SSC DISCUSSION DOCUMENT
Blueline Tilefish Fishing Level Projections

Prepared by Council Staff
August 25, 2015

Background

The SSC reviewed Blueline Tilefish stock projections prepared since the SEDAR 32 stock assessment during a meeting held via webinar on June 3, 2015. Projection findings are summarized in Table 1 and Figure 1 below. Each projection scenario had different assumptions for the interim landings levels leading up to the beginning of the projected management scenario and different terminal years for the observed data.

The SSC discussed the shift in the fishery northward late in the assessment time period, to areas that were previously unexploited, and the continuation of that trend since the assessment terminal year (Figures 2-4). It was noted that there remains relatively little information from some of the more northern areas in regards to Blueline Tilefish landings and age distribution. The SSC expressed concern over the extremely high projected F values estimated in the projection model for years since the assessment terminal year, noting that it contradicts both anecdotal evidence suggesting Blueline Tilefish are plentiful north of Cape Hatteras, NC, and the landings trend since the assessment terminal year (Figures 2-4). However, it remains unclear to what extent the sustained high catches since the assessment are based on recruitment events or continued effort shifts toward the North, to areas of low historical effort and high local abundance.

The SSC concluded that the projections were properly prepared using acceptable methodologies. However given the concerns over the continued shift in effort and the apparent spatial issues that the model was unable to resolve, the SSC determined that the available projections were not Best Scientific Information Available and should not be used for setting catch level recommendations. The SSC requested updated projections incorporating recent observed landings. These projections use the same methods and assumptions of the prior scenarios and are described here as the "base" projections. The SSC also requested that the Science Center prepare alternative projection scenarios applying different assumptions of recruitment (R). The intent of the alternatives, as described in the SSC meeting report, is to use recruitment modifications to simulate the effects of two possible alternative explanations for continued high catches - one being strong recruitment and the other being geographic shifts in effort. Both essentially result in more fish in the population in recent years than is 'expected' by the projection methodology, in which assumptions of recruitment since the terminal year are governed by the stock-recruitment relationship. A third explanation, that the stock is experience severe overfishing, is addressed by the base projection methodology. A concern with the base projections is that the fishing mortality estimates are several times greater than those estimated during the assessment years. Basically, regardless of whether there is increased R or the fishery moved to an area of higher abundance, increasing R in the projections for the first several years is the only way of increasing the numbers of fish available to the fishery and addressing unreasonably high fishing mortality estimates for the post-assessment period.

Updated Projection Results

The Science Center updated the base projections as requested by the SSC, and also provided an updated handline CPUE index based on an input dataset used in the last assessment (SEDAR 32). The first set of projections are the P* projections (P*=0.3 and P*=0.5, Table 2) using updated landings for the interim years and the base projection methodology. These differ from the projection runs the SSC reviewed at the June 3rd webinar by using the most recent observed landings for 2013 and 2014, and preliminary landings for 2015.

The Science Center decided that there was not sufficient scientific support for the requested alternative approaches assuming higher levels of recruitment; therefore those runs were not prepared. Reasoning for this is detailed in a separate document from the Science Center and summarized in the projection document. There was mention that the recent trend in landings may be a "transient phenomenon" given the exploitation history of Blueline Tilefish. Figure 5 shows the exploitation history of Blueline Tilefish for the SSC to compare the recent increase in landings to the increase seen in the past.

In lieu of the requested projection runs, the Science Center updated the handline (HL) CPUE index from SEDAR 32 (Figure 6). This was offered as a means of evaluating whether the biomass trend reflected in observed data, the index, is consistent with biomass as estimated in the projection model. Consistent with the SEDAR 32 evaluation of CPUE, this updated index is based on information from Cape Hatteras to Cape Canaveral. As noted in the project document, productivity of Blueline north of Cape Hatteras remains largely unknown, despite most landings since 2006 coming from this area and continued northward shifts in commercial effort.

