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## Investigation of Violations in the Black Sea During the 2008-2012 Fishing Season

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### Abstract

The infringements for the fisheries catching ban were investigated by using acquired data after controls performed by the Turkish Coast Guard Command in seafood catching activities between the Kocaeli-Kefken and Artvin-Hopa borders from 2008 to 2012. In parallel with the gradual increase of world population, both food needs and interest to supply of the need by sea because of limited terrestrial production increases in the same parallel. From this aspect, the protection and improvement of existing catching areas have great importance for the sustainability of fisheries sources in our country. In the present study it has been aimed to contribute to solution offers and fisheries chapter as a part of the European Union accession project via analyses of the infringements for catching ban made by fisheries within the process, based upon the Communique (no: 2/1) that regulates commercial fisheries catching from 2008 to 2012. It has been seen that the number and types of infringements of different catching boats in the different parts of the Black Sea Region are different from each other, and cross-domain differences have been observed. Within the four-year catching season, it has been taken against a total of 234 trawlers, 116 of the punishments from the Middle Black Sea, and being taken criminal actions against 80 seine boats and 175 from the Eastern Black Sea have been an indicator of local variability in catching activities.

### 1. Introduction

A rapid increase in the world's population, various climate changes, increases in the average temperature levels around the globe, melting of the glaciers, storms, natural disasters, and changes in the natural vegetation which have all been continuously increasing their impact since the last decades of 20'th century, are creating a variety of problems that affect our living environment and the entire world. In the first place, among these problems is providing the proper nutrition for an

individual to maintain his/her life (Baykal & Baykal, 2008). The world's population has exceeded 7 billion by the year 2012 and it is predicted that it will be 9,6 billion in the year 2050 (URL-1: [www.un.org](http://www.un.org)). While the natural systems on the earth's surface are not enhancing and remain constant, the human population is ascending. If global climate changes and harming the soil because of improper cultivation are added to this situation, it raises the issue of healthy food security in the world.

For a human body to grow and operate healthy and protect itself from diseases, nourishment has gained

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much more attention within the last couple of years (Mol, 2008). The rapid increase in the world's population made it compulsory to use the limited food resources more efficiently. Today, it is recognized that not only just satiating people is essential, but at the same time, feeding them well-balanced is also crucial. Nowadays, besides being hygienic and economical, food is desired to contain protein, fat, carbohydrates, vitamins, and minerals in a balanced proportion. Aquaculture products are the only foodstuff that fits this request, and fish take the first place (Varlik et al., 2004). Fishing activities must be controlled and adequately conducted to preserve the stocks of aquaculture products and the revenues obtained from those stocks. The existence and size of the seafood stocks are related to food quantity inside the sea and the ecological conditions (Fasham, 1978)

As long as there is sufficient food and suitable habitat, the quantitative reduction because of fishing or natural deaths is compensated by the new individuals, and both the new individuals and the growth of the small ones can equalize the decrease in the total mass. In normal conditions, the stocks' continuance is achieved this way but can be damaged by overfishing or similar outside solid effects. Aquaculture stocks are substantially affected by commercial sea transportation enhancement and coastal pollution. Furthermore, overfishing activities above the sea's capacity are leading to spoilage in the balance and equation within the stocks. This situation shows itself by reducing the average length and age of the individuals in the population, and the decrease in the number of hunted fishes. Unless necessary measures are taken, the fishermen who catch from unbalanced stocks are reducing the size of meshes, making bigger nets, raising the working hours, and using more advanced technical equipment to protect their revenues. As a result, this behavior is boosting the fishing pressure on the population. Because of the accelerating fishing efforts, many small fish have been caught without getting the chance to grow up and reproduce. For this reason, the stock balance spoils much more, and getting products at the optimum level becomes impossible. For efficient management, fish that will be caught must reach specific length, age, and weight levels. With the help of scientific research, the minimum length and mesh size must be determined for each species (Erkoyuncu et al., 1995).

In our country, various limitations about fishing zones, characteristics, and technical properties are being publicly announced every four years. There is not much literature on how the fishermen violate the rules, why they intend to violate them, and which rules are especially violated in the Communiqué, which comprises four years the presentation of which type of fisherboat had breached what rule is very important. Generally, monthly and annual comparisons during the fishing sessions will be useful. Moreover, creating maps of the Black Sea based on sections and provinces will help identify the areas where regulation violations by commercial fishing boats are concentrated. The research will guide us on the EU's Fishing Chapter, data evaluations, and other public institutions' risk analysis studies.

