Atlantic States Marine Fisheries Commission

Winter Flounder Technical Committee

Report on the Federal Specifications and the Reopening of the Southern New England-Mid-Atlantic Winter Flounder Fishery

For Board Consideration

2013 ASMFC Spring Meeting

May 20, 2013

Recent History in the Fishery

The 2008 GARM III assessments (covering the period through 2008) indicated that SNE-MA winter flounder spawning stock biomass was extremely low (9% of SSB threshold) and overfishing was occurring. Southern New England-Mid/Atlantic winter flounder was considered to be in critical condition. In 2009, National Marine Fishery Service published a secretarial interim final rule that set zero retention limits for SNE winter flounder (for both commercial and recreational vessels). Projections from the GARM III assessment indicate that SNE/MA winter flounder was unlikely to rebuild by 2014 in the absence of any fishing mortality, but would rebuild between Fishing Year 2015 and 2016. In order to achieve a fishing mortality as close to zero as practicable, it was necessary to eliminate overfishing on the stock and facilitate rebuilding by FY 2015 or 2016.

ASMFC developed complementary measures for state water fisheries in Addendum I to Amendment 1 to the interstate fishery management plan for inshore stocks of winter flounder in 2009.

Assessment summary

A new benchmark assessment for SNE-MA winter flounder was reviewed in SARC 52. The new benchmark differed from the old benchmark in using an ASAP SCAA model instead of the ADAPT VPA. Other changes included increasing M from 0.2 to 0.3 for all ages and years. New biological references points were developed. The model had a terminal year of 2010.

Assessment (year)	SSB_{target}	F_{msy}
GARM III (2008)	38,761 mt	0.248 (F40% proxy)
SARC 52 (2011)	43,661 mt	0.29 (Fmsy estimate)

Stock status in 2010 indicated that SSB was 16% of the target B and overfishing was not occurring (F=0.05). Recruitment remains poor and the SARC report had a special comment:

> A considerable source of vulnerability for SNE/MA winter flounder is the continued weak recruitment and low reproductive rate (e.g., recruits per spawner). Recruitment estimates for the last decade are lower than predicted by the stock recruitment model (Figures A5 and A12). If weak recruitment and low reproductive rate continues, productivity and rebuilding of the stock will be less than projected.
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> Stock recruit modeling suggests that warm winter temperatures can have a negative effect on recruitment of SNE/MA winter flounder.

Trends in Recruitment

Recruitment has generally declined throughout the time series. Six out of the last 10 year classes have been below the 25th quantile (Figure 1). The two most recent year classes have ranked 5th and 6th lowest in the 30 year time series. The last above average year class was 1996. Four young of the year indices from state waters indicates that recruitment since 2010 remains poor (Figure 5). The only exception occurs in the MADMF seine survey, where the 2011 year class appears to be near the timeseries median.

Trends in SSB

Spawning stock biomass declined from 1981 through 1993 (Figure 2). Moderate rebuilding occurred from 1993 to 2000, followed by a less precipitous decline through 2005. Spawning stock has shown small improvement since 2005. Spawning stock biomass in 2010 (7,076 tons) remains well below the biomass target (43,661 tons). Relative biomass surveys from state waters and NEFSC surveys generally remain low, with the exception of the NEFSC Fall survey.

Trends in fishing mortality

Target fishing mortality rates have changed throughout the years as selectivity and other model changes result in updated reference points. Fishing mortality rates have been well above reference points from 1981 through 2007 (Figure 3). Fishing mortality dipped below the Fmsy reference point in 2008. This was likely in response to DAS restriction in Amendment 13 and a differential DAS counting area in SNE-MA area implemented under Framework 42 in 2008. Fishing mortality declined well below the reference point in 2009, when zero possession limits (Secretarial interim final rule) and low trip limits in state waters (Addendum I) were implemented. The inability to adequately control mortality until recently, is astounding, given that both ASMFC and NEFMC to control fishing mortality have been attempting to manage fishing mortality since the mid-1990's. Strong retrospective patterns in previous stock assessments and failure to account for uncertainty have contributed to the failure to meet mortality objectives.

Stock and Recruitment

Recruits per unit of spawning biomass as modeled in the Beverton-Holt spawning recruit has shown marked declines during the most recent 12 years of recruitment. This suggests either a poor model fit or a change in survival due to changed conditions.

