

Plaice (*Pleuronectes platessa*) in subdivisions 21–23 (Kattegat, Belt Seas, and the Sound)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2021 should be no more than 5176 tonnes.

Note: This advice is abbreviated due to the Covid-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time



Figure 1 Plaice in subdivisions 21–23. Summary of the stock assessment. Weights in thousand tonnes. Recruitment, F, and SSB show confidence intervals (95%) in the plot. Assumed recruitment is unshaded.

Stock and exploitation status

Table 1 Plaice in subdivisions 21–23. State of the stock and the fishery relative to reference points.

| | | Fishing pressure | | | | Stock size | | |
|---------------------------|-------------------|------------------|------|-------------------------|-------------------|------------|------|------------------------------|
| | | 2017 | 2018 | 2019 | | 2018 | 2019 | 2020 |
| Maximum sustainable yield | F_{MSY} | ✗ | ✗ | ✗ Above | MSY | ✓ | ✓ | ✓ Above trigger |
| Precautionary approach | F_{pa}, F_{lim} | ✓ | ✓ | ✓ Harvested sustainably | B_{pa}, B_{lim} | ✓ | ✓ | ✓ Full reproductive capacity |
| Management plan | F_{MGT} | — | — | — Not applicable | B_{MGT} | — | — | — Not applicable |

Catch scenarios

Table 2 Plaice in subdivisions 21–23. Assumptions made for the interim year and in the forecast. Weights are in tonnes. Recruitment is in thousand individuals.

| Variable | Value | Notes |
|------------------------------|-------|---|
| $F_{\text{ages 3–5}}$ (2020) | 0.38 | $F_{\text{ages 3–5}}$ in 2019. |
| SSB (2021) | 13083 | From the F_{2020} assumption. |
| $R_{\text{age 1}}$ (2020) | 28584 | Median resampled from the entire time-series. |
| $R_{\text{age 1}}$ (2021) | 28584 | Median resampled from the entire time-series. |
| Total catch (2020) | 6319 | From the F_{2020} assumption. |
| Projected landings (2020) | 4944 | Based on the observed discard rate by age in 2017–2019. |
| Projected discards (2020) | 1375 | Based on the observed discard rate by age in 2017–2019. |

Table 3 Plaice in subdivisions 21–23. Annual catch scenarios. All weights are in tonnes.

| Basis | Total catch (2021) | F (2021) | SSB (2022) | % SSB change * | % Advice change ** |
|--|--------------------|----------|------------|----------------|--------------------|
| ICES advice basis | | | | | |
| MSY approach: ($F = F_{\text{MSY}}$) | 5176 | 0.31 | 13423 | 2.6% | –51% |
| Other scenarios | | | | | |
| $F = 0$ | 0 | 0 | 17338 | 33% | –100% |
| $F = F_{2019}$ | 6174 | 0.382 | 12651 | –3.3% | –42% |
| $F = F_{\text{p05}}$ | 9643 | 0.68 | 10000 | –24% | –9.3% |
| F_{pa} | 10258 | 0.74 | 9551 | –27% | –3.6% |
| $F = F_{\text{lim}}$ | 12478 | 1 | 7868 | –40% | 17.3% |
| $\text{SSB (2022)} = B_{\text{pa}}$ | 16826 | 1.775 | 4732 | –64% | 58% |
| $\text{SSB (2022)} = \text{MSY } B_{\text{trigger}}$ | 16826 | 1.775 | 4732 | –64% | 58% |
| $\text{SSB (2022)} = B_{\text{lim}}$ | 18399 | 2.253 | 3630 | –72% | 73% |
| MSY approach: ($F = F_{\text{MSY}}$) Lower | 3194 | 0.18 | 14909 | 14% | –70% |
| MSY approach: ($F = F_{\text{MSY}}$) Upper | 8704 | 0.59 | 10729 | –18% | –18% |

* SSB 2022 relative to SSB 2021.

** Catches in 2021 relative to ICES advised catch for 2020 (10 636 tonnes).

The advised catch has been reduced for 2021, mainly due to a change in the basis for the advice (from precautionary approach to MSY approach).

Quality of the assessment

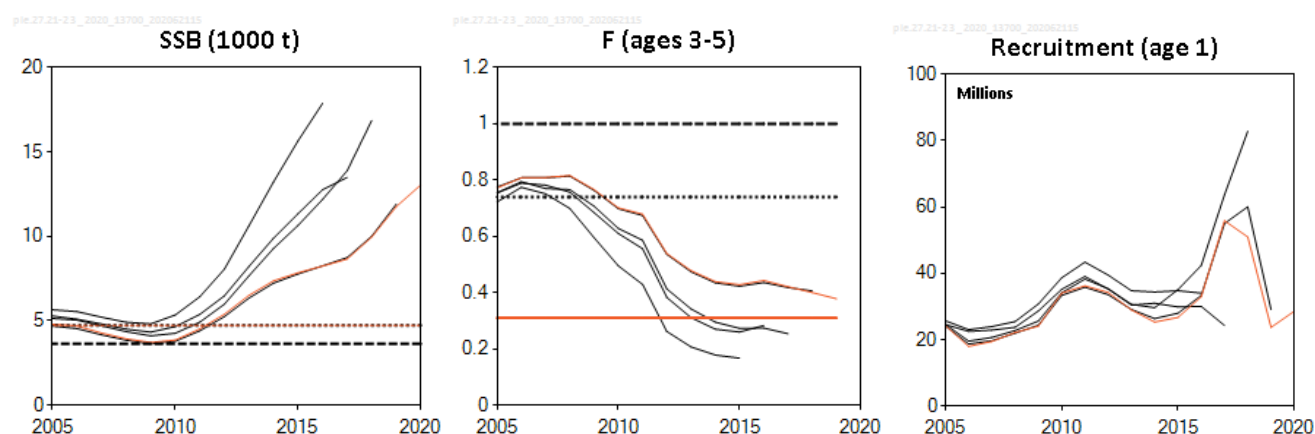


Figure 2* Plaice in subdivisions 21–23. Historical assessment results. The final recruitment estimate in 2020 is the median of the time-series. This stock assessment procedure was revised in 2019.

