

The Annual Report On the Latvian Fishing Fleet 2018

1. Summary of report

This report is elaborated according to *Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy*.

Since 2004 Latvia has fulfilled the existing rules and requirements of vessel entry/exit regime without any deviations.

The fishing vessel decommissioning process affects positively the balance between the fishing fleet's capacity and the fish resources allocated to Latvia.

The Technical indicators shows by how much fleet capacity could be reduced without reducing overall fleet output (landings). The Technical indicators can therefore be considered the **baseline indicator** for each fleet segment (*COM (2014)545 final*).

The first of Technical indicators - **Inactive Fleet Indicator (IFI)** showed that for Latvian offshore fleet segments the proportion of inactive vessels does not exceed allowable level for the period of last 4 years. Values of the second Technical indicator - **The Vessel Utilization Indicator (VUI)** for segment VL1218 remained almost at the same level as in the previous year and reached 0.94 in 2018. Average value **VUI** for 2015-2018 is 0.8 and therefore this segment can be considered as "in balance". **VUI** for segment VL2440 increased compare with previously year and it could be stated that capacity of this segment is "in balance" with the fishing opportunity. Value **VUI** for segment VL0010 remained at the same level as in the previous four years, i.e. not "in balance".

Following the recommendations and applying the interpretation proposed in the Guidelines (*COM (2014)545 final*) about the first of Biological Indicator - **Sustainable Harvest Indicator (SHI)** it can be concluded:

- for two segments (trawlers 12-18 m and trawlers 24-40 m) that rely on herring and sprat stocks in the Gulf of Riga SHI values are practically equal to "1". Segments are "in balance".

- for segment of trawlers 24-40 m which mainly exploits the sprat stock in the Baltic proper (Sd 25-32) SHI average value (1,11) is practically corresponds to the level of Maximum Sustainable Harvest Yield. It can be stated that segment is "in balance".

For the evaluation of the achievement balance between fleet capacity and fishing opportunities in Latvian fishery from 2013 to 2017 three Baltic Sea fleet segments were selected and included in the analysis. Two economic indicators were calculated for each fleet segment to evaluate whether fleet segments are economically sustainable in the long - term and short - term.

The indicator Return on Investment (ROI) shows investment profitability. ROI positive and greater than the low risk long - term interest rate shows positive return generated by the investment and suggests that extraordinary profits are being generated a sign of economic under-capitalization. During the analysed period from 2013 to 2017 the ROI indicator has stable positive values for the segment trawlers VL2440. In turn, the ROI indicator for the segment VL1218 trawlers operating in the Gulf of Riga was positive in 2015 and 2017. Despite of positive ROI shown in 2017 for the both Baltic Sea trawlers segments the coastal vessels attributed to the segment VL0010 show the loss and negative ROI in 2017. In general, during the analysed period the ROI ratio greater than 1 indicates that the economic activity of the segments VL2440, VL1218 and VL0010 was cost-effective.

The second economic indicator Ratio of Current revenue to Break-even revenue (CR/BER) reflects the financial capability of businesses with vessel in a given fleet segment to continue operating on a day-by-day basis. All three Baltic Sea segments operating in costal and offshore zone in 2017 show CR/BER ratio positive but close to zero. The CR/BER results indicate that the insufficient income is generated to cover fixed and capital costs signify the potential over-capitalization in 2017. However, during the analysed period 2013-2017 the CR/BER indicator is not stable. The results for 2015 indicate a ratio greater than 1 for the all fleet segments indicating the economically efficient activity.

2. Statement of MS opinion on balance of fleet capacity and fishing opportunity

Latvia continues to apply strictly and fully complies with the existing rules for the Community Fishing Fleet entry/exit scheme. The Fisheries Department (FD) of the Ministry of Agriculture requires withdrawal of the fishing vessel or vessels with equivalent or bigger capacity from the fishing fleet without public support before the entry of the new fishing vessel or vessels into register. After 1 May 2004 there were 344 fishing

vessels decommissioned and withdrawn from the Baltic Sea fleet in total. This process positively affects the balance between the fishing fleet's capacity and the fish resources allocated to Latvia.

3. Section A

i) Description of fleets

General Description of the Latvian Fishing Fleet

The Latvian fishing fleet is historically divided into three major groups: High Sea vessels, Baltic Sea (including the Gulf of Riga) offshore vessels and coastal fishing vessels. All fishing vessels flying Latvian flag are registered in ten Latvian ports.

Table 1. The Latvian Fleet Segmentation for the 2018

Fleet segment	% from total No of vessels	% from total GT	% from total kW
High Seas	1.3	68.8	48.3
Baltic Sea offshore	8.2	27.9	41.1
Coastal	90.5	3.3	10.6

On 31st of December, 2017 the Latvian fishing fleet contained 675 vessels with total fleet engine power 47642 kW and overall gross tonnage 27392 GT, but on the 31st of December 2018 the Latvian fishing fleet contained 671 vessels with total fleet engine power 41539 kW and overall gross tonnage 22317 (Table 3).

ii) Link with fisheries

High Sea Fleet:

- Represented by 9 big vessels. These vessels contribute only 1.3% to the total vessel number but cover 68.8% of the total GT and 48.3% of the total KW respectively;

In 2018 vessels of this segment performed their fishing activities in the waters governed by the North East Atlantic Fisheries Commission (NEAFC) and the Fishery Committee for the Eastern Central Atlantic (CECAF). Main fishing gears for these vessels were midwater otter trawls and bottom otter trawls.

- Target species in the NEAFC area were redfish and cod and in the CECAF area - mackerel, horse mackerel, sardinella, sardine. This fleet segment constitutes about 47.9% of the total Latvian catch.

Baltic Sea (including the Gulf of Riga) offshore Fleet:

- This fleet group consisted of 55 fishing vessels (on the 31st of December 2018) with overall length from 12 to 40 m LOA (Length overall). Number of vessels in this segment was 8.2% of the total Latvian fishing fleet and it contributed 27.9 % to total GT and 41.1% to total kW;
- Vessels of this group operate only in the Baltic Sea (including the Gulf of Riga) offshore waters in ICES SD (subdivisions) 22 – 32;
- The main fishing gears for these vessels are midwater and bottom otter trawls targeting for sprat, herring and cod. This fleet segment constitutes about 49.0% of the total Latvian catch.

