystem Recovery Project (BSERP)**

The Black Sea Ecosystem Recovery Project (BSERP) has been developed under the auspices of the Global Environmental Facility (GEF) International Waters Program, and is implemented by the UNDP. The BSERP was launched as a two phase, US$10 million, 5-year effort, with UN Operations Services acting as managing agent on behalf of UNDP. The project supports the regional aspects of the Black Sea Partnership for Nutrient Control and assists and strengthens the role of the BSC. It also ensures the provision of a suite of harmonized legal and policy instruments for tackling the problem of eutrophication, and release of certain hazardous substances, and to facilitate ecosystem recovery (Popescu, 2010).

The BSERP is closely working with the BSC, which is the project’s main “client”, besides the wider public of the Black Sea region. The World Bank Investment Fund and the Danube Regional Project (DRP) are the other key partners under the GEF Black Sea-Danube Strategic Partnership, where the BSERP also belongs. All together, they are addressing transboundary environmental degradation in the Danube/Black Sea basin, the BSERP and the DRP through policy and legal reform, public awareness raising, and institutional strengthening, and the World Bank Investment Fund through funding investments in nutrient reduction in the Black Sea region (Popescu, 2010).

**Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS)**

ACCOBAMS is an intergovernmental Agreement that was concluded in the auspices of the Convention on Migratory Species in 1996 and entered into force in 2001. Its purpose is to reduce threats to cetaceans within the geographical area of the Agreement by improving current knowledge on these animals and by promoting closer cooperation amongst Parties with a view to conserving all cetacean species present in the area. The Agreement Area consists of all the maritime waters of the Black Sea, the Mediterranean and the contiguous Atlantic area west of the Straits of Gibraltar. In January 2014, 23 countries of the ACCOBAMS area were Parties to the Agreement. In the Black Sea the Agreement applies to three species of cetaceans: Harbour porpoise, *Phocoena phocoena*, Bottlenose dolphin, *Tursiops truncatus* amd the Common dolphin, *Delphinus delphis*.

Parties to ACCOBAMS are required to implement a detailed Conservation Plan to achieve and to maintain a favourable conservation status for cetaceans. This commitment combines total protection of threatened species with stronger habitat protection. Within the limits of their sovereignty and/or jurisdiction and in accordance with their international obligations, the Parties are requested to provide:

* Legislative measures prohibiting intentional catch, reducing incidental catch in fishing nets, submitting to impact assessment activities that may affect cetaceans, and strengthening actions against pollution;
* Assessment and management of interactions between human activities and cetaceans;
* Habitats protection in particular by establishing Specially Protected Areas within critical habitats for cetacean feeding or reproduction;
* Research and monitoring as a support to conservation measures and to enhance their efficiency;
* Capacity building enabling all riparian Countries to implement conservation measures and collects the required information more efficiently;
* Information, training and education programs for the general public and professional sectors;
* Responses to emergency situations for the rescue of wounded, sick or stranded animals or for scientific sampling from dead ones.

ACCOBAMS runs two regional programmes of relevance to fisheries: “mitigation of the impacts of fishing activities” and, “assessment and reduction of the impact of ghost fishing on marine biodiversity”. It also organizes a Biennial Conference on Cetacean Conservation in South Mediterranean Countries.

**United Nations Convention on the Law of the Sea (UNCLOS)**

The United Nations Convention on the Law of the Sea (UNCLOS) is the international agreement that resulted from the third United Nations Conference on the Law of the Sea, which took place between 1973 and 1982. UNCLOS defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources. With the exception of Turkey, all Black Sea coastal states have signed and ratified UNCLOS.

Article 63 on “Stocks occurring within the exclusive economic zones or two or more coastal States or both within the exclusive economic zone and in an area beyond and adjacent to it” emphasizes the need for coordinated action among coastal States sharing fishing stocks:

“1. Where the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal States, these States shall seek, either directly or through appropriate subregional or regional organizations, to agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks without prejudice to the other provisions of this Part.

2. Where the same stock or stocks of associated species occur both within the exclusive economic zone and in an area beyond and adjacent to the zone, the coastal State and the States fishing for such stocks in the adjacent area shall seek, either directly or through appropriate subregional or regional organizations, to agree upon the measures necessary for the conservation of these stocks in the adjacent area”.

