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SUMMARY OF ICES ADVICE ON THE EXPLOITATION OF BALTIC SEA FISH STOCKS IN 2016

3 June 2015

On 29 May 2015, the International Council for the Exploration of the Sea (ICES) Advisory Committee published their advice regarding the exploitation of the Baltic Sea fish stocks for 2016.[1] Here we provide a summary and comment on the assessments and advice.

ADVICE ACCORDING TO THE NEW CFP

ICES conducts stock assessments and provides advice according to the objectives of the reformed EU Common Fisheries Policy (CFP) – importantly Article 2.2:

The Common Fisheries Policy 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.

In order to reach this 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.

This objective is also in line with the EU commitment made in Johannesburg in 2002.[2] Rather than focusing on avoiding an undesired outcome – as is the case with the precautionary approach – the Maximum Sustainable Yield (MSY) framework strives at achieving a desired outcome: a high sustainable long-term yield.

TOTAL CATCH AND TOTAL ALLOWABLE CATCH (TAC)

Readers of ICES advice must understand that "total catch" is not always synonymous with Total Allowable Catch (TAC).

ICES advises the total catch for a stock whenever possible. Total catch represents the total fishing mortality for a stock from all stakeholders and across the stock's full range. The range of a stock may cross multiple management areas. This advice is only as good as the data behind it, and ICES notes where their data are uncertain. For some data-limited stocks, ICES may be unable to estimate total catch and advises total landings only.

According to the European Commission, a TAC applies to specific management areas and only to commercial fisheries. For fisheries under the landing obligation, the corresponding TAC represents total commercial catch. For fisheries not yet under the landing obligation, the corresponding TAC represents only commercial landings. ICES may suggest ways to distribute this catch between areas and user groups, but holds no preference for any distribution method other than preventing total fishing mortality from exceeding their advised total catch. Readers must examine ICES advice closely and be familiar with the management of a relevant stock to determine what portion of the advised total catch represents the advised TAC.

[1] Full ICES advice is available at http://www.ices.dk/publications/library/Pages/default.aspx
[2] Johannesburg Declaration, WSSD, 2002.

Difference between ICES advised total catch and TAC

	total catch	Total Allowable Catch (TAC)
Framework	scientific	management, informed by science
Constraint	stock range	management area
Stakeholder	all	commercial
Fishing Mortality	total	dependent on landing obligation

SUMMARY TABLE

Table showing ICES 2016 advice for total catch and % change from ICES 2015 advice

This is not a comparison of TAC. For the sake of comparison with last year's advice, total landings for some species are shown in lieu of total catch. Total landings in these cases are determined using the ICES catch equation provided in the advice document. All figures are in tonnes, excepting salmon catch which is in numbers of fish.

Stock	total catch	% change
Cod, Western Baltic	5 385	-47%
Cod, Eastern Baltic	29 220	+0.5%
Herring, Central Baltic	201 000	+4%
Herring, Gulf of Riga	26 200	-24%
Herring, Bothnian Sea	96 613	-47%
Herring, Bothnian Bay	6 641	+20%
Sprat	205 000	-8%
Plaice, Kattegat, Belts & Sound	8 639	+114%
Brill	23	-21%
Salmon, Baltic Sea excluding Gulf of Finland	116 000	0%
Salmon, Gulf of Finland	11 800	0%
	total landings	
Plaice, Baltic	1 093	+20%
Flounder, Belt Sea & Sound	2 094	+20%
Flounder, Southern Baltic	20 618	+20%
Flounder, Eastern Gotland & Gulf of Gdansk	2 606	-20%
Flounder, Northern Central & Northern Baltic	274	+20%
Turbot	198	-10%
Dab	1 599	+12%

A detailed summary of ICES advice and rationale, stock by stock, is given in later in this document.

DEFINITONS AND BASIS FOR ADVICE

The fishing mortality rate (F), or exploitation rate, is a metric for the number of fish killed by fishing. Exploitation rates (F_{MSY}) in line with the MSY approach are estimated to maximise the average long-term catch within the prevailing ecosystem considerations. The only way to sustainably fish at F_{MSY} is if the fish stock is large enough on average to support that level of fishing mortality. This corresponding average stock level, measured in Spawning Stock Biomass (SSB), is termed B_{MSY}. The SSB, measured in tonnes, represents only those fish mature enough to reproduce.

