Atlantic States Marine Fisheries Commission

SHAD AND RIVER HERRING
Advisory Panel Call and Webinar

Friday, January 15, 2021
10:00 a.m. - 11:00 a.m.

DRAFT AGENDA

Webinar: https://global.gotomeeting.com/join/777840093
You can also dial in using your phone: +1 (224) 501-3412; Access Code: 777-840-093

Objectives:
- *Review Technical Committee recommendations for improving shad stocks*
- *Provide AP input on TC recommendations*

1. **Welcome & Review of the Agenda** *(P. Lyons-Gromen)* 10:00 a.m.

2. **Review Technical Committee recommendations for improving shad stocks** *(C. Starks)* 10:05 a.m.

3. **AP Discussion on TC recommendations** *(P. Lyons-Gromen)* 10:20 a.m.

4. **Adjourn** 11:00 a.m.

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Shad and River Herring Management Board**

FROM: **Shad and River Herring Technical Committee**

DATE: **January X, 2021**

SUBJECT: **TC Recommendations on improving shad stocks given assessment results**

In August 2020, the Board reviewed and accepted the 2020 Benchmark Stock Assessment for American shad (assessment), which found that the coastwide metapopulation is depleted, and adult mortality for several system-specific stocks is unsustainable. Additionally, the assessment concluded that shad rebuilding is limited by restricted access to spawning habitat. In response, the Board tasked the Shad and River Herring Technical Committee (TC) to "*identify potential paths forward to improve shad stocks along the coast considering the assessment results*." The TC met several times via webinar following the August 2020 meeting to address this task.

The TC considered potential management and monitoring improvements for specific stocks identified in the assessment as unsustainable, depleted, or of unknown status with an active fishery. In addition, the TC developed broad recommendations for the coastwide metapopulation. A summary of the TC's system-specific and coastwide recommendations are summarized below. For each system, more information and rationale for the TC recommendation is provided in individual memos (enclosed).

Connecticut River

The assessment found that adult mortality for the Connecticut River stock is unsustainable. However, the annual adult shad fish lift counts have shown an increasing trend over the past 12-15 years, even as total mortality has remained very high. In addition, the sustainability metrics in the approved Sustainable Fishery Management Plan (SFMP) have remained above target levels, with the exception of the initial year of the plan's implementation. The TC agrees that high downstream mortality at hydropower facilities and other associated factors are the primary sources of Connecticut River shad mortality, rather than fishery effort, and that the current low levels of fishing activity have not contributed to the increased values of total mortality in the system. Therefore, the TC does not recommend any further restrictions to the Connecticut River shad commercial and recreational fisheries. The TC recommends the following actions as pathways to improve the stock:

- Continue to closely monitor the metrics currently used to gauge fishery sustainability: adult lift passage, juvenile abundance, and adult escapement and implement management response to negative metrics, as appropriate
- Work with Connecticut River Atlantic Salmon Commission partners to realize continued passage and habitat improvements
- Explore alternative (non-creel) survey methods to provide recreational effort and harvest estimates

Delaware River

The assessment found that adult mortality for the Delaware River stock is unsustainable. The TC does not recommend any changes to management or monitoring for the 2021 fishing season. The TC recommends the following actions as first steps for addressing the Delaware River stock:

- Revise the SFMP to include updated data and stock assessment results, and incorporate a management response to be triggered by an unsustainable adult mortality determination from the stock assessment. Potential management responses that will be considered by the Delaware River Basin Fish and Wildlife Management Cooperative include:
    - Closure of commercial fishery; recreational catch and release only
    - Reduce commercial fishery by 50% through gear restrictions, seasons, trip limits, or quota reduction; reduce recreational fishery to 1 fish bag limit
    - Reduce commercial fishery by 25% through gear restrictions, seasons, trip limits, or quota reduction; reduce recreational fishery to 2 fish bag limit
    - Gill nets with stretch mesh greater than or equal to 4 inches and less than 7 inches will be prohibited below the mixed stock demarcation line during February 1st - May 31st. Harvest of American shad as bycatch (American shad <50% of harvest by weight) is still permissible below the demarcation line from Bowers Beach, DE to Gandys Beach, NJ.

