ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

HORSESHOE CRAB
(*Limulus polyphemus*)

2020 Fishing Year

Prepared by the Plan Review Team

Approved October 21, 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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I. Status of the Fishery Management Plan

Date of FMP Approval:	December 1998
Amendments	None
Addenda	Addendum I (April 2000) Addendum II (May 2001) Addendum III (May 2004) Addendum IV (June 2006) Addendum V (September 2008) Addendum VI (August 2010) Addendum VII (February 2012)
Management Unit:	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
States with Declared Interest:	Massachusetts – Florida, Potomac River Fisheries Commission
Active Boards/Committees:	Horseshoe Crab Management Board, Advisory Panel, Technical Committee, and Plan Review Team; Delaware Bay Ecosystem Technical Committee; Adaptive Resource Management Subcommittee

Goals and Objectives

The Interstate Fishery Management Plan for Horseshoe Crabs (FMP) established the following goals and objectives.

2.0. Goals and Objectives

The goal of this Plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of the coastal ecosystem, while providing for continued use over time. Specifically, the goal includes management of horseshoe crab populations for continued use by:

1) *current and future generations of the fishing and non-fishing public (including the biomedical industry, scientific and educational research);*
2) *migrating shorebirds; and,*
3) *other dependent fish and wildlife, including federally listed (threatened) sea turtles.*

To achieve this goal, the following objectives must be met:

(a) prevent overfishing and establish a sustainable population;

(b) achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit;

(c) establish the appropriate target mortality rates that prevent overfishing and maintain adequate spawning stocks to supply the needs of migratory shorebirds;
(d) coordinate and promote cooperative interstate research, monitoring, and law enforcement;
(e) identify and protect, to the extent practicable, critical habitats and environmental factors that limit long-term productivity of horseshoe crabs;
(f) adopt and promote standards of environmental quality necessary for the long-term maintenance and productivity of horseshoe crabs throughout their range; and,
(g) establish standards and procedures for implementing the Plan and criteria for determining compliance with Plan provisions.

Fishery Management Plan Summary

The framework for managing horseshoe crabs along the Atlantic coast was approved in October 1998 with the adoption of the Interstate Fishery Management Plan (FMP) for Horseshoe Crabs. The goal of this plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of coastal ecosystems while providing for continued use over time.

In 2000, the Horseshoe Crab Management Board approved Addendum I to the FMP. Addendum I established a state-by-state cap on horseshoe crab bait landings at 25 percent below the reference period landings (RPL's), and *de minimis* criteria for those states with a limited horseshoe crab fishery. Those states with more restrictive harvest levels (Maryland and New Jersey) were encouraged to maintain those restrictions to provide further protection to the Delaware Bay horseshoe crab population, recognizing its importance to migratory shorebirds. Addendum I also recommended that the National Marine Fisheries Service (NMFS) prohibit the harvest of horseshoe crabs in federal waters (3-200 miles offshore) within a 30 nautical mile radius of the mouth of Delaware Bay, as well as prohibit the transfer of horseshoe crabs in federal waters. A horseshoe crab reserve was established on March 7, 2001, by NMFS in the area recommended by ASMFC. This area is now known as the Carl N. Shuster Jr. Horseshoe Crab Reserve (Figure 1).

In 2001, the Horseshoe Crab Management Board approved Addendum II to the FMP. The purpose of Addendum II was to allow the voluntary transfer of harvest quotas between states to alleviate concerns over potential bait shortages on a biologically responsible basis. Voluntary quota transfers require Technical Committee review and Management Board approval.

In 2004, the Board approved Addendum III to the FMP. The addendum sought to further the conservation of horseshoe crab and migratory shorebird populations in and around the Delaware Bay. It reduced harvest quotas and implemented seasonal bait harvest closures in New Jersey, Delaware, and Maryland, and revised monitoring components for all jurisdictions.

Addendum IV was approved in 2006. It further limited bait harvest in New Jersey and Delaware to 100,000 crabs (male only) and required a delayed harvest in Maryland and Virginia.

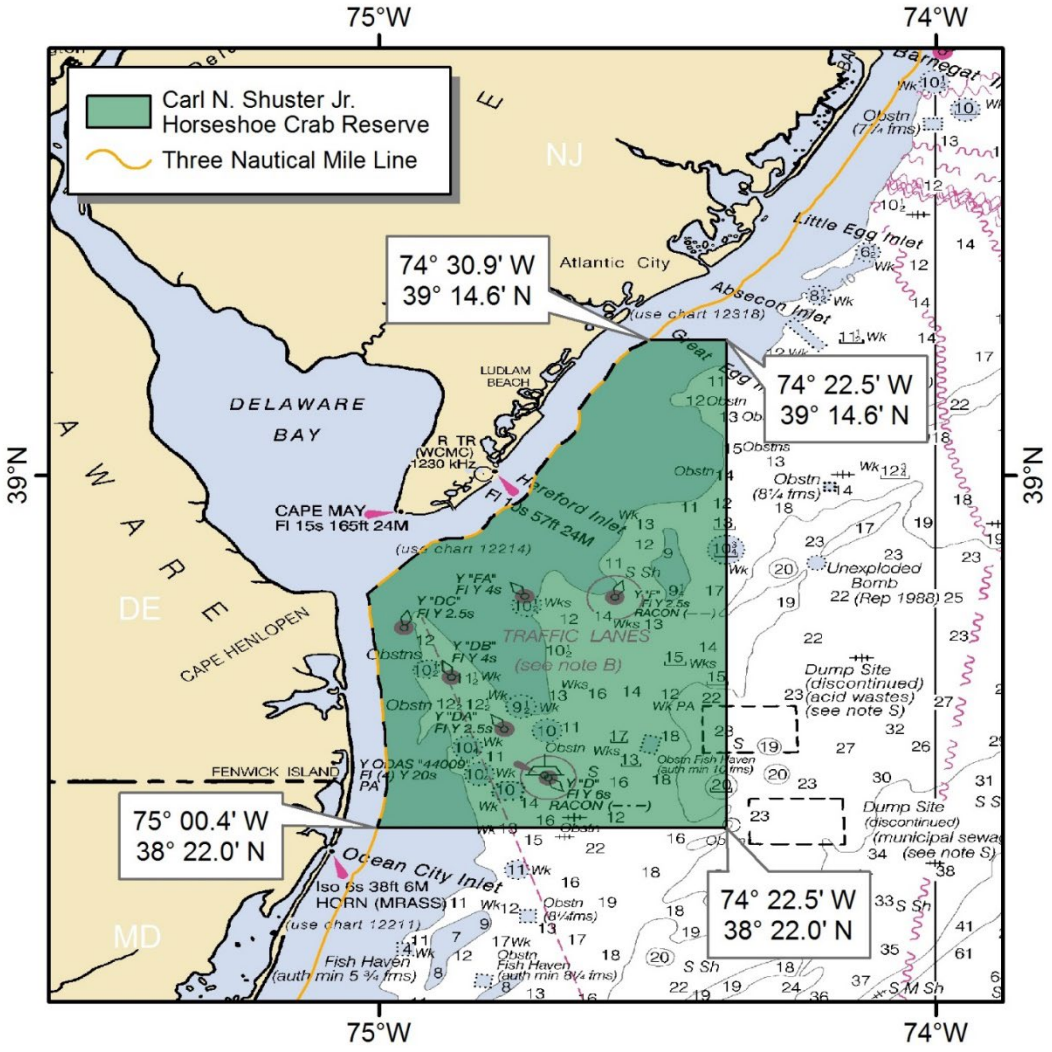


Figure 1. Carl N. Shuster Jr Horseshoe Crab Reserve.