Table 2. Description and segmentation of the Baltic Sea (including the Gulf of Riga) offshore fleet in 2018

Length	Type of gear	Number of vessels			% of total fleet catch in 2018		
		31.12.2017	Active in 2018	31.12.2018	Cod	Sprat	Herring
VL 12-18 m	Trawler	11	11	11	0	2.5	27
	Netter	0	0	0	0	0	0
VL 18-24m	Trawler	0	0	0	0	0	0
	Netter	0	0	0	0	0	0
VL 24-40m	Trawler	44	44	44	100	97.5	73
	Netter	0	0	0	0	0	0

Coastal Fishing Fleet:

- Represented by 607 fishing boats with overall length equal to or less than 12 m which constitute the majority of vessel number or 90.5% from the total, but contribute only 10.6% to total kW and 3.3% to total GT.
- In 2018, the coastal fishers used actively 194 boats for the commercial fishing and 63 boats - for self-consumption fishing. Some boats (19) have been used in both fisheries. Other fishing boats fished episodically or were used as accessory boats.
- Coastal fleet segment is very important for Latvian coastal regions along the Gulf of Riga and sea coastline for socio – economic reasons. Small-scale fishery is the main source of subsistence and employment for residents of remote coastal communities.
- However, the catches of coastal fishing fleet are relatively small (about 6% of the total Baltic Sea catches) and these include Baltic herring, cod, round goby, flounder, smelt, as well as garfish, perch, vimba, bream and other non-TAC and non-quota species mainly obtained by fixed passive fishing gears. This fleet segment contributed about 3.1% to the total Latvian catch (including High Sea fishery).
- In 2018 coastal fishing fleet also includes 63 boats (from 607) used for self-consumption fishing within one gear rule (maximum 1 net or 1 herring net or 1 fyke net or 100 hooks could be used simultaneously by one person) and it is prohibited the marketing of these catches.
However, in the coastal fishing fleet the scrapping plan was fulfilled in relation to GT and kW but was not fully achieved in relation to the number of vessels. Since in the coastal fishery only passive gears are deployed, the balancing of the number of the vessels is more important than GT and kW.

iii) Development in fleets

Table 3. Evolution of Latvian fishing fleet from (1st of May, 2004 to 31st of December, 2018)

Date	Number of vessels	GT	kW
Census: 1 st of May, 2004	898	44449	74320
31 st December, 2017	675	27392	47642
31 st December, 2018	671	22317	41539
Difference between CEN date and 31 st of December 2018	227	22132	32781

4. Section B

Statement of compliance with entry / exit scheme and with level of reference

In 2018 Latvia fully respected capacity limitations in terms of GT and kW according to the Commission Regulations 1438/2003 and 916/2004. National legislation prescribes that all new intensions for entries – purchase or construction of any fishing vessel shall be agreed before with the relevant authorities (the Fisheries Department (FD) of the Ministry of Agriculture).

Table 4. Management of entry/exit regime on 31.12.2018

		GT		kW	
1	Capacity of fleet on 1st May 2004	GT_{FR}	44449	kW_{FR}	74320
2	Capacity level for the application of entry/exit regime	GT₀₄	56555	kW₀₄	83930
3	Entries of vessels of more than 100 GT financed with public aid	GT₁₀₀	0	kW₁₀₀	0
4	Other entries or capacity increases (not included in 3 & 5)		50703		64956
5	Increases in tonnage GT for reasons of safety	GT_S	0	-	-
6	Total entries (3+ 4 + 5)		50703		64956
7	Exits before 1/1/2007 financed with public aid	GT_{a1}	3134	kW_{a1}	7441
8	Exits after 1/1/2007 financed with public aid	GT_{a2}	8105	kW_{a2}	19826
9	Other exits (not included in 7 & 8)		61596		70470
10	Total exits (7 + 8 +9)		72835		97737
11	Power of engines replaced with public aid conditional to power reduction	-	-	kW_r	0
12	Capacity of the fleet on 31.12.2018 (1 + 6 - 10)	GT_t	22317	kW_t	41539
13	Fleet ceiling on 31.12.2018		45687		56663

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

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

5. Section C

i) Information on general level of compliance with fleet policy instruments

In 2018, as before, the main organizations responsible for the management of the national fleet were:

- the Fisheries Department (FD) of the Ministry of Agriculture with responsibilities:
 - elaboration of the national Fisheries Policy and functioning of the Latvian Fisheries Integrated Control and Information System (LFICIS);
 - supervision of implementation of the national fisheries management measures, including national fishing fleet ceiling levels and the fishing fleet capacity adjustment plans;
 - implementation of the fisheries policy in Latvia (issuing special fishing permits for fishing vessels according to the EU requirements, authorization for entry/exit of the fishing vessels into the Fishing Fleet Register etc.);
 - general management of fishing licenses and fishing authorization for offshore fishing vessels;
- the State Environmental Service of the Ministry of Environment and Regional Development is responsible for general management of fishing licenses of coastal fishing boats, control and enforcement of the fishing activities and VMS reporting;
- the Latvian Ship Register (LSR) of the Maritime Administration of the Ministry of Transport is responsible for registration of the vessels (also the fishing vessels) into the common ship register;
- the Rural Support Service (RSS) under the supervision of the Ministry of Agriculture is responsible for management of projects implementation with respective national and EU public support from the European Maritime and Fisheries Fund.

ii) summary of strengths and weaknesses of the fleet management system

Strengths of the fleet management system:

- Development of the LFICIS provided close collaboration between above mentioned Latvian fishing fleet management institutions;
- The Institute of Food Safety, Animal Health and Environment “BIOR” has to provide and obtain precise information about stock conditions and fleet fishing effort in the Baltic Sea and the Gulf of Riga;
- Functioning of the fishing fleet register is supervised by FD that provides complete and precise data on all concerned vessels;
- Good and practically functioning vessel entry/exit management scheme is established in Latvia.

