

**ASMFC Horseshoe Crab Technical Committee
January 26, 2000 - Meeting Summary (Minutes)
Linthicum, Maryland**

ATTENDANCE:

Technical Committee (TC) Members:

Gregory Breese (US FWS)
Jeff Brust (ASMFC)
Joanna Burger (NJ)
Andy Draxler (NMFS)
Frank Germano (MA)
Christina Grahn (NY)
Peter Himchak (TC Chairman; NJ)
Tom O'Connell (MD & ASMFC)
Derek Orner (NMFS)

Stock Assessment Committee Members:

Jeff Brust (ASMFC)
Mike Millard (US FWS)

Advisory Panel (AP) Members:

Robert Munson (AP Chairman)
Jim Cooper (AP Vice-Chairman)

Others:

Kim King (US FWS)

Jurisdictions with Technical Committee Members not in attendance:

RI - Tim Lynch
CT - Penny Howell
DE - Stewart Michels
VA - Lewis Gillingham
NC - Trish Murphy
SC - Mark Thompson, Larry DeLancey, Elizabeth Wenner
GA - Brad Winn
NMFS - Rich Maney
US FWS - Hal Laskowski, Kevin Moody

HANDOUTS: The following handouts were distributed to the technical committee:

- 1) Draft of "Public Comment Summary on Addendum 1";
- 2) Summary of MA and RI requests for reference period landing adjustments;
- 3) Preferred management option and rationale for MA's technical committee representative;
- 4) Preferred management option for NC's technical committee representative;
- 5) Preferred management option for SC's technical committee representative; and
- 6) Draft of "Guidelines for Delineating Horseshoe Crab Spawning and Juvenile Habitats"

REVIEW OF PUBLIC COMMENTS:

Tom O'Connell reported on the public comments for the Public Information Document of Addendum 1 which were received through public hearings in New York, New Jersey, Delaware, Maryland, Virginia and Georgia, and through written correspondences from various stakeholder groups and concerned citizens throughout the United States. **A summary of the public comments is attached.**

UPDATE ON ALTERNATIVE BAITS & TRAP TECHNIQUES:

Dr. Robert Fisher, VA Institute of Marine Sciences was asked to brief the technical committee on the research and field studies that have been conducted using bait bags in conch pots but was unable to attend due to inclement weather conditions. Tom O'Connell reported that conch fishermen working directly with Dr. Fisher attended the VA public hearing and indicated the use of bait bags is very

promising but stressed the need to provide fishermen the time to make these changes.

Peter Himchak reported that an information sheet on these alternative baits and trap techniques to be distributed to conch and eel fishermen along the Atlantic coast is currently being developed.

Frank Germano reported that Massachusetts conch fishermen are having good success with using gravid green crabs for conch bait. Christina Grahn reported that New York fishermen are also having success with gravid green crabs, as well as spider crabs for conch bait.

UPDATE ON ECONOMIC IMPORTANCE STUDY OF THE HSC FISHERY:

Last October, the technical committee was informed about a study being conducted by Industrial Economics, Incorporated for the U.S. Fish & Wildlife Service on the economic importance of the commercial horseshoe crab fishery. Michele Manion, Industrial Economics, Incorporated, was asked to brief the technical committee on the preliminary findings of this report but was unable to attend due to inclement weather conditions. Tom O'Connell contacted Michele Manion after the meeting and was able to obtain the following information:

Industrial Economics, Incorporated (IEc) is currently developing a report for the U.S. Fish and Wildlife Service that assesses the economic contribution of the Atlantic horseshoe crab fishery. In our assessment, we focus on the economic importance of this unique fishery to the three diverse industries/user groups that rely on the horseshoe crab population: the biomedical industry, the Atlantic commercial eel and conch fisheries, and recreational birding groups.

To conduct this assessment, we analyze the economic contribution of these three "industries" by measuring two types of effects: (1) changes in regional economic activity, and (2) changes in net social welfare. The former refers to changes in production and employment in a local economy. The latter reflects changes in national economic welfare generated by competitive markets for products that rely on the horseshoe crab. Below we describe a few preliminary results.

The LAL Industry

The three U.S. firms that dominate the \$50 million to \$70 million LAL industry produce a lysate (*Limulus Amoebocyte Lysate, or LAL*) from the blood of horseshoe crabs. This substance enables the pharmaceutical industry to test certain biomedical products (e.g., vaccines) for dangerous endotoxins.

