



DELaware STATE UNIVERSITY
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

11-25-06

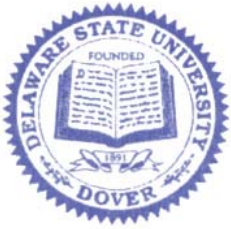
Mr. Wesley S. Patrick c/o
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Mr. Patrick,

Thank you for giving me the opportunity to review the Atlantic sturgeon Status Review Report. In general, I found the Status Review well organized and very thorough in its approach. As you are aware, much of the information concerning Atlantic sturgeon populations along the US East Coast are lacking in detail and are at times fragmentary in nature. This lack of scientific information coupled with the highly migratory nature of this species has made management of Atlantic sturgeon very difficult. I would like to commend the members of the Status Review Team (SRT) on a thoughtfully construed document that attempts to pull together all pertinent information relating to Atlantic sturgeon. As per your directions, I will try to limit my specific comments to the questions outlined below.

A: Are the distinct population segment delineations supported by the information presented and currently available?

The distinct population segments (DPS) proposed in the Status Review are separated into five groups. The New York Bight DPS includes both the Delaware and Hudson River systems. It is my understanding that recent analyses conducted by Dr. Tim King indicate a genetically distinct haplotype in adult Atlantic sturgeon collected in the Delaware River. I question why these recent findings were not included in the results shown in Table 3, and Figures 14-15? Adult (2005-2006) and juvenile (1997-1998) Atlantic sturgeon samples collected in the Delaware River appear to be included in neighbor-joining genetic tree depicted in Figure 16. Since tagging evidence suggests that site fidelity is low for juveniles, I would recommend running the analyses again with only adults from the Delaware River if sample size requirements can be met. Given the historic size and importance of the Delaware River Atlantic sturgeon population it is my belief that if the genetic evidence indicates the Delaware is genetically distinct from the Hudson River it should not be included in the same DPS.



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B: In general does the status review report include and cite the best scientific and commercial information available on the species and threats to its habitat?

Overall, the status review does a good job examining the scientific information available for Atlantic sturgeon but within the Delaware River I have some recommendations on pertinent information that the SRT may wish to examine.

- The SRT may wish to consult Cobb (1900) for a description of the Delaware River Atlantic sturgeon fishery as well as information on reported spawning areas prior to the large-scale dredging which began in 1910.
- The SRT may wish to include the record of a young-of-the-year (YOY) (342 mm) Atlantic sturgeon collected by Mr. Hal Brundage (Environmental Resource Consulting) in the Marcus Hook anchorage during February, 2005.
- Additionally, there are two other records of YOY Atlantic sturgeon collected in the Delaware River.
 - Summer 1978 Burlington Island, NJ (157-175 mm n=3)
 - Summer 1979 Pea Patch Island, DE (128mm)
- The large dams in both Pennsylvania and New York portions of the Delaware River watershed are operated as a source of drinking water and approximately 800 million gallons/day are removed. During low flow conditions, water exports are managed to allow for specific salinity regimes in the Delaware River. Under this agreement and coupled with contemporary tidal influences, it is likely that there has been a reduction in the amount of suitable fresh water habitat available to sturgeon species in the Delaware River. A discussion of the water sharing agreements, history of dredging operations and the combined influence of these two factors on tidal and salinity regimes in the Delaware River can be found in DiLorenzo et al. (1993). Their findings indicate that water diversions coupled with dredging have led to significantly greater salinity intrusions as well as increased tidal amplitude in important Atlantic sturgeon nursery grounds as well as likely spawning sites.
- In the summary and evaluation of anthropogenic impacts to the Delaware River watershed (3.1.5; page 56) the SRT should include the issue of water diversion which can impart a significant influence on the salinity regime under drought conditions.



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- It is my understanding that power generating plants along the Delaware River other than the Salem nuclear power station regularly impinge or entrain sturgeon species. Some of these events are occurring much further upstream than the Salem nuclear plant and are involving YOY sturgeons. Records of these events should be available from Ken Straight (Public Service Energy Group (PSEG)).
- The SRT should be apprised of a proposed deepening of the Delaware River navigation channel from its currently maintained depth of 40' to a depth of 50'. This proposal is being considered for implementation and may have negative impacts on Atlantic sturgeon including a loss of hard bottom habitat, increased salinity intrusion, and increased large commercial traffic which is thought to be a source of mortality for Delaware River Atlantic sturgeon.

Cobb, J.N. 1900. The sturgeon fishery of Delaware River and Bay. Report of the Commissioner, U.S. Commission of Fish and Fisheries 25:369-381.

DiLorenzo, J. L., P. Huang, M. L. Thatcher, and T. O. Najarian. 1993. Effects of historic dredging activities and water diversions on the tidal regime and salinity distribution of the Delaware Estuary. Final Report Submitted to Delaware River Basin Commission. 124pp.

C: Concerning extinction risk analysis, is the methodology used appropriate?

I question the decision by the SRT to consider “subpopulations” in their assessment of extinction risk analysis for individual DPS. As an example, the SRT determined that both the Delaware and Hudson Rivers were of enough importance to constitute a SPOIR. However the members of the SRT determined that the Hudson River Atlantic sturgeon “subpopulation” only warranted a moderate risk of extinction while the Delaware “subpopulation” warranted a moderately high risk of extinction. As I have previously mentioned in my review, I question the decision by the SRT to include both the Delaware and Hudson River Atlantic sturgeon populations under the heading of the New York Bight DPS. As outlined above, if the genetic findings based on adult Atlantic sturgeon collections for the Delaware and Hudson Rivers support genetic isolation then I would argue these two systems be considered independently and not lumped into one DPS.



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D: In general, are the scientific conclusions sound and derived logically from the results?

Overall, I think the Status Review's conclusions are sound and are derived clearly from the results. With the key change of splitting the New York Bight DPS into two DPS units (Delaware DPS and Hudson DPS) I do not see any major weakness in the document. The items noted in section B above should help clarify some of the factors influencing the Delaware River Atlantic sturgeon population.

E: Where available are opposing scientific studies or theories acknowledged and discussed?

I would like to commend the SRT in their review of the material presented in the Status Review. Although information on Atlantic sturgeon is fragmentary they have done what I consider to be a fine job in pulling all the information together into one document and presenting it in a clear manner. This has been done in such a way to present most, if not all, views on this subject matter. For the Delaware River in particular, I would urge the SRT to include the additional material I have discussed in my review.

Thanks again, for giving me the opportunity to review the Status Review. If you require any further information or would like clarification on my comments please do not hesitate to contact me.

Regards,

Dewayne Fox Ph.D.
Assistant Professor Fisheries