ICES applies different SSB reference points within the MSY framework to represent biomass levels necessitating a management response. A healthy SSB will naturally fluctuate around B_{MSY}. The lower bound of this fluctuation is $B_{trigger}$, below which ICES advises a more conservative F to allow the fished stock to rebuild. In extreme cases stocks could be depressed through natural or fishing mortality to the lowest reference point, B_{lim}. This represents the SSB below which a fish stock will experience recruitment failure. Fishing a stock to such a low level is disastrous for the fished stock and for dependent fishing communities. Recognising this danger, coupled with fisheries stock assessment uncertainty, ICES developed a precautionary buffer called B_{pa}. Generally B_{pa} is B_{lim} scaled up by a multiplier, representing a slightly larger SSB to provide managers response time to reduce fishing mortality. In practice $B_{trigger}$ is often set at B_{pa} even though the two concepts have a different basis.

In 2012, ICES developed a framework for quantitative advice regarding data-limited stocks. The framework categorises all stocks into six different categories from data-rich to data-poor. Data-limited advice is essentially based on a combination of biomass indices and landings data (depending on what is available) and a ±20% "uncertainty cap" applied to the previous years' advice or so-called *status quo* landings. Although ICES considers all data categories precautionary, ICES references the precautionary approach specifically when providing advice on data limited stocks, and the MSY approach when providing advice on data-rich stocks.

WHAT HAPPENS NEXT?

The European Commission published a policy statement on fishing opportunities for 2016 in early June 2015. After consulting the Scientific, Technical and Economic Committee for Fisheries (STECF), it will then publish a proposal for fishing opportunities in the Baltic Sea for 2016 – most likely in September 2015.

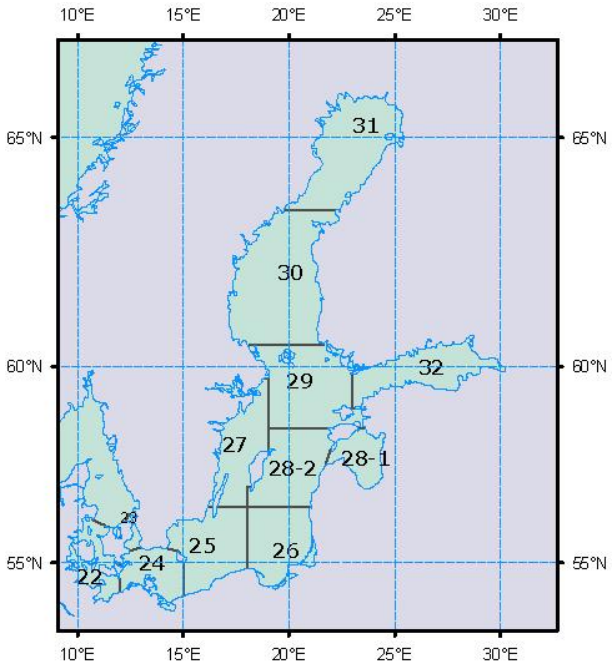
Fisheries Council Working Groups will discuss the Commission's proposal prior to the Council's meeting in October, where they are likely to agree on the 2016 fishing quotas. In the meantime, the European Commission on behalf of the European Union will negotiate with Russia, including Russian fishing interests in the Baltic. The Lisbon Treaty, which came into force on 1 January 2010, gives the European Parliament co-decision powers on most EU fisheries matters, but the setting of annual catch quotas remains the Council's sole responsibility.

As part of the increased regionalisation of the CFP, the Baltic Sea Advisory Council (BSAC) will consider and comment on the proposal, and it will be discussed in the regional forum for Baltic Member States – BALTFISH.

DETAILED SUMMARY OF ICES ADVICE

ICES provides total catch advice applicable to a stock across that stock's total range. The Commission applies a TAC to a stock by management area. Both ICES and the Commission identify stocks by the management area subdivisions (SD) which contain the bulk of the stock.

