

Horseshoe Crab Biomedical Ad-Hoc Working Group Report

**October 3, 2011
10:00 a.m. – 3:00 p.m.**

The Horseshoe Crab Biomedical *ad-hoc* Working Group (WG) met on October 3 to discuss the biomedical process and begin building a biomedical best management practices document, as tasked by the Horseshoe Crab Management Board at its August 4, 2011 meeting. The meeting opened with a brief background on the biomedical industry, its impacts, and the Board's task, followed by a period of public comment. The WG received written public comment from the Horseshoe Crab Conservation Association of Massachusetts, and Amanda Dey of New Jersey. Discussion by the WG was conducted in a closed door setting, in anticipation that potential confidential and proprietary information may be discussed. The following report presents the biomedical process broken down by steps, with the best management practices that are associated with each step. Some areas for improvement, through training and other methods, have been identified. Additionally, the group felt that future discussions will likely be necessary as practices continue to evolve.

Attendees

Technical Committee Members

Larry DeLancey (SC), Chair
Alicia Nelson (VA)
Steve Doctor (MD)
Steve Meyers (NMFS)

Vin Malkoski (MA)
Jeff Brust (NJ), Delaware Bay Ecosystem
Technical Committee Chair

Advisory Panel Members

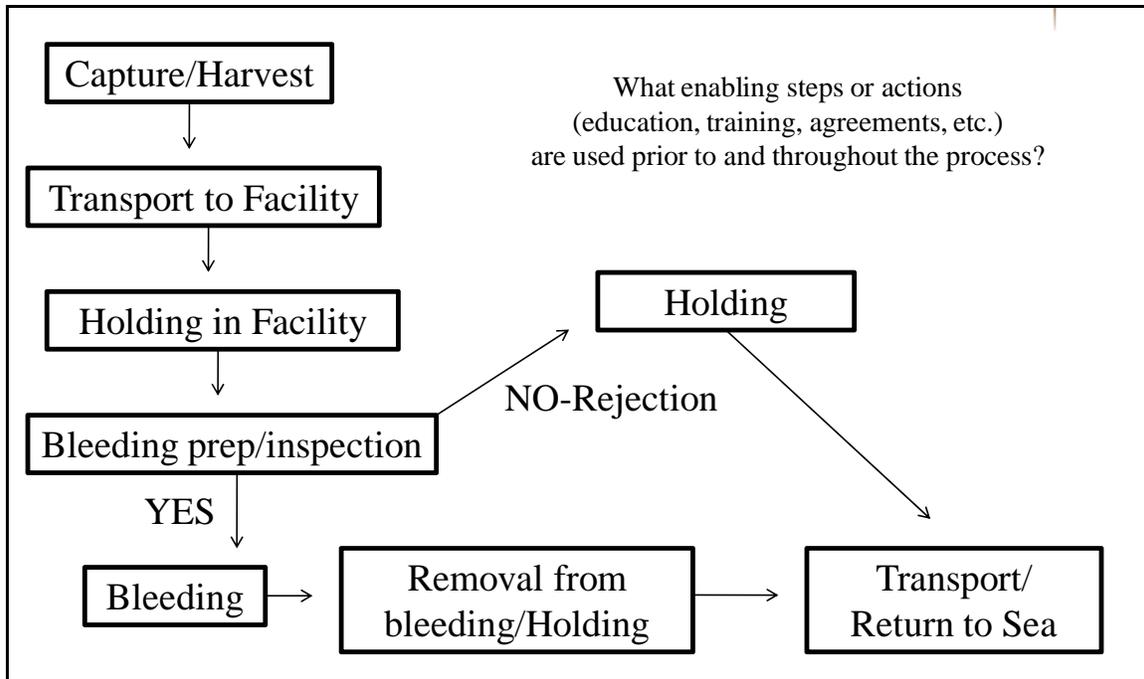
James Cooper, Chair
Michael Dawson, Assoc. of Cape Cod
Allen Burgenson, Lonza Walkersville Inc.
Benjie Swan, Limuli Laboratories

Others

Danielle Brzezinski (ASMFC), Staff
Robert Beal (ASMFC), only present for the opening presentation and comments

Biomedical Best Management Practices

The WG based its discussion of best management practices (BMPs) on the following step chart. The scope of discussion for the BMPs was limited to the collection, bleeding, and release of crabs collected solely for biomedical purposes. However, the WG recognized that these same practices must also be used when collecting crabs that will ultimately go to the bait industry to ensure a quality product for the biomedical and bait industries. However, the focus of this discussion was on biomedical-only crabs.



