20 Georges Bank yellowtail flounder

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This assessment of the Georges Bank yellowtail flounder (Limanda ferruginea) stock was reviewed during the July 2017 TRAC meeting (Legault and McCurdy 2017, TRAC 2017). It is an operational assessment of the existing 2016 update assessment (Legault and Busawon 2016). Based on the previous TRAC assessment the stock status was unknown, but stock condition was poor. However, NMFS determined that the status of Georges Bank yellowtail flounder will remain overfished with overfishing ocurring based on the 2013 assessment update for this stock (TRAC 2013). This 2017 assessment updates commercial fishery catch data through 2016 (Table 56, Figure 96) and updates research survey indices of abundance and the empirical approach assessment through 2017 (Figure 97). No stock projections can be computed using the empirical approach.

State of Stock: Based on this updated assessment, Georges Bank yellowtail flounder (*Limanda ferruginea*) stock status is recommended to be unknown due to a lack of biological reference points associated with the empirical approach (Table 57), but stock condition is poor. Retrospective adjustments were not made to the model results. The average survey biomass in 2017 (the arithmetic average of the 2017 DFO, 2017 NEFSC spring, and 2016 NEFSC fall surveys) was estimated to be 3,118 (mt) (Figure 94). The 2016 exploitation rate (2016 catch divided by 2016 average survey biomass) was estimated to be 0.009 (Figure 95).

Table 56: Catch and model results table for Georges Bank yellowtail flounder. All weights are in (mt). The average survey biomass in year y is the arithmetic average of the year y DFO, year y NEFSC spring, and year y-1 NEFSC fall surveys. The exploitation rate is the catch divided by the average survey biomass. Model results are from the current updated empirical approach assessment.

	2010	2011	2012	2013	2014	2015	2016
			Data				
US landings	654	904	443	130	70	63	26
US discards	289	192	188	49	74	41	7
Canadian landings	17	22	46	1	1	3	1
Canadian discards	210	53	48	39	14	11	10
Other catch	0	0	0	0	0	0	0
Catch for Assessment	1,170	1,171	725	218	159	118	44
			Model Results				
Average Survey Biomass	60,565	23,262	31,559	15,404	7,015	7,064	4,997
Exploitation Rate	0.019	0.05	0.023	0.014	0.023	0.017	0.009

Table 57: Comparison of reference points estimated in an earlier assessment and from the current assessment update. But note that status based on NMFS determination remains overfished with overfishing ocurring.

	2016	2017
F_{MSY} *proxy*	NA	NA
SSB_{MSY} (mt)	NA	NA
MSY (mt)	NA	NA
Overfishing	Unknown	Unknown
Overfished	Unknown	Unknown

Projections: Short term projections cannot be computed using the empirical approach. Application of an exploitation rate of 2% to 6% to the 2017 average survey biomass (3,118 mt) results in catch advice for 2018 of 62 mt to 187 mt. This was the recommendation of the TRAC external reviewers and science members. The NEFMC SSC recommended the ABC should not exceed 300 mt, an amount of catch equivalent to a 10% exploitation rate. The TMGC will meet September 5-8, 2017 to negotiate the 2018 quota for Georges Bank yellowtail flounder.

Special Comments:

- What are the most important sources of uncertainty in this stock assessment? Explain, and describe qualitatively how they affect the assessment results (such as estimates of biomass, F, recruitment, and population projections).

  The largest source of uncertainty is the appropriate exploitation rate to apply to this stock, which has seen continued decline in survey biomass despite low exploitation rates.

- Does this assessment model have a retrospective pattern? If so, is the pattern minor, or major? (A major retrospective pattern occurs when the adjusted SSB or F_{Full} lies outside of the approximate joint confidence region for SSB and F_{Full}).

  The model used to assess this stock does not allow estimation of a retrospective pattern.

- Based on this stock assessment, are population projections well determined or uncertain? If this stock is in a rebuilding plan, how do the projections compare to the rebuilding schedule?

