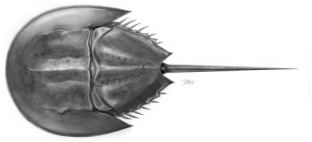
Horseshoe Crab
Plan Review Team Report
North Carolina's Transfer Request

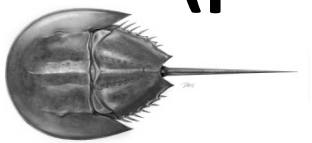
Presented to Horseshoe Crab Management Board

February 6, 2014



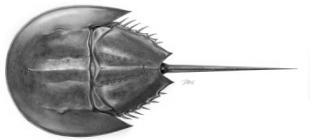
Transfer Request

- North Carolina exceeded its quota of 24,036 crabs in 2013
  - Blue Crab Trawl Fishery
  - Commercial HSC fishery was closed August 1, 2013 (preliminary trip estimates showed quota was close to being exceeded)
- Quota overage is estimated at 2,247 crabs (preliminary)



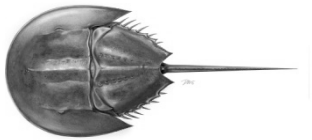
Transfer Request

- Requested transfer of 3,000 crabs from Georgia
- Request review by Shorebird and Horseshoe Crab Advisory Panels, Horseshoe Crab Technical Committee and reviewed and summarized by the Plan Review Team



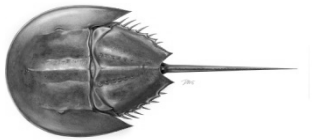
Comments

- **TC members suggested re-evaluation of NC quota, due to multiple overages and transfer requests (2009, 2011 and 2012)**
  - **Current quota 24,036 crabs is based on 1998 landings**
  - **Directed fishery seems to be developing**
- **No other concerns with the transfer request**



Conclusion

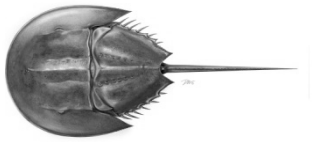
- **In summary, the PRT does not oppose the transfer request, given the small number of crabs and previous transfer precedence**
  - **Suggest returning to 2012 approach (trip limit of 0 crabs until April 1, 50 crabs after April 1) to ensure no overages**



Trends in New England and New York Horseshoe Crab Indices and Harvest

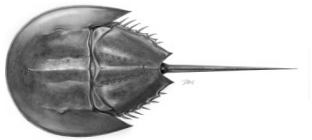
Presented to Horseshoe Crab Board
February 6, 2014

John A. Sweka (SAS Chair)
Penny Howell (TC Chair)
Marin Hawk (FMP Coordinator)



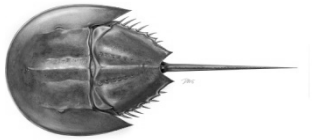
Background

- 2013 Horseshoe Crab Stock Assessment Update
- Used ARIMA modeling to examine trends in abundance indices
- Estimated the probability of the terminal year of an index being below an index-based reference point (25th percentile) and 1998 index value



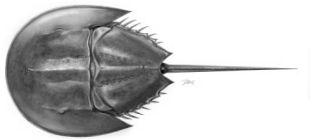
Number of indices in a region where terminal year of the index is below an index-based reference point.

	2013Update		2009 Assessment	
Region	$P(i_f<i_{1998})>0.50$	$P(i_f<Q_{25})>0.50$	$P(i_f<i_{1998})>0.50$	$P(i_f<Q_{25})>0.50$
New England	5 out of 6	6 out of 7	2 out of 3	2 out of 5
New York	3 out of 5	1 out of 5	1 out of 5	1 out of 5
Delaware Bay	4 out of 11	2 out of 16	5 out of 11	1 out of 19
Southeast	0 out of 2	0 out of 5	0 out of 5	0 out of 3
Coastwide	12 out of 24	9 out of 33	8 out of 24	4 out of 32



Background

- Management Board charged the TC/SAS with further examination of trends in New York and New England Regions
- Inclusion of biomedical mortality
- Data confidentiality issues



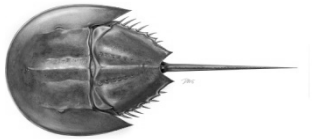
Methods

Survey indices

- New England Region – 8 indices
- New York Region – 6 indices
- Developed a composite index of NY and NE indices with linear mixed effects models
- Random effect = Survey
- Scaled surveys so that their values were within the same order of magnitude