Addendum V, adopted in 2008, extended the provisions of Addendum IV through October 31, 2010.

In early 2010, the Board initiated Draft Addendum VI to consider management options that would follow expiration of Addendum V. The Board voted in August 2010 to extend the Addendum V provisions, via Addendum VI, through April 30, 2013. The Board also chose to include language allowing them to replace Addendum VI with another Addendum during that time, in anticipation of implementing an Adaptive Resource Management (ARM) Framework.

The Board approved Addendum VII in February 2012. This addendum implemented an ARM framework for use during the 2013 fishing season and beyond. The framework considers the abundance levels of horseshoe crabs and shorebirds in determining the optimized bait harvest level for the Delaware Bay states of New Jersey, Delaware, Maryland, and Virginia (east of the

COLREGS). A process to review and possibly revise the ARM Framework was initiated in 2019 and is expected to be completed in 2022.

II. Status of the Stock and Assessment Advice

A benchmark stock assessment was completed and approved for management use in 2019. The assessment report is available at:
http://www.asmfc.org/uploads/file/5cd5d6f1HSCAssessment_PeerReviewReport_May2019.pdf

This assessment was the first to successfully apply a stock assessment model to a component of the horseshoe crab stock. A Catch Multiple Survey Analysis (CMSA) model, a stage-based model that tracks progression of crab abundances from pre-recruits to full recruits to the fishery, was applied to female crabs in the Delaware (DE) Bay region (New Jersey-Virginia). This model estimated regional female crab abundance using relative abundance information from the Virginia Tech Benthic Trawl Survey, New Jersey Ocean Trawl Survey, and Delaware Adult Trawl Survey, and estimates of mortality including natural mortality, commercial bait harvest, commercial discard mortality, and mortality associated with biomedical use. While reference points were not approved to determine stock status, the CMSA population estimates were recommended as the best estimates for female horseshoe crab abundance in the DE Bay region.

The base CMSA model population estimates show an increase in the number of female crabs in the DE Bay region since 2012, when the ARM Framework was established via Addendum VII. This increasing trend is supported by positive trends in regional fishery-independent surveys during this time period. Population estimates from the base model are not publicly available due to the inclusion of confidential biomedical data. However, a sensitivity run assuming no biomedical mortality is publicly viewable, and these estimates are not significantly different from the base model results. Estimates of discard mortality from the Northeast Fisheries Observer Program (NEFOP) were also included in the base CMSA model and indicate that discard mortality could be significant, of similar or greater magnitude than mortality due to bait harvest. Population estimates from the CMSA are currently being considered for incorporation into the ARM Framework, which is applied annually to specify bait harvest quotas for the DE Bay region.

Autoregressive Integrated Moving Average (ARIMA) models, similar to those used in previous assessments, were applied to all regions. ARIMA models were fit to fishery-independent survey indices trends of abundance in each of the regional horseshoe crab populations: Northeast (Massachusetts-Rhode Island), New York (Connecticut-New York), DE Bay, and Southeast (North Carolina-Florida). No definitions for overfishing or overfished status have been adopted by the Management Board. However, the assessment characterized the status of each regional and the coastwide population based on the percentage of surveys within a region (or coastwide) having a >50% probability of the terminal year being below the ARIMA reference point. The ARIMA reference point was the 1998 index for each survey. “Poor” status was defined as >66%

of surveys meeting this criterion, “Good” status was defined as <33% of surveys, and “Neutral” status was defined as 34–65% of surveys. Based on these criteria, stock status was neutral for the Northeast region, poor for the New York region, neutral for the Delaware Bay region, and good for the Southeast region. Coastwide, abundance has fluctuated through time with many surveys decreasing after 1998 but increasing in recent years. The coastwide status includes surveys from all regions and indicates a neutral trend, likely due to a combination of positive and negative trends.

III. Status of the Fishery

Bait Fishery

For most states, the bait fishery is open year round. However, because of seasonal horseshoe crab movements (to the beaches in the spring; deeper waters and offshore in the winter), the fishery operates at different times along the coast. New Jersey has prohibited commercial harvest of horseshoe crabs in state waters since 2006. State waters of Delaware are closed to horseshoe crab harvest and landing from January 1st through June 7th each year, and other state horseshoe crab fisheries are regulated with various season/area closures.

The total reported bait landings in 2020 were well below the ASMFC coastwide quota of 1,587,274 crabs (Table 1, Figure 2). Coastwide bait landings in 2020 totaled 456,675 crabs, excluding confidential landings from Rhode Island. This represents a 45% decrease from 2019 landings of 832,755 crabs. Landings decreased in all states except Rhode Island, with the most significant decreases occurring in Virginia (84% decrease from 2019) and North Carolina (72% decrease from 2019). It is likely that the significant decreases in bait landings for 2020 are related to the COVID-19 pandemic restricting harvest effort.

Reported coastwide landings since 1998 show more male than female horseshoe crabs were harvested annually. Several states presently have sex-specific restrictions in place which limit or ban the harvest of females. The American eel pot fishery prefers egg-laden female horseshoe crabs as bait, while the whelk (conch) pot fishery is less dependent on females. States with greater than 5% of coastal landings are required to report sex for at least a portion of their bait harvest; for 2020 these states include Massachusetts, Connecticut, New York, Delaware, Maryland, and Virginia. Within these states, 63% of reported bait landings were male, 13% were female, and 24% were unclassified in 2020.

The hand, trawl, and dredge fisheries typically account for the majority of reported commercial horseshoe crab bait landings. Other gears that account for the remainder of the harvest include rakes, hoes, and tongs, fixed nets, and gill nets.

Table 1. Reported commercial horseshoe crab bait landings by jurisdiction. Note: Landings from 2017 and earlier were updated to numbers validated by all jurisdictions for use in the 2019 benchmark stock assessment.