  Population projections for Georges Bank yellowtail flounder are not computed. Catch advice is derived from applying an exploitation rate to the current estimate of survey biomass. The survey indices continue to decline, indicating the stock is not rebuilding.

- Describe any changes that were made to the current stock assessment, beyond incorporating additional years of data and the effect these changes had on the assessment and stock status.

  Based on a TRAC intersessional meeting, the survey catchability for all three surveys was changed from 0.37 (a literature value) to 0.31 based on experimental results for this stock and the NEFSC survey net. The area of a tow was changed to use wing width instead of door width based on a separate experiment conducted using the NEFSC survey net. Under these changes average survey biomass is approximately three times higher, but the trend does not change.

- If the stock status has changed a lot since the previous assessment, explain why this occurred.

  The stock status of Georges Bank yellowtail flounder remains unknown and stock condition continues to be poor.

- Provide qualitative statements describing the condition of the stock that relate to stock status.

  All three surveys for Georges Bank yellowtail flounder are at (DFO and NEFSC spring) or near (NEFSC fall) time series low values and show truncated age structure. The declining trend in average survey biomass to low levels, despite reductions in catch to historical low amounts, indicates a poor state of the resource. Recent catch is low relative to the biomass estimated from the surveys but catch curve analyses indicate high total mortality rates (Z above 1 for most years). Recent recruitment has generally been below average, survey recruits per biomass indicate low reproductive success recently, and condition (weight at length) has been poor recently. The TRAC concluded stock biomass is low and productivity is poor.

- Indicate what data or studies are currently lacking and which would be needed most to improve this stock assessment in the future.

  The Georges Bank yellowtail flounder assessment could be improved with studies on appropriate exploitation rates or control rules for stocks that are not recovering despite low catches.

- Are there other important issues?

  None.

20.1 Reviewer Comments: Georges Bank yellowtail flounder

Recommendation:

The panel received a presentation on the recent Georges Bank yellowtail flounder assessment. However, because this assessment was reviewed through the Transboundary Resources Assessment Committee (TRAC) process, no additional review was conducted here. The information provided in this assessment was useful in the panels review of the other yellowtail flounder stocks. Overall, stock biomass is low and productivity is poor.

References:

Legault, C.M. and D. Busawon. 2016. Stock Assessment of Georges Bank Yellowtail Flounder for 2016. TRAC Ref. Doc. 2016/01. 63 p. TRAC2016

Legault, C.M. and Q.M. McCurdy. 2017. Stock Assessment of Georges Bank Yellowtail Flounder for 2017. TRAC Working Paper 2017/03. 58 p. TRAC2017

TRAC. 2013. Georges Bank Yellowtail Flounder. TRAC Status Report 2013/01. TSR2013

TRAC. 2017. Georges Bank Yellowtail Flounder. TRAC Status Report 2017/03. TSR2017