## 2. Method

The Black Sea Region is divided into three parts regarding fishing activities: West Black Sea, Central Black Sea, and East Black Sea. The criteria in the General Directorate of State Meteorology reports are used principally. According to those, the West Black Sea section includes the Sakarya, Düzce, Zonguldak, Bartın, and Kastamonu provinces. In contrast, the Central Black Sea section is composed of Sinop, Samsun, and Ordu, and the East Black Sea includes Giresun, Trabzon, Rize, and Artvin provinces in the research. In aggregate, the entire Black Sea Region from the province of Sakarya to the Turkey-Georgia borderline is defined as the research field with approximately 1310 km of coastline.

Within the limitations of Communiqué on the Commercial Fishing No: 2/1 on the Black Sea, 1205 small or big fishing vessels, including trawlers, purse seine, beam trawlers, and other different types that are existed in the entire Black Sea region between 2008-2012 fishing seasons, had been examined in the research study. These vessels or boats are both local and had come from outside the Black Sea for temporarily fishing there. The records and data were obtained from the routine controls of the Turkish Coast Guard Black Sea Regional Command.

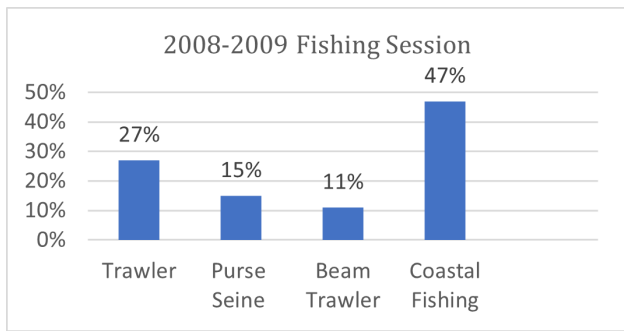
Violations are classified in parallel with the official records of the Turkish Coast Guard Black Sea Regional Command, which carries out the duty of control and supervision in the Black Sea most effectively and successfully has every type of marine vehicle, equipment, and personnel for this purpose. Between 2008 and 2012, violation cases are analysed with regard to the introduced systematic, both for each fishing session and for four years of communiqué 2/1. Firstly, the fishing vehicles are assorted into four categories: trawlers, purse seine, beam trawlers, and coastal fishing. Secondly, the data in these categories are classified according to the year, month, section, and province parameters. Then, the violation cases against the place, time, characteristics, documents, and length prohibitions within Communiqué 2/1 are analyzed by dividing them into years and sections.

## 3. Results

In the 2008-2009 fishing session, most of the violations were made by shore fishers, while the least were made by beam trawlers (Table 1, Figure 1).

**Table 1.** Violations Based on Vessel Types in the 2008-2009 Fishing Session

Vessel Types	2008-2009 Fishing Session	
	N	%
<b>Trawler</b>	64	27
<b>Purse seine</b>	36	15
<b>Beam Trawler</b>	25	11
<b>Coastal Fishing</b>	109	47
<b>Total</b>	234	100

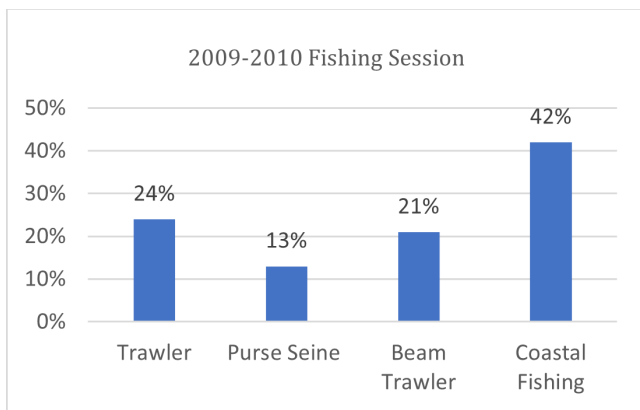


**Figure 1.** Violations Based on Vessel Types in the 2008-2009 Fishing Session

It can be seen that in the 2009-2010 fishing session, most of the violations were made by shore fishers. Violations by trawlers and beam trawlers are close to each other. The least is purse seine (Table 2, Figure 2).

