

# Maryland's 2009 Horseshoe Crab (*Limulus polyphemus*) Compliance Report to the Atlantic States Marine Fisheries Commission

## I. Introduction

The Interstate Horseshoe Crab Fishery Management Plan (FMP) was approved and adopted by the Atlantic States Marine Fisheries Commission (ASMFC) on October 22, 1998. The goal of the FMP is to conserve and protect the horseshoe crab resource for continued use over time by maintaining sustainable levels of spawning stock biomass to ensure its continued role in the ecology of coastal ecosystems. The FMP contains a monitoring program aimed at providing the necessary data to guide future management decisions on the horseshoe crab fishery. Section 4.2 of the FMP addressed horseshoe crab fishery closures, and established *de minimis* criteria for those states with a limited horseshoe crab bait fishery.

Addendum I to the FMP, approved in April 2000, set forth changes to the harvest level threshold for horseshoe crab bait fisheries. Addendum I required all states to: (1) establish a cap on their horseshoe crab bait fishery landings; and (2) close their respective fisheries once the state's cap was reached. Each state's cap was calculated at 25 percent below the reference period landings (RPL). Maryland's reference period landings were 613,225 horseshoe crabs. Addendum I further encouraged those states (Maryland and New Jersey) that had already achieved harvest reductions in excess of 25 percent below the RPL, to maintain their current harvest restrictions until a plan for adjusting their harvest has been reviewed by the ASMFC Horseshoe Crab Technical Committee and approved by the Management Board.

In May 2001, the Management Board approved Addendum II which established criteria for voluntary quota transfers between states. Addendum III, approved in May 2004, addressed the need for changes regarding the reporting requirements for biomedical companies and states, and voiced concern about the bait fishery's impact on the horseshoe crab population in the Delaware Bay area. Addendum III further reduced the horseshoe crab bait fishery harvest in and around the Delaware Bay. New Jersey and Delaware are restricted from harvesting more than 150,000 horseshoe crabs annually and Maryland must not exceed an annual harvest of 170,653 horseshoe crabs (2001 landings). All other states are restricted from harvesting greater than their respective quotas on bait landings as established by Addendum I. The new harvest limit for Maryland was established by public notice on April 22, 2004.

## II. Request for *de minimis* status

Not Applicable.

## III. Previous Year's Fishery and Management Program

### A. Fishery Dependent Monitoring

### B. Fishery Independent Monitoring

Please refer to section V(B) for independent monitoring results.

### C. Previous Year's Fishery and Management Program

Maryland's horseshoe crab fishery has been governed by the Code of Maryland Regulations (COMAR) 08.02.10.01 since its adoption on April 9, 1998. The online COMAR pertaining to horseshoe crabs is available at <http://www.dsd.state.md.us/comar/08/08.02.10.01.htm>.

Maryland regulations close all waters of the state to the harvest of horseshoe crabs from May 1 to June 7 of each year. In an effort to protect female horseshoe crabs during the

spawning season, Maryland enacted a policy in 2004 that limited the harvest of horseshoe crabs to *males only* (May 1 to June 7) for use in the biomedical processing industry. In April of 2004, those regulations were amended to reflect the new harvest limit of 170,653 horseshoe crabs (Appendix A).

**D. Harvest by Gear Type**

**1. Commercial Landings**

In 2009, Maryland’s horseshoe crab bait fishery reported a harvest total of 165,344 horseshoe crabs (Table 1). Horseshoe crabs are harvested by bottom trawls. The horseshoe crab season was closed for the year on October 8<sup>th</sup>, 2009.