Bait Harvest

- New England = ASMFC reported landings to ME, NH, MA, and RI
- New York = ASMFC reported landings to CT and NY



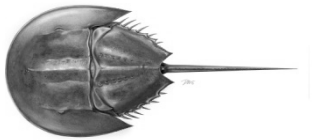
Methods

Biomedical Harvest

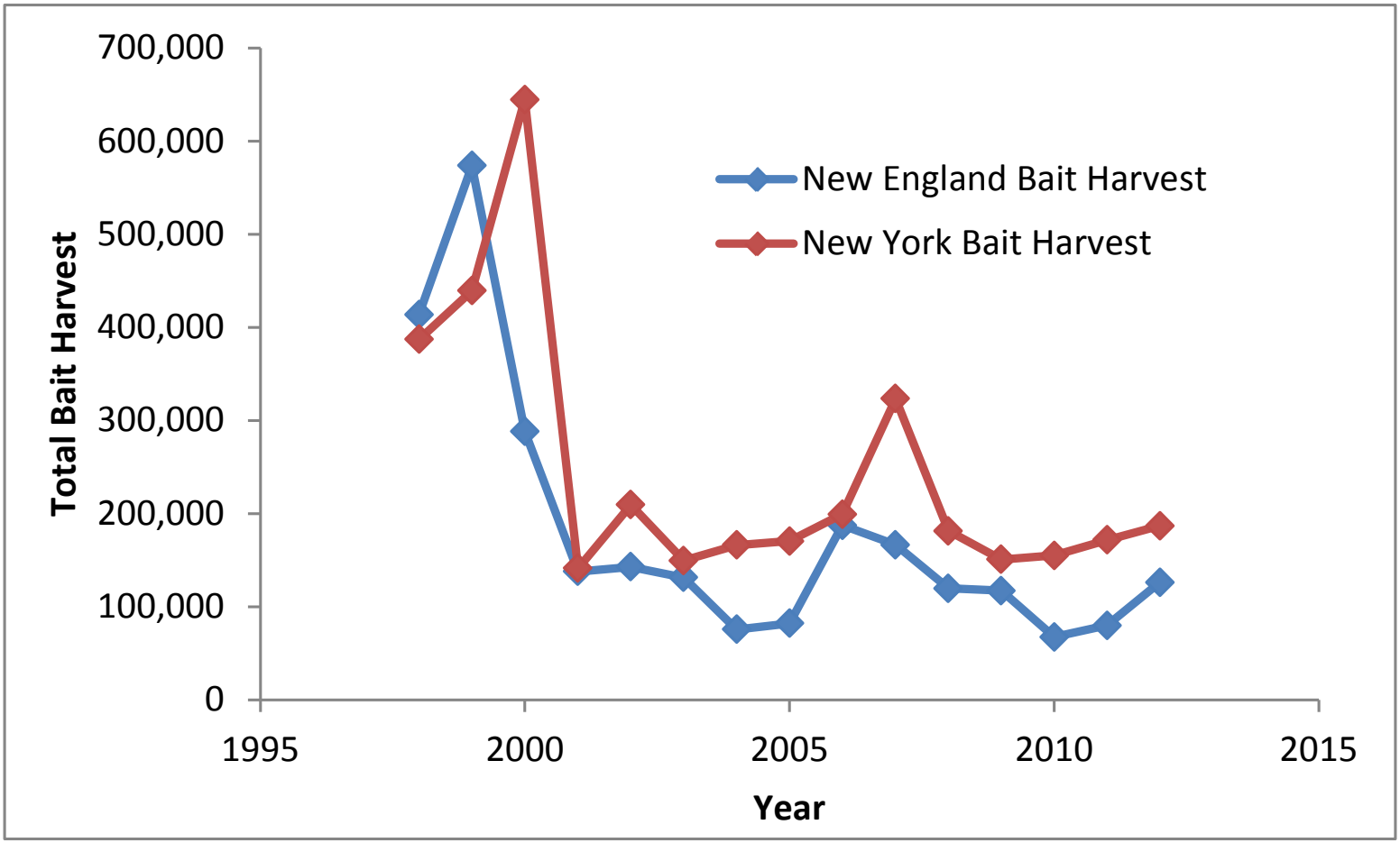
- Data from Associates of Cape Cod Inc.
- Kill = Released HSC x 0.15 + dead HSC prior to bleeding
- Did not include HSC that ultimately went to the bait industry (no double counting)