Map of the Baltic Sea showing subdivisions (SD) used for management[6]



COD

Since 2004, the Baltic Sea cod (*Gadus morhua*) has been managed as two separate stocks, the Eastern and the Western stock, with advice provided per fishing zone regardless of stock mixing. Although biologically distinct, significant mixing of the Eastern and Western stocks in SD 24 has challenged ICES to refine their advice. Based on the 2015 cod benchmarking exercise, ICES now advises separately for stocks in SD 24 rather than providing a single area-wide figure for total catch.

In 2007, the European Commission adopted a multi-annual plan for both stocks (EC 1098/2007). This plan has proven inadequate for the fisheries management challenges in the Baltic Sea, and a forthcoming multiannual multi-species plan covering Baltic stocks of cod, sprat, and herring is currently in negotiation.

[6] UN Food and Agricultural Organisation (FAO) major fishing areas, http://www.fao.org/fishery/area/Area27/en

Cod in Subdivisions 22–24, Western Baltic

The Western Baltic cod stock has declined from a recorded high SSB in the early 1980s to a low in 2010. Since the late 1990s the SSB has fluctuated around B_{lim} and below B_{pa}, dropping and staying below B_{lim} since 2008. The stock is still dangerously low.

The cod in the area does not belong to one homogeneous genetic population. Three potential spawning sites have been identified: the Sound (SD 23), the Belt Sea (SD 22) and the Arkona basin (SD 24). Spawning occurs during different periods of the year. A recent study indicates that local measures should be taken to protect cod spawning in the Sound.[7]

ICES identified substantial mixing between the Eastern and Western cod stocks in SD 24. Contrary to previous years, the current stock assessment accounts for these differences and provides a more realistic picture of the stock. Although this introduces new uncertainty in the assessment, ICES was able to diminish the high uncertainty related to discarding and fish age-reading issues in past assessments. To account for catches of Eastern Baltic cod in SD 24, ICES advises a separate sub-TAC for SD 22-23.

The ICES advice for 2016 also incorporates recreational catch, where data exist. For this year only German recreational fishery data are represented. ICES notes that they are not in a position to advise on specific allocation decisions between recreational and commercial uses, though ICES does provide a number of options for management to consider in accompanying tables in the advice.

In 2013 ICES concluded that they had consistently overestimated the fishing possibilities over time. Despite annual commercial landings falling below ICES advice for most years since 2008, the overall fishing mortality has not declined as anticipated. ICES estimates that current fishing mortality is well above both F_{MSY} and the long-term fishing mortality rate set in the existing cod management plan.

The existing cod management plan aims at rebuilding the stock by limiting the annual landings with a ±15% restriction on changes in permitted landings per year. The plan also sets out to reduce fishing effort (number of fishing days) by 10% annually until the plan's target fishing mortality is met. As in last year's assessment, ICES states that the current management plan can no longer be considered precautionary and therefore bases its advice on the MSY approach.

Bycatch species in the fishery primarily consist of flatfishes, especially flounder, which can be substantial at times. Amounts of undersized cod as bycatch have increased in recent years as well. In 2001 the International Baltic Sea Fisheries Commission (IBSFC) introduced fishing gear modifications, including the "Bacoma" cod-end. The fishing industry has pointed out that these measures are ineffective and that increased flounder bycatch interferes with the selectivity of the gear, leading to increased cod discarding. Reconciling these issues under the landing obligation through the coming Baltic Sea multiannual management plan and an EU-wide Technical Measures Framework may allow greater flexibility for fishing gear design.

In accordance with the MSY approach, ICES advises that the total catch of Western Baltic cod should not exceed 5 385 tonnes. ICES suggests multiple methods to distribute the advised total catch to commercial users, and advises allocating part of

[7]Lindegren M., Waldo S., Nilsson P.A., Svedäng H. and A. Persson. 2013. Towards sustainable fisheries of the Öresund cod (*Gadus morhua*) through sub-stock-specific assessment and management recommendations. ICES Journal of Marine Science, 70: 1140–1150.

the neighbouring Eastern Baltic Cod stock to the SD 24 TAC to account for stock mixing. Due to additional management considerations, a range of TACs corresponding to this advice are possible.