Potomac River

The assessment found that adult mortality for the Potomac River stock is unsustainable. Additional years of data not included in the assessment (2018-2020) show continued increasing trends in the Potomac Pound Net Catch per Unit Effort index, as well as increasing trends for shad in the Potomac River Striped Bass Spawning Stock and Juvenile Seine Surveys. The current known sources of in-river removals include broodstock collection programs, and limited bycatch harvest by in-river pound and gill net fisheries. The TC was concerned that further restricting these minor removals could result in reduced data availability for assessment, and would likely not have a significant positive impact on the stock. The TC recommends the following actions as pathways to improve the stock:

- Reduce or eliminate harvest/bycatch of Potomac River origin American shad in ocean fisheries (near term, high priority)
- Prioritize conservation of natural land cover throughout the lower Potomac watershed (ongoing, long term, high priority).
- Continuation of expansion of commercial and recreational fisheries on non-native predators (blue catfish and flathead catfish) in the Potomac River (ongoing, high priority).
- Identify the contribution of Potomac River origin American shad to mixed stock ocean bycatch through the collection and submission of biological samples (i.e. American shad fin clips) to the U.S. Geological Survey for their effort in building a comprehensive genetic tissue repository for alosine species (Starting in 2021, high priority).

Hudson River

The assessment found that the Hudson River stock is depleted. There is currently no harvest of American shad permitted in the system. TC agrees that harvest of Hudson-origin shad in mixed-stock fisheries in large coastal bays (i.e. Delaware Bay), incidental bycatch of American shad in federal fisheries, and habitat loss are the main factors affecting the status of the stock. The TC recommends the following actions as potential pathways to improve the stock:

- Reduce/eliminate harvest of Hudson shad in mixed-stock fisheries and ocean bycatch (near-term; high priority)

- Identify stock composition of bycatch occurring in Federal fisheries and quantify impact to the Hudson stock (near-term; high priority)
- Implement habitat restoration actions identified in the Hudson River Estuary Habitat Restoration Plan (Miller 2013) to restore high-quality spawning, nursery and refuge habitats for American shad (on-going, long-term; high priority)
- Continuation of fishery closure until recovery targets (Hudson River American Shad Recovery Plan, in prep) are met and stocks are robust enough to support sustainable harvest (long-term; high priority)

Maine Systems

The assessment determined that American shad stock status throughout Maine is unknown. The two major areas of concern addressed in the assessment regarding data were insufficient time series length and validity of count data collected at monitored fishways on Maine's larger rivers. The TC agreed that there is currently limited potential to improve biological data collection due to small run sizes, so the TC recommends the following action as a pathway to improve Maine shad stocks:

- Removal of significant barriers to upstream passage. This may enhance production, increase abundance and provide more opportunity to collect biological data through additional sampling methods without taking a significant portion of the returns to a system.

Merrimack River

The assessment determined that the American shad stock status in the Merrimack River is unknown; data were insufficient to determine abundance status, and deficiencies with low age samples in some years prevented the calculation of a mortality estimate. The Merrimack SFMP benchmark for spawning run sustainability has been achieved with an increasing trend in the last 10 years. However, the SFMP's warning threshold on shad mortality (based on Amendment 3 provides benchmark values for New England) has been exceeded each year since 2013. Based on the assessment findings and this additional data, the TC recommends the following focal areas and actions as pathways to improve the stock:

- Merrimack River Shad Mortality: Commit to addressing concerns with data time series and age sample sizes as indicated in SFMP. Discuss goals, and focus new staff on sampling targets and the need to improve the data quality and utility of mortality estimates for some years.
- Juvenile Abundance Index: No historical or recent efforts have been undertaken to create a shad juvenile abundance index (JAI) on the Merrimack River, though state and federal agencies have discussed an interest in developing a JAI index. Concerns have been expressed over inherent high variability in shad JAI indices on the East Coast, and most importantly, no identified funding source to support a JAI index project.
- Repeat Spawning Ratio: Improve spawning ratio data time series through ongoing shad scale aging. The current time series is too brief to use the data for setting a repeat spawning ratio benchmark or to discern any trends.
- Restoration Efforts: Poor passage at mainstem dams and tributaries without passage is a significant limitation to increasing shad populations. Continue annual reviews with hydropower dam owners to identify operation and maintenance issues that can impact shad passage and recommended improvements. Continue development of a Comprehensive Plan for fish restoration in the Merrimack system that will set target population levels and prioritize restoration efforts during the Pawcatuck Dam relicensing process.

Tar-Pamlico

The assessment determined that the American shad stock status in the Tar-Pamlico system is unknown, due to insufficient data. SFMP sustainability metrics, including relative female abundance and relative fishing mortality (F) for female shad derived from the electrofishing survey, have not triggered a management response; however, the female abundance index has fallen below the threshold in the last two years for which data is available (2018 and 2019, data are unavailable for 2020 due to COVID-19 pandemic restrictions). The estimate of female relative F has remained well below the threshold since 2013, consistent with a decline in commercial landings. In 2017, NCDMF initiated exploratory juvenile abundance sampling for striped bass using trawl and seine nets in the Tar-Pamlico and Neuse rivers. While the focus of the survey is to obtain juvenile striped bass, the survey may also intercept American shad and may be of use for a juvenile abundance index in the future.