Fishing Level Recommendation Alternatives

The SSC is asked to update the fishing level recommendations for Blueline Tilefish. Due to the many projection scenarios considered, the uncertainties identified with stock productivity and geographic trends in the fishery, and the concerns expressed with the base projection estimates, several possible alternatives are offered here for consideration

1. Updated P* projection scenarios using the base method
   2016 ABC = 30,669 pounds (landings)
   2017 ABC = 47,832 pounds (landings)

This is the approach used to support previous fishing level recommendations for Blueline Tilefish. While the updated results incorporate recent observed landings, they retain the issues the SSC identified at the previous meeting, including a lack of population information in the Northern area where most landings are now taken and uncertainty in stock productivity.

**NOTE: These values are based on the projection results of August 11, 2015. Revised projections including updated landings may be available for consideration during the meeting.*

2. Equilibrium Yield at 75% F_{MSY} from SEDAR 32
   2016 and 2017 ABC = 224,100 lbs ww

Since the SSC concluded earlier projections were inadequate to support fishing level recommendations, and the only available updated projections are based on the same methods and assumptions as earlier projections, an alternative approach is offered for consideration. According to the SEDAR 32 assessment and the Council's MSST and MFMT definitions, Blueline Tilefish are not overfished but overfishing is occurring. Basing fishing levels on the equilibrium yield from an exploitation rate below F_{MSY} has been used in the past to designate ABC for stocks that are not overfished when forward projections were unavailable.

3. Other suggested approaches?

Tables

Table 1. SEDAR 32 projection scenarios highlighting the major differences. Taken from the P*=0.3 runs.

Projection	Year	Landings	F	MRIP Landings
Dec 2013	2012	484,867	1.11	SEFSC estimate
	2013	484,867	1.54	Assumed equal to 2012
	2014	484,867	3.17	Assumed equal to 2012
Apr 7, 2014	2012	484,867	1.11	SEFSC estimate
	2013	376,567	1.25	Preliminary SEFSC estimate
	2014	224,100	0.896	Yield at 75% F_{MSY}
Apr 28, 2014 SEFSC	2012	484,867	1.11	SEFSC estimate
	2013	556,018	2.33	SEFSC estimate
	2014	224,100	1.49	Yield at 75% F_{MSY}
Apr 28, 2014 Imputed	2012	484,867	1.11	SEFSC estimate
	2013	317,116	0.935	Avg 2010 and 2012 estimates
	2014	224,100	1.49	Yield at 75% F_{MSY}
May 15, 2014 Interpolated	2012	484,867	1.11	SEFSC estimate
	2013	491,642	1.95	MRIP Website
	2014	224,100	1.29	Yield at 75% F_{MSY}

Table 2. 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. 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.

