

EU request on an interarea flexibility between divisions 8.c and 9.a for horse mackerel

Advice summary

ICES advises that catches of each of the horse mackerel stocks (Southern Horse mackerel - Division 9.a in Atlantic Iberian waters as well as the Western horse mackerel - Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k in the Northeast Atlantic) would be precautionary, providing they do not exceed the catch corresponding to a fishing mortality of $F_{p,05}$ for the respective stocks, and that they follow the ICES advice rule. This means that the interarea flexibility between these stocks should not exceed the difference between the catch corresponding to a fishing mortality of $F_{p,05}$ and the established total allowable catch (TAC). There should be no transfer of TAC to a stock with a spawning–stock biomass (SSB) below B_{lim} .

ICES also advises that while such interarea flexibility would be precautionary, this approach may not achieve the objective of maximum sustainable yield (MSY). Allowing interarea flexibility also means that TAC shares by country (relative stability) are not maintained.

Request

To allow the Commission to consider a proposal for an amendment of the 2018 TAC regulation on the special condition applied to horse mackerel, ICES is requested to analyse any information deemed suited:

(a) to evaluate the impact of an increased interarea flexibility, from 5% to 15%, to facilitate the implementation of the landing obligation, notably whether such an increase would be in line with the precautionary approach.

(b) to evaluate what % of interarea flexibility could be considered to be in line with the precautionary approach, if a negative opinion is given to (a).

Background:

The Horse mackerel (*Trachurus trachurus*) stocks in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k (the Northeast Atlantic) and in Division 9.a (Atlantic Iberian waters) are both classified by ICES as category 1 stock and apply the MSY approach. The TACs for horse mackerel will be set separately for 2018 as follows:

Species:	Horse mackerel <i>Trachurus spp.</i>	Zone:	8c (JAX/08C.)
Spain	14 335 ⁽¹⁾	Analytical TAC	
France	248		
Portugal	1 417 ⁽¹⁾		
Union	16 000		
TAC	16 000		
⁽¹⁾ Special condition: up to 5 % of this quota may be fished in 9 (JAX/*09.).			

Species:	Horse mackerel <i>Trachurus spp.</i>	Zone:	9 (JAX/09.)
Spain	14 373 ⁽¹⁾	Analytical TAC	
Portugal	41 182 ⁽¹⁾	Article 7(2) of this Regulation applies	
Union	55 555		
TAC	55 555		
⁽¹⁾ Special condition: up to 5 % of this quota may be fished in 8c (JAX/*08C.).			

During the Council negotiations on TACs and quotas for 2018 the Commission received a request from Spain, asking for a change to the special condition by increasing the interarea flexibility from 5% to 15%.

Elaboration on the advice

The request for interarea flexibility between divisions 8.c and 9.a for horse mackerel signifies that part of the quota for one stock (either the Southern stock (Division 9.a) or the Western stock (Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k)) would be caught in the area of the other stock. This means that the request for interarea flexibility represents a request for interstock TAC flexibility. In addition, for the Western stock, the interarea flexibility would be limited to Division 8.c. ICES was not able to evaluate the 5% to 15% flexibility, but is able to provide advice on an approach that would allow for interarea flexibility and that would be precautionary. ICES advises that catches not exceeding the level associated with a fishing mortality of $F_{p,05}$ are considered precautionary, and that any transfer of TAC from one stock (donor stock) to another (recipient stock) should therefore not exceed the catch associated with $F_{p,05}$ for the recipient stock. $F_{p,05}$ is an upper F limit that is considered precautionary in the ICES MSY advice rule and that should lead to $SSB \geq B_{lim}$ with a 95% probability.

The interarea flexibility could, therefore, be calculated as tonnage for a given year as the difference between the catch corresponding to $F_{p,05}$ for the recipient stock and the established TAC. If the TAC is set at F_{MSY} , the interarea flexibility will be the difference between the catch corresponding to $F_{p,05}$ and the catch corresponding to F_{MSY} . It should be noted that while catches consistent with the $F_{p,05}$ are considered precautionary, they will not necessarily be consistent with the MSY objective, particularly if quota transfers are consistently in just one direction.

ICES was not requested to examine the impact of interarea flexibility on the relative stability (quota shares by country). Any interarea flexibility has the potential to result in some change in relative stability for the two stocks individually. Given that interarea flexibility may also result in a loss of yield, there could be some reduction in the yield for all countries participating in the fisheries on these stocks.

When SSB in the advice year is below MSY $B_{trigger}$ the interarea flexibility would be calculated based on the reduced $F_{p,05}$, according to the ICES MSY advice rule. There should be no transfer of TAC when the SSB of the recipient stock is below B_{lim} .