Collection

- For targeted horseshoe crab trawl tows, reasonable tow times, recommended at 20-30 minutes bottom time (winches locked)
- Proper care and handling of horseshoe crabs while sorting and placing into bins
- Avoid exposure to direct sun, extreme temperatures as well as rapid temperature changes
- Night harvesting is recommended during periods of excessive heat
- During collection, sort out juveniles and do not bleed
- Sort out an return to the water individuals that do not appear to be healthy (damaged, slow movement, dull shell/old)
- When possible, release juveniles or unhealthy individuals immediately and do not transport to the facility
- Educate collectors in proper handling techniques
- Specify expectations of collectors in written contracts
- Periodically audit horseshoe crab collectors on implementation of BMPs for collecting

Transport to Facility

- Maintain temperature between approximately ambient water temperature at time of collection and 10°F below ambient-water temperature
- Maintain good ventilation while stacked in bins
- Limit number of horseshoe crabs to a suitable number, dependent on container size and shape, and avoiding over-stacking to minimize damage to other horseshoe crabs
- Minimize travel time
- Keep bins and horseshoe crabs covered to protect against direct sunlight
- Secure containers in transport vehicle

Holding at Facility/Preparation for bleeding/Bleeding

- Limit holding time, under normal circumstances, at the facility to less than 24 hours
- No prolonged exposure to fresh water
- Follow written procedures for proper care and handling when sorting horseshoe crabs and moving them between bins and within the facility
- Inspect crabs for health and damage, selecting only undamaged and healthy crabs for bleeding
- Maintain clean, sanitary conditions during bleeding
- Maintain same level of care for rejected crabs that are not bled while they are being held until released back to sea
- Avoid bleeding crabs more than once per year
- If crabs are marked to avoid re-bleeding, ensure that the mark is residual and not harmful to the crab
- Bleed until rate slows down so that excessive bleeding is prevented
- Continue 30-year policy of not attempting to suction additional blood from the horseshoe crabs
- Perform internal audits to maintain quality control over written procedures

Post-Bleeding Holding

- Recognizing that the horseshoe crabs are now stressed from the bleeding process, maintain the same level of care as that used when transporting horseshoe crabs into the facility for bleeding
- Return to the water as soon as possible. If not being returned to the area of capture, ensure that conditions (salinity, water temperature, etc.) are similar to those found at the harvest site
- Minimize holding time post-bleeding
- While in holding, keep horseshoe crabs in the dark to minimize movement and injury
- Keep horseshoe crabs well-ventilated, moist, and allocate only a suitable number of crabs to holding containers
- Do not keep crabs out of the water for longer than 36 hours in total

Return to Sea

- Use same care in handling and transporting crabs being returned to the water
- Include return written instructions and requirements within contract with collectors, if applicable
- Periodically audit horseshoe crab collectors on implementation of BMPs for returning

Overarching practices for all steps

- Generate written procedures for all handlers of horseshoe crabs, covering all steps in the process from collection to release
- Keep horseshoe crabs cool, moist and covered, avoiding direct sunlight
- Establish a dialogue among collectors, the biomedical company, and the state regulatory agency to address concerns and challenges
- Have a written contract between collectors and the biomedical company, outlining practices and expectations
- Perform audits of the various steps and contractors/employees throughout the process
- Ensure proper monitoring and recording of mortality at each step in the chain of custody

Other opportunities-Dual use of bait horseshoe crabs

The WG agreed that dual use of bait horseshoe crabs should be encouraged where possible but not required due to differing state regulations and the challenges of transport, volume, and timing. Depending upon capture and facility location, travel time may exceed what is practicable to maintain the health of the horseshoe crabs during transport to a biomedical facility. Additionally, the bait industry tends to collect a large volume of crabs within a short period, such that a biomedical facility would not be able to keep up with that volume in that time frame. Company representatives felt that licensing issues would not be a major challenge to using more bait crabs in the biomedical process first; rather, it would be the logistics of coordinating harvesters and their volume of catch in order to increase the use of bait crabs.

Review of Bleeding Mortality reports

There was some discussion that given recent findings and the wide variation in testing conditions and mortality results in bleeding studies, a formal peer review of the published studies might be considered. Publication of such a report could reduce some of the conflicting views currently expressed by various interests. Such a report could also frame future research avenues.

Summary

This report establishes BMPs for the various steps throughout the biomedical process, from harvest to release. Many of these practices are already in use by the biomedical companies, in order to sustain the horseshoe crab population and ensure a steady and reliable supply of product to the pharmaceutical market. The WG recommends that biomedical facilities follow these practices and monitor their suppliers. The WG also recommends holding future meetings to discuss opportunities to further decrease mortality. Given the recent and expected future increased demand for LAL, such periodic meetings are essential for continued successful management of the horseshoe crab resource along the Atlantic coast.