*Atlantic States Marine Fisheries Commission*

# ADDENDUM II TO THE OMNIBUS AMENDMENT TO THE INTERSTATE FISHERY MANAGEMENT PLANS FOR SPANISH MACKEREL, SPOT, AND SPOTTED SEATROUT

## *Management of the Spot Fishery using the Traffic Light Approach*

*Vision: Sustainably Managing Atlantic Coastal Fisheries*

**Approved August 2014**

## 1.0 Introduction

ASMFC has coordinated interstate management of spot (*Leiostomus xanthurus*) from 0-3 miles offshore since 1987. The management area extends from Delaware to the east coast of Florida. Spot is managed under the Omnibus Amendment (2011) to the Spot, Spotted Seatrout, and Spanish Mackerel FMPs. Management authority from 3-200 miles from shore lies with NOAA Fisheries.

This Addendum establishes the use of the Traffic Light Approach (Caddy and Mahon, 1995; Caddy, 1998, 1999) with precautionary management framework in the management of spot. The management framework utilizing the Traffic Light Approach replaces the management triggers as stipulated in the Omnibus Amendment. The Board initiated this addendum at its February 2014 meeting following the development of the Traffic Light Approach (TLA) report and management memo by the Atlantic Croaker Technical Committee (TC) and Spot Plan Review Team (PRT). The PRT recommend spot for a benchmark stock assessment with the proposed Traffic Light Approach (TLA) providing guidance in the interim period.

## 2.0 Overview

### 2.1 Statement of the Problem

Under the previous management program for spot, commercial landings, recreational harvest, and survey index values for spot are compared to the 10$^{th}$ percentile of the indices time series. If two of these indices (one of which must be fishery-independent) are below the 10$^{th}$ percentile the PRT is to recommend to the Board that it consider management action.

The spot management triggers as stipulated in the Omnibus Amendment are limited in their ability to illustrate long-term declines or increases in stock abundance. Under the annual trigger exercises, the high degree of variability in year to year index values make it difficult to respond to gradual but persistent decreases in the trigger indices without a formal management framework in place.

### 2.2 Background

Spot are a small sciaenid forage species that support commercial and recreational fisheries in the Mid and South Atlantic regions. Spot migrate seasonally along the coast, moving northward and inshore to estuaries and bays during warmer months (spring-fall) and southward and offshore to more oceanic waters in the winter. Spot feed on planktonic organisms as post-larvae and young of the year, and as juveniles and adults prey on bottom dwelling organisms such as worms and crustaceans. Spot reach maturity by approximately age two and are considered a short-lived species rarely living beyond six years.

While state level stock assessments for spot have been conducted over the years, a coastwide benchmark assessment has not yet been done. As such, the stock status of spot is unknown.

The Omnibus Amendment initiated annual trigger exercises to monitor the status of spot resource while also directing the Board to consider management action depending on the results of the trigger exercise. Without coastwide minimum management measures, the current trigger exercises do little to provide effective management in between stock assessments.

Additional concerns have been raised over the significant level of spot bycatch and discards that may be occurring in the shrimp trawl fishery (ASMFC 2010, 2011). While bycatch monitoring programs have been enacted in some states, such efforts have not encompassed the entire management range. Though bycatch reduction devices have been introduced in the shrimp trawl fishery, there has not been observed increases in spot abundance in recent years. Addressing these bycatch concerns, as well as the potential for increased regulatory discards in directed fisheries under the new management program will need to be considered by the Board.

In relatively short-lived species like spot it is preferable to respond to persistent periodic declines that occur over several years rather than respond to rapid annual changes. Declines that occur over several years require close monitoring in order to anticipate when or if management action may be required. With this in mind, management responses that use techniques showing multi-year changes and trends would be more useful than simply examining year to year changes. Knowing the level at which to respond or initiate some type of management action should be based on long-term knowledge of general stock indications as well as how that stock has changed over time. The Traffic Light Approach offers the ability to illustrate trends based on relevant stock characteristics that can include historical abundance, life history parameters, and response to fishing pressure; this approach can also incorporate assessment based reference points.

*Traffic Light Approach (TLA)*

The TLA was originally developed as a precautionary management framework for data poor fisheries whereby reference points could be developed that would allow for a reasonable level of resource management. The name comes from assigning a color (red, yellow, or green) to categorize relative levels of different indicators for either a fish population or a fishery. These indicators can be combined to form composite characteristics within similar categories and can include biological indicators, such as growth and reproduction; population level indicators, such as abundance and stock biomass estimates; or fishery indicators, such as harvest/landings and fishing mortality. However, each indicator must be evaluated separately to determine its appropriateness for use in management.

