

EU request to ICES on additional elements concerning the ICES advice evaluating long-term management strategies for Norway pout in Subarea 4 and Division 3.a

Service summary

ICES has evaluated additional harvest control rules (HCRs) within the escapement strategy presently used for Norway pout, with additional lower (TAC_{min}) and upper (TAC_{max}) bounds on TAC and use of an upper fishing mortality (F_{cap}) at 0.7.

Several HCRs were identified that combined TAC_{min} in the range of 20 000–40 000 tonnes and TAC_{max} less than or equal to 200 000 tonnes, resulting in no more than a 5% probability of the spawning-stock biomass falling below B_{lim} . Increasing the F_{cap} from 0.4 (which was previously evaluated) to 0.7 results in a higher median and mean TAC, but also in a higher long-term probability of SSB falling below B_{lim} . It also results in a higher probability of being constrained by the TAC_{max} .

Given that Norway pout is short-lived and that the HCR scenarios are based on the escapement strategy, the application of an additional interannual quota flexibility of $\pm 10\%$ is not considered precautionary.

Request

Request from the European Commission

ICES on 29 May 2018 released its advice evaluating long-term management strategies for Norway pout in area 4 and 3a (http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/Special_requests/eu-no.2018.07.pdf). In recent consultations between EU and Norway, held on 5 and 6 September 2018, the advice was presented by ICES and in the following discussions, certain limited additional elements, to be reviewed by ICES, came up.

Request

ICES is requested to assess, following MSY Bescapement:

1. which scenarios of TAC_{min} and TAC_{max} would be precautionary, if the F_{cap} is set at 0.7 (building on request part 2 and 3, pages 3 and 4 of the advice).
2. which scenarios of TAC_{min} and TAC_{max} would be precautionary, if an inter-annual flexibility of $\pm 10\%$ (both banking and borrowing) was introduced for Norway pout (building on request part 2 and 3, pages 3 and 4 of the advice, plus including precautionary scenarios with an F_{cap} of 0.7 – following from paragraph 1 of this request).

Elaboration on the service

ICES has evaluated harvest control rules (HCRs) within the escapement strategy presently used (aimed at retaining a minimum stock size in the sea every year after fishing) that are restricted by a combination of TAC lower bounds (TAC_{min}) and upper bounds (TAC_{max}). An upper limit on forecast F (F_{cap} set at 0.7 as requested) is also used.

As for the scenario made for ICES May 2018 advice (ICES, 2018), ICES evaluations were conditioned by a maximum realized level of fishing mortality the fishery can exert (assumed at 0.89; $F_{historical}$), which means that the full TAC will not be taken if the required F to catch the TAC exceeds this value.

Request part 1

ICES has evaluated harvest control rules (HCRs) within the presently used escapement strategies, bounded by a combination of TAC_{min} (at either 20 000 or 30 000 tonnes) and TAC_{max} (at 150 000 or 200 000 tonnes). For the results presented in Table 1, $B_{escapement}$ at 39 450 tonnes (B_{lim}) was applied; a higher $B_{escapement}$ at 65 000 tonnes was applied for the results presented in Table

2. Tables 1 and 2 summarize the long-term (2023–2037) performance metrics for the (precautionary) combinations that result in no more than 5% probability of SSB falling below B_{lim} in the period 2023–2037. More detailed statistics for both precautionary and non-precautionary HCRs are shown in Table 3.

Table 1 Long-term summary statistics for precautionary request part 1 HCRs with application of TAC_{min} , TAC_{max} , F_{cap} at 0.7, and with $B_{escapement}$ at 39 450 tonnes (scenarios a, b, and c) and scenarios with an F_{cap} at 0.4 (scenarios 14, 21, 16, 23).

Scenario *	F_{cap}	TAC_{min} (tonnes)	TAC_{max} (tonnes)	Long-term $P(SSB < B_{lim})$ (%)	TAC median (tonnes)	TAC mean (tonnes)	TAC change (tonnes)	At $F_{historical}$ (%)	At TAC_{min} (%)	At TAC_{max} (%)
New scenarios										
a	0.7	20000	150000	3.68	119378	98156	44676	7.7	20.8	41.7
b	0.7	30000	150000	4.86	117909	99786	41725	8.2	24.7	41.3
c	0.7	20000	200000	3.85	115288	113620	63088	12.9	21.4	27.9
Scenarios 14, 21, 16, and 23 from ICES May 2018 advice (ICES, 2018)										
14	0.4	20000	150000	3.55	89742	87686	42865	2.2	20.1	23.4
21	0.4	30000	150000	4.55	89236	89391	40005	2.7	23.8	23.2
16	0.4	20000	200000	3.61	88465	95345	54578	3.1	20.4	12.4
23	0.4	30000	200000	4.67	88057	97107	51715	3.6	24.2	12.3

* See Table 3.

Table 2 Long-term summary statistics for precautionary request part 1 HCRs with application of TAC_{min} , TAC_{max} , F_{cap} at 0.7, and with a $B_{escapement}$ at 65 000 tonnes (Scenario e) and with an F_{cap} at 0.4 (Scenario 31).