As a result of the large change in stock productivity, a regression tree was used to model log recruits as a function of spawning stock biomass. A tree with a single split (SSB=8577 tons) was selected as the most parsimonious fit. Diagnostics indicated the distributions of residuals were skewed left. Recruitment appeared more variable in the lower productivity bin than the high one, but this may be a function of the different number of observations between bins. This analysis suggests that productivity will remain low at SSB< 8,577 tons. Spawning stock biomass was 7,076 in the terminal year of the assessment (2010).

Stock status and updated information
The SARC 52 assessment indicated low spawning stock biomass and continued low recruitment. Survey indices all suggest that stock conditions have not improved since the assessment was conducted (terminal year 2010).

Projections
NEFSC's groundfish plan development team (PDT) ran projections for the purposes of setting OFL and ABC's for SNE-MA winter flounder. The PDT was skeptical of basing catches on projected large increases in exploitable biomass. The PDT developed two constant catch ABC:

> The PDT developed two constant catch ABCs: 2,000 mt and 1,676 mt. The rationale for each is slightly different. With a constant catch of 2,000 mt for FY 2013- 2015, the Frebuild from 2016 to 2023 is nearly identical to the Frebuild from 2013 to 2023 (0.178 vs. 0.175). The 2013 F would be expected to be less than 75 pct of FMSY. This amount of catch, however, would result in a 12 percent decline in SSB from FY 2013 to FY 2015 should near-term recruitment be similar to that experienced from 1999 – 2010 rather than the recruitment predicted by the BH stock recruit curve adopted by the assessment.
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> If long-term recruitment is closer to the recent 1999 – 2010 experience rather than the BH stock-recruit prediction, then long-term yield would be about 1,676 mt. This constant catch quota would result in a smaller reduction in SSB from 2013 to 2015 (7 percent) under the low-recruitment scenario. Rebuilding would occur more rapidly under the BH recruit assumption than would be the case at 2,000 mt.
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> Given the recent history of this stock, the PDT recommends the constant ABC of 1,676 mt. This is about double the current 2013 ABC, and is more than the catch in any year since 2007. This catch should also be sustainable if recruitment in the future does not decline from what was observed during the last 12 years of the assessment (1999 – 2010).

It is important to note that one of the key rationalizations for removing restrictions on SNE-MA winter flounder catches is the extension of rebuilding timeframe from 2014 to 2023, not improved stock conditions. Note that rebuilding by 2023 requires an average annual percentage rate of 15% (Figure 6). During the past 30 years, the median annual percent increase was 8.9% during rebuilding periods, well below the required 15% for rebuilding by 2023. At 8.9% growth, the stock will be at approximately 21,436 metric tons in 2023 (49% of Bmsy, still overfished). However, the period of these low annual growth rates occurred simultaneously with high fishing mortality rates and declining recruitment. Periods when growth was near or exceeded 15% were associated with above median recruitment (mid-1990's) or the recent period with low recruitment and relatively low fishing mortality rates. The Technical Committee's skepticism about meeting the new 2023 rebuilding timeframe appears well founded. As part of Amendment 16's rebuilding control rule, rebuilding F are adjusted when new survey information suggest that the rebuilding program is not meeting rebuilding objectives.

ASMFC's Winter Flounder Technical Committee Comments

Stock status remains poor and lifting of catch restrictions will result in further stock deterioration. State waters fisheries will likely be targeting winter flounder during pre- and post-aggregation for spawning. The lifting of restrictions will likely attract an increase of fishing effort. Sector rosters are frozen on April 30th. There will be no increase in common pool vessels in the Southern New England area in 2013 (personal communication, Doug Christel (NERO).

The technical team can not estimate the effect of raising trip limits on catches within state waters. The technical team reiterates that loosening of federal restrictions within state waters is not related to improved stock conditions. Any increase in the trip limit should be accompanied by adoption of annual quota and accountability measures. Adequate real time monitoring will be required to monitor catches so that the target quota is not exceeded. Another issue that the Management Board may wish to consider is allocation among user groups (recreational/commercial) and allocation of quota among states.