Cod in Subdivisions 25–32, Eastern Baltic

Due to favourable environmental conditions and strong year classes towards the end of the 1970s, the Eastern Baltic cod stock reached its highest recorded levels in 1980–1982. From an early 1980s high of approximately 640 000 tonnes, high fishing mortality and poor environmental conditions encouraged a stock decline to only 87 000 tonnes by 1992. Fishing mortality remained high on this depressed stock through the 2000s. The Helsinki Commission and the International Union for Conservation of Nature (IUCN) labelled Eastern Baltic cod as "vulnerable" due to the threat of synergistic effects of eutrophication and climate change.[8]

Following the 2015 ICES benchmarking exercise, ICES reluctantly maintains that Eastern Baltic cod is data-limited. Key issues in the analytical assessment include the failure to confidently age cod, changes in cod growth which ICES has not been able to quantify, and a recent dramatic decrease in older cod without a clear picture of the fishing mortality for these 'megaspawners'. These issues, among others, increase the current assessment's uncertainty to such a degree that the full analytical assessment is unusable. Over the past two years, based on an indexed trawl survey, ICES estimates that the Eastern Baltic cod SSB has decreased by more than 20%.

In late 2014 the Baltic experienced its third largest recorded inflow event, receiving 198 cubic metres of oxygenated, highly saline water and ending a decade-long stagnation in the central Baltic.[9] This will have a positive impact for the productivity of cod and other species in the Baltic, though seeing the impact in fishery productivity may take a year or two to develop.

ICES estimates total Eastern Baltic cod catch in 2014 at 45 657 tonnes, which includes 11 310 tonnes of discards. Much of the cod catch in 2014 was below the minimum landing size, possibly due to the decreased growth rate of cod in this particularly stressed ecosystem.

In accordance with the precautionary approach, ICES advises that the total catch of Eastern Baltic cod should not exceed 29 220 tonnes. ICES suggests multiple methods to distribute the advised total catch to commercial users, and advises allocating part of the Eastern Baltic Cod stock to the SD 24 TAC to account for stock mixing. Due to additional management considerations, a range of TACs corresponding to this advice are possible.

HERRING

The Baltic herring (*Clupea harengus*) is managed in four separate areas: Central Baltic Sea, Gulf of Riga, Bothnian Sea and Bothnian Bay. Management of Baltic herring is evolving in the forthcoming Baltic multiannual multi-species management plan for cod, sprat, and herring, currently in negotiation.

[8] HELCOM, 2013. Species Information Sheet for Cod: www.helcom.fi

[9] Mohrholz V., Naumann M., Nausch G., Krüger S. and U. Gräwe. 2015. Fresh oxygen for the Baltic Sea – An exceptional saline inflow after a decade of stagnation. Journal of Marine Systems, 148: 152-166.

The Central Baltic and Gulf of Riga herring stocks overlap in area 28.2. ICES provides its primary advice on the total catch of these stocks, then identifies the proportion of stock mixing and the resulting TAC for each management area.

Stock boundaries for Bothnian Bay and Bothnian Sea herring are still being debated.

Herring in Subdivisions 25–29 and 32, Central Baltic Sea, excluding Gulf of Riga

This is the largest of the Baltic herring stocks, composed of a number of local populations. Following a SSB decline below B_{lim} in the late 1990s, the stock has shown a steady increase and is now well above MSY $B_{trigger}$. Fishing mortality has remained below F_{MSY} since 2004.

The assumed 2016 commercial catch of this stock in the Gulf of Riga, outside of the Central Baltic, is 4 620 tonnes.

The assumed 2016 commercial catch from the Gulf of Riga herring stock in the Central Baltic is 220 tonnes.

The corresponding TAC for the Central Baltic management area would recognise the mixing of these two stocks. Discards are considered negligible.

In accordance with the MSY approach, ICES advises that the total catch of Central Baltic herring should not exceed 201 000 tonnes. The corresponding TAC for this management area, representing stock mixing, would be 196 600 tonnes.