Jurisdiction	ASMFC Quota 2020	State Quota 2020	2020	2019	2018	2017	2016	2015
MA	330,377	165,000	163,695	172,664	159,002	134,707	110,399	117,611
RI	26,053	8,398	C	C	1,889	3,415	20,676	7,867
CT	48,689	48,689	15,942	17,588	21,870	19,944	21,945	19,632
NY	366,272	150,000	63,367	167,181	138,223	195,717	176,632	145,324
NJ*	162,136	0	0	0	0	0	0	0
DE*	162,136	157,122	124,803	164,225	126,065	201,132	109,836	151,262
MD*	255,980	255,980	61,165	145,907	66,647	237,146	157,013	27,494
PRFC	0	0	0	0	0	0	0	0
VA**	172,828	172,828	24,031	151,727	140,584	160,331	128,848	102,235
NC	24,036	24,036	3,672	13,463	10,998	25,161	25,197	24,839
SC	0	0	0	0	0	0	0	0
GA	29,312	29,312	0	0	0	0	0	0
FL	9,455	9,455	0	0	C	1,394	689	264
TOTAL	1,587,274	1,020,820	456,675	832,755	665,278	978,947	751,235	596,528

*Male-only harvest

**Virginia harvest east of the COLREGS line is limited to 81,331 male-only crabs under the ARM harvest package #3. Virginia data shown are preliminary. Virginia harvest east of the COLREGS in 2019 was 0 crabs.

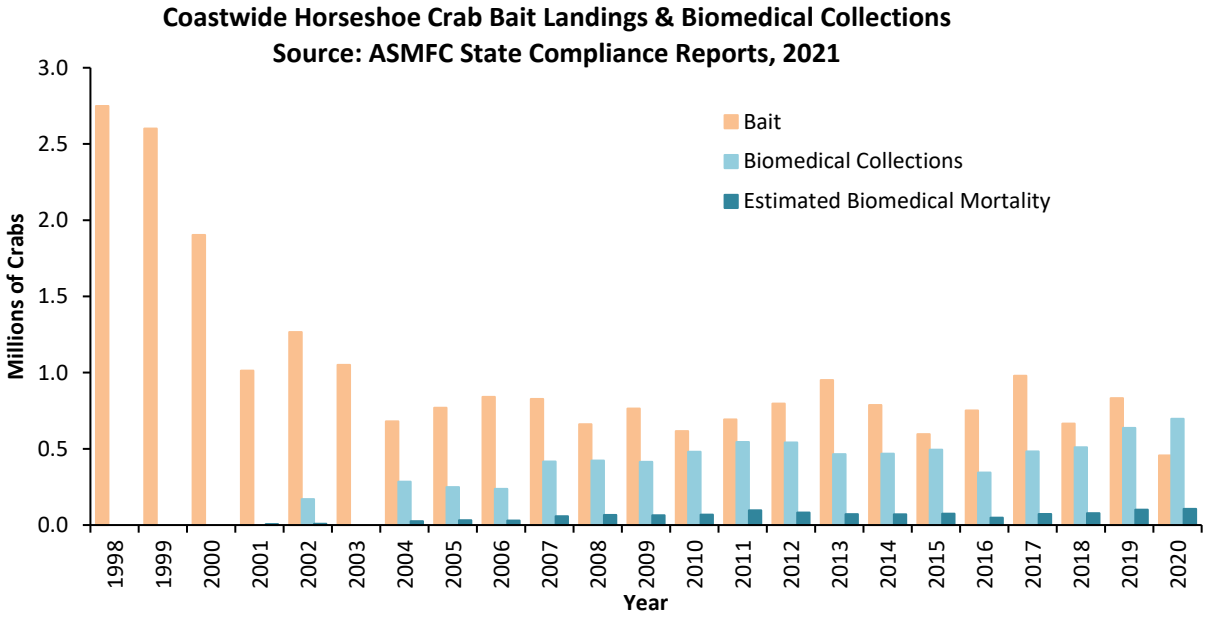
Biomedical Use

The horseshoe crab is an important resource for research and manufacture of materials used for human health. There are five companies along the Atlantic Coast that process horseshoe crab blood for use in manufacturing Limulus Amebocyte Lysate (LAL): Associates of Cape Cod, Massachusetts; Lonza (formerly Cambrex Bioscience), Limuli Laboratories, New Jersey; Wako Chemicals, Virginia; and Charles River Endosafe, South Carolina. Addendum III requires states where horseshoe crabs are collected for biomedical bleeding to collect and report total collection numbers, crabs rejected, crabs bled (by sex) and to characterize mortality.

The Plan Review Team (PRT) annually calculates total coastwide collections and estimates mortality associated with biomedical use. In 2020, 697,025 crabs were collected coastwide solely for biomedical bleeding[1] (Table 2).

[1] This does not include bait crabs that were borrowed for bleeding and then returned to the bait market; these are counted against state bait quotas. The dual use of horseshoe crabs harvested for bait is encouraged as a conservation tool. Facilities that bleed horseshoe crabs to manufacture LAL can utilize crabs from the bait market in what is often referred to as the "rent a crab" program. Permitted bait harvesters and/or dealers can "rent" crabs caught for the bait industry to the bleeding facility; these crabs are returned to the bait vendor after bleeding.

Figure 2. Number of horseshoe crabs harvested for bait and collected for biomedical purposes, 1998-2020.



*Biomedical collections are annually reported to the Commission and include all horseshoe crabs brought to bleeding facilities except those that were harvested as bait, "rented" by biomedical facilities and counted against state bait quotas.
*Most of the biomedical crabs collected are returned to the water after bleeding; a 15% mortality rate is assumed for all bled crabs that are released. This number plus observed mortality reported annually by bleeding facilities via state compliance reports equals the 'Estimated Biomedical Mortality.'

This represents an 11.8% increase from 2019. Males accounted for 60% of total biomedical collections and females comprised 40%. Some crabs were rejected prior to bleeding due to mortality, injuries, slow movement, and size (mortality observed while crabs were going through the biomedical process is included under 'Observed Mortality' in Table 2). Approximately 1.3% of crabs collected solely for biomedical purposes were observed and reported as dead from the time of collection up to the point of bleeding.

During the 2019 benchmark stock assessment, literature estimates were analyzed to estimate post-bleeding mortality. Although many of these studies did not implement biomedical best practices, these values are the only available estimates of mortality experienced after bleeding. Post-bleeding mortality was estimated at 15%. Tagging data was used in the assessment to compare survivorship between crabs that were and were not bled. These results indicated

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These crabs are caught under bait permits, are counted against the bait quota of the state of origin, and must comply with that state's regulations for bait harvest. The dual use of crabs in this program can reduce overall harvest, may decrease overall mortality, can provide the LAL manufacturers with an additional source of raw material, and may offer harvesters and dealers opportunity within this secondary market.

some decrease in short-term survivorship, but greater long-term survivorship for bled crabs. These results are likely attributable to the culling process used by biomedical facilities to select healthy crabs for bleeding.