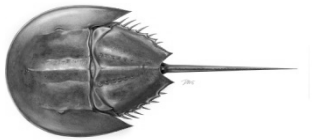
Index of Relative F

- Relative F_{bait} = bait harvest / composite index
- Relative F_{biomed} = biomedical kill / composite index

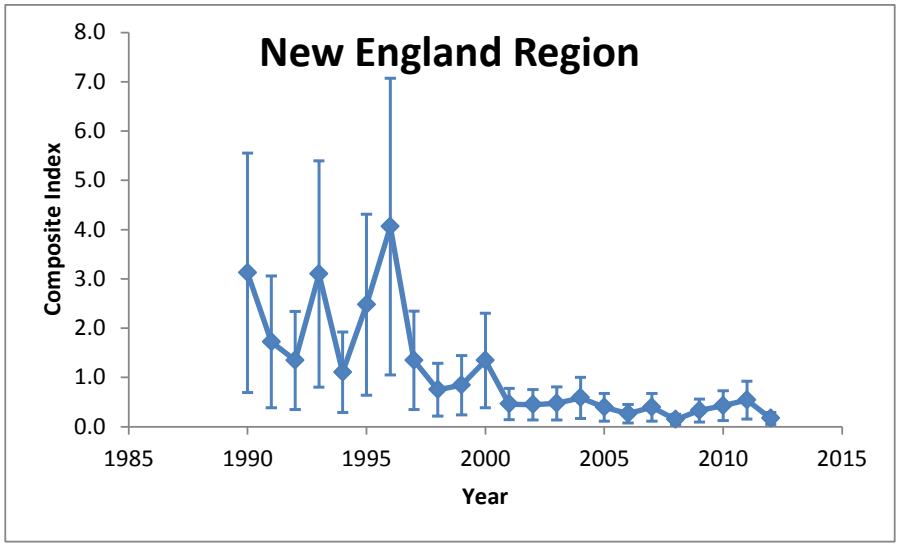


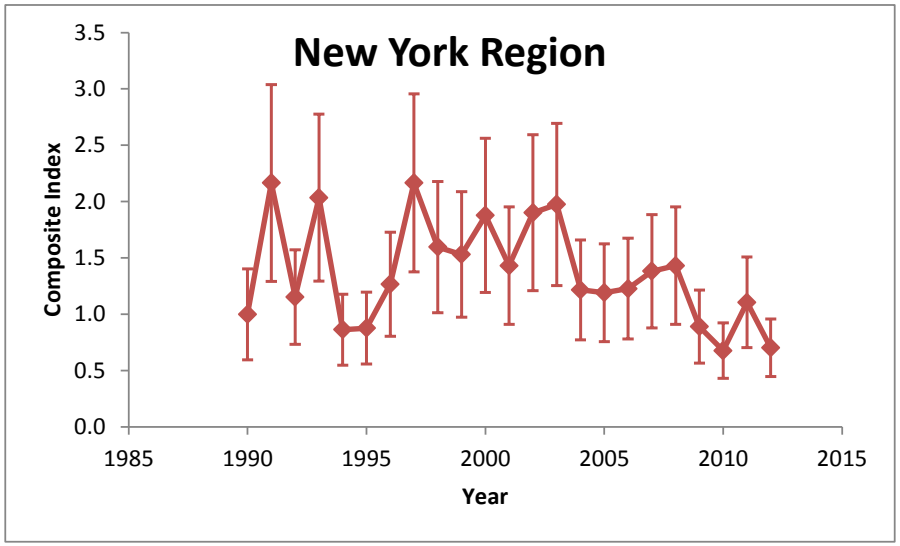
Bait Harvest

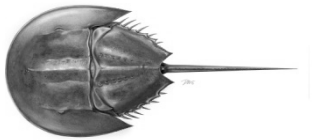




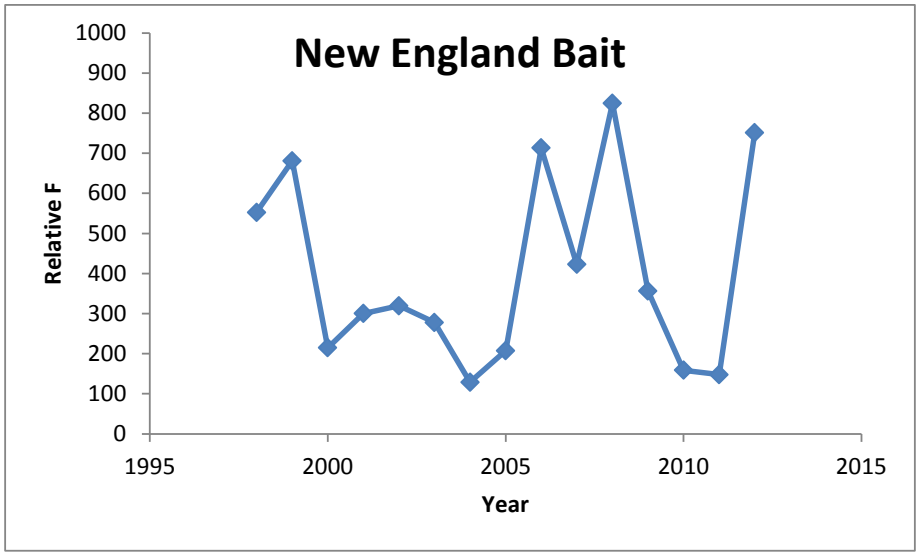
Composite Abundance Indices

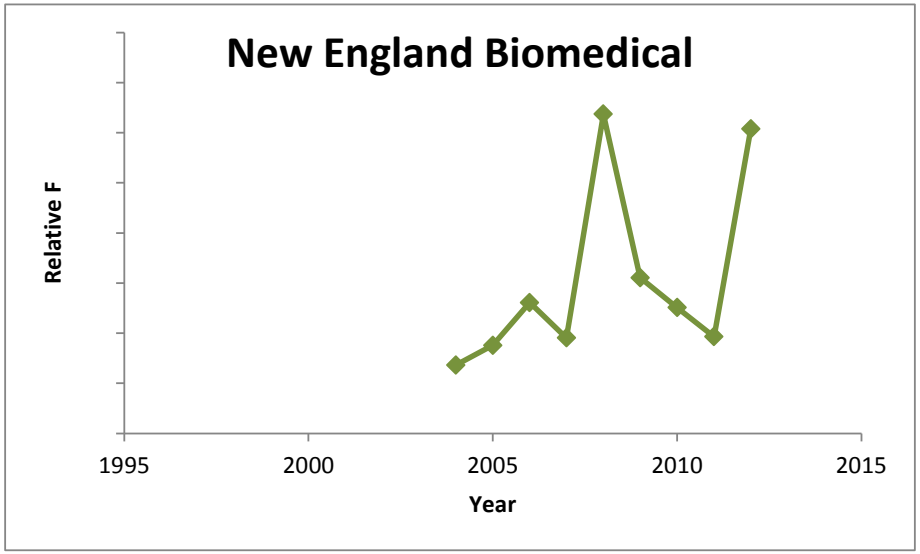


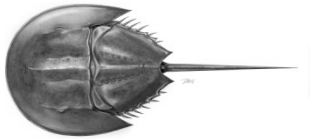




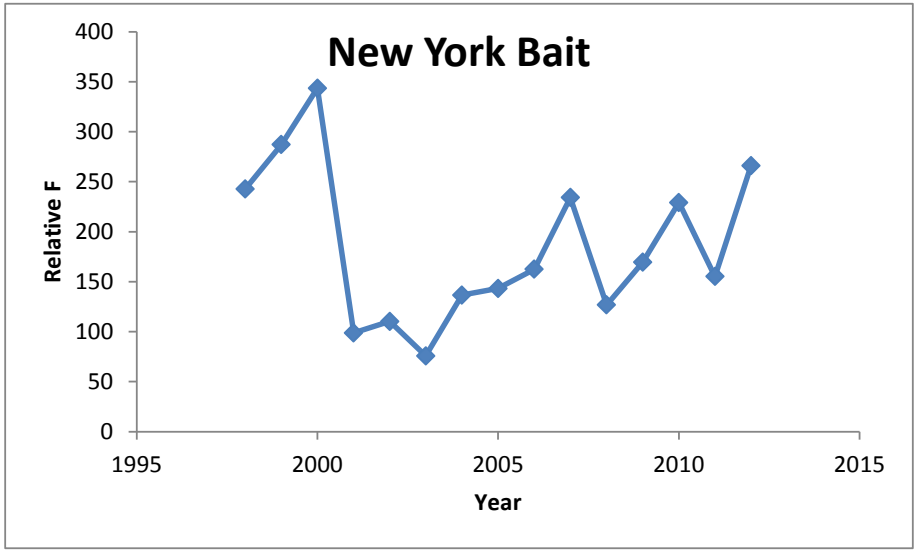
Relative F

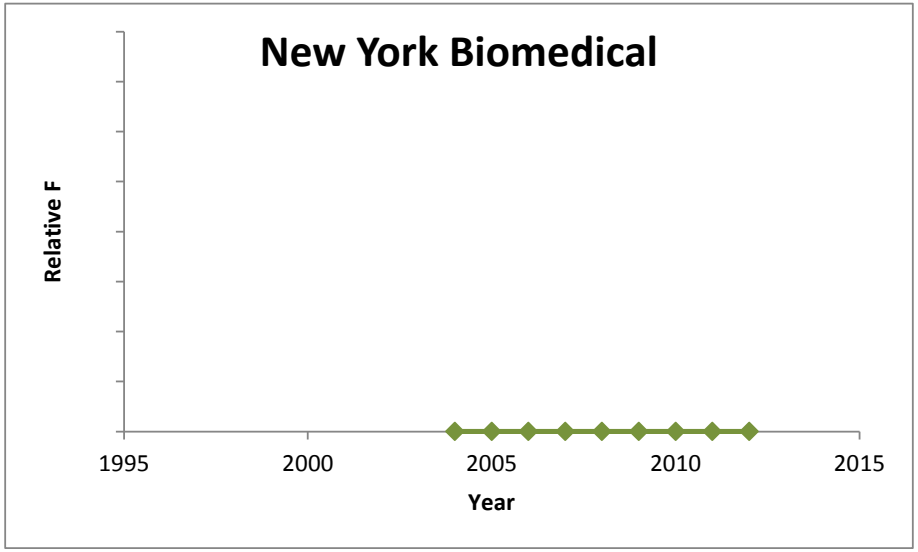

New England Bait
Relative F
1000
900
800
700
600
500
400
300
200
100