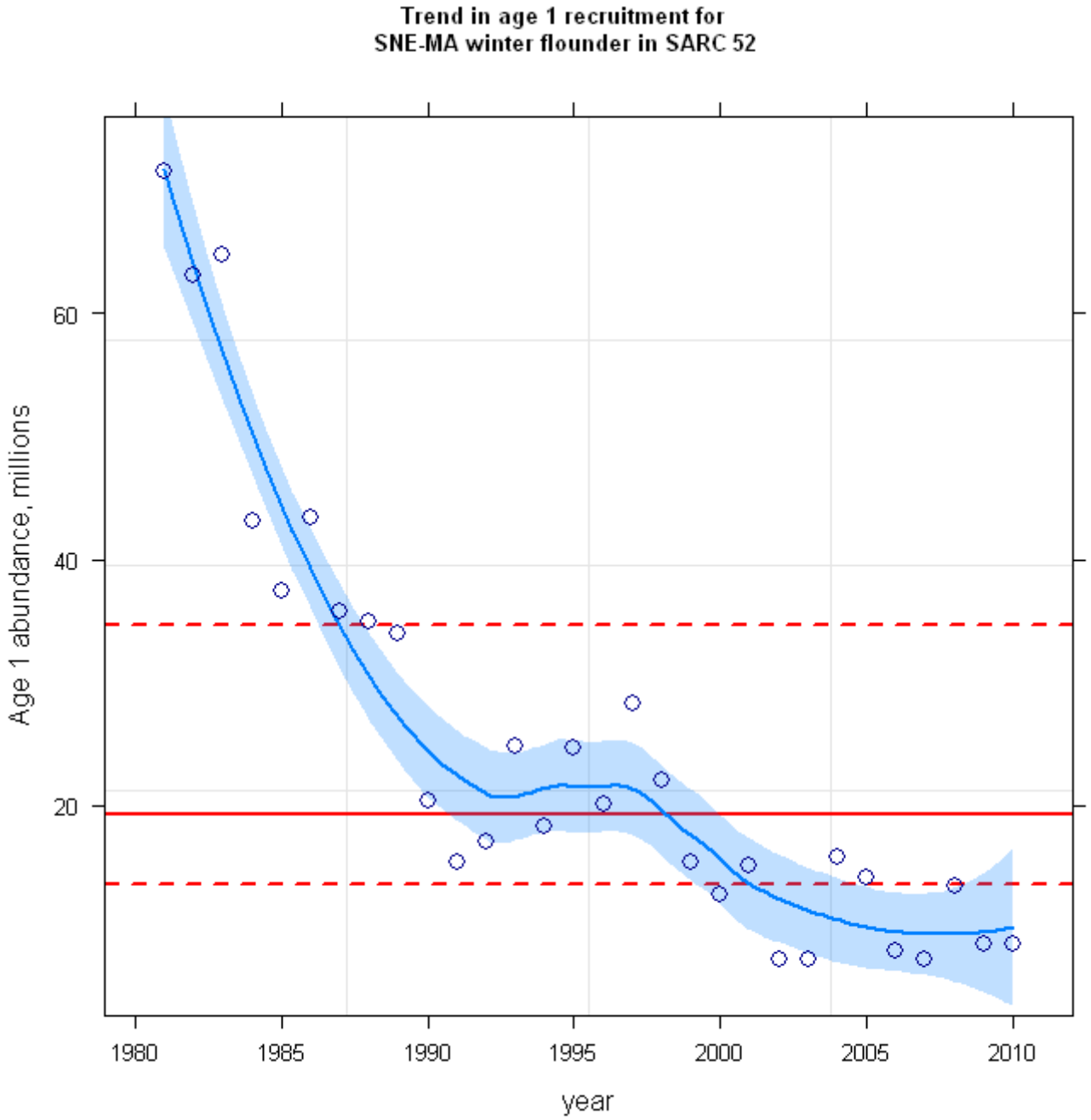

Figure 1. Trend in age 1 abundance (millions) from SARC 52 assessment of SNE-MA winter flounder assessment. Solid red line is time series median, dashed red lines are the 75th and 25th quantiles for the time series. The blue line is loess fit with span=0.66 and blue colored area are approximate 95% confidence limits on loess fitted values.