Weaknesses of the fleet management system:

- Information entered in LFICIS was accessible for changes to correct the previously entered data; however on the other hand for justified reasons the data normally could be slightly changed within the time to adjust with real status.

iii) plan for improvements in fleet management system

- In 2018 still some improvement was done in the LFICIS in order to comply with all the requirements set by the EU Fisheries control regulation. This ensured not only improvement of the fisheries data quality by the crosschecks and data validation but also facilitates the work of the personnel working with LFICIS.

At this stage massive work is done in order to develop and put in place the new UN/FLUX standard for the snapshot reporting in Latvia. It is main priority to deliver UN/FLUX standard reporting as soon as possible in order to comply with the EU requirements.

6. Section D

Information on changes of the administrative procedures relevant to fleet management

There were no significant changes in 2018 in the administrative procedures. However it should be mentioned that the work with LFICIS improvement and development is still continuing. For the years 2012-2018 the Fisheries Department (FD) invested quite a lot in development of LFICIS to improve reliability of the data, to make easier the processing of the data and routine work, to improve the modelling of the required reports.

7. Section E

Estimation and discussion of balance indicators

i) Technical indicators - Vessel Use Indicators

Technical indicators for Latvian fishing fleet were calculated according to the 2014 Balance Indicator Guidelines (COM 2014, 545 final). These indicators show- how much fleet capacity could be reduced without reducing overall fleet output (landings). The technical indicators can be considered as the **baseline indicator** for each fleet segment. The maximum day at sea was calculated as follows: the average number of days at sea of the top 10 most active vessels in a fleet segment in a given year.

i-1) The Inactive Fleet Indicator - IFI

The proportion of inactive vessels of the total fleet was calculated with respect to number of vessels, GT and kW. The total number of vessels registered in the fleet register on 31 December and all active vessels of the

corresponding year were taken to determine the number of inactive vessels by different length classes. The values of Inactive Fleet Indicator for period 2009-2018 are presented in Annex I.

The IFI indicator shows low values for both vessel length-classes VL2440 and VL1218. Less than 10% of the vessels were inactive during the last 4 years for the vessels 24-40 m and there was not inactive vessel for the vessels 12-18 m length. The proportion of inactive vessels does not exceed threshold value (20%) and according to the 2014 Balance Indicator Guidelines these segments are in balance with respect to IFI.

i-2) The Vessel Utilization Indicator VUI

Vessel Utilisation Indicator characterizes the ratio between efforts actually deployed to the maximum effort that could be extended by the fleet. All active Baltic Sea vessels which had license and fish at least one day a year have been taken for the calculation. Data on Vessel Utilization Indicator also known as Vessel Utilisation Ratio (VUR) for the segments of netters 24-40 m, trawlers 12-18 m, trawlers 24-40 m and small boats less than 10 m are presented in Annex II.

The segment of trawlers 12-18 m operates mainly in the Gulf of Riga with target species Baltic herring. Number of active vessels in 2018 was reduced by 69% compared to 2005. According to the guidelines *COM (2014) 545 final* to consider whether the segment is in balance or not "*it is appropriate to consider several years rather than a single year*". Thus, taking into account average VUI value of last four years (0.8) it could be stated that capacity of this segment was approximately *in balance* with the fishing opportunity and corresponds to "yellow light" in terms of "traffic light system".

The segment of trawlers and netters 18-24 m does not exist since 2017. According to the rules of clustering (Regulation (EU) 2016/679) the remaining vessels (number of vessels less than 5) were included to the segment of trawlers 24-40.

The segment of netters 24-40 m historically targeted Baltic cod does not exist anymore. However, data on vessel utilization ratio for the period of 2005-2015 are presented in Annex II.

The segment of trawlers 24-40 m operates mainly in areas 25-32 with target species Baltic sprat with bycatch of Baltic herring and Baltic cod as well. Number of active vessels in 2018 was diminished by 49% compared to 2005. Vessel utilization indicator in terms of days and kW*days for this segment remain on the quite low level and do not exceed threshold value of 0.7. The average VUI in terms of kW*days for the 2018 was 0.63. Thus, capacity of this segment was somewhat in excess of opportunity as regards of Vessel utilization indicator and corresponds to "red light" in terms of "traffic light system" according to the guidelines *COM (2014) 545 final*.

Vessel utilization indicator for small-scale coastal fishery was calculated for only commercial fishery. The coastal fishery uses different static gears such as nets, traps, lines and seines. Average activity level for this segment was less than 25% of the potential during the period of 2009-2018. In general, it indicates that for significant part of coastal fishers the fishery constitutes only a part job in their activities. This could be also connected with the availability of fish resources and its' seasonality in the coastal area. Although the utilisation ratio of small boats less than 10 m is consistently at a very low level, this segment is very important in socio-cultural aspect as traditional activities for population of coastal settlements.

Summary:

In the segments where the number of vessels is around 10 or less, any changes in fishing strategy by one vessel or one company could noticeably vary the technical indicator values. For Latvian fishing fleet the segment of trawlers 12-18 m can be considered as small in number of vessels and any conclusion of it balance should be treated with caution and verified over the time.

During last year the values of the vessel utilization rate for the two segments (trawlers 12-18 m and trawlers 24-40 m) slightly increased, and for boats less than 10 m it remained at the level of previous year.

ii) Biological indicators

Biological indicator Sustainable Harvest Indicator - SHI

The *Sustainable Harvest Indicator* (SHI) was defined for three Latvian fishing fleet segments which contribute around 91% to the total Latvian catch in the Baltic Sea. The values of SHI for period of 2008-2017 and two fishing regions (Baltic proper and Gulf of Riga) were calculated for the following fleet segments:

- trawlers 24-40 m in Sd 25-32 with target species of sprat (76-93% in 2009-2017);
- trawlers 12-18 m in the Gulf of Riga (28.1) with target species of herring (75-90% in 2009-2017);
- trawlers 20-40 m in the Gulf of Riga (28.1) with target species of herring (78-91% in 2009-2017).