0
1995
2000
2005
2010
2015
Year

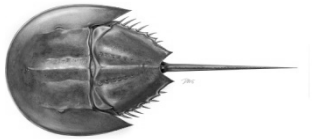

New England Biomedical
Relative F
1995
2000
2005
2010
2015
Year



Relative F

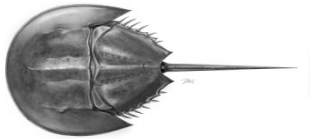

New York Bait
Relative F
400
350
300
250
200
150
100
50
0
1995
2000
2005
2010
2015
Year


New York Biomedical
Relative F
1995
2000
2005
2010
2015
Year



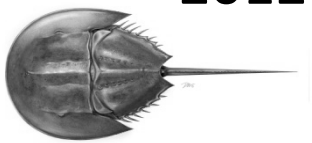
Conclusions

- Composite Indices show declining trends – agrees with 2013 Stock Assessment Update
- Bait Harvest was reduced in both regions after 2000
- Trends in Relative F for the New England Region are similar between bait harvest and biomedical mortality
- Bait Relative F shows some upward trend after 2003 in the New York Region
- No biomedical harvest from the New York Region



Questions remain

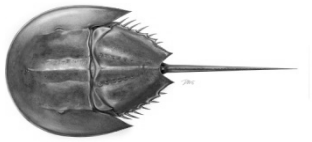
- How does biomedical mortality in the New England Region compare to bait mortality? (Data Confidentiality Issue)
- Is total mortality (bait + biomedical) still too high to allow population growth in both regions?
- Should bait and/or biomedical take be reduced in these regions?
- How does assessment of horseshoe crabs advance given data confidentiality issues? (Coast-wide biomedical mortality in 2012 was 10% of total harvest).