Herring in Subdivision 28.1, Gulf of Riga

The Gulf of Riga is a semi-enclosed ecosystem of the Baltic Sea and the low salinity restricts the occurrence of marine species. Herring is the dominant species in the Gulf, and predation mortality is low for the Riga herring.

The recruitment of Gulf of Riga herring is highly dependent on environmental conditions, such as ice cover. Since the 1989, the majority of winters have been mild, and this climate has been favourable for herring reproduction. The mean weight started to decline in the mid-1980s and remains on the low side.

The assumed 2016 commercial catch of this stock in the Central Baltic, outside of the Gulf of Riga, is 220 tonnes.

The assumed 2016 commercial catch from the Central Baltic herring stock in the Gulf of Riga is 4 620 tonnes.

The corresponding TAC for the Gulf of Riga management area would recognise the mixing of these two stocks. Discards are considered negligible.

In accordance with the MSY approach, ICES advises that the total catch of Gulf of Riga herring should not exceed 26 200 tonnes. The corresponding TAC for this management area, representing stock mixing, would be 30 600 tonnes.

Herring in Subdivision 30, Bothnian Sea

Due to low salinity and mean temperature, the herring in the Gulf of Bothnia is slow-growing and relatively small. The spawning stock biomass of Bothnian Sea herring tripled in the late 1980s, only to then drop by 40% by 1999. Since 2003, this stock's SSB has grown to the highest levels assessed in 20 years. While still high, ICES has dramatically revised the stock's estimated SSB downward due to a necessary change in the assessment to handle ongoing uncertainty concerns. These concerns should diminish over time as the acoustic survey time-series grows.

Due to the revised SSB, ICES has decreased its advised catch by nearly 50% from 181 000 tonnes in 2015 to 96 613 tonnes for 2016. Discarding is considered negligible.

In accordance with the MSY approach, ICES advises that the total catch of Bothnian Sea herring should not exceed 96 613 tonnes. The corresponding TAC for this management area would be equal to the total catch.

Herring in Subdivision 31, Bothnian Bay

This small herring stock exists at the herring's most northerly range, under relatively extreme environmental conditions. A combination of low salinity, long winters, ice cover and cool summers affect this stock's growth.

ICES categorises Bothnian Bay herring as data-limited and bases their 2016 advice on an exploratory assessment. Although uncertain, the survey index shows an increasing trend in excess of 20% which permits a precautionary increase in advice. Discarding is considered negligible.

In accordance with the precautionary approach, ICES advises that the total catch of Bothnian Bay herring should not exceed 6 641 tonnes. The corresponding TAC for this management area would be equal to the total catch.

SPRAT

Sprat (*Sprattus sprattus*) is managed as a single stock across the Baltic Sea. Declining to below B_{lim} in the early 1980s, sprat has since recovered to well above $B_{trigger}$ reaching a maximum assessed SSB in 1996 of 1.9 million tonnes. Sprat stocks have since declined, approaching but still above $B_{trigger}$. At present sprat is being harvested unsustainably according to ICES estimates of fishing mortality. Since 2006 sprat stocks have not been under a management plan, but sprat is incorporated in the forthcoming Baltic multiannual multi-species management plan for cod, sprat, and herring, currently in negotiation.

Cod and clupeid stocks (including sprat and herring) share a strong predator-prey relationship. Higher cod SSB in the early 1980s contributed to lower sprat populations. As cod declined, sprat recovered. At present sprat is more abundant in areas outside of the cod's range. ICES estimates that 47% of the total 2014 sprat catch was taken in the southern Baltic, SD 25 and 26. Decreasing fishing effort on sprat in SD 25 and 26 would make more sprat available as feed for cod, improving cod growth. Increasing effort northward in the Baltic to SD 27–32 would also optimize the yield and growth of sprat and herring by reducing competition within these stocks for prey. Because of this skewed geographic

distribution, species interactions between cod and clupeids, and possible management concerns to improve cod condition, ICES suggests, but does not specifically advise, that a spatial management plan be devised and implemented for clupeid stocks.

Discarding is considered negligible.

In accordance with the MSY approach, ICES advises that the total catch of sprat should not exceed 205 000 tonnes. The corresponding TAC for this management area would be equal to the total catch.