The values of current fishing mortality F_c for different years and reference points F_{msy} for stocks exploited by Latvian fishing fleet were obtained from ICES Baltic Fisheries Assessment Working Group Report (WGBFAS Report 2018. ICES CM 2018/ACOM:11):

- Sprat in Subdivisions 22-32;
- Cod in Subdivisions 25-32;

- Herring in Subdivisions 25-29 and 32 (excluding Gulf of Riga herring. Subdivision 28.1);
 - Herring in Subdivision 28.1(Gulf of Riga).
- Fishing mortality values for level of *maximum sustainable yield* F_{msy} for considered stocks are:
- for Sprat in Sd 22-32 $F_{msy}=0.26$;
 - for Herring in Sd 25-29 and 32 (excluding Gulf of Riga herring in Subdivision 28.1). $F_{msy}=0.22$;
 - for Herring in Subdivision 28.1(Gulf of Riga) $F_{msy} = 0.32$

The calculated SHI indicators for all species and fleet segments are shown in the Annex III and Fig.1. and Fig.2.

For segment trawlers 24-40 m in Sd 25-32 (excl. 28.1) average value of SHI was calculated for sprat and herring, as cod stock parameters were not defined by WGBFAS and cod catch contributed less than 6 % to total catch by this fleet segment (Annex III). The SHI values are quite widely fluctuate around “1” and mainly depend on the variation of fishing mortality values for the sprat which is the largest part of the total catches in this segment (around 78 % of total catch in the segment). In 2017 the value of SHI parameter was 1.11. (Fig 1, Annex III) Segment is “in balance”.

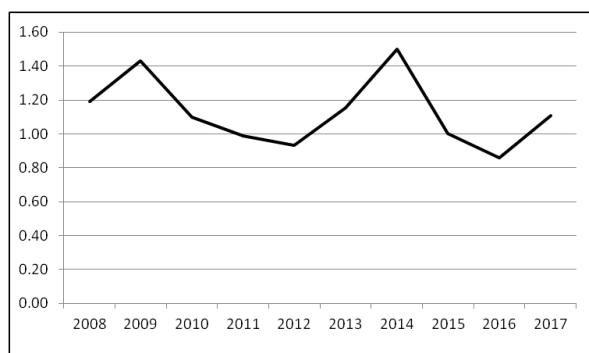


Fig 1. The changes of biological indicator SHI during the period of 2008-2017 for the segment of VL2440 trawlers in the Baltic Sea.

In the Gulf of Riga for trawlers 24-40 m and trawlers 12-18 m which are mostly fishing herring the small bycatch of sprat was also taken into account. (Fig.2, Annex III)

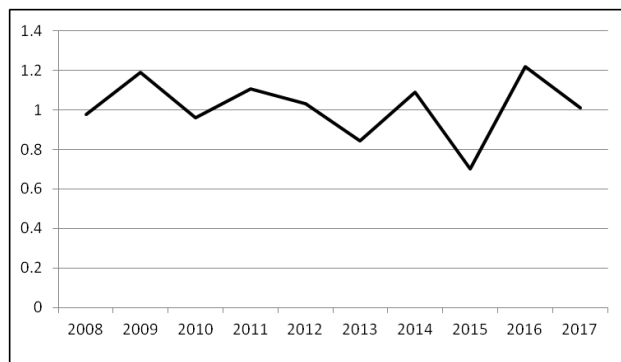


Fig.2 The changes of biological indicator SHI during the period of 2008-2017 for the segments of VL1218 and VL2440 trawlers in the Gulf of Riga.

In 2017 average value of SHI parameter for both trawler segments in the Gulf of Riga was practically equal to “1”.

Following the recommendations and applying the interpretation proposed in the Guidelines it can be concluded:

- for segment of trawlers 24-40 m which mainly exploits the sprat (78%) stock in the Baltic proper (Sd 25-32) SHI average value (1.11) indicates the level of Maximum Sustainable Harvest Yield. (Fig. 1) It can be stated that segment is “in balance”.

- for two segments (trawlers 12-18 m and trawlers 24-40 m) in the Gulf of Riga that rely on stocks of herring and sprat (bycatch) average values of SHI are practically equal to “1”, i.e. satisfying the definition of the level of Sustainable Harvest Yield. Long-term dynamics of the SHI parameter demonstrate that relatively high or low

value of SHI cannot be considered as the indication of force-major situation because the current fishing mortality for these stocks fluctuated quite widely around Fmsy during the period of 2008-2017. (Fig.2) Segments are “in balance”.

iii) Economic Indicators

For the evaluation of the achievement balance between fleet capacity and fishing opportunities in Latvian fishery from 2013 to 2017 three Baltic Sea fleet segments were selected and included in the analysis. Two economic indicators were calculated for each fleet segment to evaluate whether fleet segments are economically sustainable in the long - term and short - term.

The indicator Return on Investment (ROI) shows investment profitability. ROI positive and greater than the low risk long - term interest rate shows positive return generated by the investment and suggests that extraordinary profits are being generated a sign of economic under-capitalization. During the analysed period from 2013 to 2017 the ROI indicator has stable positive values for the segment trawlers VL2440. In turn, the ROI indicator for the segment VL1218 trawlers operating in the Gulf of Riga was positive in 2015 and 2017. Despite of positive ROI shown in 2017 for the both Baltic Sea trawlers segments the coastal vessels attributed to the segment VL0010 show the loss and negative ROI in 2017. In general, during the analysed period the ROI ratio greater than 1 indicates that the economic activity of the segments VL2440, VL1218 and VL0010 was cost-effective. The detailed ROI calculations for each fleet segment and conclusions are presented in the section iii-1 and Annex IV.

The second economic indicator Ratio of Current revenue to Break-even revenue (CR/BER) reflects the financial capability of businesses with vessel in a given fleet segment to continue operating on a day-by-day basis. All three Baltic Sea segments operating in costal and offshore zone in 2017 show CR/BER ratio positive but close to zero. The CR/BER results indicate that the insufficient income is generated to cover fixed and capital costs signify the potential over-capitalization in 2017. However, during the analysed period 2013-2017 the CR/BER indicator is not stable. The results for 2015 indicate a ratio greater than 1 for the all fleet segments indicating the economically efficient activity. The detailed calculations and conclusions are presented in the section iii-2 and Annex V.