**Table 1. Summary of Maryland’s 2004 - 2009 Horseshoe Crab Bait Fishery Landings, n=total number horseshoe crabs.**

Harvest Category	Year					
	2004	2005	2006	2007	2008	2009
# Males	96,955	108,707	46,833	70,768	97,237	114,134
# Females	64,973	61,114	89,900	101,349	66,258	50,698
# Unsexed	0	0	0	0	0	602
<b>Total #</b>	<b>161,928</b>	<b>169,821</b>	<b>136,733</b>	<b>172,117</b>	<b>163,495</b>	<b>165,344</b>
<b>Total lbs.</b>	<b>529,430</b>	<b>534,294</b>	<b>546,090</b>	<b>653,732</b>	<b>535,444</b>	<b>496,040</b>
<b>% Females</b>	40	36	66	59	40	31

**2. Recreational Landings**

There are no recreational landings of horseshoe crabs.

**E. Progress in Implementing Habitat Recommendations**

There were no habitat recommendations for the plan. Maryland Department of Natural Resources staff, working with the Coastal Bays Program staff and Worcester County, continue to work on cooperative projects that display how shore stabilization can be achieved with soft shorelines, creating or protecting horseshoe crabs spawning habitat.

**IV. Planned management programs for the current calendar year.**

Regulations regarding horseshoe crab management in Maryland will not change for 2010. All regulations will reflect the final regulatory actions in place at the end of 2004, however regulations were passed in 2009 that delay the start of general harvest until July 13 from July 1. Regulations and monitoring activities are in compliance with Addendum III and are detailed in the plan specific monitoring program requirements.

**V. Plan specific requirements (components A, B, D, E, and F are required for Maryland).**

**A1. Monthly reporting of all harvest (including, but not limited to: bait fisheries, bycatch, biomedical industry, and scientific and educational research).**

Bait Fisheries

It is required that all persons who catch or land horseshoe crabs in Maryland report their catch and landing information on the forms provided by the MDNR. In 1998, MDNR established a horseshoe crab landing permit and issued permits to individuals who landed horseshoe crabs in Maryland during 1996 (Appendix B). A total of 10 permits were issued in 2009. Permit holders are required to report weekly numbers landed by gender, area of harvest and gear type. Non-permit holders are restricted to no more than 25 horseshoe crabs per

day during an open season and area, and are required to report this information using MDNR monthly commercial logbooks.

In 2009, Maryland's horseshoe crab bait fishery reported a harvest total of 162,994 horseshoe crabs (Appendix C). Beginning June 8 and continuing through July 10 the fishery was only open more than one mile off the Maryland Atlantic coast, and only harvesters possessing a Maryland Horseshoe Crab Harvester's Permit were allowed to harvest and possess 100 crabs per day. Those fishermen without a permit were limited to harvesting and possessing 25 crabs per day. The quota was projected to be caught and the fishery was closed for the year on October 8th, 2009. July 13 through November 30, all Maryland waters were open and harvesters with a permit were allowed to harvest and possess daily the number of crabs indicated on their permits.

Bycatch Horseshoe Crabs are sometimes caught as bycatch in the ocean trawl and Chesapeake Bay pound net fisheries. Due to the resilient nature and hard carapaces of horseshoe crabs, the crabs which are not retained for harvest are most often released alive with little injury. Mortality associated with capture and release of horseshoe crabs in other fisheries is assumed to be small.

#### Biomedical Industry

Maryland requires all persons who collect horseshoe crabs for scientific research, including the biomedical industry, to obtain a scientific collection permit and report the number of animals collected annually. In 2009, Lonza Biomedical and Limuli Laboratories were the only companies to obtain a scientific collection permit for the purpose of collecting horseshoe crabs within Maryland for Limulus Amoebocyte Lysate (LAL) production.

#### Scientific And Educational Research

The Maryland Department of Natural Resources (MDNR), working through the state school system, conducts an educational program entitled "Green Eggs and Sand." Participation in this program involves the collection and hatching of a small number of horseshoe crab eggs (hundreds) in the classroom. Live adult horseshoe crabs are sometimes used for demonstrations in conjunction with this program, but all specimens have been returned live to the wild after their use. The total number of horseshoe crabs used for demonstrations purposed for this program and others thorough out the state in any year is around ten. This program will continue in 2010. The effect on the horseshoe crab stock is positive, as the program raises awareness of horseshoe crab ecology and the need to protect sand on nesting beaches.