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

Figures

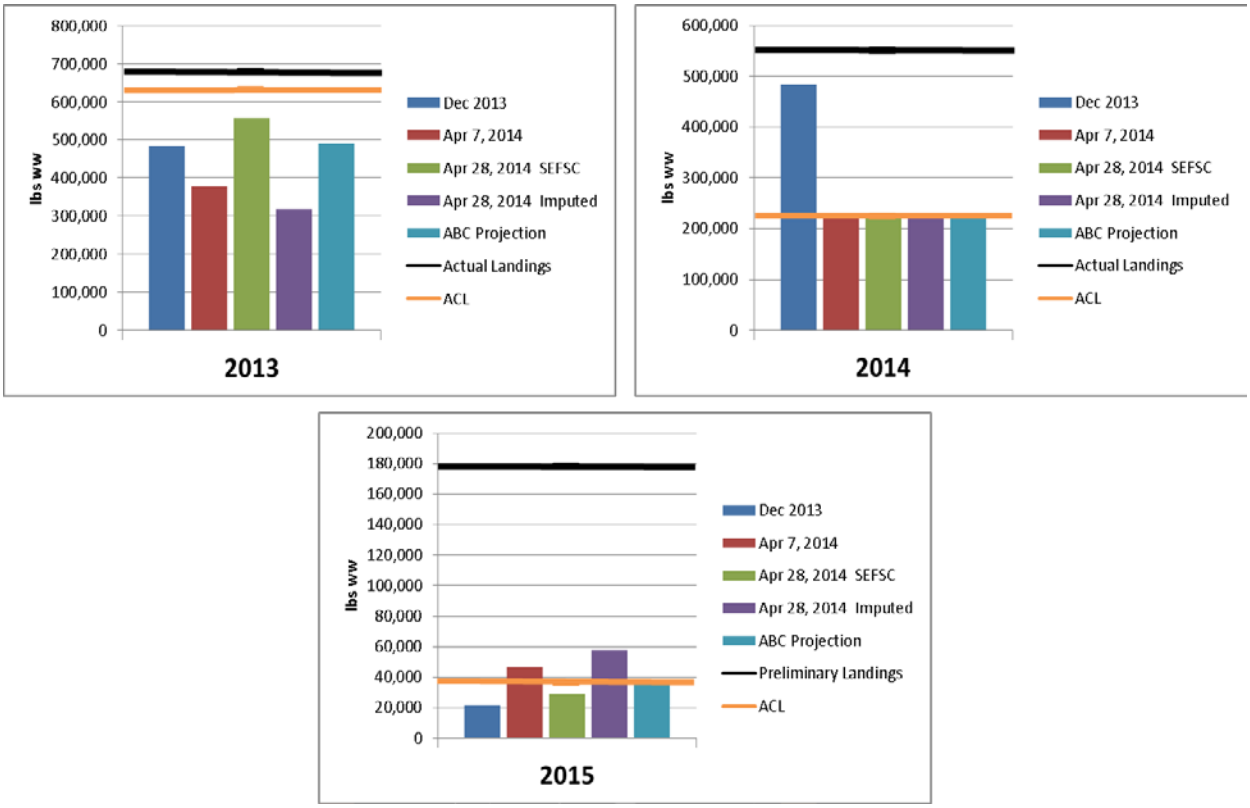

Figure 1. Assumed interim landings, projected landings, ACL, and actual landings for 2013 to 2015.

