



Horseshoe Crab Adaptive Resource Management (ARM) Review Update

Horseshoe Crab Management Board

May 3, 2016

Background



- February 2016
 - Management Board tasked the ARM Subcommittee with short-term review
 - Plan is to complete ARM review by fall 2016
- Three components involved our review
 1. Monitoring Program
 2. Harvest Packages
 3. Objective Function for decision making



1. Evaluate the Monitoring Program

- A. Virginia Tech Trawl Survey (VTTS)
- Our review emphasizes need for funding VTTS beyond 2016
 - Composite Index used in 2015
 - Mark-recapture approach problematic
 - Potential for use of catch-survey model



1. Evaluate the Monitoring Program

- B. Red Knot mark-recapture program
 - Our review brought clarity to study design and sampling plan
 - Sampling Plan Report and conference call with shorebird research teams
- C. Biomedical data

2. Alternative Harvest Packages

- Are current harvest packages adequate?
 - Current framework includes 5 packages
 - Alternative set of harvest packages under review

3. Revisit the Objective Function

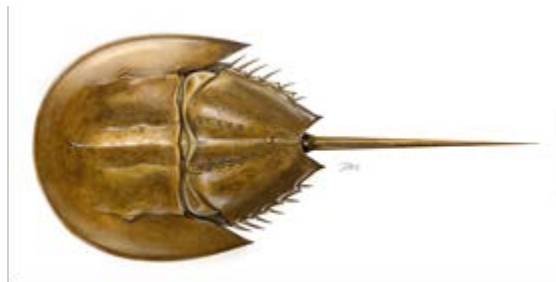
- A. Reward Function for Optimization
 - Male harvest utility: sex ratio constraint
 - Redundant with population dynamics model?
 - Preliminary results suggest only minor changes in harvest with sex ratio constraint removed.
- B. Red Knot status change – 2014
Endangered Species Act protection as threatened species



Next Steps

- Summer 2016
 - Conclude short-term review
 - Meeting with Delaware Bay Technical Committee and Horseshoe Crab Technical Committee
 - Finalize Recommendations for Board Meeting August 2016