SALMON

The last Baltic-wide management plan for Baltic salmon (*Salmo salar*) ended in 2006. The European Commission proposed a new plan in 2011 (COM(2011)470) which is still in negotiation. Currently salmon stocks are managed through EU quotas annually set in Council and individual Member State management of local salmon rivers. However the lack of an approved long-term management plan for Baltic salmon is particularly serious as Baltic salmon is listed under the Habitats Directive, obliging Member States to ensure "favourable conservation status". It is also covered by targets in the Water Framework Directive and the Marine Strategy Framework Directive.

ICES advises on Baltic salmon catch within two management areas: the Main Basin and the Gulf of Bothnia (SD 22–31), and the Gulf of Finland (SD 32). Within these management areas Baltic salmon exist in a large number of river-specific populations ranging from healthy to vulnerable.

Baltic salmon are greatly affected by environmental conditions, especially those prevalent in their home spawning rivers. Dams and other forms of habitat destruction have a devastating effect on salmon habitat and spawning grounds. In many parts of the Baltic Sea region, particularly in the South, natural salmon populations have declined or even disappeared.

In some larger rivers, hydropower companies are obliged to carry out major restocking programs, releasing salmon smolt (young salmon), in order to compensate for the loss of habitat and migration obstacles resulting from hydropower installations. The process of restocking is costly and ineffective. Today, reared fish die in high numbers before maturing to spawning adults. Although 5.5 million reared salmon smolts are released each year, compared to 2.9 million produced in the wild, salmon catches consist of between 72 and 92% wild fish.

Despite some positive developments, such as improved habitats in both spawning and nursery areas and subsequent increases in natural reproduction, the wild salmon in several rivers have not recovered. Juvenile salmon suffer higher than expected mortality. The reasons for this low survival are still largely unknown.

Baltic salmon remain depressed due to a combination of environmental factors, fishing mortality, substantial misreporting, low post-smolt survival and poor reproduction of some populations. Fisheries in open sea areas or coastal waters pose a greater threat to depleted stocks than fisheries in estuaries and rivers. ICES advises that management of salmon fisheries should be based on the status of individual river stocks, and that fisheries on mixed stocks should be reduced as they present particular threats to stocks that do not have a healthy status.

Salmon in Subdivisions 22–31, Baltic Sea excluding Gulf of Finland

ICES assesses 29 rivers divided into 5 assessment units based on salmon biology and genetics. Since 1997 wild smolt production has increased substantially from very low values, particularly in the North. Smolt production in the Southeast shows no signs of improvement. Increases in production are mainly due to increases in 2–3 rivers. The situation in the southernmost rivers is unchanged or deteriorating.

To evaluate the status of specific salmon runs, ICES uses the smolt production in 2014 relative to projected natural smolt production capacity on a river-by-river basis. The target for rebuilding stocks is to reach at least 75%[10] of the estimated potential smolt production for each river. As an interim objective for weak stocks, 50% of the potential smolt production is used. Out of 29 stocks assessed, only 4 rivers show a high probability of reaching the 75% target in the near future, while 18 rivers are less than 30% likely to reach this goal. Of those rivers, 7 are less than 30% likely to meet even the interim goal.

The rivers Rickleån, Kågeälven, and Öreälven in the Gulf of Bothnia, Emån in southern Sweden, and several other rivers in the Southeastern Main Basin are especially weak and desperately need longer-term stock-specific rebuilding measures.

ICES advises a total commercial catch at sea of 116 000 individuals, including an estimated 10% unwanted catch and 90% wanted catch. ICES estimates the fishery will correctly report only 77% the total commercial salmon catch. ICES estimates that the remaining wanted catch will be 6% misreported and 7% unreported. Recreational fishing at sea will catch an estimated 19 000 more salmon, and river catches an additional 39 000 more salmon.

In accordance with the MSY approach, ICES advises a total commercial sea catch of fewer than 116 000 salmon, including estimates of unwanted, misreported, and unreported catch.