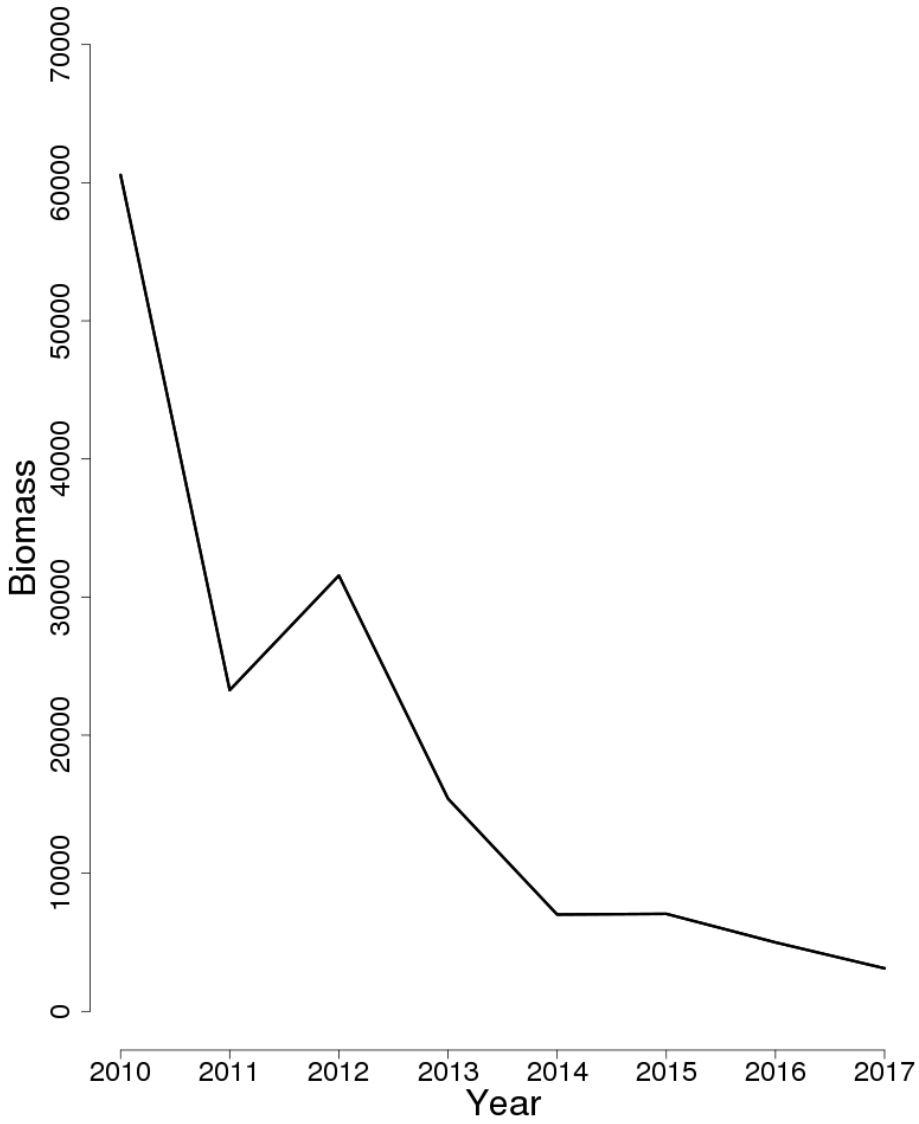

Figure 94: Trends in average survey biomass (mt) of Georges Bank yellowtail flounder between 2010 and 2017 from the current assessment.