Biomedical Data Confidentiality & Stock Assessment Planning



May 3, 2016



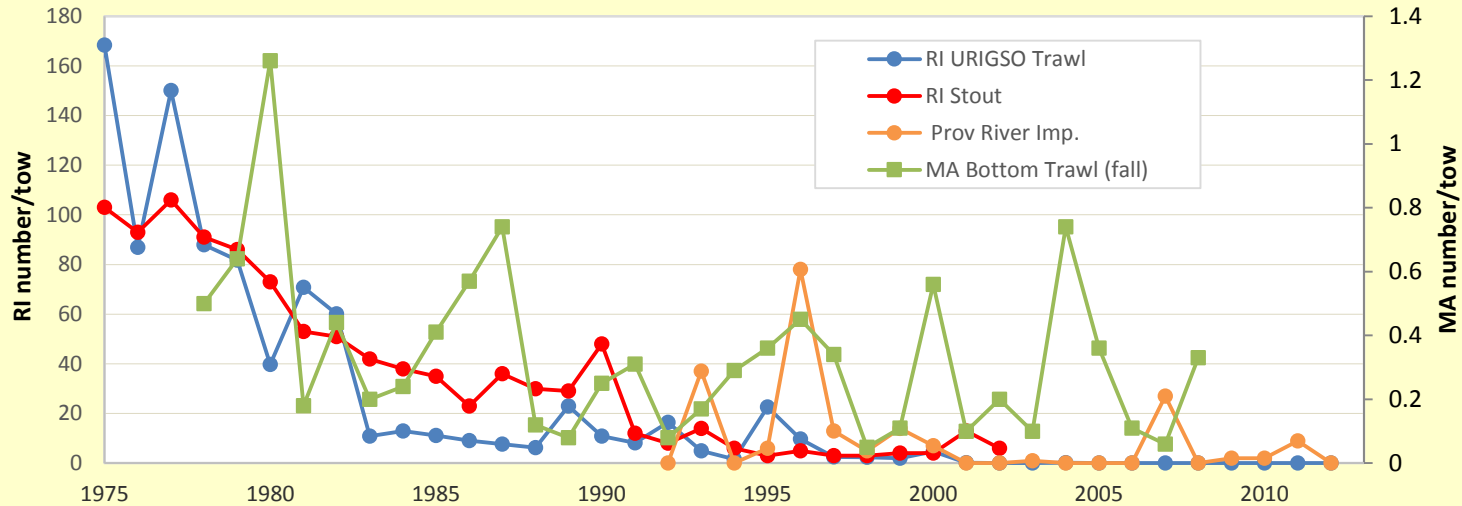
Benchmark Status

- Previous benchmark (2009) for coast-wide population
 - Some models omitted biomedical data
 - Biomedical now accounts for >10% of mortality
 - Benchmark (2009) and update (2013) identified need for regional analysis, inclusion of biomedical data
- TC did not recommend doing a benchmark in 2016 because the inability to use biomedical data on a regional level
 - Prioritized review of ARM model