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Annex 1. Characteristics of the turbot fisheries in the Black Sea. Fleet segments and fishing gears are according to GFCM Task 1 terminology. Target and associated (bycatch of commercial value) species are listed in order of volume in the catches. Information from Turkey sourced from GFCM (2013) and Zengin (2014). \* potential number of vessels since that some also operate pelagic trawls. No information could be obtained on the fleet from Russian Federation.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Fleet segment | Fishing gear | Area of operation (GSAs, depth) | Number vessels | Fishing period | Main target species | Associated species |
| **Bulgaria** |  |  |  |  |  |  |
| B, 0 – 6 m | Gillnets and entangling nets | GSA29, 5 – 25 m | 52 | Jan – Dec | Turbot | *M. merlangus*  *A. immaculata*  *M. barbatus*  *P. saltatrix* |
| C, 6 – 12 m | Gillnets and entantling nets (not specified) | GSA29, 5 – 35 m | 38 | Jan – Dec | Turbot | *M. merlangus*  *A. immaculata*  *M. barbatus*  *P. saltatrix)* |
| Polyvalent vessels, 12 – 24 m | Gillnets and entantling nets (not specified) | GSA29, 5 – 65 m | 30 | Jan – Dec | Turbot | *M. merlangus*  *A. immaculata*  *M. barbatus*  *P. saltatrix* |
| Trawlers, 12 – 24 m | Gillnets and entantling nets (not specified) | GSA29, 5 – 65 m | 10 | Jan - Dec | Turbot | *M. merlangus*  *A. immaculata*  *M. barbatus*  *P. saltatrix* |
| **Romania** |  |  |  |  |  |  |
| Vessels < 6 m | Set gillnets (anchored) | GSA 29, 35 – 46 m | 8 | Jan – April; Jun – Dec | Turbot | *Raja clavata*  *Dasyatis pastinaca* |
| Vessels 6 – 12 m | Set gillnets (anchored) | GSA 29, 22 – 70 m | 55 | Jan – April; Jun – Dec | Turbot | *Raja clavata*  *Dasyatis pastinaca* |
| Vessels 12 – 18 m | Set gillnets (anchored) | GSA 29, 22 – 70 m | 2 | Jan – April; Jun – Dec | Turbot | *Raja clavata*  *Dasyatis pastinac* |
| Vessels 18 – 24 m | Set gillnets (anchored) | GSA 29, 35 – 64 m | 1 | Jan – April; Jun – Dec | Turbot | *Raja clavata*  *Dasyatis pastinaca* |
| Vessels 24 – 40 m | Set gillnets (anchored) | GSA 29, 21 – 70 m | 1 | Jan – April; Jun – Dec | Turbot | *Raja clavata*  *Dasyatis pastinaca* |
| **Turkey** |  |  |  |  |  |  |
| East: 4.5 – 12 m (average 7.3 m)  West: 5 – 23 m (average 9.9 m) | Set gillnets (anchored) | GSA 29, 25 - 100 m | 336 (east)  250 (west) | April – Jun (prohib. 15 April – 15 June) | Turbot | *\_* |
| Trawlers 12 – 30 m (average 19.9 m) | Bottom trawl | GSA 29, 25 – 100 m | 134\* (east)  313\* (west) | Forbidden 15 April – 15 Sept. | Whiting  Red mullet | Turbot |
| **Ukraine** |  |  |  |  |  |  |
| Small-size vessels (barkas, feluccas <12 m) | Set gillnets (anchored) | GSA 29, 6 – 90 m | 159 | February-April;  June-October | Turbot | Thomback ray, common stingray, picked dogfish (up to 5%) |
| M – Small tonnage fleet (SCHS, PTR) | Set gillnets (anchored) | GSA 29, 6 – 15 m | **3** | March-July | Turbot | Picked dogfish (3-5%) |

Annex 2. Summary of management measures for turbot fisheries in the Black Sea by countries and the EU. Relevant recommendations by the GFCM are also provided.

