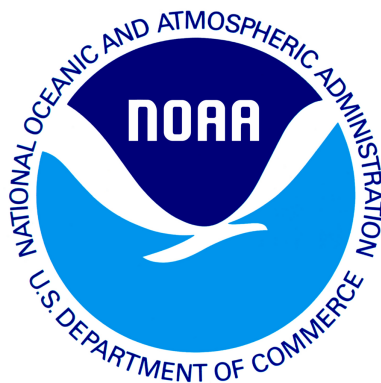


draft working paper for peer review only



Witch flounder

2017 Assessment Update Report

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

Compiled August 2017

This assessment of the witch flounder (*Glyptocephalus cynoglossus*) stock is an operational assessment of the existing 2016 benchmark assessment (NEFSC 2017). Based on the 2016 assessment the stock status was overfished and overfishing unknown, and stock condition was poor. This assessment updates commercial fishery catch data through 2016 (Table 1, Figure 3), and updates research survey biomass indices and the empirical approach assessment through 2016 (Figure 4). No stock projections can be computed using the empirical approach.

State of Stock: Based on this updated assessment, witch flounder (*Glyptocephalus cynoglossus*) recommended stock status is overfished and overfishing is unknown due to a lack of biological reference points associated with the empirical approach; stock condition remains poor. Retrospective adjustments were not made to the model results. The exploitable biomass in 2016 (defined as the arithmetic average of the 2016 NEFSC spring and 2015 NEFSC fall surveys population biomass estimates and converted to exploitable biomass using 0.9 based on examination of survey and fishery selectivity patterns) was estimated to be 14,563 (mt) (Figure 1). The 2016 exploitation rate (2016 catch divided by 2016 exploitable biomass) was estimated to be 0.035 (Figure 2).

Table 1: Catch and model results table for witch flounder. All weights are in (mt). The exploitable biomass in year y is the arithmetic average of the year y NEFSC spring and year y-1 NEFSC fall surveys then converted to exploitable biomass using 0.9. The exploitation rate is the year y catch divided by the year y exploitable biomass. Model results are from the current updated empirical approach assessment.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	<i>Data</i>										
Commercial Landings	1,863	1,076	1,009	954	759	870	1,038	686	570	492	397
Commercial Discards	211	135	127	203	153	201	230	124	106	93	115
Catch for Assessment	2,075	1,210	1,136	1,158	912	1,071	1,268	810	675	585	512
	<i>Model Results</i>										
Exploitable Biomass	18,082	16,728	31,661	18,756	16,380	14,834	16,817	10,617	13,486	15,862	14,563
Exploitation Rate	0.115	0.072	0.036	0.062	0.056	0.072	0.075	0.076	0.05	0.037	0.035

Table 2: Comparison of reference points estimated in an earlier assessment and from the current assessment update.

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

Projections: Short term projections cannot be computed using the empirical approach. The estimated 2017 exploitable biomass is 19,202 mt. Using the January 2017 NEFMC PDT/SSC

approach for catch advice, application of the mean exploitation rate of 6.0% (based on nine years, 2007-2015) to the 3 year (2015- 2017) moving average of exploitable biomass (16,543 mt) results in an estimated catch for 2018 of 993 mt.

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).
Uncertainty in the catch has increased due to recent reports/allegations of catch misreporting currently under litigation.
- 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} ; see RhoDecisionTab.ref).
The model used to estimate status of 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 witch flounder are not computed. Catch advice is derived from applying a mean exploitation rate of 0.060 (based on nine year, 2007-2015) to the 3 year average (2015-2017) of the exploitable biomass.
- 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.
Recent landings and discards were updated and the time series of survey indices was updated; however, this has no impact on the stock status.
- If the stock status has changed a lot since the previous assessment, explain why this occurred.
No change in stock status has occurred for witch flounder since the previous assessment. Biological references points remain unknown.
- Provide qualitative statements describing the condition of the stock that relate to stock status.
The witch flounder stock condition remains poor. Fishery landings and survey catch by age indicate truncation of age structure and a reduction in the number of older fish in the population. NEFSC relative indices of abundance and biomass remain below their time series average.
- Indicate what data or studies are currently lacking and which would be needed most to improve this stock assessment in the future.
The witch flounder assessment could be improved with accurate catch statistics. Additional research recommendations are given in NEFSC 2017.
- Are there other important issues?
Minimum estimates of scientific research removals of witch flounder ranged between 0.1 and 15.9 mt, with an average of 1 mt between 1963 and 2016. The NEFSC bottom trawl

surveys, Massachusetts Division of Marine Fisheries inshore surveys, Atlantic States Marine Fisheries Commission summer shrimp surveys, and various Cooperative Research surveys (e.g., such as Industry-based surveys for cod and for yellowtail flounder) and gear studies have contributed to scientific research removals. The August 2016 Gear Efficiency Study removed 14.0 mt of witch flounder.