### **A2. Characterize a portion of the commercial catch based on prosomal width by sex.**

Maryland's horseshoe crab landing permit holders are required to report the gender of horseshoe crabs landed. Permitted horseshoe crab fishermen accounted for almost 100 percent of Maryland's total horseshoe crab landings in 2009. Of these reported landings, 31 percent were females.

In 2009, Lonza (biomedical processing lab Lonza Biomedical 410-677-0389) working with Virginia Tech measured prosomal width on a large subsample of the horseshoe crabs that were delivered to their processing facility (Table 2). These samples were taken through the harvest season, and the lengths of the animals are



							<b>FAC/PROD. ISSUES</b>
<b>JUNE</b>	8,807	10,324	602	26	49	1	829
<b>JULY</b>	17,385	14,170	939	127	43	0	0
<b>AUGUST</b>	18,509	14,541	883	31	12	356	163
<b>SEPTEMBER</b>	12,056	11,974	874	346	3	412	0
<b>OCTOBER</b>	9,305	12,715	859	12	4	245	442
<b>NOVEMBER</b>	8,800	9,050	566	9	0	138	0
<b>Grand Total</b>	<b>74,862</b>	<b>72,774</b>	<b>4,723</b>	<b>551</b>	<b>111</b>	<b>1,152</b>	<b>1,434</b>

Maryland requires that a Chain of Custody Form to follow each batch of horseshoe crabs collected for biomedical use, from the time of capture through the time of release. This form is returned to the MDNR and reviewed by staff biologists. Biologists periodically examine the biomedical horseshoe crabs and the bleeding facility as well. The chain of custody forms were examined for information on horseshoe crabs rejected prior to transport to the bleeding facility.

**A4. Certify that horseshoe crabs collected for biomedical use are not used for other purposes.**

The LAL production permit issued to the biomedical companies from the Food and Drug Administration, as well as the Maryland scientific collecting permit, requires all horseshoe crabs collected for LAL production to be returned alive to the waters from which they were collected within 48 hours of collection. In 2004, new regulations allowed the use of bait crabs for blood collection and the return of these crabs to the bait fishery.

**B. Continue existing benthic sampling programs (record weight, number, and prosomal width by sex). States with juvenile trawl surveys should include these data in annual monitoring reports.**

MDNR continues to collect the required horseshoe crab data from the Maryland Coastal Bays Trawl Survey. An index of horseshoe crab relative abundance is produced annually from those data (Figure 1). Data are collected monthly with a 16 ft otter trawl from April to October. The data for 2009 are not available and will be updated when it becomes available in May of 2010.