For the two stocks concerned, it should be noted that the precautionary reference point F_{pa} (which is defined as a constant F below which exploitation is considered to be precautionary, having accounted for estimation of uncertainty) is lower than the $F_{p,05}$ precautionary criterion. $F_{p,05}$ provides an upper F limit that is considered precautionary for the ICES MSY advice rule or other management plans. It has been established by stochastic Management Strategy Evaluations (MSE) including biological (i.e. recruitment, M, maturity, growth) and fishery (e.g. selectivity) variability and advice error. In contrast to F_{pa} , $F_{p,05}$ is established from a harvest control rule that may have a stock-size dependent F.

Basis of the advice

Background

The two horse mackerel stocks (Southern Horse mackerel - Division 9.a in Atlantic Iberian waters and the Western horse mackerel stock - Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k in the Northeast Atlantic) have separate assessments with different statistical catch-at-age models. The stock distributions do not overlap and their dynamics are very different, with historically diverse catch values that range from 19 000–41 000 tonnes for the Southern stock and 83 000–535 000 tonnes for the Western stock in the period since 1992. SSB in 2017 is estimated to be the highest in the time-series for the Southern stock and the lowest in the time-series for the Western stock of horse mackerel.

Since 2010, a special condition to the EU TAC regulations allowed for a 5% interarea flexibility for Spain and Portugal for horse mackerel between divisions 9.a (Southern stock) and 8.c which is part of the Western stock (EU, 2018). This interarea flexibility has not been evaluated by ICES.

The most appropriate approach to responding to the request would have required a multistock MSE, because the size of the two stocks need to be considered in order to establish a fixed percentage of interarea flexibility that would remain precautionary. A readily available tool to conduct such work for the two horse mackerel stocks was not available. The conditions that would trigger interarea flexibility to be included in a realistic MSE were also unclear. After consultation with the client, an alternative approach was identified in order to respond to the request for interarea flexibility. The approach does not evaluate the specific percentages of flexibility (5% to 15%) indicated in the request, but rather provides a method to determine the amount of quota that can be transferred from one stock to the other while being consistent with the precautionary approach (see ICES, 2018a for further information).

Methods

ICES defines a precautionary F criterion, $F_{p.05}$, estimated by means of stochastic simulation, to determine an upper F limit that is considered precautionary using the ICES MSY advice rule. $F_{p.05}$ is the maximum value of F applied when $SSB > MSY B_{trigger}$ and that will result in $SSB \geq B_{lim}$ with a 95% probability. The derivation of $F_{p.05}$ should include expected stochastic variability of biology and fishery, as well as advice error (ICES, 2017a). Consistent with the ICES advice rule (ICES, 2018b), $F_{p.05}$ is proportionally reduced when $SSB < MSY B_{trigger}$.

The proposed approach defines the maximum TAC (including any interarea flexibility) that can be considered precautionary for an individual stock as the catch corresponding to a fishing mortality of $F_{p.05}$. The difference between the catch corresponding to a fishing mortality of $F_{p.05}$ and the established TAC is the amount of interarea flexibility. In summary, to ensure that the interarea flexibility (transfer of quota from one stock (donor stock) to be taken in the area of the other stock (recipient stock)) between the two stocks is precautionary, the F level on the recipient stock should not exceed the $F_{p.05}$ of the recipient stock.

Allowing any interarea quota flexibility could negatively affect one of the two stocks, if already in an overexploited or depleted situation. This inter-area flexibility should therefore only be applied when, according to the interim year assessment, the SSB of the recipient stock is above B_{lim} . Thus, there should be no transfer of TAC to a recipient stock with $SSB < B_{lim}$.

Results and conclusions

The advised approach for the two stocks is illustrated using the existing reference points and the results from the 2018 assessments. Two opposing scenarios were examined. In the first scenario, the Southern stock is the recipient stock and the Western stock is the donor stock. In the second scenario, the reverse situation is examined with the Western stock being the recipient stock. It should be noted that the interarea flexibility in the EU regulations apply only to the quotas for Spain and Portugal in these areas. Consequently, in the first scenario, only the quotas for Spain and Portugal can be transferred from divisions 8.c to 9.a.

The biological reference points for the Southern and Western horse mackerel stocks were estimated by ICES (2016; 2017b) and ICES (2017c) respectively (Table 1). ICES notes that there is considerable bias in the assessment of the Western horse mackerel stock (Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k) which may affect the validity of current estimates and reference points for this stock. While the $F_{p.05}$ approach is considered valid, it should be noted that the issues of the assessment model may result in the revision of the assessment and reference points for this stock.