References:

Northeast Fisheries Science Center. 2017. 62nd Northeast Regional Stock Assessment Workshop Assessment Report, Northeast Fisheries Science Center, Woods Hole, Massachusetts, January 2017. US Dep Commer, NOAA Fisheries, Northeast Fish Sci Cent Ref Doc. 17-03; 822 p.

[CRD17-03](#)

Northeast Fisheries Science Center. 2015. Operational Assessment of 20 Northeast Groundfish Stocks, Updated through 2014. US Dep Commer, NOAA Fisheries, Northeast Fish Sci Cent Ref Doc. 15-24; 251 p. [CRD15-24](#)

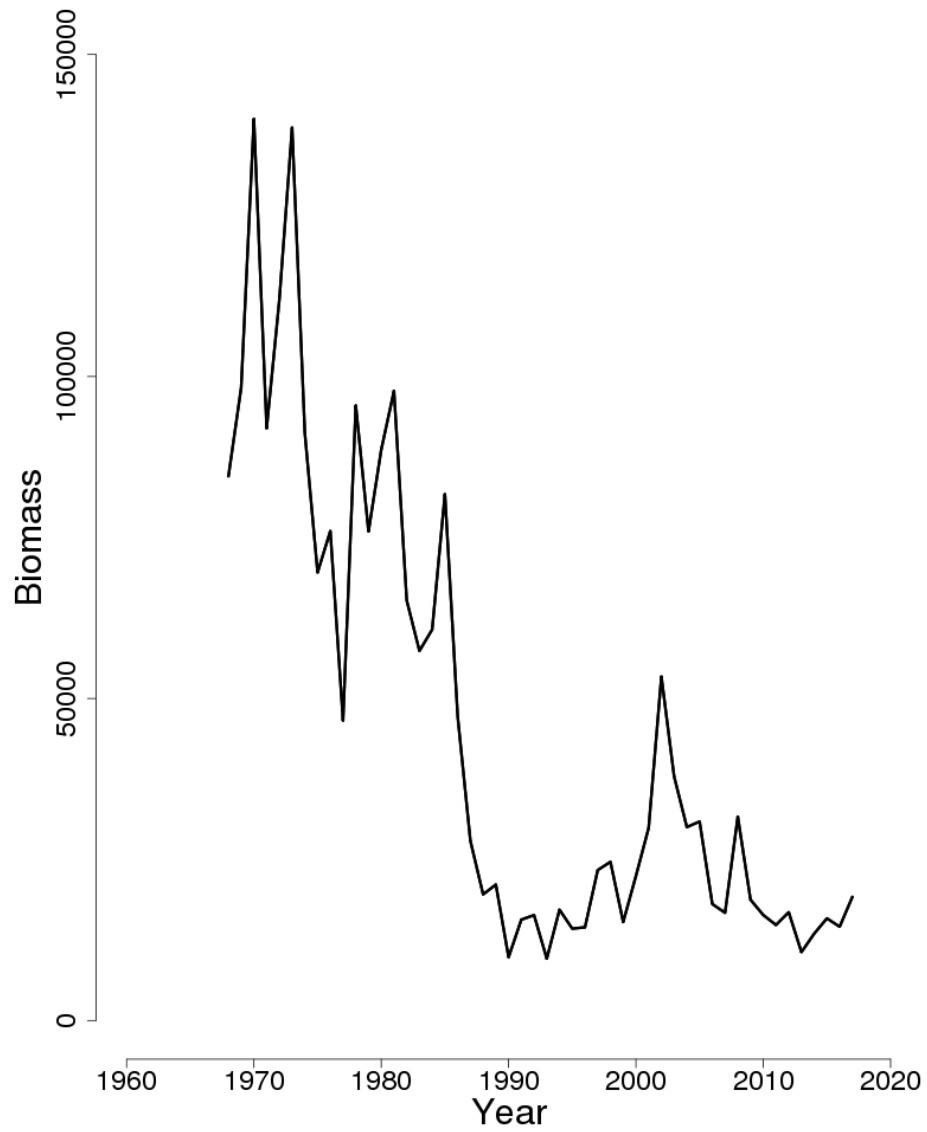


Figure 1: Trends in exploitable biomass (mt) of witch flounder between 1968 and 2017 from the current assessment.

