American plaice in Divisions 3LNO Advice June 2014 for 2015-16

Recommendation for 2015-2016
SSB remains below B_{lim}, therefore Scientific Council recommends that, in accordance with the rebuilding plan, there should be no directed fishing on American plaice in Div. 3LNO in 2015 and 2016. Bycatches of American plaice should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.

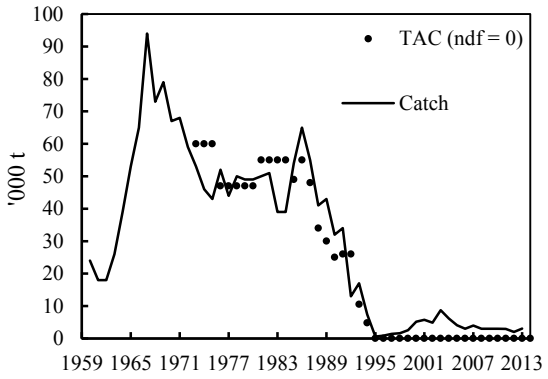
Management objectives
In 2010 FC adopted an "Interim 3LNO American Plaice Conservation Plan and Rebuilding Strategy" (FC Doc. 10/13). There is a Harvest Control Rule (HCR) in place for this stock.

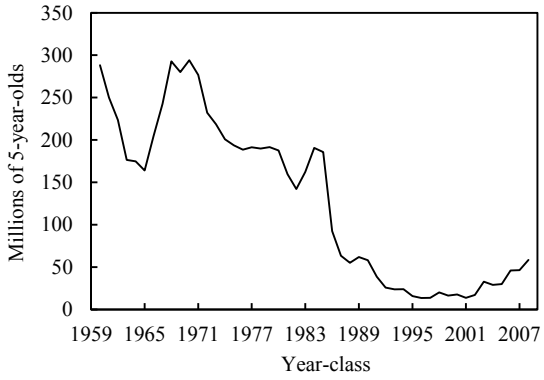
Convention objectives	*Status*	*Comment/consideration*
Restore to or maintain at B_{msy}	🔴	B<B_{lim}
Eliminate overfishing	🟡	No directed fishery, current bycatches are delaying recovery
Apply Precautionary Approach	🟢	Reference points defined
Minimise harmful impacts on living marine resources and ecosystems	🟡	VME closures in effect, no specific measures.
Preserve marine biodiversity	⚪	Cannot be evaluated

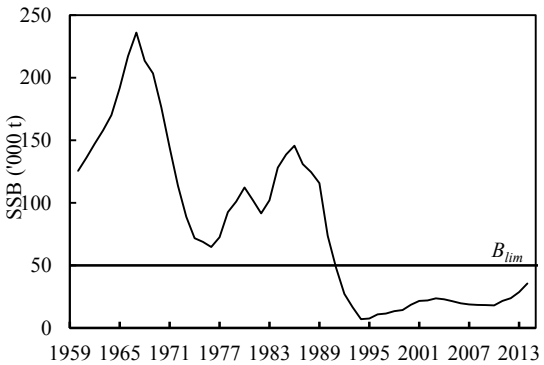
🟢 OK
🟡 Intermediate
🔴 Not accomplished
⚪ Unknown

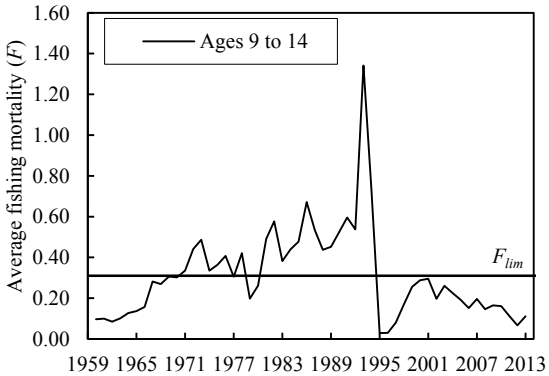
Management unit
American plaice in Div. 3LNO is considered a separate stock.