The combined quarter 3 and 4 survey indices for 2019 were not used in the assessment due to very low catch rates of all ages. This was potentially caused by environmental changes that resulted in distributional shifts of the plaice stock.

Issues relevant for the advice

Table 4 Plaice in subdivisions (SDs) 21–23. Calculation of TACs by management area based on the catch distribution observed in 2019. Weights are in tonnes. Landings including BMS.

| Basis | | Catch 2019 | Landings 2019 | ICES stock advice 2021 (catch) |
|---|-----------|---|---------------|--------------------------------|
| Stock area-based | SDs 21–23 | 5388 | 4334 | 5176 |
| | SDs 24–32 | 2359 | 1741 | 3297 |
| Total advised catch, 2021 (SDs 21–32) | | | | 8473 |
| Management area-based | SD 21 | 748 | 363 | |
| | SDs 22–23 | 4640 | 3971 | |
| | SDs 22–32 | 6999 | 5712 | |
| Calculation | | | | Result |
| Share of SD 21 of the total catch in SDs 21–23 in 2019 | | 748 / 5388 (catch in 2019 SD 21 / catch in 2019 SDs 21–23) | | 0.139 |
| Catch in 2021 for SD 21 | | 5176 x 0.139 (ICES stock advice in 2021 [catch] for SDs 21–23 x share) | | 719 |
| Catch in 2021 for SDs 22–32 | | 8473 - 719 (total advised catch in 2021 SDs 21–32 – catch SD 21) | | 7754 |
| Share of SD 21 of the total landings in SDs 21–23 in 2019 | | 363 / 4334 (landings in 2019 SD 21 / landings in 2019 SDs 21–23) | | 0.084 |

* Version 2: Reference point lines in the figure were updated.

History of the advice, catch, and management

Table 5 Plaice in subdivisions (SDs) 21–23. ICES advice, TACs, and ICES catches. All weights are in tonnes.

| Year | ICES advice | Catch corresp. to advice for SDs 21–23 | Catch corresp. to advice for Skagerrak and Kattegat combined | TAC Kattegat (SD 21) | TAC Baltic Sea (SDs 22–32) | ICES landings (SDs 21–23) ^{^^} | Discards (SDs 21–23) ^{^^} |
|------|--|--|--|-------------------------|-------------------------------|--|---------------------------------------|
| 1992 | TAC | | 14 000 | 2 800 | | 2 700 | |
| 1993 | Precautionary TAC | | - | 2 800 | | 1 700 | |
| 1994 | If required, precautionary TAC | | - | 2 800 | | 2 100 | |
| 1995 | If required, precautionary TAC | | - | 2 800 | | 2 100 | |
| 1996 | If required, precautionary TAC | | - | 2 800 | | 3 500 | |
| 1997 | No advice | | - | 2 800 | | 3 400 | |
| 1998 | No increase in F from the present level | | 11 900 | 2 800 | | 2 900 | |
| 1999 | No increase in F from the present level | | 11 000 | 2 800 | | 3 400 | 2 313 |
| 2000 | $F < F_{pa}$ | | 11 800 | 2 800 | | 3 900 | 2 313 |
| 2001 | $F < F_{pa}$ | | 9 400 | 2 350 | | 4 100 | 2 313 |
| 2002 | $F < F_{pa}$ | | 8 500* | 1 600** | | 3 900 | 4 357 |
| 2003 | $F < F_{pa}$ | | 18 400 | 3 000 | | 3 400 | 2 004 |
| 2004 | $F < F_{pa}$ | | *** | 1 800 | | 2 600 | 1 368 |
| 2005 | $F < F_{pa}$ | | < 9 500 | 1 900 | | 2 400 | 1 197 |
| 2006 | No increase in F | | < 9 600 | 1 900 | | 2 400 | 1 769 |
| 2007 | Maintain current TAC | | < 9 600 | 2 100 | | 2 600 | 1 190 |
| 2008 | No increase in catch | | < 9 400 | 2 300 | | 2 000 | 1 901 |
| 2009 | Same advice as last year | | < 9 400 | 2 300 | | 1 700 | 1 447 |
| 2010 | Same advice as last year | | < 9 400 | 2 300 | | 1 500 | 1 488 |
| 2011 | Last three years' average landings (2007–2009) | | < 8 000 | 1 988 | 3 041 | 1 600 | 2 045 |
| 2012 | Reduce catch | | - | 1 988 | 2 889 | 1 800 | 1 350 |
| 2013 | Increase catch by 16%, transition to F_{MSY} | < 1 800 [^] | | 1 800 | 3 409 | 2 000 | 1 637 |
| 2014 | Increase landings by 20% | 2 224 [^] | | 2 160 | 3 409 | 1 931 | 1 946 |
| 2015 | Increase catch by 20% | 4 031 | | 2 626 | 3 409 | 2 687 | 1 021 |
| 2016 | MSY approach | ≤ 8 639 | | 2 347 | 4 034 | 3 020 | 1 501 |
| 2017 | MSY approach | ≤ 8 333 | | 2 343 | 7 862 | 3 253 | 988 |
| 2018 | MSY approach | ≤ 5 405 | | 1 483 | 7 076 | 3 459 | 1 387 |
| 2019 | Precautionary approach | ≤ 15 237 | | 1 705 | 10 122 | 4 334 | 1 054 |
| 2020 | Precautionary approach | ≤ 10 636 | | 1 141 | 6 894 | | |
| 2021 | MSY approach | ≤ 5 176 | | | | | |

* In March 2002 ICES revised its advice to 11 600 tonnes for both areas combined.