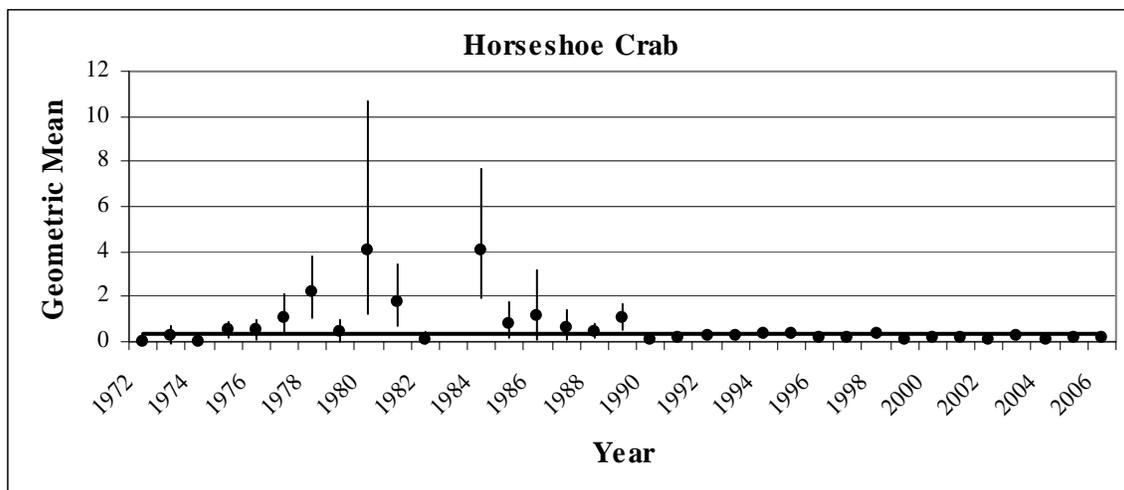


Figure 1. Horseshoe crab trawl index of relative abundance (geometric mean) with 95% confidence intervals (1972-2006). Solid line represents the 1972-2006 time series grand mean.

**C. Implement a pilot program to survey horseshoe crab eggs in New Jersey and Delaware by the 1999 spawning season.**

This component is not mandatory for Maryland.

**D. Implement a pilot program to survey horseshoe crab spawning in New Jersey, Delaware, and Maryland by the 1999 horseshoe crab spawning season.**

Please reference section V, F of this report.

**E. A coordinated tagging program should be implemented by the Tagging Subcommittee.**

Both Lonza and Limuli Laboratories participate in the U.S Fish and Wildlife Service Coast-wide Tagging Program using horseshoe crabs collected and released in Maryland waters.

**F. Identify potential horseshoe crab spawning and nursery habitat.**

Since 2002 the Maryland Coastal Bays Program (MCBP), part of the National Estuary Program, has coordinated a volunteer horseshoe crab spawning survey in the Maryland Coastal Bays. MDNR has assisted MCBP in conducting the survey, which is a continuation of preliminary work done by the state beginning in 1998. A summary of the survey results is attached in a report completed by the Coastal Bays Program (Appendix D). The survey is beginning to show some trends in areas where the horseshoe crabs spawn, and the timing of the spawn. Volunteers have also begun taking temperatures during the surveys to better understand the horseshoe crab spawning behavior in the Maryland Coastal Bays.

**VI. Law Enforcement Requirements**

None

**APPENDIX A**  
**Maryland's Horseshoe Crab Regulations**

.01 Horseshoe Crabs.

A. Quota. The annual total allowable landings of horseshoe crabs for the commercial fishery is 170,653 horseshoe crabs.

B. Seasons

(1) A person may not catch or land horseshoe crabs in Maryland:

(a) From December 1 through March 31, inclusive; and

(b) From May 1 through June 7, inclusive.

(2) From April 1 through April 30, inclusive, and June 8 through June 30, inclusive, a person:

(a) May not catch or land horseshoe crabs from:

(i) The Chesapeake Bay and its tidal tributaries, or

(ii) Within 1 mile of the Atlantic coast or its coastal bays; and

(b) May catch and land horseshoe crabs outside of 1 mile of the Atlantic coast on Monday through Friday in accordance with the catch limits in §D of this regulation.

(3) From July 1 through November 30, inclusive, a person may catch or land horseshoe crabs from the tidal waters of the State on Monday through Friday in accordance with the catch limits in §D of this regulation.

C. Time Restrictions. A person may not catch or land horseshoe crabs on Saturday or Sunday.

D. Catch Limits.

(1) A person may not catch or land more than 25 horseshoe crabs daily, except as follows:

(a) From April 1 through June 30, inclusive, the daily catch limit for this period for a permittee shall be 100 horseshoe crabs; and

(b) From July 1 through November 30, inclusive, the daily catch limit for this period for a permittee shall be based on the ratio of landings reported by the permittee in Maryland during 1996 to the total reported landings for 1996 as applied to the annual total allowable landings for the present year.

