

Cod in Division 3M

Advice June 2013 for 2014

Recommendation for 2014

In the short term the stock can sustain values of F up to F_{max} , however any fishing mortality over F_{max} will result in an overall loss in yield in the long term. Scientific Council considers that yields at $F_{statusquo}$ are not a viable option. Projections are heavily influenced by the 2010 year class, which is estimated to be extremely large, but with high uncertainty. Given the uncertainty in the projections, Scientific Council makes these recommendations for 2014 only, and does not advise using the 2015 results as a basis for management decisions. The stock should be reassessed in 2014.

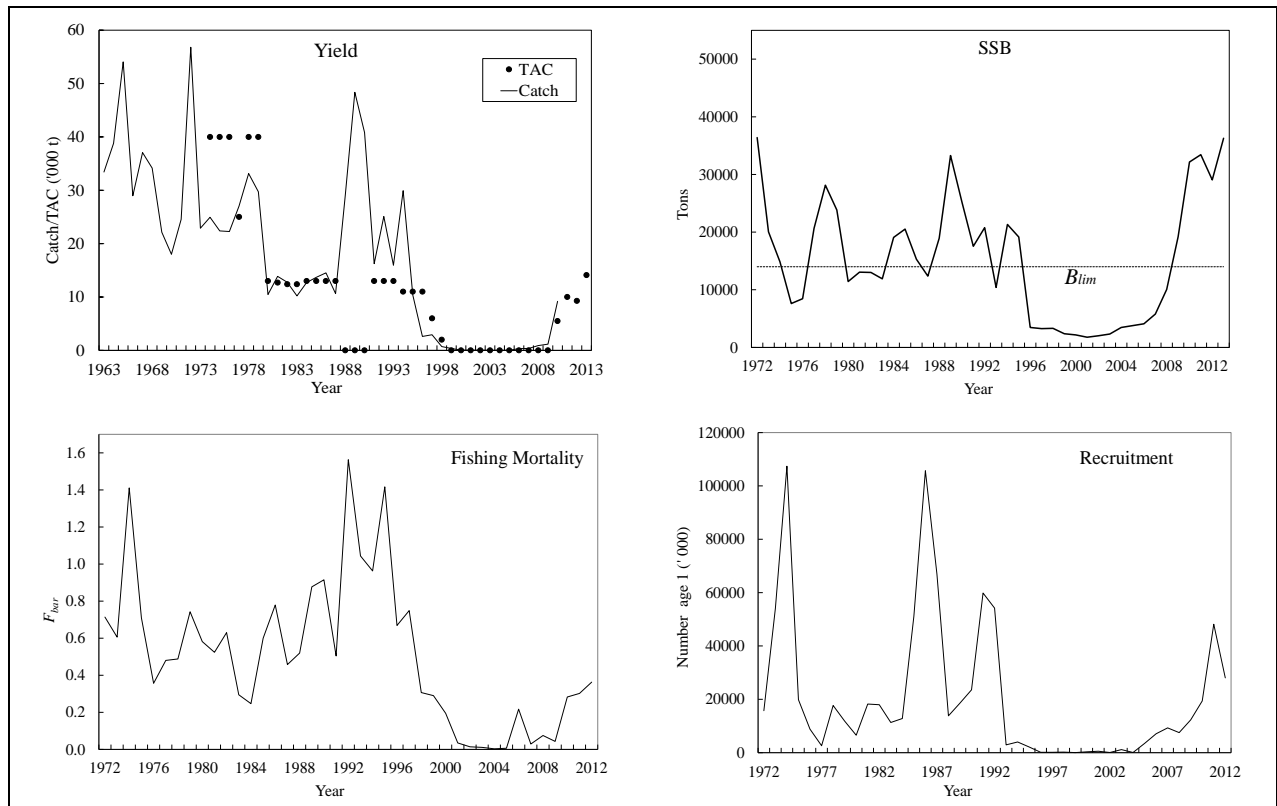
Management objectives

No explicit management plan or management objectives defined by Fisheries Commission. General convention objectives (GC Doc. 08/3) are applied.

Convention objectives	Status	Comment/consideration	
Restore to or maintain at B_{msy}		B_{msy} unknown, stock increasing	OK
Eliminate overfishing		Current F not sustainable in the long term	Intermediate
Apply Precautionary Approach		Only B_{lim} is defined	Not accomplished
Minimise harmful impacts on living marine resources and ecosystems		VME closures in effect, no specific measures.	Unknown
Preserve marine biodiversity		Cannot be evaluated	

Management unit

The cod stock in Flemish Cap is considered to be a separate population.