Salmon in Subdivision 32, Gulf of Finland

This area contains a few small, wild populations with mixed reared and wild salmon caught in some rivers. The wild salmon populations are genetically distinct from each other, which indicate that these still are original salmon stocks, meaning that they have not reproduced with reared salmon. Reared salmon are easily identified by their missing adipose fin. This fin is removed before releasing a reared salmon into the wild.

ICES considers salmon stocks in the Gulf of Finland data-limited and advises using the precautionary approach. Very little data on wild smolt production is available for the assessment, consisting mainly of limited electrofishing surveys. Recreational sea and river catch is uncertain. In ICES expert judgement, all wild salmon rivers in the Gulf of Finland are well below the 75% potential smolt production target and generally not showing signs of recovery.

According to ICES, a reduction in the TAC alone would most likely not safeguard wild populations from exploitation. Instead, ICES advises the development of more selective harvesting methods that target reared salmon.

[10]In the HELCOM Baltic Sea Action Plan, the target is 80 % of potential smolt production.

Assuming a similar amount of restocking to previous years, ICES advises a total commercial catch at sea of 11 800 reared salmon, including an estimated 10% unwanted catch and 90% wanted catch. ICES estimates the fishery will correctly report only 83% the total commercial salmon catch leaving 7% unreported.

In accordance with the precautionary approach, ICES advises no wild salmon catch and that bycatch of wild salmon be minimised. ICES advises a total commercial sea catch of no more than 11 800 reared salmon.

SEA TROUT

The Baltic Sea region contains approximately 1 000 sea trout stocks (*Salmo trutta*), which can be found in 881 rivers, and 471 of those stocks are thought to be wild. The status of the stocks varies considerably, as does the quality of their habitats in the rivers.

Sea trout is caught in rivers, coastal areas and the open sea. It does not migrate as extensively as salmon, but longer migrations do occur, and the main fishery is in fact in the Main Basin. Nominal commercial catches of sea trout in the Main Basin have declined from around 1 000 tonnes in 2002 to 219 tonnes in 2014. Nominal recreational catches vary greatly between 2001 and 2014. ICES notes that the data on recreational catches is incomplete, and it could be as much as three times the estimated commercial catch.

The majority of the catches contain mixed stocks, which is potentially problematic for the weaker stocks. Discards of undersized sea trout take place mainly in the coastal fisheries, particularly in the gillnet fishery, but there are no clear estimates available for any fisheries. There are also strong indications that significant amounts of salmon are still misreported as sea trout.

There is no TAC set for sea trout, but national regulations include *inter alia* minimum landing size, local and seasonal closures, and minimum mesh sizes for the gillnet fishery. According to ICES, additional management measures to address bycatch of sea trout should be considered, particularly in SD 30–32. Minimum mesh sizes, reduction of fishing effort, minimum legal landing sizes, as well as temporal and spatial closures are all viable options. Existing fishing restrictions should be maintained and habitat improvements are needed in many rivers.

Based on precautionary considerations and the limited amount of data on sea trout population dynamics, ICES advises that catches in the Gulf of Bothnia and fishing intensity in SD 22, 24, and 26 should be reduced to safeguard the remaining wild populations in the region, both locally and on their migration routes. ICES advises that habitat improvements are necessary in trout spawning rivers around the Baltic.

FLATFISHES

Five flatfish species are found in the Baltic Sea: Baltic flounder (*Platichthys flesus*), turbot (*Scophthalmus maximus*), brill (*Scophthalmus rhombus*), plaice (*Pleuronectes platessa*) and dab (*Limanda limanda*). The fishing for these species is mostly for human consumption, although a large part of the flatfish caught in the Baltic today is bycatch in the cod trawl fishery. There

are currently no management plans for flatfishes in the Baltic, and Plaice is the only species under TAC management. The knowledge concerning most stocks is limited.

Flounder

Flounder is the most widespread and abundant flatfish in the Baltic Sea. ICES provides advice for four different stocks of flounder. However, the exact number of stocks is uncertain.

Population studies show that two different strategies for spawning behaviour in flounder are correlated with the different stocks. In areas with low salinity, flounder spawn in shallow waters on the sea bottom, whereas in areas with higher salinity, flounder spawn in the open sea (so called pelagic spawners).