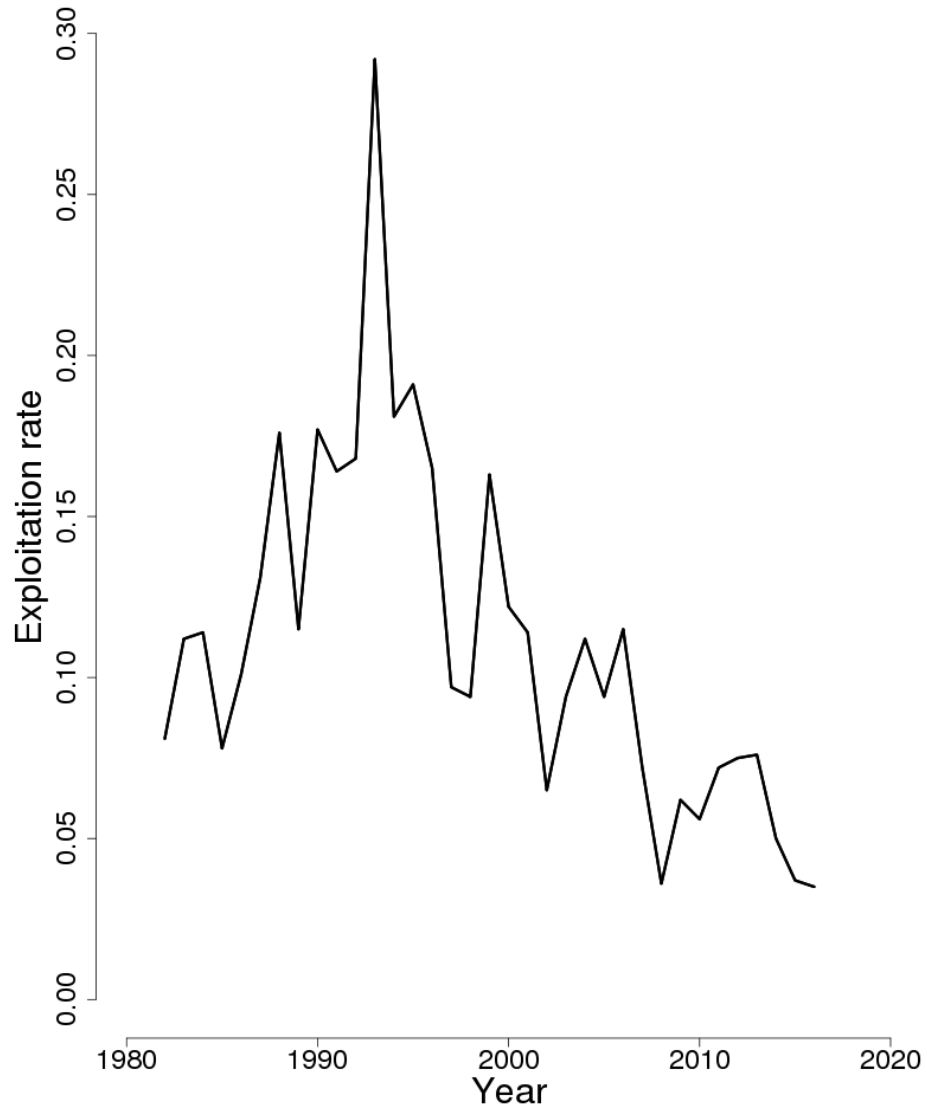


Figure 2: Trends in the exploitation rate (catch/ exploitable biomass) of witch flounder between 1982 and 2016 from the current assessment.