Post-bleeding mortality, calculated as 15% of the number of bled biomedical-only crabs (not from the bait market), for 2020 was estimated as 97,432 crabs. Total mortality (observed mortality plus post-bleeding mortality) of biomedical crabs for 2020 was estimated as 106,339 crabs. This represents approximately 26% of the 2020 total directed use mortality (399,319 crabs), which includes both total biomedical mortality and removals for bait (excluding bait landings from MA).

The 1998 FMP established a biomedical mortality threshold of 57,500 crabs that, if exceeded, requires the Board to consider management action. This threshold was exceeded in 2020. Results of the 2019 Benchmark Stock Assessment indicate that levels of biomedical mortality prior to 2017 (the terminal year of data used in the assessment), which were relatively consistent between 2013-2018 (with the exception of 2016), did not have a significant effect on horseshoe crab population estimates or fishing mortality in the Delaware Bay region. However, the average biomedical mortality in the last three years has been about 40% higher than the 2013-2017 average.

Table 2. Numbers of horseshoe crabs collected, bled, and estimated mortality for the biomedical industry. Numbers shown are for crabs collected solely for biomedical use. Mortality of bled crabs that later enter the bait industry is included in bait harvest.

Year	Crabs Collected	Crabs Bled	Post-Bleeding Mortality	Observed Mortality	Total Mortality
2010	480,914	412,781	61,917	6,829	68,746
2011	545,164	486,850	73,028	24,139	97,166
2012	541,956	497,956	74,693	7,370	82,063
2013	464,657	440,402	66,060	5,447	71,507
2014	467,897	432,340	64,851	5,658	70,509
2015	494,123	464,506	69,676	5,362	75,038
*2016**	344,495	318,523	47,778	1,004	48,782
2017	483,245	444,115	66,617	6,056	72,674
2018	510,407	479,142	71,871	5,588	77,459
2019	637,029	589,361	88,404	12,789	101,193
2020	697,025	649,546	97,432	8,907	106,339

***Some biomedical collections were reduced in 2016 due to temporary changes in production.**

IV. Status of Research and Monitoring

The Horseshoe Crab FMP set forth an ambitious research and monitoring strategy in 1999 and again in 2004 to inform future management decisions. Despite limited time and funding there are many accomplishments since 1999. These accomplishments were largely made possible by forming partnerships between state, federal and private organizations, and the support of hundreds of public volunteers.

Addendum III Monitoring Program

Addendum III requires affected states to carry out three monitoring components:

1. All states who do not qualify for *de minimis* status report monthly harvest numbers and subsample a portion of the catch for sex and harvest method. In addition, those states with annual landings above 5% of the coastwide harvest report all landings by sex and harvest method. Although states with annual landings less than 5% of annual coastwide harvest are not required to report landings by sex, the PRT recommends all states require sex-specific reporting for horseshoe crab harvest.
2. States with biomedical collections are required to monitor and report collection numbers and mortality associated with the transportation and bleeding of the crabs.
3. States must identify spawning and nursery habitat along their coasts. All states have completed this requirement, and a few continue active monitoring programs.

Virginia Tech Research Projects

The Virginia Tech Horseshoe Crab Trawl Survey (VT Survey) was not conducted in 2013-2015, due to a lack of funding, but was conducted in 2016-2020, and is in progress for 2021. The 2020 survey began in early August, earlier than most years to accommodate the increased frequency of fall storms, and continued through early September. The average bottom temperature was the highest seen in the time series.

In the coastal Delaware Bay area (DBA), stratified mean catches-per-tow for all demographic categories (immature, newly mature, and mature females and males) were relatively consistent from 2016 to 2018, but showed variations in the two most-recent years. Stratified mean catches of mature females and males have been variable over the time-series, but are significantly correlated. Both mature females and males were relatively less abundant in 2019 and more abundant in 2020 than in the previous five years. Yearly trends from the delta- and normal-distribution models followed similar patterns for all demographic groups. Mean catches of newly mature males generally are correlated with mean catches of newly mature females the following year from 2002-2018. In the two recent years, the trend of newly mature females and males are quite different. By adding results in 2019 and 2020, the correlations are no longer statistically significant, potentially due to low mean catches of newly mature females in 2019 and 2020. Mature males are typically more than twice as numerous as mature females throughout the survey time-series, however, the ratio of newly mature males to females is highly variable. This may reflect sampling effects, temporal variability in recruitment to the newly mature class relative to survey period, or differences in year-class abundance because females are believed to mature a year later than males. There has been a continued slight but detectable decreasing trend in the mean prosomal widths of mature and newly mature male and female crabs in the DBA survey over time, which continued through the 2020 survey.

In the lower Delaware Bay (LDB) survey mean catches of immature female and male crabs and newly mature female crabs in 2019 and 2020 were the lowest for the time-series. Mean catches of mature females were lower than in 2019 and further decreased in 2020, and both the male and females in all the three maturity groups were low in 2020. Sex ratios (M:F) of mature

horseshoe crabs were higher within the lower Delaware Bay than on the coast, which may reflect a tendency for male horseshoe crabs to remain near the spawning beaches. Decreasing trends in mean prosomal width were observed for mature females and males in the LDB survey, but an increasing trend was detected for newly mature males.

The Adaptive Resource Management (ARM) Working Group will use the indices from this survey to estimate horseshoe crab abundance for the ARM model, which specifies harvest limits for the upcoming year. The VT Survey for 2021 is currently in progress, although it began in early August to accommodate expected poor weather. Funding sources beyond 2021 continue to be explored.

Spawning Surveys

The redesigned Delaware Bay spawning survey was completed for the twenty-second consecutive year in 2020, although the number of beaches was greatly reduced due to field work restrictions associated with the COVID-19 pandemic. Five beaches in Delaware and one beach in New Jersey experienced limited sampling effort in 2020. The index of female spawning activity calculated from limited data suggests that spawning peaked during the third lunar period (June 3- June 7). The index of spawning activity was not reported due to biases associated with the spatial and temporal truncation of the survey in 2020.