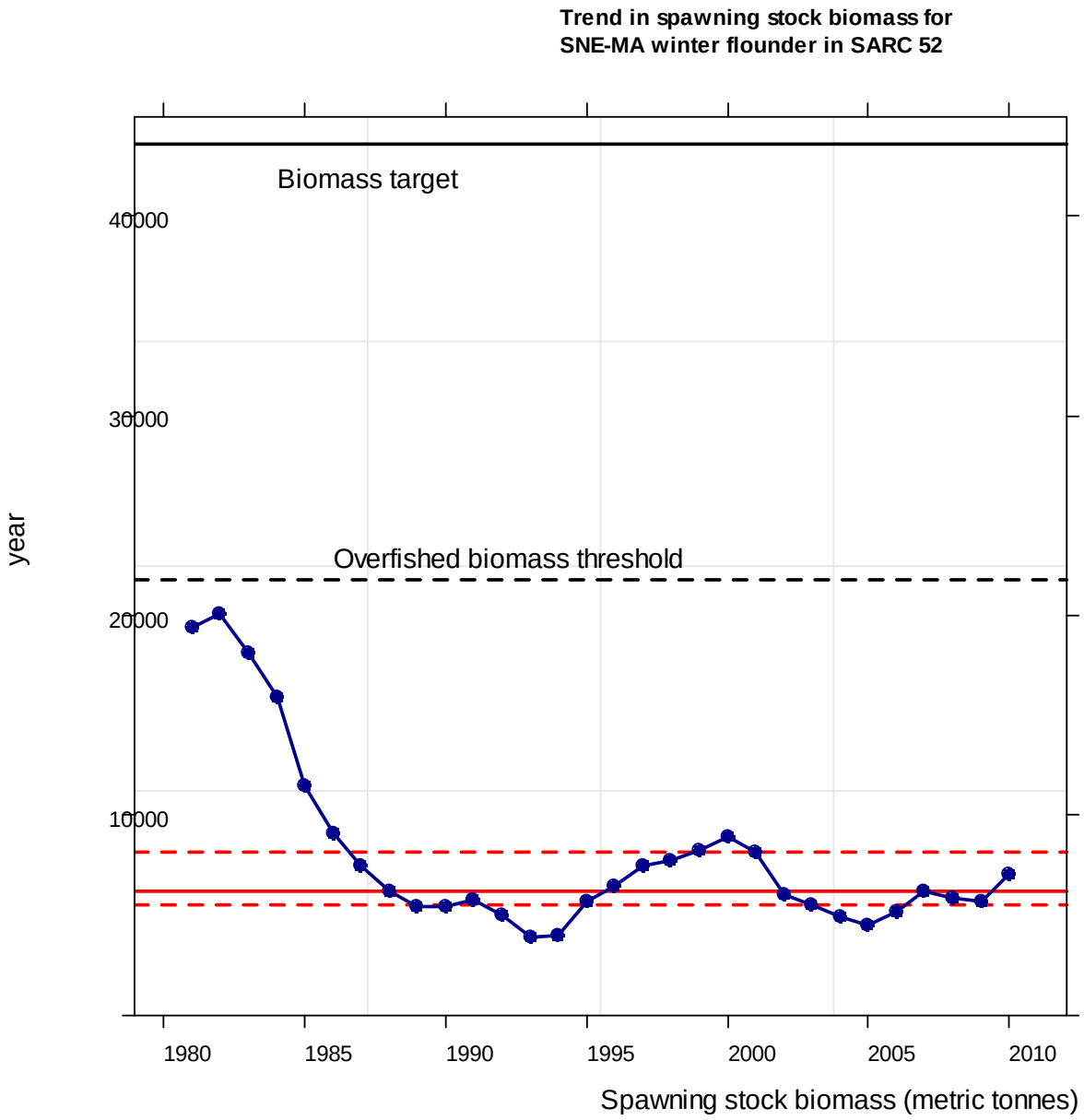

Figure 2. Trend in spawning stock biomass (metric tonnes) from SARC 52 assessment SNE-MA winter flounder assessment. Solid red line is time series median, dashed red lines are the 75th and 25th quantiles for the time series. The solid black line is the biomass target, the black dashed line is the biomass threshold that defines overfished.