Additionally, a management response for striped bass has been in effect since March 18, 2019 prohibiting the use of all gill nets upstream of the ferry lines from the Bayview to Aurora Ferry in the Tar-Pamlico River and the Minnesott Beach and Cherry Branch ferry in the Neuse River. While targeting striped bass, this action also protects American shad by removing gill nets from the normal fishing grounds for American shad in the Tar-Pamlico River.

- Considering the recent management and monitoring changes described above, the TC recommended no additional actions for the Tar-Pamlico system at this time.

Cape Fear

The assessment determined that the American shad stock status in the Cape Fear system is unknown, due to insufficient data. The 2020 Benchmark Stock Assessment noted that there is an increasing trend in adult abundance, likely a sign of improved passage at Lock and Dam 1. Monitoring under the current SFMP is sufficient to detect any changes in abundance. Annual updates to sustainability parameters for female relative abundance and female relative F have not exceeded their thresholds since 2011 and 2012, respectively. Additionally, in 2017, NCDMF initiated exploratory juvenile abundance sampling for striped bass using trawl and seine nets in the Cape Fear River and its tributaries. While the focus of the survey is to obtain juvenile striped bass, the survey may also intercept American shad and may be of use for a juvenile abundance index in the future.

- Considering the assessment findings and the information above, the TC does not recommend any changes to management or monitoring requirements for the Cape Fear system at this time.

South Carolina Systems

The assessment determined that the American shad stock status for the Winyah Bay, Santee-Cooper, and Ace Basin systems are unknown due to insufficient data. Commercial fisheries occur in these systems under approved SFMPs. Additional information considered by the TC for each system is summarized below.

Winyah Bay: Young of Year (YOY) abundance data were not available, and there have been conflicting trends in adult abundance since 2005, further confounding assessment of abundance conditions in recent years. Data from fishery independent gill netting on the Waccamaw River (currently 2011-2020) will meet the minimum time series requirement and will be available for the next benchmark stock assessment. Electrofishing sampling for YOY juvenile shad began in 2011 and has occurred every year since. These data (currently 2011-2020) will meet the minimum time series (ten years) and will be available for the next benchmark stock assessment.

Santee-Cooper: YOY abundance data were not available and there have been conflicting trends in adult abundance since 2005, with an increasing trend detected from the Cooper River Recreational Creel Survey and no trend detected from the Santee River Adult Gill Net Survey or Santee River Commercial CPUE. Data from fishery independent gill netting on the Santee River (currently 2011-2020) will meet the minimum time series requirement and will be available for the next benchmark stock assessment. Electrofishing sampling for YOY juvenile shad began in 2011 and has occurred every year since. These data (currently 2011-2020) will meet the minimum time series and will be available for the next benchmark stock assessment.

ACE Basin: There were no YOY abundance data available and no trend detected in adult abundance since 2005. Electrofishing sampling for YOY juvenile shad began in 2011 and has occurred every year since; these data (currently 2011-2020) will meet the minimum time series and will be available for the next benchmark stock assessment.

- Considering the assessment findings and the information above, the TC does not recommend any changes to management or monitoring requirements for South Carolina systems at this time.
- The TC agrees with recommendations proposed by South Carolina to continue and improve existing monitoring programs and sampling efforts in all systems to expand the time series to meet the assessment threshold of ten years. Specific monitoring recommendations are included in the enclosed memo from South Carolina. The highest priority is beginning to collect age samples from otoliths in addition to scales.

Savannah River

The assessment determined that the American shad stock status in the Savannah River is unknown. Currently, commercial fisheries are pursued by both SC and GA under approved SFMPs. There were no YOY abundance data sets with appropriate time series available and no trend detected in adult abundance (two data sets) since 2005. As part of an ongoing sampling program, GADNR conducts electrofishing for spawning adult shad; these data (currently 2010-2020) will meet the minimum time series (ten years) and will be available for the next benchmark stock assessment. Additionally, SCDNR has conducted electrofishing sampling for YOY juvenile since 2011; these data will meet the minimum time series and will be available for the next benchmark stock assessment.

- Considering the assessment findings and the information above, the TC does not recommend any changes to management or monitoring requirements for the Savannah River at this time.
- South Carolina and Georgia intend to continue and improve existing monitoring programs and sampling efforts in all systems to expand the time series to meet the assessment threshold of ten years. Specific monitoring recommendations are included in the enclosed memos from South Carolina and Georgia.

