Atlantic States Marine Fisheries Commission

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MEMORANDUM

April 20, 2015

To:	**Atlantic Striped Bass Management Board**
From:	**Atlantic Striped Bass Technical Committee**
RE:	**Progress on F Reference Points for the Chesapeake Bay, Delaware Bay and Hudson River**

The Atlantic Striped Bass Technical Committee (TC) met on January 9, and March 24, 2015 to continue the development of fishing mortality (F) reference points for the Chesapeake Bay (CB) as well as consider potential F reference points for the other spawning stocks (Delaware Bay and Hudson River). The following is a summary of the TC's discussion.

Chesapeake Bay Reference Point Discussion

In January 2015, the TC reviewed the previously proposed options for developing F reference points for the CB and recommended a suite of options to be analyzed further. The TC reviewed these analyses at their March 2015 meeting. The analyses reviewed as well as the conclusions reached are detailed below.

(1) Use the statistical catch at age (SCAA) natural mortality (M) in the tagging model or use the tagging model M in yield per recruit (YPR) calculations.
   - The analysis showed that this approach led to a relatively stable estimate of fishing mortality (F) over time causing the Harvest Control Model (HCM), used for setting the CB quota, to be driven mostly by the exploitable biomass in the CB. This resulted in a quota that varied drastically year to year which is un-desirable by industry and management.
   - Additionally, this method would create disconnect between the methods used to assess and manage the CB and the remainder of the coastal fishery because the CB reference points would be external from the SCAA modeling of the striped bass population.

(2) Use tag-based estimates of F for the CB and compare it to an empirical target or threshold to assess status and set a CB quota. The target or threshold may be based on a comparison with a juvenile abundance index (JAI) or historic estimates of tag based CB F for resident fish (males, 18-28") during a stable period.
   - There was only a very weak relationship between F and the MD JAI with a three year lag. The approach also suggests no negative impact of F on juvenile recruitment.
   - Back-calculating the CB quotas with this method led to significant inter-annual variation in the quotas making it difficult to use for management.
   - This method would also create disconnect between the CB and the remainder of the coastal fishery because the CB would be assessed and managed using a different model than SCAA modeling of the striped bass population.

(3) Use the CB fleet component of the coastwide F reference points developed from the SCAA model as the target and threshold, and use annual estimates of the CB fleet F to assess overfishing status and set the CB quota.

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- The analysis showed that since the stock was declared rebuilt in 1995, the ratio of the Bay fleet F and coastwide F has been fairly constant over time, suggesting that the CB F contributes half of the total F at age-5. There was also a slight declining trend over recent years meaning the CB F is declining compared to the coastal F.
- The CB fleet F in the model represents the impact of the CB fleet on the entire population, not just the CB stock, since the model is not stock-specific. Maintaining the CB fleet F at the target should ensure that the impact of the CB fleet on the entire population is sustainable.

The TC concluded that using the SCAA CB fleet F reference point (option 3) would be the best approach going forward to develop the CB F reference points for several reasons:
- The F estimates for the CB fleet are based on the total harvest and age structure specific to the Bay.
- The CB F would be directly related to the coastwide F, and would provide consistent management metrics for the coast and the CB.
- The risk of overfishing would be relatively low because the CB F is tied into the coastwide F which is generally thought to be conservative.

The TC also acknowledged that this approach would require annual assessment updates in order to set the CB quota. The TC next discussed the timeframe to be used to establish the ratio of CB F reference points to coastwide reference points for this analysis. Two timeframes were proposed, a five year and a twelve year. After much discussion the majority of TC members felt that using the shorter, five year timeframe, was the appropriate method because the shorter five year time frame would be consistent with what had been used in the peer reviewed 2013 benchmark stock assessment to establish the coastwide reference points.

Hudson River Reference Point Discussion
The TC representative from New York gave an overview of NY tagging data for the Hudson River (HR). The data showed that the majority of fish tagged within the HR are re-captured on the coast (70%) and that they appear to be migrating to the coast relatively quickly having a short residence time within the HR. The TC also discussed the difficulty in trying to set a boundary line to demarcate the estuary if it were to become its own fleet within the SCAA model because a majority of the fish are within the NY Bight and Long Island Sound. As a result, the TC felt that it was not a viable option to have a separate F reference point for the HR.

Delaware Bay Reference Point Discussion
The TC representative from Delaware gave an overview of DE tagging data for the Delaware Bay (DB). The tagging data revealed that for all lengths, 32% of tagged fish are re-captured within DB and 23% are re-captured within CB. A large percentage of the fish that go to the CB are harvested or sold. DE is proposing developing DB F reference points and setting an annual quota similar to the CB. The TC thought it was a viable option to develop DB Fs by adding DB as a fleet within the SCAA and use the same methods as decided upon for the CB to develop the DB F reference points.

Conclusions
CB

The TC concluded that it was capable of developing F reference points for the CB as described above. It is the most readily available reference points of the spawning stocks because the CB is an existing fleet within the SCAA model, and it would be within the scope of an update assessment to develop the CB F and a complementary set of F reference points for the coastal fleet.

DB

Considering the DB is currently part of the coastwide fleet within the SCAA model, the TC concluded it was outside the scope of an update assessment to pursue developing DB Fs for management prior to the next benchmark stock assessment. The TC can continue to explore incorporating a separate DB F reference point into the SCAA model in preparation for the next benchmark stock assessment.

HR

The TC concluded that it is not possible to derive F reference points for the Hudson River stock primarily due to the fact that Hudson origin striped bass spend very little time in the river and most of the exploitation occurs in the ocean where they become part of the mixed coastwide stock. Because this stock is exploited as a part of costwide population, the coastwide population F reference points seem to be most appropriate for management.