Stock status
The stock remains low compared to historic levels and, although SSB is increasing, it is still estimated to be below B_{lim}. Although estimated recruitment at age 5 has been higher from 2004-2009 than from 1995-2003, recruitment has been low since the late 1980s.









Reference points

B_{lim}: 50 000 t of spawning biomass (Scientific Council Report, 2003)
B_{msy}: 242 000 t of spawning biomass (Scientific Council Report 2011)
F_{lim}: 0.31 (Scientific Council Report, 2011)

Projections

	***F* = 0**		
	SSB ('000 t)		
	$p10$	p_{50}	p_{90}
2014	31	34	38
2015	39	44	48
2016	47	53	60
2017	54	62	71

	F_{2013} **= 0.1**						
	SSB ('000 t)				Yield ('000 t)		
	p_{10}	p_{50}	p_{90}		p_{10}	p_{50}	p_{90}
2014	31	34	38		3.5	3.9	4.3
2015	36	40	44		4.0	4.5	5.0
2016	40	45	51		4.2	4.7	5.5
2017	41	47	55				

	Yield			P(SSB>B_{lim})			$p_{(SSB2017 > SSB2014)}$
Fishing Mortality	2014	2016	2017	2015	2016	2017	
$F = 0$	-	-	-	0.05	0.76	0.95	1.00
$F_{2013} = 0.13$	3910	4456	4732	<0.05	0.13	0.30	1.00

Under no removals, spawning stock biomass is projected to increase, with p(SSB>B_{lim}) in 2017 of >0.95. SSB was projected to have a probability of 0.30 of being greater than B_{lim} by the start of 2017 when $F = F_{2013}$ (0.10). Current fishing mortality is delaying the recovery of this stock.

Assessment

An analytical assessment using the ADAPTive framework tuned to the Canadian spring, Canadian autumn and the EU-Spain Div. 3NO survey was used. A virtual population analysis (VPA) was conducted based on the 2011 assessment formulation, with updated data.

The next full assessment is planned for 2016.

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

Biological and environmental interactions
Capelin and sandlance as well as other fish and invertebrates are important prey items for American plaice. There has been a decrease in age at 50% maturity over time, possibly brought about by some interaction between fishing pressure and environmental/ecosystem changes during that period.

Fishery

American plaice in recent years is caught as bycatch mainly in otter trawl fisheries of yellowtail flounder, skate, Greenland halibut and redfish. The stock has been under moratorium since 1995. To estimate catch for 2011-2013 for Div. 3N information on effort from NAFO observers and logbook data was used where possible with the assumption that CPUE has not changed substantially from 2010. To estimate catch the ratio of effort in year y+1 to year y was multiplied by the estimated catch in year y to produce catch in year y+1. For example for 2011 this was $Catch_{2011} = (Effort_{2011}/Effort_{2010})*Catch_{2010.}$ Effort for 2013 was considered provisional so this catch estimate could change if revised. This method is unlikely to be useful in future as CPUE is likely to change as the plaice population increases and as other fishing opportunities change.

Recent catch estimates and TACs are:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
TAC	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf	ndf
STATLANT 21	2.4	0.9	1.5	1.9	1.8	1.5	1.2	1.3	2.1	
STACFIS	4.1	2.8	3.6	2.5	3.0	2.9	2.9[1]	3.0[1]	3.1[1]	

ndf - no directed fishing.
[1] Catch was estimated using fishing effort ratio.

Effects of the fishery on the ecosystem

Not applicable, no directed fishery.

Special comments

Total catch was estimated for 2011-13 using an assumption about constant CPUE which is unlikely to hold in the future, and may not be useful in future years.

Sources of information

SCS Doc. 14/6, 10, 11, 13, 14; SCR Doc. 14/5, 12, 31, 34