

**Atlantic States Marine Fisheries Commission  
Horseshoe Crab Technical Committee  
Baltimore, Maryland  
September 25, 2000**

**Meeting Summary**

**Nomination and Selection of TC Vice-Chairperson**

Nominations were sought for TC Vice-Chairperson, selection of a Vice-Chairperson was tabled until nominees could seek administrative approval from their states, given the time constraints already on the nominees.

**Establishment of Protocols for Managing HSC Use by Biomedical Industry**

The TC discussed several issues regarding the biomedical industry:

- There was a consensus that the ASMFC should control whether the biomedical harvest is sold as bait or returned to the water alive; however, it was recognized that more information was needed as well as input from the biomedical industry and fishermen.
- A question as to what state should have the responsibility for ensuring that crabs harvested by the biomedical industry are returned to the water alive, when the crabs were harvested in one state and bled in another. One example cited was crabs purchased in MD were shipped to MA for bleeding.
- An update and reevaluation of biomedical mortality was also recommended. It was recommended that a second questionnaire be sent to the biomedical companies with modifications to some of the questions and that the possibility that some discard work is being done.

It was recommended that a sub-group be formed to investigate these issues more closely. Mr. Peter Himchak and Mr. Frank Germano will serve on the sub-group and were asked to seek representatives from each of the biomedical companies and solicit input from fishermen. The TC asked for clarification of the time period for license renewal between the biomedical companies and FDA, specific language currently used by FDA for requiring the release of HSCs, and type of permit/license currently required (i.e. state, FDA).

**Timeline for Submitting State's HSC Annual Reports**

The TC discussed the timeline for submitting / reviewing annual state compliance reports. Mr. Tom O'Connell reported that under the current March 1 due date any recommended adjustments by the PRT would be nearly impossible to adopt in time for the spring fishery given necessary review by the TC, AP and MB. The TC considered a January due date, but felt that the landings data would be incomplete, especially given

that several states can have significant landings in the late fall and early winter. The TC did find that a more modest adjustment of the date was reasonable and will improve the possibility of accommodating changes, if necessary. The TC, therefore recommends that the compliance reporting date be moved to February 1 of each year.

### **Evaluate Provisions for State to State Quota Transfers**

The TC evaluated provisions under which state to state quota transfers would be allowed, as charged by the MB. Mr. Peter Himchak reviewed previous considerations of this issue by both the TC and the MB:

- A TC Summary Report to the MB on Oct. 13-14, 1998 TC meeting stated, "Transferability of state quotas requires TC review and approval."
- The issue was briefly discussed at the October 20 MB meeting in Jekyll Island, but the discussion was deferred for later in the meeting and never revisited.
- The TC agreed on "Option 9 - Transfer of Quotas" as being a MB issue at its January 26, 2000 meeting.
- At the February 9, 2000 MB meeting in Alexandria it is proposed by motion to allow transfers of quota from state to state and there should be a Mid Atlantic regional quota from NJ to VA. The motion failed for lack of a second.
- At the August 21, 2000 MB meeting the TC is charged with evaluating the provisions for state to state quota transfers.

It was the consensus of the TC that quota transfers should be reviewed by the TC, on a case by case basis. Each quota transfer request should be evaluated upon the following:

- Quota transfers, in the expected continued absence of estimates of stock(s) size and exploitation rates, should occur within a regional area. Regional areas to be defined by genetic studies that have passed peer review by an ASMFC Peer Review Committee.

- Quota transfers should include an assessment of current harvest pressure and expected impacts of the quota transfer.
- States will retain control of the harvest within their jurisdiction.

### **Review Stock Assessment Committee's Report "Stock Assessment of Atlantic Cost Horseshoe Crabs: A Proposed Framework", and Prioritization and Funding of Research and Monitoring Needs**

Mr. Michael Millard (SAC Chair) gave a presentation on a proposed framework for a horseshoe crab stock assessment, followed by questions from TC members. The TC shared with the SAC some concern over the ability to accurately identify recruits, but approved the framework. It was recommended that although the egg per recruit model would be very difficult given our current state of knowledge to the molt-specific incremental growth and mortality, as well as the extended lag time between egg stage

and recruitment to the spawning population, this model not be entirely discounted for consideration at a later date.

The TC also reviewed the SAC's recommended projects for the expenditure of state challenge funds and agreed that these projects were necessary for progressing toward a formal stock assessment. The TC agreed that at the very least funds should be allocated as soon as possible for the genetic stock identification of horseshoe crabs using variation at microsatellite DNA loci (item 2). The proposed funding of a study to assess the feasibility of aerial videography (item 4), although not critical, is a low-cost item that could provide an important check to the existing spawner surveys, and may allow for a method to assess spawning in inaccessible areas.