** The TAC for the two areas combined was adjusted to 11 200 tonnes in mid-2002.

*** The exploitation of this stock should be conducted in the context of mixed fisheries.

[^] Landings.

^{^^} On 1/1/2017 the EU landing obligation was introduced for plaice in SDs 22 to 32. From 2017, landings include below minimum size (BMS) landings.

Summary of the assessment

Table 6 Plaice in subdivisions 21–23. Assessment summary. Weights are in tonnes, recruitment is in thousands. High and low refers to 95% confidence intervals.

| Year | Recruitment | | | SSB | | | Landings | Discards | Fishing mortality | | |
|------|-------------|---------|---------|-------|-------|------|----------|----------|-------------------|------|------|
| | Age1 | High | Low | SSB | High | Low | | | ages 3–5 | High | Low |
| 1999 | 52413 | 71040 | 38671 | 4434 | 5525 | 3559 | 3406 | 2313 | 1.02 | 1.25 | 0.84 |
| 2000 | 45327 | 59488 | 34536 | 5184 | 6235 | 4310 | 3935 | 2313 | 1.02 | 1.21 | 0.86 |
| 2001 | 25110 | 33362 | 18898 | 6081 | 7300 | 5066 | 4054 | 2313 | 0.96 | 1.12 | 0.82 |
| 2002 | 36380 | 50081 | 26427 | 6121 | 7318 | 5119 | 3939 | 4357 | 0.90 | 1.06 | 0.76 |
| 2003 | 23004 | 30341 | 17441 | 5598 | 6619 | 4735 | 3618 | 2004 | 0.81 | 0.96 | 0.68 |
| 2004 | 28584 | 37447 | 21819 | 5063 | 5955 | 4304 | 2766 | 1369 | 0.77 | 0.91 | 0.64 |
| 2005 | 24239 | 31723 | 18520 | 4801 | 5661 | 4072 | 2354 | 1197 | 0.77 | 0.92 | 0.65 |
| 2006 | 17970 | 24750 | 13047 | 4686 | 5553 | 3954 | 2580 | 1770 | 0.81 | 0.96 | 0.68 |
| 2007 | 19445 | 25547 | 14801 | 4272 | 5056 | 3609 | 2691 | 1191 | 0.81 | 0.96 | 0.68 |
| 2008 | 22159 | 29453 | 16672 | 3936 | 4651 | 3330 | 2028 | 1902 | 0.82 | 0.97 | 0.69 |
| 2009 | 24071 | 31442 | 18429 | 3718 | 4397 | 3144 | 1635 | 1448 | 0.77 | 0.91 | 0.64 |
| 2010 | 34055 | 44998 | 25773 | 3857 | 4542 | 3274 | 1570 | 1489 | 0.70 | 0.84 | 0.58 |
| 2011 | 36238 | 47368 | 27723 | 4516 | 5319 | 3834 | 1584 | 2045 | 0.68 | 0.84 | 0.55 |
| 2012 | 34243 | 45457 | 25795 | 5387 | 6378 | 4549 | 1845 | 1351 | 0.54 | 0.67 | 0.43 |
| 2013 | 28948 | 37758 | 22194 | 6505 | 7693 | 5501 | 1956 | 1638 | 0.48 | 0.60 | 0.38 |
| 2014 | 25305 | 34027 | 18819 | 7361 | 8715 | 6218 | 1931 | 1946 | 0.44 | 0.56 | 0.35 |
| 2015 | 26707 | 35210 | 20257 | 7845 | 9319 | 6605 | 2687 | 1021 | 0.43 | 0.54 | 0.34 |
| 2016 | 32897 | 44211 | 24479 | 8240 | 9872 | 6877 | 3020 | 1501 | 0.44 | 0.56 | 0.35 |
| 2017 | 55885 | 79114 | 39476 | 8655 | 10543 | 7105 | 3247 | 778 | 0.42 | 0.55 | 0.32 |
| 2018 | 50983 | 76970 | 33770 | 9954 | 12592 | 7869 | 3446 | 1400 | 0.40 | 0.55 | 0.29 |
| 2019 | 23707 | 43570 | 12900 | 11760 | 15938 | 8677 | 4334 | 1054 | 0.38 | 0.56 | 0.26 |
| 2020 | 28584 * | 55885 * | 17970 * | 13050 | 18846 | 8665 | | | | | |

* Median of the time-series.

Sources and references

ICES. 2020. Baltic Fisheries Assessment Working Group (WGBFAS). ICES Scientific Reports, 2:45. <http://doi.org/10.17895/ices.pub.6024>.

Recommended citation: ICES. 2020. Plaice (*Pleuronectes platessa*) in subdivisions 21–23 (Kattegat, Belt Seas, and the Sound). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, ple.27.21-23. <https://doi.org/10.17895/ices.advice.5870>.

Annex 1

ICES Advice on fishing opportunities, catch, and effort
Baltic Sea ecoregion, Greater North Sea ecoregion
Published 29 May 2019

Plaice (*Pleuronectes platessa*) in subdivisions 21–23 (Kattegat, Belt Seas, and the Sound)

ICES advice on fishing opportunities

In the context of the EU multiannual plan for the Baltic, which considers this stock to be bycatch, the EC has requested that ICES provide advice based on the precautionary approach. ICES advises that catches of up to 10 636 tonnes are considered to be precautionary.

Stock development over time

The spawning-stock biomass (SSB) has increased significantly from 2009, and has been above $MSY_{Btrigger}$ since 2012. Fishing mortality (F) has declined since 2008, but F remains above F_{MSY} . Recruitment has fluctuated without trends between 1999 and 2016 and the last two year classes are the highest observed.

