

## EU standing request on catch scenarios for zero TAC stocks 2021; herring (*Clupea harengus*) in divisions 6.a and 7.b–c (West of Scotland, West of Ireland)

### Service summary

ICES has provided forecasts on the development of herring (*Clupea harengus*) in divisions 6.a and 7.b–c (West of Scotland, West of Ireland), with zero-catch TAC, with partial (1540 tonnes), and with full (4840 tonnes) uptake of the current monitoring TAC, under two different uptake scenarios for the monitoring TAC in 2021. All scenarios show an increase in spawning-stock biomass (SSB) in 2022 (17% and 21%), and a small (4% and 5%) decrease in SSB in 2023.

### Request

EU DGMARE has requested ICES to evaluate the following:

*For by-catch and for target stocks where ICES is advising zero TACs, but the stock is caught in demersal mixed-fisheries with other species where non-zero catches are advised, where possible ICES will provide the EU with illustrative catch scenarios that are consistent with the advice for the main target species in the fishery. This may involve carrying out mixed fisheries forecast or providing F-multipliers consistent with the advice for the target stocks or where forecasts are not possible the catch scenario should be based the best available scientific information.*

*Where the zero TAC advice is given for a target stock subject to a MAP the catch scenarios for the zero TAC stock should include scenarios consistent the  $F_{MSY}$  range in the target stock (e.g.  $F_{MSY}$ ,  $F_{MSY\ Lower}$  and intermediate values) and quantify the corresponding changes in biomass. Where possible, F scenarios that give, a stable biomass and increasing biomass (if  $F_{MSY}$  ranges do not) should also be provided.*

*Where possible ICES should provide catch scenarios which include changes in fishing pattern if they considered likely by ICES.*

*For stocks which are typically not caught in mixed fisheries (e.g. herring) but where ICES is advising zero TACs and where a monitoring fishery would be useful to monitor stock development, where possible ICES will provide catch scenarios for a monitoring TAC. This should be the minimum level of catches needed to provide sufficient data for ICES to continue providing scientific advice on the state of this stock.*

### Basis of the advice

The information presented here represents two stocks that are assessed as one (herring in Division 6.a [N], and herring in divisions 6.a [S] and 7.b–c). The advice is based on trends from an analytical assessment. The update assessment shows that SSB has been declining since 2000 and is at the lowest level in the time-series. Recruitment is also at a low level, with no strong cohorts evident in recent years. Fishing mortality has reduced since the introduction of the zero catch advice, and is currently in line with the monitoring TAC in 2016.

Given the current zero catch advice for herring in divisions 6.a and 7.b–c, and that a monitoring TAC has yet to be formally agreed for 2021, exploratory forecasts were carried out; different catches were assumed in the intermediate year (2021). The two scenarios considered were:

1. Full uptake of the monitoring TAC (4840 tonnes) in the intermediate year (2021).
2. Partial uptake of the monitoring TAC (1540 tonnes) in the intermediate year (2021). This assumes full uptake (1360 tonnes) in divisions 6.a (S) and 7.b–c, and an uptake based on the 2020 catches in Division 6.a (N) (180 tonnes).

All catch options show an increase in SSB in 2022 of between 17% and 21%. Under the zero TAC option, a 4% decrease, and under the full uptake a 5% decrease in SSB is forecast for 2023, reflecting the very low recruitments present in the range of years used to calculate the geometric mean.

## Results

**Table 1** Herring in divisions 6.a and 7.b–c. Assumptions made for the intermediate year and in the forecast for scenario 1.

Variable	Notes
$F_{\text{ages (wr) 3-6}}$ (2021)	F corresponding to the assumed total catch for 2021.
$R_{\text{age (wr) 1}}$ (2021–2023)	Geometric mean 2016–2020.
SSB (2021)	Tonnes; calculated in the short-term forecast based on the assumptions for the intermediate year.
Total catch (2021)	Tonnes; Monitoring TAC (4840 tonnes)

**Table 2** Herring in divisions 6.a and 7.b–c. Catch scenarios based on full uptake of the TAC.

Basis	Total catch (2022)	% SSB change 2022 relative to 2021	% SSB change 2023 relative to 2022	% TAC change 2022 relative to 2021
Precautionary approach: zero catch	0	+21	–4	–100
Other scenarios				
TAC = partial uptake of the Monitoring TAC	1540	+20	–4	–68
TAC = Monitoring TAC	4840	+17	–5	0

**Table 3** Herring in divisions 6.a and 7.b–c. Assumptions made for the intermediate year and in the forecast for scenario 2.

Variable	Notes
$F_{\text{ages (wr) 3-6}}$ (2021)	F corresponding to the assumed total catch for 2021.
$R_{\text{age (wr) 1}}$ (2021–2023)	Geometric mean 2016–2020.
SSB (2021)	Tonnes; calculated in the short-term forecast based on the assumptions for the intermediate year.
Total catch (2021)	Tonnes; partial uptake of the monitoring TAC (1540 tonnes).

**Table 4** Herring in divisions 6.a and 7.b–c. Catch scenarios based on partial uptake of the monitoring TAC.

Basis	Total catch (2022)	% SSB change 2022 relative to 2021	% SSB change 2023 relative to 2022	% TAC change 2022 relative to 2021
Precautionary approach: zero catch	0	+21	–4	–100
Other scenarios				
TAC = partial uptake of the Monitoring TAC	1540	+21	–5	–68
TAC = Monitoring TAC	4840	+18	–5	0

## Sources and references

ICES. 2020. Herring Assessment Working Group for the Area South of 62°N (HAWG). ICES Scientific Reports, 2:60. 1054 pp. <http://doi.org/10.17895/ices.pub.6105>.

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