Our analysis finds that the LAL industry likely generates significant economic welfare benefits on an annual basis. We estimate the total annual economic value of this industry to be \$____ million (1999 dollars). Two key factors account for the magnitude of this economic surplus:

- **U.S. Food and Drug Administration (FDA) regulations:** FDA requires that pharmaceutical and biomedical manufacturers use LAL to test certain end-products for the presence of endotoxin before releasing them to the market, thereby assuring that short-run demand for LAL remains relatively firm in the event of a price increase;
- **Absence of viable substitutes:** In the U.S., end-product testing with LAL has replaced its predecessor, the rabbit fever test, as the industry standard; alternative tests are currently under research and development, but are probably five to ten years from being commercially available.

The LAL industry's contribution to the regional economies in the areas where LAL firms reside is also significant. Results from the regional economic analysis suggest that, in the absence of the horseshoe crab population, output in the LAL industry would decline by ___ percent. Similarly, we estimate that employment by LAL firms would decline by ___ percent, or ___ jobs.

Wildlife Viewing/Birding

Each spring, thousands of migratory shorebirds stop in Delaware Bay to feed on the eggs of spawning horseshoe crabs during their annual fly-over to the Arctic. The ecological importance of this event is still poorly understood -- researchers are currently examining if the horseshoe crab population is critical to the viability of these bird populations, and whether bird populations are more productive as a result of feeding on horseshoe crab eggs once they arrive in the Arctic. Despite these ecological uncertainties, Delaware Bay's beaches and viewing areas are a major destination for birders each spring.

Using estimates provided by Eubanks and Stoll (1999) and state wildlife personnel, we estimate that 10,000 to 20,000 visitors travel to Cape May, New Jersey each spring for the primary purpose of viewing the horseshoe crab/migratory shorebird event. Each birder spends, on average, about four days in the area during their visit. Eubanks and Stoll estimate birder's average "willingness-to-pay" for this event at \$___ per day. Individuals' willingness-to-pay measures the amount of money an individual is willing to give up (beyond what one is actually required to spend) to experience an event. Using these estimates for visitation and economic surplus per birder, we calculate the annual economic value of this wildlife viewing event to range from \$___ million to \$___ million. While the willingness-to-pay value used here is higher than average birding values expressed in the literature, birders' statements generally reflect that they view the Cape May event as a unique and high-quality viewing experience. Thus, birders' preferences may explain the difference in per-day values.

The impacts of annual birding activity on the Cape May regional economy arise, in part, from birders' purchases of recreation-related goods and services (e.g., food, lodging, equipment). Our analysis indicates that the annual changes in output and employee compensation associated with spending related to the horseshoe crab/migratory bird event total approximately \$___ million. Employment impacts range from ___ to ___ jobs in the area per year. We assume some uncertainty in these estimates, due to the limited understanding of the ecological relationship between bird and horseshoe crab populations.

American Eel and Conch Fisheries

Commercial conch and American eel pot fisherman along the Atlantic coast utilize horseshoe crab as a primary source of bait. Based on estimates provided by various fishermen, we assume that 85 percent of the ___ million pounds of horseshoe crabs used annually in commercial fishing support the Atlantic conch pot fishery; the remaining 15 percent of horseshoe crabs are used as bait in the American eel pot fishery. Based on bait need requirements and active conch and eel fishing effort provided by fishermen, we develop for each state an estimate of conch and eel landings and quantities sold. For conch, we estimate ___ pounds were sold in 1999, at a market price of \$___ per pound.

The 1999 market for eel, which is oriented more towards export than conch, ranges from ___ pounds to ___ pounds. Due to stronger consumer preferences for eel in the international marketplace, we find demand to be more inelastic (i.e., less responsive to a change in price) than conch. This results in a higher consumer surplus value than conch, or \$___ per pound. Given that the total market for eel is smaller than conch, however, the total annual economic value is about ___ percent of the conch market, or \$___ million.

[Industrial Economics is still researching the eel and conch markets and conducting runs of the regional economic model, so we do not have results yet for these fisheries.]

Other TC Discussions Worth Noting:

Peter Himchak reported that a resume from Robert Unsworth from Industrial Economics, Incorporated has been submitted to the ASMFC requesting his addition to the technical committee.