In general practice when applying the TLA, the green/yellow boundary is typically set at the long-term mean of the data series reference period (Halliday et al., 2001) of the indicator and the yellow/red boundary is set at 60% of the long-term mean, which would indicate a 40% decline from the series mean. Index values in the intermediate zone can be represented by a mixture of either yellow/green or yellow/red depending on where they fall in the transition zone. Since increasing proportions of red reflect decreasing trends away from the time series mean, the relative proportion of red of the indicator may offer one way of determining if any management response is necessary.

*North Carolina Blue Crab Adaptive Management Framework*

One current example of the TLA was recently implemented for the North Carolina blue crab fishery (Table 1) by the North Carolina Division of Marine Fisheries (NCDMF). The NCDMF developed a management framework that applies the TLA to stock characteristics (adult abundance, recruit abundance, and production) derived from fishery-independent data (NCDMF surveys). Within the management framework, two levels of management response were developed based on the relative proportion of red within each characteristic. A moderate

response is required when the traffic light characteristic meets or exceeds 50% red for three consecutive years and can result in actions that limit harvest such as restricting trip level harvest for sponge crabs, institution of minimum and/or maximum size limits for female crabs, or seasonal closures in spawning areas. An elevated management level response is initiated when the traffic light characteristic meets or exceeds 75% proportion of red for three consecutive years and can result in more restrictive management actions such as prohibition of sponge crabs, no peeler harvest, or closure of the fishery through season closures, gear restrictions or both.

**Table 1. North Carolina Blue Crab Adaptive Management Framework**

| Stock Characteristic | Moderate management level (50% red) | Elevated management level (75% red) |
|---|---|---|
| **Adult abundance** | A1. Increase in minimum size limit for male and immature female crabs<br>A2. Reduction in tolerance of sub-legal size blue crabs (to a minimum of 5%) and/or implement gear modifications to reduce sublegal catch<br>A3. Eliminate harvest of v-apron immature hard crab females | A4. Closure of the fishery (season and/or gear)<br>A5. Reduction in tolerance of sub-legal size blue crabs (to a minimum of 1%) and/or implement gear modifications to reduce sublegal catch<br>A6. Time restrictions |
| **Recruit abundance** | R1. Establish a seasonal size limit on peeler crabs<br>R2. Restrict trip level harvest of sponge crabs (tolerance, quantity, sponge color)<br>R3. Close the crab spawning sanctuaries from September 1 to February 28 and may impose further restrictions | R4. Prohibit harvest of sponge crabs (all) and/or require sponge crab excluders in pots in specific areas<br>R5. Expand existing and/or designate new crab spawning sanctuaries<br>R6. Closure of the fishery (season and/or gear)<br>R7. Gear modifications in the crab trawl fishery |
| **Production** | P1. Restrict trip level harvest of sponge crabs (tolerance, quantity, sponge color)<br>P2. Minimum and/or maximum size limit for mature female crabs<br>P3. Close the crab spawning sanctuaries from September 1 to February 28 and may impose further restrictions | P4. Prohibit harvest of sponge crabs (all) and/or require sponge crab excluders in pots for specific areas<br>P5. Reduce peeler harvest (no white line peelers and/or peeler size limit)<br>P6. Expand existing and/or designate new crab spawning sanctuaries<br>P7. Closure of the fishery (season and/or gear) |

*Applying the Traffic Light Approach to Spot*

The TLA has utility in addressing declines in harvest or production of spot fisheries. While the Blue Crab Adaptive Management Framework uses the TLA as a stock assessment, the TLA can provide management guidance in lieu of a current stock assessment for spot. The PRT recommends spot for a benchmark stock assessment with the proposed TLA providing guidance in the interim period.