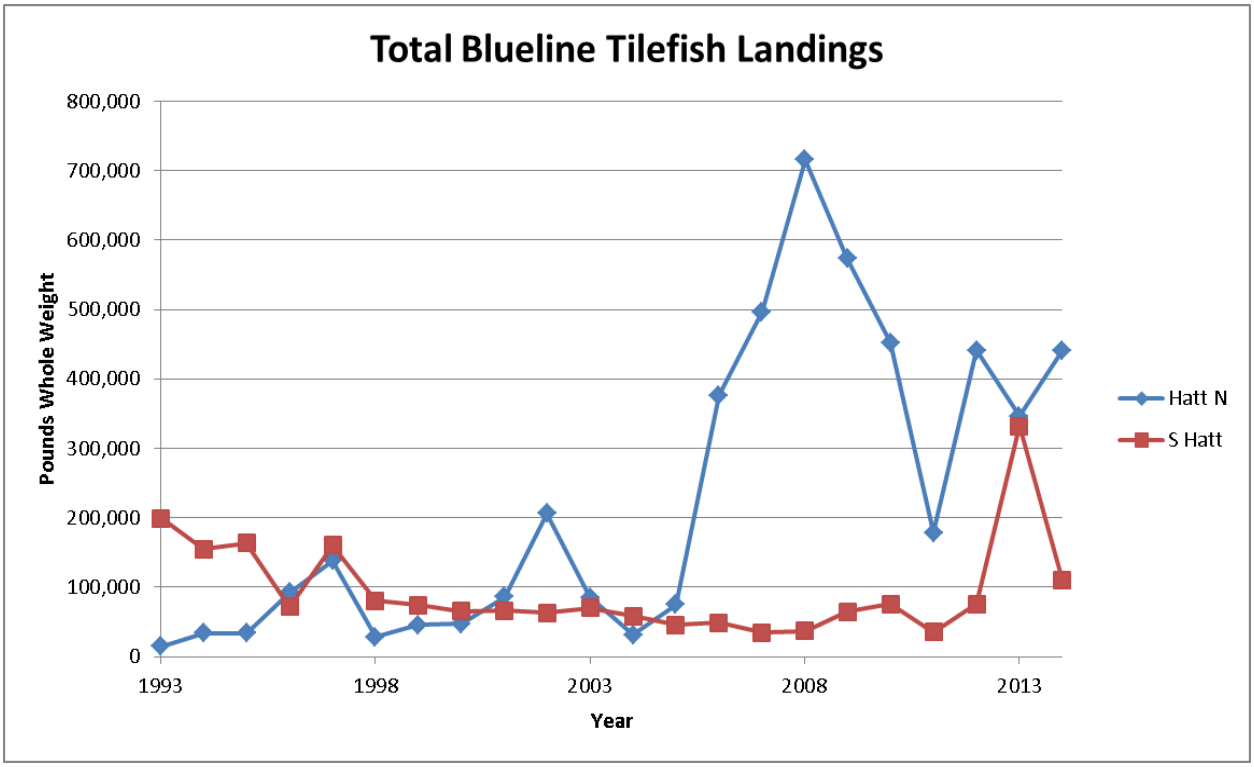

Figure 2. Total landings of Blueline Tilefish separated into Hatteras north and south of Hatteras. Note: MRIP shows no landings of Blueline Tilefish in the Northeast but the Vessel Trip Report (VTR) data show landings by the For-Hire sector in the Northeast.

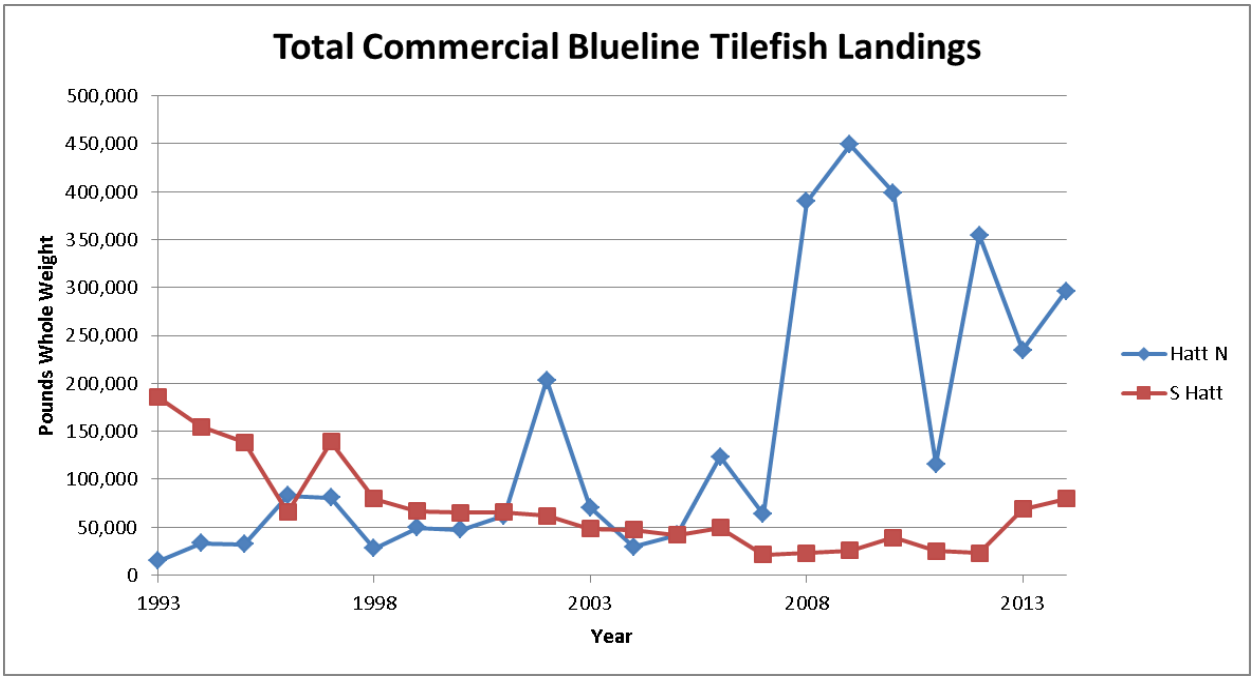

Figure 3. Commercial landings of Blueline Tilefish separated into Hatteras north and south of Hatteras.