Greg Breese asked if anyone knew the status of an economic study on Wildlife Ecotourism that he had heard about. Peter Himchak reported that he had and agreed to find out more about it.

UPDATE ON HABITAT DELINEATION GUIDE:

Tom O'Connell reported that Mark Thompson, who was unable to attend the meeting due to inclement weather conditions, provided the technical committee with an updated version of the Horseshoe Crab Habitat Delineation Guide. A significant amount of work by Mark Thompson, Dr. Carl Shuster, ASMFC Habitat Workgroup and others went into the development of this updated habitat guide. Mark Thompson requested that members of the technical committee review the document and provide comments to him by February 15th. Mark Thompson can be reached at South Carolina Department of Natural Resources, P.O. Box 12559, Charleston, SC 29422; phone (843)406-4066; fax: (843)762-5110; email: thompsonm@mrd.dnr.state.sc.us. **A copy of the habitat guide is attached.**

1999 ANNUAL HSC MANAGEMENT REPORT - DEADLINE REMINDER:

A reminder about Section 5.1.2 of the FMP - State Reporting and Compliance Schedule: Each state must submit an annual report concerning its horseshoe crab fisheries and management program on or before March 1 each year, beginning March 1, 1999. The report shall cover: (a) the previous calendar year's fishery and management program, including activity and results of monitoring (as identified in Section 3.5 of the Plan), regulations that were in effect and harvest, including estimates of nonharvest losses; and, (b) the planned management program for the current calendar year (summarizing regulations that will be in effect and monitoring programs to be performed) highlighting any changes from the previous year.

REVIEW OF REFERENCE PERIOD LANDINGS:

The states of Massachusetts and Rhode Island submitted requests for changing their reference period landings based upon additional data which has become available during 1999. The state of Georgia also made reference to changes to their reference period landing prior to the technical committee meeting, however the technical committee did not receive a formal request or additional data to justify any changes. Below is a review of these requests and the technical committee's recommendation to the management board.

Massachusetts - The technical committee reviewed the request for changing MA's reference period landings from 400,000 to 473,593 horseshoe crabs. The original number of 400,000 horseshoe crabs was based upon a back calculation from MA's conch landings data which estimated the number of horseshoe crabs which were used by their conch fishermen. While this number did not include the number of horseshoe crabs which were harvested in MA for their eel fishery, it did include an unidentifiable number of imports. Given MA's insight on the magnitude of the two, it was assumed that the two canceled out each other and the number was as accurate as possible. In 1999, MA implemented mandatory reporting as required under the FMP and fishermen for the first time were required to report all

of their horseshoe crab landings in 1999 and is the basis for this request. The 1999 harvest reports 473,593 horseshoe crabs were landed in MA, and an additional 73,778 horseshoe crabs were imported to MA from the states of DE, MD and VA. The reports also indicated that 33,090 of the 473,593 horseshoe crabs landed in MA were sold or used in MA for other purposes other than bait (education, research and aquarium trade). The technical committee agreed to exclude the 33,090 horseshoe crabs because the reference period landings is based upon commercial bait landings, and make the following recommendation to the management board:

The technical committee recommends that the management board approve the adjustment to Massachusetts reference period landings from 400,000 to 440,503 horseshoe crabs based upon Massachusetts new mandatory reporting program which was implemented in 1999 as required by the FMP. It should be noted that the adjusted number does not include biomedical harvests or imports, and it is the technical committee belief that this increase is not the result of increased effort and landings in Massachusetts but rather the result of a better reporting system which more accurately reflects Massachusetts commercial bait landings between 1995 and 1997.

Rhode Island - Based upon the data presented to the technical committee, an RPL of 30% of the 86,842 reported landings can be determined to be a minimum bait harvest for Rhode Island. The data indicated that the remaining 70% of the 86,842 was used for biomedical purposes, and that a portion of this 70% was then sold/used as bait. The technical committee recognizes that it is illegal to sell/use biomedical horseshoe crabs for bait, but would support the use of these horseshoe crabs as part of Rhode Island's reference period landings. However, Rhode Island was unable to inform the technical committee as to what portion of the 70% was also sold/used as bait. Therefore, the technical committee recognizes that the Rhode Island's reference period landings is probably higher than 30% of 86,842, but any other number would be speculative and unsubstantiated at this point.

