

MANAGEMENT OF LITHUANIAN OPEN BALTIC FISHING FLEET IN ACCORDANCE WITH THE MULTIANNUAL COD RESOURCE MANA- GEMENT PLAN

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The Council of European Union in 2007 has adopted the regulation (EC) Nr. 1098/2007, establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks. According to this regulation two fishery management tools could be used: restriction of fishing effort and restriction of fishing quota. This research has been done during the preparation of the Fishing effort adjustment plan 2008–2009 for Lithuania.

To evaluate the possible consequences of management plan two possible scenarios of effort management have been evaluated and the results of it are presented in this article.

The calculations showed that the restriction of fishing days wouldn't influence the use of quota by trawlers, the lack of fishing days is observed only in the optimum scenario with the minimum average CPUE (catch per unit effort). The regulation of fishing effort would influence the vessels using gillnet or longlines most, as those vessels can use the available quota during the days allowed only if the CPUE would be the highest, which have been observed during the trips in 2005–2007.

The calculations also showed rather good economic performance of the cod fishery and even in the case of pessimistic scenario of decisions made the allowed fishing quota is enough for staying in business, but the restriction of fishing effort doesn't allows using the entire quota allowed for fishery.

Multiannual plan for the cod stocks in the Baltic Sea, efficiency of fishery, cod fishery, fishing effort

Introduction

The Council of European Union in regard to the Agreement of Establishment of European Community and its 37 article, the proposal of the Commission and the opinion of Parliament, 18 of September 2007 accepted the Council Regulation (EC) Nr. 1098/2007, establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 779/97.

This regulation have been proposed and accepted in accordance with the ICES (International Council for the Exploration of the Sea) recommendations and 2007 advice that the cod stock in the Baltic Sea ICES 25–32 subdivisions is at a historical low level and no increase in the spawning-stock biomass could be observed in recent years. Based on the most recent estimates of SSB and fishing mortality ICES classified the stock as suffering reduced reproductive capacity and being harvested unus-

tainably. Recent years have generally shown low recruitment; however, there are indications that the 2003 year class is above the average of the last 15 years (ICES..., 2007). The cod stock has been used too intensively in recent years.

Due to that reasons there have been taken actions to produce the long term management plan for cod stocks in the Baltic Sea. The plan has to ensure the sustainable exploitation of the cod stocks concerned by gradually reducing and maintaining the fishing mortality rates at certain levels (Council Regulation Nr. 1098/2007, 2007). The main target indicator, which could show if the targets are reached are fishing mortality rate which have to be lower then:

- 0,6 on ages 3 to 6 years for the cod stock in subdivision 22–24;
- 0,3 on ages 4 to 7 years for the cod stock in subdivisions 25–28 and 29–32.

There are two main groups of the measures to archive the targets:

- Setting the TACs (total allowable catch), which have to match fishing effort. To ensure fishing stability the TACs are restricted from year to year, by setting the fluctuation frames.
- Gradual reduction of fishing effort to the targeted level;
- Strengthening fishing control (Council Regulation Nr. 1098/2007, 2007).

After evaluation of possible consequences of the implementation of the measures established in the multiannual cod plan for the Baltic Sea it is clear that the main influence to the fishery sector will have the decisions relate to the determination of the TAC and restriction of the cod fishing effort.

TAC should be reduced each year till the fishing mortality level will reach the targeted level. The level of reduction should be determined at the level not exceeding 10 percent of fishing mortality rate reached in the preceding year. The TAC could not be reduced or increased more than 15 percent per year. In accordance with the article Nr. 7 of the Council Regulation Nr. 1098/2007 the Council may, where it considers this appropriate, adopt a TAC that is below the TAC reduction level of 15 percent.

