



## Atlantic States Marine Fisheries Commission

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### Weakfish Technical Committee Report

Conference call: September 21, 2012

Summary Report

#### Participants

##### *Technical Committee / Stock Assessment Subcommittee Members*

Joe Cimino (VA), Chair	Pat Geer (GA)
Lee Paramore (NC)	Christina Grahn (NY)
Jim Uphoff (MD)	Jen Pyle (NJ)
Mike Greco (DE)	Erin Levesque (SC)
Joseph Munyandorero (FL)	Ellen Cosby (PRFC)
Nicole Trivisono (RI)	Jeff Brust (SAS; NJ)

##### *ASMFC Staff*

Katie Drew  
Mike Waine

**Objective:** To address the ASMFC Weakfish Management Board tasks to (1) begin developing stock indicators for possible management use as the weakfish stocks begin to recover and (2) review trends in gear- and area-specific weakfish landings, 2007-2011.

#### Stock Indicators for Weakfish

The weakfish stock status indicators the TC updates annually include,

1. Proportion of trips that max out the harvest limit
2. Relative biomass indices (recreational CPUE, Delaware Bay Trawl CPUE, New Jersey Trawl positive tows)
3. Proportional Stock Density (a size quality index estimated from the Delaware Bay trawl survey and the NJ trawl survey)
4. Relative F (harvest and discards divided by an index of abundance or biomass)
5. Juvenile Abundance Indices (JAI)

##### *Proportion of trips that max out the harvest limit*

Information on the number of trips that max out the 100 lb trip limit (or the 10% bycatch allowance for North Carolina) could provide managers with some information on potential changes in discards of legal size weakfish over time. This status indicator is limited to states that have a trip level reporting system. It was also noted that changes in the proportion of trips that max out the harvest limit may be indicative of either stock changes or changes in fishing behavior.

*2011 Results*

From states with trip ticket reporting systems, a total of 6,899 trips landed weakfish in 2011. Approximately 4.4% of those trips maxed out or exceeded the trip limit implemented through Addendum IV to Amendment 4. State trip level data are shown in the table below.

Table 1: Total trips that harvested weakfish and the proportion of trips that exceeded the weakfish trip limit by state.

State	total trips with weakfish	# trips over trip limit	% overage trips	total lbs weakfish	overage lbs (lbs over trip limit)	% pounds over trip limit
NC	3,986	252	6.3	65,896	6,828	10.4
RI	602			5,766		
NJ	309	30	9.7	13,324	4,941	37.1
DE	195	0	0.0	1,100	0	0.0
MD	108	4	3.7	2,751	744	27.0
PRFC	13	0	0	45	0	0
VA	1,581	8	0.5	26,104	2,631	10.1
FL	105	0	0.0	608	0	0.0

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*Relative Biomass Indices*

Three age-aggregated adult indices were recommended to provide information on trends in the stock size of weakfish. The indices include a fishery-dependent recreational CPUE index and two age-aggregated adult indices (Delaware Bay and New Jersey Trawl Surveys). All three indices were included in the 2009 peer reviewed assessment and are highly correlated. The recreational CPUE (age 1+) is based on total catch (A+B1+B2) divided by effort (trips by private/rental boats) from MRIP. It represents the only coast wide index used in the stock assessment. The Delaware Bay trawl survey provides an age aggregated index of abundance over time based on CPUE while the New Jersey trawl survey index is based on the proportion of positive tows for weakfish occurring during August.

*2011 Results*

In recent years, the Delaware Bay survey and MRIP index have declined to very low values. In 2011, the New Jersey Trawl survey showed an increase from previous years (see table below). Concern was expressed by the TC since indices are at such low levels, a signal from these indices can be lost as a result of any noise; however, all indicate very low stock size.