Tagging Studies

The USFWS continues to maintain a toll-free telephone number and a website for reporting horseshoe crab tag returns and assists interested parties in obtaining tags. Tagging work continues to be conducted by biomedical companies, research organizations, and other parties involved in outreach and spawning surveys. Beginning with the 2013 tagging season, additional efforts were implemented to ensure that current tagging programs are providing data that benefits the management of the coastwide horseshoe crab population. All existing and new tagging efforts are required to submit an annual application to be considered for the USFWS tagging program and all participants must submit an annual report along with their tagging and resighting data to indicate how their tagging program addresses at least one of the following objectives: determine horseshoe crab sub-population structure, estimate horseshoe crab movement and migration rates, and/or estimate survival and mortality of horseshoe crabs. The PRT recommends all tagging programs approved by the states coordinate with the USFWS tagging program, in order to ensure a consistent coastwide program to support management.

Since 1999, over 373,000 crabs have been tagged and released through the USFWS tagging program along the Atlantic coast. Crabs have been tagged and released from every state on the Atlantic Coast from Florida to New Hampshire. In the early years of the program, tagging was centered around Delaware Bay; however, in recent years, tagging has expanded and increased in Long Island Sound and the Southeast. Tagging information from this database has been used in the 2019 Benchmark Stock Assessment to define stock structure, estimate total mortality, and characterize impacts of biomedical use on crab mortality.

New York Region Monitoring

Following the 2019 Benchmark Stock Assessment, which characterized the status of the horseshoe crab population in the New York region as "Poor", the Board directed the PRT to monitor fishery-independent surveys in this area to track progress of state management actions toward improving this regional population. During the assessment, five surveys were included in the ARIMA model to characterize this population. One of these, the Northeast Area Monitoring and Assessment Program (NEAMAP), includes sample areas outside of the New York region, making it too data-intensive to specify the regional index on an annual basis. The most recent information from the state-conducted surveys used in the assessment is summarized below, but can be viewed in greater detail in the Connecticut and New York state compliance reports. The Western Long Island (WLI) Little Neck Bay and Manhasset Bay seine surveys were combined in the assessment to form a single index, but are shown below separately. None of these beach seine surveys were completed in 2020 due to the COVID-19 pandemic. Figures 3-7 show the annual index for each survey over the time series until 2019.

Connecticut

- Long Island Sound Trawl (Fall) – 2020 index – **Due to the COVID-19 pandemic the LIS Trawl Survey did not take place. Sampling for LIS Trawl Survey was not authorized until Spring 2021.**

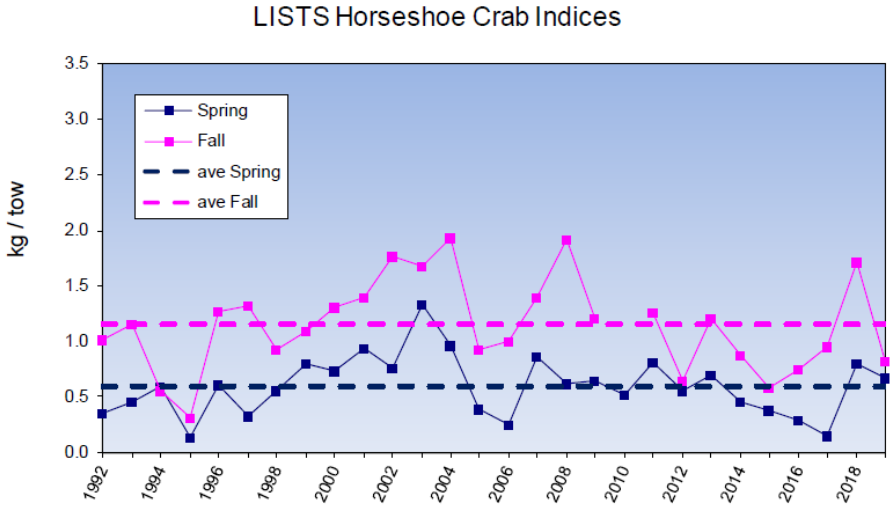

Figure 3. LISTS Horseshoe Crab Indices, 1992-2019.

New York

- Peconic Trawl – 2020 index = 0.05 (delta distribution average catch per unit effort [CPUE]), decrease from 2019, below 2010-20 average. **The 2020 mean is the lowest value in the time series, but the survey did not sample in May, which is one of the months with highest horseshoe crab catch.**

- WLI Jamaica Bay Seine (all horseshoe crabs) – **In 2020 sampling did not begin until July due to the COVID-19 pandemic. Therefore, there is no abundance index for 2020.** 2019 index = 0.23 (geometric mean), decrease from 2018, below 2010-19 average (0.32).
- WLI Little Neck Bay Seine (all) – **In 2020 sampling did not begin until July due to the COVID-19 pandemic. Therefore, there is no abundance index for 2020.** 2019 index = 0.88 (geometric mean), decrease from 2018, below 2010-19 average (1.16).
- WLI Manhasset Bay Seine (all) – **In 2020 sampling did not begin until July due to the COVID-19 pandemic. Therefore, there is no abundance index for 2020.** 2019 index = 0.68 (geometric mean), decrease from 2018, below 2010-19 average (0.65).

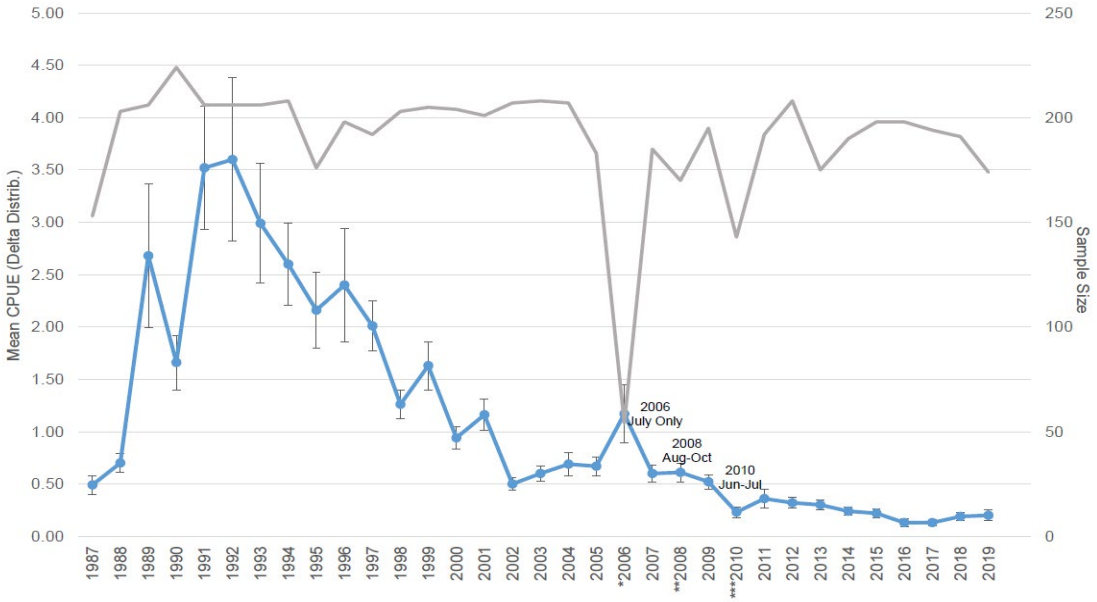

Figure 4. Peconic Bay Trawl Survey: May through July, 1987-2019. (gray line=sample size, blue line=mean CPUE)