(2) A permittee may not catch or land more than the daily catch limit specified on the horseshoe crab landing permit issued by the Department.

E. Horseshoe Crab Landing Permit.

(1) The Department may issue a permit to catch and land horseshoe crabs in Maryland to a person who:

(a) Is licensed in accordance with Natural Resources Article, §4-701, Annotated Code of Maryland; and

(b) Reported catching and landing horseshoe crabs in Maryland during 1996.

(2) The daily catch limits shall be printed on the horseshoe crab landing permit.

(3) A permittee shall possess the horseshoe crab landing permit when engaged in permitted activities.

(4) Permanent Transfer of a Landing Permit. The Department may approve the permanent transfer of a landing permit to a person who:

(a) Is the permittee's spouse, daughter, son, stepchild, grandchild, step-grandchild, parent, sister, brother, grandparent, father-in-law, mother-in-law, son-in-law, daughter-in-law, sister-in-law, or brother-in-law;

(b) Upon death of the permittee, has been indicated as the transferee to the Department by the permittee or authorized representative of the permittee;

(c) Has purchased a vessel used for commercial fishing from the permit holder; or

(d) Provides a notarized bill of sale for the purchase of equipment and assets with a minimum value of \$2,000 and the commercial fishing business from the permit holder.

(5) Temporary Transfer of a Landing Permit.

(a) The Department may approve the temporary transfer of a landing permit to a person for not less than 30 days and not more than 90 days.

(b) A person may not transfer a permit in exchange for any type of remuneration.

(c) At the end of the specified transfer time period the permit automatically returns to the original permittee.

(6) A horseshoe crab landing permit may only be transferred to a person who:

(a) Is licensed in accordance with Natural Resources Article, §4-701, Annotated Code of Maryland; and

(b) Is not currently a permit holder.

F. General.

(1) A person who catches or lands horseshoe crabs in Maryland shall report catch and landing information daily on the forms provided by the Department.

(2) A person shall return the form containing catch and landing information to the Department in the time period specified by the Department.

(3) A person authorized to catch and release horseshoe crabs for purposes of scientific research:

(a) Shall return within 48 hours the live horseshoe crabs to the waters from which the horseshoe crabs were taken; and

(b) Is exempt from §§A—E of this regulation.

(4) A person who purchases horseshoe crabs for purposes of scientific research may:

(a) Return the horseshoe crabs to the harvester for use or sale as bait;

(b) Return or sell the horseshoe crabs to a bait dealer; or

(c) Return the horseshoe crabs live to tidal waters.

(5) The Secretary may modify or close a season by publishing notice in a daily newspaper of general circulation at least 48 hours in advance, stating the effective hour and date.

(6) The Secretary shall make a reasonable effort to disseminate public notice through various other media so that an affected person has reasonable opportunity to be informed.

**APPENDIX B**



**WEEK 1**

**(6/8/09 TO 6/12/09)**

**MARYLAND DEPARTMENT OF NATURAL RESOURCES**

**FISHERIES SERVICES**

**2009 HORSESHOE CRAB LANDING PERMIT**

**MAXIMUM DAILY ALLOWABLE LANDING LIMIT: 100 HORSESHOE CRABS**

**FISHERIES SERVICES**

Fisherman's name

**HSC PERMIT # AP08-2009-HSC-1**

Address

**LICENSE # 016551**

**AREAS OF HARVEST**

**GEAR USED**

<b>A</b> = Chesapeake Bay	<b>D</b> = Ocean, 1 – 3 Miles	<b>1</b> = Trawl	<b>4</b> = Pound/Fyke Net
<b>B</b> = Coastal Bays	<b>E</b> = Ocean, 3 – 12 Miles	<b>2</b> = Gill Net, Drift	<b>5</b> = Hand
<b>C</b> = Ocean, < 1 Mile	<b>F</b> = Ocean, 12+ Miles	<b>3</b> = Gill Net, Anchor	<b>6</b> = Other, Specify