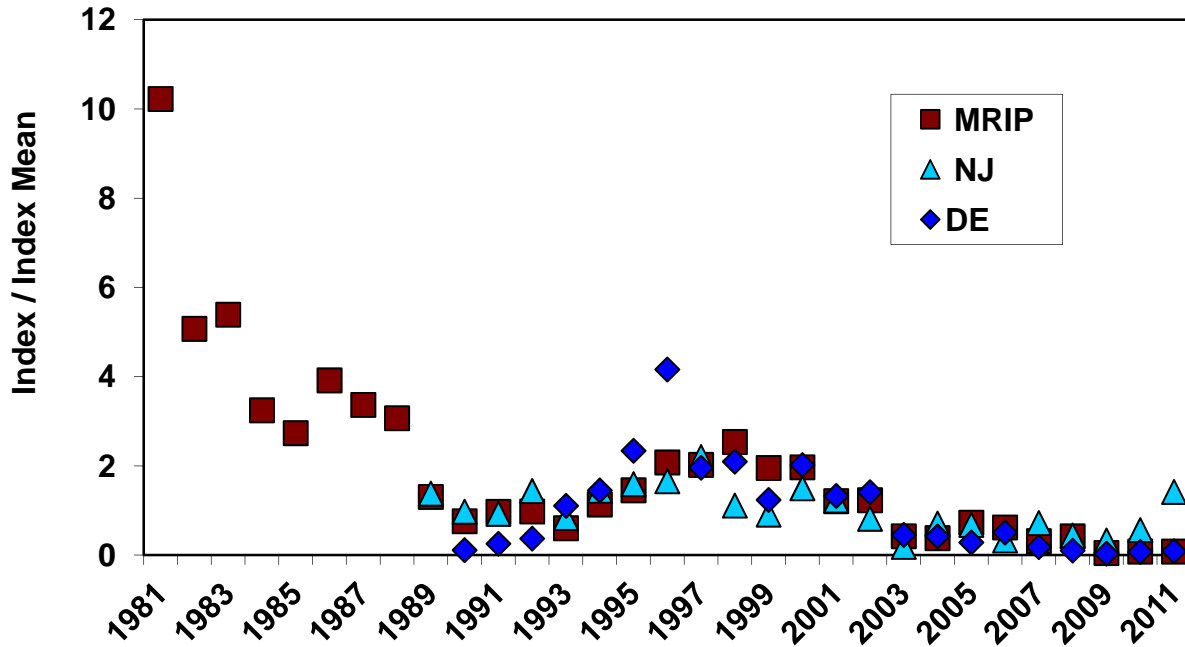


Figure 1: Relative biomass indices.

*Proportional Stock Density*

Proportional stock density (PSD) is a method that can be used to quantify length frequency data and provide managers with information on the proportion of fish in a population that are of a certain size. The TC recommended providing PSD information for both the Delaware trawl and New Jersey trawl surveys. While the relative biomass indices provide information on trends in stock size, additional PSD analysis could compliment this information by providing a standardized index on the size structure of the population. The TC notes several positive aspects to this index. It is easy to calculate, it reflects population dynamics (even when there is uncertainty in what the signal is from JAIs), it should reflect fishery performance and it is significantly correlated ( $P < 0.05$ ,) with commercial landings ( $r = 0.94$ ) and recreational harvest ( $r = 0.87$ ).

*2011 Results*

PSD is at an all time low, meaning the proportion of larger fish is very low. This follows trends of a skewed abundance towards juveniles while recruitment to adult sizes appears to remain an issue.