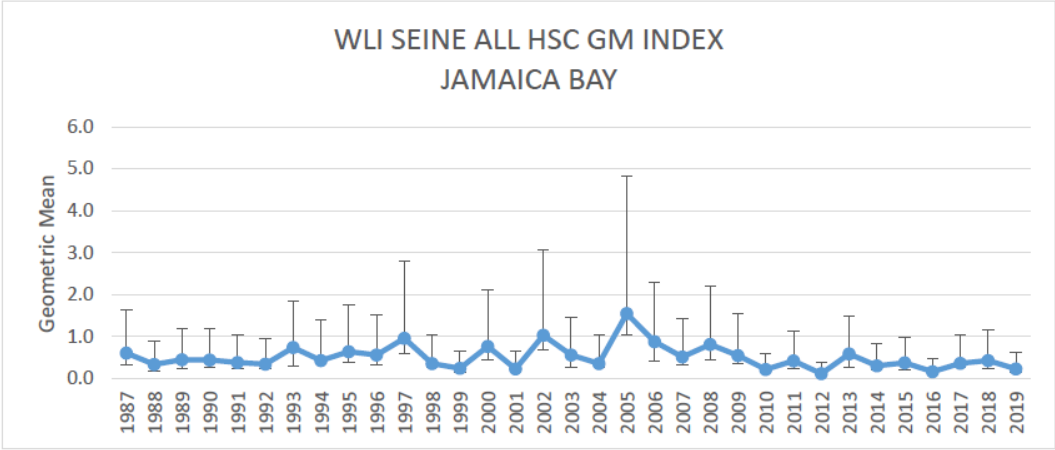

Figure 5. NYSDEC WLI Beach Seine Survey All Horseshoe Crab GM Index, 1987-2019.

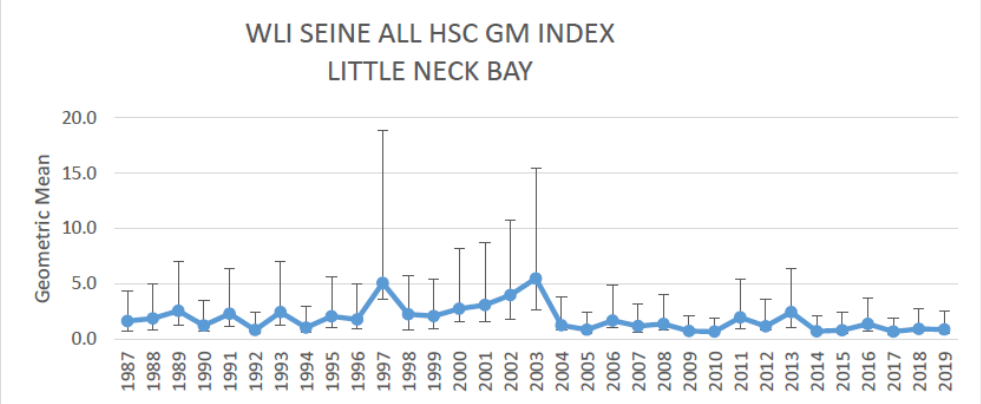

Figure 6. Little Neck Bay Seine Survey All Horseshoe Crab GM Index, 1987-2019.

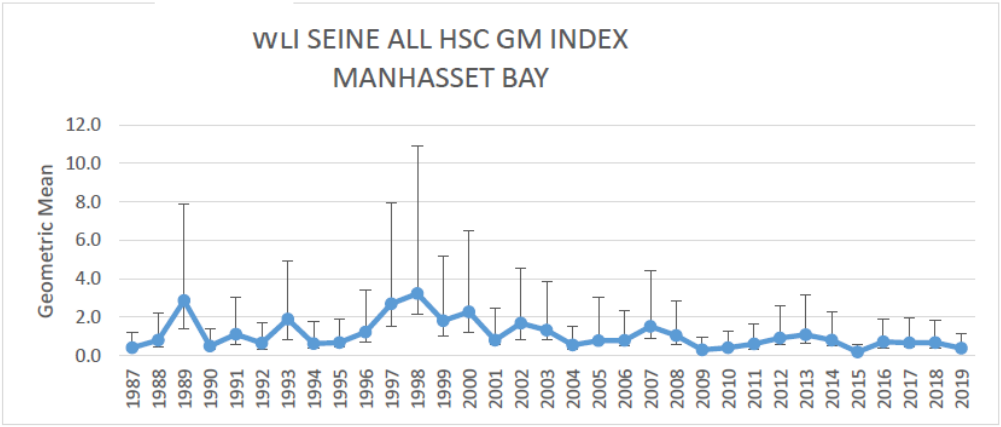

Figure 7. Manhasset Bay Seine Survey All Horseshoe Crab GM Index, 1987-2019.

V. Status of Management Measures and Issues

ASMFC

Initial state harvest quotas were established through Addendum I. Addendum III outlined the monitoring requirements and recommendations for the states. Addendum IV set harvest closures and quotas, and other restrictions for New Jersey, Delaware, Maryland, and Virginia, which were continued in Addendums V and VI.

In February 2012 the Board approved Addendum VII to implement the ARM Framework; it was implemented in 2013. Addendum VII includes an allocation mechanism to divide the Delaware Bay optimized harvest output from the ARM Framework among the four Delaware Bay states (New Jersey, Delaware, Maryland, and Virginia east of the COLREGS). Season closures and restrictions present within Addendum VI remain in effect as part of Addendum VII.

State-specific charts outlining compliance and monitoring measures are included in Section VII. With the exception of required sampling that was not completed due to the COVID-19 pandemic, the PRT finds that all other jurisdictions appear to be in compliance with the FMP

and subsequent Addenda in 2020. Minor changes to the state compliance reports requested by the PRT are below:

- Massachusetts should provide report to ASMFC by required deadline.
- Connecticut report should include monthly totals for bait harvest. Only annual totals were provided.
- PRFC should clearly state if any scientific use permits were issued.

Changes to State Regulations

Massachusetts

- In April 2020, Massachusetts implemented an open entry trip limit of 75 horseshoe crabs for mobile gear fishermen that do not possess a horseshoe crab permit.
- Mobile gear fishermen were exempted from mobile gear "no-fishing days" (Fridays and Saturdays during the fluke season) beginning on October 9, 2020, which allowed for the taking of horseshoe crabs as bycatch.