The EU overcapacity problem has been under specific attention during the last decades through the implementation of capacity adjustment programmes (Lindebo, 2004). The premiums for scrapping have been played in 2004-2006 from Financial Instrument for Fisheries Guidance. Due to that Lithuanian fishing fleet has been reduced by 3.6% of total GT and 6.2% of kW since 2005 (Motova, 2008). The reduction of fleet capacity in 2005-2006 had positive effect on economic performance of the fleet since catch per vessel increased. The reduction of fleet continued in 2007 (Commission, 2008). The main segments, which have been scrapped are vessels fishing cod with nets and trawls, which had been reduced by more than 50%. As the premiums for scrapping are rather high, there is still demand for scrapping among the fisherman.

Fishery management is not just a control rules. Management decisions have to include critical evaluation and selection of specific knowledge for the decision (Degnbol, 2004). So the influence of multiannual cod management plan and its risks

for the fishing fleet have to be evaluated before taking the decisions of fishery management also as before determining the measures of fishing effort adjustment plan.

The target of this research is to evaluate the possible risks of the multiannual cod management plan and to minimize them in the future. The research have been made during the preparation of Lithuanian fishing effort adjustment plan which have to be produced to implement the measures of first priority axis of Lithuanian operational program (approved by European Commission, 2007) and author would like to thank the biologists of Fishing research laboratory V. Piscikas and J. Maksimov for help with understanding of the meaning of biological parameters and help. The model of the research study Optimization of fishing capacity in Baltic sea, coastal area and Curonian lagoon have been modified and used for the purpose of this research (Motova, 2006).

Main assumptions and evaluation of variables

To evaluate the influence of the cod management plan to the fishery sector two risks, which are connected to the implementation of the measures defined in the document have to be evaluated:

- are there enough vessels to catch the fish quota during the reduced fishing days in the fleet and what capacity will be needed if the number of fishing days decrease and the efficiency will stay constant?
- how the decrease of cod quota will influence the economic performance of fishing fleet. And what is the minimum efficiency of the vessels to stay fishing?

To predict the possible changes of the quota in the nearest future the dynamics of fishing mortality rates in the past have to be evaluated. According to the ICES, the cod stocks of the Baltic Sea are divided to two separate stocks Western (subdivision 22–24) and Eastern (subdivision 25–32). So the cod fishing quota is also divided accordingly. As it is presented in the figure 1, the targeted fishing mortality in subdivision 25–32 has never been achieved during 1990–2007 periods, but this indicator decreasing recently, and the Eastern cod stocks are slowly recovering. So the proposed TAC for 2009 is 48.6 thousand tonnes (increase by 15% since agreed TAC for 2008) (ICES, 2008).

The fluctuations of fish mortality rate for Western cod stocks (subdivision 22–24) doesn't show any stability and it is advised by ICES to decrease TAC for 2009 to <13.7 thousand tonnes (by 40% since agreed TAC for 2008) (ICES, 2008).