| Management measures | Bulgaria | Romania | Turkey | Ukraine | EC Regulations (valid for Bulgaria and Romania) | GFCM (valid for Bulgaria, Romania and Turkey) |
| --- | --- | --- | --- | --- | --- | --- |
| Spatial restrictions | Prohibited at NATURA 2000 sites, prohibited on fishing in one mile zone, in the region of ports and around estuaries on rivers. | The trawl is prohibited in Danube Delta Marine Reservation, in Vama Veche-2 Mai Reservation and also, in marine zone under the 20 m depths.  No protected areas in Romanian EU waters. | Bottom trawling is prohibited in the areas between 1) Sinop city, İnceburun (42° 05.959’N-34° 56.695’E and Samsun city Çayağzı cape (41° 41.040’ N-35° 25.193’ E), 2) Ordu city; Ünye, Taşkana cape (41° 08.725’ N-37° 17.531’ E) and Georgia border. Furthermore, it is also banned within 2 miles from land between Zonguldak city; Ereğli, Baba cape (41° 17.342’ N-31° 23.937’E) and Bartın city; Amasra, Tekke cape (41° 43.485' N-32° 19.258' E). In the rest of the areas, the waters open for trawling are 3 miles from the coast. (Figure A). | Prohibition of trawl fishing engagement in case of bycatch of valuable fish species (in 2012 – from cape Opuk to cape Takil, in 2013 – from cape Chauda to cape Takil). |  | Prohibited trawling within 3 nautical miles off the coast, provided that the 50 meters isobath is not reached, or within the 50 meters isobath where that depth is reached at a shorter distance from the coast. |
| * Temporal restrictions | 15.04-15.06 every year | In conformity with annul order, for turbot, the closed season is 15 April-15 June | In open areas, bottom trawling for turbot is banned between 15 April and 15 September. Turbot fishery by gillnet is allowed except during the period 15 April – 15 June. | Prohibition of turbot fishing during its spawning in the Black Sea (15-day graded prohibition from 1 to 30 May)  Limitation of fishing gears during turbot spawning – temporary prohibition to trawl fishing, baiting hooks and gears for Black Sea turbot.  Target gillnet fishery allowed from 1 February to 31 October.  Prohibition of fishing in fish wintering holes during concentration of water bioresources in winter period. | Closed season from 15 April to 15 June |  |
| * Catch restrictions | TACs defined annually | TACs defined annually |  | TAC defined annually and divided among users, including bycatch users. | TACs defined annually |  |
| * Effort restrictions |  |  |  | Total effort limited at 7 700 gillnets. For small vessels the minimum number of gillnets is 20. For registered vessels is 100 units. |  | Resolution GFCM/33/2009/1 calling a reduction of a minimum of 10% of bottom trawling fishing effort to be applied in all GFCM areas, unless proven unnecessary by sound scientific advice. |
| * Gear restrictions | Minimum mesh size for bottom set nets of 360 - 400 mm. | In conformity with Order 449/2009:  Gears type dredge and bottom trawl are prohibited in the Romanian territorial waters;  Fishing gears monofilament net are prohibited;  For turbot, the gillnet mesh size is 2a=40cm. | Mesh size of the codend should not be lower than 40 mm for bottom trawl nets.  Mesh size of gillnets should not be lower than 400 mm.  Long lines and trammel gillnets are forbidden for turbot fishery. | Gillnets for turbot allowed with the following dimensions:   * length: 100 meters * minimum mesh size: 180 – 200 mm * number of meshes in height: 8 units.   Bycatch allowed in the following gears:  - midwater trawls (6.0 mm) for sprat;  - midwater trawls (12.0 mm) for whiting;  - pound nets (6 mm in a pound, 10 mm in a heart, 14 mm in a lead line);  - beach seines (30 mm in a bag, 36 mm in the net inset between a bag and a wing, and 40 mm in a wing);  - gillnets (100 mm and not more than 120 mm in 2013) for picked dogfish;  - gillnets (100 mm and not more than 180 mm in 2013) for ray and stingray;  - longlines (hook size of 26 mm ±2 mm) for picked dogfish and ray&stingray. | Minimum mesh size for bottom set nets of 360 - 400 mm. | Turbot in the Black Sea (GSA29) fished exclusively using bottom-set gillnets.  Minimum mesh size for bottom set gillnets of 40 cm.  Maximum monofilament or twine diameter of 0.5 mm.  Minimum 40 mm square mesh or a diamond mesh size of at least 50 mm in the codend of demersal trawl nets. |
| Minimum size | Turbot 45 cm total length.  Picked dogfish 90 cm. | Turbot 45 cm total length.  Picked dogfish 120 cm total length. | Minimum legal size (total length) is determined as 45 cm for all fishing gears. | Turbot 35 cm (SL).  Picked dogfish 85 cm (SL)  By catch of undersized turbot allowed according to the following limits:  Non-target fisheries: up to 2% of total catch weight.  Target fisheries: up to 5% of the catch in numbers.  Long-line fisheries for dopgfish and Rajiformes: up to 20% in numbers. | Turbot 45 cm total length | Turbot 45 cm total length |
| * Participatory restrictions | Yes | - Vessel licensing  - Fishing authorisation  - Fishing Vessel Register  Annual economic agents who do not realize the allocated quota of subjective reasons, or fails to comply with national and community laws, next year do not receive specific authorization for turbot | Compulsory licensing of fishermen and vessels. | To carry out any fishing in the Black Sea an industrial body must have the relevant license. |  |  |
| Limits to fishing capacity | Plan for Adjustment of Fishing Effort |  | License has not been issued for the marine vessels since 2002 in order to reduce fishing pressure on fish stocks and to maintain sustainable fisheries (this is valid for all large scale fishing vessels, not only for those targeting turbot).  Fleet restructuring ongoing, woth expected scraping of vessels operating in the Black Sea. | Limitations of vessels number for sprat fishing from 1 November to 31 December | Fleet capacity frozen since 31/12/ 2002. | Recommended freeze in the fishing capacity of vessels more than 15 meters and undertaking capacity reduction programs in case of overcapacity.  The freeze in fishing capacity is without prejudice to countries that are in the process of developing/upgrading their fleets. |
| Others |  |  | Turbot stock enhancement project implemented by Trabzon Fisheries Research Centre (more than 100 000 turbot fry released). | Bycatch turbot limitation for trawl fishery: it is allowed to exercise fishing of sprat with midwater trawls having by-catch of turbot of fishing size (if a user has quota, by-catch of turbot can be left on the board) – to 4 specimens per 1 ton of catch.  Prohibited discards of species that are not forbidden to be fished. |  |  |



Figure A. Area closures and distance limitations for bottom trawling along the Turkish coast (Green lines: open areas, red lines: area closures) (Source GFCM stock assessment form turbot Turkey 2012, available at www.gfcm.org)