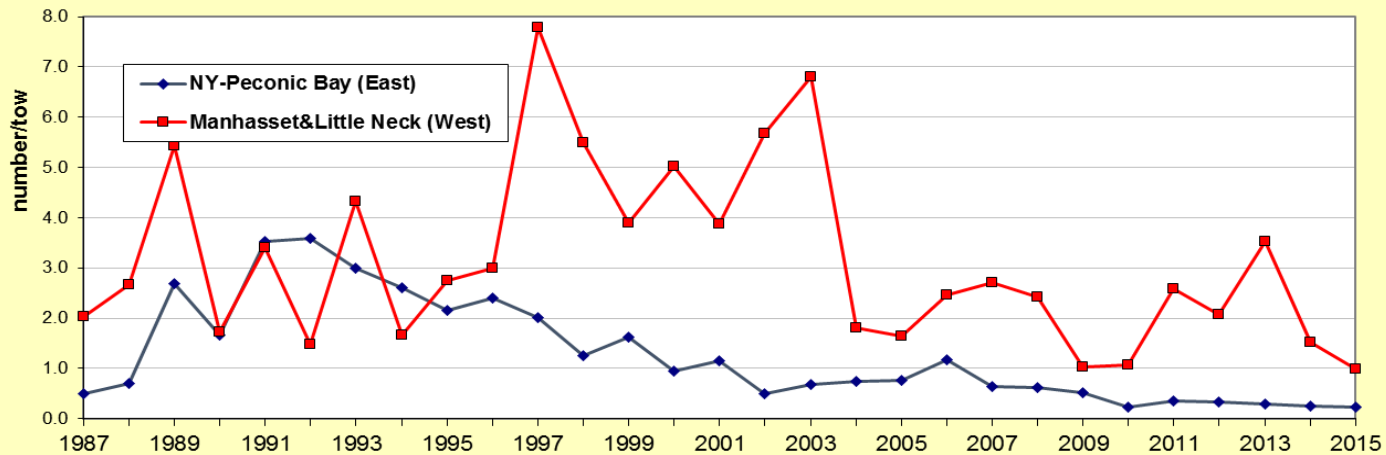
Regional Trends



RI & MA Horseshoe Crab Indices of Abundance



NY Horseshoe Crab Indices of Relative Abundance

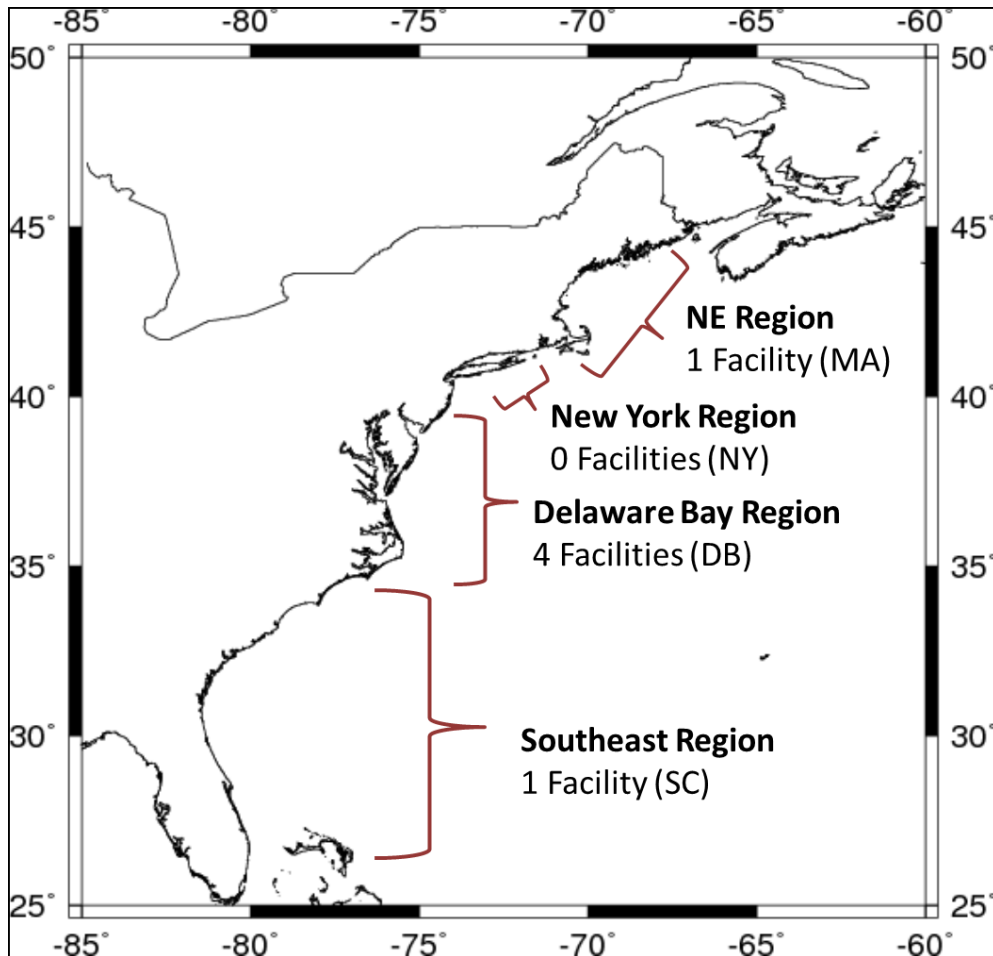


Current Biomedical Facilities (6)



- Massachusetts
 - Associates of Cape Cod (Harvest from MA & RI waters)
- New Jersey
 - Limuli Laboratories (Harvest from DE & MD waters)
- Maryland
 - Lonza (Harvest from MD waters)
- Virginia
 - Wako Chemicals (Harvest from MD waters)
 - Heptest Laboratories (Harvest from EEZ; land in VA)
- South Carolina
 - Charles River Endosafe (Harvest from SC waters)

Regional Assessment & Confidentiality



- Rule of Threes
- Now have 4 facilities in the Delaware Bay region
- Comprehensive, transparent assessment for Delaware Bay region still limited



State Regulations

- Contacted each state regarding their specific confidentiality policy
 - All have Rule of Threes policy
- Explored the possibility of a change in state permit requirements for biomedical
 - Likely still trumped by confidentiality rules



Benchmark Progress

- SAS met in March to discuss confidentiality for biomedical harvest & brainstorm strategies for completing a benchmark assessment
- ASC/MSC discussed HSC assessment challenges at their April meeting
- Both concluded that the biomedical data is undermining the advancement of an assessment
- AP met in April to discuss biomedical data
 - Expressed concern regarding data usage regardless of confidentiality thresholds in DB

Previously Discussed Options

1. Release all of the biomedical data to the public
 - Biomedical was not comfortable with this option
 - Violates confidentiality
2. Release biomedical data to SAS, TC and re-group as coast-wide in published reports
 - Biomedical included in regional analyses
 - Biomedical was in favor of this option
 - TC concerns regarding transparency
3. Proportioning mortality