Rhode Island

- In 2020 the establishment of biomedical quota changed to include consultation with biomedical facilities: "Quota: Established annually after consultation with permitted biomedical facilities; not to exceed the total allowable harvest as determined by DMF based on the current stock status"
- New regulation was also added to require best management practices in transport of horseshoe crabs to and from biomedical facilities: "Horseshoe crabs must be transported to and from a biomedical facility in a temperature-controlled vehicle at or below seventy degrees Fahrenheit (70˚ F). Containers of crabs must be secured and at most two thirds (2/3) full."

New York

- Five-day lunar closures around the full moon in May and the new moon in June were implemented for 2021, and the initial trip limit was dropped to 150 crabs in period 2.

Alternative Baits

Trials testing effectiveness of alternative baits to horseshoe crab for the American eel and whelk fisheries have previously been conducted. Additionally, a survey of bait usage in the eel and whelk fisheries was conducted in 2017. This survey is available at: http://www.asmfc.org/uploads/file/5a04b785HSC_BaitSurveyTCReport_Oct2017.pdf.

Shorebird

The USFWS received petitions in 2004 and 2005 to emergency list the red knot under the Endangered Species Act. In fall 2005, it determined that emergency listing was not warranted at the time. As part of a court settlement, the USFWS agreed to initiate proposed listings of over 200 species, including the red knot. In fall 2013, the USFWS released a proposal for listing the red knot as threatened. In January 2015 the USFWS designated the red knot as threatened under the Endangered Species Act.

The red knot has been listed as an endangered species in the state of New Jersey since 2012.

VI. PRT Recommendations and Research Needs

De Minimis

States may apply for *de minimis* status if, for the last two years, their combined average horseshoe crab bait landings (by numbers) constitute less than one percent of coastwide horseshoe crab bait landings for the same two-year period. States may petition the Board at any time for *de minimis* status, if their fishery falls below the threshold level. Once *de minimis* status is granted, designated States must submit annual reports to the Board justifying the continuance of *de minimis* status.

States that qualify for *de minimis* status are not required to implement any horseshoe crab harvest restriction measures, but are required to implement components A, B, E and F of the monitoring program (Section 3.5 of the FMP; further modified by Addendum III). Since *de minimis* states are exempt from a harvest cap, there is potential for horseshoe crab landings to shift to *de minimis* states and become substantial, before adequate action can be taken. To control shifts in horseshoe crab landings, *de minimis* states are encouraged to implement one of the following management measures:

1. Close their respective horseshoe crab bait fishery when landings exceed the *de minimis* threshold;
2. Establish a state horseshoe crab landing permit, making it only available to individuals with a history of landing horseshoe crabs in that state; or
3. Establish a maximum daily harvest limit of up to 25 horseshoe crabs per person per day. States which implement this measure can be relieved of mandatory monthly reporting, but must report all horseshoe crabs harvests on an annual basis.

The following states have been removed from the Management Board since its formation: Pennsylvania (2007), Maine (2011), and New Hampshire (2014). South Carolina, Georgia, and Florida are requesting *de minimis* status for the 2021 fishing season based on the 2019-20 season landings and meet the FMP requirements for being granted this status (Table 1). The PRT recommends granting these jurisdictions *de minimis* status.

Biomedical Threshold

In 2020, total biomedical mortality exceeded the FMP's mortality threshold of 57,500 crabs, which requires the Board to consider management action. This threshold has been exceeded in 13 of the last 14 years. The PRT has noted previously that the results of the 2019 Benchmark Stock Assessment indicated recent levels of biomedical use did not result in mortalities that would significantly alter population status. However, biomedical mortality in 2019 and 2020 was higher than the average biomedical mortality between 2009 and 2018.

Funding for Research and Monitoring Activities
The PRT strongly recommends the funding and continuation of the VT benthic trawl survey. This effort provides a statistically reliable estimate of horseshoe crab relative abundance that is essential to continued ARM implementation and use of the CMSA stock assessment model.

Discard Mortality Estimation
Results of the 2019 Benchmark Stock Assessment indicate that discard mortality may be significant, of similar or greater magnitude than bait harvest. The Review Panel's report indicated that these estimates could be further refined to reduce their uncertainty and more precisely characterize this mortality source. The PRT recommends the Board take steps to increase access to and use of data from the NEFOP, allowing for improved monitoring and estimation of discard mortality.

Improvement of the New York Regional Population
Results of the 2019 Benchmark Stock Assessment indicate a "Poor" status for the New York regional population, due to negative trends in regional abundance indices. New York and Connecticut have indicated that they will take actions within their states to improve this population. The PRT recommends that the Board encourage such actions to continue so that this population's status may improve.

The PRT will continue to annually report regional indices of abundance so that progress of management actions may be tracked through the annual FMP Reviews. The PRT notes that sampling for the Fall CT Long Island Sound Trawl Survey, Jamaica Bay Seine Survey, Little Neck Bay Seine Survey, and the Manhasset Bay Seine Survey was significantly decreased or not completed due to the COVID-19 pandemic.

VII. State Compliance and Monitoring Measures

MASSACHUSETTS		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	**Report Not Provided**	**Report Not Provided**
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	330,377 (165,000)	330,377 (165,000)
- Other Restrictions	Bait: 300 crab daily limit year round; limited entry; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit Mobile gear: 75 crab trip limit, exempted from "no-fishing days" starting 10/9/2020; All: May and June 5-day lunar closures; 7" PW minimum size; Pleasant Bay Closed Area	Bait: 300 crab daily limit year round; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit All: May and June 5-day lunar closures; No mobile gear harvest Fri-Sat during summer flounder season; 7" PW minimum size; Pleasant Bay Closed Area
- Landings	**163,695**	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes, plus weekly dealer reporting through SAFIS	Yes, plus weekly dealer reporting through SAFIS
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	**Not conducted due to COVID-19.**	Yes
Monitoring Component B_3 Implement spawning survey	Yes. Several beaches did not participate due to COVID-19.	Yes
Monitoring Component B_4 Tagging program	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay

RHODE ISLAND		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not request *de minimis*	Did not request *de minimis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	26,053 (8,398)	26,053 (8,398)
- Other Restrictions	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1-May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May. - Biomedical quota and best management practices	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1-May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May - Biomedical quota and best management practices
- Landings	Confidential	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes, weekly call in and monthly on paper	Yes, weekly call in and monthly on paper
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes, details within Massachusetts' biomedical reports	Captured in Massachusetts' biomedical reports
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes, since 2000 (methods unspecified)	Yes
Monitoring Component B_4 Tagging program	State Wildlife Grant for 2020-2021 tagging program in collaboration with University of Rhode Island.	State Wildlife Grant for 2020-2021 tagging program in collaboration with URI. Status unknown beyond 2021.