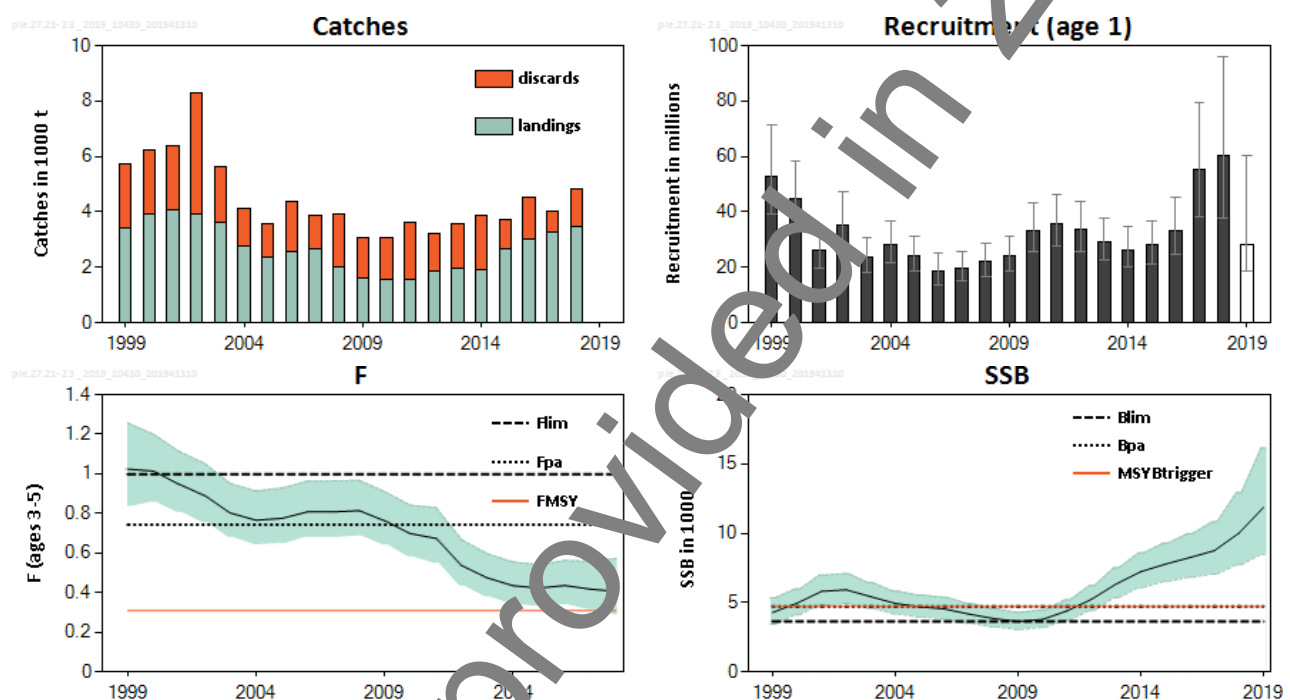


Figure 1 Plaice in subdivisions 21–23. Summary of the stock assessment. Weights in thousand tonnes. Recruitment, F, and SSB have confidence intervals (95%) in the plot. The unshaded 2019 recruitment is not based on data, but is the median of the time series.

Stock and exploitation status

ICES assesses fishing pressure on the stock to be above F_{MSY} , but below F_{pa} and F_{lim} , and the size of the spawning stock to be above $MSY_{Btrigger}$, B_{pa} , and B_{lim} .

Table 1 Plaice in subdivisions 21–23. State of the stock and fishery relative to reference points.

| | | Fishing pressure | | | | Stock size | | | |
|---------------------------|-------------------|------------------|------|------|-----------------------|------------|------|------|----------------------------|
| | | 2016 | 2017 | 2018 | | 2017 | 2018 | 2019 | |
| Maximum sustainable yield | F_{MSY} | ✗ | ✗ | ✗ | Above | ✓ | ✓ | ✓ | Above trigger |
| Precautionary approach | F_{pa}, F_{lim} | ✓ | ✓ | ✓ | Harvested sustainably | ✓ | ✓ | ✓ | Full reproductive capacity |
| Management plan | F_{MGT} | — | — | — | Not applicable | — | — | — | Not applicable |

Catch scenarios

Table 2 Plaice in subdivisions 21–23. Assumptions made for the interim year and in the forecast. Weights are in tonnes. Recruitment is in thousand individuals.

| Variable | Value | Notes |
|------------------------------|--------|--|
| F _{ages 3–5} (2019) | 0.41 | F _{ages 3–5} in 2018. |
| SSB (2020) | 13 207 | From the F ₂₀₁₉ assumption. |
| R _{age 1} (2019) | 29 103 | Median resampled from the entire time series of recruitment. |
| R _{age 1} (2020) | 28 260 | Median resampled from the entire time series of recruitment. |
| Total catch (2019) | 6405 | From the F ₂₀₁₉ assumption. |
| Wanted catch (2019) | 4515 | Based on the observed discard rate by age in 2016–2018. |
| Unwanted catch (2019) | 1890 | Based on the observed discard rate by age in 2016–2018. |

Table 3 Plaice in subdivisions 21–23. Annual catch scenarios. All weights are in tonnes.

| Basis | Total catch (2020) | F (2020) | SSB (2021) | % SSB change * | % Advice change ** |
|---|--------------------|----------|------------|----------------|--------------------|
| ICES advice basis | | | | | |
| Precautionary approach: (F=F _{p05}) | 10 636 | 0.68 | 10 894 | –18% | –30% |
| Other scenarios | | | | | |
| F = 0 | 0 | 0 | 18 700 | 42% | –100% |
| F = F ₂₀₁₈ | 7168 | 0.41 | 13 443 | 2% | –53% |
| F _{pa} | 11 291 | 0.74 | 10 403 | –21% | –26% |
| MSY approach: F _{MSY} | 5675 | 0.34 | 14 527 | 10% | –63% |
| F = F _{lim} | 13 794 | 1 | 8578 | –35% | –9% |
| SSB (2021) = B _{pa} | 19 339 | 0.92 | 4732 | –64% | 27% |
| SSB (2021) = MSY B _{trigger} | 19 339 | 1.93 | 4732 | –64% | 27% |
| SSB (2021) = B _{lim} | 20 991 | 2.41 | 3637 | –72% | 38% |

* SSB 2021 relative to SSB 2020.