The technical committee recommends that the management board approve an adjustment to Rhode Island's reference period landings from 184 to 26,053 horseshoe crabs (30% of 86,842) plus a portion of the 60,789 horseshoe crabs (70% of 86,842) which were used for biomedical purposes and sold/used as bait, if Rhode Island can provide additional information to support this adjustment.

Georgia - Prior to the technical committee meeting, Tom O'Connell received notice about Georgia possibly requesting an adjustment to their reference period landings from 30,000 to ~40,000 horseshoe crabs based upon new landings reports which indicated a total of 146,560 pounds of horseshoe crabs were landed in Georgia during 1999. Tom O'Connell informed Georgia that the technical committee would need additional information if Georgia wanted the technical committee to review this request and make a recommendation to the management board. Since additional information was not provided prior to or at the meeting the technical committee was unable to make a recommendation to the management board. However, the technical committee would most likely to support this increase if the adjustment more accurately reflected Georgia's landings between 1995 and 1997.

After the technical committee meeting, Tom O'Connell contacted Georgia, obtained additional information about their request and distributed this information to the technical committee. The review of the technical committee determined that Georgia was using a ~3 pound conversion ratio (based upon NMFS) and that a 5 pound conversion ratio was more appropriate. In summary, the technical committee

approved the use of new landings data for 1999 (146,560 pounds) but using a 5 pound conversion ratio Georgia’s reference period landings remains at ~30,000 (29,312) horseshoe crabs.

The technical committee recommends that the management board maintain Georgia’s reference period landings at 30,000 (or for accuracy purposes 29,312) horseshoe crabs.

ADDENDUM 1 - MANAGEMENT OPTION RECOMMENDATION:

It should be noted that the following jurisdictions have not designated a technical committee representative: ME, NH, PA, DC, PRFC, FL.

Option 1 to 8 - Coastwide Cap:

The technical committee was unable to come to a consensus on a single option for capping the commercial horseshoe crab bait fishery (Options 1 -8). The preferences of the representatives present or who had made know their preferences via email/fax/phone are detailed in the table below:

Jurisdiction	Option 1	Option 2	Option 3	Option 3A ¹	Option 4	Option 7
MA		✗				
RI		✗				
CT						
NY		✗				
NJ			✗ ²		✗ ²	
DE			✗			
MD		✗ ³		✗ ³		
VA						✗
NC		✗				
SC			✗			
GA						
US FWS					✗	
NMFS ⁴						

1 - Option 3A is a coastwide state-by-state cap with a 50% reduction in the mid-Atlantic region (NJ - VA) and a 25% reduction in non-mid-Atlantic states.

2 - New Jersey has two technical committee representatives which supported different options.

3 - Maryland’s technical committee representative supports Option 3A as a conservative, risk-averse management strategy based upon the lack of adequate data, horseshoe crabs late maturity and population resiliency, and the importance of horseshoe crabs to migratory shorebirds in the Delaware Bay region, and supports Option 2 based upon the available data.

4 - The NMFS technical committee representatives decided not to take a position on Options 1-8.

After much discussion, the representatives that were present arrived at the following consensus:

The technical committee finds unanimous agreement in recommending a state-by-state cap on commercial horseshoe crab bait landings, with a 0-25% reduction of the reference period landings coastwide, and up to a 50% reduction of the reference period landings in the mid-Atlantic states (NJ-VA).

It should be noted that in conversation prior to the meeting, the representative from Virginia indicated that they would support a state-by-state cap if there was assurance that the allowable catch in the mid-Atlantic region would be caught, for which the Virginia conch fishermen are dependent upon. However, given the current circumstances in Maryland and New Jersey, Virginia does not anticipate Maryland and New Jersey to relax their current harvest restrictions, and as a result supports the establishment of a mid-Atlantic quota, not allocated state-by-state.

Option 9 - Transfer of Quotas:

The technical committee agreed that Option 9 was a management board issue.

Option 10 - Non-Mid-Atlantic Option of Coastwide Cap or 25 HSC Daily Possession Limit:

There was no opposition for Option 10. However, the technical committee indicated that *de minimis* states would already be exempt from any harvest caps and that the daily possession limit of 25 horseshoe crabs would most likely be insufficient (too low) for other non-mid-Atlantic states.