Scenario *	F_{cap}	TAC_{min} (tonnes)	TAC_{max} (tonnes)	Long-term $P(SSB < B_{lim})$ (%)	TAC median (tonnes)	TAC mean (tonnes)	TAC change (tonnes)	At $F_{historical}$ (%)	At TAC_{min} (%)	At TAC_{max} (%)
New scenarios										
e	0.7	40000	150000	4.99	45575	83453	38583	4.3	48.6	29.6
Scenario 31 from ICES May 2018 advice (ICES, 2018)										
31	0.4	40000	150000	4.95	46387	80923	37221	3.0	48.4	22.4

* See Table 3.

For the scenarios using $B_{escapement}$ at 39 450 tonnes (Table 1) the requested new scenarios, with F_{cap} at 0.7 (scenarios a, b, and c), result in a higher median and mean TAC, but also in a higher long-term probability of SSB falling below B_{lim} , compared with scenarios from ICES May 2018 advice where F_{cap} at 0.4 is used. $F_{historical}$ is reached in 8–13% of the years for scenarios a, b, and c, which makes the results sensitive to the assumption that the fishery stops catching Norway pout when F exceeds $F_{historical}$. Therefore, the HCR should be re-evaluated if future F exceeds $F_{historical}$ (0.89).

When using $B_{escapement}$ at 65 000 tonnes (Table 2), the performance statistics for the scenarios using F_{cap} at 0.7 or F_{cap} at 0.4 are similar. There is, however, a higher mean TAC and risk to B_{lim} when the high value of F_{cap} is applied.

Request part 2

ICES has not made a quantitative evaluation of the effect of an interannual quota flexibility of $\pm 10\%$ (both banking and borrowing) applied for the requested scenarios.

HCR evaluations for long-lived species made by ICES often show that an interannual flexibility of $\pm 10\%$ does not affect the performance of a harvest control rule much. For a short-lived species like Norway pout, the natural mortality is much higher (0.29–0.44 per quarter) than for long-lived species that have a natural mortality of around 0.05 per quarter. The higher natural mortality for short-lived species means that the Norway pout that escape the fishery will die due to natural causes and contribute less to the fishery the following year than would be the case for long-lived fish. Therefore, “banking” will not increase the stock size of short-lived fish as much as for long-lived fish species.

The requested HCR scenarios are all based on the escapement strategy, with additional bounds on TAC and F. This means that in some scenario years the stock is fished down to an absolute minimum, constrained by the probability of less than 5% of being below B_{lim} . For such years, “borrowing” quotas (increase catches) would imply a considerable increase in the probability of SSB falling below B_{lim} .

Given that Norway pout is short-lived with a high natural mortality for all ages, and given that the HCR scenarios are based on the escapement strategy, the application of an additional interannual quota flexibility of $\pm 10\%$ is not considered precautionary.

Basis of the service

The present technical service provides evaluation of additional HCR scenarios to the advice provided in May 2018 (ICES, 2018), using the same methodology.

The performance statistics from all the additional evaluated HCRs are presented in Table 3. The results of the simulations should be used for comparison between scenarios and not as forecasts of absolute quantities.

Table 3 Summary statistics for HCR scenarios for the request. Shaded scenarios have more than 5% probability of SSB being below B_{lim} in the long term and are not considered precautionary.

Scenario	$B_{escapement}$ (tonnes)	F_{cap} (per year)	TAC_{min} (tonnes)	TAC_{max} (tonnes)	SSB (tonnes)	Short term $P(SSB < B_{lim})$ (%)	Long- term $P(SSB < B_{lim})$ (%)	F_{bar} (per year)	At $F_{historical}$ (%)	TAC median (tonnes)	TAC mean (tonnes)	TAC change (tonnes)	At TAC_{min} (%)	At TAC_{max} %
a	39450	0.7	20000	150000	116604	3.0	3.68	0.366	7.7	119378	98156	44676	0	0
b	39450	0.7	30000	150000	115199	3.8	4.86	0.390	8.2	117909	99786	41725	0	46.5
c	39450	0.7	20000	200000	110714	3.4	3.85	0.423	12.9	115288	113620	63088	0	36.9
d	39450	0.7	30000	200000	109695	4.0	5.04	0.444	13.5	113763	115127	59851	20.8	46
e	65000	0.7	40000	150000	127368	3.7	4.99	0.307	4.3	45575	83453	38583	21.7	36.4
f	65000	0.7	40000	200000	123224	3.8	5.03	0.331	6.9	41901	94884	53853	24.6	45.7

Sources and references

ICES. 2018. EU/Norway request to ICES on evaluation of long-term management strategies for Norway pout in ICES Subarea 4 (North Sea) and Division 3.a (Skagerrak–Kattegat). ICES Special Request Advice, Greater North Sea Ecoregion, sr.2018.07. 12 pp. Published 29 May 2018. <https://doi.org/10.17895/ices.pub.4374>.