

## EU standing request on catch scenarios for zero-TAC stocks: cod (*Gadus morhua*) in Subdivision 21 (Kattegat)

### Service summary

There is no targeted cod fishery in the Kattegat at present. Cod is mainly taken as bycatch in the Norway lobster fishery, hence the fishing mortality on the cod stock is closely linked to effort directed to Norway lobster. It is not possible to forecast short-term stock development. Catches and SSB have been declining in recent years, while mortality has increased. The 2021 catches of 50 tonnes are the lowest in the time-series.

Since cod are bycaught in mixed fisheries, it is likely that a specific monitoring TAC would not be required for this stock.

### Request

EU DGMARE has asked 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

This technical service has been produced based on ICES data sources. The main information used is the category 3 assessment (ICES, 2022) and data on the catch composition by métier. Because cod in this area does not have a full analytical assessment, it is not possible to provide an accurate forecast on short-term stock development.

### Results

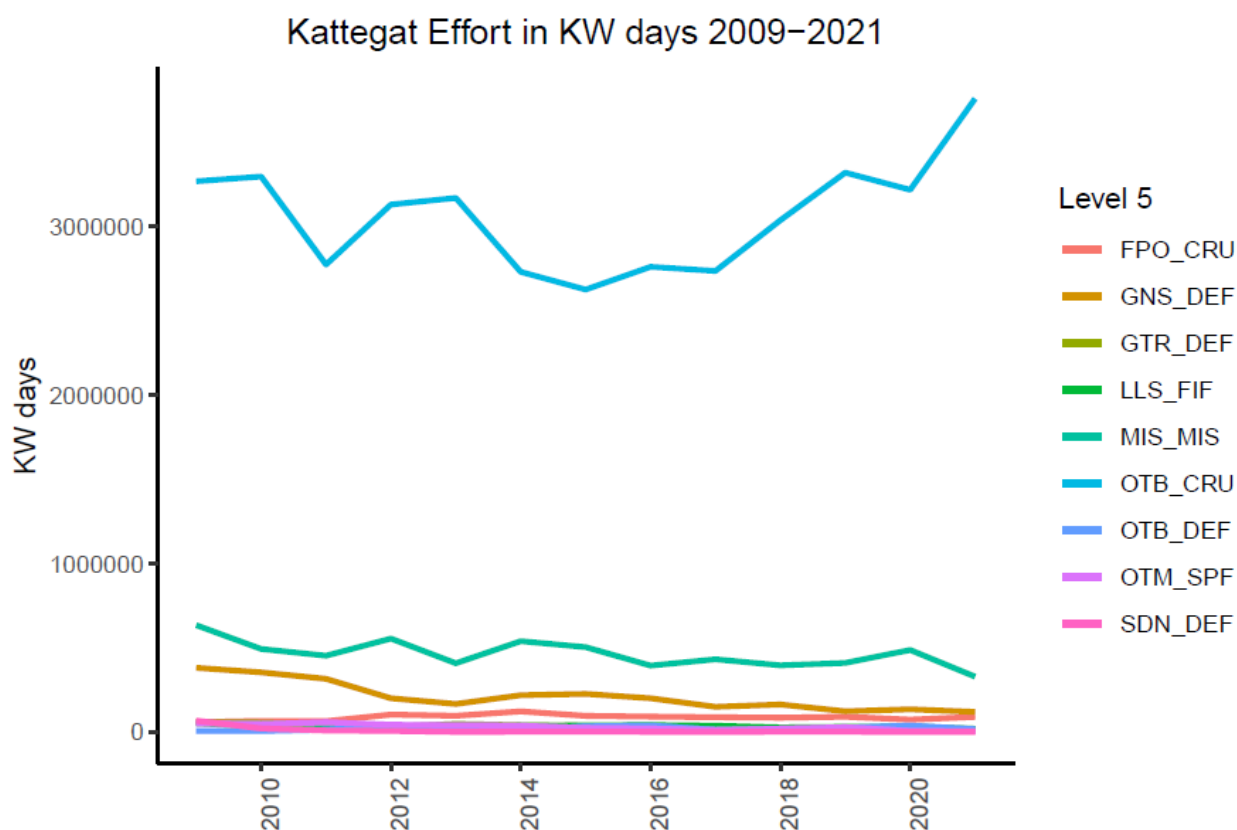
#### Cod in Subdivision 21

Cod is mainly caught in three métiers (EU Data Collection Framework [DCF] level 5) operating in the Kattegat (Table 1). Over the 12-year period 2009–2021, the majority of cod catches (~92%) were taken by bottom trawls targeting crustaceans (OTB\_CRU). There were also some catches of cod (5%) in gillnets targeting demersal fish (GNS\_DEF). Minor catches of cod (1%) were taken by trawlers targeting demersal fish (OTB\_DEF). The percentage of cod in the total catches of all species for a specific métier is generally low ( $\leq 7\%$ ; Table 1), indicating there is no targeted cod fishery in the Kattegat at present. Since the majority of cod is taken as bycatch in the Norway lobster fishery, the fishing mortality of the cod stock is closely linked to effort in the Norway lobster fishery. The removal of the effort system in 2016, together with the loss of fishing opportunities for cod in the Baltic Sea, has increased the effort in the Norway lobster fishery over the last years (Figure 1).