The methodology used for economic analysis have been proposed by *communication from the Commission to the European Parliament and the Council Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy (Brussels, 2.9.2014. COM (2014) 545 final)*. There are two economic indicators proposed by the guidelines. The economic indicators show the extent of economic over or under capitalization in a fleet, both in the short and in the long term. In order to assess the profitability of the fleet in the long-term the indicator return on investment (ROI) was calculated. The second indicator applied is ratio between current revenue and break-even revenue (CR/BER) reflects the financial capability of businesses with vessels in a given fleet segment to continue operating on a day-by-day basis. The indicator characterise economic situation in the short-term.

The following categories of fishing vessels were excluded from the analysis:

- vessels over 40 meters operating in the Atlantic (area 27 and 34) due to the data confidentiality and because of limited number of vessels;
- inactive vessels due to the small number and low capacity;
- coastal fishing vessels not engaged in commercial fishing and involved only in self-consumption (recreational) fishing.

For the calculations and analysis the data collected in the frame of Data Collection (implemented under Reg. (EU) 2017/1004; Commission Implementing Decision (EU) 2016/1251 Table 5A Economic variables for the fleet and Table 4 Fishing activity variables) have been used.

The economic indicators have been calculated for the active Baltic Sea fishing fleet by economic segments provided in Table 5B COM (EU) 2016/1251. All commercial vessels operated in the coastal zone were included in the segment VL0010.

Long-term interest rates for indicators calculation have been taken from the European Central Bank as Latvian average interest rate for the last five years, available at https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/long_term_interest_rates/html/index.en.htm

iii-1a) Return on Investment (ROI)

Return on investment (ROI) shows investment profitability and is defined as Net profit after capital stock depreciation and then divided by capital asset value of the fleet. The subsidies are excluded from the calculation.

According to the guidelines the ROI positive and greater than the low risk long-term interest rate shows positive return generated by the investment and suggesting that extraordinary profits are being generated, a sign of economic under-capitalization. Values of ROI positive but smaller than the low risk interest rate would yield negative values for the indicator indicating that in the long-term it would be more beneficial to invest elsewhere which is a sign that probably the fleet is overcapitalised and therefore economically inefficient. Negative ROIs can by themselves indicate economic over-capitalisation. ROI results and calculations for each fleet segment are presented in Table 5 and Annex V.

Table 5. Return on Investment (ROI – risk free long term interest rate %)

Fleet Segments	2013	2014	2015	2016	2017
VL0010 PG	2683	2315	1486	857	-17
VL1218 TM	-135	-149	50	-0.76	49
VL2440 TM	29	26	41	25	26

iii-1b) Application and interpretation

The ROI shows positive and high values from 2013 to 2017 for the trawlers in the segment VL2440. The positive ROI values indicate that extraordinary profit is being generated and positive return of investments ensures the segment profitability. The main factor is that the segment target species are herring and sprat which provide the necessary turnover for the segment. The herring and sprat catches contributed in average 39% and 51% respectively to total Latvian volume of landing in the Baltic Sea as well as 33% and 48% to total value of landing from 2013 to 2017.

The ROI values for the coastal fleet vessels in the segment VL0010 were too high during the period from 2013 to 2016. The high values of ROI in the segment can be explained with a low fleet capital asset value due to low residual values of capital and a long service life of vessels and vessel equipment. The average vessel age for the segment VL0010 was around 30 years and the share of the capital asset value in the total fleet capital assets was 0.8% in 2016. The positive ROI values indicate that the segment is profitable in the long-term and normal investments returns are being generated. Nevertheless, too high ROI results caused by the low capital asset value also can indicate the modernization of the vessels and equipment is necessary. The negative value of ROI in 2017 is a result of increased costs in the segment VL0010 and in particular of the costs - crew wage which in turn led to losses in 2017. However, negative ROI values for the VL0010 segment cannot be considered as characterizing of the low profitability of the segment in the long-term.

The positive ROI values are indicated in 2017 for the segment trawlers VL1218 operating in the Gulf of Riga and the Baltic Sea trawlers in the segment VL2440. The ROI positive and greater than low risk long term interest rate indicate the profitable fishery in the long-term.

In general, for the three main fleet segments (coastal boats VL0010, trawlers VL1218, trawlers VL2440) it could be concluded that fishing activity is cost-effective in the long-term but fleet modernization could be necessary in the near future. It should also be noted that the potential capacity can be exploited by 20–30% more for some vessels in segments VL1218 and VL2440. If intensity of fishing for some vessels in the segments VL1218 and 2440 will increase, the segments could obtain greater amount of catch and higher revenue from sales which in turn can facilitate a profit growth.

iii-2a) Ratio of Current revenue to Break-even revenue (CR/BER)

The break-even revenue (BER) is the revenue required to cover both fixed and variable costs, that no losses are incurred and no profits are generated. The current revenue (CR) is the total operating income of the fleet segment, which consists of income from landings and non-fishing income. Data on subsidies were excluded from the calculation. In addition, income and expenditures from the fishing rights has '0' values due to the absence of fishing rights market in Latvia. The opportunity costs are included in the calculation.

According to the definition in the guidelines the ratio between fleet current revenue and break-even revenue shows how close the current revenue of a fleet is to the revenue required for the fleet to break even in the short-

term. If the ratio is greater than 1, then enough income is generated to cover variable, fixed and capital costs, indicating that the segment is profitable, with potential under-capitalisation. Conversely, if the ratio is less than 1, insufficient income is generated to cover variable, fixed and capital costs, indicating that the segment is unprofitable, with potential over-capitalisation. If the CR/BER result is negative, this means that variable costs alone exceed current revenue, indicating that the more revenue is generated, the greater the losses will be. Ratio between current revenue and break-even revenue (CR/BER) indicates a profitable fishery in the short - term. The CR/BER results and calculations for each fleet segment are presented in Table 6 and Annex V.

Table 6. Ratio of Current revenue to Break-even revenue CR/BER)

Fleet Segments	2013	2014	2015	2016	2017
VL0010 PG	47.94	51.29	10.53	3.24	0.16
VL1218 TM	-1.20	-1.14	3.60	0.16	0.42
VL2440 TM	1.30	1.31	1.88	0.30	0.44

iii-2b) Application and interpretation

The segment of small boats less than 10 metres with polyvalent passive gears attributed to the segment VL0010 annually has the highest CR/BER ratio between 2013 and 2016. The segment contributed only 7% to total Latvian value of landing during analysed period and does not practically affect to the economic situation in the Latvian fishery.