Table 1. Biological Reference Points and $F_{p.05}$ precautionary criterion for the horse mackerel stocks.

	Southern stock	Western stock
F_{MSY}	0.11	0.1079
F_{pa}	0.11	0.1079
$F_{p.05}$	0.15	0.1203
MSY $B_{trigger}$	181000 t.	911588 t.
B_{lim}	103000 t.	661917 t.

Table 2. Scenario 1: Predicted maximum interarea flexibility for horse mackerel in Divisions 9.a and 8.c in the advice year 2019 when the southern horse mackerel stock is the recipient stock. The maximal potential TAC with interarea flexibility assumes that the maximum possible would be transferred from the donor stock to the recipient stock. All values in tonnes.

	Southern stock (Recipient)	Western stock (Donor)	
	Entire stock (Division 9.a)	Division 8.c only	Entire stock
F_{MSY} Advice	94017	19850	145237
+ 5% flexibility of 8.c	95009 (94017+ 5% of 19850)	18858 (19850 - 5% of 19850)	144245 (145237- 5% of 19850)
+ 15% flexibility of 8.c	96994 (94017+ 15% of 19850)	16873 (19850 - 15% of 19850)	142260 (145237- 15% of 19850)
Catch corresponding to $F_{p.05}$	133715		
Interarea flexibility (difference between $F_{p.05}$ and F_{MSY} advice)	39698 (133715–94017)		
$SSB_{2019} \geq MSY B_{trigger}$	yes		
$SSB_{2019} > B_{lim}$	yes		
Maximum possible added	19542		
Maximal potential TAC with interarea flexibility	113559 (94017+19542)	308 (quota for France)*	125695 (145237 - 19542)

* Assuming the same country shares as in 2018.

In scenario 1, the $F_{p.05}$ for the Southern stock is substantially higher than the F_{MSY} and this implies an interarea flexibility of an additional 39 698 t that could be taken from the Southern stock and still be precautionary. However, since the interarea flexibility is between divisions 8.c and 9.a, there is only 19542 t (the quotas for Portugal and Spain in 8.c) that can be transferred to 9.a. Under this scenario, the TAC in 8.c would be reduced to 308 as only the quota for France would remain.

In scenario 2, the $F_{p.05}$ for the Western stock is slightly higher than the F_{MSY} and this implies that an additional 15 636 t could be taken from the entire Western stock. This extra catch could be entirely taken in division 8.c without exceeding $F_{p.05}$ for the Western stock as a whole. Under this scenario, 15 636 or 17% of the advised catch of 9.a would be added to the TAC of Division 8.c. While a transfer of 15 636 tonnes from 9.a to 8.c would be precautionary when considering the Western stock as a whole, it may result in a temporary local depletion of horse mackerel in 8.c. To reduce the risk of local depletion, managers could decide to limit transfers to 8.c.

Table 3. Scenario 2: Predicted maximum interarea flexibility for horse mackerel in Divisions 9.a and 8.c in the advice year 2019 when the Western horse mackerel stock is the recipient stock. The maximal potential TAC with interarea flexibility assumes that the maximum possible would be transferred from the donor stock to the recipient stock. All values in tonnes.

	Southern stock (Donor)	Western stock (Recipient)	
	Entire stock (Division 9.a)	Division 8.c only	Entire stock
F_{MSY} Advice	94017	19850	145237
+ 5% flexibility of 9.a	89316 (94017- 5% of 94017)	24551 (19850 + 5% of 94017)	149938 (145237 + 5% of 94017)
+ 15% flexibility of 9.a	79914 (94017- 15% of 94017)	33953 (19850 + 15% of 94017)	159340 (145237 + 15% of 94017)
Catch corresponding to $F_{p,0.05}$			160872
Interarea flexibility (difference between $F_{p,0.05}$ and F_{MSY} advice)		15635 (160872 -145237)	15635 (160872 -145237)
$SSB_{2019} \geq MSY B_{trigger}$			yes
$SSB_{2019} > B_{lim}$			yes
Maximum possible added catches from 9.a		15635	15635
Maximal potential TAC with interarea flexibility	78382 (94017-15635)	35485 (19850+15635)	160872 (145237+15635)

This interarea flexibility will vary from year to year depending on the status of the individual stocks. The current 5% interarea flexibility may not be precautionary for one or both of these horse mackerel stocks in a given year. For example, this would occur in the cases where the recipient stock is below B_{lim} .

Sources and references

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