## Tina Berger

**From:** Desmond Kahn <dkahn2013@gmail.com>
**Sent:** Thursday, April 29, 2021 6:14 PM
**To:** Comments
**Subject:** [External] Document for the Shad and River Herring Management Board
**Attachments:** Negative correlation of striped bass and American shad..docx

TO the ASMFC staff, please distribute this email to the members of the above Board.

Members of the Shad and River Herring Management Board, please find an attached document that clarifies my remarks to you at your last meeting,

--
Desmond Kahn
302-368-4854

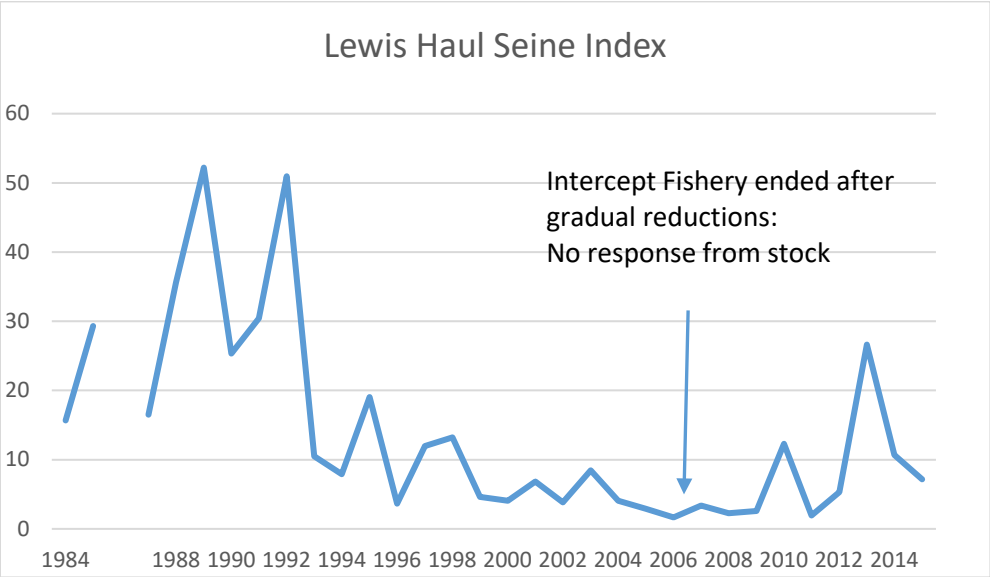
Data from the Delaware River shows that striped bass and American shad are negatively correlated.

Desmond M. Kahn, Ph.D.

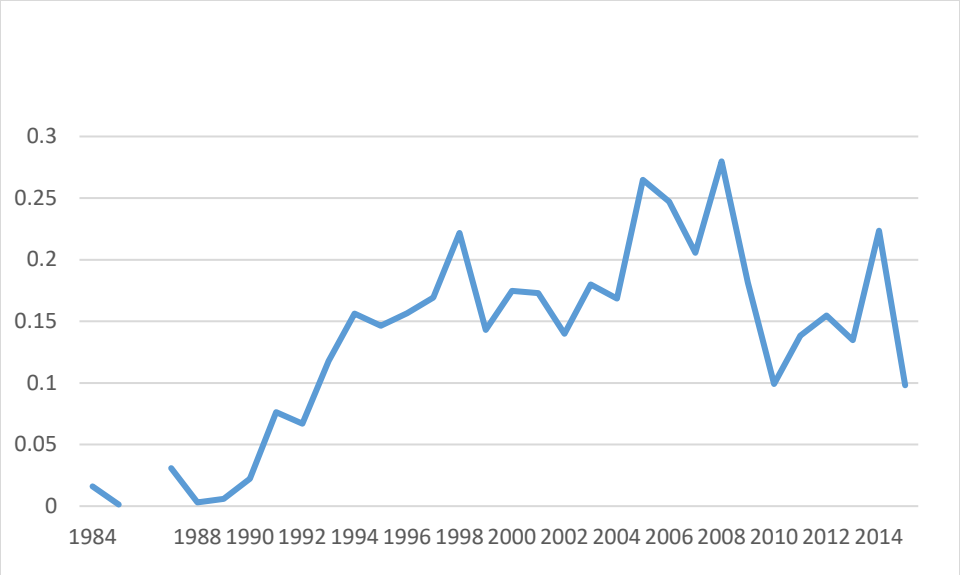
Retired, Delaware Division of Fish and Wildlife