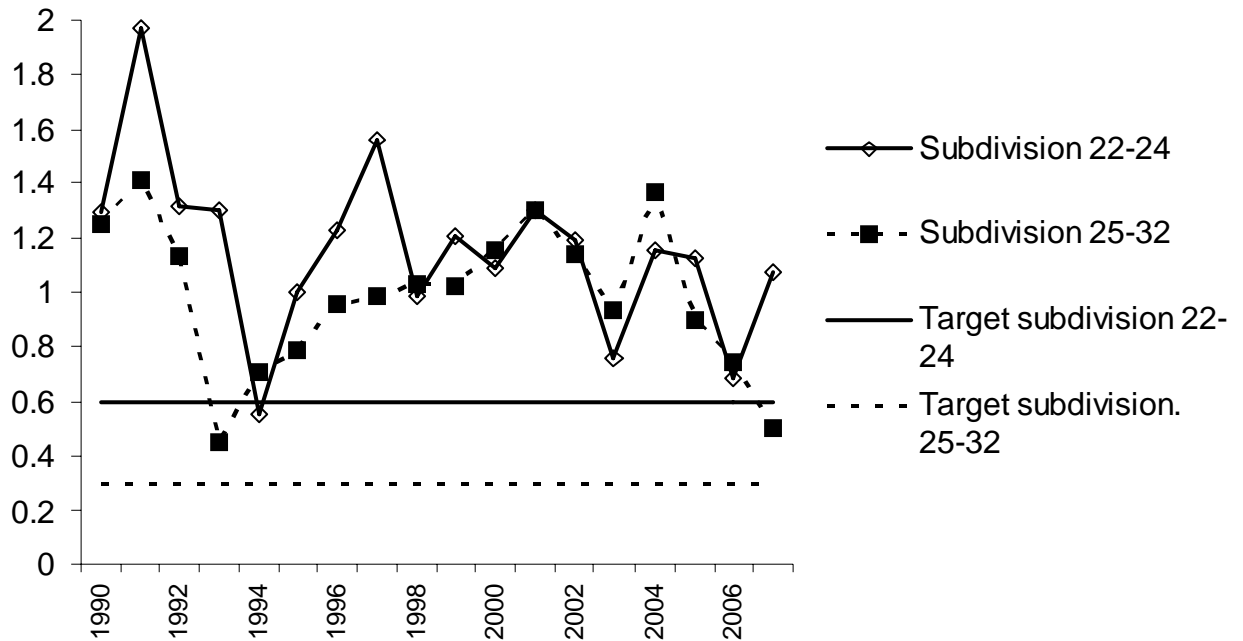


Fig. 1. Fishing mortality rates 1990–2006.

Data source: ICES, 2008, p. 44–45, 57–58;

Lithuanian fishing vessels are fishing both cod stocks, so to produce the optimal cod TAC scenario for 2009–2010 the TACs for Eastern and Western cod have to be evaluated. In 2008 the share of Western cod quota in the total Lithuanian TAC is 17%, but if the TAC in subdivision 22-24 will decrease by the maximum rate allowable by management plan (15%) during the next two years and TAC in subdivision 25–32 will increase at the same rate, the total quota would increase annually by 10% for 2009 and by 11% in 2010.

The assumptions and calculations produced, allows producing the first scenario for the evaluation of the influence of the cod management plan to the fleet:

Optimal scenario – with the annual grow of cod quota in 2009 by 10% and by 11% in 2010.

Pessimistic scenario is based on the maximum reduction of fishing effort (by 10% of fishing days annually) and 15% reduction of TAC.

The cod is caught by Lithuanian fleet by four main gears: bottom otter trawl (OTB), midwater otter trawls (OTM), gillnets (GNS) and set longlines (LLS) (see Figure 2). All of these gears have the different efficiency per fishing day in other words different CPUE (CPUE – catch per unit of effort (Hoof and Salz, 2001) and the restriction of fishing effort could influence the ability of the vessel to use the available quota. There are two main types of the vessels fishing in the open Baltic Sea, usually they use two types of gear during the year: gillnetters/longliners (fishing with GNS and LLS) and trawlers (fishing cod with OTB and OTM).