The negative CR/BER ratio -1.20 in 2013 and -1.14 in 2014 indicate short - term financial difficulty for the segment trawlers VL1218 operated in the Gulf of Riga. The situation had improvements in 2015 when the segment operated with the profit €1.4 million and CR/BER ratio of 3.60 indicated the profitable economic activity in the short - term. However, the decrease of average price for the target species herring and sprat by 20% and 8% respectively in 2016 deteriorate the segment VL1218 profitability for 2016-2017 and decline the CR/BER indicator to 0.16 and 0.42 respectively. Similar situation raised by the negative influence from the fish price reduction is observed also for the segment trawlers VL2440 where CR/BER ratio in 2016 and 2017 were 0.30 and 0.44 respectively. Nevertheless, is necessary to take into account that CR/BER ratio for the fleet segment trawlers VL2440 is above '1' from 2012 to 2015 indicating the segment is profitable in the short - term.

Therefore, it can be concluded that all three segments (coastal boats VL0010, trawlers VL1218, trawlers VL2440) have CR/BER ratio above '0' but lower than 1 indicating the current revenue exceed the variable costs in 2017. However, profitability increase is necessary for the segments trawlers VL1218 and VL2440 in the nearest future in order to provide coverage of fixed and capital costs.

Annex I.

Technical indicators - The Inactive Fleet Indicator

Number and proportion of inactive vessels

Values for vessels 12-18 m

Year	Inactive vessels			% of total		
	No of Vessels	kW	GT	No of Vessels	kW	GT
2009	1	110	29	5.6	3.7	5.6
2010	1	110	29	5.0	3.0	3.4
2011	1	110	29	7.1	4.5	7.0
2012	1	110	29	8.3	5.2	8.1
2013	1	147	29	8.3	6.6	8.1
2014	0	0	0	0	0	0
2015	1	147	29	8.3	6.6	8.1
2016	1	147	29	8.3	6.6	8.1
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0

Values for vessels 24-40 m

Year	Inactive vessels			% of total		
	No of Vessels	kW	GT	No of Vessels	kW	GT
2009	9	1857	831	11.7	8.8	8.3
2010	8	1790	788	11.4	9.7	9.4
2011	7	2392	1002	11.7	13.6	13.1
2012	7	1712	805	11.7	9.6	10.5
2013	5	1102	579	8.9	6.5	7.9
2014	2	699	214	3.8	4.3	3.1
2015	2	698	222	3.9	4.3	3.3
2016	2	607	230	4.4	4.1	3.7
2017	2	606	221	4.3	3.9	3.6
2018	4	1047	441	9.1	6.9	7.5

Annex II.

Technical indicators - The Vessel utilisation Indicator

Values for netters 24-40 m

Year	Number of vessels	Capacity (average)	Effort (average)		Maximum effort (based on observed max.)		Technical indicator	
		GT	days	GT*days	days	GT*days	days ¹⁾	GT*days ²⁾
2005	41	80	138	11286	221	17707	0.63	0.64
2006	38	81	126	10581	207	16699	0.61	0.63
2007	29	86	128	11044	199	17032	0.64	0.65
2008	26	86	122	10510	186	15932	0.66	0.66
2009	23	88	94	8359	173	15171	0.55	0.55
2010	18	90	109	10270	182	16451	0.60	0.62
2011	10	101	143	14089	199	20159	0.72	0.70
2012	9	94	158	15230	196	18424	0.81	0.83
2013	8	96	145	14092	212	20273	0.68	0.70
2014	7	87	134	12984	181	15721	0.74	0.83
2015	5	99	136	13836	158	15610	0.86	0.89
2016	Number of vessels less than 5							
2017	Not exist							
2018	Not exist							

Values for trawlers 12-18 m

Year	Number of vessels	Capacity (average)	Effort (average)		Maximum effort (based on observed max.)		Technical indicator	
		kW	days	kW*days	days	kW*days	days ¹⁾	kW*days ³⁾
2006	33	153	133	21987	236	36180	0.56	0.61
2007	31	153	144	24156	290	44239	0.50	0.55
2008	28	156	139	23495	231	36110	0.60	0.65
2009	23	160	142	24797	258	41269	0.55	0.60
2010	17	168	156	27244	207	34752	0.75	0.78
2011	16	172	172	31023	260	44590	0.66	0.70
2012	13	180	160	29651	232	41760	0.69	0.71
2013	11	183	176	32837	217	39770	0.81	0.83
2014	11	190	159	30281	197	37430	0.81	0.81
2015	11	188	161	30382	251	47256	0.64	0.64
2016	11	188	147	27997	221	41608	0.67	0.67
2017	11	190	178	34015	188	35737	0.94	0.95
2018	11	190	178	34225	189	35927	0.94	0.94

Values for trawlers 24-40 m

Year	Number of vessels	Capacity (average)	Effort (average)		Maximum effort (based on observed max.)		Technical indicator	
		kW	days	kW*days	days	kW*days	days ¹⁾	kW*days ³⁾
2006	75	265	110	28526	199	52758	0.55	0.54
2007	70	270	118	32706	205	55431	0.58	0.59
2008	69	266	106	28741	184	48929	0.58	0.59
2009	60	308	91	25569	191	58780	0.48	0.44
2010	49	301	105	33199	176	52911	0.60	0.63
2011	48	308	102	30791	197	60606	0.52	0.51
2012	48	320	111	34344	214	68578	0.52	0.50
2013	46	321	115	37437	217	69549	0.53	0.54
2014	45	320	107	33801	180	57620	0.60	0.59
2015	44	326	113	36169	193	62870	0.59	0.58
2016	44	333	105	34050	184	61243	0.57	0.56
2017	44	336	118	39672	180	60590	0.66	0.65
2018	40	342	127	43414	173	60243	0.73	0.73

Values for boats less 10 m using polyvalent passive gears

Year	Number of vessels	Capacity (average)	Effort (average)		Maximum effort (based on observed max.)		Technical indicator	
		GT	days	GT*days	days	GT*days	days ¹⁾	GT*days ²⁾
2009	259	2.3	37	88	206	477	0.18	0.19
2010	260	2.2	42	101	175	382	0.24	0.26
2011	252	2.0	38	84	157	321	0.24	0.26
2012	210	1.7	41	78	215	363	0.19	0.21
2013	200	1.7	44	84	205	347	0.21	0.24
2014	223	1.9	51	104	203	383	0.25	0.27
2015	204	1.9	53	102	223	420	0.24	0.24
2016	200	2.0	50	90	188	368	0.26	0.25
2017	196	1.89	52	98	193	365	0.27	0.27
2018	194	2.0	49	103	173	350	0.28	0.28

¹⁾ ratio between average days at sea and maximum days at sea; ²⁾ ratio between average GT*days at sea and maximum GT*days at sea; ³⁾ ratio between average kW*days at sea and maximum kW*days at sea

Annex III.