Stock status

Current SSB is estimated to be well above B_{lim} . Recent recruitments are among the highest level of the time series, but these estimates are imprecise. Fishing mortality in 2012 is high, at the level of more than twice F_{max} .

Reference points

B_{lim} : 14 000 t of spawning biomass (STACFIS 2008).

Projections

	Total biomass (B)			Spawning Stock Biomass (SSB)			Yield (t)		
	5%	50%	95%	5%	50%	95%	5%	50%	95%
Fishing mortality (F)= $F_{0.1}$ (median=0.085)									
2013	56681	84139	123214	23218	36274	53972	14113		
2014	73341	116604	180008	36290	61946	98400	5253	9142	14787
2015	108560	171317	265541	60070	100614	165438	14727	23626	37698
Fishing mortality (F)= F_{max} (median=0.140)									
2013	56319	84086	122757	23168	36277	54027	14113		
2014	73277	116617	178999	36528	62032	98464	8536	14521	23305
2015	104107	164311	256187	56909	94836	157739	21218	33518	52688
Fishing mortality (F)= F_{2012} (median=0.363)									
2013	56621	84208	123004	23183	36460	54255	14113		
2014	73787	116640	179196	36862	61824	98655	21512	32470	52390
2015	85144	142867	227577	40818	75177	131648	31367	49436	77229
Catch=TAC ₂₀₁₃									
	Total Biomass			SSB			F		
	5%	50%	95%	5%	50%	95%	5%	50%	95%
2013	56613	84078	122899	23190	36230	54366	0.1201	0.1913	0.3043
2014	73466	116513	178478	36807	62157	97733	0.0830	0.1337	0.2285
2015	98745	165579	262320	51811	95533	164692	0.0450	0.0787	0.1480

	Yield (t)			P($B < B_{lim}$)			P($F > F_{0.1}$)			P($F > F_{max}$)			P($B_{15} < B_{12}$)
	2013	2014	2015	2013	2014	2015	2013	2014	2015	2013	2013	2015	
$F_{0.1}$	14113	9142	15640	<5%	<5%	<5%							<5%
F_{max}	14113	14521	23494	<5%	<5%	<5%							<5%
F_{2012}	14113	32470	41778	<5%	<5%	<5%	>95%	>95%	>95%	85.58%	>95%	>95%	<5%
Catch=TAC ₂₀₁₃	14113	14113	14113	<5%	<5%	<5%	>95%	92.90%	43.80%	85.60%	46.40%	7.30%	<5%

Assessment

A quantitative model introduced in 2008 was used (STACFIS 2008). Model settings were in general kept unchanged and the results are consistent with the previous assessments. Due to problems of estimating exact catches for 2011 and 2012, catches for those years were entered as a probability distribution reflecting “best expert estimate” and the uncertainty associated. The use of imprecise catch estimates for the recent two years introduces additional element of uncertainty in the assessment. Without improved estimates of catch this assessment method will be discontinued in 2014.

The next full assessment is planned for 2014.

Human impact

Mainly fishery related mortality. Other sources (e.g. pollution, shipping, oil-industry) are undocumented.

Biological and environmental interactions

Redfish and shrimp are important prey items for cod. Recent studies indicate important trophic interactions between these species in the Flemish Cap. Changes in maturity of cohorts in the late 1990s - early 2000s may be a response to increased feeding opportunities, water temperature and density dependent changes in growth rate.

Fishery

Cod is caught in a directed trawl fishery and as bycatch in other trawl fisheries, mainly the redfish fishery. The fishery is regulated by quota.

Recent catch estimates and TACs are:

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
TAC	ndf	ndf	ndf	ndf	ndf	ndf	5.5	10	9.3	14.1
STATLANT 21	0.0	0.0	0.1	0.1	0.4	1.2	5.3	9.8	9.0	
STACFIS	0.0	0.0	0.3	0.3	0.9	1.2	9.2	13.6 ¹	13.7 ¹	

ndf = no directed fishery

Effects of the fishery on the ecosystem

No specific information available. General impacts of fishing gear on the ecosystem should be considered.

Special comments

In 2012 the lack of length distributions and age-length keys from some contracting parties has further increased uncertainty in the current assessment.

Sources of information

SCR Doc. 13/13, 13/41, 13/50; SCS Doc. 13/05, 13/07, 13/09, 13/15, 13/16, GC Doc. 08/3