** Catches in 2020 relative to the ICES advised catch for 2019 (15 237 t).

The large decrease in the advice is due to the downward revision of the SSB from this year's assessment.

Basis of the advice

Table 4 Plaice in subdivisions 21–23. The basis of the advice.

| | |
|-----------------|---|
| Advice basis | Precautionary approach. |
| Management plan | The EU Multiannual Plan for the Baltic Sea (EU, 2016) takes bycatch of this species into account. Currently no management plan covers subdivision 21. |

Quality of the assessment

In the past this assessment has suffered from bias in SSB and F ; changes were made to the assessment this year to address these problems. Nevertheless, the updated assessment has a large downward revision in SSB and upward revision in F compared to last year.

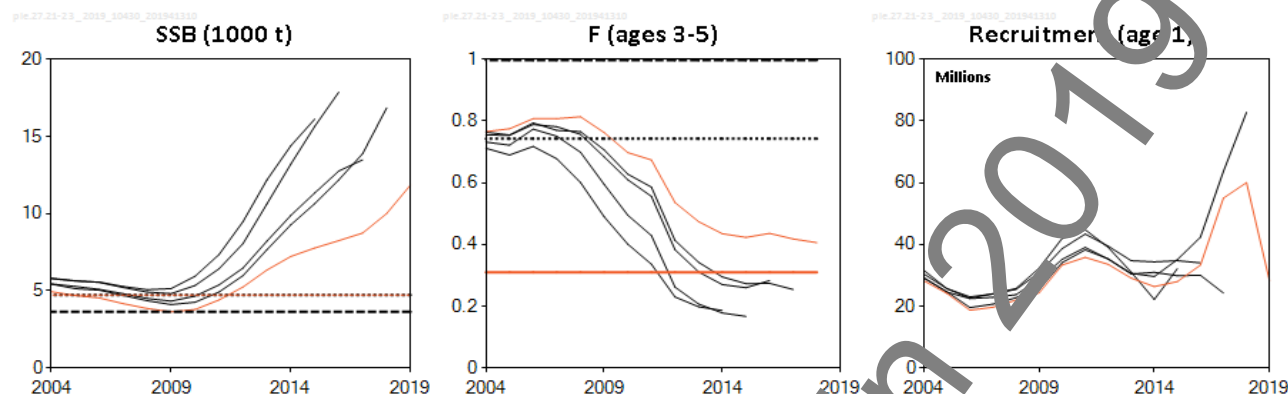


Figure 2 Plaice in subdivisions 21–23. Historical assessment results. The final recruitment estimate in 2019 is the median of the time series.

Issues relevant for the advice

The basis for the advice this year is the precautionary approach, as requested by the European Commission (ICES, 2019a). The precautionary advice for this stock is based on a constant fishing mortality that has a low probability of bringing SSB below B_{lim} in the long term ($F_{p05} = 0.68$; see introduction to the advice). This would imply a large increase in F compared to current levels, and is also well above F_{MSY} .

The assessment was revised and the reference points were updated accordingly in 2019, leading to a lower estimate of reference points (see Table 6.)

The EU landing obligation has covered plaice in the Baltic (subdivisions (SDs) 22–32) from January 2017 onwards. The implementation has been gradual in the Kattegat (SD 21), but the main fisheries have been included from 2019 onwards. Landings of fish below the minimum conservation reference size (MCRS) are very low (13 t BMS were reported in 2018), and discarding still takes place. The estimated discard amount, 1387 tonnes in 2018 (approximately 29%), is based on observer data.

The management areas for plaice in the Baltic Sea (i.e. subdivisions 21 and 22–32) are different from the stock areas (i.e. SDs 21–23 and 24–32). As for the plaice stock in SDs 24–32 (ICES, 2019b), this section provides an option for calculating TACs by management area, based on the catch distribution observed in 2018. The catch ratio between SDs 21 and 22–23 in 2018 was used to calculate a split of the advised catches for the stock in SDs 21–23 for 2020. The advised catch for the stock in SDs 24–32 was added to the calculated catch for SDs 22–23, in order to obtain plaice catches by management area that would be consistent with the ICES advice for the two stocks. The details of this calculation are presented in Table 5. This results in catches of no more than 3 010 tonnes in SD 21, and 10 452 tonnes in SDs 22–32.

Table 5 Plaice in subdivisions (SDs) 21–23. Calculation of TACs by management area based on the catch distribution observed in 2018. Weights are in tonnes. Landings including BMS.

| Basis | | Catch 2018 | Landings 2018 | ICES stock advice 2020 (catch) |
|---|-----------|---|---------------|--------------------------------|
| Stock area-based | SDs 21–23 | 4846 | 3459 | 10636 |
| | SDs 24–32 | 2355 | 1644 | 2826 |
| Total advised catch, 2020 (SDs 21–32) | | | | 13462 |
| Management area-based | SD 21 | 1372 | 534 | |
| | SDs 22–23 | 3474 | 2925 | |
| | SDs 22–32 | 5829 | 4569 | |
| Calculation | | | | Results |
| Share of SD 21 of the total catch in SDs 21–23 in 2018 | | 1372 t / 4846 t (catch in 2018 SD 21 / catch in 2018 SDs 21–23) | | 0.283 |
| Catch in 2020 for SD 21 | | 10 636 t × 0.283 (ICES stock advice in 2019 (catch) for SDs 21–23 × share) | | 3010 |
| Catch in 2020 for SDs 22–32 | | 13462 t – 3010 t (total advised catch in 2019 SDs 21–32 – catch SD 21) | | 10452 |
| Share of SD 21 of the total landings in SDs 21–23 in 2018 | | 534 t / 3459 t (landings in 2018 SD 21 / landings in 2018 SDs 21–23) | | 0.154 |