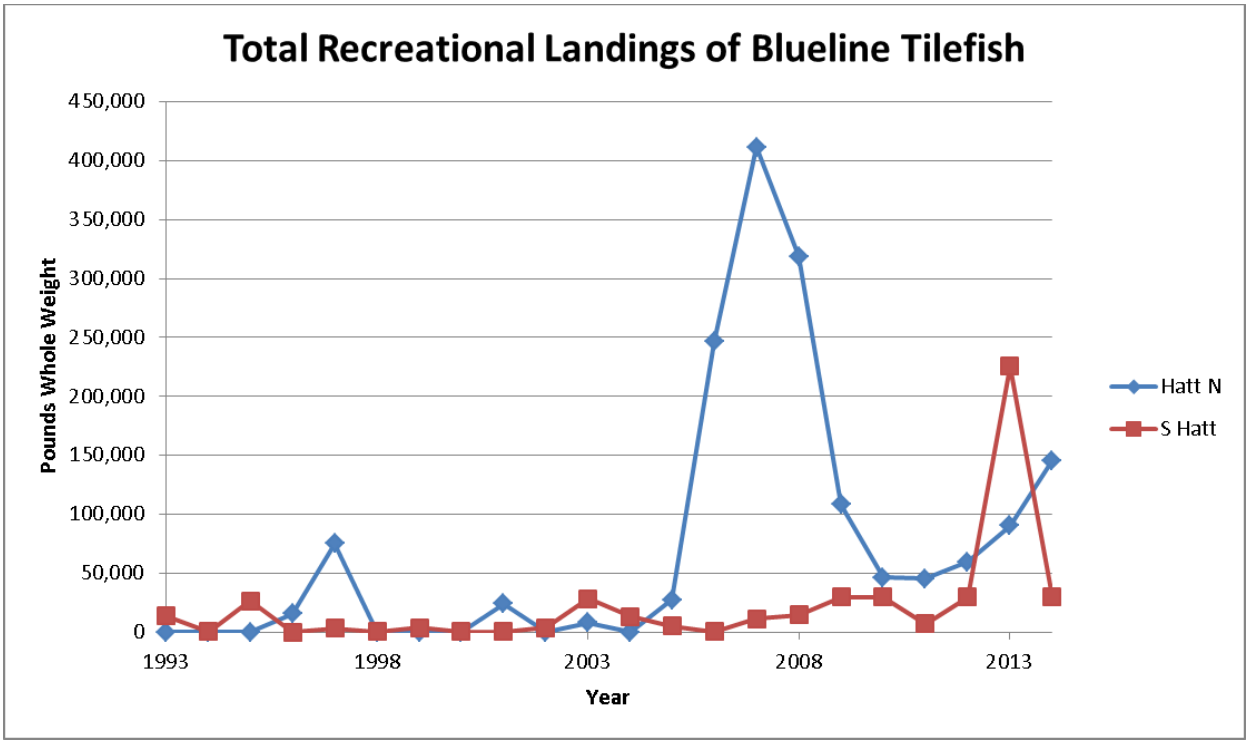

Figure 4. Recreational landings of Blueline Tilefish separated into Hatteras north and south of Hatteras. Note: MRIP shows no landings of Blueline Tilefish in the Northeast but the Vessel Trip Report (VTR) data show landings by the For-Hire sector in the Northeast.

