

Fishery Management Report No. 32b
of the

Atlantic States Marine Fisheries Commission



**Addendum II to the Interstate Fishery Management Plan for
Horseshoe Crab**

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Acknowledgements

This Addendum was prepared by the Commission's Horseshoe Crab Plan Development Team, composed of: Stewart Michels, Delaware Department of Natural Resources and Environmental Control; Thomas O'Connell, Maryland Department of Natural Resources; Paul Perra, National Marine Fisheries Service; and Eric Schrading, U.S. Fish and Wildlife Service. The Horseshoe Crab Management Board approved the Addendum on April 24, 2001.

Addendum II
to the
Atlantic States Marine Fisheries Commission
Fishery Management Plan for Horseshoe Crab

1. INTRODUCTION

In April 2001, the Atlantic States Marine Fisheries Commission (ASMFC) Horseshoe Crab Management Board approved Addendum II to the Interstate Fishery Management Plan for Horseshoe Crab (HSC FMP). The purpose of the Addendum is to provide for the voluntary transfer of harvest quotas between states to alleviate bait shortages on a biologically responsible basis. Voluntary quota transfers will require Technical Committee review and Management Board approval.

The framework for managing horseshoe crabs along the Atlantic coast was approved in October 1998 with the adoption of the HSC FMP. This FMP required the States of Maryland, Delaware and New Jersey to maintain their current horseshoe crab harvest reduction strategies, and required all states to implement certain horseshoe crab research and monitoring programs in an effort to facilitate future management decisions.

In February 2000, the Horseshoe Crab Management Board approved Addendum I to the HSC FMP. Addendum I established a state-by-state cap on horseshoe crab bait landings at 25 percent below the reference period landings beginning in 2000, and *de minimis* criteria for those states with a limited horseshoe crab fishery. Those states with more restrictive harvest levels (Maryland and New Jersey) are 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 by NMFS in the area recommended by ASMFC on March 7, 2001. NMFS will consider developing a proposal to prohibit the transfer of horseshoe crabs in federal waters in 2001.

2. STATEMENT OF PROBLEM

Addendum I to the HSC FMP provides for a 25 percent reduction in each state's horseshoe crab bait landings. Unilateral regulatory actions taken in Maryland and New Jersey that are encouraged by Addendum I have resulted in harvest caps that yield a greater than 25 percent reduction. States that have traditionally imported crabs from these states may have difficulty obtaining enough crabs to meet their bait demand. Quota transfers could alleviate bait shortages, but must be considered on a biologically responsible basis. There are no provisions under Addendum I to allow for quota transfers. Therefore, the Horseshoe Crab Management Board approved the development of Addendum II to the HSC FMP to establish a mechanism for the responsible and voluntary transfer of quota between states.

Consideration of quota transfers is complicated by recent findings that the horseshoe crab population along the East Coast of the United States may be comprised of more than one discrete population (stock). Pierce *et al.* (2000) using DNA analysis found that upper Chesapeake Bay and Delaware Bay horseshoe crabs are genetically distinct. Shuster (1979) suggested that each major estuary along the eastern coast of the United States has a relatively discrete population based on external morphology. Riska (1981) also found significant variation in size and shape from seven localities along the eastern United States. This suggests the existence of numerous stocks or sub-populations. Transferring quota from a region with a large horseshoe crab population to a region with a small population could threaten the smaller stock. It is for this reason that quota transfers should occur within a population and must be predicated on stock delineation and estimates of stock size.

Quota transfers should also be evaluated for their impact on competing uses, especially migratory shorebird populations and the biomedical industry. Migratory shorebird populations in the Delaware Bay are present due to a superabundance of horseshoe crab eggs (ASMFC 1998). This superabundance of eggs may require a surplus of horseshoe crabs beyond what is necessary to sustain the horseshoe crab population within that region. Further, the use of horseshoe crabs by the biomedical industry to manufacture *Limulus* Amoebocyte Lysate (LAL) should be considered. LAL is the current worldwide standard for testing drugs and other pharmaceuticals for bacterial endotoxins. The importance of LAL to human health warrants consideration of the potential impacts of a quota transfer on the biomedical fishery. The impacts of a quota transfer on migratory shorebirds, the biomedical industry, as well as other competing uses should be evaluated before a quota transfer is granted.

Development of Addendum II to the HSC FMP should provide an opportunity to better address the bait needs of whelk and eel pot fishermen. However, quota transfers must not unduly impact horseshoe crab populations or its competing uses.