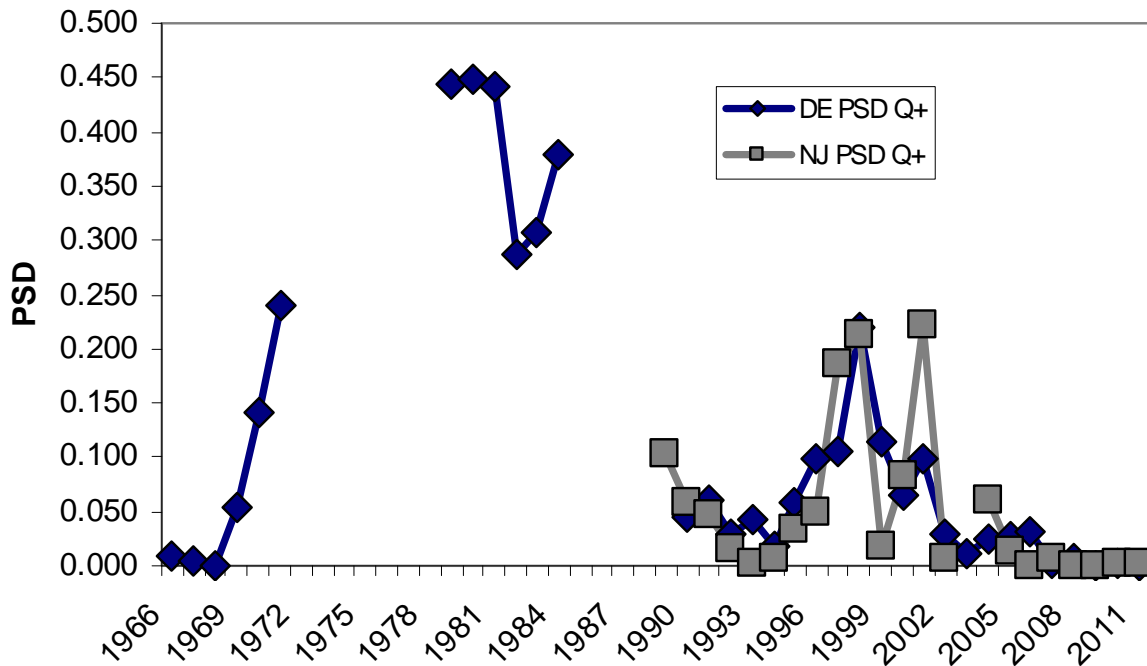


Figure 2: Proportional stock density indices for the DE and NJ Trawl Surveys.

### *Relative F*

Relative F is calculated as the ratio between annual harvest and an annual index of abundance (recreational CPUE). For weakfish, relative F was used in the 2009 peer reviewed assessment because it was free of the assumption of a constant M as was assumed in the previously used ADAPT VPA. Relative F is easily updated once annual landings are finalized. Concern was expressed that this index may not be as informative near term because the CPUE from the index of abundance has become too low. This makes interpretation of relative F more difficult because there is potential that noise in the index could mask the overall signal. An additional issue with using this relative F as an indicator is that calculating it requires an estimate of total removals from the population. This is a concern because annual estimates of discards are not available for the commercial fishery. Past methods use ratio-based estimates calculated across all years. However, with recent changes in the regulations (i.e. 100 lb trip limit), the most recent discard ratios may not reflect what is happening under current management. The TC recommended updating the relative F index possibly through 2010 pending the availability of landings data and noting the above concerns.

### *2011 Results*

Regarding the discard estimates, the ratio-based estimates of the past can be scaled up and some 2011 estimates did just that. However, overall a recent decline in relative F is still indicated. This may reflect actions taken in Addendum 4, but it should be noted the estimate of relative F for 2010 was also affected by averaging the high 2011 NJ index, with lower 2011 MRIP and DE indices.