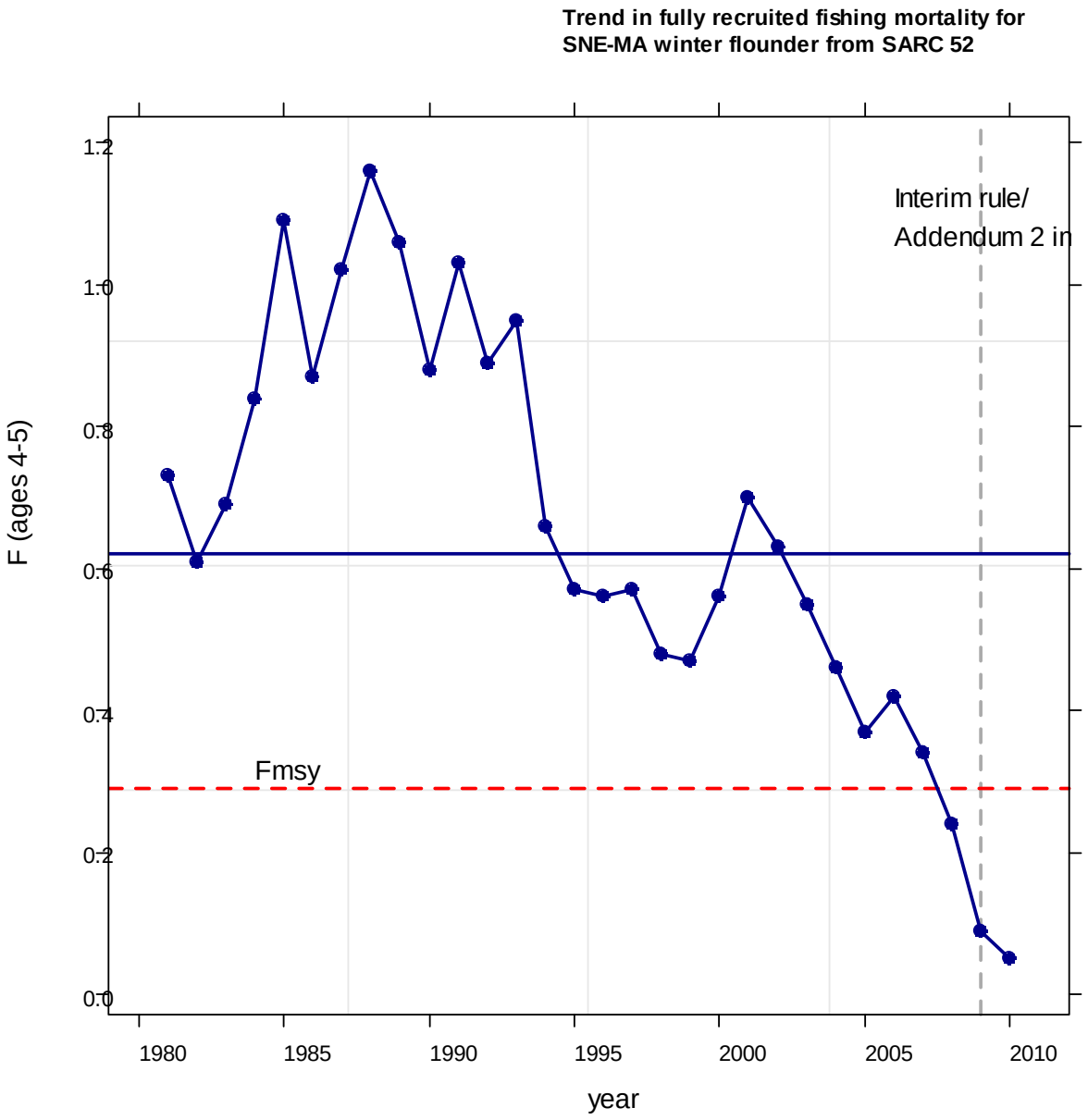

Figure 3. Trend in fully recruited fishing mortality (ages 4-5) from SARC 52 assessment SNE-MA winter flounder assessment. Solid blueline is time series median, dashed red line is Fmsy threshold. Vertical dashed gray line indicates implementation of Secretarial interim final rule and Addendum I in 2009.