Altamaha River

The assessment determined that the American shad stock status in the Altamaha River is unknown. A commercial fishery occurs in this system under an approved SFMP. There were no YOY abundance data sets with appropriate time series available, and abundance indices showed conflicting trends. Since 2010, GADNR has conducted seine surveys to collect data on YOY shad; these data will meet the minimum time series and will be available for the next benchmark stock assessment. Additionally, GADNR will consider implementing improvements to the Altamaha River Tagging Survey that were recommended in the assessment.

- Considering the assessment findings and the information above, the TC does not recommend any changes to management or monitoring requirements for the Altamaha River at this time.
- Georgia intends to evaluate and discuss possible changes to improve management and monitoring. In particular, the state is considering collecting both otoliths and scales for age data.

St. Johns River

The assessment determined that the American shad stock status in the St. Johns River is unknown. Trend analysis of YOY and spawning stock abundance indices showed no trend and an increasing trend, respectively. It is likely that the population was stable or improving during the assessment period, since neither index declined over time and mean fork length of males and females both increased. Additional data that could aid in stock status determination are being collected; spawner otoliths are available for age composition and size-at-age starting in 2011, and a time series greater than ten years will be available for the next assessment. Currently, the only known source of American shad removals is recreational harvest permitted under the approved SFMP.

- Considering the assessment findings and the information provided by the state, the TC does not recommend any changes to management or monitoring requirements for the St. Johns River at this time.
- The TC recommends that FL improve monitoring data by better accounting for environmental variability effects, and using age data to identify year class and maturity schedule.

Coastwide Recommendations

The TC also discussed pathways for improving shad stocks at the coastwide level. In general, the TC felt that management restrictions at the system level are not likely to produce the desired result, given that directed harvest is already significantly restricted and current habitat conditions and other factors such as passage are limiting population recovery at a larger scale. Therefore, the TC recommends the following actions to improve data quality and availability for assessment, and to lay a stronger foundation for success in shad recovery efforts along the coast.

- The TC agrees that upstream and downstream passage mortality pose substantial threats to shad stocks along the coast and limit the potential for population recovery. The assessment provided analysis suggesting that passage barriers reduce coastwide spawner production potential by as much as 41%. To address this issue, the TC recommends that further action by the Board or Commission is needed to promote or implement measures to improve fish passage along the coast. The TC is currently developing a memo to provide the Board with more detail and recommendations on this issue.
- The TC does not recommend any changes to the current monitoring requirements established in Amendment 3. However, the TC recommends that states aim to improve their surveys to increase survey power to meet the assessment threshold of 80% power to detect a change of 50% over a 10 year time period, when feasible.
- The TC recommends paired otoliths and scales be collected in all systems where it is possible.
- The TC recommends the Board task them with developing alternative methods or metrics to evaluate bycatch removals in directed mixed-stock fisheries in state waters. Such methods are needed to understand and reduce impacts to stocks outside the area where directed catch occurs.
- The TC recommends that system-specific restoration targets should be developed for those systems where appropriate and when sufficient data are available, or revisited where they already exist. These targets should be incorporated in shad habitat plans and existing SFMPs during the next update. The TC would provide input on restoration targets proposed for

inclusion in the SFMPs. The rationale is that this will provide measurable goals for evaluating recovery efforts.

Of the high priority research recommendations identified in the assessment, the TC wanted to highlight two in particular that would contribute the most to the ability to improve shad stocks and the assessment:

- Conduct annual stock composition sampling through existing and new observer programs from all mixed-stock fisheries (bycatch and directed). Potential methods include tagging (conventional external tags or acoustic tags) of discarded catch and genetic sampling of retained and discarded catch. Mortality rates of juvenile fish in all systems remain unknown and improvement in advice from future stock assessments is not possible without this monitoring. Known fisheries include the Delaware Bay mixed-stock fishery and all fisheries operating in the Atlantic Ocean (U.S. and Canada) that encounter American shad (see Section 4.1.4 in the stock assessment report).
- Otoliths should be collected as the preferred age structure. If collection of otoliths presents perceived impact to conservation of the stock, an annual subsample of paired otolith and scales (at least 100 samples if possible) should be collected to quantify error between structures.
    - The TC recognizes that otoliths are difficult to obtain from some sources (e.g., for fishery dependent sampling it will be difficult to obtain the otolith and/or a paired subsample of otoliths/scale without purchase or donation of fish from the harvester). Therefore, the TC agrees that scales can continue to be collected from data sources where otoliths are unable to be collected.