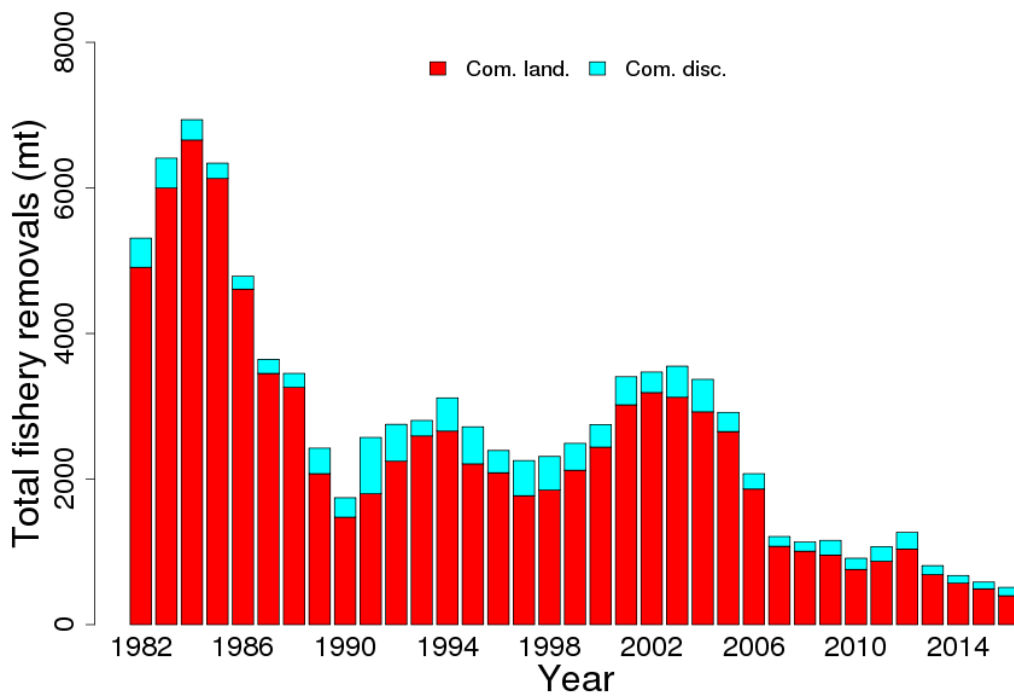


Figure 3: Total catch of witch flounder between 1982 and 2016 by fleet (commercial) and disposition (landings or discards).

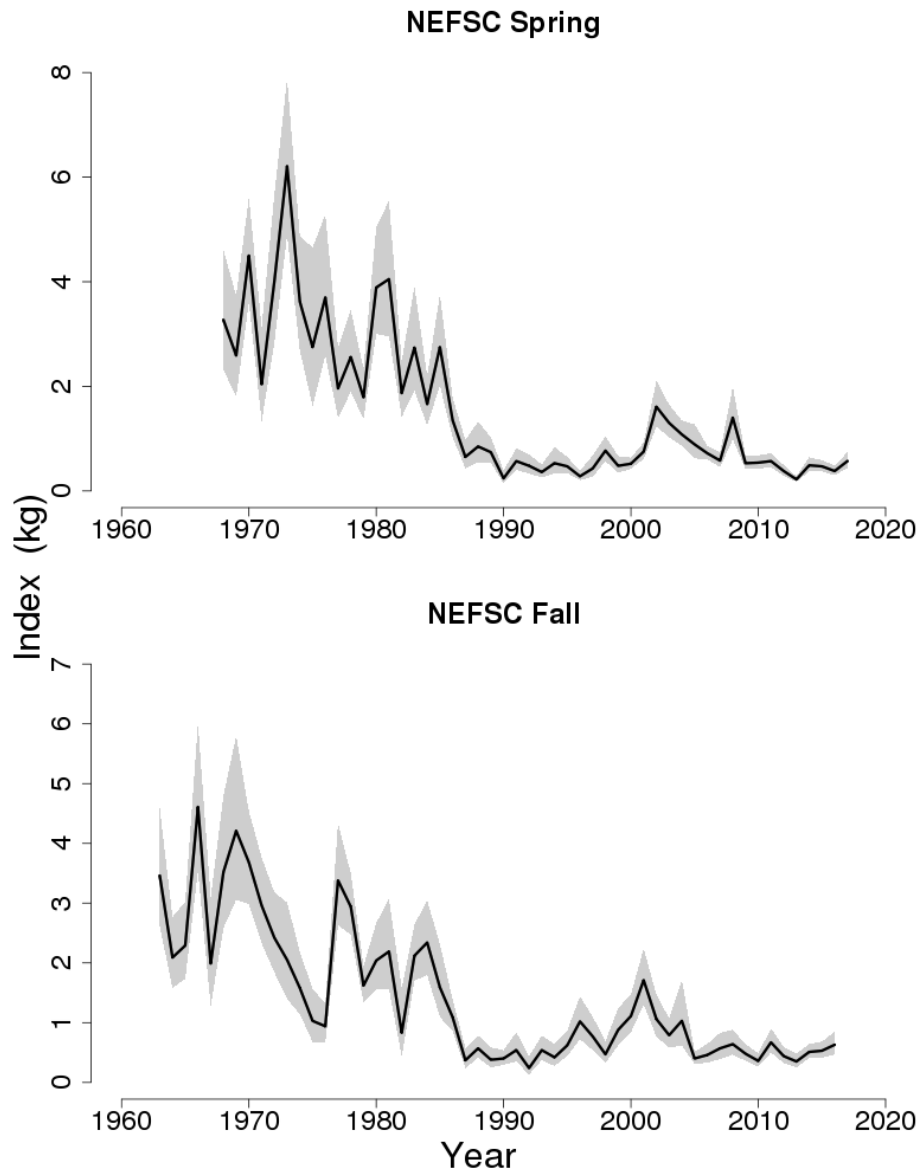


Figure 4: Indices of biomass for the witch flounder between 1963 (Fall) and 2017 (Spring) for the Northeast Fisheries Science Center (NEFSC) spring and fall bottom trawl surveys. The approximate 90% lognormal confidence intervals are shown.