### **Update on Spawner and Egg Count Surveys in Delaware Bay**

A brief review of the progress on the Delaware spawner and egg count surveys was given. Given the current level of manpower, it is unlikely that the spawner survey will achieve the initial target established at the TC's spawner survey workshop.

This survey depends on a large contingent of volunteers to man 20 beaches, on 12 occasions, often at very late/early hours. It is unlikely that more beaches or days could be adequately covered. Currently, the survey would have the ability to detect a 25% change in the population with about 80 percent probability over 10 years. In 2000, 20 beaches (10 per side of the bay) were surveyed on 12 occasions, often at very late/early hours. At this level of effort, the survey will detect a 33% change in the population over 10 years with about 80 percent probability. If the survey increased to 26 beaches (13 per side of the bay), then a 25% change over 10 years would be detected with >80 percent probability. Continued funding needs to be provided to assure survey coordination.

(The above power analyses were based on the 1999 pilot spawner survey. A manuscript on the 1999 survey is undergoing peer-review. See attached abstract.)

The pilot egg surveys conducted in 1999 found a relationship between spawners and eggs and, the relationship differed between DE and NJ. Spawners and eggs 5 to 20 cm below the surface were related; however, spawners and eggs at the surface (0 to 5 cm) were not related. Also, questions arose as to the location of eggs along the beachfront. Staff from USGS-BRD collected additional information in 2000 and are continuing to analyze the data.

### **Clarification of HSC Harvest Reporting Methods**

The TC discussed possible inaccuracies in landings data. There is concern that some of landings are being reported to NMFS in "female units" (two males equal one female unit) and that inappropriate conversion factors are being applied. The TC agreed that each member should verify that their state landings personnel are reporting correctly.

Mr. Tom O'Connell will contact the NMFS to make them aware of these potential problems.

### **Monitoring/Management of HSCs in Curio/Pet Trade**

The TC discussed the possibility that HSCs landed for use in the curio /pet trade may be missed in the commercial landings data. It is uncertain if these harvesters are aware that this species is regulated and that they must report their landings. It is also not clear whether all states have a mechanism in place to capture and segregate these landings. The TC and PRT representatives present agreed that this would be a good issue for the PRT to investigate further.

## **Attachment**

### Spatial and Temporal Distribution of Horseshoe Crab (Limulus polyphemus) Spawning in Delaware Bay: Implications for Monitoring

D. R. Smith, P. S. Pooler, B. L. Swan, S. F. Michels, W. R. Hall, and P. J. Himchak.

**ABSTRACT:** Concern for the status of horseshoe crab (Limulus polyphemus) has increased as harvest for conch and eel bait has increased and spawning habitat has decreased. In early 1999 a workshop was held at the behest of the Atlantic States Marine Fisheries Commission to design a statistically valid survey of horseshoe crab spawning in Delaware Bay. The survey that resulted was a redesign of a volunteer-based spawning survey that began in 1990, and its network of volunteers was relied on to implement the 3-stage sampling design in 1999. During May and June of 1999, 163 participants surveyed during the highest of the daily high tides on 16 beaches (8 on each side of Delaware Bay). During the first half of the spawning season, spawning was associated with lunar phases; however, it was moderated by wave height. Disproportionately more spawning occurred within 3 d of the first new and full moons ( $t = 4.27$ , 79 df,  $p < 0.001$ ), and spawning activity was correlated inversely to the % of beaches with waves  $\geq 0.3\text{m}$  ( $r = -0.558$ ,  $p = 0.011$ ). Spawning was heaviest on the Delaware shore around the full moon in May in spite of low waves in New Jersey during the new and full moons in May. Number of beaches sampled was the most important factor in determining the precision of the spawning index and power to detect a decline. Explicit consideration of statistical power has been absent from the current debate on horseshoe crab status and harvest. Those who argue against harvest restrictions because of a lack of statistically significant declines take on a burden to show that the surveys they cite have high statistical power. We show the Delaware Bay spawning survey will achieve high statistical power with sufficient sampling intensity and duration. We recommend that future Delaware Bay spawning surveys 1) sample on 3 d around each new and full moon in May and June and 2) increase the number of beaches to ensure high statistical power to detect trends in baywide spawning activity. For example, a 25% decline in spawning activity over 10 yr would be detectable (power  $\geq 0.80$ ,  $\alpha = 0.20$ ) if 13 beaches were sampled per state on 3 d around each new and full moon.