For spot, the PRT determined a more appropriate production characteristic for both species would be a 'harvest' characteristic (figure 1) comprised of composite commercial landings and recreational harvest data. These indices are currently used in the annual trigger exercises for these species. Similarly, a composite of fishery-independent survey indices could be used to derive the adult abundance characteristic (figure 2). As the TLA is not considered a stock assessment, the characteristics would be understood as population characteristics rather than stock characteristics. The PRT will utilize the best available data and modify the TLA as needed in an annual review and update

*Population Characteristics*

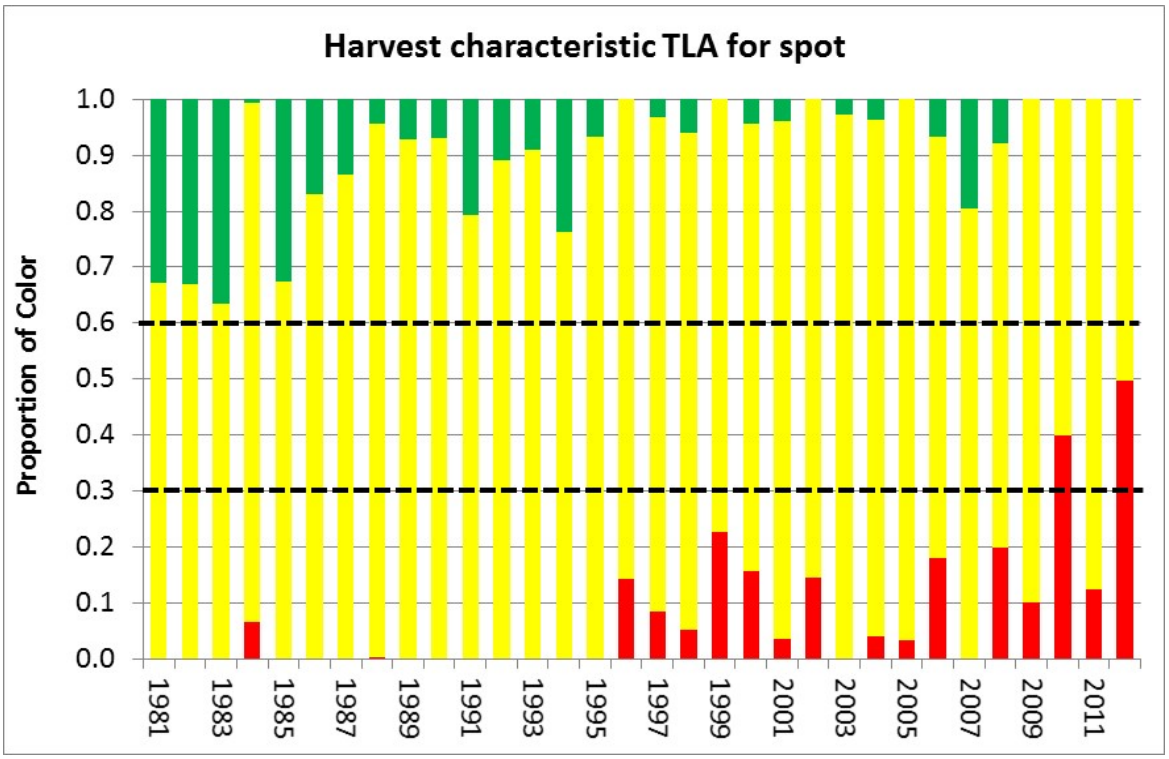


Figure 1. Composite TLA using Commercial Landings and Recreational Harvest for spot with Management Thresholds of 30% and 60% Proportion Red (Base years 1989 – 2012).