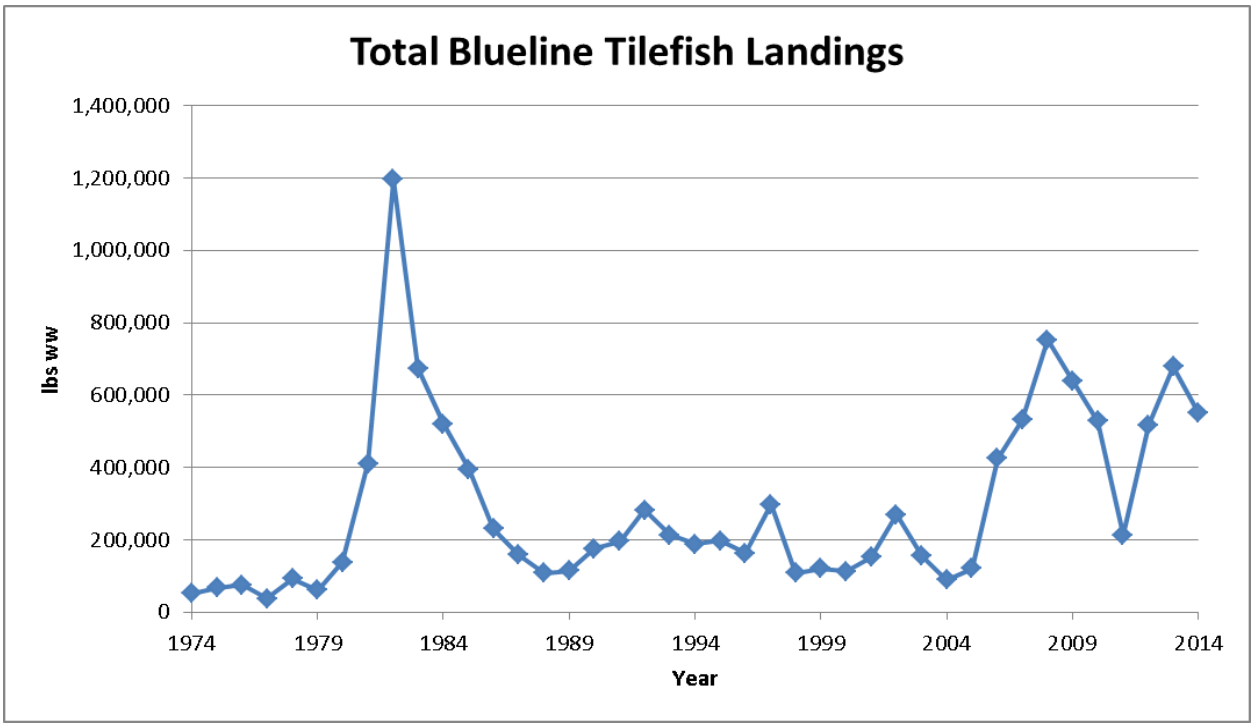

Figure 5. Total landings of Blueline Tilefish. 2005-2014 include Northeast For-Hire VTR landings. Note: MRIP shows no landings of Blueline Tilefish in the Northeast but the Vessel Trip Report (VTR) data show landings by the For-Hire sector in the Northeast.

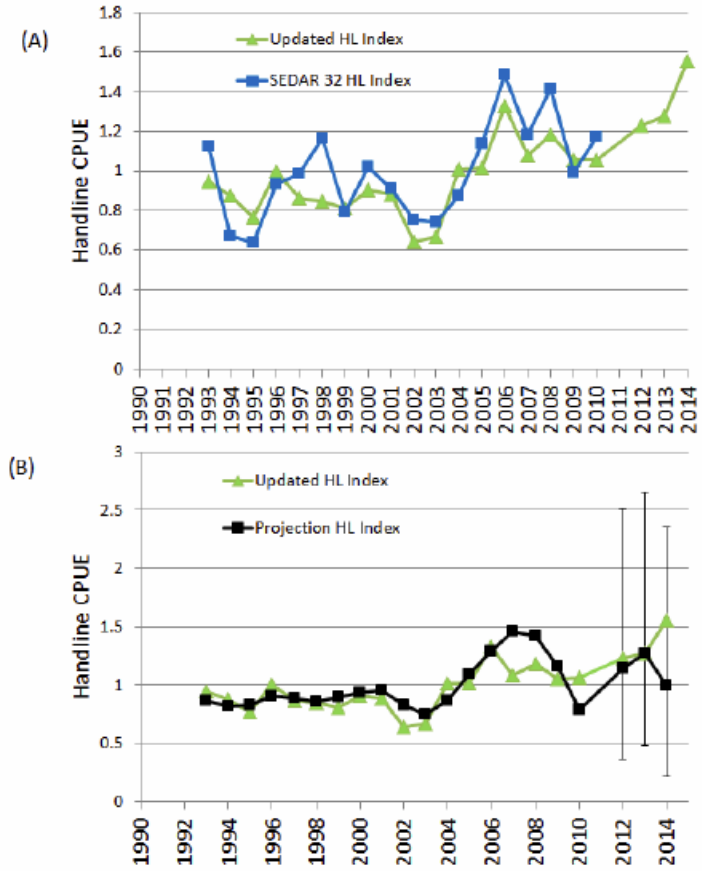

Figure 6. (A) The original handline index used in the assessment (1993-2010) and the updated index (1993-2014). (B) The updated index compared to the predicted biomass of Blueline from the projections. Error bars are the 5th and 95th percentiles of the projection biomass from 10,000 bootstrap replicates.