3. DISTRIBUTION OF ATLANTIC COAST HORSESHOE CRAB POPULATIONS

The North Atlantic horseshoe crab has an extensive geographical distribution, ranging from Maine to the Gulf of Mexico. Horseshoe crabs have been reported to be most abundant from New Jersey to Virginia with their center of abundance being around Delaware Bay. The management of the horseshoe crab resource through a quota system is complicated by the fact that there is currently a lack of information to determine the degree to which the horseshoe crab population(s) along the Atlantic coast are an independent or dependent related stock.

The USGS-Biological Resources Division is presently conducting a study of variation at neutral genetic loci in the horseshoe crab with the specific goal of identifying microsatellite DNA variation among horseshoe crabs collected from spawning habitat from Maine to Florida. Tissue samples from horseshoe crab populations in 9 Atlantic coast states (minimum of 50 samples per collection) have already been collected, and arrangements are being made to collect horseshoe crabs from the other states. To the extent that population cohesion can be identified, populations that are reproductively

isolated into distinct stocks will be identified. The findings of this research will be promptly reported to ASMFC and subjected to peer review.

It is anticipated that the findings from this research will be immediately applicable to the identification of appropriate management units to allow an informed response to requests for quota transfers.

4. MANAGEMENT PROGRAM SPECIFICATIONS

For a detailed description of the coastwide requirements, prohibited actions, and other compliance measures that are applicable to the Interstate Horseshoe Crab FMP refer to *Fishery Management Report No. 32 of the Atlantic States Marine Fisheries Commission: Interstate Fishery Management Plan for Horseshoe Crab*, and *Fishery Management Report No. 32a of the Atlantic States Marine Fisheries Commission: Addendum I to the Fishery Management Plan for Horseshoe Crab*.

The provisions in this section may be changed in order to meet the goal and objectives specified in Section 2 of the HSC FMP. Any changes made to Addendum II will be done through adaptive management procedures in accordance to Section 4.5 of the HSC FMP.

4.1 Management for Voluntary State to State Quota Transfers

It is permissible for states to petition the Management Board for a voluntary quota transfer between states.

Transfer requests must follow the procedures for review and approval of state-to-state quota transfers contained in Section 4.2 of this Addendum.

4.2 Procedures for Review and Approval of State to State Quota Transfers

- (a) A state may submit a proposal for a state-to-state quota transfer pursuant to Addendum II of the FMP to the ASMFC. The voluntary quota transfer must be agreeable to both states identified in the proposal. The proposed quota transfer shall be submitted to the ASMFC staff, who will distribute the proposal to the Management Board, the Plan Review Team, the Technical Committee, and the Advisory Panel.
- (b) The Technical Committee and Management Board in their review of each proposal for a state-to-state quota transfer shall take into consideration the following:
 - (i) Amount of transfer being requested;
 - (ii) Amount of all previous transfers approved in that calendar year;
 - (iii) Impact that the transfer will have on the Atlantic coast horseshoe crab population(s) as determined by genetic studies that have passed the peer review process conducted by or through the Atlantic States Marine Fisheries

Commission;

- (iv) Impact that the transfer will have on shorebird populations; and
 - (v) Impact that the transfer will have on the biomedical industry.
- (c) The Plan Review Team is responsible for gathering the comments of the Technical Committee and the Advisory Panel, and presenting these comments to the Management Board for action.
- (d) The Management Board will review each state quota transfer proposal on a case-by-case basis taking into consideration the criteria outlined in (b) of this Section, and will approve the proposal if it determines that the quota meets the goals and objectives of the FMP.

LITERATURE CITED

- ASMFC. 1998. Stock Assessment Report No. 98-01 of the Atlantic States Marine Fisheries Commission. Terms of Reference and Advisory Report for the Horseshoe Crab Stock Assessment Peer Review. ASMFC, Washington, D.C. 15pp.
- Pierce, J.C., G. Tan and P.M. Gaffney. 2000. Delaware Bay and Chesapeake Bay populations of the horseshoe crab *Limulus polyphemus* are genetically distinct. *Estuaries*. 23(5): 690-698.
- Riska, B. 1981. Morphological variation in the horseshoe crab *Limulus polyphemus*. *Evolution*. 35(4): 647-658.
- Shuster, C.N., Jr. 1979. Session I: Biology of *Limulus polyphemus*. Pages 1 - 26 in Elias Cohen *et al.* (eds.). Biomedical applications of the horseshoe crab (Limulidae) Alan Liss, Inc. New York.