Reference points

Table 6 Plaice in subdivisions 21–23. Reference points, values, and their technical basis. Weights in tonnes.

| Framework | Reference point | Value | Technical basis | Source |
|------------------------|-------------------|-------------|---|--------------|
| MSY approach | MSY $B_{trigger}$ | 4730 | $= B_{pa}$ | ICES (2019b) |
| | F_{MSY} | 0.31 | Equilibrium scenarios stochastic recruitment. | ICES (2019b) |
| Precautionary approach | B_{lim} | 3635 | B_{loss} (lowest observed biomass = Biomass in 2009) | ICES (2019b) |
| | B_{pa} | 4730 | $B_{lim} \times e^{-1.645\sigma}$, $\sigma = 0.16$ | ICES (2019b) |
| | F_{lim} | 1.00 | Equilibrium scenarios $prob(SSB < B_{lim}) < 50\%$ with stochastic recruitment. | ICES (2019b) |
| | F_{pa} | 0.74 | $F_{lim} \times e^{-1.645\sigma(F)}$, $\sigma_F = 0.18$ | ICES (2019b) |
| Management plan | SSB_{mgt} | Not defined | | |
| | F_{mgt} | Not defined | | |

Basis of the assessment

Table 7 Plaice in subdivisions 21–23. Basis of the assessment and advice.

| | |
|--------------------------|--|
| ICES stock data category | (ICES, 2018). |
| Assessment type | Age-based analytical assessment SAM (ICES, 2019b) that uses catches in the model and in the forecast. |
| Input data | Commercial catches; two combined survey indices (NS-IBTSQ1 and BITS-Q1, NS-IBTSQ3 and BITS-Q4); mean maturity data for the modelled period (from commercial catch and surveys); natural mortalities are fixed and assumed to be 0.1 except for age 1, which has 0.2. |
| Discard and catch | Discard information is available from 1999 from the main fleets (covering 89% of the landings in 2018) and is included. |
| Indicators | None. |
| Other information | The stock was last benchmarked in 2015 (ICES, 2015). |
| Working group | Baltic Fisheries Assessment Working Group (WGBFAS). |

Information from stakeholders

There is no additional available information.

History of the advice, catch, and management

Table 8 Plaice in subdivisions (SDs) 21–23. ICES advice, TACs, and ICES catches. All weights are in tonnes.

| Year | ICES advice | Catch corresp. to advice for SDs 21–23 | Catch corresp. to advice for Skagerrak and Kattegat combined | TAC Kattegat (SD 21) | TAC Baltic Sea (SDs 22–32) | ICES landings (SDs 21–23) [†] | Discards (SDs 21–23) ^{^^} |
|------|---|--|--|-------------------------|-------------------------------|---|---------------------------------------|
| 1992 | TAC | | 14 000 | 2800 | | 2700 | |
| 1993 | Precautionary TAC | | - | 2800 | | 2700 | |
| 1994 | If required, precautionary TAC | | - | 2800 | | 2100 | |
| 1995 | If required, precautionary TAC | | - | 2800 | | 2100 | |
| 1996 | If required, precautionary TAC | | - | 2800 | | 3500 | |
| 1997 | No advice | | - | 2800 | | 3400 | |
| 1998 | No increase in F from the present level | | 11 900 | 2800 | | 2900 | |
| 1999 | No increase in F from the present level | | 11 000 | 2800 | | 3400 | 2313 |
| 2000 | $F < F_{pa}$ | | 11 800 | 2800 | | 3900 | 2313 |
| 2001 | $F < F_{pa}$ | | 9400 | 2350 | | 4100 | 2313 |
| 2002 | $F < F_{pa}$ | | 8500* | 1600** | | 3900 | 4357 |
| 2003 | $F < F_{pa}$ | | 18 400 | 3000 | | 3400 | 2004 |
| 2004 | $F < F_{pa}$ | | 18 000** | 1800 | | 2600 | 1368 |
| 2005 | $F < F_{pa}$ | | 19 500 | 1900 | | 2400 | 1197 |
| 2006 | No increase in F | | 19 600 | 1900 | | 2400 | 1769 |
| 2007 | Maintain current TAC | | 19 600 | 2100 | | 2600 | 1190 |
| 2008 | No increase in catch | | < 9400 | 2300 | | 2000 | 1901 |
| 2009 | Same advice as last year | | < 9400 | 2300 | | 1700 | 1447 |
| 2010 | Same advice as last year | | < 9400 | 2300 | | 1500 | 1488 |
| 2011 | Last three years' average landings (2007–2009) | | < 8000 | 1988 | 3041 | 1600 | 2045 |
| 2012 | Reduce catch | | - | 1988 | 2889 | 1800 | 1350 |
| 2013 | Increase catch by 5%, transition to F _{MSY} | < 1800 [^] | | 1800 | 3409 | 2000 | 1637 |
| 2014 | Increase landings by 20% | 2224 [^] | | 2160 | 3409 | 1931 | 1946 |
| 2015 | Increase catch by 20% | 4031 | | 2626 | 3409 | 2687 | 1021 |
| 2016 | MSY approach | ≤ 8639 | | 2347 | 4034 | 3020 | 1501 |
| 2017 | MSY approach | ≤ 8333 | | 2343 | 7862 | 3253 | 988 |
| 2018 | MSY approach | ≤ 5405 | | 1483 | 7076 | 3459 | 1387 |
| 2019 | Precautionary approach | ≤ 15 237 | | 1705 | 10 122 | | |

| Year | ICES advice | Catch corresp. to advice for SDs 21–23 | Catch corresp. to advice for Skagerrak and Kattegat combined | TAC Kattegat (SD 21) | TAC Baltic Sea (SDs 22–32) | ICES landings (SDs 21–23) ^{^^} | Discards (SDs 21–23) ^{^^} |
|------|---------------------------|--|--|-------------------------|-------------------------------|--|---------------------------------------|
| 2020 | Precautionary approach | ≤ 10 636 | | | | | |

* In March 2002 ICES revised its advice to 11 600 tonnes for both areas combined.