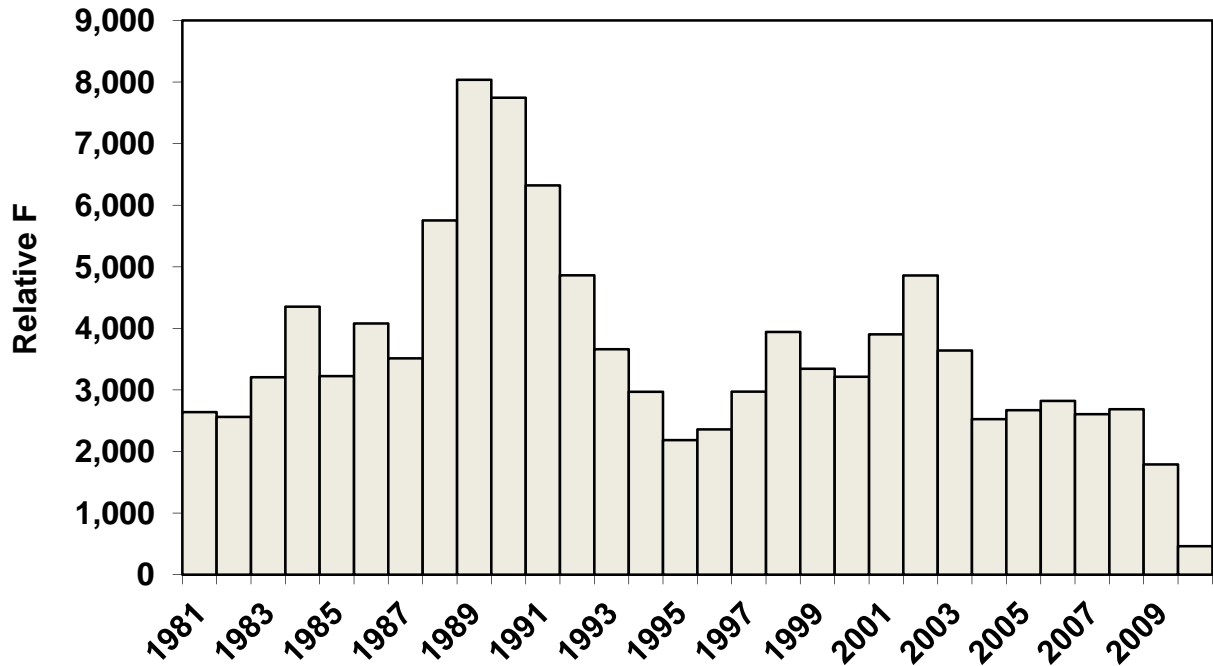


Figure 3: Relative F for weakfish.

*Juvenile Indices (age 0)*

The TC recommended that age 0 indices of abundance be updated and presented to the Board as an early indicator of stock recruitment.

*2011 Results*

Standardized indices continue to show some fluctuation, recruitment is still occurring at a level that does not reflect the complete downward trend in stock status shown everywhere else. However since a spike in the unweighted grand mean in 2007, the values have remained fairly low for a four year period, when compared to the time series.

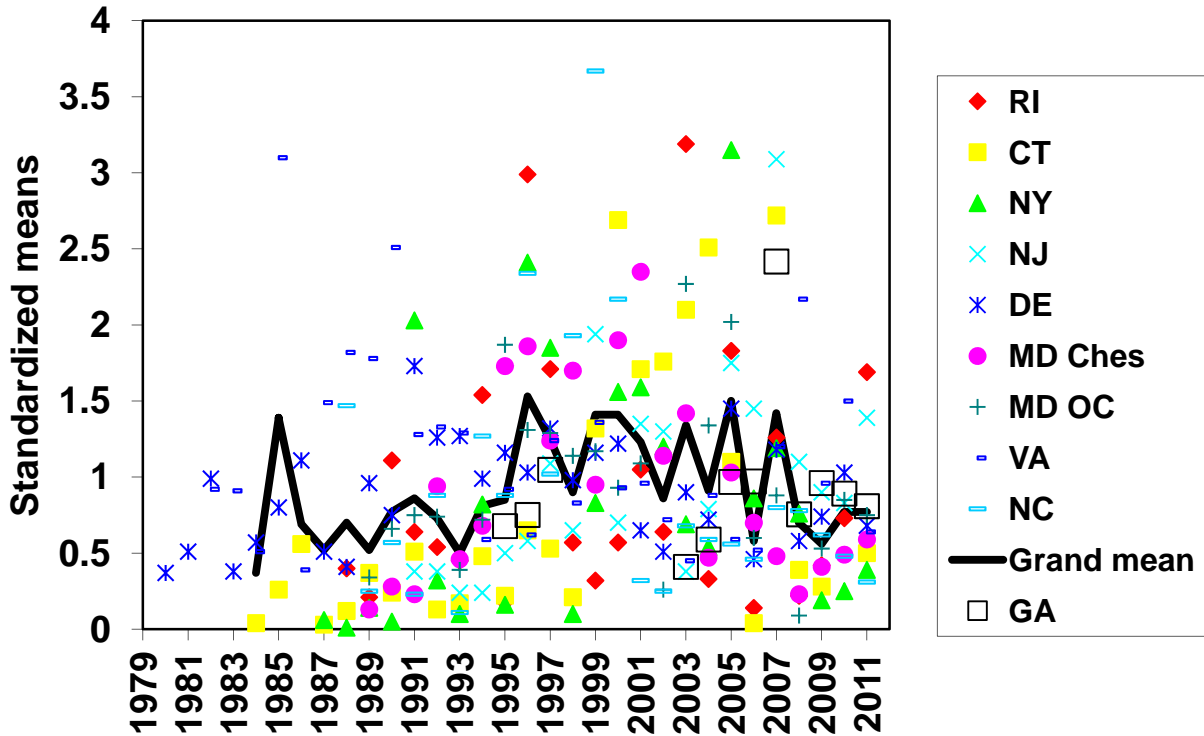


Figure 4: Juvenile abundance indices by state and grand unweighted mean for weakfish.