Option 11 - Harvest Sex Ratio Limit of at Least 1 Male to 1 Female:

The technical committees supports the concept of maintaining a balance between the number of male and female horseshoe crabs harvested but recommends that the strategy to accomplish this objective needs further examination. The problem related to the targeting of female horseshoe crabs does not appear to be a coastwide issue. Catch reports indicate a balance in the number of male and female horseshoe crabs from hand harvesters in the Delaware Bay and trawl landings in Virginia. The only reported problem is in Maryland where low landing limits have resulted in the targeting of female horseshoe crabs as they are worth twice the value of male horseshoe crabs. The technical committee is also concerned that enforcement may be a problem and this management strategy may result in a wasteful of harvest of male horseshoe crabs by eel fishermen who harvest horseshoe crabs for personal use. Unlike conch fishermen which utilize both male and female horseshoe crabs, eelers prefer female horseshoe crabs and if subjected to this restriction would be required to catch an equal number of male horseshoe crabs (without a use of them) just so they can legally catch the number of female horseshoe crabs which they need for their eel pots.

The technical committee recommends that the management board not approve Option 11 as a coastwide management strategy but rather require those states with a reported problem to implement this strategy or an alternative strategy to obtain a balance in the number of male and female horseshoe crabs harvested.

Option 12 - Closure of Federal Waters:

In October 1999, the technical committee recommended that the management board consider the following management strategy to close the loop hole in the coastwide management of this fishery. The original wording of the technical committee's recommendations was as follows:

- If a coastwide state-by-state cap is established, there is no action needed in the EEZ (Federal waters) for the 2000 fishing season.
- If the management board fails to implement a coastwide state-by-state cap, the management board should recommend to the National Marine Fisheries Service that the following management measures should be implemented in the EEZ: 1) a possession limit of 1,500 horseshoe crabs, no more than 50% of which could be females; and 2) prohibition on the transfer of horseshoe crabs at sea.

The technical committee would like to note that the management board did not include the two options stated above in the Addendum but rather decided to include Option 12 (Federal waters closure) for which the technical committee never recommended.

As worded in the Addendum, only two technical committee members support Option 12, the U.S. Fish & Wildlife Service and one of the New Jersey representatives. The technical committee remains concerned about two issues in the EEZ that interfere with the management of this resource: 1) the transfer of harvest at sea which is difficult to enforce and could easily go unreported; and 2) the potential of horseshoe crab landings shifting to *de minimis* states, as they did during 1998 and 1999, without having an assurance that these states will take immediate action if this occurs. However, the technical committee also recognizes the biological advantages for leaving the Federal waters open to the harvest of horseshoe crabs. The harvest offshore primarily occurs after the spawning season, providing at least one spawning season for those crabs to spawn prior to being harvested. The sex ratio of the harvested horseshoe crabs appears to be more balanced offshore than on the spawning grounds. And, it is probably beneficial to disperse the harvest of horseshoe crabs over a broader area and time.

The technical committee recommends one of the following alternatives for addressing the shift in landings that has occurred in the past:

- **Require states to establish a state landing permit, making it only available to fishermen with a history of landing horseshoe crabs in that state; or**
- **Require *de minimis* states to implement mandatory monthly reporting and to close their respective fisheries when landings exceed the *de minimis* threshold.**

In addition, at this time the technical committee recommends the following strategy to address the transfer of harvest at sea in Federal waters:

- **That the National Marine Fisheries Service prohibit the transfer of horseshoe crabs in Federal waters.**

Option 13 - Alternative Baits and Trap Techniques:

The technical committee recommends that the management board support Option 13 and provide the necessary resources to facilitate the development of these alternative bait and trap techniques in an aggressive and swift manner.

REVIEW OF STOCK ASSESSMENT COMMITTEE RECOMMENDATION:

Prior to the technical committee meeting, the stock assessment committee (SAC) distributed information about the development of a benthic survey for stock assessment purposes, and a follow-up letter which addressed the questions which were raised by a couple of technical committee members. Mike Millard (Vice-Chair of the SAC) attended the meeting and addressed the questions and concerns of the technical committee. After some discussion, the technical committee made the following recommendation to the stock assessment committee:

The technical committee directs the SAC to complete the following course of action by June 30, 2000:

- 1) Identify appropriate assessment models for a horseshoe crab stock assessment;**
- 2) Report to the technical committee on these models, their underlying assumptions, their data needs, and surveys to meet the data needs; and**
- 3) Recommend which assessment model and surveys should be implemented.**