** The TAC for the two areas combined was adjusted to 11 200 tonnes in mid-2002.

*** The exploitation of this stock should be conducted in the context of mixed fisheries.

[^] Landings.

^{^^} On 1/1/2017 the EU landing obligation was introduced for plaice in SDs 22 to 32. From 2017 landings include BMS.

History of the catch and landings

Table 9 Plaice in subdivisions 21–23. Catch distribution by fleet in 2018 as estimated by ICES

| Catch (2018) | Landings | | Discards |
|--------------|------------------|-------------------|-------------|
| 4846 tonnes | Active gears 85% | Passive gears 15% | 1387 tonnes |
| | 3459* tonnes | | |

*including 13 tonnes of BMS

Table 10 Plaice in subdivisions (SDs) 21–23. History of commercial catch and landings. ICES estimated landings by area and country, estimated discards, and officially reported BMS. All weights are in tonnes.

| Year and SD | Denmark | | Germany | | Sweden | | Total BMS |
|-------------|----------|----------|----------|----------|----------|----------|-----------|
| | Discards | Landings | Discards | Landings | Discards | Landings | |
| 2002 | 3877 | 3654 | 22 | 39 | 458 | 246 | |
| 27.3.a.21 | 3314 | 1880 | | | 446 | 204 | |
| 27.3.b.23 | 178 | 75 | | | 13 | 42 | |
| 27.3.c.22 | 385 | 1699 | 22 | 39 | | 0 | |
| 2003 | 1635 | 3308 | 17 | 31 | 353 | 279 | |
| 27.3.a.21 | 1235 | 2132 | | | 351 | 253 | |
| 27.3.b.23 | 23 | 105 | | | 1 | 6 | |
| 27.3.c.22 | 377 | 1071 | 17 | 31 | | 0 | |
| 2004 | 1195 | 2540 | 48 | 54 | 126 | 173 | |
| 27.3.a.21 | 711 | 1454 | | | 120 | 137 | |
| 27.3.b.23 | 48 | 137 | | | | 35 | |
| 27.3.c.22 | 435 | 949 | 48 | 54 | | 0 | |
| 2005 | 1048 | 2171 | 37 | 48 | 113 | 135 | |
| 27.3.a.21 | 617 | 1145 | | | 108 | 100 | |
| 27.3.b.23 | 37 | 152 | | | 4 | 34 | |
| 27.3.c.22 | 394 | 874 | 37 | 48 | | | |
| 2006 | 1593 | 2321 | 25 | 45 | 152 | 214 | |
| 27.3.a.21 | 1165 | 1400 | | | 149 | 175 | |
| 27.3.b.23 | 17 | 180 | | | 3 | 39 | |
| 27.3.c.22 | 410 | 742 | 25 | 45 | | | |
| 2007 | 962 | 2376 | 56 | 75 | 173 | 241 | |
| 27.3.a.21 | 641 | 1244 | | | 170 | 172 | |
| 27.3.b.23 | 42 | 199 | | | 2 | 69 | |
| 27.3.c.22 | 279 | 933 | 56 | 75 | | | |
| 2008 | 1807 | 1754 | 16 | 92 | 79 | 182 | |
| 27.3.a.21 | 1471 | 899 | | | 76 | 137 | |
| 27.3.b.23 | 39 | 120 | | | 3 | 45 | |
| 27.3.c.22 | 297 | 735 | 16 | 92 | | 0 | |
| 2009 | 1332 | 1317 | 1 | 191 | 99 | 127 | |
| 27.3.a.21 | 1033 | 589 | | | 99 | 84 | |
| 27.3.b.23 | 10 | 144 | | | 0 | 42 | |
| 27.3.c.22 | 289 | 585 | 16 | 191 | | 0 | |
| 2010 | 1212 | 1262 | 149 | 226 | 127 | 83 | |
| 27.3.a.21 | 388 | 421 | 5 | 5 | 127 | 66 | |
| 27.3.b.23 | 5 | 59 | | | 1 | 17 | |
| 27.3.c.22 | 819 | 782 | 144 | 221 | | 0 | |
| 2011 | 1823 | 1224 | 127 | 310 | 95 | 51 | |
| 27.3.a.21 | 1042 | 327 | | | 94 | 40 | |
| 27.3.b.23 | 27 | 46 | | | 1 | 11 | |
| 27.3.c.22 | 754 | 851 | 127 | 310 | | 0 | |
| 2012 | 1192 | 1439 | 119 | 365 | 39 | 41 | |
| 27.3.a.21 | 277 | 196 | | | 39 | 30 | |
| 27.3.b.23 | 1 | 54 | | | 1 | 12 | |
| 27.3.c.22 | 914 | 1189 | 119 | 365 | | 0 | |
| 2013 | 1423 | 1561 | 111 | 320 | 104 | 74 | |
| 27.3.a.21 | 756 | 232 | 3 | 1 | 103 | 60 | |
| 27.3.b.23 | 1 | 76 | | | 1 | 14 | |
| 27.3.c.22 | 666 | 1252 | 109 | 319 | | 0 | |
| 2014 | 1750 | 1497 | 100 | 321 | 96 | 113 | |
| 27.3.a.21 | 525 | 343 | 1 | 1 | 94 | 68 | |
| 27.3.b.23 | 5 | 57 | | | 2 | 45 | |
| 27.3.c.22 | 1220 | 1097 | 99 | 320 | | 0 | |