CONNECTICUT		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	48,689	48,689
- Other Restrictions	Limited entry program, possession limits, and seasonal and area closures	Limited entry program, possession limits, and seasonal and area closures
- Landings	15,942	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes, but only annual totals were reported.	Yes
- Characterize commercial bait fishery	No – exempt under Addendum III because landings are < 5% of coastwide total	No – exempt under Addendum III because landings are < 5% of coastwide total
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	**LIS Trawl Survey did not take place due to COVID-19.**	Yes
Monitoring Component B_3 Implement spawning survey	Yes, since 1999 (methods differ from DE Bay survey)	Yes
Monitoring Component B_4 Tagging program	Yes, in collaboration with local universities (Sacred Heart University since 2015)	Yes

NEW YORK		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	366,272 (150,000)	366,272 (150,000)
- Other Restrictions	Ability to close areas to harvest; seasonal quotas and daily harvest limits	Ability to close areas to harvest; seasonal quotas and daily harvest limits - Five-day lunar closures around the full moon in May and the new moon in June. -Initial trip limit dropped to 150 crabs in period 2.
- Landings	63,367	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes. (Unable to sample in May 2020 due to COVID-19)	Yes
Monitoring Component B_3 Implement spawning survey	Yes. Due to COVID-19 only 8 long-term sites were monitored by DEC, CCE and Stony Brook University staff.	Yes
Monitoring Component B_4 Tagging program	Yes	Yes

NEW JERSEY		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not request *de miminis*	Does not request *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary state quota)	162,136 [male only] (0)	162,136 [male only] (0)
- Other Restrictions	Bait harvest moratorium	Bait harvest moratorium
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Not Applicable	Not Applicable
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	No. Did not complete due to COVID-19.	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Outside, independent groups currently	No
Monitoring Component B_5 Egg abundance survey	Yes, but removed as a mandatory component	Yes
Monitoring Component B_6 Shorebird monitoring program	Yes	Yes

DELAWARE		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota (State Quota)	162,136 [male only] 157,122 [male only]	162,136 [male only] 157,122 [male only]
- Other Restrictions	Closed season (January 1 – June 7); season closed early on June 16	Closed season (January 1 – June 7)
- Landings	124,803 males	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (daily call-in reports & monthly logbooks)	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes –updates once every 5 years or as needed	Yes – updates once every 5 years or as needed
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes. **Effort greatly reduced due to COVID-19.**	Yes
Monitoring Component B_4 Tagging program	No state program but has assisted in the past with various Delaware Bay horseshoe crab tagging initiatives	No
Monitoring Component B_5 Egg abundance survey	Removed as component	Removed as component
Monitoring Component B_6 Shorebird monitoring program	Yes	Yes

Note: The egg abundance survey has been discontinued as a mandatory monitoring element. Delaware will include information on the survey if it continues, but is no longer required to perform the survey.

MARYLAND		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	255,980 (male only)	255,980 (male only)
- Other Restrictions	Delayed harvest and closed season/area combinations, catch limits	Delayed harvest and closed season/area combinations, catch limits
- Landings	61,165 males	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (weekly reports for permit holders; monthly for non-permit holders)	Yes (weekly reports for permit holders; monthly for non-permit holders)
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Yes – through biomedical use	Yes – through biomedical use

POTOMAC RIVER FISHERIES COMMISSION		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2019.	*De minimis* requested and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	No horseshoe crab fishery	No horseshoe crab fishery
- Daily possession limit <25 for *de minimis* state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	0
Monitoring Component A_1		
- Mandatory monthly reporting	Yes - weekly	Yes - weekly
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Not Applicable	Not Applicable
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Not Applicable	Not Applicable
Monitoring Component B_3 Implement spawning survey	Not Applicable	Not Applicable
Monitoring Component B_4 Tagging program	Not Applicable	Not Applicable

VIRGINIA		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de miminis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	172,828 (81,331 male-only east of COLREGS line)	172,828 (81,331 male-only east of COLREGS line)
- Other Restrictions	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.
- Landings	24,031 (14,490 males)	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	No permits issued in 2020	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Yes – completed	No
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	No	No
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

NORTH CAROLINA		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	Did not qualify for *de miminis*	Does not qualify for *de minimis*
Bait Harvest Restrictions and Landings		
- ASMFC Quota	24,036	24,036
- Other Restrictions	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.
- Landings	13,463	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes – trip level reporting each month	Yes – trip level reporting each month
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Little information available; Survey discontinued after 2002 and 2003 due to low levels of crabs recorded	Not specified
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

SOUTH CAROLINA		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2020.	*De minimis* requested for 2021 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	No horseshoe crab bait fishery	No horseshoe crab bait fishery
- Daily possession limit <25 for *de minimis* state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes (Biomedical)	Yes (Biomedical)
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A_2		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A_3 Identify spawning and nursery habitat	Completed	No
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes. **Sampling effort reduced due to COVID-19.**	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	Yes	Yes

GEORGIA		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2020.	*De minimis* requested for 2021 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	Yes	Yes
- Daily possession limit <25 for *de minimis* state	25/person; 75/vessel with 3 licensees	25/person; 75/vessel with 3 licensees
- HSC landing permit	Must have commercial shrimp, crab, or whelk license; LOA permit required	Must have commercial shrimp, crab, or whelk license; LOA permit required
Bait Harvest Restrictions and Landings		
- ASMFC Quota	29,312	29,312
(State Quota)	29,312	29,312
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No bait landings	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Completed	Not Applicable
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	No	No
Monitoring Component B_4 Tagging program	No	No

FLORIDA		
	2020 Compliance	**2021 Management Proposal**
***De minimis* status**	*De minimis* status granted in 2020.	*De minimis* requested for 2021 and meets criteria.
- Ability to close fishery if *de minimis* threshold is reached	Yes	Yes
- Daily possession limit <25 for *de minimis* state	25/person w/ valid saltwater products license; 100/person with marine life endorsement	25/person w/ valid saltwater products license; 100/person with marine life endorsement
- HSC landing permit	See above	See above
Bait Harvest Restrictions and Landings		
- ASMFC Quota	9,455	9,455
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A_1		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No	Yes
Monitoring Component A_2		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A_3 Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B_1 Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2020	Yes, VT Trawl Survey will be conducted in 2021; future years and spatial scope unknown at this time
Monitoring Component B_2 Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B_3 Implement spawning survey	Yes	Yes
Monitoring Component B_4 Tagging program	No	No