DATE	# OF FEMALES	# OF MALES	# NOT SEXED	AREA OF HARVEST	GEAR USED	SEAFOOD DEALER #
<b>06/06/2009</b>	<b>CLOSED</b>					
<b>06/07/2009</b>						
<b>06/08/2009</b>						
<b>06/09/2009</b>						
<b>06/10/2009</b>						
<b>06/11/2009</b>						
<b>06/12/2009</b>						
<b>06/13/2009</b>	<b>CLOSED</b>					
<b>06/14/2009</b>						

RETURN WITHIN 3 DAYS AFTER THE WEEK IS OVER TO:

Maryland Department of Natural Resources  
Fisheries Service B-2  
Attn: Horseshoe Crab Monitoring  
580 Taylor Avenue

Annapolis, MD 21401

Fax #: 410.260.8279 Attn: Allison Luettel, Horseshoe Crab Monitoring

**PLEASE READ REVERSE SIDE FOR IMPORTANT INFORMATION**

## INSTRUCTIONS TO PERMITTEE

- 1) Your name, address, license number, permit number, and daily maximum allowable landing limit appears in the top section of this permit.
- 2) Write the number of female and male horseshoe crabs in the **NUMBER OF FEMALE** and **NUMBER OF MALE** space.
- 3) Write the number of horseshoe crabs, which were not sexed in the **NUMBER NOT SEXED** space.
- 4) Write the area of harvest using the letter codes on top of the permit in the **AREA OF HARVEST** space.
- 5) Write the gear used to harvest the horseshoe crabs using the numeric codes on the top of the permit in the **GEAR USED** space.
- 6) If horseshoe crabs are sold to a seafood dealer write the dealer's ID number in the **SEAFOOD DEALER'S ID NUMBER** space.
- 7) You are responsible for the accuracy of any and all information recorded on this permit.
- 8) You must return this permit to the Department of Natural Resources (address and fax number below) within 3 days after the week is over. Failure to do so, **even if "0" horseshoe crabs are landed**, could result in the revoking of your permit.

## HORSESHOE CRAB TAG RECAPTURES

Tag Number	Date Recovered	HSC Kept/Released	Tag Kept/Mailed/Disposed

**If you need additional information or have questions please call:  
Allison Luettel 410.260.8343 or 800.620.8DNR x.8343**

**APPENDIX C**  
**Description of Maryland’s Horseshoe Crab Fishery**

Maryland’s 2009 Horseshoe Crab Bait Harvest Summary

- 1. 2009 QUOTA**
  - 170,653 Horseshoe Crabs
- 2. 2008 HARVEST**
  - Total: 165,344 HSCs / 496,040 lbs.
  - Percent of MD quota: 96.3%
- 3. NUMBER OF FISHERMEN**
  - Permittees: 10
  - Trawl (9); Pound Net (1)
- 4. SEX RATIO OF HARVEST**
  - Female: 31%
  - Male: 69%
- 5. AREA OF HARVEST**
  - Chesapeake Bay: 2%
  - Atlantic Ocean: 98%
- 6. METHOD OF HARVEST**
  - Pound//Fyke Net: 2%
  - Trawl Net 98%
- 7. MONTH OF HARVEST**

<b>Table 5. Numbers of Horseshoe crabs caught by month and sex in the commercial fishery in Maryland in 2008.</b>				
<b>Month</b>	<b>Males</b>	<b>Females</b>	<b>Unknown</b>	<b>Total</b>
June	2,530	1,347		3,877
July	12,561	6,137	600	19,298
August	45,076	19,110	2	64,188
September	33,370	13,880		47,250
October	20,597	10,224		30,821
<b>Total</b>	114,134	50,698		165,344

**Appendix D**

**2009 Horseshoe Crab Spawning Survey results**  
**Attached as a separate file**  
**“HSC spawning activity in MD Coastal Bays 2002 to 2009”**