| Year and SD | Denmark | | Germany | | Sweden | | Total BMS |
|-------------|----------|----------|----------|----------|----------|----------|-----------|
| | Discards | Landings | Discards | Landings | Discards | Landings | |
| 2015 | 784 | 2014 | 115 | 560 | 122 | 113 | |
| 27.3.a.21 | 345 | 807 | 0 | 0 | 122 | 87 | |
| 27.3.b.23 | 6 | 103 | | | 0 | 26 | |
| 27.3.c.22 | 434 | 1103 | 115 | 560 | | 0 | |
| 2016 | 1223 | 2199 | 145 | 681 | 133 | 141 | |
| 27.3.a.21 | 633 | 984 | 1 | 1 | 131 | 121 | |
| 27.3.b.23 | 17 | 107 | | | 2 | 20 | |
| 27.3.c.22 | 573 | 1108 | 144 | 680 | | 0 | |
| 2017 | 787 | 2198 | 142 | 936 | 59 | 140 | 10 |
| 27.3.a.21 | 479 | 703 | | 1 | 5 | 97 | |
| 27.3.b.23 | - | 70 | | | 3 | 13 | 0.106 |
| 27.3.c.22 | - | 1424 | - | 936 | | | 10 |
| 2018 | | | | | | | 13 |
| 27.3.a.21 | - | 482 | - | 1 | | 51 | |
| 27.3.b.23 | - | 111 | - | | - | 13 | |
| 27.3.c.22 | - | 1708 | - | 1080 | - | 0 | |

Summary of the assessment

Table 11 Plaice in subdivisions 21–23. Assessment summary. Weights are in tonnes, recruitment is in thousands. High and low refers to 95% confidence intervals.

| Year | Recruitment (Age 1) | Recruitment High | Recruitment Low | SSB | SSB High | SSB Low | Landings | Discards | F (ages 3–5) | F High | F Low |
|------|---------------------|------------------|-----------------|--------|----------|---------|----------|----------|--------------|--------|-------|
| 1999 | 52 781 | 71 358 | 39 041 | 4279 | 534 | 2426 | 3406 | 2313 | 1.02 | 1.26 | 0.83 |
| 2000 | 44 729 | 58 241 | 34 352 | 4961 | 5970 | 4122 | 3935 | 2313 | 1.01 | 1.20 | 0.86 |
| 2001 | 25 936 | 34 334 | 19 591 | 5811 | 6968 | 4837 | 4054 | 2313 | 0.95 | 1.11 | 0.81 |
| 2002 | 35 014 | 47 090 | 26 036 | 5920 | 7083 | 4947 | 3939 | 4357 | 0.89 | 1.05 | 0.75 |
| 2003 | 23 550 | 30 837 | 17 986 | 5426 | 6589 | 4584 | 3618 | 2004 | 0.80 | 0.95 | 0.68 |
| 2004 | 28 260 | 36 663 | 21 782 | 494 | 5820 | 4195 | 2766 | 1369 | 0.77 | 0.91 | 0.64 |
| 2005 | 24 153 | 31 281 | 18 648 | 4691 | 5546 | 3968 | 2354 | 1197 | 0.78 | 0.93 | 0.65 |
| 2006 | 18 679 | 25 228 | 13 831 | 4537 | 5380 | 3826 | 2580 | 1770 | 0.81 | 0.96 | 0.68 |
| 2007 | 19 657 | 25 532 | 15 134 | 4138 | 4940 | 3516 | 2691 | 1191 | 0.81 | 0.96 | 0.68 |
| 2008 | 21 977 | 28 739 | 16 806 | 3851 | 4558 | 3254 | 2028 | 1902 | 0.81 | 0.97 | 0.69 |
| 2009 | 24 345 | 31 419 | 18 654 | 3635 | 4302 | 3071 | 1635 | 1448 | 0.76 | 0.91 | 0.64 |
| 2010 | 33 350 | 43 391 | 25 632 | 3785 | 4463 | 3210 | 1570 | 1489 | 0.70 | 0.84 | 0.58 |
| 2011 | 35 831 | 46 252 | 27 753 | 4403 | 5189 | 3736 | 1584 | 2045 | 0.67 | 0.83 | 0.55 |
| 2012 | 33 553 | 43 794 | 25 701 | 5244 | 6215 | 4425 | 1845 | 1351 | 0.54 | 0.67 | 0.43 |
| 2013 | 29 103 | 37 470 | 22 205 | 6343 | 7513 | 5355 | 1956 | 1638 | 0.47 | 0.60 | 0.38 |
| 2014 | 26 360 | 34 927 | 19 894 | 7224 | 8573 | 6086 | 1931 | 1946 | 0.44 | 0.55 | 0.34 |
| 2015 | 27 975 | 36 819 | 21 256 | 7772 | 9275 | 6513 | 2687 | 1021 | 0.42 | 0.54 | 0.33 |
| 2016 | 33 319 | 45 015 | 24 662 | 8249 | 9972 | 6824 | 3020 | 1501 | 0.44 | 0.56 | 0.34 |
| 2017 | 55 037 | 69 304 | 38 196 | 8741 | 10 819 | 7062 | 3257 | 768 | 0.42 | 0.56 | 0.31 |
| 2018 | 60 066 | 75 920 | 37 614 | 10 004 | 12 936 | 7737 | 3459 | 1387 | 0.41 | 0.57 | 0.29 |
| 2019 | 29 103* | 39 066* | 18 679* | 11 907 | 16 241 | 8541 | | | | | |

* not based on data, but the median of the time series.

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Recommended citation: ICES. 2019. Plaice (*Pleuronectes platessa*) in subdivisions 21–23 (Kattegat, Belt Seas, and the Sound). In Report of the ICES Advisory Committee, 2019, ple.27.21–23, <https://doi.org/10.17895/ices.advice.4751>