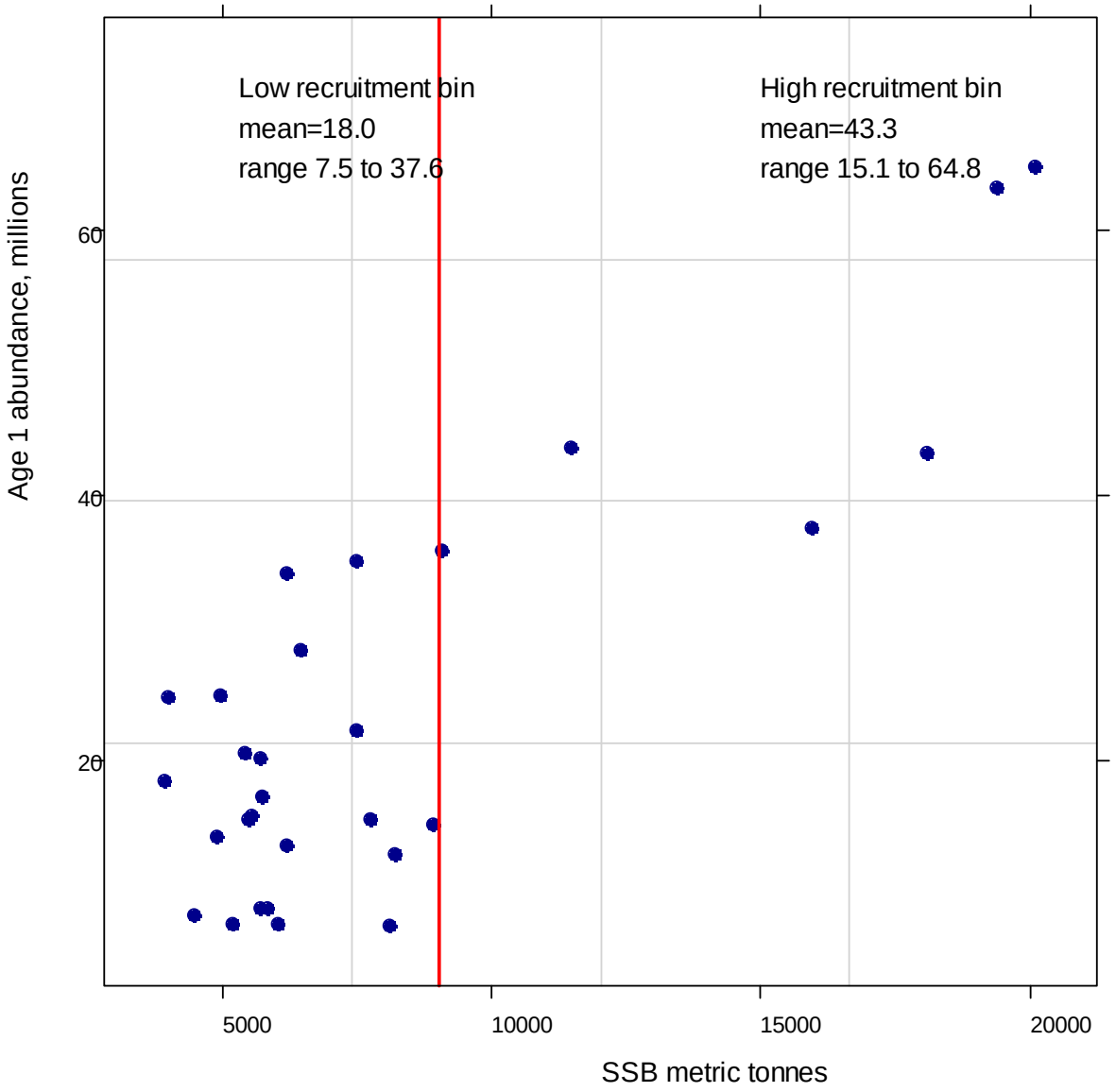

Figure 4. Recruit abundance and spawning stock biomass. Solid red line splits the SSB into a high recruitment (≥8577 SSB) and a low recruitment (<8577 SSB) bins based on a regression tree model. The amount of spawning stock biomass that spawned the 1980 yearclass of approximately 72 million age 1 recruits is unknown, but is extremely likely to be in the high recruitment bin (>8577). SSB in 2010 was 7076 metric tons.