Biological indicators SHI for Latvian Fleet segments in 2015-2017

			2015				2016				2017			
	Fleet segment	Parameters	COD 25-32	HER 25-29, 32 (excl.28.1)	SPR 22-32	HER GOR (28.1)	COD 25-32	HER 25-29, 32 (excl.28.1)	SPR 22-32	HER GOR (28.1)	COD 25-32	HER 25-29, 32 (excl.28.1)	SPR 22-32	HER GOR (28.1)
SD 25-32	VL2440 trawlers	Catch,t	2406	4298	30175		2404	6989	26503		2384	6819	33017	
		F c	n/d	0.18	0.27		n/d	0.2	0.22		n/d	0.28	0.28	
		Fmsy	n/d	0.22	0.26		n/d	0.22	0.26		n/d	0.22	0.26	
		F/Fmsy	n/d	0.82	1.04		n/d	0.91	0.85		n/d	1.27	1.08	
		F/Fmsy for segment		1.01				0.86				1.11		
28.1 Gulf of Riga (GOR)	VL1218 trawlers	Catch,t			781	7977	n/d		706	6413			1000	7219
		F c			0.27	0.42	n/d		0.22	0.4			0.28	0.32
		Fmsy			0.26	0.63	n/d		0.26	0.32			0.26	0.32
		F/Fmsy			1.04	0.67			0.85	1.25			1.08	1.00
		F/Fmsy for segment			0.70				1.21				1.01	
	VL2440 trawlers	Catch,t			535	11757	n/d		892	9901			1724	8896
		F c			0.27	0.42	n/d		0.22	0.4			0.28	0.32
		Fmsy			0.26	0.63	n/d		0.26	0.32			0.26	0.32
		F/Fmsy			1.04	0.67			0.85	1.25			1.08	1.00
		F/Fmsy for segment			0.68				1.22				1.01	

Annex IV.

Table 1. ROI calculation

Year	Values for calendar year (€000)	VL0010 PG	VL1218 TM	VL2440 TM
2013	Income from landings + other income	1,327,239	3,212,550	17,183,804
	Low risk long term interest rate %	7.30	7.30	7.30
	Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs	111,116	4,896,305	13,670,847
	Capital costs (depreciation + interest payments)	18,965	542,441	926,881
	Net profit = (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs + depreciation)	1,197,158	- 2,226,197	2,586,076
	Fleet capital asset value (vessel replacement value + estimated value of fishing rights)	44,496	1,745,767	7,110,643
	ROI = Net profit / capital asset value %	2,690.48	- 127.52	36.37
	ROI – risk free long term interest rate %	2,683.18	- 134.82	29.07
2014	Income from landings + other income	1,735,010	2,406,672	16,106,155
	Low risk long term interest rate %	5.33	5.33	5.33
	Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs	174,763	3,558,292	12,428,376
	Capital costs (depreciation + interest payments)	18,925	316,277	1,228,724
	Net profit = (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs + depreciation)	1,541,322	- 1,467,897	2,449,055
	Fleet capital asset value (vessel replacement value + estimated value of fishing rights)	66,432	1,024,936	7,842,539
	ROI = Net profit / capital asset value %	2320.15	-143.22	31.23
	ROI – risk free long term interest rate %	2314.82	-148.55	25.90
2015	Income from landings + other income	1,514,647	2,670,386	16,502,938
	Low risk long term interest rate %	3.46	3.46	3.46
	Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs	522,681	1,808,191	10,817,657
	Capital costs (depreciation + interest payments)	24,822	90,131	1,514,114
	Net profit = (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs + depreciation)	967,144	772,064	4,171,167
	Fleet capital asset value (vessel replacement value + estimated value of fishing rights)	64,915	1,450,109	9,340,218
	ROI = Net profit / capital asset value %	1489.86	53.24	44.66
	ROI – risk free long term interest rate %	1486.40	49.78	41.20

to be continued

Table 1. ROI calculation (continuation)

Year	Values for calendar year (€000)	VL0010 PG	VL1218 TM	VL2440 TM
2016	Income from landings + other income	1,072,810	2,429,772	14,082,390
	Low risk long term interest rate %	2.38	2.38	2.38
	Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs	314,188	1,909,862	11,171,380
	Capital costs (depreciation + interest payments)	26,955	479,572	555,351
	Net profit = (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs + depreciation)	731,667	40,339	2,355,659
	Fleet capital asset value (vessel replacement value + estimated value of fishing rights)	85,093	2,490,057	8,456,737
	ROI = Net profit / capital asset value %	859.84	1.62	27.86
	ROI – risk free long term interest rate %	857.46	- 0.76	25.47
	2017	Income from landings + other income	1,223,394	2,871,084
Low risk long term interest rate %		1.61	1.61	1.61
Crew costs + unpaid labour costs + fuel costs + repair & maintenance costs + other variable costs + non variable costs		1,097,354	2,186,827	13,148,491
Capital costs (depreciation + interest payments)		303,966	121,156	2,048,458
Net profit = (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs + depreciation)		- 177,926	563,101	2,421,846
Fleet capital asset value (vessel replacement value + estimated value of fishing rights)		1,150,165	1,119,599	8,630,287
ROI = Net profit / capital asset value %		-15.47	50.29	28.06
ROI – risk free long term interest rate %		-17.08	48.68	26.45

Annex V.