Most flounder landings come from bycatch in the cod fishery, although there are some targeted flounder fisheries, particularly in subdivisions 24 and 25. Preliminary analysis indicates that discarding of flounder in the cod fishery can be substantial. Recreational landings are substantial in the northern Baltic Sea (SD 27 and 29-32).

ICES categorises all four flounder stocks as data-limited. For flounder in the southern and south-central parts of the Baltic Sea (SD 22–25), positive trends in stock sizes can be seen, whereas the stock sizes in the central, north and eastern parts of the Baltic Sea are stable or slightly declining. ICES could estimate a discard rate only for flounder stocks in SD 22-25, permitting advice based on total catch. For the remaining flounder stocks ICES could only advise on landings, though discarding does occur.

In accordance with the precautionary approach, ICES advises that:

- **total catch of flounder in the Belts and the Sound should not exceed 3 042 tonnes;**
- **total catch of flounder in the Southern Baltic Sea should not exceed 28 908 tonnes;**
- **flounder landings in the waters east of Gotland and the Gulf of Gdansk should not exceed 2 606 tonnes;**
- **flounder landings in the Northern Baltic Sea should not exceed 274 tonnes.**

Turbot

Turbot is found in large parts of the Baltic Sea but is not as widespread as flounder. All the Baltic Sea turbot is suggested to belong to one genetically similar stock. The species is sedentary and show a high spawning site fidelity, which makes it locally sensitive to high fishing pressure. The state of the stock is not fully known, but the ICES stock size indicator does not show any significant long term trends.

More than half of the reported turbot landings come from SD 22, with relatively substantial landings in SD 24-26. Catches have fluctuated greatly during the last decades, and in the 1990s landings were up to three times as high as today.

In accordance with the precautionary approach, ICES advises that turbot landings should not exceed 198 tonnes.

Plaice, dab, and brill

The following three species have a limited distribution in the Baltic Sea, mainly confined by their tolerance of low salinity. Plaice is common in the western parts and extends eastwards to the Gulf of Gdansk and northwards to the Gotland area; it is sporadically found farther north. Dab has a similar, somewhat more westerly distribution, whereas brill is almost exclusively found in SD 22–24. There are at least two plaice populations and indications of three different dab populations in the region.

According to the annual scientific trawl survey, plaice stocks appear to be increasing strongly. Dab has also increased in numbers in the last years, whereas brill seems to fluctuate considerably between years and no significant trends can be detected.

Plaice is the only flatfish species in the Baltic Sea subject to EU quota management. Plaice is exempt from the landing obligation this year, **thus the corresponding TACs for the two management areas represent landings only**. Since 2012, the ICES advice is divided into a western stock (SD 21–23) and an eastern, or Baltic, stock (SD 24–32). Estimated landings and discards for the western stock in 2014 are 1 931 tonnes and 1 956 tonnes, and for the Baltic stock are 534 tonnes and 481 tonnes, respectively. Due to an increase in data quality for the western stock from last year, ICES applies the MSY approach for the 2016 advice. ICES categorises the eastern stock as data-limited, which limits increases in advice to 20%. Both stocks are subject to high levels of discarding as bycatch.

In accordance with the MSY approach, ICES advises that total catch for plaice in SD 21-23 should not exceed 8 639 tonnes. The corresponding TAC for this management area would be 4 642 tonnes.

In accordance with the precautionary approach, ICES advises that total catch for plaice in SD 24-32 should not exceed 2 156 tonnes. The corresponding TAC for this management area would be 1 093 tonnes.

ICES categorises the dab stock as data-limited. Estimated landings and discards for 2014 are 1 269 tonnes and 757 tonnes, respectively. Dab shows a continuing increase in biomass, roughly a threefold increase since 2002.

In accordance with the precautionary approach, ICES advises that the total catch of dab should not exceed 2 980 tonnes.

ICES categorises the brill stock as data-limited. Estimated landings and discards for 2014 are 28 tonnes and 4 tonnes, respectively. Brill shows an indexed decrease in excess of 20%.

In accordance with the precautionary approach, ICES advises that the total catch of brill should not exceed 23 tonnes.