The uptake of the TAC for Norway lobster was 61% in 2021, allowing for a further increase in the effort of the trawl fishery targeting it. Selective gears have been in place for fisheries targeting Norway lobster, such as the Swedish sorting grid that has a bycatch of less than 1.5% cod by weight. This sorting grid has formerly been used extensively by Swedish fishers; after the introduction of the landing obligation (and the removal of effort limits in the cod long-term management plan), however, there are no incentives to continue using the sorting grid and the uptake of the gear has decreased since 2016.

**Table 1** Summary of species mixing with cod in the catches in Kattegat from 2009 to 2021, covering ICES Subdivision 27.21.

Métier (level 5)	Cod catches (tonnes)	Percentage of total cod catches (%)	Total catches (tonnes)	Cod percentage of total catches (%)
OTB_DEF	45.61	1.06	668.28	6.82
GTR_DEF	30.73	0.71	653.83	4.70
GNS_DEF	218.93	5.09	5266.27	4.16
OTB_CRU	3935.63	91.47	108644.07	3.62
SDN_DEF	22.64	0.53	603.03	3.75
LLS_FIF	11.68	0.27	414.00	2.82
FPO_CRU	0.11	0.00	395.14	0.03
MIS_MIS	36.91	0.86	152176.00	0.02
OTB_SPF	0.20	0.00	18473.60	0.00



**Figure 1** Total effort (KW days) over the complete time-series (2009–2021) for level 5 métiers operating in Kattegat.

ICES advice for the majority of the species caught within the OTB\_CRU métier allows for an increase in fishing mortality (Table 2). The advised increase in the *Nephrops* harvest rate and catches could result in an increase in effort in the OTB\_CRU métier, with an associated increase in fishing mortality on cod.

**Table 2** TAC area, stock codes, fishing mortality (F) for 2022 and advised F for 2023, and the % change in ICES catch advice for 2023.

Species	Corresponding EC TAC area	ICES stock code	F 2022	Advised F 2023	% advice change*
Cod ( <i>Gadus morhua</i> )	Subdivision 21	cod.27.21	NA	0	0
Norway lobster ( <i>Nephrops norvegicus</i> )	Division 3.a	nep.fu.3–4	5,1%**	7.9%***	–16.5
Sole ( <i>Solea solea</i> )	Subdivisions 20–24	sol.27.20–24	0.195	0.178–0.244	–30, –25.7
Whiting ( <i>Merlangius merlangius</i> )	Division 3.a	whg.27.3a	NA	NA	–27^
Plaice ( <i>Pleuronectes platessa</i> )	Subdivisions 21–23	ple.27.21–23	0.268	0.31	+35
Haddock ( <i>Melanogrammus aeglefinus</i> )	Subarea 4, Division 6.a, Subdivision 20	had.27.46a20	0.111	0.24	+6.5

\* Advice value 2023 relative to the advice value 2022.

\*\* Harvest rate 2021.

\*\*\* Harvest rate 2023.

^ Advice value 2023 relative to the advice value 2022.

## Sources and references

ICES. 2022. Cod (*Gadus morhua*) in Subdivision 21 (Kattegat). In Report of the ICES Advisory Committee, 2022. ICES Advice 2022, cod.27.21. <https://doi.org/10.17895/ices.advice.1944786>

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