**Table 2.** Violations Based on Vessel Types in the 2009-2010 Fishing Session

Vessel Types	2009-2010 Fishing Session	
	N	%
<b>Trawler</b>	55	24
<b>Purse seine</b>	29	13
<b>Beam Trawler</b>	47	21
<b>Coastal Fishing</b>	96	42
<b>Total</b>	227	100

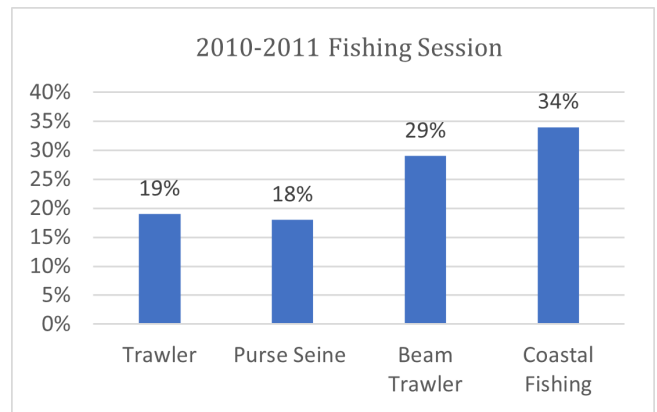


**Figure 2.** Violations Based on Vessel Types in the 2009-2010 Fishing Session

The results show that in the 2010-2011 fishing session, most of the violations were made by beam trawlers and shore fishers close to each other. Similarly, violations by trawlers and purse seine are near (Table 3, Figure 3).

**Table 3.** Violations Based on Vessel Types in the 2010-2011 Fishing Session

Vessel Types	2010-2011 Fishing Session	
	N	%
<b>Trawler</b>	61	19
<b>Purse seine</b>	57	18
<b>Beam Trawler</b>	91	29
<b>Coastal Fishing</b>	109	34
<b>Total</b>	318	100

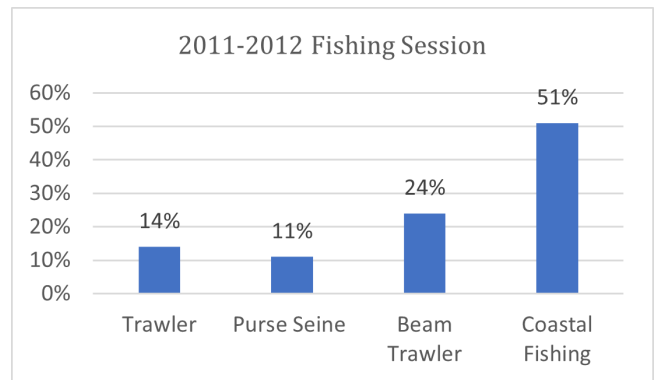


**Figure 3.** Violations Based on Vessel Types in the 2010-2011 Fishing Session

It is shown that, in the 2011-2012 fishing session, most of the violations were made by shore fishers. Violation cases of trawlers and purse seine are close to each other, and they share the bottom of the table (Table 4, Figure 4).

**Table 4.** Violations Based on Vessel Types in the 2011-2012 Fishing Session

Vessel Types	2011-2012 Fishing Session	
	N	%
<b>Trawler</b>	58	14
<b>Purse seine</b>	48	11
<b>Beam Trawler</b>	104	24
<b>Coastal Fishing</b>	216	51
<b>Total</b>	426	100



**Figure 4.** Violations Based on Vessel Types in the 2011-2012 Fishing Session

We can see that the highest percentage in the West Black Sea section is document deficiency, while breach against time limitation is the highest in the Central Black Sea section. In the East Black Sea section, a violation against technical properties is at the top. (Table 5, Figure 5).

**Table 5.** Violations Against Regions, Time, Technical Properties, Document Length- Species Prohibitions According to the Sections in the 2008-2009 Fishing Session

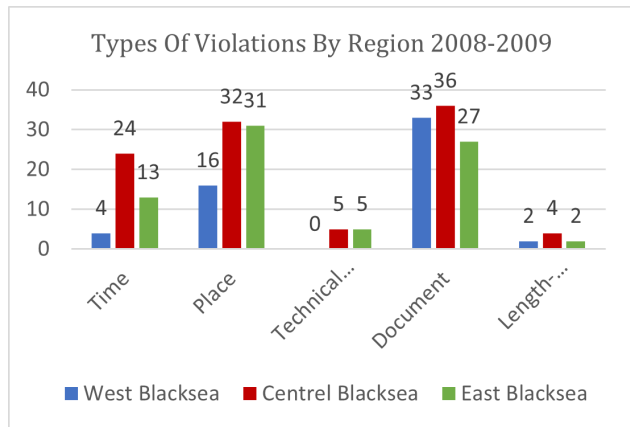
Regions	Time	Place	Technical Properties	Document	Length- Species Prohibitions
West Blacksea	4	16	0	33	2
Centrel Blacksea	24	32	5	36	4
East Blacksea	13	31	5	27	2
<b>Total</b>	<b>41</b>	<b>79</b>	<b>10</b>	<b>96</b>	<b>8</b>