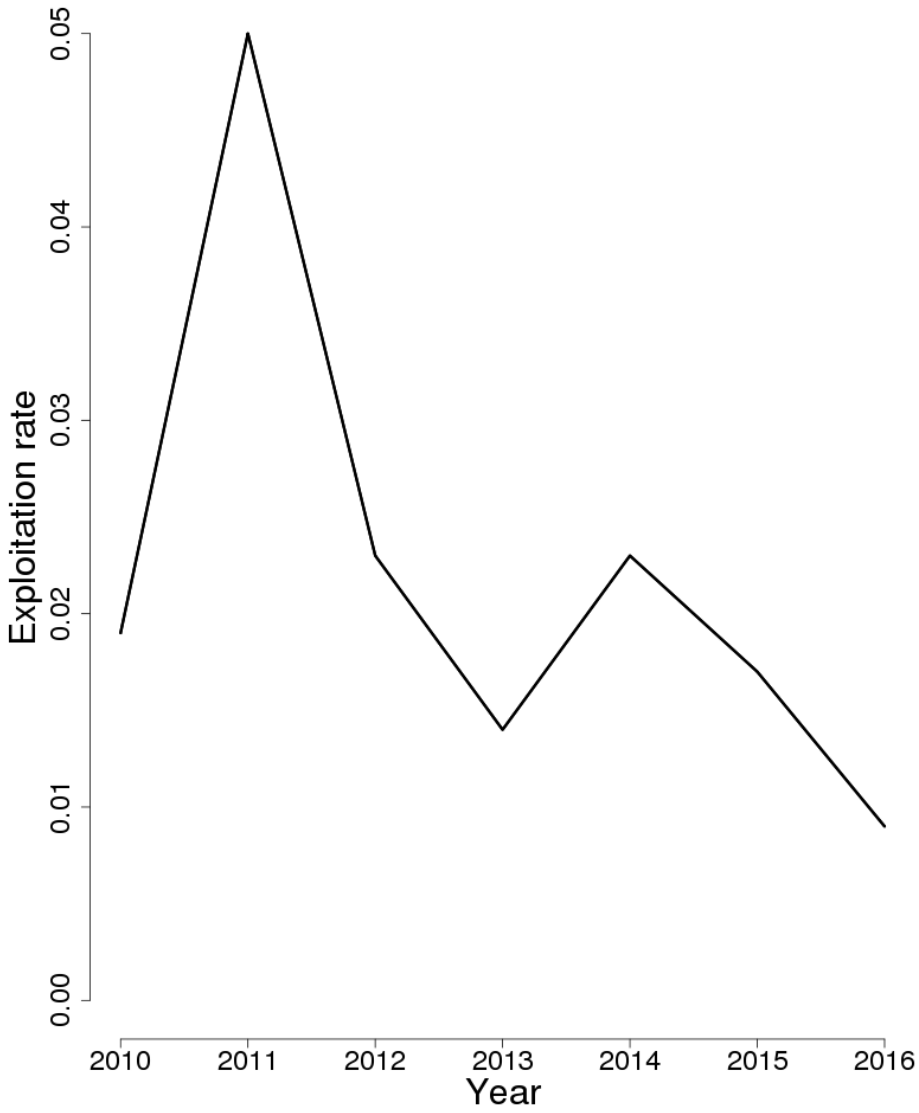

Figure 95: Trends in the exploitation rate (catch/average survey biomass) of Georges Bank yellowtail flounder between 2010 and 2016 from the current assessment.

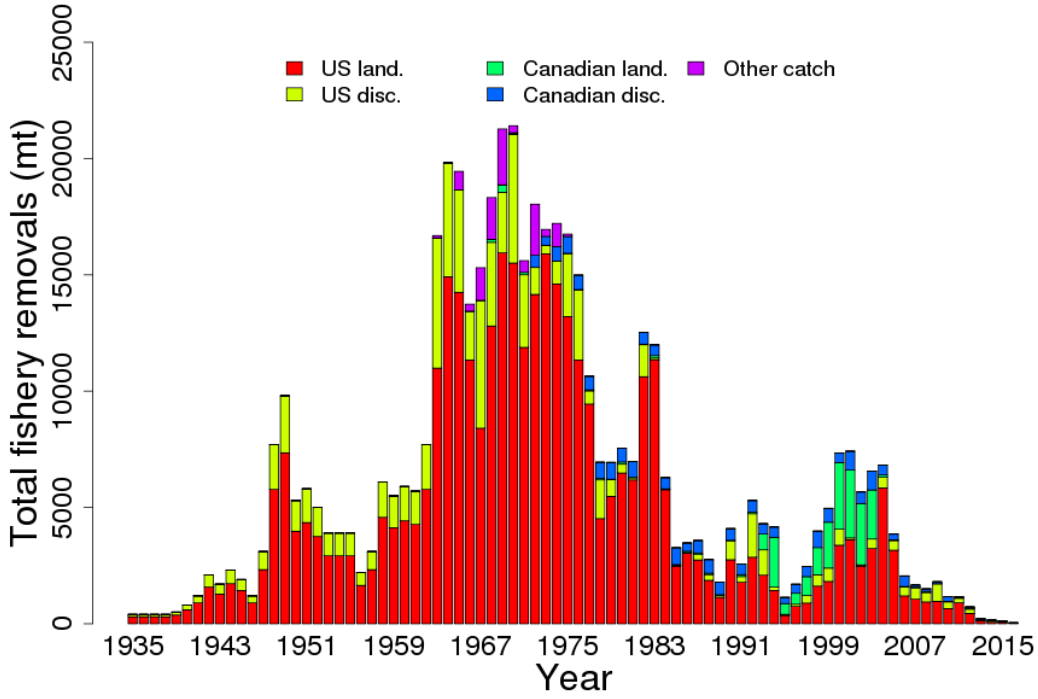

Figure 96: Total catch of Georges Bank yellowtail flounder between 1935 and 2016 by fleet (US, Canadian, or Other) and disposition (landings or discards).