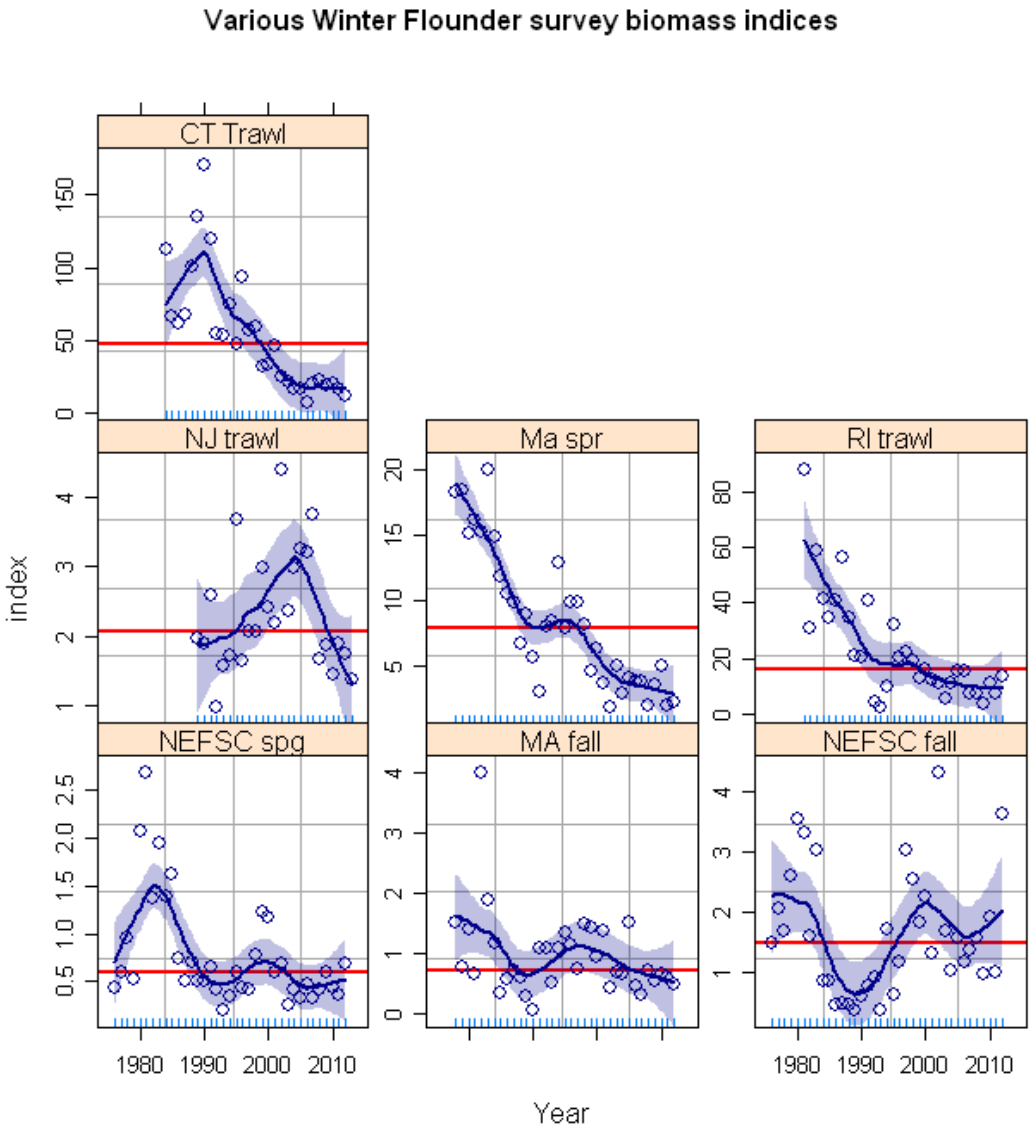

Figure 5. Seven relative biomass indices for state and NEFSC surveys. Note that series cover different periods. Y-axis scales vary among panels. Red line is time series median. Blue line is loess fit with span=0.4 and family=Gaussian. Blue polygon covers approximate 95% confidence interval on loess fitted values. NEFSC surveys have been calibrated for door, gear and vessel changes.

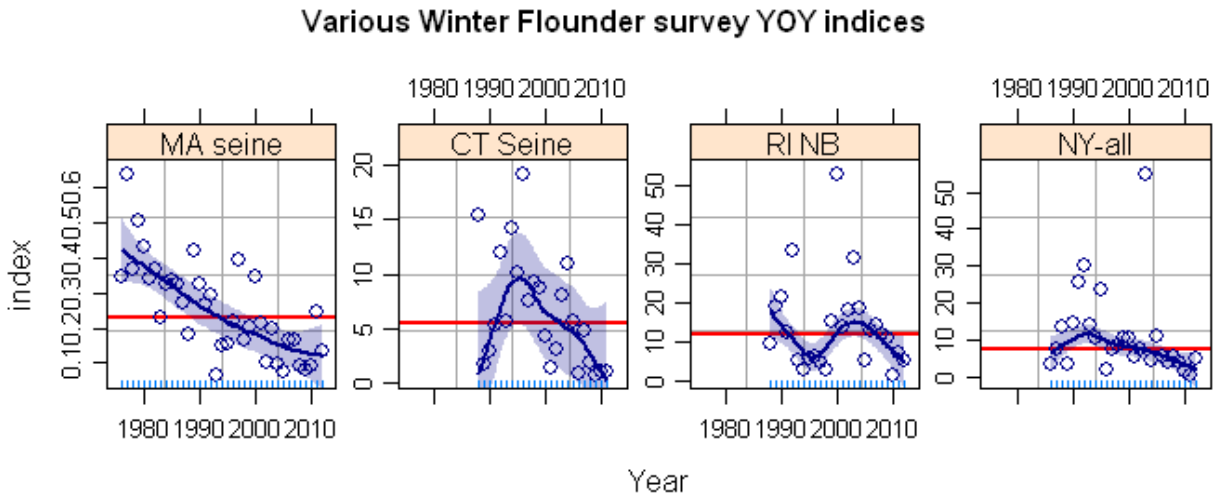

Figure 6. Young of the year indices from four state surveys. Note that series cover different periods. Y-axis scales vary among panels. Red line is time series median. Blue line is loess fit with span=0.5 and family=symmetric.