**Table 6.** Violations Against Regions, Time, Technical Properties, Document, and Length-Species Prohibitions According to the Sections in the 2009-2010 Fishing Session

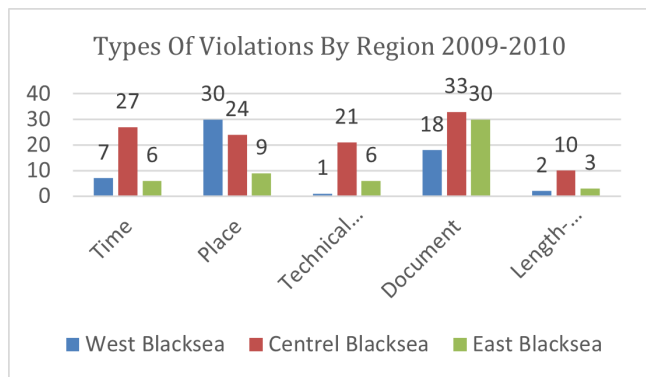
Regions	Time	Place	Technical Properties	Document	Length- Species Prohibitions
West Blacksea	7	30	1	18	2
Centrel Blacksea	27	24	21	33	10
East Blacksea	6	9	6	30	3
<b>Total</b>	<b>40</b>	<b>63</b>	<b>28</b>	<b>81</b>	<b>15</b>

**Table 7.** Violations Against Regions, Time, Technical Properties, Document and Length-Species Prohibitions According to the Sections in the 2010-2011 Fishing Session

Regions	Time	Place	Technical Properties	Document	Length- Species Prohibitions
West Blacksea	13	17	7	23	0
Centrel Blacksea	22	56	18	63	3
East Blacksea	10	19	33	32	2
<b>Total</b>	<b>45</b>	<b>92</b>	<b>58</b>	<b>118</b>	<b>5</b>



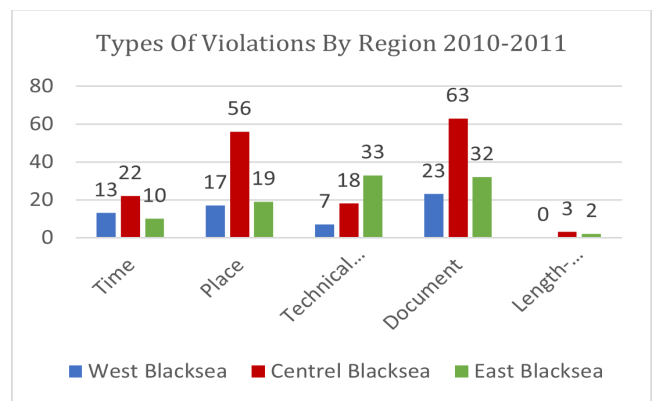
**Figure 5.** Violations Against Regions, Time, Technical Properties, Document, and Length- Species Prohibitions According to the Sections in the 2008-2009 Fishing Session



**Figure 6.** Violations Against Regions, Time, Technical Properties, Document and Length-Species Prohibitions According to the Sections in the 2009-2010 Fishing Session

In the 2009-2010 fishing session, breach against place constraints in the West Black Sea section, violation against technical properties in the Central Black Sea section, and document deficiency in the East Black Sea sector have the highest percentages (Table 6, Figure 6).

In the 2010-2011 fishing session, length and genus violations in the West Black Sea section, breach against place constraints in the Central Black Sea section, and violations against technical constraints in the East Black Sea sector have the highest percentages (Table 7, Figure 7).

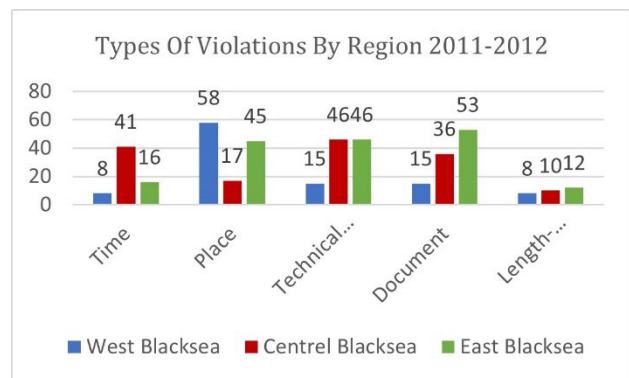


**Figure 7.** Violations Against Regions, Time, Technical Properties, Document, and Length-Species Prohibitions According to the Sections in the 2010-2011 Fishing Session

In the 2011-2012 fishing session, breach against place constraints in the West Black Sea section, breach against time limitation in the Central Black Sea section, and document deficiency in the East Black Sea sector have the highest percentages (Table 8, Figure 8).