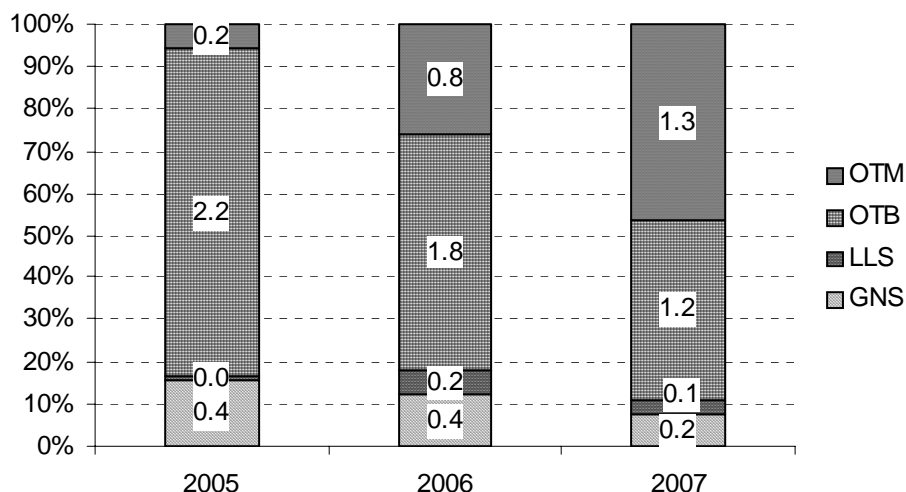


Fig 2. Cod catches in the open Baltic Sea of Lithuanian fleets by fishing gear in 2005–2006.

Data source: Fishery Department under the Ministry of Agriculture, National data collection programme.

There were 30 vessels fishing cod in the open Baltic Sea in 2007, 7 of them have been approved for scraping in 2007 and beginning of 2008. After the decommissioning 3 gillnetters and 20 trawlers are staying in the open Baltic Sea cod fishery. It is obvious that the efficiency and usage of the allowable fishing days per each fishing technique is different, the average efficiency CPUE of trawl fishery is almost twice higher than in net or logline fishery (see table 1). To catch the same amount of fish gillnetters and longliners have to spend almost twice more time.

Table 1. Efficiency of cod fishery in 2005–2007

Year	Fishing technique	Allowed fishing effort, fishing days	Used fishing effort, fishing days	Number of cod fishing vessels	Cod quota, t	Average cod quota per vessel*, t	CPUE, t per fishing day
2005	Trawlers	272	70	33	2998	66	1.253
	Gillnetters		57	10			0.670
2006	Trawlers	246	64	32	3258	77	1.988
	Gillnetters		41	8			1.105
2007	Trawlers	222	47	26	2995	92	1.986
	Gillnetters		85	5			0.716

* it is assumed, that 5% of total national quota is left for coastal fishery, the other 95% are divided equally among the fishing vessels.

Data source: Fishery Department under the Ministry of Agriculture, fishery database.

Due to weather conditions and strong wind in the Baltic during the winter it is not possible to use all the fishing days for fishing, as it is too stormy. According to 2005–2007 data the maximum usage of fishing days for trawl fishery have been 26%,

for gillnetters – 38%. It is assumed, that the maximum percentage of the days used for fishing is equal to 50%. This assumption has been used to estimate the number of fishing days used in the model.

To evaluate economic performance of the fishery the volume of break even landings per fishing day have been evaluated. It has been assumed, that the cod price is stable during 2008–2010 and equals 5.04 Lt (the average price in 2007). While the costs have been used from Annual economic report (STECF, 2008) and analysis of the economic performance of Lithuanian fleet (Motova, 2007) and raised by 20% for fuel costs, 8% for crew costs and 4% for other costs annually for prediction.

Results

The results of calculations showed that the restriction of fishing days wouldn't influence the use of quota by trawlers, the lack of fishing days is observed only in the optimum scenario with the minimum average fishing efficiency. If the average CPUE of trawlers will be 1.253 tonnes per day, and Lithuanian TAC would increase by 10% in 2009 and allowable fishing effort stay constant, there will be not enough time to use the quota for the vessels fishing with trawl. The results of scenarios are presented in the Table 2.

The regulation of fishing effort would influence the vessels using gillnet or longlines most, as those vessels can use the available quota during the days allowed only if the CPUE would be the highest, which have been observed during the trips in 2005–2007.

The results showed rather good economic performance of the cod fishery and even in the case of pessimistic scenario of decisions made according to the management plan the allowed fishing quota is enough for staying in business, but the restriction of fishing effort doesn't allows to use all the quota allowed for fishery.

Findings and conclusions

Multiannual cod management plan can influent fishery fleet in two ways: restriction of catches and restriction of fishing days, which can lead to untapped cod quota in the future. The simulation of possible scenarios has to be evaluated before taking the management decisions of Baltic Sea fleet.