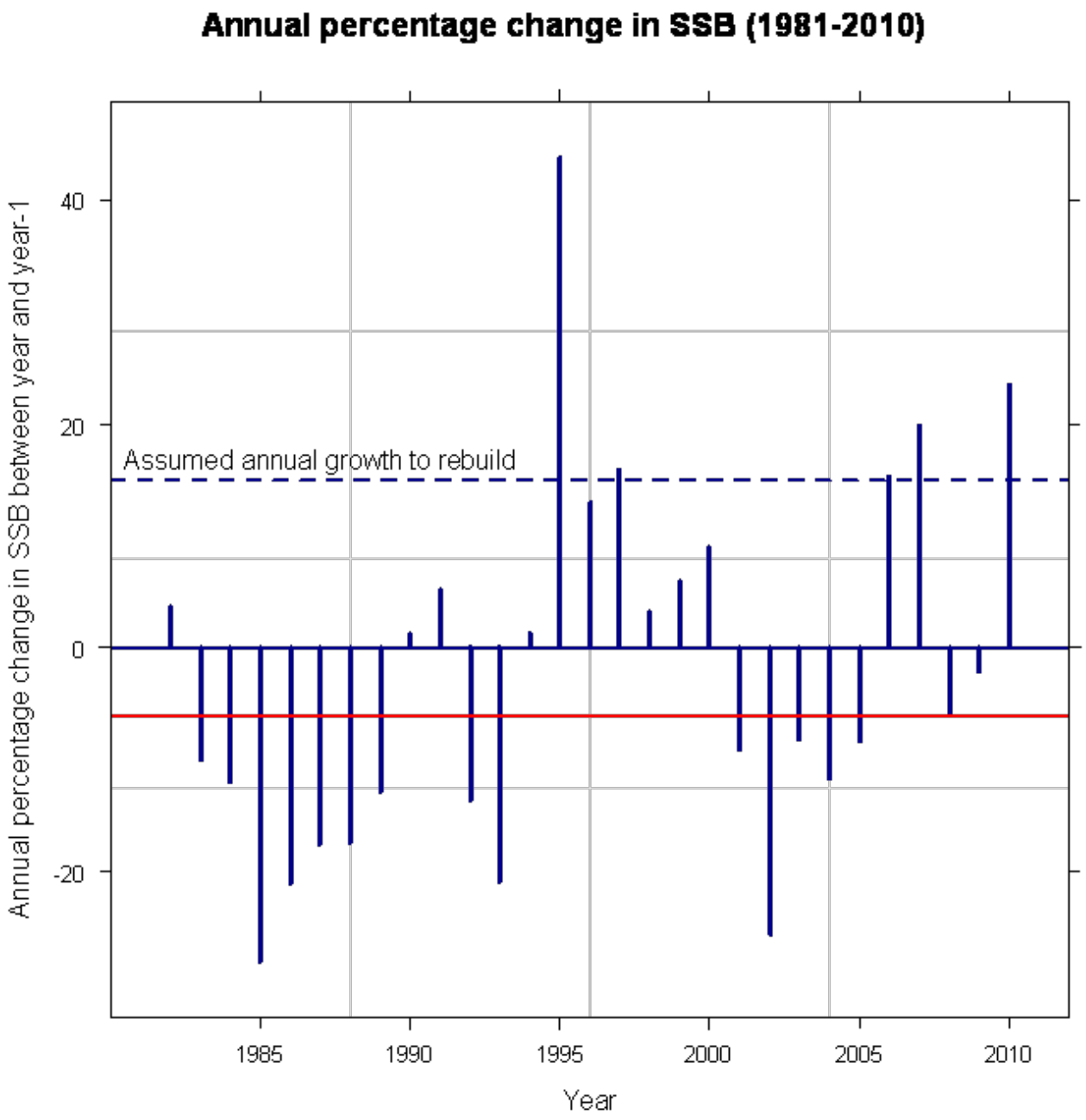

Figure 7. Annual percent change in SSB from 1981-2012. Red dashed line is median percent change over the entire period. The blue dashed line is the average annual percent increases in SSB to rebuild by 2023.