Table 2. Ratio of Current revenue to Break-even revenue (CR/BER) calculation

Year	Nr.	Values for a calendar year (€'000) Use Segment total figures	VL0010 PG	VL1218 TM	VL2440 TM
2013	1	Current revenue (CR) = Income from landings + other income	1,327,239	3,212,550	17,183,804
	2	Fixed costs = Non variable costs + depreciation + opportunity of capital	25437	1071561	6899383
	3	Variable costs = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	107893	4494653	8217529
	4	BER = $2 / (1 - [3 / 1])$	27688	-2684997	13222620
	5	CR / BER = 1 / 4	47.94	-1.20	1.30
2014	1	Current revenue (CR) = Income from landings + other income	1735010	2406672	16106155
	2	Fixed costs = Non variable costs + depreciation + opportunity of capital	30577	711514	6514800
	3	Variable costs = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	166653	3217701	7560438
	4	BER = $2 / (1 - [3 / 1])$	33826	-2111369	12278476
	5	CR / BER = 1 / 4	51.29	-1.14	1.31
2015	1	Current revenue (CR) = Income from landings + other income	1514647	2670386	16502938
	2	Fixed costs = Non variable costs + depreciation + opportunity of capital	101246	277432	4380236
	3	Variable costs = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	448503	1671064	8274707
	4	BER = $2 / (1 - [3 / 1])$	143838	741353	8785213
	5	CR / BER = 1 / 4	10.53	3.60	1.88
2016	1	Current revenue (CR) = Income from landings + other income	1072810	2429772	14082390
	2	Fixed costs = Non variable costs + depreciation + opportunity of capital	236275	6977332	25407456
	3	Variable costs = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	307574	1343832	6464632
	4	BER = $2 / (1 - [3 / 1])$	331241	15611667	46968901
	5	CR / BER = 1 / 4	3.24	0.16	0.30
2017	1	Current revenue (CR) = Income from landings + other income	1223394	2871084	17618796
	2	Fixed costs = Non variable costs + depreciation + opportunity of capital	2420402	2141086	20625599
	3	Variable costs = Crew costs + Unpaid labour costs + Energy costs + Repair & maintenance costs + Other variable costs	832684	1969451	8466112
	4	BER = $2 / (1 - [3 / 1])$	7578781	6817895	39704008
	5	CR / BER = 1 / 4	0.16	0.42	0.44

Annex VI. Table 3. The statement of balance between fleet capacity and fishing opportunities for Latvia

VL1218TM								
Indicator	Definition	Area	2015	2016	2017	2018	Average (2015-2018)	
ECONOMIC1	ROI	Gulf of Riga	positive ROI under-capitalization	negative ROI over-capitalization	positive ROI under-capitalization	NA		
ECONOMIC2	CR/BER	Gulf of Riga	-1<3.6 economically profitable with potential under-capitalization	0<0.16<1 current revenue cover the current costs	0<0.42<1 current revenue covers the current costs	NA		
TECHNICAL1	IFI - Proportion of inactive vessels**	Gulf of Riga	8.3 (<20%)	8.3 (<20%)	0	0	4.15 (<20%) In balance	
TECHNICAL2	VUI-Vessel utilisation (Ratio between average and maximum effort per vessel, kW*days)	Gulf of Riga	0.64 (<0.7)	0.67 (<0.7)	0.95	0.94	0.8 (0.7-0.9) In balance	
BIOLOGICAL1	SHI - Ratio between F estimated and F target (MSY)	Gulf of Riga	0.71	1.21	1.01	NA	In balance	
BIOLOGICAL2	SARI - Stock-at-risk	Gulf of Riga	Not calculated					

VL2440TM							
Indicator	Definition	Area	2015	2016	2017	2018	Average (2015-2018)
ECONOMIC1	ROI	Sd 22-29, 32	positive ROI under-capitalization	positive ROI under-capitalization	positive ROI under-capitalization	NA	
ECONOMIC2	CR/BER	Sd 22-29, 32	1<1.88 economically profitable with potential under-capitalization	0<0.30<1 current revenue cover the current costs	0<0.44<1 current revenue cover the current costs	NA	
TECHNICAL1	IFI - Proportion of inactive vessels**	Sd 22-29, 32	3.9 (<20%)	4.4 (<20%)	4.3 (<20%)	9.1	5.4 (<20%) In balance
TECHNICAL2	VUI-Vessel utilisation (Ratio between average and maximum effort per vessel, kW*days)	Gulf of Riga	0.58 (<0.7)	0.56 (<0.7)	0.65 (<0.7)	0.73	0.63 (<0.7)
BIOLOGICAL1	SHI - Ratio between F estimated and F target (MSY)	Sd 22-29, 32 excl. Gulf of Riga	1	0.86	1.11		In balance
		Gulf of Riga	0.69	1.22	1.01		In balance

BIOLOGICAL2	SARI - Stock-at-risk	Sd 25-32	Not calculated				
VL0010TM							
Indicator	Definition	Area	2015	2016	2017	2018	Average (2015-2018)
ECONOMIC1	ROI	Sd 26-28 incl Gulf of Riga	positive and high ROI under-capitalization, fleet modernization will be necessary in the future	positive and high ROI under-capitalization, fleet modernization will be necessary in the future	negative ROI over-capitalization	NA	
ECONOMIC2	CR/BER	Sd 26-28 incl Gulf of Riga	1<10.53 economically profitable with potential under-capitalization	1<1.34 economically profitable with potential under-capitalization	0<0.16<1 current revenue cover the current costs	NA	
TECHNICAL1	IFI - Proportion of inactive vessels**	Sd 26-28 incl Gulf of Riga	Not calculated				
TECHNICAL2	VUI-Vessel utilisation (Ratio between average and maximum effort per vessel, kW*days)	Sd 26-28 incl Gulf of Riga	0.24	0.25	0.27	0.28	0.26 (<0.7)
BIOLOGICAL1	SHI - Ratio between F estimated and F target (MSY)	Sd 26-28 incl Gulf of Riga	Not calculated				
BIOLOGICAL2	SARI - Stock-at-risk	Sd 25-32	Not calculated				