According to the research, there is no need to reduce Lithuanian open Baltic Sea fleet capacity in 2009–2010, as there is a threat to fail to catch the cod TAC in the future.

The economic performance of the fleet does not show the necessity to scrap the vessels, as there is enough quota and fishing days to perform fishing economically efficiently.

Table 2. The results of calculations

Year	Fishing technique	Used fishing effort, days	Number of vessels	Cod TAC, t*	Quota per vessel, t	Fishing efficiency, t per day	Number of fishing days needed	Fishing effort used – number of fishing days needed	
								days	%
Average fishing efficiency 2005-2007, pessimistic scenario									
2008	Trawlers	89	20	2499	109	1.674	65	24	27
	Gillnetters		3			0.819	133	-44	-49
2009	Trawlers	80	20	2125	92	1.674	55	25	31
	Gillnetters		3			0.819	113	-33	-41
2010	Trawlers	72	20	1806	79	1.674	47	25	35
	Gillnetters		3			0.819	96	-24	-33
Break-even efficiency, pessimistic scenario									
2008	Trawlers	89	20	2499	109	0.910	119	-30	-34
	Gillnetters		3			0.637	171	-82	-92
2009	Trawlers	80	20	2125	92	1.015	91	-11	-14
	Gillnetters		3			0.711	130	-50	-62
2010	Trawlers	72	20	1806	79	1.137	69	3	4
	Gillnetters		3			0.796	99	-27	-37
Average fishing efficiency 2005-2007, optimal scenario									
2008	Trawlers	89	20	2499	109	1.674	65	24	27
	Gillnetters		3			0.819	133	-44	-49
2009	Trawlers	89	20	2749	120	1.674	71	18	20
	Gillnetters		3			0.819	146	-57	-64
2010	Trawlers	89	20	3052	133	1.674	79	10	11
	Gillnetters		3			0.819	162	-73	-82
Minimum average fishing efficiency in 2005-2007, optimal scenario									
2008	Trawlers	89	20	2499	109	1.253	87	2	3
	Gillnetters		3			0.670	162	-73	-82
2009	Trawlers	89	20	2749	120	1.253	95	-6	-7
	Gillnetters		3			0.670	178	-89	-100
2010	Trawlers	89	20	3052	133	1.253	106	-17	-19
	Gillnetters		3			0.670	198	-109	-123

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Lietuvos atviros Baltijos jūros žvejybos laivyno valdymas, atsižvelgiant į ilgalaikį menkių išteklių valdymo planą

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Santrauka

2007 metais Europos Sąjungos Taryba priėmė reglamentą Nr. 1098/2007, nustatanti Baltijos jūros menkių išteklių ir jų žvejybos būdų daugiametį planą. Reglamente yra numatytos dvi priemonės, kurių pagalba būtų atliekamas laivyno valdymas: žvejybos pastangų ribojimas ir žvejybos galiomybių ribojimas. Žvejybos valdymo plano įtakai žvejybos laivynui buvo nustatyti du galimi valdymo scenarijai: pesimistinis ir optimalus, kurie buvo įvertinti, o rezultatai pateikti šiame straipsnyje.

Skaičiavimo rezultatai taip pat parodė, kad žvejybos dienų ribojimas beveik neapribotų žvejybos kvotos išnaudojimo galimybių. Žvejybos dienų trūkumas pastebimas tik optimalaus scenarijaus nagrinėjimo metu. Nustatyta, kad žvejybos pastangų ribojimas labiausiai paveiks laivus, žvejojančius tinklais ir ūdomis. Ekonominė analizė rodo pakankamai geras ekonomines menkių žvejybos galimybes ir netgi pesimistinio valdymo scenarijaus atveju skiriamos menkių kvotos pakaktų žvejybai palaikyti.

Daugiametis menkių išteklių žvejybos planas Baltijos jūroje, žvejybos efektyvumas, menkių žvejyba, žvejybos pastangos.