

## Horseshoe Crab Technical Committee Report

February 10, 2004

The Technical Committee (TC) met in Baltimore on February 5<sup>th</sup> and 6<sup>th</sup> to review the draft Stock Assessment and respond to the requests of the Management Board. The following is a summary of that meeting.

### **Attendees**

#### *Committee Members*

Andrew Draxler

Larry DeLancey

Trish Murphy

Anne McMillen-Jackson

Scott Olszewski

Greg Breese, Chair

Pete Himchak

Stew Michels

Steve Doctor

Kim McKown

Penny Howell

Lewis Gillingham

Dave Smith, HSC SAS

Jim Berkson, HSC SAS Chair

Brad Spear, Staff

#### *Public*

Carl Shuster

Sheila Eyster

Charlie Givens

Rick Robins

Dave Hata

Michelle Davis

Whitney Grogan

Mike Oates

Sara

### **NMFS Shuster Reserve**

The TC heard about the Board's support for NMFS reissuing an experimental fishing permit (EFP) that would allow the harvest of up to 10,000 crabs for biomedical use from the reserve. At the December meeting an earlier TC report was referenced. TC members could not recall the earlier report that stated its support for harvest of up to 20,000 crabs. However, it supported the Board's decision to endorse the EFP.

Benjie Swan of Limuli Labs, New Jersey, is required to do research as part of receiving the EFP. As part of the permit reissuing process, she would like to collect information to support the horseshoe crab stock assessment. She is looking to the TC to provide guidance on the study design. The TC recommended that Benjie tag horseshoe crabs with USFWS tags and have that data incorporated into the coastwide tagging database. The TC will further review Benjie's annual report to NMFS and may provide other recommendations.

### **Draft 2004 HSC Stock Assessment Report**

Jim Berkson gave an overview of the report including methods, results, and recommendations. The TC provided the Stock Assessment Subcommittee (SAS) insightful comments on the report and suggested changes. It unanimously approved the document pending changes that were suggested. The TC tasked the SAS to (1) explore the application of Gibson and Olszewski's Rhode Island HSC Assessment to Delaware Bay data (see Section 9.0 c); and (2) conduct sensitivity analyses on trend data in the next HSC assessment.

The TC would like to emphasize the importance of the monitoring and research recommendations (Section 9.0 f) in the SA Report. Currently, funding for these efforts is year-to-year, frequently coming at the last minute. Yet these monitoring and research programs are being relied upon to inform the Management Board in future years. Funding for these programs needs to be certain and available in a timely manner if managers wish to have reliable, long-term data on horseshoe crab abundance. This is true for both horseshoe crab and shorebird monitoring.

The Virginia Tech Benthic Trawl Survey has received funding from a variety of sources during the past three years. VT may receive federal funding this fiscal year in excess of the costs to run the survey thus far. However, it is not at full implementation, needing both expansion geographically and in terms of developing a method to identify primiparous (newly-recruited) females.

The Delaware Bay Spawning Survey is in its fifth season and will soon be a powerful tool in determining horseshoe crab spawning population abundance in the Bay. Each year there is question as to whether the survey will be conducted because funding is difficult to obtain. The spawning survey is largely a volunteer effort and funding goes toward salaries for coordinating the volunteers and data input and analysis. A stable funding source is required to ensure the continuation of this powerful survey.

The TC recommends the development of a standardized survey to determine the Delaware Bay-wide egg abundance available to shorebirds in 0-5 cm depth of substrate. Currently, two independent surveys are conducted on each side of the Bay. The SAS did not include this survey as a research recommendation priority in its report because its importance goes beyond the scope of the assessment. The TC highlights the need for bay-wide survey as a crucial step in understanding the link between shorebird and horseshoe crab populations. Funding is being piecemealed together to get it started in 2004.

In addition, this past fall the HSC Tagging Subcommittee developed a strategy for a coast-wide tagging program designed to identify population structure/management units, estimate survival, and estimate movement/migration rates. King et al. (see "HSC Genetics..." below) has identified 4 broad sub-populations, confirming the need for this work. But no funding to carry this out has been identified.

The TC strongly recommends that the Management Board work with the TC to develop a "strategic plan" for monitoring and research programs. Ideally, this plan would address specific goals for both HSC and Shorebird information, identify which monitoring and research programs are needed to meet these goals, and estimate the manpower and funding required to meet these goals. Based on the "plan", a timeline and strategy to obtain funding should be developed, so that these programs can be implemented in the most effective and predictable way.

### **Virginia Tech Benthic Trawl Survey**

On behalf of the Board, Chair Bruce Freeman tasked the TC and SAS to review a series of questions about the survey in a memo dated January 13, 2004. Virginia Tech (VT) put together a response for review by the TC and SAS. The TC accepted VT's response. Generally, there are not of enough years of data to confidently detect a trend in total adult, multiparous, primiparous, or immature HSC populations. However, there was a statistically significant difference in the

occurrence of primiparous HSCs between 2002 and 2003. Differences in water temperature and timing between the 2002 and 2003 surveys may have influenced the difference in primiparous crabs. The TC believes that VT's conversion formula to standardize day and night sampling is straightforward and appropriate. In addition the TC believes the conversion factor has little effect on the results since VT has essentially eliminated day sampling, except when bad weather requires it in order to complete the survey. Based on power analyses, the survey will be able to detect a minimum of a 12% change in mature females with five years of data.

The TC gave its recommendations to VT for implementation of the Fall 2004 survey. It suggested that the 2004 survey expand out to eastern Long Island, expand the Delaware Bay region portion, incorporate the South Carolina portion again, and initiate a pilot segment from Rhode Island north. Virginia Tech said that this should happen if funding is received with enough lead time to make the necessary arrangements. The TC also asked VT to explore the possibility of expanding the survey within Delaware Bay. The TC fully supports the expansion of the trawl survey and will make its services available to the Board to help make sure the survey happens seamlessly this year.

The TC tasked the SAS to submit population estimates from the survey to the Board.

#### **HSC Genetics and Population Structure Study**

The TC reviewed King et al.'s report, "Microsatellite DNA reveals regional differentiation among populations of the horseshoe crab." The major conclusion of the report is that their data suggest the presence of four population units: Gulf of Maine, mid-Atlantic, Florida-Atlantic, and Florida-Gulf. The TC agreed with King et al. that more sampling is needed from North Carolina down the Atlantic coast of Florida. However, the TC noted that large genetically different stocks may not be practical divisions from a management point of view. The TC formed a list of questions and suggestions for King et al. One question was what is the effective population size of the HSC population and what does that mean.

One of the research recommendations in the SA Report is to increase tagging to cover the Atlantic coast. This would provide an independent way of verifying King et al., and provide a finer level of detail on subpopulations for management purposes. Some states are willing to move forward on this proposal with guidance on how to develop tagging programs. Staff will provide all members with the Coastwide Tagging Guidance Document developed by the HSC Tagging Subcommittee.

#### **HSC Population Dynamics and Harvest in Pleasant Bay, MA**

The TC reviewed "Abundance and population structure of the Atlantic horseshoe crab, *Limulus polyphemus*, in Pleasant, Bay, Cape Cod" by Carmichael et al. and "Magnitude of harvest of Atlantic horseshoe crabs, *Limulus polyphemus*, in Pleasant Bay, Massachusetts" by Rutecki et al. The studies provided interesting insights specific to Pleasant Bay. The TC felt that the studies had little utility for determining sustainability and coastwide population estimates.