Current options



- 1. Continue to delay a benchmark indefinitely**
- 2. “Turn of the crank” Update**
 - Coast-wide ARIMA trend analysis, no biomedical data
- 3. Transparent Coast-wide Benchmark**
 - include coast-wide biomedical
 - explore other modeling approaches
- 4. Non-transparent, Regional “Black Box” Benchmark**
 - SAS, TC, & peer review panel get access to confidential data
 - Assessment done regionally with regional biomedical data
 - Final product omits confidential data, i.e. recommends regional allocation adjustments, shows trends without values attached



Next Steps

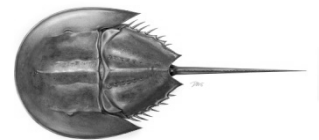
- Looking for guidance from the Board for how to proceed to complete a stock assessment



ASMFC Alternative Bait Cost Comparison Report

**Presented to Horseshoe Crab
Management Board**

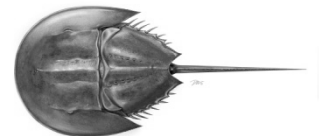
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Background



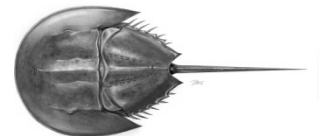
- **February 2014 Board Meeting**
 - Request for Alternative Bait Trials
- **Fall 2014 Alternative Bait Trials**
 - were conducted in CT and RI
- **February 2016 Board Meeting**
 - Board requested a cost analysis be conducted



Discussions



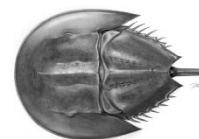
- **Alternative Bait Working Group**
 - Met via conference call March 30th
 - Discussed results and lessons learned
- **Cost considerations**
 - Different Price by region by sex
 - Mid-Atlantic: Females valued 2X as males
 - New England: same for males and females, but higher price
 - Refrigeration
 - Transportation



Feedback from LaMonica Fine Foods



- Price per box of bait was \$40
 - Price per piece of bait \$0.80
 - Price per box would be maintained for 6 months
- No delivery costs
 - Delivery to New Bedford and Mid-Atlantic locations possible
- Number of crabs in the ingredient mix
 - 4-5 females crabs or 8-10 male crabs
 - Range of 1/10 to 1/4 crab per piece of bait
 - If doubled closer to 1/5 to 1/2

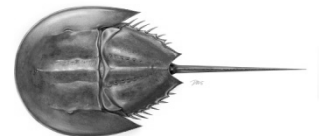


- Crabs used from all over the coast

Feedback from AP



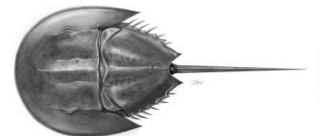
- **Conservation measures already in place**
- **Most buy bait from Dealer**
- **Ecobait labeled as 'Alternative' or 'Artificial' misleading**
 - Many are already 'making' their own
- **Further bait trials/studies should be conducted along the coast**



Conch/Welk regulations



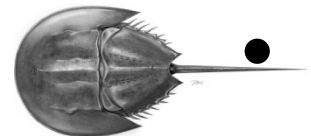
- MA- no limit
- RI- no limit
- CT- no limit
- NY- no limit
- NJ- bait saving device, no limit
- DE- ½ female crab or 1 male crab per bait bag
- MD- male only, no limit
- VA- ½ female crab or 1 male crab per bait bag
- NC- no limit



American Eel Regulations



- ME- 25 crabs daily limit*
- NH- 10 crabs daily limit*
- MA-no limit
- RI- no limit
- CT- no limit, license endorsement
- NY- 5 live crabs daily limit*
- NJ- no limit, but no harvest from NJ waters
- DE- no limit
- MD- male only, no limit
- VA- no limit
- NC- no limit
- SC- no allowance of horseshoe crabs



Summary



- Unclear LaMonica Fine Foods ecobait is cost-competitive compared to traditional horseshoe crab bait
- Breakdown of cost comparison categories in Table 1 of cost analysis memo