President, Fishery Investigations

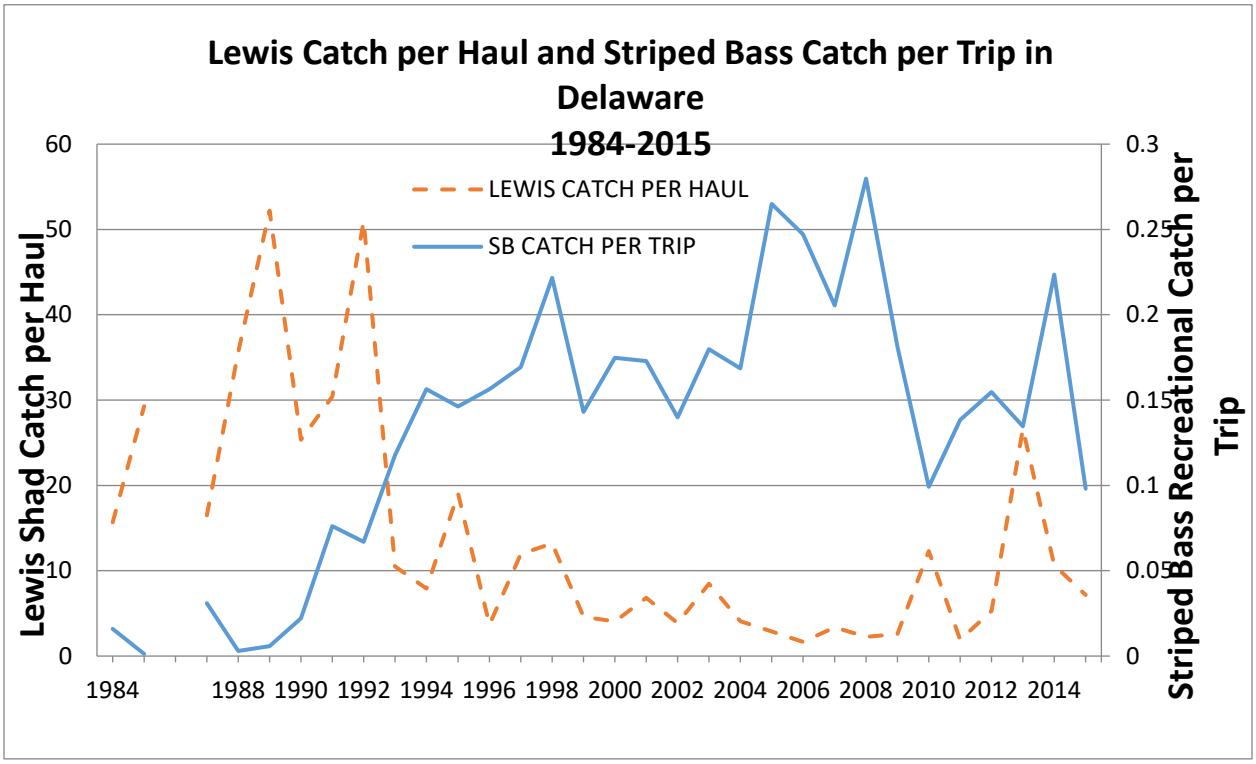
This analysis is updated from a similar one included in the 2011 American Shad sustainable fishery plan for the Delaware River. The index of shad abundance depicted here is from the Lewis haul seine fishery in the Delaware River, well above the head of tide at Trenton, New Jersey. It the average annual number of shad caught per haul of the seine. Here is the time series of the Lewis catch-per-haul from 1984 through 2015:




Here is the MRIP catch-per-trip index of striped bass from the waters of the state of Delaware; this index of relative abundance is highly correlated with the abundance of striped bass from the ASMFC striped bass stock assessment statistical catch-at-age model:




What is the relation between abundance of striped bass and abundance of American shad in the Delaware River? Here is a plot of the indices for the two species together.



There is a very highly significant negative correlation between these two indices of relative abundance. When shad were abundant in the Delaware River in the 1980s, bass were very low in abundance. As bass increased during the 1990s, shed declined. When bass peaked in the 2000s, shad were at their lowest abundance. When bass declined slightly in the 2010s, shad increased somewhat. This pattern is consistent with the hypothesis that abundance of American shad in the Delaware River is controlled by the abundance of striped bass. We know that the herring family, including shad and herring, is the primary prey of striped bass. Extensive research conducted in the Connecticut River showed that bass predation on shad and, to an even greater extent, on blueback herring controlled abundance of the alosids. These research results indicate that, with the current high abundance of striped bass, neither American shad nor blueback herring will be able to return to high abundance.