Biomedical Working Group Report

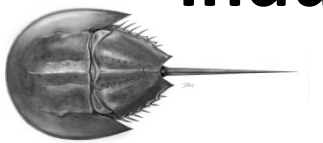
Presented to Horseshoe Crab Management Board

February 6 , 2014



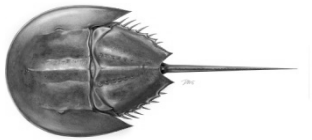
Concerns with Biomedical Industry

- In October 2013, Board raised concerns with the increase in number of dead crabs attributed to the biomedical sector
  - Lack of ability to use these data in stock assessments due to confidentiality issues
- Board formed the Biomedical WG to facilitate discussions between Board members and industry



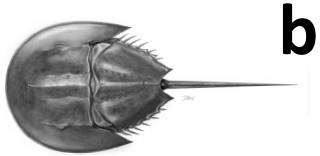
Biomedical WG

- Consisted of representatives from each biomedical company and Board members from each state with a biomedical company (MA, VA, MD, NJ, SC)
- Held a conference call in December to provide solutions and recommendations to the HSC Board



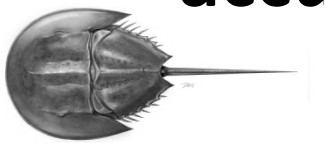
Topics of Discussion

- **Confidentiality of data**
  - **Less than 3 biomedical companies in one region prevents that data from being included in regional assessment**
- **Increased mortality in biomedical sector**
  - **Increased mortality is due to increased harvest, NOT increased mortality rate**
  - **10% of coastwide mortality is attributed to biomedical sector**



Confidentiality of Biomedical Data

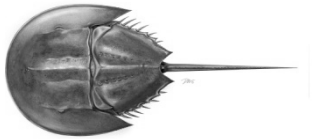
- HSC are assessed based on region (NE, NY, DE Bay, SE)
  - Lack of biomedical companies prevents biomedical data being used in these assessments
- Due to increased contribution to coastwide mortality, SAS feels that excluding biomedical harvest and mortality does not provide an accurate assessment



Possible Solutions

1. **Release all biomedical data to the public**

2. **Release biomedical data to SAS, but require it remain confidential to the public**



1. Release data to public

Pros

- Data would be available to SAS and included in assessment
- Data would be published in report, promoting transparency

Cons

- Misuse of data by interest groups
- Potential business issues since production could be determined by rival companies
  - Biomedical representatives strongly opposed this option

2. Release to SAS; remain confidential

Pros

- Data would be available to SAS and included in assessment
- Avoids potential business complications from releasing records

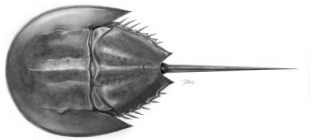
Cons

- Unclear how useful this information would be for management
- Clouds transparency of stock assessment process because public would not understand how stock status was obtained
  - SAS and TC representatives strongly opposed this option

Questions (on confidentiality)?

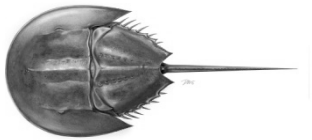
Biomedical Mortality

- 1998: 2% of coastwide mortality from biomedical sector
- 2012: 10% of coastwide mortality
- Partially due to constraints on bait harvest
- Increased number of dead crabs may have an effect on population



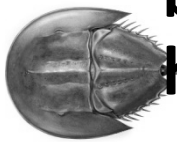
Possible Solutions

1. **Mandate use of bled biomedical crabs in bait industry**
   - **MA harvests crabs for bait, gives them to the biomedical industry to bleed, then uses them for bait**
   - **All biomedical crabs would enter bait industry**
     - **Reduce overall number of dead crabs**
     - **Increase 15% mortality in biomedical sector to 100%**



Potential Issues

- **Short seasons for harvesting horseshoe crabs commercially would impede the biomedical industry's ability to meet their demand**
  - **needs a steady flow of horseshoe crabs year round**
- **Unclear how bleeding impacts the effectiveness in the bait industry**
- **Using bait crabs in the biomedical industry may present challenges that need to be explored before this option is considered a concrete alternative.**
- **SC and NJ do not have a bait harvest, so those biomedical companies would need to continue harvesting from the ocean**



Questions?