**Potential for Triggers based on Stock Indicators**

The TC discussed whether there was any basis for setting triggers for management changes. No definitive recommendations were made. It was put forward that the biomass indices provided a reasonable option. A potential trigger would be to consider management changes once current index levels are near those realized in the period of 1997 to 1999, a period when the stock size was considered to be above 20% SSB.

**Review of Trends in gear- and area-specific weakfish landings, 2007-2011**

*Percent of Landings by State for Recreational Fishery*

There has been an ongoing shift in the area where a majority of the recreational harvest occurs from New Jersey to North Carolina over the most recent years. However, Addendum IV to Amendment 4 (2010) implemented a 1 fish bag limit in the recreational fishery.

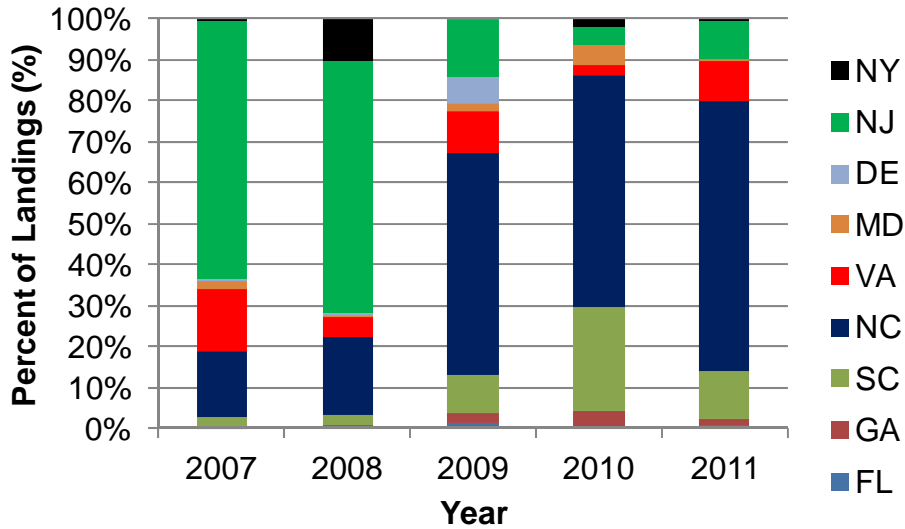


Figure 5: Percent of recreational landings by state.

*Percent of Landings by State for Commercial Fishery*

There has also been an ongoing shift in the area where a majority of the commercial harvest occurs from New Jersey to North Carolina over the most recent years. However, Addendum IV to Amendment 4 (2010) implemented a 100 lb trip limit in the commercial fishery.

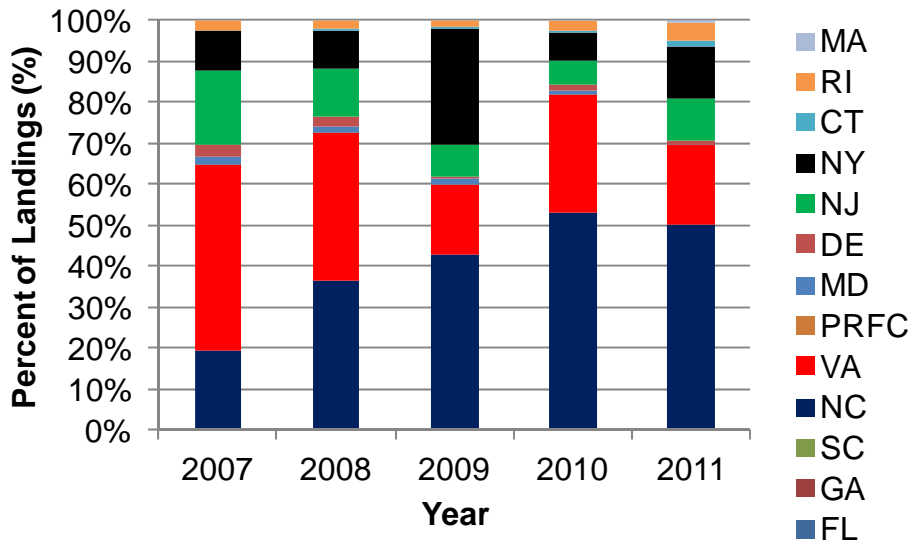


Figure 6: Percent of commercial landings by state.