UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149 U.S.A.
(305) 361-4200 Fax: (305) 361-4499

SEC-TJ-2015-SAC-3575

August 12, 2015

MEMORANDUM TO: Roy E. Crabtree, Ph.D.
Regional Administrator, Southeast Regional Office

FROM: for Bonnie Ponwith, Ph.D. Stacy Hargrove
Science Director

SUBJECT: Blueline Tilefish Stock Projections

Please find attached the Southeast Fisheries Science Center report, "Projections for South Atlantic Blueline Tilefish SEDAR 32 Stock Assessment."

This document responds to the June 18, 2015 request to provide revised projections to address recent landings and concerns over continued effort shifts and apparent spatial differences in stock productivity.

Cc:

F/SEC – Theo Brainerd, Peter Thompson, Sophia Howard
Stacy Hargrove, Tom Jamir, Larry Massey
F/SER – Andy Strelcheck, Heather Blough
Jack McGovern, Rick DeVictor
Monica Smit-Brunello
SAFMC – Robert Mahood, Gregg Waugh, John Carmichael
MAFMC – Chris Moore

Projections for South Atlantic Blueline Tilefish SEDAR 32 Stock Assessment

Sustainable Fisheries Branch, National Marine Fisheries Service,
Southeast Fisheries Science Center,
101 Pivers Island Rd, Beaufort, NC 28516

August 11, 2015

This document responds to a request from the SSC (June 18, 2015) for additional projections following the SEDAR 32 South Atlantic blueline tilefish stock assessment. The request consisted of two components: (1) P* projections with updated landings information and (2) Additional projection scenarios assuming high recruitment.

1. P* projections within updated landings information

50% and 30% P* projections were requested with actual blueline landings for the 2012-2014 interim years, the best estimate of blueline landings for the 2015 interim year, and predicted landings associated with P*=0.5 and P*= 0.3 for 2016-2020 (the prediction years). The terminal year of the assessment was 2011 and so this represents a 9 year P* projection. Actual total landings (commercial and recreational) for the interim period were 464,974 lb in 2012, 497,263 lb in 2013, 363,654 lb in 2014, and 94,638 lb in 2015. Landings in 2015 are underestimated because they cover only a portion of the year and are highly preliminary. Projections were requested with both Northeast Vessel Trip Reports (VTRs) and MRIP landings estimates for the recreational sector. Projections were conducted using only the MRIP estimates. VTRs cover only the charterboat sector and only in the northeast region of the stock area. This same mode is covered by MRIP and so the two data sources are redundant. Results of the P* projections are shown in Table 1.

Table 1. Acceptable biological catch (ABC) of blueline tilefish based on the annual probability of overfishing P* = 0.3 (left panel) and P*=0.5 (right panel). Landings were set to those observed for 2012, 2013, 2014, and 2015 (partial year), with the ABC associated with the specified probability of overfishing calculated for the remaining years (2016-2020). L=Landings, D=Discards.

Year	P*=0.3				P*=0.5			
	ABC-L (1000 lb)	ABC-D (1000 lb)	ABC-L (1000 fish)	ABC-D (1000 fish)	ABC-L (1000 lb)	ABC-D (1000 lb)	ABC-L (1000 fish)	ABC-D (1000 fish)
2016	30.669	0.033	6.703	0.008	48.391	0.052	10.700	0.011
2017	47.832	0.052	9.702	0.010	70.848	0.077	14.481	0.016
2018	65.536	0.079	12.559	0.014	92.465	0.100	17.937	0.019
2019	81.253	0.088	14.878	0.016	110.039	0.119	20.482	0.022
2020	93.496	0.101	17.934	0.019	122.596	0.133	24.713	0.027

2. Additional projection scenarios

Additional projections using actual landings of blueline tilefish (as described above) but assuming multiple, alternative high recruitment scenarios were requested. The request for assumed high recruitment during the projection period was based on continued high landings of blueline tilefish beyond the terminal year of the assessment. A previous document outlined the scientific issues surrounding the assumption of an alternative recruitment regime during the projection period. Based on several internal and external discussions, it was decided there was not sufficient scientific support to assume the recruitment scenarios requested for the projections. As an alternative, the handline index used in the assessment was extended to 2014 and compared to the predicted biomass of blueline tilefish available to the handline fishery from the projections. This comparison allows an evaluation of whether the pattern in predicted biomass of blueline beyond the terminal years of the assessment (2012-2014) is similar to trends in the available empirical data.

The handline index used in the assessment spanned 1993-2010 and covered the area from Cape Hatteras south to Cape Canaveral. The index was extended to 2014 (excluding the 2011 deep water closure year) and the entire index was re-standardized (hereafter 'Updated HL index'). The predicted biomass vulnerable to the handline fishery from the projections was computed for 2012-2014 (i.e., abundance at age X handline selectivity at age X mean weight at age; hereafter 'Projection HL index'), and for consistency in comparison, these computations were extended backward in time (1993-2010) using the abundance at age from the assessment. The original handline index from the SEDAR 32 assessment and the updated HL index are shown in Figure 1A. The general pattern in the two indices is similar, though the re-standardization alters some of the years. The updated HL index has shown a positive trend since the terminal year of the assessment (2011) with the largest increase in relative abundance in 2014. The updated HL index compared to the projection HL index is shown in Figure 1B. The projection HL index shows a similar increase in relative abundance of blueline tilefish to the updated HL index in 2012 and 2013. The two indices diverge in 2014 with the updated HL index increasing and the projection HL index declining. However, the uncertainty in the projection HL index incorporates the estimates of relative abundance from the updated HL index for each of the three years.

Discussion

Projections of fish stocks are highly uncertain, particularly in the long-term (>3 years). The P* projections were run over 9 years (2012-2020) with a 4 year interim period (2012-2015). Fisheries were assumed to continue fishing at their estimated current proportions of total fishing efforts, using the estimated current selectivity patterns. Changes in the fishery or responses to management regulations (implemented in 2014 and 2015) would likely affect projection results. As noted in previous documents (see Sept 20, 2013 memo) projections beyond 3 years are highly uncertain for this stock.

The projections assume that the estimated spawner-recruit relationship applies in the future and that past residuals reflect future uncertainty in recruitment. Enhanced recruitment has been put forth as one hypothesis for the continued high landings of blueline tilefish. However, analysis of recent age

composition and length composition data (since the assessment) do not provide empirical evidence for continued high recruitment. Increases in catchability and increased fishing effort are plausible alternative hypotheses for the continued high landings of blueline.

Exploitation of previously unexploited ‘pockets’ of fish in the northern region of the range have also been put forth as a hypothesis to explain the recent high landings of blueline tilefish. The productivity of blueline north of Cape Hatteras is not known. Because blueline are sedentary, it is highly unlikely that productivity has shifted northward. Given the lack of a physical transport mechanism to the south, it is also unclear how much fish in the northern region of the range contribute to coastwide productivity of the stock. There is currently insufficient scientific information to determine the contribution of northern fish to coastwide productivity of blueline. Irrespective of the particular mechanism, the exploitation history of deepwater species, such as blueline tilefish, would suggest that recent high landings may be a transient phenomenon.

Figure 1. (A) The original handline index used in the assessment (1993-2010) and the updated index (1993-2014). (B) The updated index compared to the predicted biomass of blueline from the projections. Error bars are the 5th and 95th percentiles of the projection biomass from 10,000 bootstrap replicates.