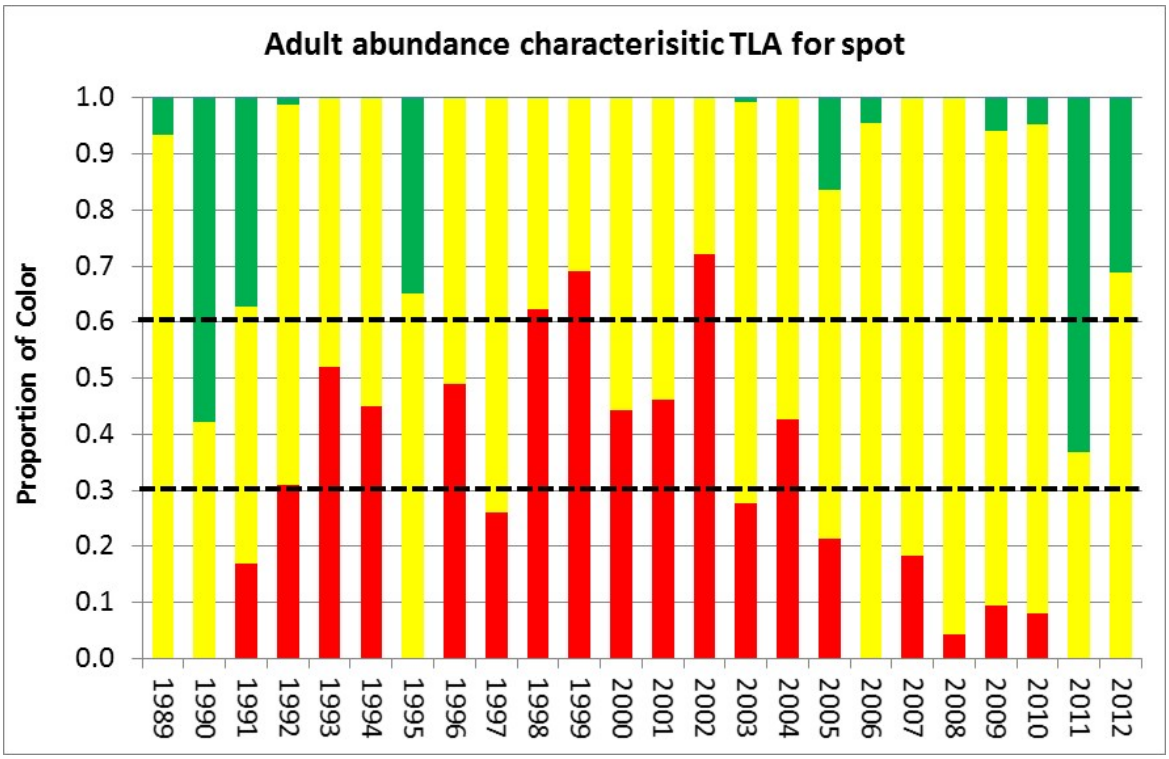


Figure 2. Composite TLA using Fishery-independent Surveys and Index for spot with Management Thresholds of 30% and 60% Proportion Red (Base years 1989 – 2012).

## 3.0 Management Program

### 3.1 Spot Management

**State-by-State Management Framework Based on Threshold of Multiple Population Characteristic criteria for Management Action**

Under this management program, if thresholds for both population characteristics (Adult abundance 'AND' Harvest) achieve or exceed the proportion of threshold for the specified two year period, then management action will be taken. These thresholds are listed below:

***Proportion Thresholds***

30%- this represents moderate concern to the fishery with moderate management response
60%- this represents significant concern to the fishery with elevated management response

Management measures will remain in place for two years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the thresholds will not be applied to the harvest characteristics in assessing the fishery for two years, as the fishery-dependent data may be influenced by management action.

***Management Measures***

The PRT will recommend the appropriate percent reduction in harvest needed and state-by-state measures to achieve the harvest reduction for approval by the Board. This allows the states to meet the individual needs of their state's fisheries. The application of an overall harvest percentage reduction would be proportional to the magnitude of exceeding the trigger, using a combination of management tools that include size limits, bag/trip limits, seasonal closures, and gear restrictions.

Management measures will remain in place for two years to promote consistent measures and allow for sufficient time to evaluate population response. Once management action has been taken, the thresholds will not be applied to the harvest characteristics in assessing the fishery for two years, as the fishery-dependent data may be influenced by management action.

## 4.0 Compliance:

The management framework contained in Section 3.0 of Addendum II to the Omnibus Amendment are effective immediately upon its approval

## 5.0 References

ASMFC, 2005. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker. Approved 2005. 92pp.

ASMFC, 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. 366pp.

ASMFC, 2011. Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout. Approved 2011. 131pp.

Caddy, J.F. 1998. A short review of precautionary reference points and some proposals for their use in data-poor situations. FAO Fisheries Technical Paper No. 379, 30pp.

Caddy, J.F. 1999. Deciding on precautionary management measures for a stock based on a suite of Limit Reference Points (LRPs) as a basis for a multi-LRP harvest law. NAFO Sci. Council Studies, 32:55-68.

Caddy, J.F. 2002. Limit reference points, traffic lights, and holistic approaches to fisheries management with minimal stock assessment input. Fisheries Research 56:133-137.

Halliday, R.G., L.P. Fanning, and R.K. Mohn. 2001. Use of the Traffic Light Method in Fishery Management Planning. Canadian Science Advisory Secretariat, Research Document No. 108, 41pp.