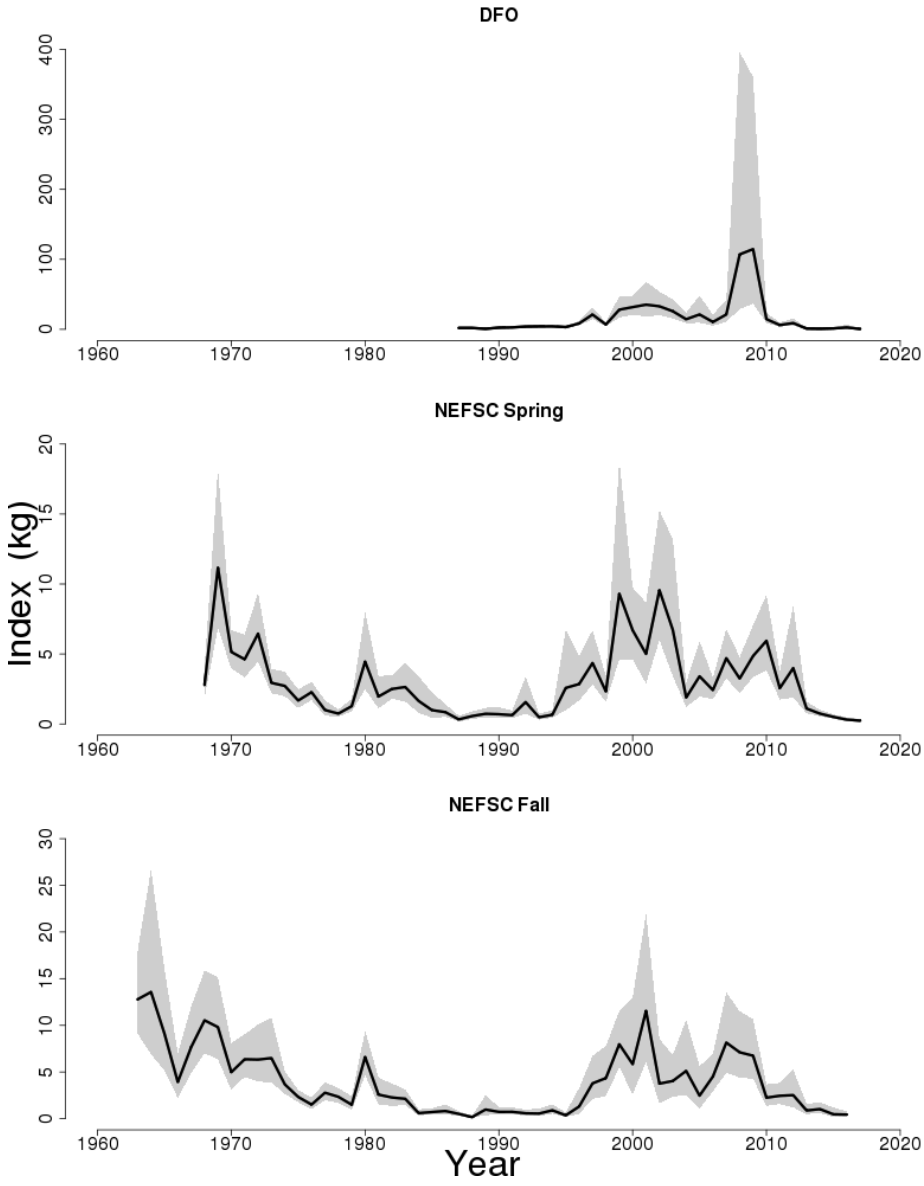

Figure 97: Indices of biomass for the Georges Bank yellowtail flounder between 1963 and 2017 for the Canadian DFO and Northeast Fisheries Science Center (NEFSC) spring and fall bottom trawl surveys. The approximate 90% lognormal confidence intervals are shown.