**Table 8.** Violations Against Regions, Time, Technical Properties, Document, and Length-Species Prohibitions According to the Sections in the 2011-2012 Fishing Session

Regions	Time	Place	Technical Properties	Document	Length- Species Prohibitions
West Blacksea	8	58	15	15	8
Centrel Blacksea	41	17	46	36	10
East Blacksea	16	45	46	53	12
<b>Total</b>	<b>65</b>	<b>120</b>	<b>107</b>	<b>104</b>	<b>30</b>

**Figure 8.** Violations Against Regions, Time, Technical Properties, Document, and Length-Species Prohibitions According to the Sections in the 2011-2012 Fishing Session

#### 4. Discussion

The Black Sea is an area where the leaders of our country's fishing potential, that are anchovy, horse mackerel, bonito, bluefish, or other migrant fishes, are being caught by the purse seine. In contrast, trawlers or other dragging vehicles are hunting deep sea fishes like whiting, red mullet, or turbot. Compared to the other seas, the Black Sea is more advantageous for the small shore fishers, mostly below 12 meters, in terms of available boat yards and other facilities.

Regarding fishing for migrant species, local Black Sea vessels and vessels from other seas (Marmara, Aegean Sea etc.) exist and fish here. Besides, in the areas open to standard trawl fishing, the vessels have been continuously doing bottom trawling since years ago. As we understand, some foreign vessels have come to the Black Sea for a short fishing period in addition to the local fishing vessels. The fishing activities, which have been usually done in various techniques and within different periods, are supervised every month of the session or even in specific periods.

In the four-year fishing period, it is seen that the biggest amount of violations has been done by shore fishers, which is 530 out of 1205. Violations by purse seine and trawlers mostly increased in the 2010-2011 fishing session, while shore fishers and beam trawlers scored the highest in the session 2011-2012. In sectional comparison according to years, in the East Black Sea, breaches reached 172 in 2011-2012. In the violations against the regulations on the fish types' length, species, and weight, the maximum number of 29 was in the 2011-2012 session.

As the communique 2/1 covers a four-year period, it is normal that annual production quantities of the aquaculture products are different. It is assumed that

violations are increasing during the abundant or rich sessions in terms of catchable fish quantity. According to the TÜİK records, total aquaculture product amounts vary in the sessions 2008-2012.

Primarily, powering the effectiveness of supervisory institutions' control and inspecting actions, which leads to an increase in the control and inspection counts, will help to lay off the violations more easily. Another point is that the Turkish Coast Guard Command and other public institutions can positively affect fishermen via educational activities like informative meetings, workshops, conferences, etc., which can prevent them from breaking the rules. The annual rise in the fines that fishermen face can be considered another factor preventing them from violating the regulations.

#### 5. Conclusion

Generally, the variety of the violations and the types of vessels who does these violations in the Black Sea are known. The dispersion of the fishes that migrated to the Black Sea varies because of sectorial differentiations. The increase of the violations in the Central Black Sea section arise from the intense fishing activities of the trawlers, bottom trawlers, purse seine and shore fishers because of the weak limitations of the Communique in this sector.

Violation scores vary according to the type of vessel because of economic profitability. The increase in the breach against time limitation during the summer days when it is prohibited can be an example of this situation. This shows us that violations can go up parallel with the economic incomes.

The data that are gained from effective controls shows the direction of the fishing behaviors in the hunting sessions. However, we think that controls in the sea cannot be sufficient for preserving the stocks. In order to preserve the stocks:

- Boarding points must be active and expert aquaculture engineers should be employed,

- Quotas should be given to prevent overfishing for some species; like in the tuna fish, the data must be instantly shared with the regulatory institutions while fishing anchovy or bonito.

- Quotas should be given to fish processing facilities, especially the fish flour factories.

- Hunting areas ought to be created, and fishermen should hunt within these areas under specific constraints like time or quantity. This can help to preserve the stocks and decrease the costs of fishing.

- Official permission has to be given to the fishermen whose only source of income is fishing.

It is believed that these precautions will help to preserve and protect the fish stocks.

## Author contributions

Yekta Tanış: Investigation, data analysis, writing, sample design, methodology and final editing. Data collection, data curation. Validation, supervision and editing.

## Conflicts of interest

The author declare that for this article they have no actual, potential, or perceived conflict of interest.

## Statement of Research and Publication Ethics

For this type of study formal consent is not required.

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URL-1:

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